

**OBEY CREEK MIXED-USE DEVELOPMENT**  
**TRAFFIC IMPACT STUDY**  
**TECHNICAL MEMORANDUM #2**



Prepared for:  
The Town of Chapel Hill  
Engineering Department

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April 2014

**HNTB**

**OBHEY CREEK  
MIXED-USE DEVELOPMENT  
TRAFFIC IMPACT STUDY  
TECHNICAL MEMORANDUM #2  
2022 SITE CONCEPT ANALYSIS**



**Prepared for:**

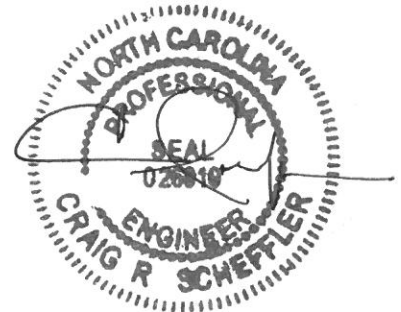
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## I. INTRODUCTION

### A. Project Overview

A new mixed-use development, tentatively named Obey Creek, is being proposed in southern Chapel Hill and will be located along US 15-501 just east of Southern Village. **Figure 1**, found in **Appendix A**, shows the general location of the site and the project study area defined for this report and agreed-upon by Town of Chapel Hill staff and the Applicant. This technical memorandum analyzes the 2022 build-out year+1 traffic conditions in the project study area and will be used as a precursor to a final preferred alternative scenario and will be included in a full traffic impact study document that will be prepared following the final preferred alternative scenario analysis. 2013 existing year study area conditions were analyzed in *Obey Creek Mixed Use Development Traffic Impact Study - Technical Memorandum #1 Existing Conditions Analysis*, submitted by HNTB in May 2013.

### B. Site Location and Study Area

This technical memorandum defines and analyzes the future transportation system in the Obey Creek project study area. The following 27 existing intersections are part of the project study area:

- NC 86 (Columbia Street) & Franklin Street
- NC 86 (S. Columbia Street) & Cameron Avenue
- NC 86 S (Pittsboro Street) & W. Cameron Avenue
- NC 86 S (Pittsboro Street) & McCauley Street
- NC 86 N (S. Columbia Street) & South Drive
- NC 86 (S. Columbia St) & Manning Drive
- NC 86 (S. Columbia St) & Mason Farm Road
- NC 86 (S. Columbia St) & NC 54 Bypass (Fordham Blvd) WB Ramps
- US 15-501 & NC 54 Bypass (Fordham Blvd) EB Ramps
- US 15-501 & Culbreth Road/Mt. Carmel Church Road
- US 15-501 & Arlen Park Drive/Bennett Road
- US 15-501 & Market Street
- US 15-501 & Southern Village Park & Ride Driveway
- US 15-501 & Dogwood Acres Drive
- US 15-501 & Smith Level Road
- Mt. Carmel Church Road & Bennett Road
- Greensboro Street & NC 54 Bypass (Fordham Blvd) WB On-Ramp/Merritt Mill Road
- Smith Level Road & NC 54 Bypass (Fordham Blvd) EB Ramps
- NC 54 Bypass (Fordham Blvd) WB Off-Ramp & Merritt Mill Road
- US 15-501/NC 54 Bypass (Fordham Blvd) & Manning Drive
- US 15-501/NC 54 Bypass (Fordham Blvd) & Old Mason Farm Road
- US 15-501 Bypass (Fordham Blvd) & NC 54 (Raleigh Rd) Interchange Ramps (4 quadrants)
- NC 54 & Burning Tree Drive/Finley Golf Course Road
- NC 54 & Hamilton Road
- Smith Level Road & Culbreth Road
- Smith Level Road & Dogwood Acres Drive
- Mt. Carmel Church Road & Old Lystra Road



The impacts of the proposed site at the study area intersections will be evaluated during the AM, noon, and PM peak hours of an average weekday, so all 2022 build-out+1 year analyses include these three peak time periods. A planning-level evaluation of daily traffic flows and capacities on study area roadway segments for future conditions will be completed in the analysis of the final design concept.

**C. Site Description**

The Obey Creek site is currently a heavily wooded parcel with several small residential buildings and driveway access points along US 15-501. Site frontage along US 15-501 would extend from a point north of the existing Market Street intersection down to approximately 200 feet north of the existing Dogwood Acres Drive intersection. No other access to any other transportation facilities in the vicinity of the site parcel currently exists, as land in the central and eastern portions of the site features Obey Creek and significant terrain changes.



**Obey Creek Site Parcel Looking East  
Near Southern Village P&R Driveway**



**Obey Creek Site Parcel Looking South  
Near Southern Village P&R Driveway**

**D. Proposed Site Concept**

The Obey Creek preliminary site concept, developed in January 2014 and analyzed in this study is shown in **Figure 2**. The proposed site concept plan delineates five access points along US 15-501 site frontage. One proposed access point would form the fourth leg of the US 15-501/Market Street intersection. A second proposed full access point would be located directly across from the existing limited access Southern Village Park-and-Ride intersection with US 15-501. Per information from that Applicant, this intersection would feature full access and signalization. The remaining driveways would be right-turn in/right-turn out (RIRO) limited access intersections. A potential pedestrian bridge across US 15-501 is also shown on the plan. The site concept plan also shows potential building footprints and designations, as well as an internal street system and surface and structured parking locations. Land uses for each building footprint are also included and described in more detail in **Section II.C.i** of this report.





## **II. FUTURE BUILD-OUT YEAR SCENARIO CONDITIONS**

### **A. Future Ambient Traffic Growth Without Proposed Development**

Area-wide ambient traffic growth for the study area was estimated by reviewing data from the latest version of the Triangle Region Travel Demand Model (TRM Version 5.0) and comparing it to historic NCDOT AADT traffic estimates for study area roadways. The TRM can be used to estimate regional traffic growth for the Chapel Hill area by comparing model daily traffic assignments for base year (2010) and future year (2040) conditions. Annual growth percentages, based on model daily traffic assignment data, were approximately 1.20 percent per year from the 2010 base model to 2040, using gross total daily traffic flows around the project study area roadway cordon. Individual link assignments show considerable variability, depending on the relative daily traffic levels, with lower volume facilities sometimes exhibiting high individual increases. Historic NCDOT AADT counts in the project study area also show considerable variability over the last decade, with many locations in the project study area actually showing a decrease in traffic volumes.

**Table 1** displays the historic NCDOT AADT count data that is available for study area roadways. Over the last eight years, where data is available, the general trend in the study area is that daily traffic growth is stagnant or actually decreasing in multiple locations. Though historic NCDOT AADT information indicates that, overall, there is little growth (or even negative growth) in traffic volume in the project study area, TRM results in **Table 2** show that future regional traffic growth is expected to occur between the 2010 base year data and 2040 future year model estimates. To conservatively estimate that some growth is likely to occur in the project study area, the gross composite estimate of a 1.20 percent per year factor (corresponding to a 10.8 percent, nine-year growth factor for the estimated 2022 analysis year) applied to 2013 traffic count volumes for the baseline 2022 analysis year for the Obey Creek development.

### **B. Approved Background Traffic**

There are numerous Town-approved developments and development plans under review in or near the project study area. Several projects are either currently under construction or could be fully built-out by the Obey Creek 2022 analysis year. Other projects are in early planning stages and are projected to be longer-term phased developments. There are also several development projects in nearby Carrboro that may have a potential background traffic growth impact on the project study area for Obey Creek.

In addition to specific private development, the Town has conducted a planning study for the NC 54 (Raleigh Road) corridor and the NCDOT is currently studying the US 15-501 Corridor, both studies and any recommendations that are implemented over the next 9 years from them may potentially affect study area background traffic patterns. The results of these studies were also considered in the anticipated traffic patterns and roadway networks in future Obey Creek analyses. These background developments and studies are listed in **Table 3**.



**Table 1. Historic Study Area NCDOT AADT Information**

NCDOT AADT STATION	ROUTE	LOCATION	Count Year					6/8 Year Growth	Per Year Growth
			2011	2009	2007	2005	2003		
753	SR 1962 (DOGWOOD ACRES)	W OF US 15-501	940	960	630	540	550	71%	8.9%
797	SR 2048 (RALEIGH RD)	W OF US 15-501	21000	20000	21000	20000	16000	31%	3.9%
754	US 15-501	N OF SR 1919 (SMITH LVL RD)	17000	16000	17000	13000	14000	21%	2.7%
793	NC 54	E OF FINLEY GOLF COURSE RD	44000	44000	46000	43000	37000	19%	2.4%
777	US 15-501	S OF SR 1994 (CULBRETH RD)	0	22000	21000	18000	20000	10%	1.7%
781	US 15-501	N OF SR 1008 (MT CARMEL CH)	32000	32000	33000	30000	30000	7%	0.8%
795	NC 54 BYPASS	E OF US 15-501	46000	46000	48000	44000	0	5%	0.8%
827	US 15-501 BYPASS	S OF SR 1750 (ESTES DR)	0	38000	40000	39000	37000	3%	0.5%
780	US 15-501 BYPASS	S OF WINTER RD	0	41000	43000	40000	40000	3%	0.4%
796	US 15-501 BYPASS	S OF NC 54 (RALEIGH RD)	0	51000	53000	51000	50000	2%	0.3%
951	SR 1008 (MT CARMEL CH RD)	S OF SR 1915 (OLD LYSTRA RD)	8700	8800	9400	9000	8700	0%	0.0%
823	NC 86 (N COLUMBIA ST)	N OF SR 1010 (FRANKLIN ST)	18000	18000	16000	16000	18000	0%	0.0%
755	SR 1919 (SMITH LEVEL RD)	S OF SR 1920 (WOODWARD RD)	7100	7000	6900	6700	7400	-4%	-0.5%
952	SR 1915 (OLD LYSTRA RD)	S OF SR 1008 (MT CARMEL CH)	1600	1700	1700	1800	1700	-6%	-0.7%
950	MERRITT MILL RD	E OF ROBERTS ST	11000	10000	11000	11000	12000	-8%	-1.0%
774	NC 54 BYPASS	W OF SR 1919 (SMITH LVL RD)	30000	30000	32000	31000	33000	-9%	-1.1%
779	NC 54 BYPASS	E OF SR 1919 (SMITH LVL RD)	30000	31000	32000	32000	34000	-12%	-1.5%
782	SR 1008 (MT CARMEL CH RD)	E OF US 15-501	9600	9900	11000	11000	11000	-13%	-1.6%
778	SR 1994 (CULBRETH DR)	W OF US 15-501	5000	5100	5300	5600	5800	-14%	-1.7%
811	SR 1919 (S.GREENSBORO ST)	S OF RAND RD	12000	12000	13000	12000	14000	-14%	-1.8%
775	SR 1919 (SMITH LEVEL RD)	S OF NC 54	16000	17000	17000	17000	19000	-16%	-2.0%
790	SR 1902 (MANNING DR)	N OF US 15-501	15000	17000	17000	17000	18000	-17%	-2.1%
824	SR 1010 (FRANKLIN ST)	E OF NC 86 (S COLUMBIA ST)	14000	15000	16000	15000	17000	-18%	-2.2%
807	NC 86	S OF SR 1010 (FRANKLIN ST)	15000	0	17000	16000	19000	-21%	-2.6%
783	NC 86	S OF MASON FARM RD	13000	16000	16000	15000	17000	-24%	-2.9%
786	MASON FARM RD	E OF DANIELS RD	6700	0	8500	7000	8800	-24%	-3.0%
806	CAMERON AVE	W OF NC 86 PITTSBORO ST	7500	9100	7700	7700	10000	-25%	-3.1%
802	SR 2048 (SOUTH RD)	W OF STADIUM DR	7400	7000	8100	8500	10000	-26%	-3.3%
785	SR 1902 (MANNING DR)	W OF WEST DR	11000	11000	12000	13000	15000	-27%	-3.3%

RED = High Volume Regional Arterial Facilities

BLUE = 6 Year Data Trends





**Table 2. TRM Daily Assignment and Study Area Cordon Growth Patterns 2010-2040**

<b>Cordon Segment Location</b>	<b>2010 Assignment</b>	<b>2040 Assignment</b>	<b>Overall Growth</b>	<b>Per Year Growth</b>	<b>2013-2022 Year Growth Factor</b>
Greensboro Street	10,751	14,270	32.7%	1.1%	9.8%
Merritt Mill Road	11,974	14,788	23.5%	0.8%	7.1%
NC 54 Bypass W of Smith Level	31,757	46,790	47.3%	1.6%	14.2%
Smith Level S of Culbreth	13,263	20,065	51.3%	1.7%	15.4%
Smith Level at Wal-Mart	10,673	15,987	49.8%	1.7%	14.9%
US 15-501 South	23,596	34,601	46.6%	1.6%	14.0%
Market St	9,382	10,119	7.9%	0.3%	2.4%
Culbreth (Local)	7,664	8,869	15.7%	0.5%	4.7%
Mt. Carmel Church East	10,487	15,516	48.0%	1.6%	14.4%
Old Lystra	3,148	4,621	46.8%	1.6%	14.0%
Manning Drive East	21,459	27,432	27.8%	0.9%	8.4%
Raleigh Road	34,630	43,484	25.6%	0.9%	7.7%
US 15-501 North	39,412	58,719	49.0%	1.6%	14.7%
NC 54 East	63,371	97,475	53.8%	1.8%	16.1%
W. Cameron Avenue	12,662	13,982	10.4%	0.3%	3.1%
W. Franklin Street	16,490	25,588	55.2%	1.8%	16.6%
NC 86 (N. Columbia Street)	23,687	31,273	32.0%	1.1%	9.6%
E. Franklin Street	13,246	20,072	51.5%	1.7%	15.5%
E. Cameron Avenue	7,523	9,502	26.3%	0.9%	7.9%
South Road	8,545	9,332	9.2%	0.3%	2.8%
Manning Drive West	19,871	26,958	35.7%	1.2%	10.7%
Mason Farm Road	4,533	6,253	37.9%	1.3%	11.4%
<b>Study Area Gross Composite</b>	<b>398,124</b>	<b>555,696</b>	<b>39.6%</b>	<b>1.3%</b>	<b>11.9%</b>
		<b>individual link mean</b>	<b>35.6%</b>	<b>1.2%</b>	<b>10.7%</b>
		<b>individual link median</b>	<b>36.8%</b>	<b>1.2%</b>	<b>11.0%</b>

Due to the variability in the actual development of the study area background traffic-generating projects, the potential for changes in development intensity and for new developments not yet in the planning process over the next nine years, all specific background traffic growth estimates in the project study area were assumed to be incorporated in the ambient growth rate estimates discussed previously. Since the TRM accounts for projected planning-level development patterns regionally, its results provide a reasonable guide for developing background traffic growth estimates.

The only exception to this methodology is for two developments along US 15-501 near the site that were directly incorporated into the background traffic growth estimations. The new Chatham Wal-Mart was not open for business when original turning movement counts for the Obey Creek study were compiled in April 2013. The Wal-Mart has been open for over six months, and to account for traffic at its driveway intersection and trip assignments beyond the driveway, HNTB completed a new turning movement count in January 2014. The driveway data from this count was added directly to ambient area-wide traffic growth estimates.



The second development, the Southern Village Hotel & Apartments, was analyzed by HNTB in the *Southern Village and Apartments Traffic Impact Study*, November 2013. Per information from Town of Chapel Hill Planning Department staff, this development, located just to the north of the US 15-501 and Market Street intersection, is expected to be constructed prior to the 2022 analysis year – but at this time, plans only include the hotel portion. Site traffic assignments from the previous traffic impact study were directly applied (for the hotel only) to the ambient traffic growth estimates and Wal-Mart data for the Obey Creek 2022 analysis scenarios.

**Table 3. Study Area Background Development and Studies**

Development / Study Name	Study Area Location	Impacts to Obey Creek Study Traffic Volumes/Network
South Grove Residential	US 15-501 North of Smith Level Road	Specific traffic volume growth from these development projects accounted for in overall study area ambient growth rate
Boys & Girls Club	Merritt Mill Road	
SECU Family House	Old Mason Farm Road	
140 W. Franklin	W. Franklin Street West of NC 86 (Columbia Street)	
123 W. Franklin (University Square)	W. Franklin Street West of NC 86 (Columbia Street)	
Lloyd Farm	Carrboro	
Shelton Station	Carrboro	
Roberson Square	Carrboro	
300 E. Main Street	Carrboro	
UNC Main Campus Development Plan	UNC Campus East of NC 86	
Carolina North	Outside Study Area	
Glen Lennox Redevelopment	NE Quadrant of NC 54 / US 15-501	
Southern Village Hotel & Apartments	US 15-501 North of Market Street	Specific background traffic volumes added to network from 2013 TIS
Chatham County Wal-Mart	US 15-501 and Smith Level Road	Specific background traffic volumes added to network from peak hour traffic count data collected in January 2014
<i>US 15-501 Superstreet Study (Stantec, 2014)</i>	US 15-501 Corridor – Pittsboro to NC 54 Bypass	Compared initial future traffic volume growth estimates with methodology from this analysis
<i>NC 54 / I-40 Corridor Study: Transportation – Land Use Master Plan</i>	NC 54 from US 15-501 to E. Barbee Chapel Road	Proposed improvements considered if study area intersections warrant

**Figure 3** shows the relative location of all existing background development projects, according to the latest information from the Town of Chapel Hill and Town of Carrboro Planning Departments, in relation to the Obey Creek site. The figure also shows the location of the recent planning study areas.

**Figures 4A, 4B, 5A and 5B** show the resulting 2022 No-Build Scenario weekday peak hour traffic volumes that account for ambient and background traffic growth, as previously described.



**C. Proposed Project Traffic**

**i. Trip Generation**

The projected trips generated by the proposed Obey Creek development were based on the *ITE Trip Generation Manual* (Institute of Transportation Engineers, 9<sup>th</sup> Edition, 2012). Seven separate land use types were analyzed for the development. The Applicant's basic development program is as follows:

**Table 4. Obey Creek Development Program (January 2014)**

Building	Shopping Center Retail	Office	Community Activi	Hotel	Condos	Notes
Anchor	135,000					1 STY + ROOFTOP PARK
JA 1	29,000					1-STY
JA2	18,000					1-STY
G1	55,000					1-STY
T1	40,000					
S1	18,190					STREET LVL SHOPS (LESS LOBBY FOR USE ABV.)
S2	7,590					STREET LVL SHOPS (LESS LOBBY FOR USE ABV.)
S3	12,060					STREET LVL SHOPS (LESS LOBBY FOR USE ABV.)
S4	5,800					STREET LVL SHOPS (LESS LOBBY FOR USE ABV.)
S5	3,880					STREET LVL SHOPS (LESS LOBBY FOR USE ABV.)
S6	3,260					STREET LVL SHOPS (LESS LOBBY FOR USE ABV.)
S7	7,150					STREET LVL SHOPS (LESS LOBBY FOR USE ABV.)
S8	5,060					STREET LVL SHOPS/RESTAURANT
S9	13,335					STREET LVL SHOPS (LESS LOBBY FOR USE ABV.)
S10	28,400					STREET LVL SHOPS (LESS LOBBY FOR USE ABV.)
S11	9,200					STREET LVL SHOPS (LESS LOBBY FOR USE ABV.)
S12	13,600					STREET LVL SHOPS (LESS LOBBY FOR USE ABV.)
O1		92,750				3-STY @ 15/501 & 4-STY OVER DRIVE-THRU
O2		57,000				3 STY ABOVE SHOPS
O3		69,000				3 STY ABOVE THEATER
O4		7,500				1.5 STY OVER PARKING
O5						RESERVED
CA			48,000			2 STY BELOW + 2 AT PKG. DECK & ABOVE
H1				117,000		140 KEYS + FUNCTION 3 STY @ 15/501 & 4 STY ABOVE A1 AT MAIN
R2					78,760	4-STY ABV S1
R3					30,000	3 STY
R4					77,780	4 STY OVER SHOPS
R5					79,120	4-STY OVER SHOPS
R6					138,610	5 STY OVER SHOPS AT MAIN & 2-STY OVER SHOPS AT 15/501
R7					27,400	2 STY OVER SHOPS
R8					32,070	2 STY OVER SHOPS
R9					14,400	3 STY
R10					80,800	5 STY OVER SHOPS + 4-STY OVER GROCERY
R11					40,170	3 STY
AG1					181,400	3-STY ON 15/501 & 5 -STY ON MAIN
<b>TOTAL (SF)</b>	<b>404,525</b>	<b>226,250</b>	<b>48,000</b>	<b>117,000</b>	<b>780,510</b>	
<b>TOTAL ALL USE</b>	<b>809,050</b>				<b>1,576,285</b>	<b>100 RESIDENTIAL TOTAL</b>



The selection of independent variables and the use of rate-based or equation-based generation methods for each particular land use type follow NCDOT Congestion Management Unit practices. Several assumptions were made, and agreed upon by the Town, Applicant and NCDOT, that allow consolidation of all commercial development into a single ITE Land Use Code (Shopping Center – LUC 820). The Applicant also provided information to separate planned residential components into three separate land use types – apartments, condominiums, and senior adult housing.

Additional information from the Applicant regarding location and intensity of proposed buildings within the Obey Creek site was used to initially determine all respective trip generation and then was used in the trip distribution process. Information in **Table 4** corresponds directly to building footprint locations in **Figure 2**. It should be noted that this plan is conceptual in nature and subject to change.

**Table 5** shows the estimated number of trips generated by the Obey Creek site concept during the weekday AM, noon, and PM peak hours of adjacent streets. A truck percentage of two percent was estimated for all site-generated traffic.

The methodology used in **Table 5** follows a progression of:

- 1) deriving raw unadjusted trips from ITE data,
- 2) subtracting potential internally-captured trips, using the most recent ITE internal-capture methodologies,
- 3) reducing the “net” external trips by a transit/multi-modal factor for appropriate land uses, and
- 4) segregating new external vehicular site trips, diverted linked trips and pass-by type trips.

Both transit trip reduction and internal capture assumptions were discussed, and approved, by Town staff for recent similar mixed-use transit-oriented development projects as part of this process. Additional details and methodologies regarding all trip adjustment factors are contained in the sections following **Table 5**.



Table 5. Weekday Vehicle Trip Generation Summary - Obey Creek Development

1. ITE RAW TRIP GENERATION CALCULATIONS - TOTAL NEW DEVELOPMENT

Land Use	ITE Code	Size	Unit	24 Hour Volumes			AM Peak Hour Trips			Noon Peak Hour Trips			PM Peak Hour Trips		
				Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
Apartments	220	300	Dwelling Unit	971	971	1,942	30	121	151	38	47	84	119	64	183
Condominiums/Townhomes	230	100	Dwelling Unit	322	322	644	9	43	52	13	16	29	40	20	60
Senior Adult Housing - Attached	252	300	Dwelling Unit	516	516	1,032	21	39	60	32	36	68	42	33	75
Hotel	310	140	Rooms	572	572	1,144	43	31	74	43	36	79	43	41	84
Community Rec Center	495	48	1000 SF	812	812	1,624	65	33	98	65	50	115	64	67	131
General Office Building	710	226.25	1000 SF	1,221	1,221	2,442	324	44	368	143	120	263	56	276	332
Shopping Center	820	404.525	1000 SF	8,422	8,422	16,844	227	139	366	481	467	948	734	794	1,528
<b>TOTAL RAW TRIPS</b>				<b>12,836</b>	<b>12,836</b>	<b>25,672</b>	<b>719</b>	<b>450</b>	<b>1,169</b>	<b>814</b>	<b>772</b>	<b>1,585</b>	<b>1,098</b>	<b>1,295</b>	<b>2,393</b>
<b>2. INTERNAL CAPTURE (FROM ITE CALCULATIONS)</b>				<b>1,284</b>	<b>1,284</b>	<b>2,568</b>	<b>46</b>	<b>46</b>	<b>92</b>	<b>144</b>	<b>144</b>	<b>288</b>	<b>241</b>	<b>241</b>	<b>482</b>
<b>EXTERNAL TRIP GENERATION BEFORE MODAL REDUCTION</b>				<b>11,552</b>	<b>11,552</b>	<b>23,104</b>	<b>673</b>	<b>404</b>	<b>1,077</b>	<b>670</b>	<b>628</b>	<b>1,297</b>	<b>857</b>	<b>1,054</b>	<b>1,911</b>

3. TRANSIT TRIP REDUCTIONS

	Daily Factors#			AM Peak Hour %			Noon Peak Hour %			PM Peak Hour %		
	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
Apartments	--	--	1.67	--	--	15%	--	--	7.5%	--	--	15%
Condominiums/Townhomes	--	--	1.67	--	--	15%	--	--	7.5%	--	--	15%
Senior Adult Housing - Attached	--	--	2.00	--	--	20%	--	--	10.0%	--	--	20%
Hotel	--	--	1.11	--	--	10%	--	--	5.0%	--	--	10%
Community Rec Center	--	--	1.67	--	--	15%	--	--	7.5%	--	--	15%
General Office Building	--	--	0.85	--	--	15%	--	--	7.5%	--	--	15%
Shopping Center	--	--	2.21	--	--	15%	--	--	10.0%	--	--	15%

TRANSIT TRIP GENERATION BY LAND USE	ITE Code	Size	Unit	Daily Ridership			AM Peak Hour Trips			Noon Peak Hour Trips			PM Peak Hour Trips		
				Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
Apartments	220	300	Dwelling Unit	251	251	501	4	17	21	2	3	5	14	8	22
Condominiums/Townhomes	230	100	Dwelling Unit	84	84	167	1	6	7	1	1	2	5	2	7
Senior Adult Housing - Attached	252	300	Dwelling Unit	301	301	601	4	7	11	3	3	6	7	5	12
Hotel	310	117	1000 SF	65	65	129	4	3	7	2	1	3	3	3	7
Community Rec Center	495	48	1000 SF	40	40	80	9	5	14	4	3	7	8	8	16
General Office Building	710	226.25	1000 SF	96	96	192	45	6	51	9	7	16	7	33	40
Shopping Center	820	404.525	1000 SF	447	447	894	31	19	51	39	38	78	88	95	183
<b>TOTAL TRANSIT TRIPS</b>				<b>1,282</b>	<b>1,282</b>	<b>2,565</b>	<b>98</b>	<b>63</b>	<b>161</b>	<b>60</b>	<b>57</b>	<b>116</b>	<b>131</b>	<b>155</b>	<b>286</b>

# - Daily Trips Per 1000 SF



Table 5 (Continued). Weekday Vehicle Trip Generation Summary - Obey Creek Development

4. PED/BIKE TRIP REDUCTIONS	Daily Factors			AM Peak Hour %			Noon Peak Hour %			PM Peak Hour %		
	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
Apartments	--	--	0.167	--	--	1.5%	--	--	0.8%	--	--	1.5%
Condominiums/Townhomes	--	--	0.167	--	--	1.5%	--	--	0.8%	--	--	1.5%
Senior Adult Housing - Attached	--	--	0.200	--	--	2.0%	--	--	1.0%	--	--	2.0%
Hotel	--	--	0.111	--	--	1.0%	--	--	0.5%	--	--	1.0%
Community Rec Center	--	--	0.167	--	--	1.5%	--	--	0.8%	--	--	1.5%
General Office Building	--	--	0.085	--	--	1.5%	--	--	0.8%	--	--	1.5%
Shopping Center	--	--	0.221	--	--	1.5%	--	--	1.0%	--	--	1.5%

PED/BIKE TRIP GENERATION BY LAND USE	ITE Code	Size	Unit	Daily Ped/Bike Trips			AM Peak Hour Trips			Noon Peak Hour Trips			PM Peak Hour Trips		
				Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
Apartments	220	300	Dwelling Unit	25	25	50	0	2	2	0	0	1	1	1	2
Condominiums/Townhomes	230	100	Dwelling Unit	8	8	17	0	1	1	0	0	0	0	0	1
Senior Adult Housing - Attached	252	300	Dwelling Unit	30	30	60	0	1	1	0	0	1	1	1	1
Hotel	310	140	Rooms	8	8	15	0	0	1	0	0	0	0	0	1
Community Rec Center	495	48	1000 SF	4	4	8	1	0	1	0	0	1	1	1	2
General Office Building	710	226.25	1000 SF	10	10	19	4	1	5	1	1	2	1	3	4
Shopping Center	820	404.525	1000 SF	45	45	89	3	2	5	4	4	8	9	10	18
<b>TOTAL PED/BIKE TRIPS</b>				<b>130</b>	<b>130</b>	<b>259</b>	<b>10</b>	<b>6</b>	<b>16</b>	<b>6</b>	<b>6</b>	<b>12</b>	<b>13</b>	<b>15</b>	<b>29</b>

TOTAL EXTERNAL VEHICLE TRIPS (DRIVEWAY VOLUMES)	24 Hour Volumes			AM Peak Hour Trips			Noon Peak Hour Trips			PM Peak Hour Trips		
	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
	10,140	10,140	20,280	565	335	900	604	565	1,169	712	884	1,596

5. PASS-BY TRIPS	ITE Code	Size	Unit	24 Hour Volumes			AM Peak Hour Trips			Noon Peak Hour Trips			PM Peak Hour Trips		
				Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
Pass-By Trip Rates - Shopping Center	820	404.525	1000 SF	17%	17%	17%	0%	0%	0%	34%	34%	34%	34%	34%	34%
Pass-By Trips				1,213	1,213	2,425	0	0	0	121	116	237	165	187	352
Adjusted Pass-By Trips				1,213	1,213	2,425	0	0	0	119	119	237	176	176	352
<b>TOTAL PASS-BY TRIPS</b>				<b>1,213</b>	<b>1,213</b>	<b>2,425</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>119</b>	<b>119</b>	<b>237</b>	<b>176</b>	<b>176</b>	<b>352</b>

6. DIVERTED LINKED TRIPS	ITE Code	Size	Unit	24 Hour Volumes			AM Peak Hour Trips			Noon Peak Hour Trips			PM Peak Hour Trips		
				Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
DL Trip Rates - Shopping Center	820	404.525	1000 SF	14%	14%	14%	0%	0%	0%	28%	28%	28%	28%	28%	28%
Diverted Linked Trips				999	999	1,997	0	0	0	100	96	195	136	154	290
Adjusted DL Trips				999	999	1,997	0	0	0	98	98	195	145	145	290
<b>TOTAL DIVERTED LINKED TRIPS</b>				<b>999</b>	<b>999</b>	<b>1,997</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>98</b>	<b>98</b>	<b>195</b>	<b>145</b>	<b>145</b>	<b>290</b>

TOTAL EXTERNAL VEHICLE TRIPS ADDED TO ADJACENT STREETS (NEW TRIPS)	24 Hour Volumes			AM Peak Hour Trips			Noon Peak Hour Trips			PM Peak Hour Trips		
	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
	7,928	7,928	15,858	565	335	900	387	348	736	391	563	954



**ii.) Adjustments to Trip Generation Rates**

Raw ITE trip generation estimates for daily and peak hour trips were adjusted for the following factors, in the recommended sequential order for reducing raw trip generation estimates to actual estimated vehicular trips produced by Obey Creek development.

a.) Internal Capture

The land use mix and density proposed for Obey Creek development would exhibit the potential for internally captured trips. The latest ITE methodologies for internal capture calculations automatically compute internally captured trips from raw vehicular trip generation data whenever two or more land use categories (that would be included in a mixed-use development) are aggregated. Information from the ITE results (See **Appendix B** for ITE trip generation output sheets) was used in reducing raw trip generation estimates. It was assumed that daily internal capture rates would be 10 percent of total daily generated trips, based on the range of AM and PM capture rates which varied between 8 and 20 percent. Noon peak internal capture data was estimated to be an average of AM and PM peak hour totals, and was compared to overall noon peak trip generation data for computation of internal capture percentages. **Table 6** displays the aggregate internal capture percentages for each peak hour. Summary results for internal capture reductions were applied directly to the raw trip generation rates and volumes and are shown previously in **Table 5**.

**Table 6. Summary Internal Capture Rates**

Statistic	24 Hour Daily Volumes			AM Peak Hour Trips			Noon Peak Hour Trips			PM Peak Hour Trips		
	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
Raw ITE Data	12,836	12,836	25,672	719	450	1,169	814	772	1,585	1,098	1,295	2,393
Internal Capture	1,284*	1,284*	2,568*	46	46	92	144	144	288	241	241	482
<b>Internal %</b>	<b>10%*</b>	<b>10%*</b>	<b>10%*</b>	<b>6%</b>	<b>10%</b>	<b>8%</b>	<b>18%</b>	<b>19%</b>	<b>18%</b>	<b>22%</b>	<b>19%</b>	<b>20%</b>

\* - No Specific ITE Calculation Available for Daily Trips

This information is incorporated in **Table 5** in Step 2, where internally captured trips are removed from raw overall trip estimates. No specific identification or estimate of modal distribution of internally captured trips was made for this study. A comparison of this information with the *Traditional Neighborhood Development Trip Generation Study* (Khattak, Stone, April 2004) made for the adjacent Southern Village neighborhood indicates potentially good correlation with that study's results which indicated internal capture rates for some trip types of approximately 20 percent (page v.).

b.) Modal Split

Transit

Since the study area is well served by several CHT and Triangle Transit fixed bus routes, with frequent existing service, and also has facilities for pedestrians and bicyclists with



potentially improved connectivity after the project is constructed, an analysis was conducted to estimate trip reductions for these modes. The basis for modal split estimation relies on three data sources:

- a) existing field data that compares vehicle and transit trips to/from the existing adjacent Southern Village development and results from the *Traditional Neighborhood Development Trip Generation Study*;
- b) information provided by the Town of Chapel Hill, including the document “Chapel Hill Payment-in-Lieu – Transit Trip Generation”; and
- c) research and case studies compiled for the Transportation Research Board (TRB) Transit Cooperative Research Program (TCRP) *Report 128 – Effects of Transit-Oriented Development on Housing, Parking, and Travel* (Arrington and Cervero, 2008). Case study developments presented in the research that had similar characteristics as the proposed Obey Creek development and existing/future transit service along US 15-501 were analyzed for trip generation rates, mode splits, number of automobiles owned, and parking generation rates.

Existing Field Data – Southern Village Comparison

Chapel Hill Transit staff provided the following information in **Table 7** related to 2013 ridership for specific routes directly serving the existing Southern Village development and adjacent Southern Village Park-and-Ride Lot. Boarding and alighting data (corresponding to “trips” exiting and entering Southern Village, respectively) was summarized for the total amount of peak hour and daily transit activity “produced” by Southern Village – minus estimates for the Park-and-Ride Lot usage. Route V, which winds through the existing development, was assumed to have all its transit trips related specifically to Southern Village. Bus stops that are located immediately along the Southern Village frontage with US 15-501 were included in both route data sets, though ridership at these locations may be related to other development located along US 15-501. The purpose of the compilation is to compare existing vehicular traffic levels in Southern Village with projected transit trip generation methodologies described below.

**Table 7. CHT Transit Ridership Within/Adjacent to Southern Village**

Route	Daily			AM Peak			Noon Peak			PM Peak		
	OFF (Enter)	ON (Exit)	Totals	OFF (Enter)	ON (Exit)	Totals	OFF (Enter)	ON (Exit)	Totals	OFF (Enter)	ON (Exit)	Totals
<b>NS*</b>	118	103	221	2	32	34	19	13	32	25	3	28
<b>V</b>	125	124	249	6	39	45	9	8	17	23	2	25
<b>Total</b>	<b>243</b>	<b>227</b>	<b>470</b>	<b>8</b>	<b>71</b>	<b>79</b>	<b>28</b>	<b>21</b>	<b>49</b>	<b>48</b>	<b>5</b>	<b>53</b>

\* - Data Assumes 25% Southern Village/75% Park-and-Ride Usage Estimate for AM and PM peak hours

**Table 8** provides a comparison of the CHT transit ridership data and available vehicular count data tabulated for all entrances/exits to/from the existing Southern Village parcel. Daily and peak hour volumes were not collected for all access points to/from Southern Village in the spring 2013 traffic counts for the Obey Creek project, so estimates from both raw ITE trip generation information and previous studies were used. Results indicate that general mode splits are in the four to seven percent range for both peak hour and daily trips.





**Table 8. Transit/Vehicle Mode Splits for Southern Village From Field Data**

Time Period	Transit Trips	Vehicle Trips	Mode Split	
			Transit	Vehicle
AM Peak	79	1,152	6.4%	93.6%
Noon Peak	49	650	7.0%	93.0%
PM Peak	53	1,168	4.3%	95.7%
Daily	470	12,609	3.6%	96.4%

Transit Trip Generation Estimates

Using the information from **Table 8** and general results from the TCRP Report 128, the mode splits for each proposed Obey Creek land use type were calculated, and are shown in **Table 9**. Information from the “Chapel Hill Payment-in-Lieu – Transit Trip Generation” study was analyzed, but was not used to develop peak hour transit mode splits because estimated transit trip generation factors in this document do not correlate well with overall ITE vehicular trip generation factors for several land use types. For example, the summary transit trip generation rates and resulting mode splits for the proposed Obey Creek land uses and densities would result in estimates of 40 percent or greater transit mode share compared to ITE vehicle trip data. However, the overall daily transit trip generation rates from the “Payment in Lieu – Transit Trip Generation Study” show reasonable correlation with existing field data and could be used to compute transit trip reduction factors from raw ITE trip generation results.

**Table 9. Obey Creek Development Selected Transit Trip Reductions**

Proposed Land Use	Daily Factors*	AM Peak Hour %	Noon Peak Hour %	PM Peak Hour %
Apartments	1.67	15%	7.5%	15%
Condominiums/Townhomes	1.67	15%	7.5%	15%
Senior Adult Housing - Attached	2.00	20%	10.0%	20%
Hotel	1.11	10%	5.0%	10%
Community Rec Center	1.67	15%	7.5%	15%
General Office Building	0.85	15%	7.5%	15%
Shopping Center	2.21	15%	10.0%	15%

\* - From *Chapel Hill Payment-in-Lieu – Transit Trip Generation*, Renaissance Planning Group, 2012. Data Reflects Transit Trip Generation Rate Per 1,000 Square Feet of Development

Though no standard, simplified estimates for peak hour mode splits and trip generation rates are directly presented in the TCRP Report 128 information, the aggregate data suggests that a 10-20 percent vehicle trip reductions for a higher density/transit-oriented development with proximal, high frequency transit service is achievable. This 10-20 percent represents transit trips that are made after internal trips are removed from original raw trip generation estimates. This estimate correlates well with recent, generalized data on trip making characteristics for Chapel Hill and Orange County from the 2008 American Community Survey (source: *2010 Town of Chapel Hill Data Book*, pg 7.6-7.8). This data suggests that about 70 percent of Chapel Hill and 80 percent of Orange County work-related trips were made by single occupant vehicles or car pools.



As shown in **Table 9**, a 15-20 percent transit trip reduction factor is estimated for Obey Creek residential and commercial trips. A slightly lower 10 percent factor was estimated for hotel trips, as this land uses may likely not generate trips to the degree of other land uses. Similarly, the senior adult housing estimates may be slightly higher than a baseline 15 percent in the AM and PM peak hours, due to a higher potential capture rate/lower vehicle ownership rate. Since noon hour transit service is not provided with the same frequency as AM and PM peak service, transit trip reduction estimates were assumed to be 50 percent of the peak hour estimates. As a comparison of these results to the *Traditional Neighborhood Development Trip Generation Study* for Southern Village, that study indicated 11-13 percent transit mode shares for residential trips (Table 4-9, page 4-11).

**Table 5** shows the effects of transit trip reductions on trip generation data in Step 3, after internally-captured trips are removed in Step 2.

By applying the transit trip reduction percentages to overall external trip generation estimates, rough estimates of actual daily and peak hour transit trips can be obtained. These results are shown in **Table 10**. Compared to daily and peak hour existing transit ridership data for Southern Village in **Table 7**, the Obey Creek development would represent significant increases in transit ridership, in the order of four to five times greater than existing ridership levels within to the adjacent Southern Village site.

**Table 10. Total Transit Trip Generation Estimates**

Daily Ridership			AM Peak Hour Trips			Noon Peak Hour Trips			PM Peak Hour Trips		
			Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
1,282	1,282	2,565	98	63	161	60	57	116	131	155	286

Pedestrian/Bicycle Trips

To make some initial estimates of potential pedestrian and bicycle activity related to the Obey Creek development external to the site, a rough estimate of 10 percent of total transit trip generation data was used and is shown in **Table 11**. It should be noted that a significant percentage of potential pedestrian trips to/from the Obey Creek site would be locally-based, accessing the Southern Village development or Town of Chapel Hill Southern Community Park adjacent to the Obey Creek site. Any pedestrian trips made for the purposes of transit access at the existing Park-and Ride across US 15-501 would be considered under the transit trip generation reductions. Any pedestrian trips internal to the site would be considered under the internal trip reduction methodology.

Data found in the *Traditional Neighborhood Development Trip Generation Study* for Southern Village indicates that there is/was a high percentage of mode share for walk trips from residential development within the site (17-20 percent) and small percentages of bike trips (less than one percent). The walk trips would almost exclusively be considered internal trips, in this case.



**Table 11. Total Pedestrian/Bicycle External Trip Generation Estimates By Phase**

Daily Ridership			AM Peak Hour Trips			Noon Peak Hour Trips			PM Peak Hour Trips		
			Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
130	130	259	10	6	16	6	6	12	13	15	29

Though this methodology for estimating external pedestrian and bicycle trips produces only small levels of trip-making via these modes, consideration for these modes will be made in any analyses and recommendations for the study since the likelihood will exist for an increase in biking and walking trips in the immediate project vicinity due to the development of Obey Creek.

c.) Pass-by and Diverted Linked Trips

Pass-by trips are accounted for in this study for retail components of the proposed Obey Creek development plan. ITE and NCDOT approved standards were incorporated for pass-by trip estimates and were applied to trip generation estimates after internally-captured trip reductions and transit/non-motorized trip reductions are applied.

ITE data only provides pass-by and diverted linked trip percentages for the PM peak hour. However, it will be assumed that PM peak rates would also apply to the noon peak hour (when retail would be open for business) and would be 0 percent for the AM peak hour, when retail typically would not be open. Daily overall estimates that are 50 percent of the PM peak hour estimates were also applied. Raw pass-by and diverted linked trip data will be balanced for inbound and outbound flows to achieve a 50-50 split of entering and exiting trips at site driveways serving Obey Creek retail components along US 15-501. **Table 12** shows pass-by trip generation percentages used in this study.

**Table 12. Applied Pass-by Trip Generation Percentages**

Land Use	Daily Estimate	ITE Pass-By Rates		
		AM	Noon	PM
Shopping Center (Retail)	17.0%	0.0%	34.0%	34.0%

Diverted linked trips are considered to be trips with an origin and destination not related to the Obey Creek site, but may be diverted to the Obey Creek site retail component and then to their final destination. The location of Obey Creek in relation to other significant study area transportation facilities would allow the potential for diverted linked trips from the following facilities:

- NC 54 Bypass (Fordham Boulevard) eastbound-westbound trips diverted to US 15-501/Obey Creek
- NC 86 (S. Columbia Street) northbound-southbound trips that normally access NC 54 Bypass at the interchange diverted to US 15-501/Obey Creek

The quantification of diverted linked trips was made through the review of previous data for similar shopping centers found in the *ITE Trip Generation Handbook, Second Edition*. Approximately 20 such similar data sets (see Table 5.6 in the Handbook) are available for



shopping centers ranging from 200,000 to 600,000 square feet (404,000 square feet of retail is proposed in the Obey Creek development plan documentation). An average of diverted linked trip percentages from those studies is used in the development of this trip type for Obey Creek. Diverted linked trips were assigned along the US 15-501 corridor to/from the facilities identified above and assigned to the appropriate proposed driveways serving the retail development component. **Table 13** summarizes the *ITE Trip Generation Handbook* data.

**Table 13. ITE Diverted-Linked Trip and Pass-by Trip Percentages for LUC 820 – Shopping Center (PM Peak Data Only)**

Site #	Size (1000 SF)	Diverted Linked Trip %	Pass-by Trip %
1	235	36%	35%
2	350	37%	18%
3	294	24%	25%
4	256	22%	27%
5	418	29%	20%
6	560	32%	19%
7	361	29%	17%
8	375	22%	30%
9	413	20%	28%
10	488	13%	12%
11	293	6%	24%
12	225	33%	35%
13	255	39%	24%
14	450	28%	23%
15	598	28%	17%
16	581	29%	18%
17	476	20%	26%
18	402	27%	48%
19	234	33%	46%
20	352	43%	38%
21	549	41%	33%
<b>Averages</b>	<b>389</b>	<b>28%</b>	<b>27%</b>

Thus, 28 percent of total external vehicular trips related to retail uses (and adjusted previously for internal capture estimates and transit/non-motorized trip reduction factors) would be considered to be diverted linked trips. The data shows 27 percent of total external vehicular trips related to retail uses to be pass-by trips, which is in the range of ITE/NCDOT recommended values. **Table 14** shows the diverted linked trip percentages, based on the data and methodology as described above.

**Table 14. Applied Diverted-Linked Trip Percentages**

Land Use	Daily Estimate	ITE Diverted Linked Trip Rates		
		AM	Noon	PM
Shopping Center (Retail)	14.0%	0.0%	28.0%	28.0%



After the application of all previous trip adjustments were made to each sub-phase and aggregated by phase, the total anticipated trip generation for Obey Creek was calculated and is shown in **Table 15**. **Table 15** lists anticipated overall trip generation for all driveways that will serve Obey Creek, as well as net external trips to be added to the study area network. Driveway volumes are higher, due to the presence of pass-by and diverted linked trips that utilize the driveways. As previously discussed pass-by trips represent no additional increase to traffic volumes on the study area network, and diverted linked trips will represent additional increases and changes to traffic flows between the existing US 15-501/NC 54 Bypass interchange and the Obey Creek site.

#### d.) Trip Generation Budget

Current plans for Obey Creek and discussions with the Applicant indicate that a phased construction process will likely occur over a multi-year horizon. For the purposes of this Concept Analysis, it was agreed upon by all stakeholders that a single analysis of total project build-out would be the most appropriate means of quantifying initial impacts of the proposed site.

Any additional phased analysis necessary for the Obey Creek project will be done either in the next refined analysis/concept phase of this traffic impact study, or will be done as future updates to the traffic study, as needed.

#### **iii.) Trip Distribution**

Trip distribution for site-related traffic was based on existing daily traffic patterns to determine the directional peak hour characteristics of traffic to and from the site from the major study area thoroughfares and from some of the lower volume minor arterials and collector streets, based on anticipated trip productions to/from nearby residential or commercial development areas. Local trips to/from several lower volume collector and residential streets were estimated in the analysis, as the possibility exists that a small portion of trips may occur to/from these local streets. The process for distributing trips to/from Obey Creek development used the following methodology.

- **External Trip Distribution**

Trips to/from the Obey Creek site were primarily assumed to enter/exit the network from external study area network locations. Small percentages of trips (1 to 2 percent) were assumed to originate/terminate from development areas and residential neighborhoods served by roadway facilities in the project study area, while larger distributions were assumed for higher volume arterial facilities that connect to the UNC Main Campus/downtown Chapel Hill and other areas of Chapel Hill and Carrboro beyond the immediate project study area, as well as regional trips to/from Durham, the Triangle and Chatham County. Trips were assumed to use the most direct paths from external points to access Obey Creek site via US 15-501, the NC 54 Bypass, or collector / local roadways near the Obey Creek site.



**Table 15. Obey Creek Development - Summary Trip Generation Data**

Trip Generation Step	24 Hour Volumes			AM Peak Hour Trips			Noon Peak Hour Trips			PM Peak Hour Trips		
	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
<b>1. ITE Raw Trip Generation Calculations</b>	12,836	12,836	25,672	719	450	1,169	814	772	1,585	1,098	1,295	2,393
<b>2. Internal Capture</b>	-1,284	-1,284	-2,568	-46	-46	-92	-144	-144	-288	-241	-241	-482
<b>EXTERNAL TRIP GENERATION BEFORE MODAL REDUCTION</b>	<b>11,552</b>	<b>11,552</b>	<b>23,104</b>	<b>673</b>	<b>404</b>	<b>1,077</b>	<b>670</b>	<b>628</b>	<b>1,297</b>	<b>857</b>	<b>1,054</b>	<b>1,911</b>
<b>3. Transit Trip Reductions</b>	-1,282	-1,282	-2,565	-98	-63	-161	-60	-57	-116	-131	-155	-286
<b>4. Ped/Bike Trip Reductions</b>	-130	-130	-259	-10	-6	-16	-6	-6	-12	-13	-15	-29
<b>TOTAL EXTERNAL VEHICLE TRIPS (DRIVEWAY VOLUMES)</b>	<b>10,140</b>	<b>10,140</b>	<b>20,280</b>	<b>565</b>	<b>335</b>	<b>900</b>	<b>604</b>	<b>565</b>	<b>1,169</b>	<b>712</b>	<b>884</b>	<b>1,596</b>
<b>5. Pass-By Trips</b>	-1,213	-1,213	2,425	-0	-0	-0	-119	-119	-237	-176	-176	-352
<b>6. Diverted Linked Trips</b>	-999	-999	1,997	-0	-0	-0	-98	-98	-195	-145	-145	-290
<b>TOTAL EXTERNAL VEHICLE TRIPS (NEW TRIPS)</b>	<b>7,928</b>	<b>7,928</b>	<b>15,858</b>	<b>565</b>	<b>335</b>	<b>900</b>	<b>387</b>	<b>348</b>	<b>736</b>	<b>391</b>	<b>563</b>	<b>954</b>



Initial raw and revised external trip distribution proportions are shown in **Table 16**. Several raw proportions were revised, as potential site-related trips would either be expected to use other more direct roadway connections to/from the Obey Creek site, or the local AADT proportions do not address the likely potential of regionally-based trips. The most pertinent example of this is the need to adjust overall totals in the downtown Chapel Hill/UNC Main Campus area that would utilize NC 86 (S. Columbia Street) to access the Obey Creek site to provide a more realistic comparison to other external distribution nodes.

**Table 16. External Trip Distribution Assumptions**

Study Area Cordon Roadway	Entry ID	2010 TRM	2011 AADT	Raw TRM Proportion	Revised Proportion
Greensboro Street	1	10,751	12,000	3.6%	3%
Merritt Mill Road	2	11,974	11,000	4.0%	1%
NC 54 Bypass Using Smith Level	3a	N/A	N/A	N/A	2%
NC 54 Bypass Using 15-501	3b	31,757	30,000	10.6%	10%
Smith Level South of Culbreth	4	1,222	--	0.4%	1%
Smith Level North of Dogwood Acres	5	1,135	940	0.4%	1%
Smith Level South of Dogwood Acres	6	1,135	940	0.4%	0%
Smith Level at Wal-Mart	7	1,510	--	0.5%	1%
US 15-501 South	8	23,596	23,000	7.9%	13%
Market Street	9	6,255	N/A	2.1%	2%
Arlen Park Drive	10	3,127	N/A	1.0%	1%
Culbreth Street (Local)	11	5,236	5,000	1.7%	1%
Bennett Road	12	4,353	N/A	1.5%	1%
Mt. Carmel Church Road East	13	10,487	8,700	3.5%	3%
Old Lystra Road	14	3,148	1,600	1.0%	1%
NC 86 S. Columbia Street (Cut Line)	15	25,462	13,000	8.5%	22%
Manning Drive	16	21,459	15,000	7.2%	2%
Raleigh Road	17	34,630	21,000	11.5%	2%
US 15-501 North	18	39,412	38,000	13.1%	17%
NC 54 East	19	63,371	44,000	21.1%	16%
<b>Cordon Sum</b>		<b>300,020</b>		<b>100%</b>	<b>100%</b>

Blue/Green/Red Cells = Centroid Connector Data; Grey Cells = Dogwood Acres Drive AADT; Olive Cell = 2013 AADT Data from Traffic Count ; Orange Cell = Result from **Table 16a**

**Table 16a. UNC/Downtown Chapel Hill Sub-Area**

Study Area Cordon Roadway	Entry ID	2010 TRM	2011 AADT	Raw TRM Proportion	Revised Proportion	Obey Creek Cordon Proportion
W. Cameron Avenue	1	12,662	7500	11.9%	10%	2%
W. Franklin Street	2	16,490	13,000	15.5%	15%	3%
NC 86 (N. Columbia Street)	3	23,687	18,000	22.2%	28%	6%
E. Franklin Street	4	13,246	14,000	12.4%	12%	3%
E. Cameron Avenue	5	7,523	N/A	7.1%	5%	1%
South Road	6	8,545	7,400	8.0%	5%	1%
Manning Drive	7	19,871	11,000	18.6%	15%	3%
Mason Farm Road	8	4,533	6,700	4.3%	10%	2%
<b>Cordon Sum</b>		<b>106,557</b>		<b>100%</b>	<b>100%</b>	<b>22%</b>



**Figures 6A and 6B** present the projected external trip distribution traffic percentages for the proposed site in the 2022 Build-out+1 scenario.

- Driveway Trip Distribution

From the external trip distribution estimates to/from the general site location, trips were distributed to site access points based on the spatial relationship of the trips generated by an individual development building footprints, as defined in **Figure 2**. Since the Obey Creek site has multiple proposed external access connections to US 15-501 adjacent to the site, in addition to a fully developed internal street network as shown on the site concept plan, several assumptions were made to route site-related traffic to origins/destinations within the site. Trip generation data was broken out for external site trips to assign specific trip generation to each driveway, based on the most proximal land uses/parking that each would serve. **Appendix C** contains the detailed driveway breakout data and methodology.

- Pass-By Trip Distribution

The distribution of pass-by trips differs from the external (new) trip distribution in that pass-by trips would have directional distribution patterns specific to the adjacent US 15-501 where pass-by trip-making would be expected. The pass-by trip distribution and assignment was then estimated separately from new site trips. It was assumed that the following overall pass-by percentages would occur, based on the relative weight of existing 2013 peak period traffic counts northbound and southbound on US 15-501:

- 5%/4% To/From US 15-501 Northbound at Site Driveway #2 (Noon/PM Peak, respectively)
- 30%/30% To/From US 15-501 Northbound at Site Driveway #3
- 15%/15% To/From US 15-501 Northbound at Site Driveway #4
- 5%/6% To/From US 15-501 Southbound at Site Driveway #2
- 30%/30% To/From US 15-501 Southbound at Site Driveway #3
- 15%/15% To/From US 15-501 Southbound at Site Driveway #4

Relative pass-by trip proportions for the each of the roadways described above were routed to the site access point (and removed, as appropriate, from through traffic streams related to each pass-by distribution). **Figure 7** presents the projected pass-by trip distribution traffic percentages for the proposed site in the 2022 build-out year+1 scenario.

- Diverted Linked Trip Distribution

The distribution of diverted-linked trips uses the assumption that distribution patterns are specific to the noon and PM peak hour existing traffic volumes at the US 15-501 / NC 54 Bypass interchange where diverted-linked trip-making would be expected to occur. The diverted-linked trip distribution and assignment was then estimated separately from new site trips and pass-by trips. It was assumed that the following overall diverted-linked percentages in **Table 17** would occur, based on the relative weight of existing peak period traffic counts:





**Table 17. Diverted Linked Trip Distribution**

Noon Peak Hour	Diverted Flow Direction	PM Peak Hour
15%	NC 86 Southbound to NC 54 Bypass Westbound	17%
7%	NC 86 Southbound to NC 54 Bypass Eastbound	5%
31%	NC 54 Bypass Eastbound to NC 54 Bypass Eastbound	46%
12%	NC 54 Bypass Eastbound to NC 86 Northbound	9%
30%	NC 54 Bypass Westbound to NC 54 Bypass Westbound	21%
5%	NC 54 Bypass Westbound to NC 86 Northbound	2%
100%	<b>Totals</b>	100%

All diverted-linked trip distribution percentages were broken out at the individual site driveways using the same basic methodology employed for the pass-by trips, where 30 percent of trips enter/exit at Driveway #4, 60 percent enter/exit at Driveway #3 and 10 percent enter/exit at Driveway #2. **Figure 7** presents the projected diverted-linked trip distribution traffic percentages for the proposed site in the 2022 build-out year+1 scenario.

**iv.) Trip Assignment**

**Appendix D** contains a summary of the site traffic volumes distributed on the 2022 study area network. Total volumes into and out of the site correspond to total external vehicular trips generated, based on the trip generation methodology developed previously. **Table 10** lists the anticipated transit trip generation totals from Obey Creek site. Additional transit capacity may be necessary to serve demand generated by Obey Creek site. No specific determination of distribution and assignment of these trips was made for this study. Similarly, no specific forecasts or estimates of pedestrian or bicycle trip distribution and assignment were made for this study.

**D. Future Traffic Forecasts with the Proposed Development**

**Figures 8A, 8B, 9A and 9B** display the 2022 projected study area traffic volumes with site traffic added. These traffic volumes represent the aggregate traffic growth over existing traffic volumes for a) ambient traffic growth, b) specific background site-related traffic assignments, and c) estimated overall site traffic assignments for the Obey Creek development that include all external new trips, diverted linked trips and pass-by trips.



### III. 2022 PEAK HOUR INTERSECTION LEVEL OF SERVICE ANALYSIS

#### A. Methodology

Evaluation of traffic operations on suburban arterials is most effective through the determination of level of service (LOS) criteria. The concept of level of service correlates qualitative aspects of traffic flow to quantitative terms. This enables transportation professionals to take the qualitative issues, such as congestion and substandard geometrics, and translate them into measurable quantities, such as operating speeds and vehicular delays. The 2010 *Highway Capacity Manual (HCM 2010)* characterizes level of service by letter designations A through F. Level of service A represents ideal low-volume traffic operations, and level of service F represents over-saturated high-volume traffic operations. Level of service is measured differently for various roadway facilities, but in general, level of service letter designations are described by the following in **Table 18**.

**Table 18. Level of Service (LOS) Characteristics**

Level of Service Description	Per Vehicle Delay at Signal	Per Vehicle Delay at Stop Sign
<b>LOS A</b> ➤ Free flow ➤ Freedom to select desired speed and to maneuver is extremely high ➤ General level of comfort and convenience for motorists is excellent	<b>&lt; 10.0 sec</b>	<b>&lt; 10.0 sec</b>
<b>LOS B</b> ➤ Stable flow ➤ Other vehicles in the traffic stream become noticeable ➤ Reduction in freedom to maneuver from LOS A	<b>10.0 – 20.0 sec</b>	<b>10.0 – 15.0 sec</b>
<b>LOS C</b> ➤ Stable flow ➤ Maneuverability and operating speed are significantly affected by other vehicles ➤ General level of comfort and convenience declines noticeably	<b>20.0 – 35.0 sec</b>	<b>15.0 – 25.0 sec</b>
<b>LOS D</b> ➤ High density but stable flow ➤ Speed/freedom to maneuver are very restricted ➤ General level of comfort / convenience is poor ➤ Small increases in traffic will generally cause operational problems	<b>35.0 – 55.0 sec</b>	<b>25.0 – 35.0 sec</b>
<b>LOS E</b> ➤ Unstable flow ➤ Speed reduced to lower but relatively uniform value ➤ Volumes at or near capacity level ➤ Comfort and convenience are extremely poor ➤ Small flow increases or minor traffic stream disturbances will cause breakdowns	<b>55.0 – 80.0 sec</b>	<b>35.0 – 50.0 sec</b>
<b>LOS F</b> ➤ Forced or breakdown flow ➤ Volumes exceed roadway capacity ➤ Formation of unstable queues ➤ Stoppages for long periods of time because of traffic congestion	<b>&gt; 80.0 sec</b>	<b>&gt; 50.0 sec</b>



The *Synchro Professional Version 7* operations analysis software was used to analyze peak hour conditions at signalized intersections. The *Highway Capacity Software (HCS+ Version 5.6)* was used to analyze peak hour conditions at unsignalized intersections.

The minimum acceptable peak hour intersection level of service established for this project is LOS D for signalized intersections or LOS E for critical movements at unsignalized intersections, or no increase in delay for signalized intersections operating below LOS D or unsignalized intersection critical movements operating below LOS E without the inclusion of site traffic. These conditions and thresholds will be further analyzed and mitigation recommendations made for future scenarios that account for No-Build and Build development scenarios for the Obey Creek site.

The results of this analysis are based on the procedures presented in the *HCM 2010* and performed with the corresponding capacity analysis software described previously. The methodology of evaluating each condition for signalized intersections is to use current Town of Chapel Hill data for the cycle length and splits of individual signalized intersections and report LOS and delay values from Synchro. There are several traffic signals in the project study area that operate as “free-run” signals at all times. These were analyzed as such in all scenarios. Input data includes traffic volumes, truck percentages, individual approach peak hour factors, and pedestrian data for all study area intersections.

**Appendix E** contains the Synchro output for the three peak hours analyzed for all signalized intersections in the project study area.

Unsignalized intersections were analyzed directly in HCS. Their results were evaluated on a per-movement basis, since HCS does not produce an overall intersection level of service for unsignalized intersections. **Appendix F** contains the HCS output for all unsignalized intersections under study.

Study area roadway geometrics, speed limits and traffic control assumptions remain constant from 2013 existing base year conditions and are shown in **Figures 10A and 10B**, along with any changes in the Build Scenario that are shown on the Obey Creek preliminary concept plan.

## **B. 2022 No-Build Scenario (Condition 2) Results**

**Table 19** presents the results for the existing year traffic conditions as compiled from field data. The table lists LOS and delay values for those movements that are in existence at this time. It also only lists data for individual movements encountering delay at the stop-controlled intersections (which do not have an overall intersection delay value produced by HCS). **Figures 11A and 11B** present a summary intersection LOS for each peak period.



Table 19. Capacity Analysis Results for Study Area Intersections – 2022 Analysis Year Scenarios

ID	Intersection Name	2022 No-Build Scenario						2022 Build Scenario						2022 Build Scenario with Mitigation					
		LOS			Average Delay (sec/vehicle)			LOS			Average Delay (sec/vehicle)			LOS			Average Delay (sec/vehicle)		
		AM	Noon	PM	AM	Noon	PM	AM	Noon	PM	AM	Noon	PM	AM	Noon	PM	AM	Noon	PM
1	NC 86 (Columbia Street) & Franklin Street	D	D	<b>E</b>	42.3	53.5	<b>70.8</b>	D	D	<b>E</b>	43.1	54.3	<b>76.6</b>	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*
2	NC 86 (S. Columbia Street) & Cameron Avenue	C	C	D	34.9	33.5	35.1	D	C	D	36.3	33.9	35.7	N/A	N/A	N/A	N/A	N/A	N/A
3	NC 86 S (Pittsboro Street) & W. Cameron Avenue	C	C	C	25.4	23.3	27.0	C	C	C	25.8	24.4	27.6	N/A	N/A	N/A	N/A	N/A	N/A
4	NC 86 S (Pittsboro Street) & McCauley Street	B	B	C	15.2	18.1	21.2	B	B	C	14.1	17.0	22.1	N/A	N/A	N/A	N/A	N/A	N/A
5	NC 86 N (S. Columbia Street) & South Drive	C	C	D	30.9	32.0	39.2	C	C	D	29.6	31.7	40.1	N/A	N/A	N/A	N/A	N/A	N/A
6	NC 86 (S. Columbia Street) & Manning Drive	C	D	D	27.9	38.4	43.2	C	D	D	26.4	37.0	43.4	N/A	N/A	N/A	N/A	N/A	N/A
7	NC 86 (S. Columbia Street) & Mason Farm Road	C	C	C	27.4	24.5	31.3	C	C	C	30.4	24.3	32.3	N/A	N/A	N/A	N/A	N/A	N/A
8	NC 86 (S. Columbia Street) & NC 54 Bypass (Fordham Blvd) WB Ramps	C	C	<b>E</b>	26.3	26.5	<b>57.9</b>	D	C	<b>F</b>	39.2	29.9	<b>103.3</b>	SEE TABLE 18					
9	US 15-501 & NC 54 Bypass (Fordham Blvd) EB Ramps	C	B	B	22.3	12.4	14.0	C	B	D	22.9	16.8	39.0	SEE TABLE 18					
10	US 15-501 & Culbreth Road / Mt. Carmel Church Road	<b>E</b>	B	C	<b>59.1</b>	17.8	24.2	<b>F</b>	B	D	<b>80.3</b>	17.9	51.3	SEE TABLE 18					
11	US 15-501 & Arlen Park Drive / Bennett Road	B	A	B	13.8	7.6	12.0	B	A	B	14.7	6.4	13.5	N/A	N/A	N/A	N/A	N/A	N/A
12	US 15-501 & Market Street / Site Driveway #4	C	B	C	27.4	16.2	24.4	D	C	D	44.1	24.4	46.7						
13	US 15-501 & Southern Village Park & Ride Driveway <sup>@</sup> / Site Dr #3	A	B	C	9.9	10.6	17.5	C	C	D	26.2	30.4	44.9						
14	US 15-501 & Dogwood Acres Drive	A	A	A	5.2	2.6	5.5	B	A	A	11.1	7.6	9.5	N/A	N/A	N/A	N/A	N/A	N/A
15	US 15-501 & Smith Level Road	C	C	C	27.2	22.6	31.7	C	C	C	29.0	23.0	33.6	N/A	N/A	N/A	N/A	N/A	N/A
16	Mt. Carmel Church Road & Bennett Road <sup>@</sup>	D	B	D	28.6	12.0	34.6	E	B	E	40.9	13.1	48.2	N/A	N/A	N/A	N/A	N/A	N/A
17	Greensboro Street & NC 54 Bypass (Fordham Blvd) WB On-Ramp / Merritt Mill Road	B	B	C	15.2	19.8	29.0	B	B	C	15.4	19.9	29.3	N/A	N/A	N/A	N/A	N/A	N/A
18	Smith Level Road & NC 54 Bypass (Fordham Blvd) EB Ramps	C	B	B	30.4	13.0	19.1	C	B	C	32.1	13.4	20.1	N/A	N/A	N/A	N/A	N/A	N/A
19	NC 54 Bypass (Fordham Blvd) WB Off-Ramp & Merritt Mill Road <sup>@</sup>	E	C	<b>F</b>	37.9	15.6	<b>108.1</b>	E	C	<b>F</b>	40.0	15.9	<b>121.3</b>	<b>B</b>	<b>A</b>	<b>A</b>	<b>10.5</b>	<b>6.2</b>	<b>9.6</b>
20	US 15-501/NC 54 Bypass (Fordham Blvd) & Manning Drive	D	C	D	44.7	31.3	44.5	<b>E</b>	C	<b>E</b>	<b>58.6</b>	34.6	<b>60.1</b>	<b>B</b>	<b>B</b>	<b>B</b>	<b>12.9</b>	<b>14.9</b>	<b>11.6</b>
21	US 15-501/NC 54 Bypass (Fordham Blvd) & Old Mason Farm Road	<b>F</b>	D	<b>F</b>	<b>93.7</b>	35.5	<b>82.9</b>	<b>F</b>	D	<b>F</b>	<b>109.6</b>	43.4	<b>108.4</b>	<b>D</b>	<b>B</b>	<b>D</b>	<b>51.7</b>	<b>17.4</b>	<b>36.5</b>
22	US 15-501 Bypass (Fordham Blvd) & NC 54 (Raleigh Road) Interchange Ramps (North) <sup>\$</sup>	C	C	D	28.0	20.9	37.3	C	C	D	34.4	22.6	44.9	<b>B<sup>&amp;</sup></b>	<b>B<sup>&amp;</sup></b>	<b>C<sup>&amp;</sup></b>	<b>18.6<sup>&amp;</sup></b>	<b>17.4<sup>&amp;</sup></b>	<b>22.5<sup>&amp;</sup></b>
	N	<b>E<sup>#</sup></b>	<b>E<sup>#</sup></b>	<b>F<sup>#</sup></b>	42.2 <sup>#</sup>	41.1 <sup>#</sup>	<b>199.0<sup>#</sup></b>	<b>E<sup>#</sup></b>	<b>E<sup>#</sup></b>	<b>F<sup>#</sup></b>	48.1 <sup>#</sup>	47.2 <sup>#</sup>	<b>238.4<sup>#</sup></b>						
22	US 15-501 Bypass (Fordham Blvd) & NC 54 (Raleigh Road) Interchange Ramps (South) <sup>@</sup>	C	C	E	22.1	18.6	38.6	D	C	E	26.5	20.8	48.5	N/A	N/A	N/A	N/A	N/A	N/A
22	US 15-501 Bypass (Fordham Blvd) & W NC 54 (Raleigh Road) Interchange Ramps (West) <sup>@</sup>	C	C	<b>F</b>	21.5	17.1	<b>51.3</b>	C	C	<b>F</b>	21.7	17.1	<b>51.3</b>	<b>A</b>	<b>A</b>	<b>B</b>	<b>9.9</b>	<b>6.3</b>	<b>10.2</b>
22	US 15-501 Bypass (Fordham Blvd) & E NC 54 (Raleigh Road) Interchange Ramps (East) <sup>@</sup>	C	B	C	20.0	13.3	17.3	C	B	C	21.6	13.7	18.8	N/A	N/A	N/A	N/A	N/A	N/A
23	NC 54 (Raleigh Road) & Burning Tree Drive/Finley Golf Course Road	B	B	C	20.0	12.3	21.2	C	B	C	20.8	12.3	21.7	N/A	N/A	N/A	N/A	N/A	N/A
24	NC 54 (Raleigh Road) & Hamilton Road	C	B	C	27.0	18.1	22.5	C	B	C	28.1	18.4	23.1	N/A	N/A	N/A	N/A	N/A	N/A
25	Smith Level Road & Culbreth Road	C	B	B	24.9	10.6	14.5	C	B	B	25.8	11.1	15.3	N/A	N/A	N/A	N/A	N/A	N/A
26	Smith Level Road & Dogwood Acres Drive <sup>@</sup>	B	B	C	13.1	10.5	15.2	B	B	B	13.1	10.4	14.8	N/A	N/A	N/A	N/A	N/A	N/A
27	Mt. Carmel Church Road & Old Lystra Road <sup>@</sup>	C	B	C	23.6	13.0	19.2	D	B	C	26.6	13.4	20.8	N/A	N/A	N/A	N/A	N/A	N/A
28	US 15-501 & Site Driveway #1 (RIRO) <sup>@</sup>	N/A	N/A	N/A	N/A	N/A	N/A	C	B	B	15.3	11.0	11.2	N/A	N/A	N/A	N/A	N/A	N/A
29	US 15-501 & Site Driveway #2 (RIRO) <sup>@</sup>	N/A	N/A	N/A	N/A	N/A	N/A	C	B	B	15.3	11.5	12.1	N/A	N/A	N/A	N/A	N/A	N/A
30	US 15-501 & Site Driveway #5 (RIRO) <sup>@</sup>	N/A	N/A	N/A	N/A	N/A	N/A	C	B	C	17.2	13.2	16.2	N/A	N/A	N/A	N/A	N/A	N/A
31	US 15-501 Bypass (Fordham Blvd) & Median U-Turn #1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<b>D</b>	<b>A</b>	<b>D</b>	<b>41.2</b>	<b>6.2</b>	<b>46.8</b>
32	US 15-501 Bypass (Fordham Blvd) & Median U-Turn #2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<b>A</b>	<b>A</b>	<b>A</b>	<b>8.6</b>	<b>6.2</b>	<b>6.4</b>

N/A – Not Applicable, i.e. movement is non-existent or no improvements made  
 \* - No Movement Capacity Estimated By HCM Methodology, Delay Theoretically Infinite  
 @ - Unsignalized Intersection, LOS/Delay Values Correspond to Worst-Case Critical Movement  
**BOLD/ITALICS** – Movement or Overall Intersection is over capacity as defined by Town of Chapel Hill TIS Standards  
 # - Estimated LOS/Delay For Yield-Controlled Movement Based on HCM Stop-Controlled Methodology  
**BLUE** = New/Proposed Intersections/intersections with Changes Due to Site Access  
 \$ - Intersection Signalized Southbound/Yield Controlled Northbound



Of the 30 intersection locations analyzed, seven are expected to experience deficient overall peak hour LOS in the AM, Noon, or PM peak periods, based on projected 2022 No-Build Scenario traffic volume data and reoptimized signal timings from 2013 base year conditions. The specific intersections and issues that contribute to the deficient LOS E or LOS F operations include the following:

- **Franklin Street & NC 86 (Columbia Street) – ID #1**  
The 2022 PM peak hour overall intersection LOS is expected to be LOS E at this intersection. This intersection will continue to face high volumes of pedestrian crossing conflicts, coupled with the presence of buses and bus stops in the vicinity, on-street parking, bicycles and other heavy vehicles all contribute to reducing vehicular throughput.
- **NC 86 (S. Columbia Street) and NC 54 Bypass Westbound Ramps – ID #8**  
The projected 2022 PM peak overall LOS E operational issues at this intersection are primarily due to high ramp volumes for the westbound off-ramp approach and conflicting volumes of northbound left-turns and southbound through traffic on NC 86.
- **US 15-501 and Mt. Carmel Church Road – ID #10**  
This intersection is expected to operate over capacity (LOS E) in the 2022 AM peak hour, due to heavy through traffic volumes on US 15-501 and several significant turning volumes, particularly westbound right-turns on Mt. Carmel Church Road.
- **NC 54 Bypass Westbound Off-Ramp and Merritt Mill Road – ID #19**  
This unconventional stop-controlled intersection (the off-ramp has dual left-turn stop-controlled movements) is expected to operate at a LOS F for the off-ramp approach in the 2022 PM peak hour, with queues extending back to the NC 54 Bypass mainline roadway.
- **US 15-501 Bypass (Fordham Blvd) and Old Mason Farm Road – ID #21**  
This intersection is expected to operate at a LOS F in both AM and PM peak hours in 2022, regardless of Obey Creek development traffic. Heavy through traffic volumes on US 15-501 are expected to cause extensive queuing issues upstream of this intersection in both directions and the unconventional 5-leg approaches hamper efficient signal phasing and decrease available green time for US 15-501.
- **US 15-501 Bypass Northbound and NC 54 Westbound On-Ramp – ID #22N**  
The intersection of the US 15-501 northbound travel lanes with the NC 54 Westbound on-ramp is currently yield-controlled for the on-ramp. From field observations of peak hour operations, a short acceleration lane downstream causes driver confusion and hesitancy in many cases, with the result being that many vehicles react to the intersection as being stop-controlled. The intersection has been conservatively analyzed as a stop-controlled intersection in this study and in the 2022 PM peak hour, expected traffic volumes degrade operations to a LOS F.
- **US 15-501 Bypass Southbound Off-Ramp and NC 54 Eastbound – ID #22W**  
The stop-controlled intersection at the US 15-501 southbound off-ramp and NC 54 eastbound is expected to operate at a LOS F for the off-ramp stop-controlled approach in 2022.

All other remaining signalized and unsignalized intersections in the project study area are anticipated to provide acceptable LOS, as determined by Town of Chapel Hill thresholds (LOS



D overall for signalized intersections or LOS E for critical movements for unsignalized intersections).

### **C. 2022 Build Scenario (Condition 3) Results**

**Table 19** presents the results for the 2022 Build Scenario, which includes impacts of site-related traffic (new trips, pass-by trips, diverted-linked trips) to the 2022 study area roadway network. 2022 No-Build Scenario signal timings were held constant for the Build Scenario – to provide a comparable impact of site traffic on intersection operations. Signal timings and network geometrics were updated in the vicinity of the Obey Creek site, based on assumptions taken from the site concept plans. **Figures 12A and 12B** present a summary intersection LOS for each peak period.

Of the 33 intersection locations analyzed, eight are expected to experience deficient overall peak hour LOS in the AM, Noon, or PM peak periods, based on projected 2022 Build Scenario traffic volume data. The specific intersections and issues that contribute to the deficient LOS E or LOS F operations include the following:

- **Franklin Street & NC 86 (Columbia Street) – ID #1**  
The 2022 PM peak hour overall intersection LOS is expected to be LOS E at this intersection, with a marginal increase in overall intersection delay.
- **NC 86 (S. Columbia Street) and NC 54 Bypass Westbound Ramps – ID #8**  
The projected 2022 PM peak overall LOS is expected to drop from LOS E to LOS F with the addition of site traffic. The degradation in operations is due to site-related increases in westbound off-ramp left-turn, southbound through and northbound left-turn/through volumes.
- **US 15-501 and Mt. Carmel Church Road – ID #10**  
This intersection is expected to degrade from a LOS E to a LOS F in the 2022 AM peak hour due to northbound and southbound site-related through traffic volume increases on US 15-501. The PM peak hour operations also degrade from a LOS C to a LOS D, with overall delay values doubling from No-Build conditions.
- **NC 54 Bypass Westbound Off-Ramp and Merritt Mill Road – ID #19**  
The 2022 PM peak hour NC 54 westbound off-ramp critical movement LOS is expected to remain at LOS F at this intersection, with a marginal increase in critical movement delay.
- **US 15-501/NC 54 Bypass (Fordham Blvd) & Manning Drive – ID #20**  
2022 AM and PM peak hour overall intersection LOS degrades from LOS D to LOS E in both peak hours with the addition of site-related traffic (primarily through traffic increases on US 15-501). US 15-501 operations in the vicinity of this intersection and the upstream Old Mason Farm Road intersection are near or above capacity in the 2022 No-Build scenario and will likely worsen with the addition of site-related traffic.
- **US 15-501 Bypass (Fordham Blvd) and Old Mason Farm Road – ID #21**  
This intersection is expected to continue to operate at a LOS F in both AM and PM peak hours in the 2022 Build Scenario, with increases in overall delay due to site-related through traffic on US 15-501.



- **US 15-501 Bypass Northbound and NC 54 Westbound On-Ramp – ID #22N**  
With the assumption that this intersection could be analyzed as a stop-controlled intersection in this study, the 2022 PM peak hour operations remain a LOS F for the on-ramp movement.
- **US 15-501 Bypass Southbound Off-Ramp and NC 54 Eastbound – ID #22W**  
The stop-controlled intersection at the US 15-501 southbound off-ramp and NC 54 eastbound is expected to operate at a LOS F for the off-ramp stop-controlled approach in 2022, with no projected increase in delay due to site-related traffic.

All other remaining signalized and unsignalized intersections in the project study area are anticipated to provide acceptable LOS, as determined by Town of Chapel Hill thresholds (LOS D overall for signalized intersections or LOS E for critical movements for unsignalized intersections).

#### **D. 2022 Build Scenario – With Mitigation (Condition 4) Results**

**Table 19** presents the results for the 2022 Build Scenario traffic conditions that require mitigation to meet Town thresholds for acceptable traffic operations. Specific improvements tested to improve operations are described below and in **Section IV** of this report. **Figures 12A and 12B** present a summary intersection LOS for each peak period for any intersections requiring mitigation in the 2022 No-Build or Build Scenarios. **Figures 13A and 13B** highlight schematic improvements to geometrics and/or traffic control recommended.

- **Franklin Street & NC 86 (Columbia Street) – ID #1**  
The location of this intersection in proximity to existing development limits the ability to feasibly increase intersection capacity through widening roadways/adding auxiliary lanes. Signal retiming with the addition of site-related traffic does not improve projected operations to levels that are better than No-Build Scenario estimates, but should be considered as a feasible possibility to ensure the maintenance of traffic flow at this location.
- **NC 86 (S. Columbia Street) and NC 54 Bypass Westbound Ramps – ID #8**  
To mitigate projected operational deficiencies in the 2022 No-Build and Build Scenarios, two feasible options exist – a conversion of the existing diamond interchange to a Diverging Diamond Interchange or a reconfiguration of the existing north side of the interchange to provide a westbound NC 54 loop off-ramp for traffic heading southbound on US 15-501. Other options to retime this intersection signal or add auxiliary lanes either do not provide significant operational improvement or would require widening to the existing bridge structure over the NC 54 Bypass without the amount improvement provided by the two options suggested above. A comparison of operational improvements from these two options is shown in **Table 20**, and additional information is provided in **Section IV** of this report.
- **US 15-501 and Mt. Carmel Church Road – ID #10**  
Deficient traffic operations at this intersection in the AM peak hour were analyzed by attempting to restripe existing laneage for a more optimal efficiency with existing and future projected traffic patterns. An effective strategy that was tested involved converted the existing westbound approach to a shared left-turn through lane and dual exclusive right-turn lanes. This provides a more efficient use of optimized signal timing for the intersection. A comparison of results in **Table 20** to projected No-Build and Build Conditions in **Table 19**



indicate that this potential improvement to the westbound approach mitigates deficient operations in either Alternative Scenario.

**Table 20. US 15-501/NC 86 & NC 54 Bypass (Fordham Boulevard) Interchange  
 2022 – With Mitigation Capacity Analysis Results**

**Alternative 1 – Diverging Diamond Interchange**

ID	Intersection Name	2022 Build Scenario with Mitigation					
		LOS			Average Delay (sec/vehicle)		
		AM	Noon	PM	AM	Noon	PM
8	NC 86 Northbound & NC 86 Southbound Crossover	D	C	D	40.4	21.3	36.8
81	NC 86 Northbound & NC 54 Westbound Off-Ramp Right-Turn	A	A	A	6.6	4.5	3.0
82	NC 86 Southbound & NC 54 Westbound Off-Ramp Left-Turn	A	C	C	7.8	21.2	24.7
9	US 15-501 Northbound & US 15-501 Southbound Crossover	C	C	<b>E</b>	29.0	22.5	<b>55.3</b>
91	NC 54 Eastbound Off-Ramp Left-Turn & US 15-501 Northbound	B	A	A	12.1	4.9	3.7
92	NC 54 Eastbound Off-Ramp Right-Turn & US 15-501 Southbound	A	A	B	8.1	4.6	13.9
10	US 15-501 & Culbreth Road / Mt. Carmel Church Road	D	B	D	40.0	15.6	41.0

**BOLD/ITALICS** – Movement or Overall Intersection is over capacity as defined by Town of Chapel Hill TIS Standards

**Alternative 2 – NC 54 WB Loop Off-Ramp**

ID	Intersection Name	2022 Build Scenario with Mitigation					
		LOS			Average Delay (sec/vehicle)		
		AM	Noon	PM	AM	Noon	PM
8	NC 86 (S. Columbia Street) & NC 54 Bypass WB On-Ramp	A	A	C	2.2	2.0	21.5
	NC 86 (S. Columbia Street) & NC 54 Bypass WB Off-Ramp <sup>@</sup>	B	B	B	10.4	10.7	10.1
9	US 15-501 & NC 54 Bypass EB Off-Ramp	C	B	C	30.2	18.9	23.4
10	US 15-501 & Culbreth Road / Mt. Carmel Church Road	D	B	D	40.7	18.7	43.7

<sup>@</sup> - Unsignalized Intersection, LOS/Delay Values Correspond to Worst-Case Critical Movement

• **NC 54 Bypass Westbound Off-Ramp and Merritt Mill Road – ID #19**

A potential option to improve operations at this intersection would be to convert the unconventional stop-controlled intersection to a roundabout. Additionally, the westbound leg, which is currently a three-lane undivided cross-section, could be converted to develop an additional approach lane westbound to provide additional capacity. This laneage arrangement was tested in the SIDRA roundabout evaluation software and overall





operations improve greatly, with projected queues not affecting the NC 54 westbound mainline roadway. SIDRA results are presented in **Appendix G**.

- **US 15-501/NC 54 Bypass (Fordham Blvd) & Manning Drive – ID #20**
- **US 15-501 Bypass (Fordham Blvd) and Old Mason Farm Road – ID #21**  
Standard improvements to the US 15-501 corridor in the vicinity of these intersections would require additional throughput capacity on US 15-501 to make significant improvements to overall corridor traffic operations. However, the existing four-lane divided cross-section could be maintained without widening (and with significant operational and safety benefit) with the construction of superstreet concept in this area. **Table 19** highlights the benefits of a superstreet, with the inclusion of two additional necessary median u-turn intersections.
- **US 15-501 Bypass Northbound and NC 54 Westbound On-Ramp – ID #22N**  
To mitigate this intersection’s operational issues, and maintain free flowing conditions on US 15-501 northbound, the intersection was converted to a free flowing on-ramp, with a true ramp acceleration lane. This geometric change would require the removal of the US 15-501 northbound to NC 54 westbound loop off-ramp and the creation of a northbound signal-controlled left-turn lane to accommodate this movement. No operational issues are expected with that conversion and testing the upgraded westbound on-ramp merging movement in the HCS Freeway Merge software module indicates that LOS C or better operations are expected in the 2022 Build Scenario.
- **US 15-501 Bypass Southbound Off-Ramp and NC 54 Eastbound – ID #22W**  
This existing stop-controlled intersection was tested to check if it met MUTCD peak hour signal warrants in the 2022 Build Scenario. Analysis results indicate that projected volumes and the existing intersection geometrics meet multiple peak hour warrants. The proposed improvement would be to signalize the south side of the intersection and coordinate that signal with downstream signals east of the interchange. **Appendix H** contains the signal warrant analysis details.

#### **IV. MITIGATION MEASURES/RECOMMENDATIONS**

##### **A. Planned Improvements**

Based on information from the Town of Chapel Hill and NCDOT, there are two roadway projects, currently under construction in the project study area. Though the projects do feature improvements for traffic flow, transit operations and pedestrian/bicyclists, they are not expected to significantly affect geometrics or intersection traffic operations at study area intersections.

##### **NCDOT STIP U-2803 – Smith Level Road Widening**

Per information from NCDOT, this project will improve a section of Smith Level Road in Carrboro between Rock Haven Road and the bridge over Morgan Creek south of NC 54. The plan is to widen this section of Smith Level Road to include bike lanes, sidewalks and turn lanes with a center median. A roundabout is planned for the intersection of Rock Haven Road and Smith Level Road. Construction began in March 2013 and runs through June 2014.

##### **NCDOT STIP U-0624 - South Columbia Street Enhancement Project**

Per information from NCDOT, this project affects a 0.8-mile section of N.C. 86/South Columbia Street from Purefoy Road to Manning Drive to include improvements for a center turn lane and bus pullouts, with the purpose of improving safety and the flow of traffic in the area. Sidewalks



and bike lanes will be added to both sides of the road. The project began in November 2012 and is expected to be completed by July 2014

## **B. Background Committed Improvements**

No significant background committed improvements from private developments or the University of North Carolina to the study area roadway network are expected between 2013 and 2022.

## **C. Applicant Committed Improvements**

Per the current Obey Creek Site Concept Plan, shown in **Figure 2**, the Applicant proposes five site access points to facilitate traffic to/from the site along US 15-501. The plan proposes the following details:

- US 15-501 & Market Street Intersection – Construct 4<sup>th</sup> (westbound) leg to the intersection with adequate width for two exiting lanes and approximately 250 feet of vehicular storage in those lanes, along with a single entry lane. It was assumed that this would include all necessary signal upgrades to facilitate the most efficient traffic flow with this configuration.
- US 15-501 & Southern Village Park-and-Ride Driveway Intersection – Construct 4<sup>th</sup> (westbound) leg to the intersection and create a full access median break with signalization. Create a southbound left-turn lane with 200 feet of storage. The Site Driveway leg to this intersection is initially assumed to have single lane entry and exit, with approximately 300 feet of exit lane storage.

All other proposed site driveways are to be single lane entry/exit stop-controlled intersections with US 15-501 Northbound. A fully developed internal roadway network is also depicted, with a single lane one-way frontage road proposed between the southernmost access driveway and the existing Park-and-Ride Driveway median break. In addition, a potential pedestrian bridge spanning US 15-501 is shown just north of the proposed full median break at the existing Park-and-Ride Driveway.

No other external transportation-related improvements are shown on the site plan or were analyzed as being committed to by the Applicant at this time.

## **D. Necessary Improvements**

To meet Town of Chapel Hill thresholds for adequate intersection traffic operations (overall signalized intersection LOS D or better, stop-controlled critical movement LOS E or better) in the 2022 analysis scenario, an investigation of those intersections/movements failing to meet these thresholds in the No-Build and Build Scenarios was undertaken and a description of these intersections and proposed improvements is listed in **Table 19**. Initial improvements were considered to attempt to bring vehicular delays and LOS back to No-Build Scenario levels, and if those failed to meet this qualification, additional improvement strategies were tested.

Information contained in **Table 19** is also schematically displayed in **Figures 13A and 13B**.

Improvements at the NC 54 Bypass / US 15-501 interchange may require considerable investments to widen the bridge structure or redesign and construct existing laneage to accommodate an innovative DDI design. Additional issues related to right-of-way impacts,



environmental issues, construction cost estimates and other details related to these two alternative improvement scenarios have not been discussed by project stakeholders. Due to existing limitations with the current interchange configuration and proximity of the nearby US 15-501 / Mt. Carmel Church Road/Culbreth Road intersection, conventional improvements to improve traffic operations in this area (auxiliary lane or through lane widening, signal phasing, lane restriping) would either be infeasible or would not likely provide substantial improvement to projected operations in the 2022 analysis year.

Due to the fact that the NC 54 Bypass westbound ramp terminal is expected to require improvements regardless of the development of the Obey Creek site, while still acknowledging that site traffic impacts in the interchange area do cause degradation of Level-of-Service, **Table 19** notes that the proposed improvement strategies are “partially” the responsibility of the developer. Additional discussions, evaluation, and analysis will be necessary to fully develop and compare the impacts of these alternatives.



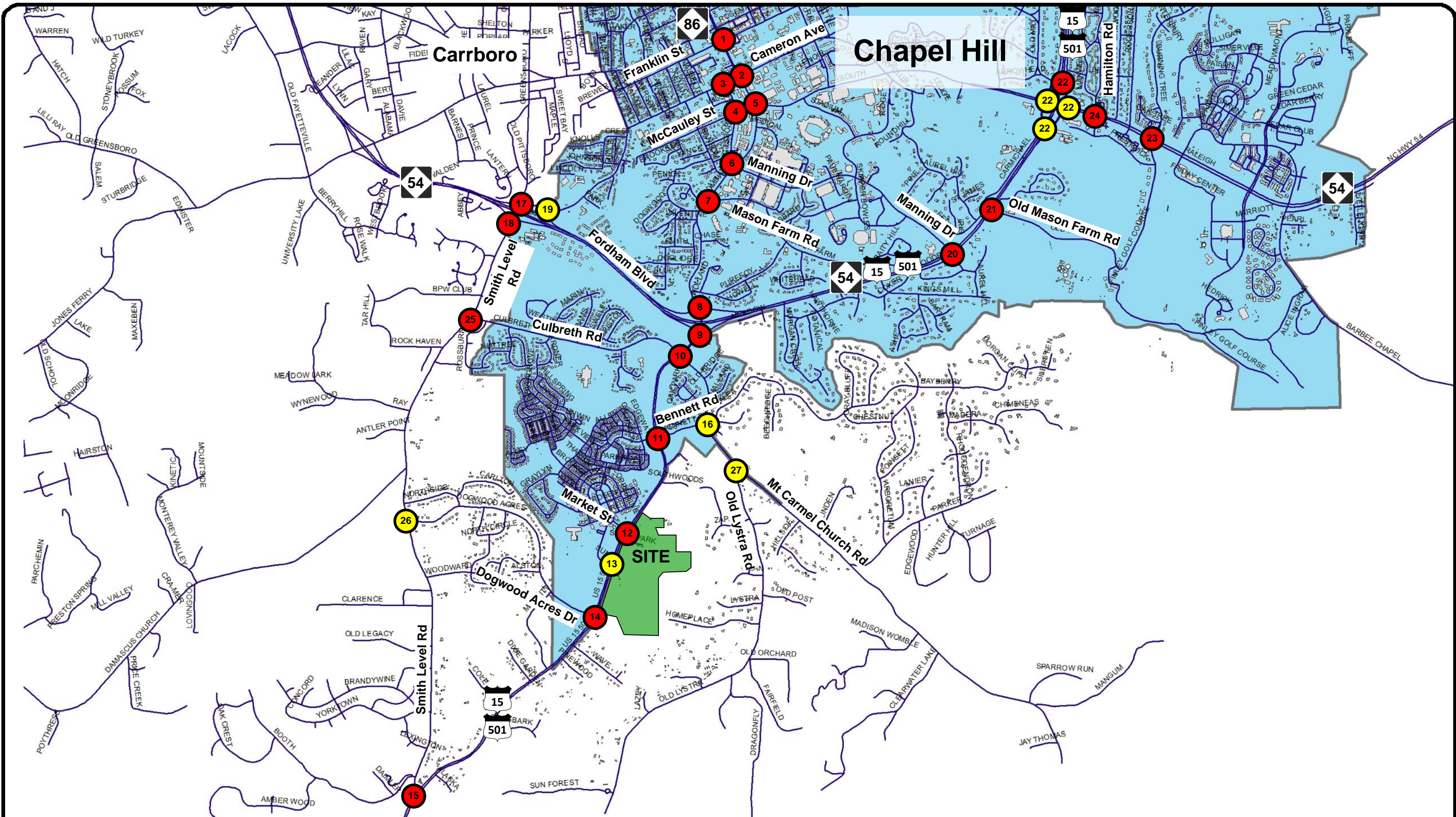
Table 19. Recommended Improvements Matrix

ID	Intersection Name	2022 No-Build Worst Case LOS	2022 Build Worst Case LOS	Proposed Improvement(s)
1	NC 86 (Columbia Street) & Franklin Street	E	E	<ul style="list-style-type: none"> <li>With limited feasible geometric improvement options available, reoptimize traffic signal after site build-out</li> </ul>
8	NC 86 (S. Columbia Street) & NC 54 Bypass (Fordham Blvd) WB Ramps	E	F	<p><u>Alternative 1</u></p> <ul style="list-style-type: none"> <li>Reconfigure existing interchange as a Diverging Diamond Interchange</li> <li>Reoptimize signals along US 15-501 corridor</li> </ul> <p><u>Alternative 2</u></p> <ul style="list-style-type: none"> <li>Create NC 54 Bypass Westbound Loop Off-Ramp with free-flowing southbound traffic movement at bridge,</li> <li>Reconfigure existing intersection for longer northbound left-turn lane,</li> <li>Create existing westbound off-ramp stop-controlled right-turn movement,</li> <li>Provide single southbound through lane and right turn lane,</li> <li>Reoptimize signals along US 15-501 corridor</li> </ul>
9	US 15-501 & NC 54 Bypass (Fordham Blvd) EB Ramps	C	D	<p><u>Alternative 1</u></p> <ul style="list-style-type: none"> <li>Reconfigure existing interchange as a Diverging Diamond Interchange</li> <li>Reoptimize signals along US 15-501 corridor</li> </ul> <p><u>Alternative 2</u></p> <ul style="list-style-type: none"> <li>No geometric changes, only signal timing reoptimization</li> </ul>
10	US 15-501 & Culbreth Road / Mt. Carmel Church Road	E	F	<ul style="list-style-type: none"> <li>Restripe existing westbound Mt. Carmel Church Road approach for a shared left-turn/through lane and dual right-turn lanes</li> <li>Reoptimize signals along US 15-501 corridor</li> </ul>
12	US 15-501 & Market Street / Site Driveway #4	C	D	<ul style="list-style-type: none"> <li>Construct northbound right-turn lane with minimum of 150 feet of storage and full taper</li> <li>Lengthen existing southbound left-turn lane for a minimum of 350 feet of storage</li> </ul>
13	US 15-501 & Southern Village Park & Ride Driveway / Site Dr #3	C	D	<ul style="list-style-type: none"> <li>Construct northbound right-turn lane with minimum of 150 feet of storage and full taper</li> <li>Provide at least 350 feet of southbound left-turn lane storage</li> <li>Provide two westbound exit lanes with 300 feet of storage – a shared left/through lane and exclusive right-turn lane with overlap</li> <li>Prohibit any right-turns into/left-turns out of the Frontage Road intersection with Proposed Site Driveway</li> </ul>
19	NC 54 Bypass (Fordham Blvd) WB Off-Ramp & Merritt Mill Road	F	F	<ul style="list-style-type: none"> <li>Convert existing stop-controlled intersection to a roundabout with dual-entry lanes from the off-ramp and westbound on Merritt Mill Road (develop a through lane with 250 feet of storage in the current center turn lane)</li> </ul>
20	US 15-501/NC 54 Bypass (Fordham Blvd) & Manning Drive	D	E	<ul style="list-style-type: none"> <li>Convert existing intersection to a “reverse” superstreet concept – allow left and right-turns at Manning Drive approaches</li> <li>Construct downstream median u-turn superstreet intersection and signalize</li> </ul>
21	US 15-501/NC 54 Bypass (Fordham Blvd) & Old Mason Farm Road	F	F	<ul style="list-style-type: none"> <li>Convert existing intersection to a superstreet concept – allow no left-turns for any approach</li> <li>Construct downstream median u-turn superstreet intersection and signalize</li> </ul>
22 N	US 15-501 Bypass (Fordham Blvd) & NC 54 (Raleigh Road) Interchange Ramps (North)	F	F	<ul style="list-style-type: none"> <li>Eliminate northbound US 15-501 loop off-ramp</li> <li>Construct northbound left-turn lane with 200 feet of storage and taper – signalize this movement into the existing southbound US 15-501 / NC 54 Westbound Loop On-Ramp signal phasing scheme</li> <li>Revise geometry of existing NC 54 Westbound on-ramp that connects with US 15-501 Northbound per NC 54 Land Use and Transportation Study Conceptual Plan</li> </ul>
22 W	US 15-501 Bypass (Fordham Blvd) & NC 54 (Raleigh Road) Interchange Ramps (West)	F	B	<ul style="list-style-type: none"> <li>Signalize Raleigh Road eastbound lanes with US 15-501 Southbound Off-Ramp if signal warrants are met in 2022 and queue storage issues are occurring on the ramp</li> </ul>
28	US 15-501 & Site Driveway #1 (RIRO)	N/A	C	<ul style="list-style-type: none"> <li>Consider eliminating intersection due to proximity to Dogwood Acres Drive signalized intersection and southbound u-turn bulb-out</li> </ul>
29	US 15-501 & Site Driveway #2 (RIRO)	N/A	C	<ul style="list-style-type: none"> <li>Construct northbound right-turn lane with minimum of 150 feet of storage and full taper</li> <li>Prohibit eastbound left or right-turn movements at Frontage Road immediate to the east of the intersection</li> <li>Prohibit left-turn or through traffic movements for either Frontage Road approach near this intersection</li> </ul>

RED = Developer Required Improvement

BLUE = Partially Required By Developer – Additional Study and Discussion Needed

## **Appendix A – Figures**



**Obey Creek Mixed-Use Development  
Traffic Impact Study**

**PROJECT STUDY AREA**



**LEGEND**

- = Signalized Study Area Intersection
- = Unsignalized Study Area Intersection

DATE: April 2014

**FIGURE 1**

Town of Chapel Hill soccer fields

Town of Chapel Hill Park & Ride




Southern Village

15 501

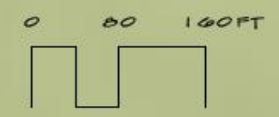
Market Street



**LEGEND**

-  = Existing Signalized Intersection
-  = Proposed Full Access Break/Signalized Intersection
-  = Proposed RIRO Stop-Controlled Intersection

→ North



Street Level



**Obey Creek Mixed-Use Development  
Traffic Impact Study**

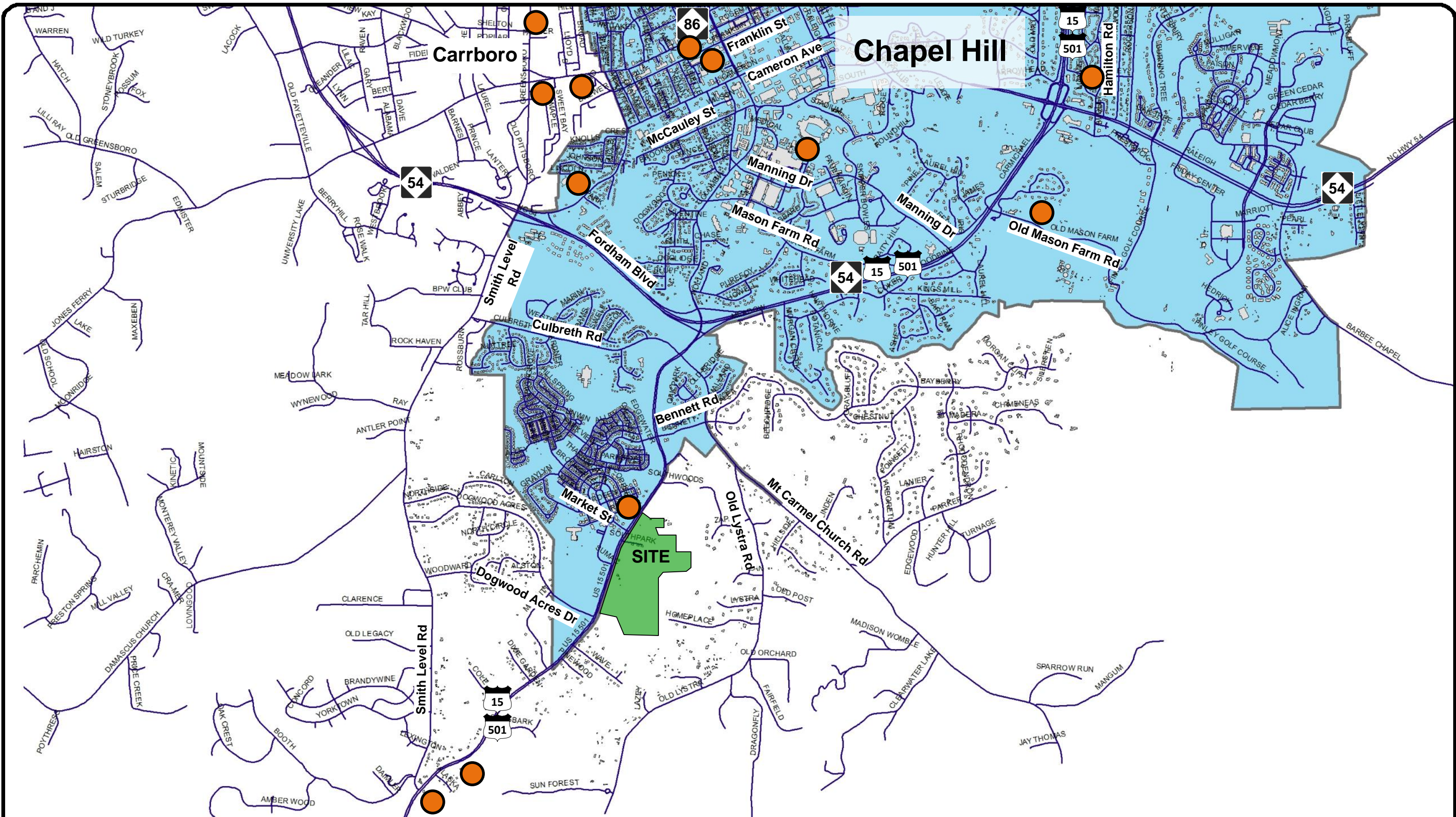
**SITE CONCEPT - PRELIMINARY PLAN**



**NOT  
TO  
SCALE**

DATE: April 2014



**FIGURE 2**



**Obey Creek Mixed-Use Development  
Traffic Impact Study**

**POTENTIAL BACKGROUND DEVELOPMENTS**

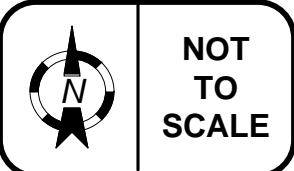
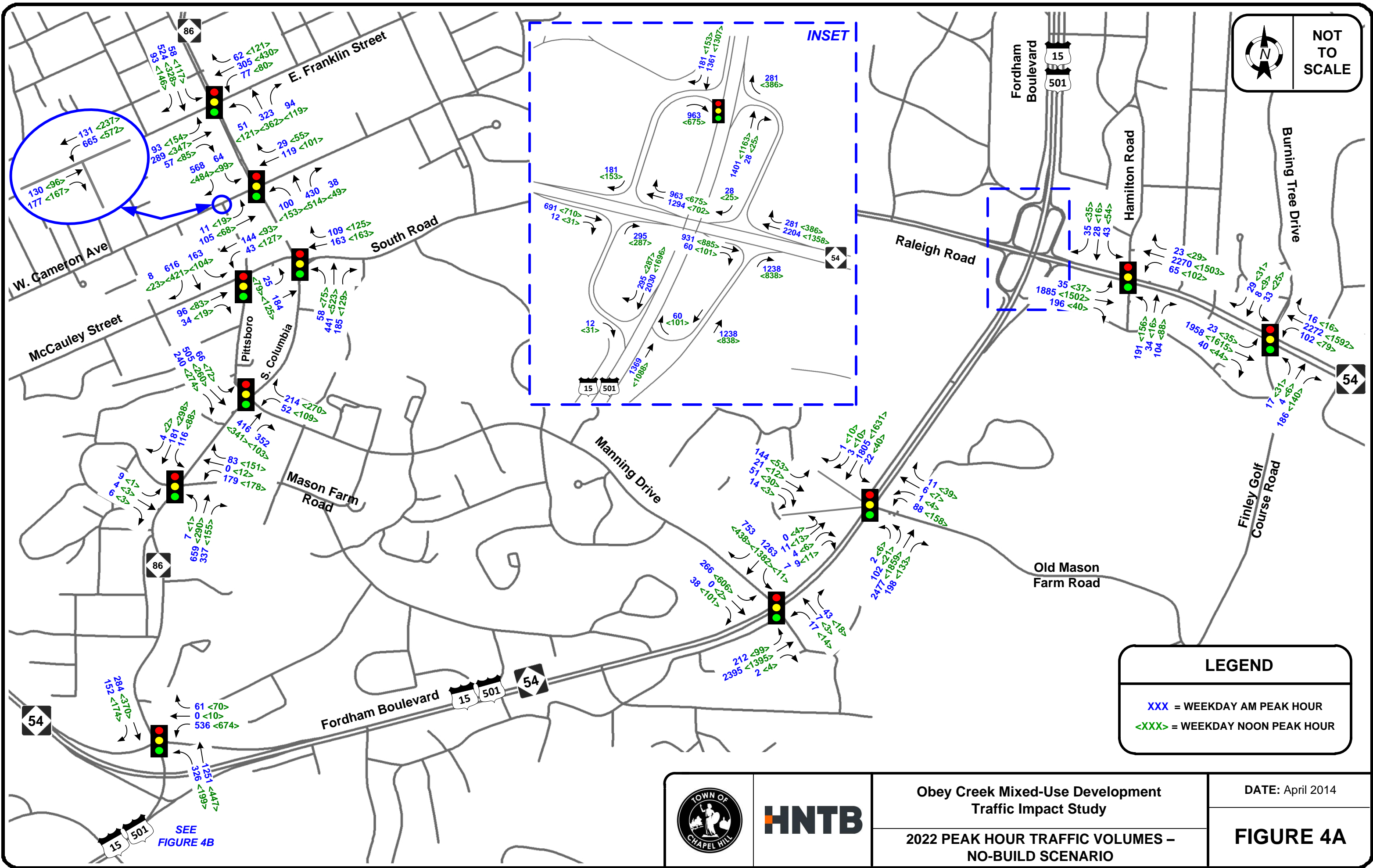


- LEGEND**
-  = Study Area Future Development Location
  -  = Obey Creek Parcel

DATE: April 2014

**FIGURE 3**





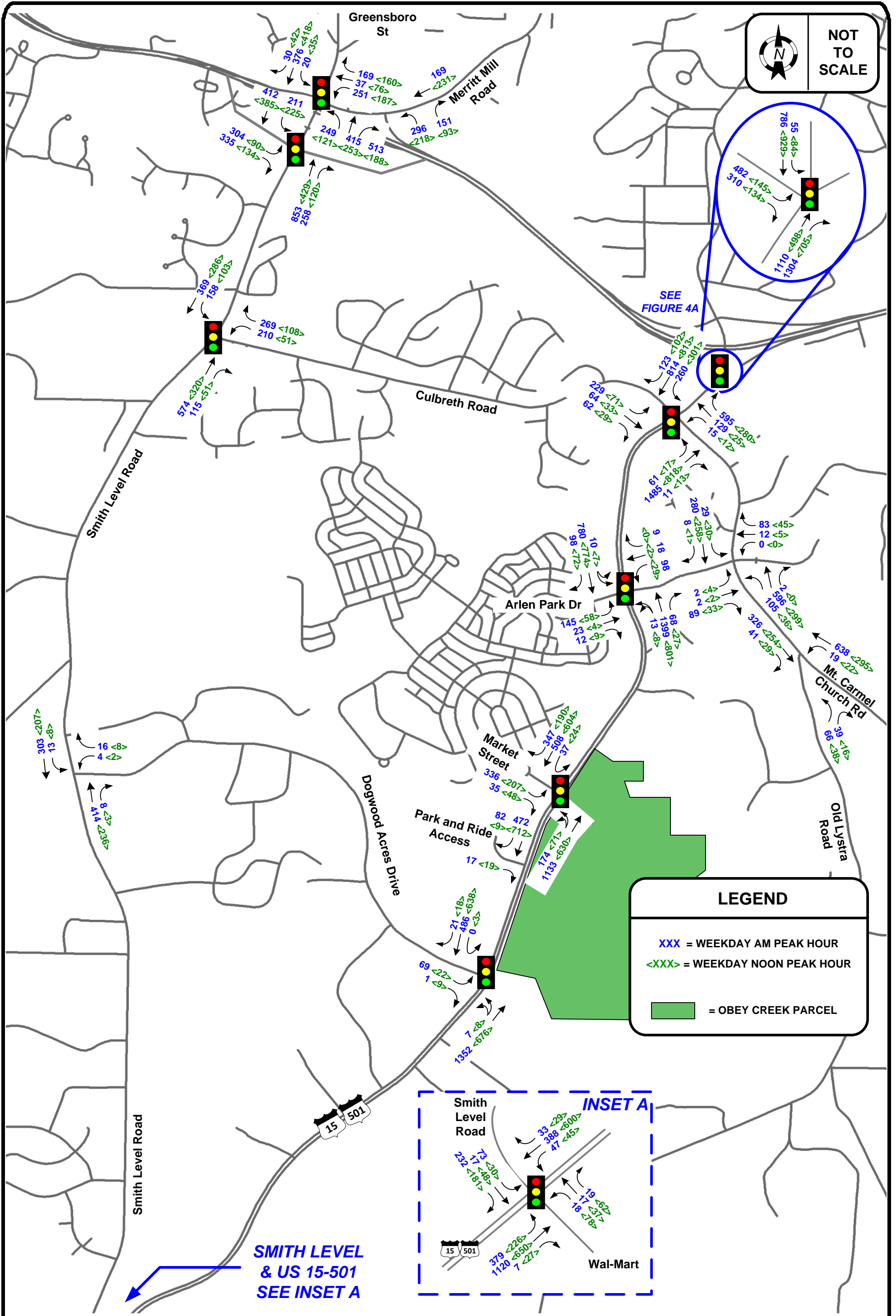
**HNTB**

Obey Creek Mixed-Use Development  
Traffic Impact Study

2022 PEAK HOUR TRAFFIC VOLUMES –  
NO-BUILD SCENARIO

DATE: April 2014

**FIGURE 4A**



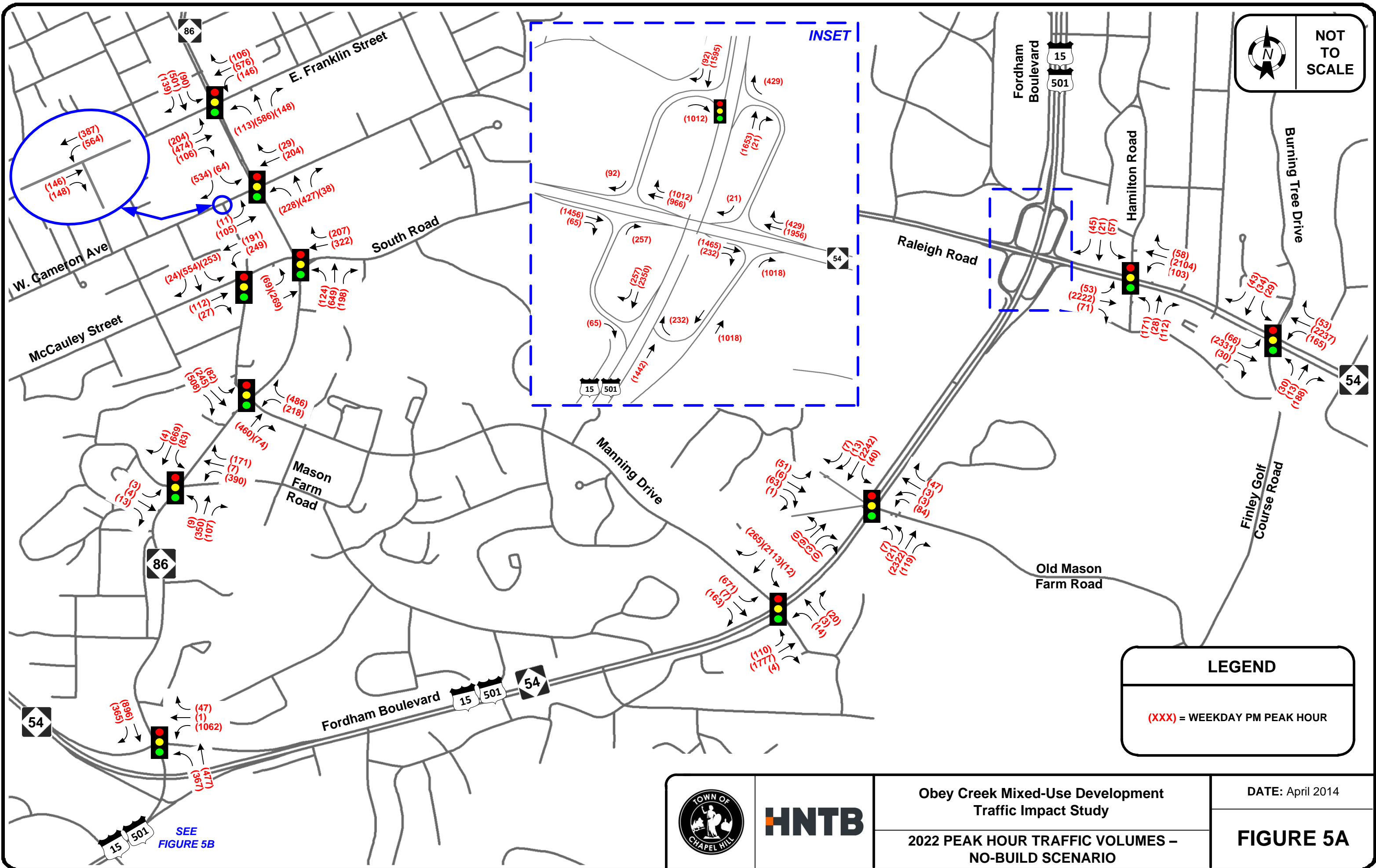
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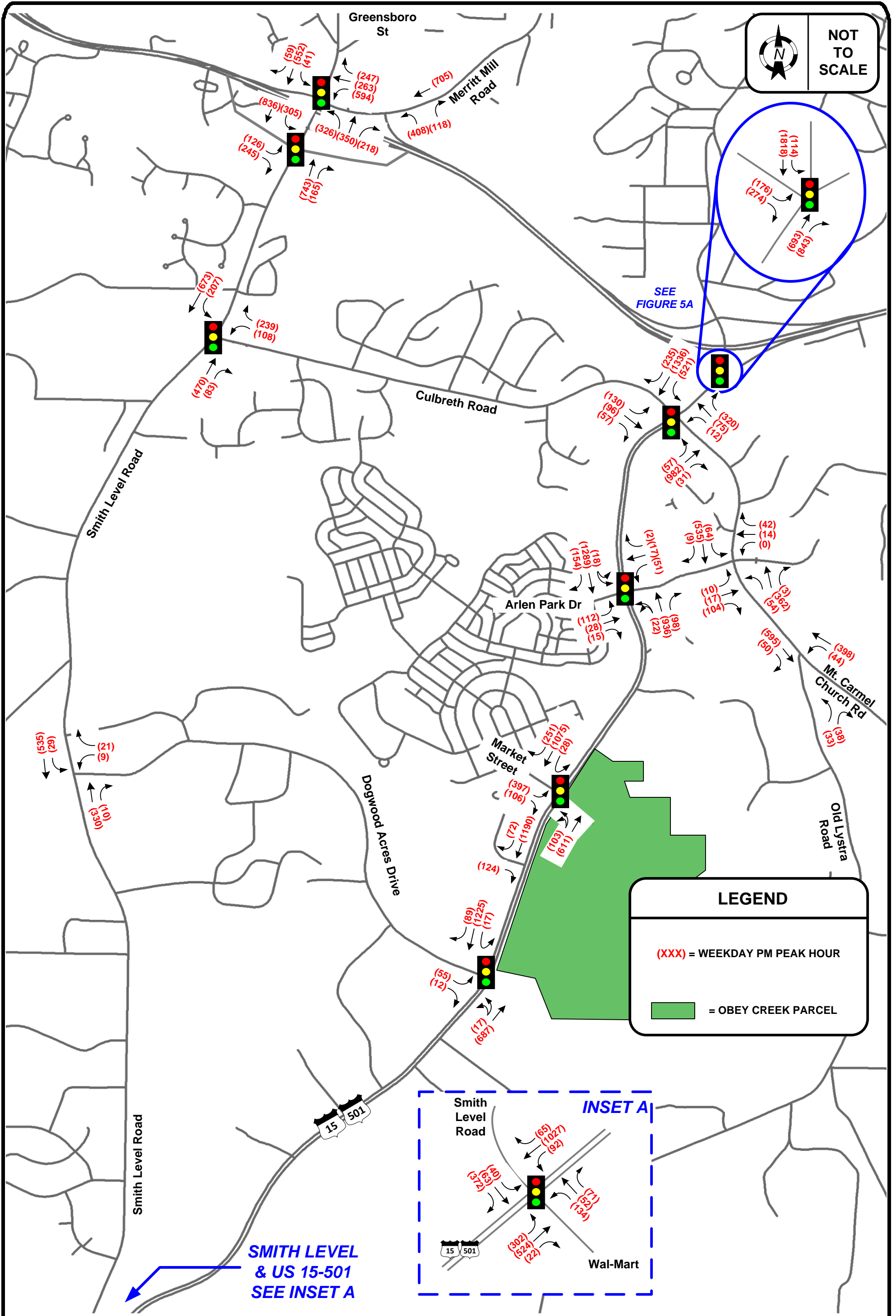
**Obey Creek Mixed-Use Development  
Traffic Impact Study**

DATE: April 2014

2022 PEAK HOUR TRAFFIC VOLUMES – NO-BUILD SCENARIO

**FIGURE 4B**





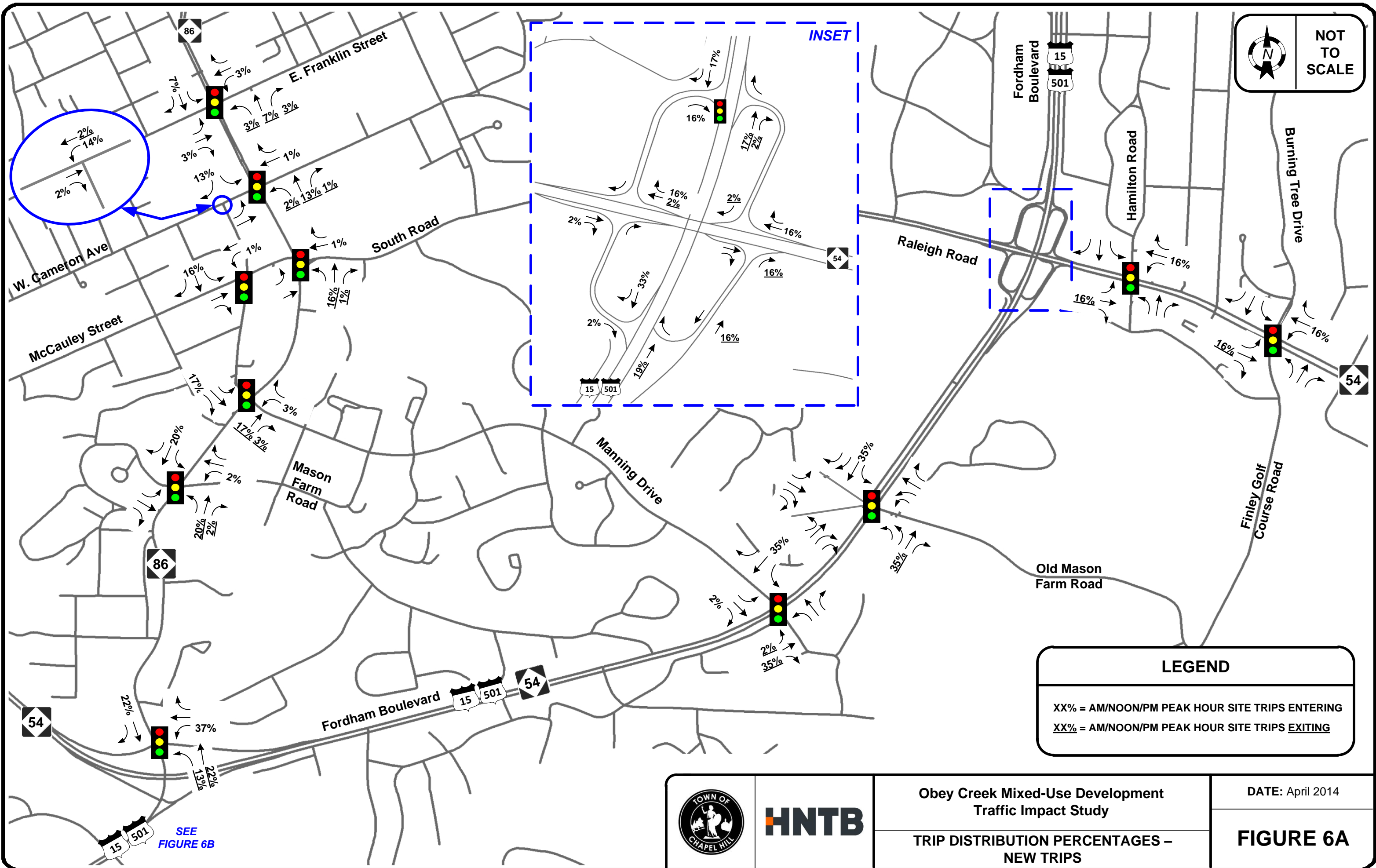
**HNTB**

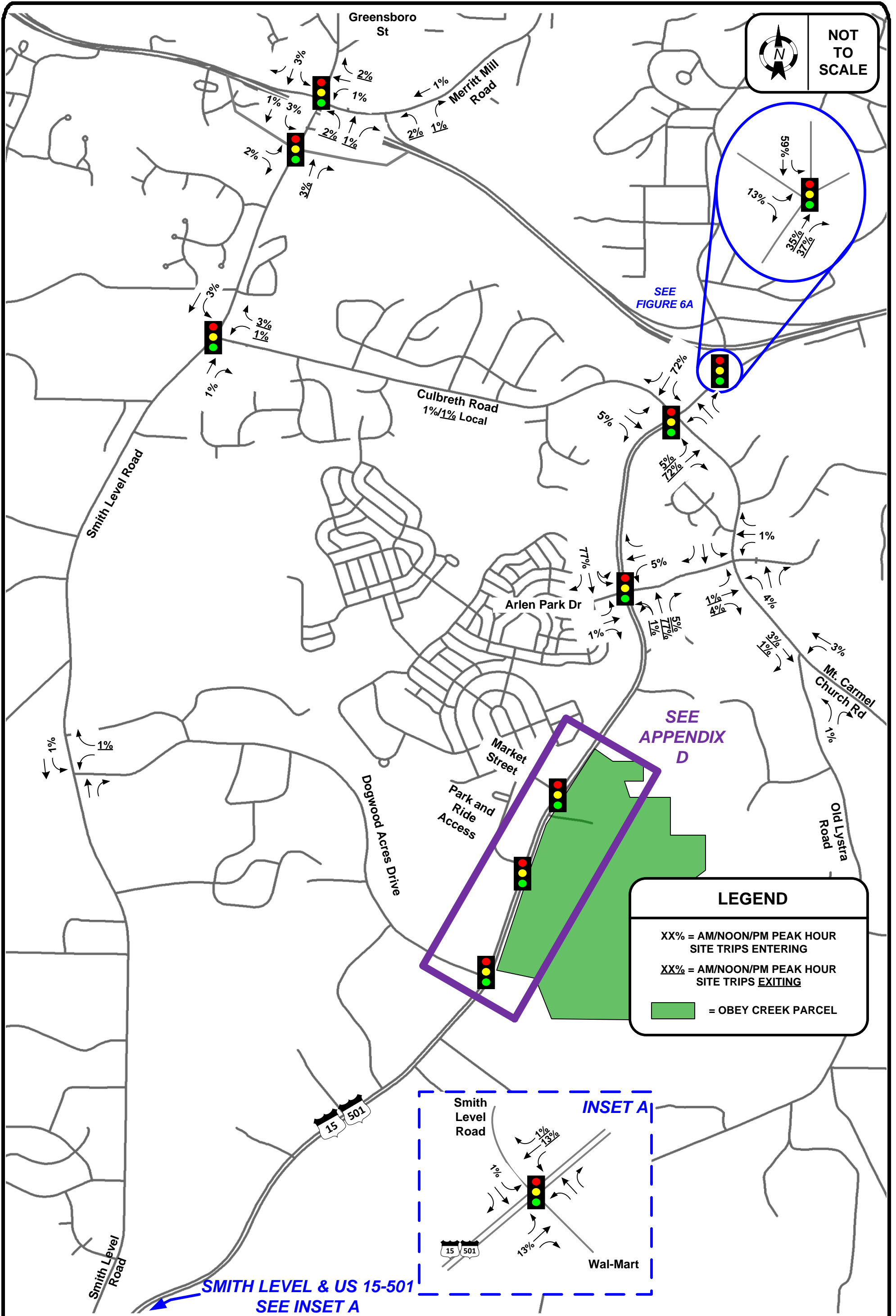
Obey Creek Mixed-Use Development  
Traffic Impact Study

2022 PEAK HOUR TRAFFIC VOLUMES – NO-BUILD SCENARIO

DATE: April 2014

**FIGURE 5B**





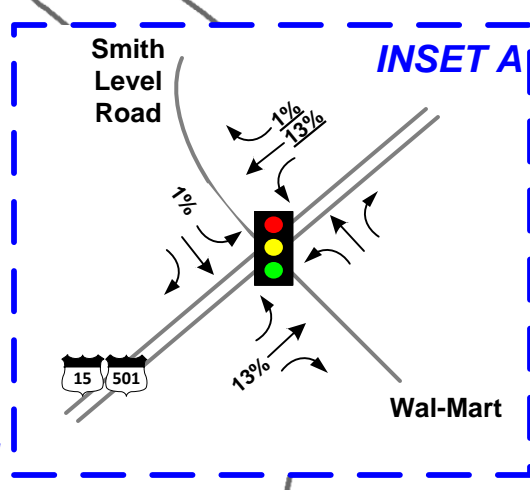
NOT TO SCALE

**LEGEND**

XX% = AM/NOON/PM PEAK HOUR SITE TRIPS ENTERING

XX% = AM/NOON/PM PEAK HOUR SITE TRIPS EXITING

[Green Box] = OBEY CREEK PARCEL



SMITH LEVEL & US 15-501  
SEE INSET A



**HNTB**

Obey Creek Mixed-Use Development  
Traffic Impact Study

DATE: April 2014

TRIP DISTRIBUTION PERCENTAGES – NEW TRIPS

**FIGURE 6B**



NOT TO SCALE

Greensboro St

Merritt Mill Road

Smith Level Road

Culbreth Road

Arlen Park Dr

DIVERTED-LINKED TRIPS

SEE INSET B

Mt. Carmel Church Rd

Old Lystra Road

Dogwood Acres Drive

Market Street

Park and Ride Access

15 501

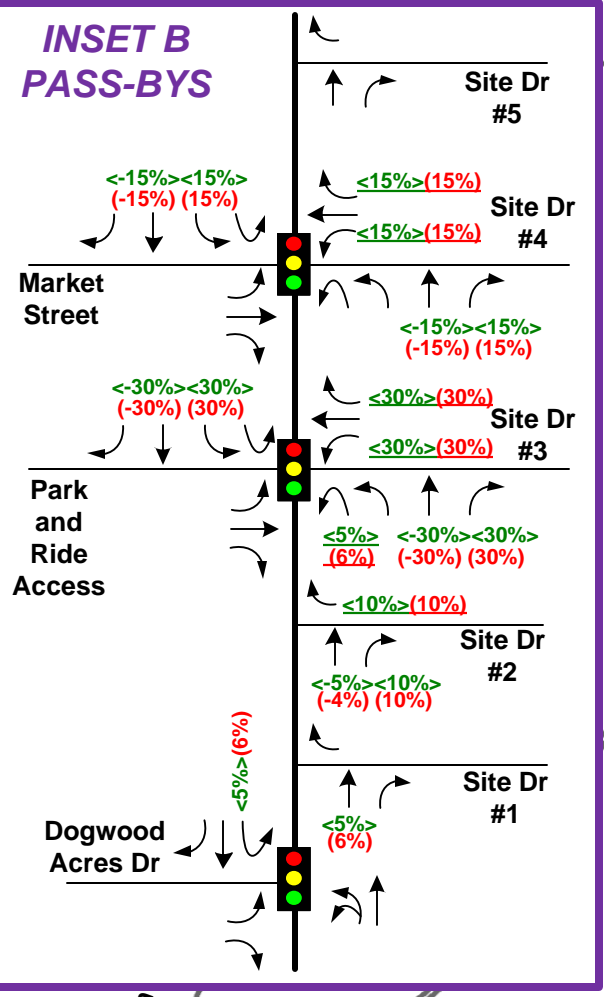
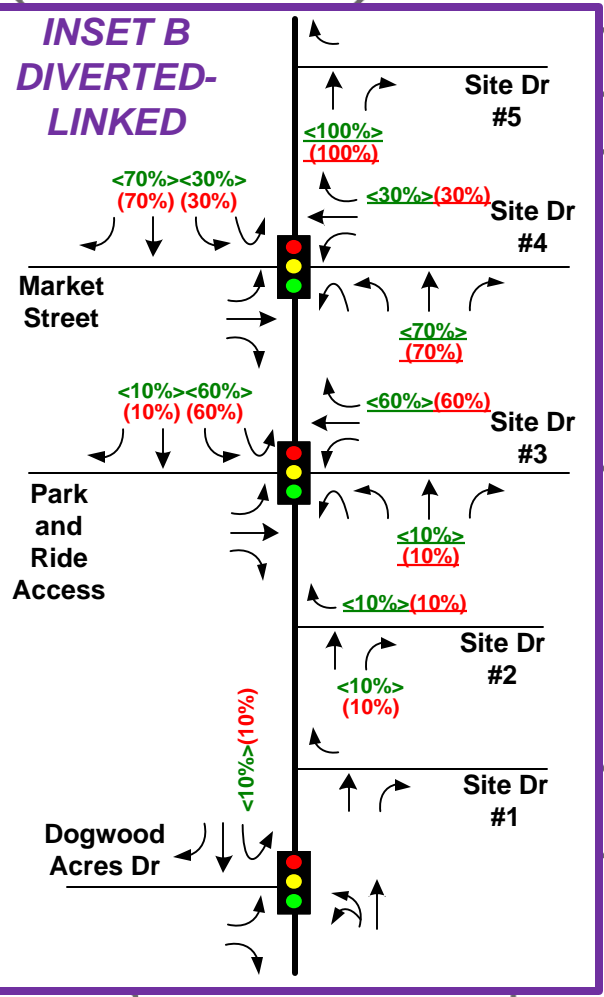
Smith Level Road

### LEGEND

(XX%) / (XX%) = WEEKDAY NOON PEAK HOUR ENTER/EXIT

(XX%) / (XX%) = WEEKDAY PM PEAK HOUR ENTER/EXIT

[Green Box] = OBEY CREEK PARCEL



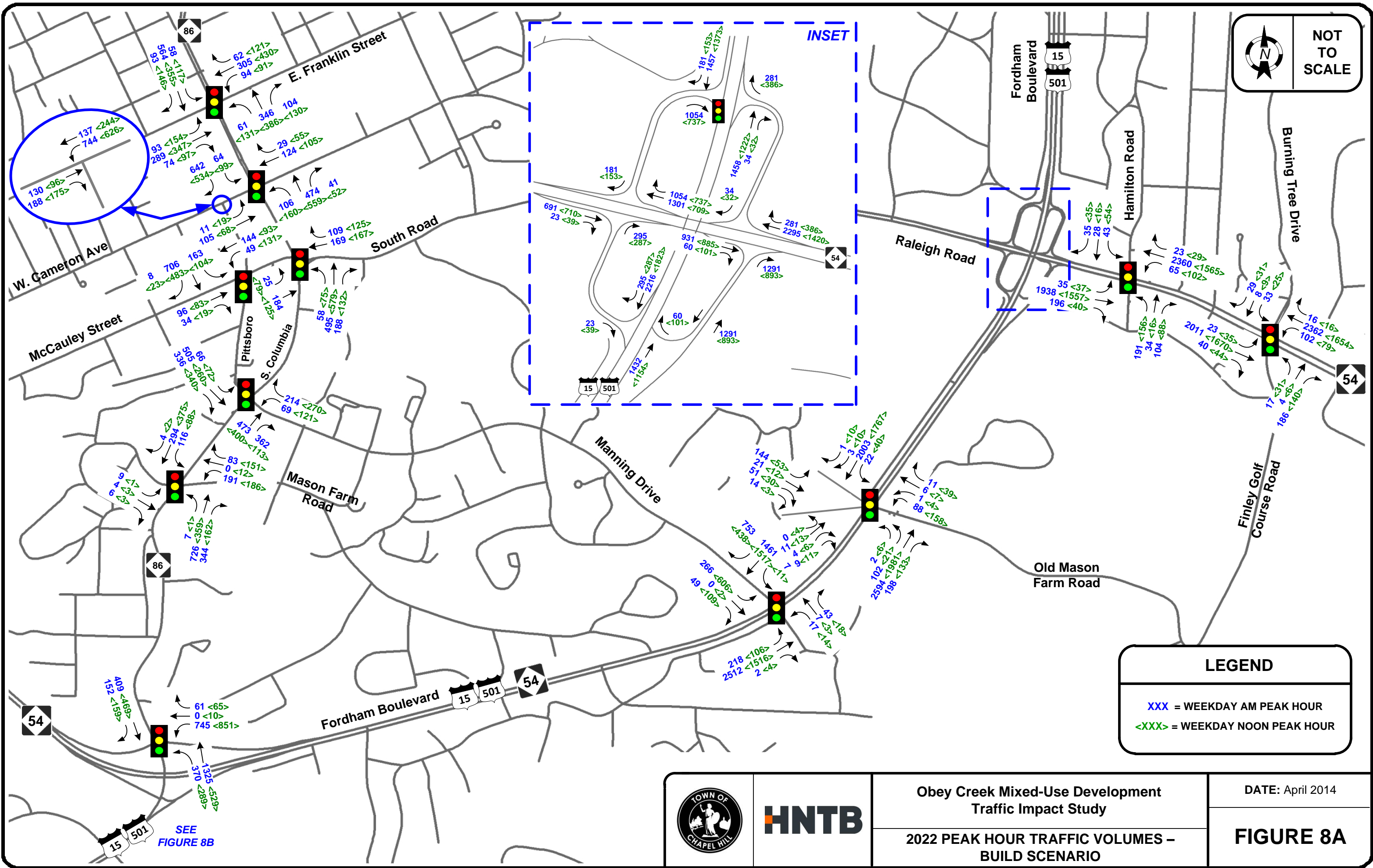
# HNTB

Obey Creek Mixed-Use Development  
Traffic Impact Study

DIVERTED LINKED TRIP & PASS-BY  
TRIP DISTRIBUTION PERCENTAGES

DATE: April 2014

## FIGURE 7



**HNTB**

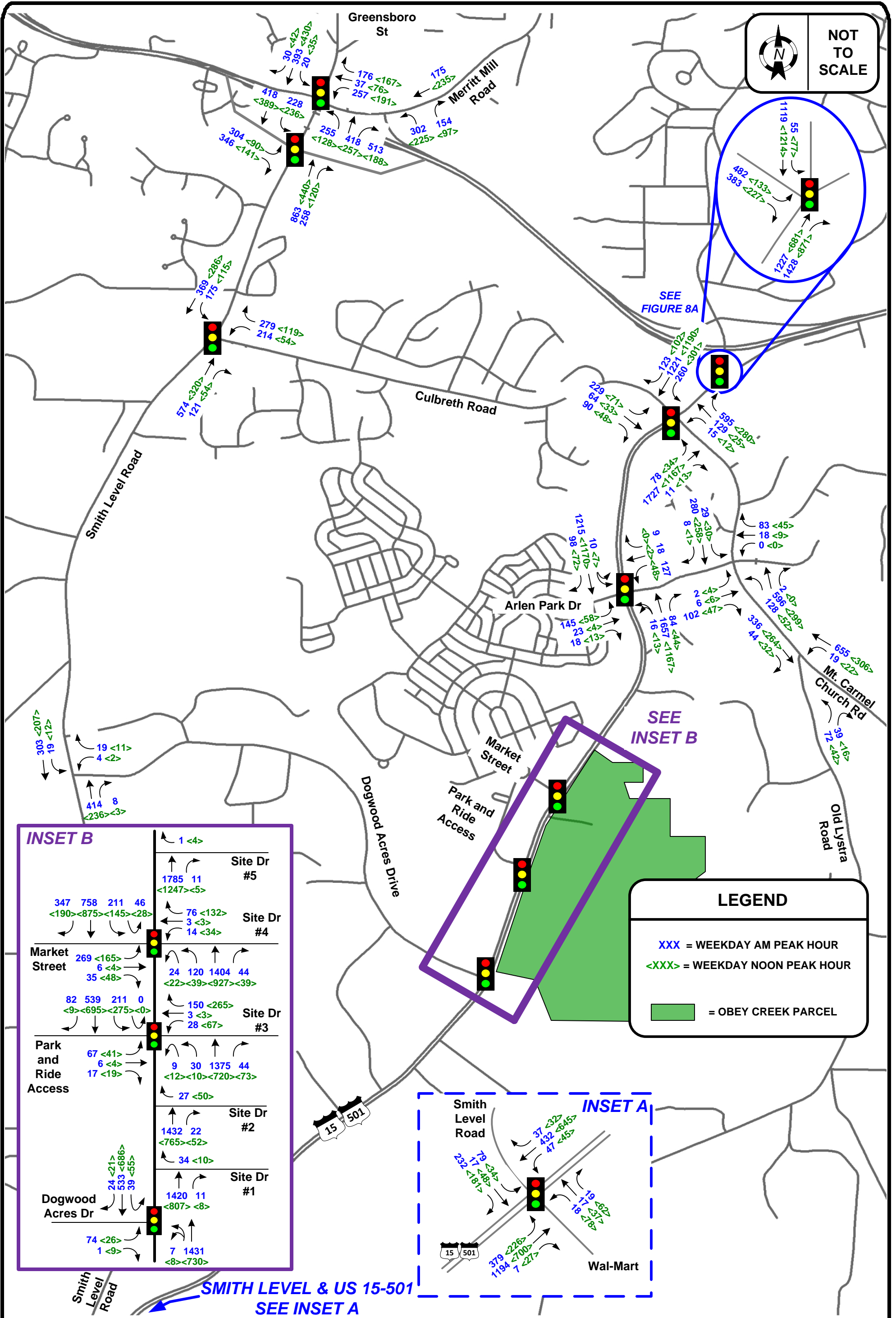
Obey Creek Mixed-Use Development  
Traffic Impact Study

2022 PEAK HOUR TRAFFIC VOLUMES –  
BUILD SCENARIO

DATE: April 2014

**FIGURE 8A**





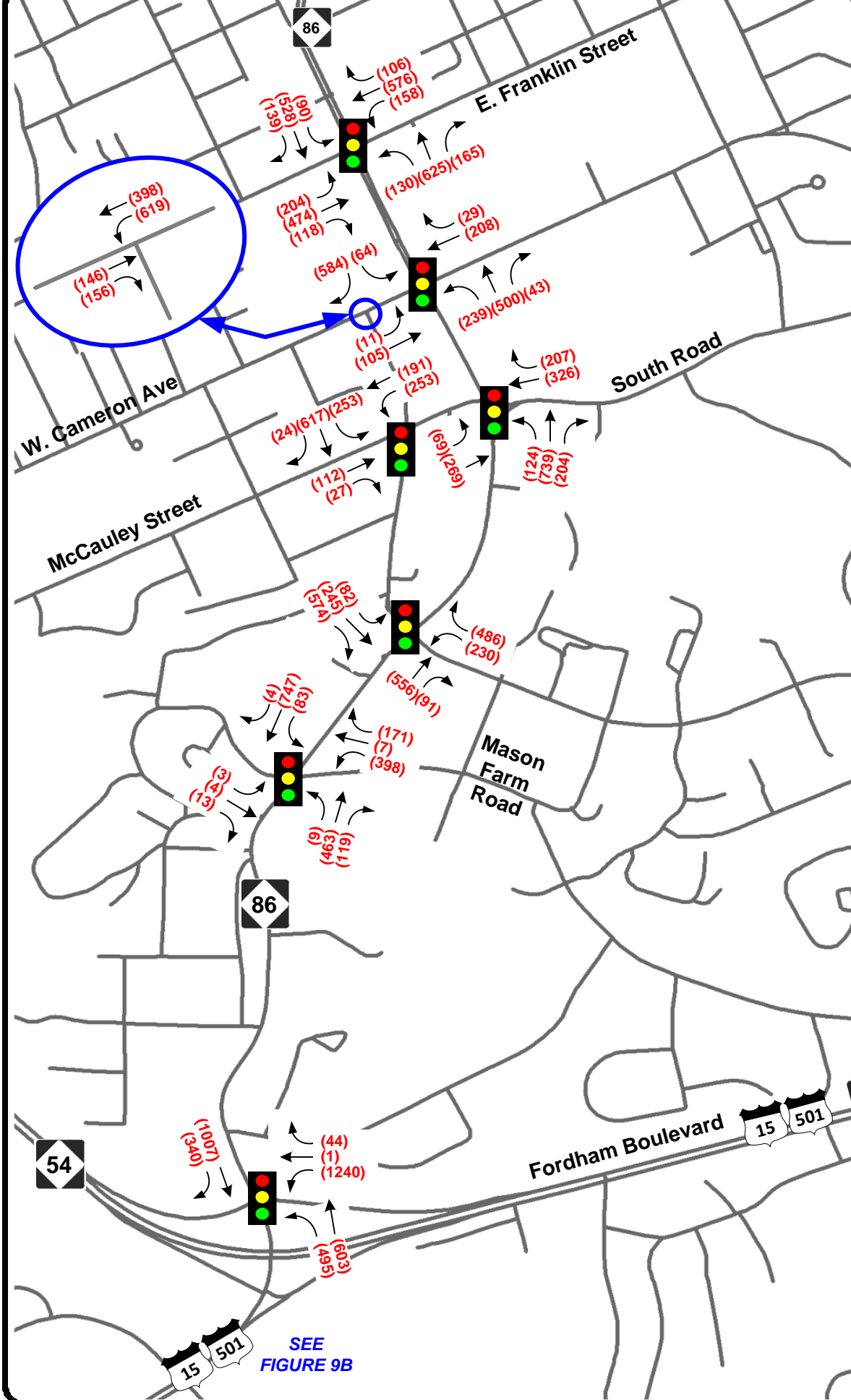
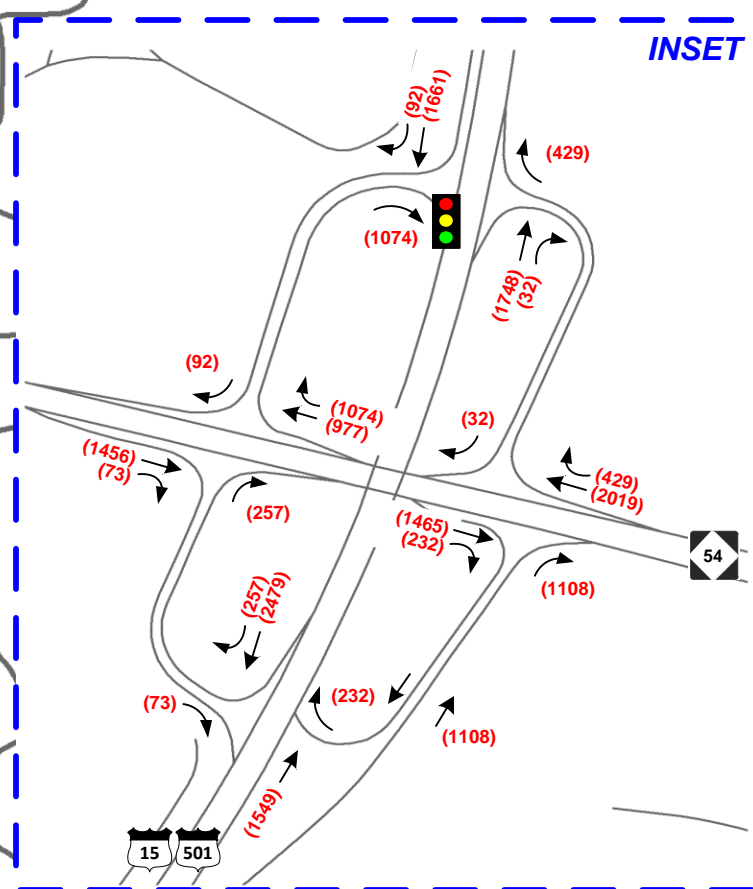
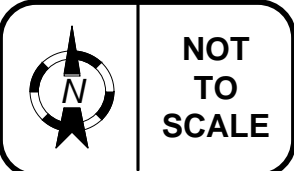
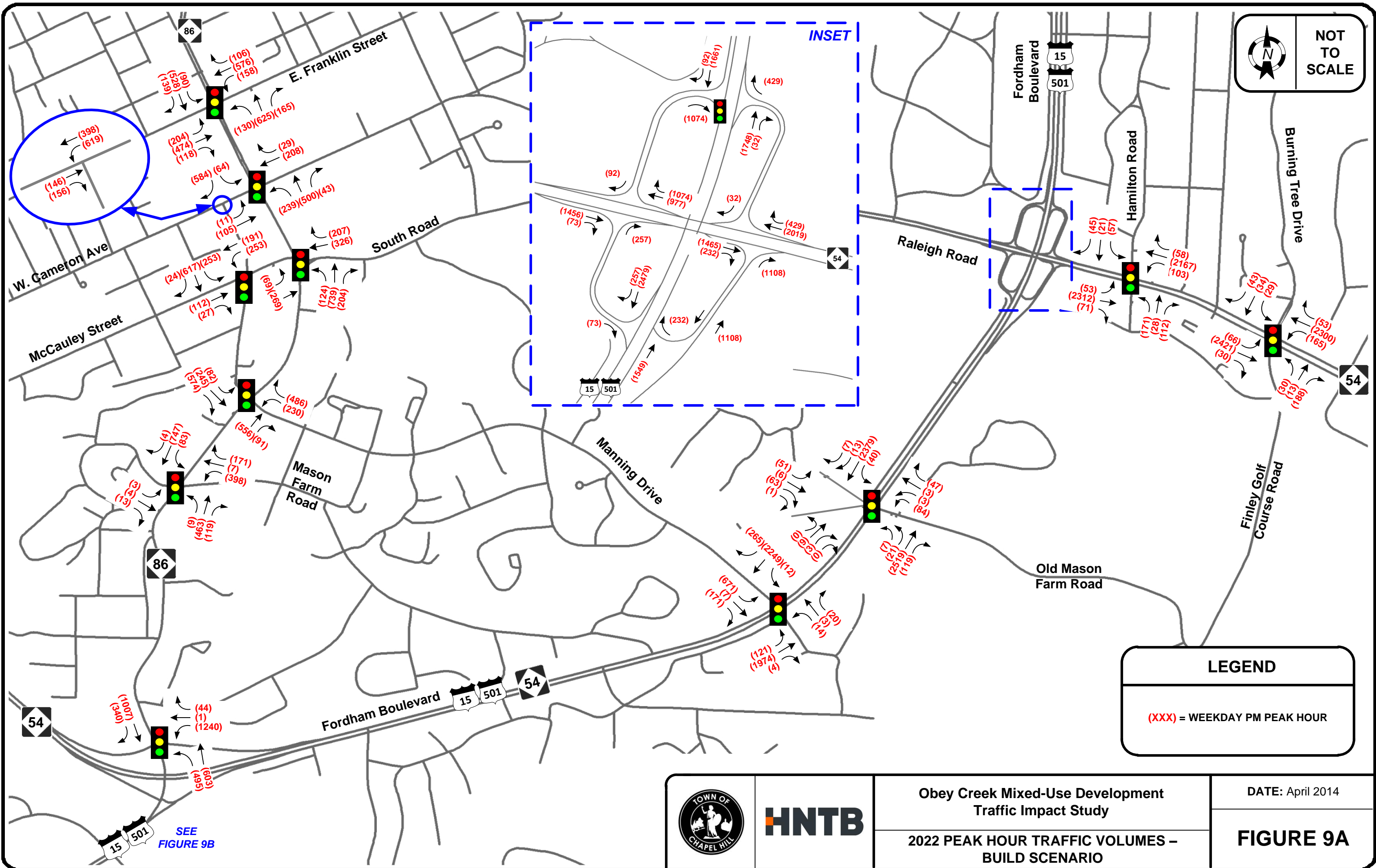
**HNTB**

Obey Creek Mixed-Use Development  
Traffic Impact Study

2022 PEAK HOUR TRAFFIC VOLUMES – BUILD SCENARIO

DATE: April 2014

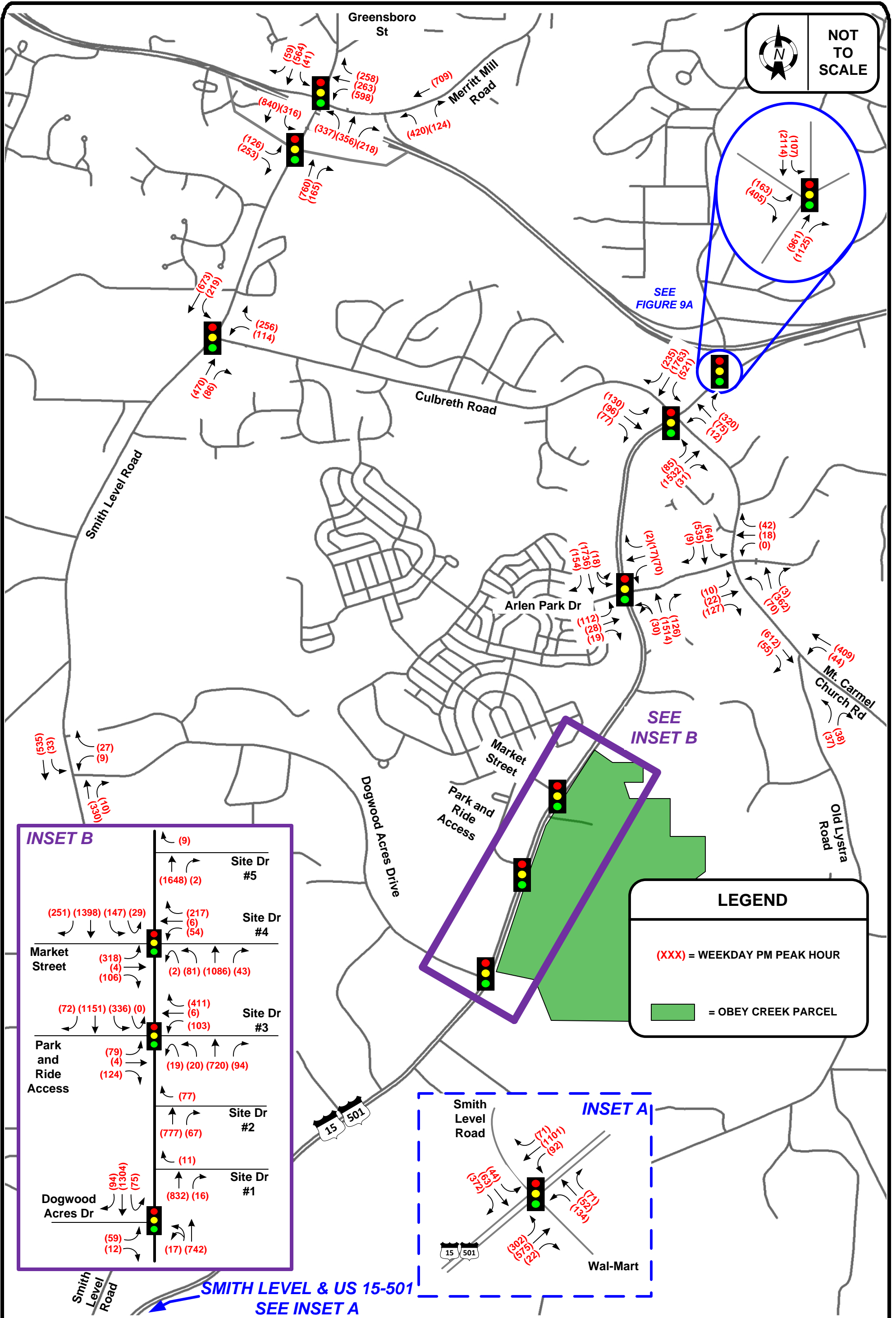
**FIGURE 8B**



**LEGEND**

(XXX) = WEEKDAY PM PEAK HOUR

		<b>Obey Creek Mixed-Use Development</b> <b>Traffic Impact Study</b>	DATE: April 2014
		<b>2022 PEAK HOUR TRAFFIC VOLUMES - BUILD SCENARIO</b>	<b>FIGURE 9A</b>



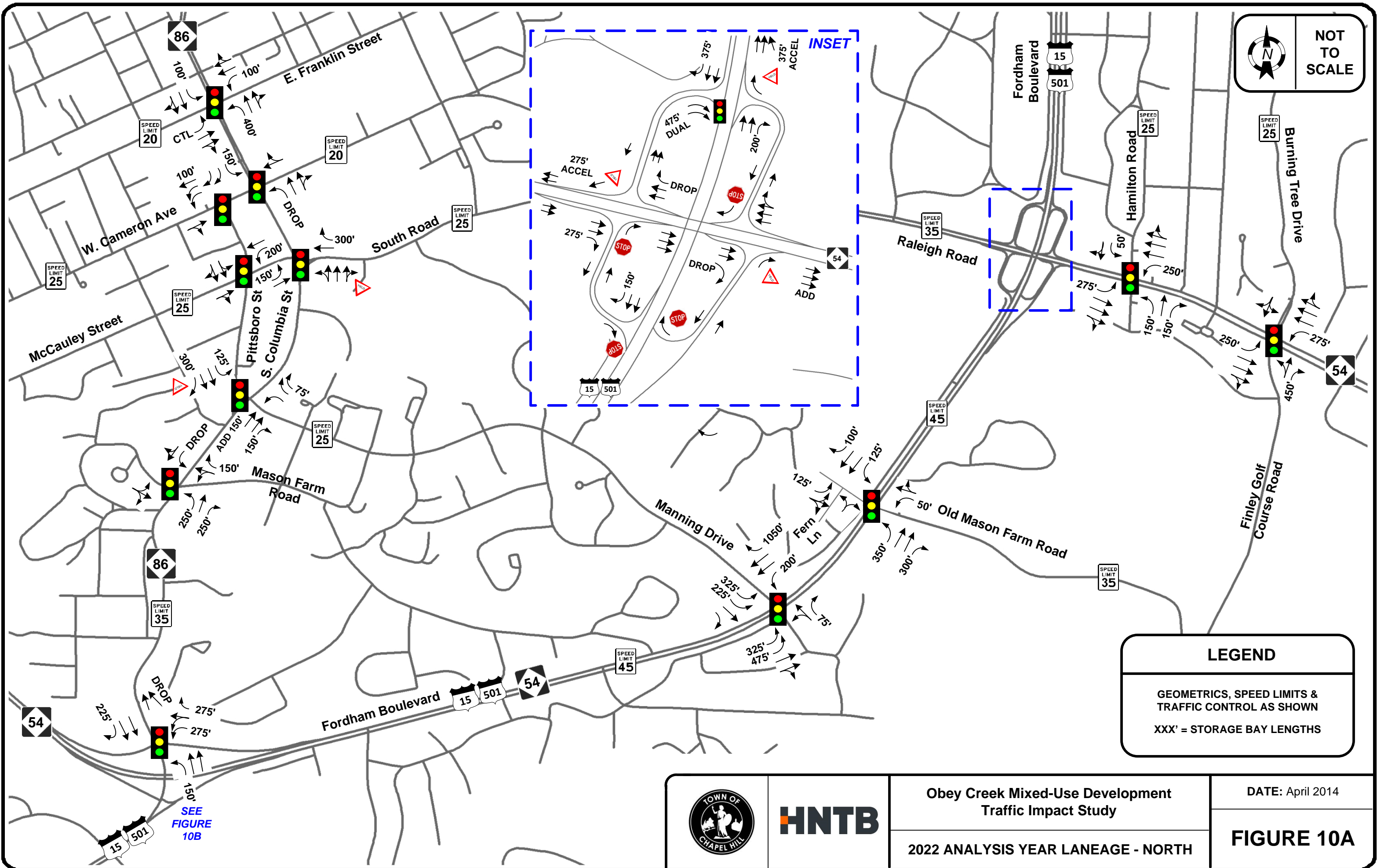
**HNTB**

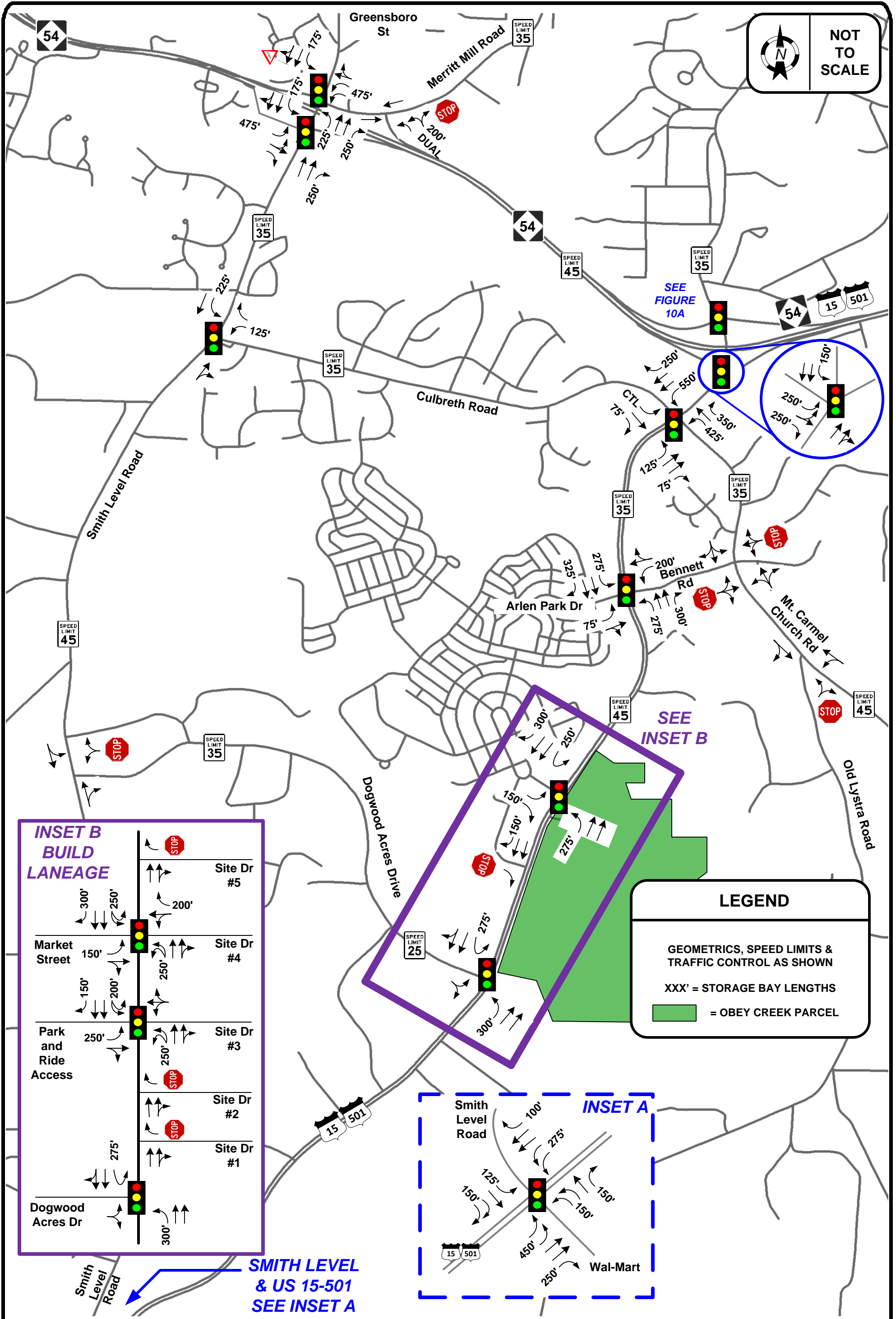
**Obey Creek Mixed-Use Development  
Traffic Impact Study**

**2022 PEAK HOUR TRAFFIC VOLUMES – BUILD SCENARIO**

DATE: April 2014

**FIGURE 9B**





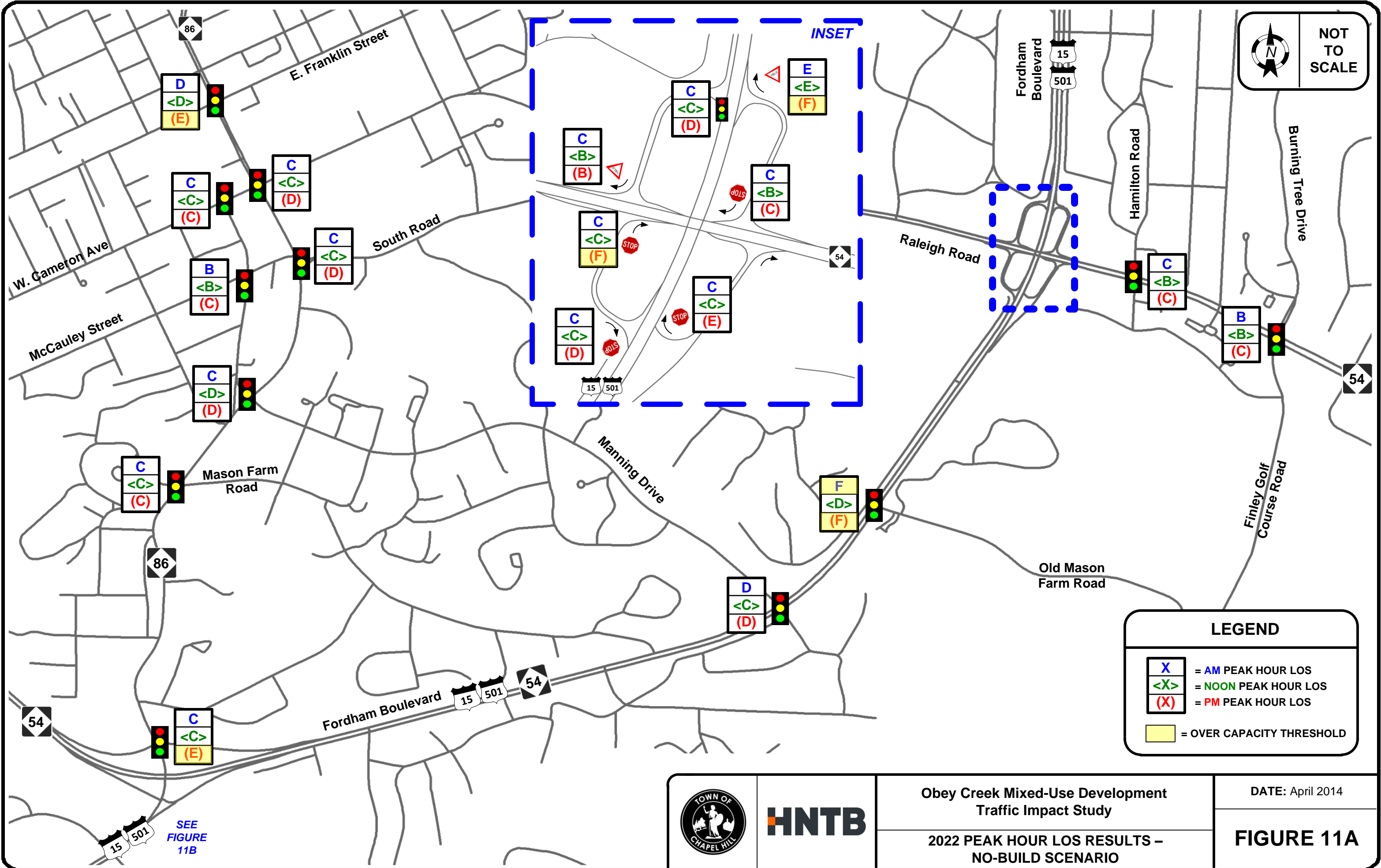
**HNTB**

Obey Creek Mixed-Use Development  
Traffic Impact Study

2022 ANALYSIS YEAR LANEAGE - SOUTH

DATE: April 2014

**FIGURE 10B**



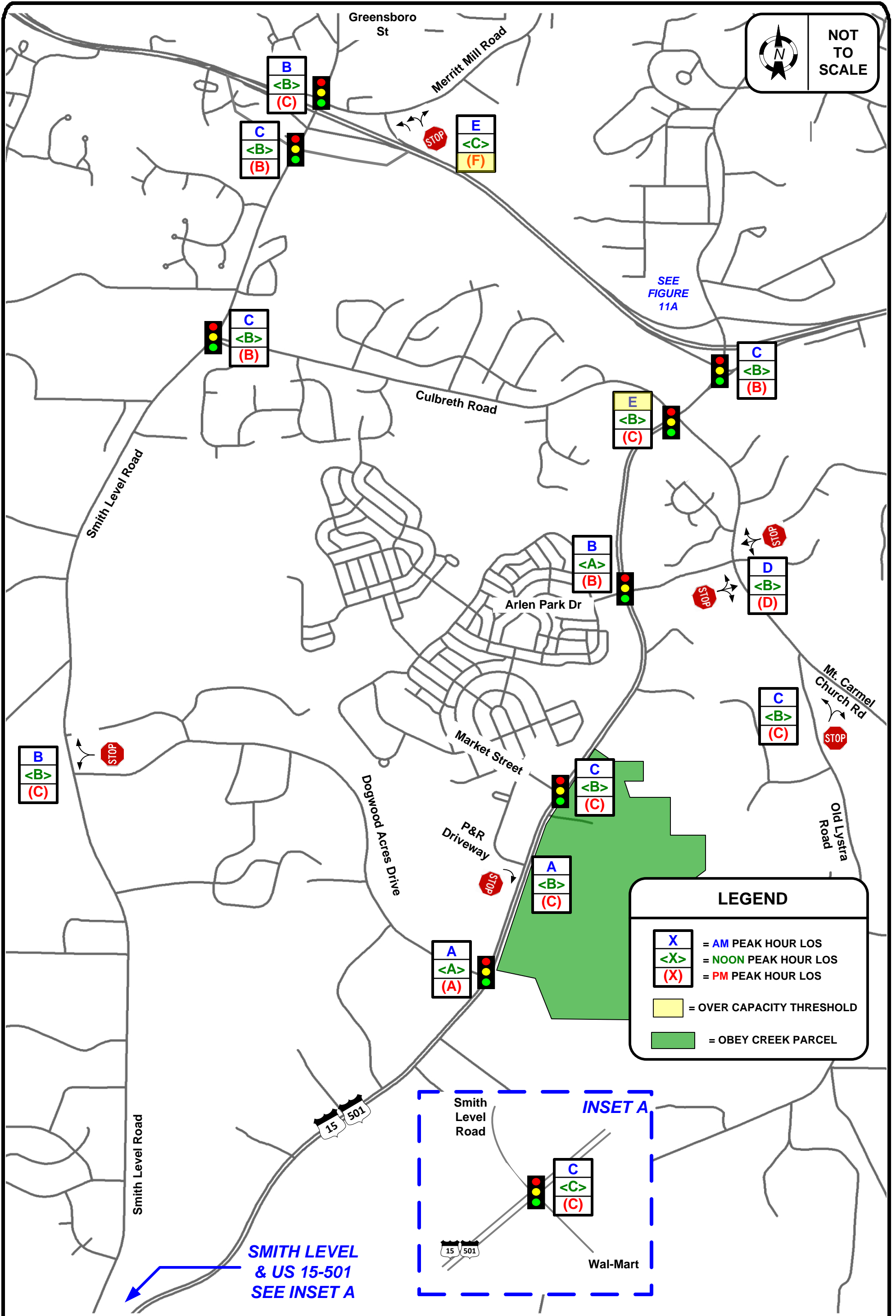
**HNTB**

Obey Creek Mixed-Use Development  
Traffic Impact Study

2022 PEAK HOUR LOS RESULTS –  
NO-BUILD SCENARIO

DATE: April 2014

**FIGURE 11A**



NOT TO SCALE

SEE FIGURE 11A

**LEGEND**

- |     |
|-----|
| X   |
| <X> |
| (X) |

 = AM PEAK HOUR LOS
- |     |
|-----|
| <X> |
|-----|

 = NOON PEAK HOUR LOS
- |     |
|-----|
| (X) |
|-----|

 = PM PEAK HOUR LOS
- = OVER CAPACITY THRESHOLD
- = OBEY CREEK PARCEL

**INSET A**

SMITH LEVEL & US 15-501 SEE INSET A



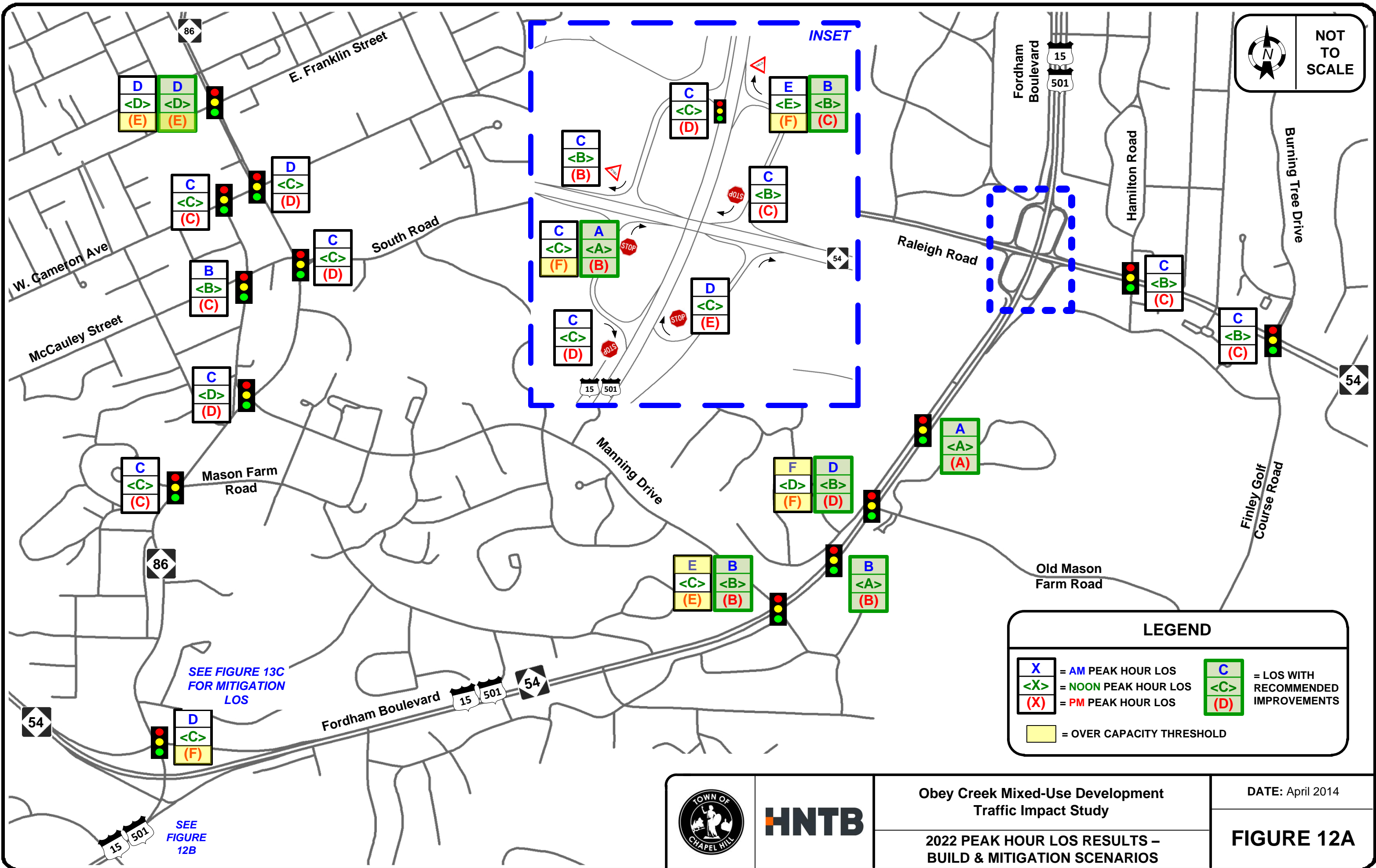
**HNTB**

Obey Creek Mixed-Use Development  
Traffic Impact Study

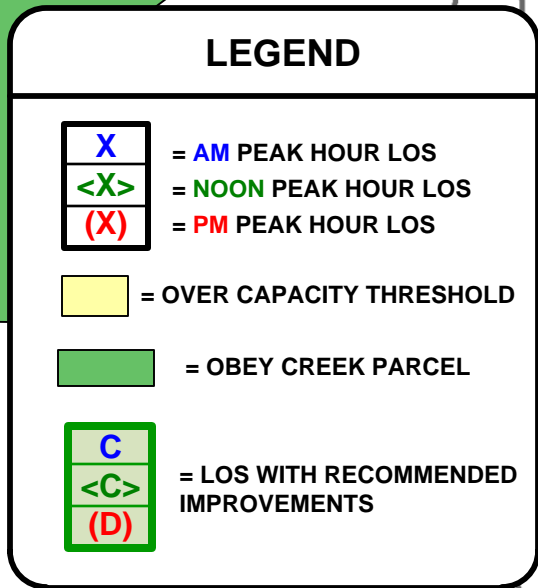
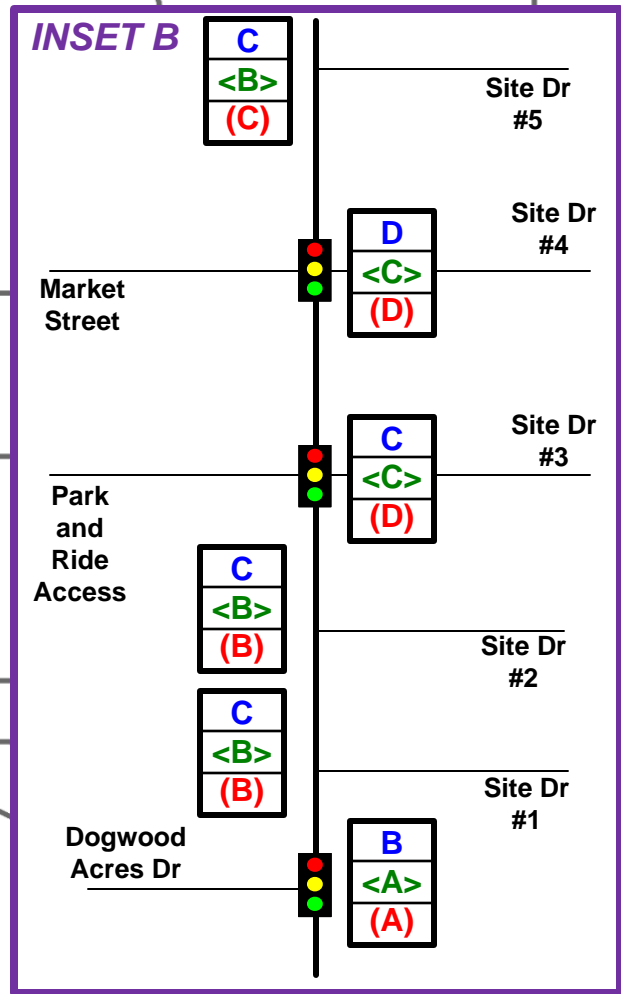
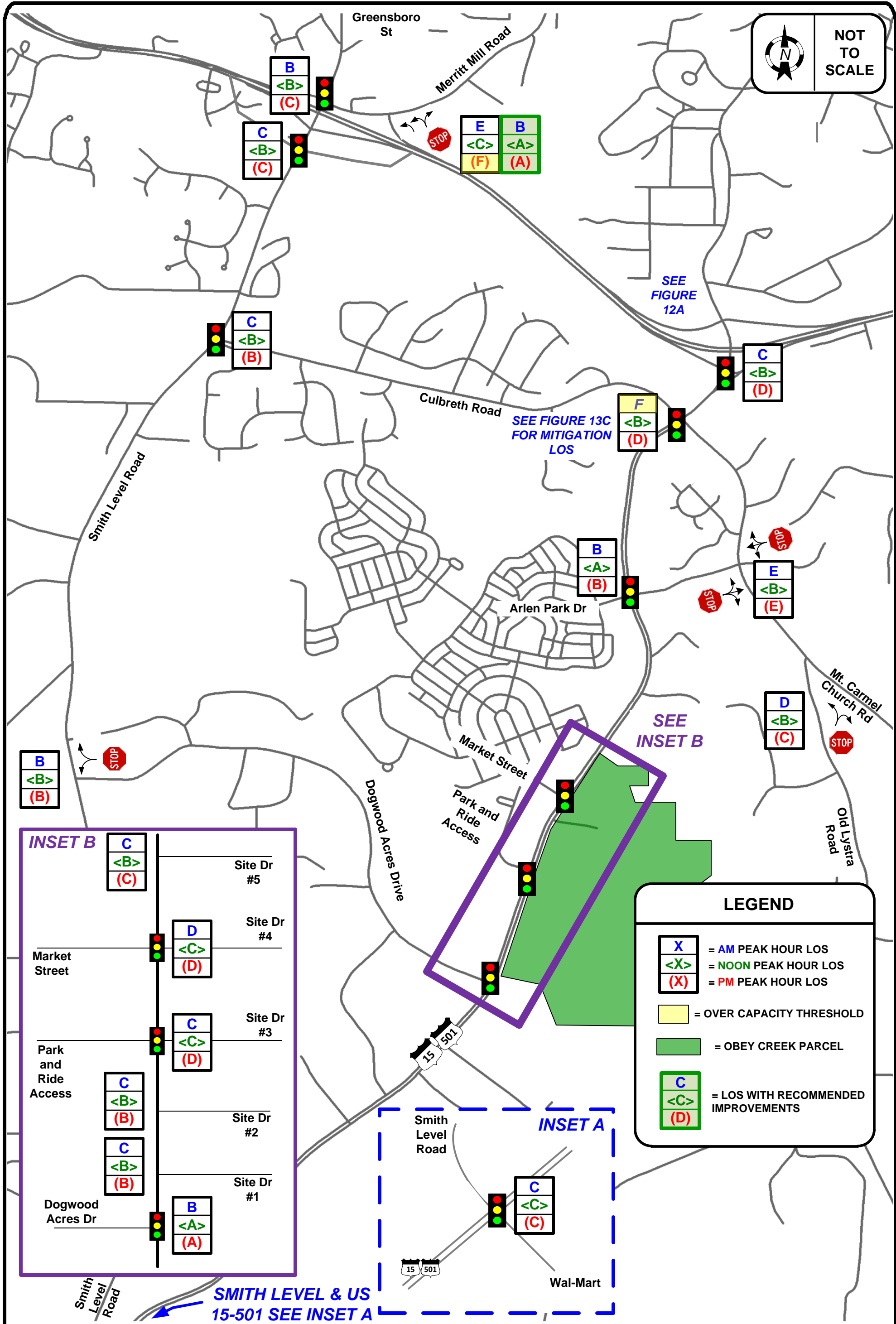
DATE: April 2014

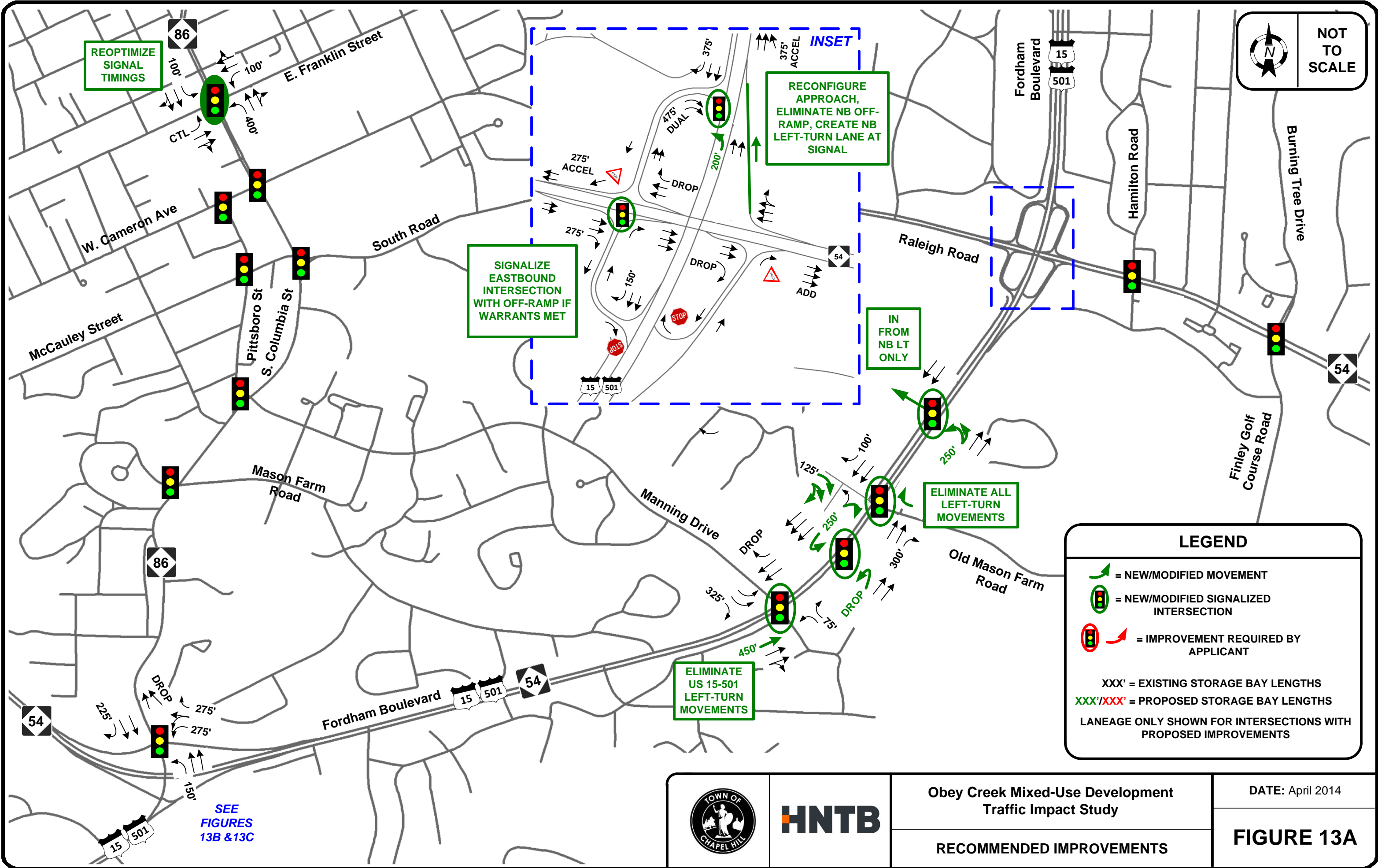
2022 PEAK HOUR LOS RESULTS – NO-BUILD SCENARIO

**FIGURE 11B**









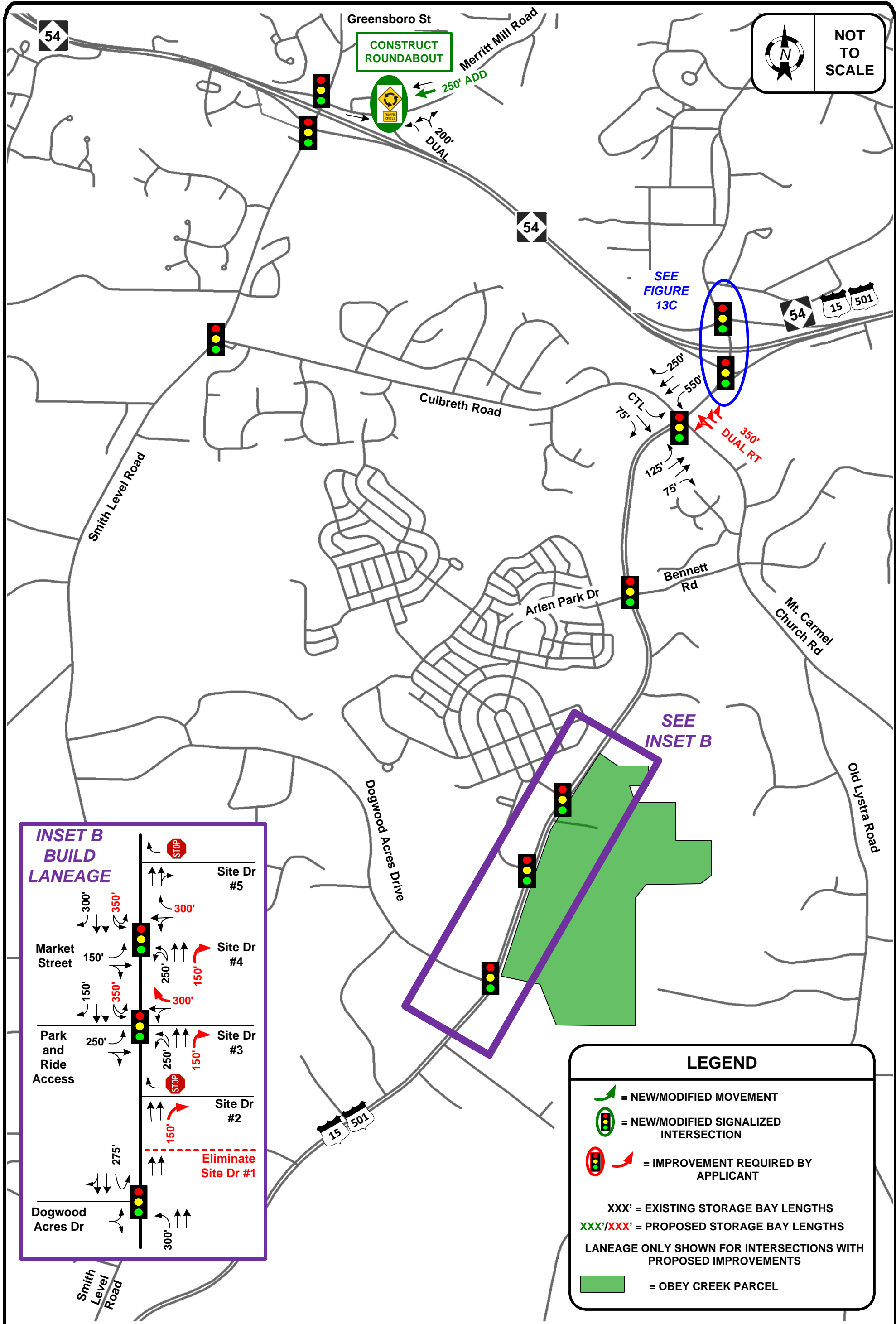
**HNTB**

Obey Creek Mixed-Use Development  
 Traffic Impact Study

RECOMMENDED IMPROVEMENTS

DATE: April 2014

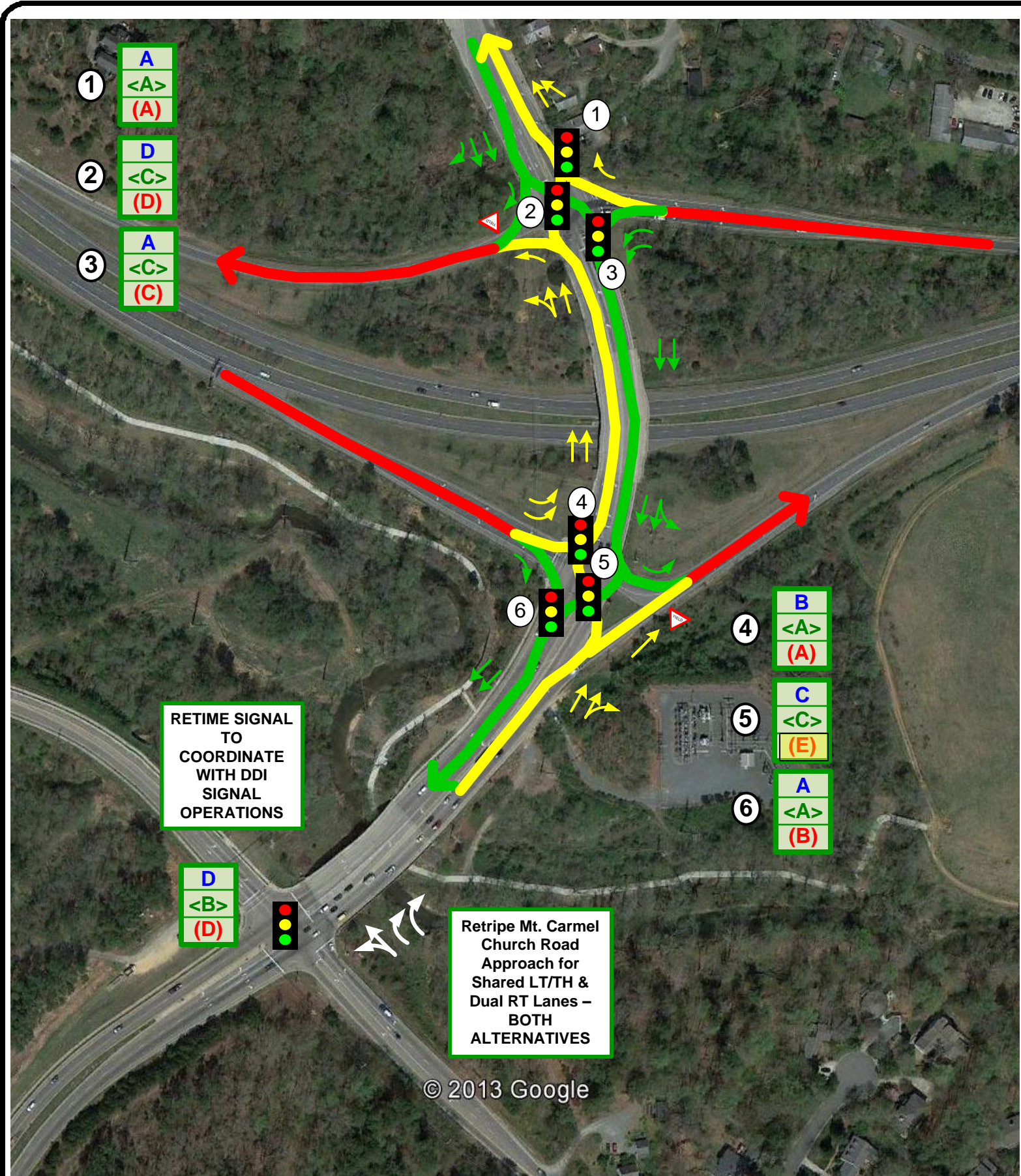
**FIGURE 13A**



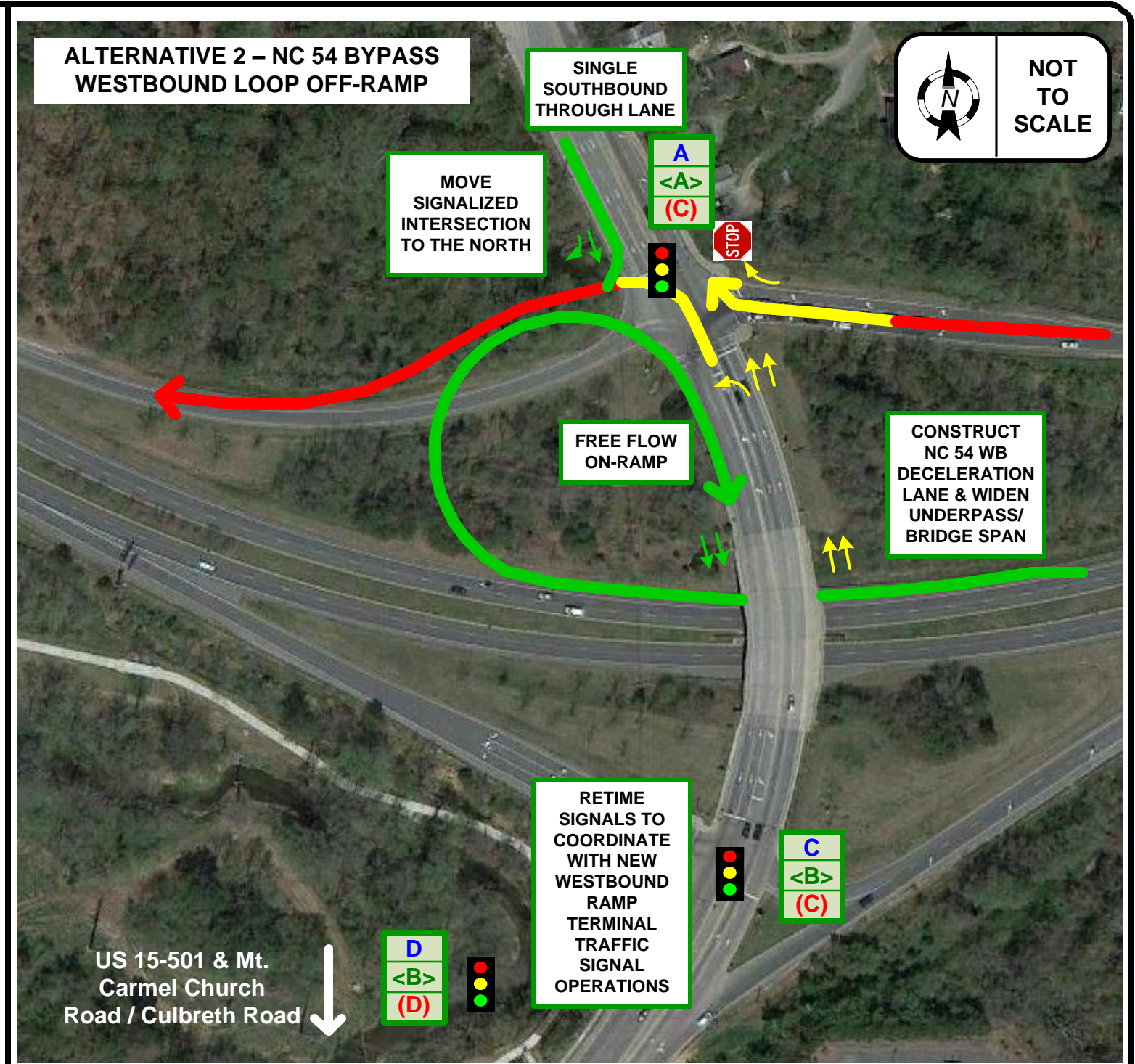
NOT TO SCALE

CONSTRUCT ROUNDABOUT





ALTERNATIVE 1 – DIVERGING DIAMOND INTERCHANGE



**LEGEND**

<p>= PROPOSED TRAFFIC CONTROL</p>	<p>YELLOW = NORTHBOUND MOVEMENTS GREEN = SOUTHBOUND MOVEMENTS RED = RAMP MOVEMENTS</p>	<p>= LOS WITH RECOMMENDED IMPROVEMENTS = OVER CAPACITY THRESHOLD</p>
<p>= PROPOSED TRAFFIC MOVEMENTS/LANEAGE</p>		

## **Appendix B – ITE Trip Generation Output**

Trip Generation Summary - Obey Creek Concept  
Average Weekday Driveway Volumes

Project: New Project  
Alternative: Obey Creek Concept

Open Date: 2/28/2014  
Analysis 2/28/2014

ITE	Land Use	Average Daily Trips			AM Peak Hour Adjacent Street Traffic			PM Peak Hour Adjacent Street Traffic		
		Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
220	Apartments 300 Dwelling Units	971	971	1942	30	121	151	119	64	183
230	Condominium/Townhomes 100 Dwelling Units	322	321	643	9	43	52	40	20	60
252	Senior Adult Housing - At 300 Dwelling Units	516	516	1032	20	40	60	41	34	75
310	Hotel 140 Rooms	572	572	1144	44	30	74	43	41	84
495	Rec Community Center 48 Gross Floor Area 1000 SF	812	811	1623	65	33	98	65	67	132
710	General Office Building 226.2 Gross Floor Area 1000 SF	1221	1221	2442	324	44	368	56	276	332
820	Shopping Center 404.2 Gross Leasable Area 1000 SF	8419	8418	16837	226	139	365	733	794	1527
Unadjusted Driveway Volume		12833	12830	25663	718	450	1168	1097	1296	2393
Unadjusted Pass-By Trips		0	0	0	0	0	0	249	270	519
Internal Capture Trips		0	0	0	45	45	90	244	244	488
Adjusted Driveway Volume		12833	12830	25663	673	405	1078	853	1052	1905
Adjusted Pass-By Trips		0	0	0	0	0	0	194	219	413
Adjusted Volume Added to Adjacent Streets		12833	12830	25663	673	405	1078	659	833	1492

Total AM Peak Hour Internal Capture = 8 Percent

Total PM Peak Hour Internal Capture = 20 Percent

## **Appendix C – Site Driveway Distribution Percentages**

Obey Creek - Site Driveway Distribution Estimates - Raw Trips AM Peak Hour

1/29/2014

Building Designation	SIZE	Proportion of LU Type	TRIP GEN DATA		Site Driveway 1 - RIRO			Site Driveway 2 - RIRO			Site Driveway 3 / Town P&R Access			Site Driveway 4 / Market Street			Site Driveway 5 - RIRO			% check	
			IN	OUT	%	Trips		%	Trips		%	Trips		%	Trips		%	Trips			
						IN	OUT		IN	OUT		IN	OUT		IN	OUT		IN	OUT		
A Target	135000	33%	76	46	0%	0	0	0%	0	0	75%	57	35	25%	19	12	0%	0	0	100%	
G1 Grocery	55000	14%	31	19	0%	0	0	35%	11	7	65%	20	12	0%	0	0	0%	0	0	100%	
T1 Theater	40000	10%	22	14	0%	0	0	0%	0	0	90%	20	12	10%	2	1	0%	0	0	100%	
JA 1	29000	7%	16	10	0%	0	0	20%	3	2	80%	13	8	0%	0	0	0%	0	0	100%	
JA 2	18000	4%	10	6	0%	0	0	20%	2	1	80%	8	5	0%	0	0	0%	0	0	100%	
S1	18190	4%	10	6	0%	0	0	0%	0	0	10%	1	1	90%	9	6	0%	0	0	100%	
S2	7590	2%	4	3	0%	0	0	0%	0	0	10%	0	0	90%	4	2	0%	0	0	100%	
S3	12060	3%	7	4	0%	0	0	0%	0	0	10%	1	0	90%	6	4	0%	0	0	100%	
S4	5800	1%	3	2	0%	0	0	0%	0	0	10%	0	0	90%	3	2	0%	0	0	100%	
S5	3880	1%	2	1	0%	0	0	20%	0	0	80%	2	1	0%	0	0	0%	0	0	100%	
S6	3260	1%	2	1	0%	0	0	20%	0	0	80%	1	1	0%	0	0	0%	0	0	100%	
S7	7150	2%	4	2	0%	0	0	20%	1	0	80%	3	2	0%	0	0	0%	0	0	100%	
S8	5060	1%	3	2	0%	0	0	20%	1	0	80%	2	1	0%	0	0	0%	0	0	100%	
S9	13335	3%	7	5	0%	0	0	20%	1	1	80%	6	4	0%	0	0	0%	0	0	100%	
S10	28400	7%	16	10	0%	0	0	20%	3	2	80%	13	8	0%	0	0	0%	0	0	100%	
S11	9200	2%	5	3	0%	0	0	20%	1	1	80%	4	3	0%	0	0	0%	0	0	100%	
S12	13600	3%	8	5	0%	0	0	20%	2	1	80%	6	4	0%	0	0	0%	0	0	100%	
O1	92750	41%	133	18	0%	0	0	0%	0	0	0%	0	0	100%	133	18	0%	0	0	100%	
O2	57000	25%	82	11	0%	0	0	0%	0	0	50%	41	6	50%	41	6	0%	0	0	100%	
O3	69000	30%	99	13	0%	0	0	0%	0	0	50%	49	7	50%	49	7	0%	0	0	100%	
O4	7500	3%	11	1	0%	0	0	0%	0	0	0%	0	0	0%	0	0	100%	11	1	100%	
CA	48000	100%	65	33	0%	0	0	0%	0	0	50%	33	17	50%	33	17	0%	0	0	100%	
H1	117000	100%	43	31	0%	0	0	0%	0	0	50%	22	16	50%	22	16	0%	0	0	100%	
R2	78760	10%	6	20	0%	0	0	0%	0	0	25%	2	5	75%	5	15	0%	0	0	100%	
R3	30000	4%	2	8	0%	0	0	0%	0	0	25%	1	2	75%	2	6	0%	0	0	100%	
R4	77780	10%	6	20	0%	0	0	0%	0	0	25%	1	5	75%	4	15	0%	0	0	100%	
R5	79120	10%	6	21	0%	0	0	20%	1	4	80%	5	16	0%	0	0	0%	0	0	100%	
R6	138610	18%	11	36	0%	0	0	20%	2	7	80%	9	29	0%	0	0	0%	0	0	100%	
R7	27400	4%	2	7	0%	0	0	20%	0	1	80%	2	6	0%	0	0	0%	0	0	100%	
R8	32070	4%	2	8	0%	0	0	20%	0	2	80%	2	7	0%	0	0	0%	0	0	100%	
R9	14400	2%	1	4	0%	0	0	20%	0	1	80%	1	3	0%	0	0	0%	0	0	100%	
R10	80800	10%	6	21	0%	0	0	20%	1	4	80%	5	17	0%	0	0	0%	0	0	100%	
R11	40170	5%	3	10	0%	0	0	0%	0	0	100%	3	10	0%	0	0	0%	0	0	100%	
AG1	181400	23%	14	47	100%	14	47	0%	0	0	0%	0	0	0%	0	0	0%	0	0	100%	
sum			14	47				31	35		332	241		331	125		11	1			
%			2%	11%				4%	8%		47%	54%		47%	28%		directly assigned			100%	100%

Shopping Center  
IN OUT  
227 139

Office  
IN OUT  
324 44

Residential  
IN OUT  
60 203

sum check	IN	OUT
	719	450
	719	450
		Inputs
		Breakouts



Obey Creek - Site Driveway Distribution Estimates - Raw Trips Noon Peak Hour

1/29/2014

Building Designation	SIZE	Proportion of LU Type	TRIP GEN DATA		Site Driveway 1 - RIRO			Site Driveway 2 - RIRO			Site Driveway 3 / Town P&R Access			Site Driveway 4 / Market Street			Site Driveway 5 - RIRO			% check	
			IN	OUT	%	Trips		%	Trips		%	Trips		%	Trips		%	Trips			
						IN	OUT		IN	OUT		IN	OUT		IN	OUT		IN	OUT		
A Target	135000	33%	161	156	0%	0	0	0%	0	0	75%	120	117	25%	40	39	0%	0	0	100%	
G1 Grocery	55000	14%	65	63	0%	0	0	35%	23	22	65%	43	41	0%	0	0	0%	0	0	100%	
T1 Theater	40000	10%	48	46	0%	0	0	0%	0	0	90%	43	42	10%	5	5	0%	0	0	100%	
JA 1	29000	7%	34	33	0%	0	0	20%	7	7	80%	28	27	0%	0	0	0%	0	0	100%	
JA 2	18000	4%	21	21	0%	0	0	20%	4	4	80%	17	17	0%	0	0	0%	0	0	100%	
S1	18190	4%	22	21	0%	0	0	0%	0	0	10%	2	2	90%	19	19	0%	0	0	100%	
S2	7590	2%	9	9	0%	0	0	0%	0	0	10%	1	1	90%	8	8	0%	0	0	100%	
S3	12060	3%	14	14	0%	0	0	0%	0	0	10%	1	1	90%	13	13	0%	0	0	100%	
S4	5800	1%	7	7	0%	0	0	0%	0	0	10%	1	1	90%	6	6	0%	0	0	100%	
S5	3880	1%	5	4	0%	0	0	20%	1	1	80%	4	4	0%	0	0	0%	0	0	100%	
S6	3260	1%	4	4	0%	0	0	20%	1	1	80%	3	3	0%	0	0	0%	0	0	100%	
S7	7150	2%	9	8	0%	0	0	20%	2	2	80%	7	7	0%	0	0	0%	0	0	100%	
S8	5060	1%	6	6	0%	0	0	20%	1	1	80%	5	5	0%	0	0	0%	0	0	100%	
S9	13335	3%	16	15	0%	0	0	20%	3	3	80%	13	12	0%	0	0	0%	0	0	100%	
S10	28400	7%	34	33	0%	0	0	20%	7	7	80%	27	26	0%	0	0	0%	0	0	100%	
S11	9200	2%	11	11	0%	0	0	20%	2	2	80%	9	8	0%	0	0	0%	0	0	100%	
S12	13600	3%	16	16	0%	0	0	20%	3	3	80%	13	13	0%	0	0	0%	0	0	100%	
O1	92750	41%	59	49	0%	0	0	0%	0	0	0%	0	0	100%	59	49	0%	0	0	100%	
O2	57000	25%	36	30	0%	0	0	0%	0	0	50%	18	15	50%	18	15	0%	0	0	100%	
O3	69000	30%	44	37	0%	0	0	0%	0	0	50%	22	18	50%	22	18	0%	0	0	100%	
O4	7500	3%	5	4	0%	0	0	0%	0	0	0%	0	0	0%	0	0	100%	5	4	100%	
CA	48000	100%	49	38	0%	0	0	0%	0	0	50%	25	19	50%	25	19	0%	0	0	100%	
H1	117000	100%	43	36	0%	0	0	0%	0	0	50%	22	18	50%	22	18	0%	0	0	100%	
R2	78760	10%	7	8	0%	0	0	0%	0	0	25%	2	2	75%	5	6	0%	0	0	100%	
R3	30000	4%	3	3	0%	0	0	0%	0	0	25%	1	1	75%	2	2	0%	0	0	100%	
R4	77780	10%	7	8	0%	0	0	0%	0	0	25%	2	2	75%	5	6	0%	0	0	100%	
R5	79120	10%	7	8	0%	0	0	20%	1	2	80%	5	7	0%	0	0	0%	0	0	100%	
R6	138610	18%	12	14	0%	0	0	20%	2	3	80%	10	12	0%	0	0	0%	0	0	100%	
R7	27400	4%	2	3	0%	0	0	20%	0	1	80%	2	2	0%	0	0	0%	0	0	100%	
R8	32070	4%	3	3	0%	0	0	20%	1	1	80%	2	3	0%	0	0	0%	0	0	100%	
R9	14400	2%	1	1	0%	0	0	20%	0	0	80%	1	1	0%	0	0	0%	0	0	100%	
R10	80800	10%	7	8	0%	0	0	20%	1	2	80%	6	7	0%	0	0	0%	0	0	100%	
R11	40170	5%	3	4	0%	0	0	0%	0	0	100%	3	4	0%	0	0	0%	0	0	100%	
AG1	181400	23%	16	19	100%	16	19	0%	0	0	0%	0	0	0%	0	0	0%	0	0	100%	
sum			16	19					60	60		454	436		248	223		5	4		
%			2%	3%					8%	8%		58%	59%		32%	30%		directly assigned			

Shopping Center  
IN      OUT  
481    467

Office  
IN      OUT  
143    120

Residential  
IN      OUT  
67      81

sum check	IN	OUT
	783	742
	783	742
		Inputs
		Breakouts

**Obey Creek - Site Driveway Distribution Estimates - Raw Trips AM Peak Hour**

1/29/2014

Building Designation	SIZE	Proportion of LU Type	TRIP GEN DATA		Site Driveway 1 - RIRO			Site Driveway 2 - RIRO			Site Driveway 3 / Town P&R Access			Site Driveway 4 / Market Street			Site Driveway 5 - RIRO			% check
			IN	OUT	%	Trips		%	Trips		%	Trips		%	Trips		%	Trips		
						IN	OUT		IN	OUT		IN	OUT		IN	OUT		IN	OUT	
A Target	135000	33%	245	265	0%	0	0	0%	0	0	75%	184	199	25%	61	66	0%	0	0	100%
G1 Grocery	55000	14%	100	108	0%	0	0	35%	35	38	65%	65	70	0%	0	0	0%	0	0	100%
T1 Theater	40000	10%	73	79	0%	0	0	0%	0	0	90%	65	71	10%	7	8	0%	0	0	100%
JA 1	29000	7%	53	57	0%	0	0	20%	11	11	80%	42	46	0%	0	0	0%	0	0	100%
JA 2	18000	4%	33	35	0%	0	0	20%	7	7	80%	26	28	0%	0	0	0%	0	0	100%
S1	18190	4%	33	36	0%	0	0	0%	0	0	10%	3	4	90%	30	32	0%	0	0	100%
S2	7590	2%	14	15	0%	0	0	0%	0	0	10%	1	1	90%	12	13	0%	0	0	100%
S3	12060	3%	22	24	0%	0	0	0%	0	0	10%	2	2	90%	20	21	0%	0	0	100%
S4	5800	1%	11	11	0%	0	0	0%	0	0	10%	1	1	90%	9	10	0%	0	0	100%
S5	3880	1%	7	8	0%	0	0	20%	1	2	80%	6	6	0%	0	0	0%	0	0	100%
S6	3260	1%	6	6	0%	0	0	20%	1	1	80%	5	5	0%	0	0	0%	0	0	100%
S7	7150	2%	13	14	0%	0	0	20%	3	3	80%	10	11	0%	0	0	0%	0	0	100%
S8	5060	1%	9	10	0%	0	0	20%	2	2	80%	7	8	0%	0	0	0%	0	0	100%
S9	13335	3%	24	26	0%	0	0	20%	5	5	80%	19	21	0%	0	0	0%	0	0	100%
S10	28400	7%	52	56	0%	0	0	20%	10	11	80%	41	45	0%	0	0	0%	0	0	100%
S11	9200	2%	17	18	0%	0	0	20%	3	4	80%	13	14	0%	0	0	0%	0	0	100%
S12	13600	3%	25	27	0%	0	0	20%	5	5	80%	20	21	0%	0	0	0%	0	0	100%
O1	92750	41%	23	113	0%	0	0	0%	0	0	0%	0	0	100%	23	113	0%	0	0	100%
O2	57000	25%	14	70	0%	0	0	0%	0	0	50%	7	35	50%	7	35	0%	0	0	100%
O3	69000	30%	17	84	0%	0	0	0%	0	0	50%	9	42	50%	9	42	0%	0	0	100%
O4	7500	3%	2	9	0%	0	0	0%	0	0	0%	0	0	0%	0	0	100%	2	9	100%
CA	48000	100%	64	67	0%	0	0	0%	0	0	50%	32	34	50%	32	34	0%	0	0	100%
H1	117000	100%	43	41	0%	0	0	0%	0	0	50%	22	21	50%	22	21	0%	0	0	100%
R2	78760	10%	20	12	0%	0	0	0%	0	0	25%	5	3	75%	15	9	0%	0	0	100%
R3	30000	4%	8	4	0%	0	0	0%	0	0	25%	2	1	75%	6	3	0%	0	0	100%
R4	77780	10%	20	12	0%	0	0	0%	0	0	25%	5	3	75%	15	9	0%	0	0	100%
R5	79120	10%	20	12	0%	0	0	20%	4	2	80%	16	9	0%	0	0	0%	0	0	100%
R6	138610	18%	36	21	0%	0	0	20%	7	4	80%	29	17	0%	0	0	0%	0	0	100%
R7	27400	4%	7	4	0%	0	0	20%	1	1	80%	6	3	0%	0	0	0%	0	0	100%
R8	32070	4%	8	5	0%	0	0	20%	2	1	80%	7	4	0%	0	0	0%	0	0	100%
R9	14400	2%	4	2	0%	0	0	20%	1	0	80%	3	2	0%	0	0	0%	0	0	100%
R10	80800	10%	21	12	0%	0	0	20%	4	2	80%	17	10	0%	0	0	0%	0	0	100%
R11	40170	5%	10	6	0%	0	0	0%	0	0	100%	10	6	0%	0	0	0%	0	0	100%
AG1	181400	23%	47	27	100%	47	27	0%	0	0	0%	0	0	0%	0	0	0%	0	0	100%
sum			47	27				102	100		680	742		268	416		2	9		
%			4%	2%				9%	8%		62%	58%		24%	32%		directly assigned			

Shopping Center  
IN      OUT  
734    794

Office  
IN      OUT  
56      276

Residential  
IN      OUT  
201    117

sum check	IN	OUT
	1098	1295
	1098	1295
		Inputs
		Breakouts

## **Appendix D – Site Trip Distribution and Assignment**

1. ITE RAW TRIP GENERATION CALCULATIONS - TOTAL NEW DEVELOPMENT

Land Use	ITE Code	Size	Unit	24 Hour Volumes			AM Peak Hour Trips			Noon Peak Hour Trips			PM Peak Hour Trips		
				Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
Apartments	220	300	DU	971	971	1,942	30	121	151	38	47	84	119	64	183
Condominiums/Townhomes	230	100	DU	322	322	644	9	43	52	13	16	29	40	20	60
Senior Adult Housing - Attached	252	300	DU	516	516	1,032	21	39	60	32	36	68	42	33	75
Hotel	310	140	Rooms	572	572	1,144	43	31	74	43	36	79	43	41	84
Community Rec Center	495	48	1000 SF	812	812	1,624	65	33	98	65	50	115	64	67	131
General Office Building	710	226.25	1000 SF	1,221	1,221	2,442	324	44	368	143	120	263	56	276	332
Shopping Center	820	404.525	1000 SF	8,422	8,422	16,844	227	139	366	481	467	948	734	794	1,528
<b>TOTAL</b>				<b>12,836</b>	<b>12,836</b>	<b>25,672</b>	<b>719</b>	<b>450</b>	<b>1,169</b>	<b>814</b>	<b>772</b>	<b>1,585</b>	<b>1,098</b>	<b>1,295</b>	<b>2,393</b>
<b>2. INTERNAL CAPTURE (FROM ITE CALCULATIONS)</b>				<b>1,284</b>	<b>1,284</b>	<b>2,568</b>	<b>46</b>	<b>46</b>	<b>92</b>	<b>144</b>	<b>144</b>	<b>288</b>	<b>241</b>	<b>241</b>	<b>482</b>
<b>EXTERNAL TRIP GENERATION BEFORE MODAL REDUCTION</b>				<b>11,552</b>	<b>11,552</b>	<b>23,104</b>	<b>673</b>	<b>404</b>	<b>1,077</b>	<b>670</b>	<b>628</b>	<b>1,297</b>	<b>857</b>	<b>1,054</b>	<b>1,911</b>

3. TRANSIT TRIP REDUCTIONS

TRANSIT TRIP GENERATION FACTORS	Daily Factors			AM Peak Hour %			Noon Peak Hour %			PM Peak Hour %		
	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
Apartments	--	--	1.67	--	--	15%	--	--	7.5%	--	--	15%
Condominiums/Townhomes	--	--	1.67	--	--	15%	--	--	7.5%	--	--	15%
Senior Adult Housing - Attached	--	--	2.00	--	--	20%	--	--	10.0%	--	--	20%
Hotel	--	--	1.11	--	--	10%	--	--	5.0%	--	--	10%
Community Rec Center	--	--	1.67	--	--	15%	--	--	7.5%	--	--	15%
General Office Building	--	--	0.85	--	--	15%	--	--	7.5%	--	--	15%
Shopping Center	--	--	2.21	--	--	15%	--	--	10.0%	--	--	15%

TRANSIT TRIP GENERATION BY LAND USE	ITE Code	Size	Unit	Daily Ridership			AM Peak Hour Trips			Noon Peak Hour Trips			PM Peak Hour Trips		
				Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
Apartments	220	300	DU	251	251	501	4	17	21	2	3	5	14	8	22
Condominiums/Townhomes	230	100	DU	84	84	167	1	6	7	1	1	2	5	2	7
Senior Adult Housing - Attached	252	300	DU	301	301	601	4	7	11	3	3	6	7	5	12
Hotel	310	117	1000 SF	65	65	129	4	3	7	2	1	3	3	3	7
Community Rec Center	495	48	1000 SF	40	40	80	9	5	14	4	3	7	8	8	16
General Office Building	710	226.25	1000 SF	96	96	192	45	6	51	9	7	16	7	33	40
Shopping Center	820	404.525	1000 SF	447	447	894	31	19	51	39	38	78	88	95	183
<b>TOTAL</b>				<b>1,282</b>	<b>1,282</b>	<b>2,565</b>	<b>98</b>	<b>63</b>	<b>161</b>	<b>60</b>	<b>57</b>	<b>116</b>	<b>131</b>	<b>155</b>	<b>286</b>

4. PED/BIKE TRIP REDUCTIONS

PED/BIKE TRIP GENERATION FACTORS	Daily Factors			AM Peak Hour %			Noon Peak Hour %			PM Peak Hour %		
	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
Apartments	--	--	0.167	--	--	1.5%	--	--	0.8%	--	--	1.5%
Condominiums/Townhomes	--	--	0.167	--	--	1.5%	--	--	0.8%	--	--	1.5%
Senior Adult Housing - Attached	--	--	0.200	--	--	2.0%	--	--	1.0%	--	--	2.0%
Hotel	--	--	0.111	--	--	1.0%	--	--	0.5%	--	--	1.0%
Community Rec Center	--	--	0.167	--	--	1.5%	--	--	0.8%	--	--	1.5%
General Office Building	--	--	0.085	--	--	1.5%	--	--	0.8%	--	--	1.5%
Shopping Center	--	--	0.221	--	--	1.5%	--	--	1.0%	--	--	1.5%

PED/BIKE TRIP GENERATION BY LAND USE	ITE Code	Size	Unit	Daily Ped/Bike Trips			AM Peak Hour Trips			Noon Peak Hour Trips			PM Peak Hour Trips		
				Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
Apartments	220	300	DU	25	25	50	0	2	2	0	0	1	1	1	2
Condominiums/Townhomes	230	100	DU	8	8	17	0	1	1	0	0	0	0	0	1
Senior Adult Housing - Attached	252	300	DU	30	30	60	0	1	1	0	0	1	1	1	1
Hotel	310	140	Rooms	8	8	15	0	0	1	0	0	0	0	0	1
Community Rec Center	495	48	1000 SF	4	4	8	1	0	1	0	0	1	1	1	2
General Office Building	710	226.25	1000 SF	10	10	19	4	1	5	1	1	2	1	3	4
Shopping Center	820	404.525	1000 SF	45	45	89	3	2	5	4	4	8	9	10	18
<b>TOTAL</b>				<b>130</b>	<b>130</b>	<b>259</b>	<b>10</b>	<b>6</b>	<b>16</b>	<b>6</b>	<b>6</b>	<b>12</b>	<b>13</b>	<b>15</b>	<b>29</b>

TOTAL EXTERNAL VEHICLE TRIPS (DRIVEWAY VOLUMES)	24 Hour Volumes			AM Peak Hour Trips			Noon Peak Hour Trips			PM Peak Hour Trips		
	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
	10,140	10,140	20,280	565	335	900	604	565	1,169	712	884	1,596

5. PASS-BY TRIPS	ITE Code	Size	Unit	24 Hour Volumes			AM Peak Hour Trips			Noon Peak Hour Trips			PM Peak Hour Trips		
				Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
Pass-By Trip Rates - Shopping Center	820	404.525	1000 SF	17%	17%	17%	0%	0%	0%	34%	34%	34%	34%	34%	34%
Pass-By Trips				1,213	1,213	2,425	0	0	0	121	116	237	165	187	352
Adjusted Pass-By Trips				1,213	1,213	2,425	0	0	0	119	119	237	176	176	352
<b>TOTAL</b>				<b>1,213</b>	<b>1,213</b>	<b>2,425</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>119</b>	<b>119</b>	<b>237</b>	<b>176</b>	<b>176</b>	<b>352</b>

6. DIVERTED LINKED TRIPS	ITE Code	Size	Unit	24 Hour Volumes			AM Peak Hour Trips			Noon Peak Hour Trips			PM Peak Hour Trips		
				Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
DL Trip Rates - Shopping Center	820	404.525	1000 SF	14%	14%	14%	0%	0%	0%	28%	28%	28%	28%	28%	28%
Diverted Linked Trips				999	999	1,997	0	0	0	100	96	195	136	154	290
Adjusted DL Trips				999	999	1,997	0	0	0	98	98	195	145	145	290
<b>TOTAL</b>				<b>999</b>	<b>999</b>	<b>1,997</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>98</b>	<b>98</b>	<b>195</b>	<b>145</b>	<b>145</b>	<b>290</b>

TOTAL EXTERNAL VEHICLE TRIPS ADDED TO ADJACENT STREETS	24 Hour Volumes			AM Peak Hour Trips			Noon Peak Hour Trips			PM Peak Hour Trips		
	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
	7,928	7,928	15,858	565	335	900	387	348	736	391	563	954

1. 2022 Site Trip Distribution Percentages

Peak AM

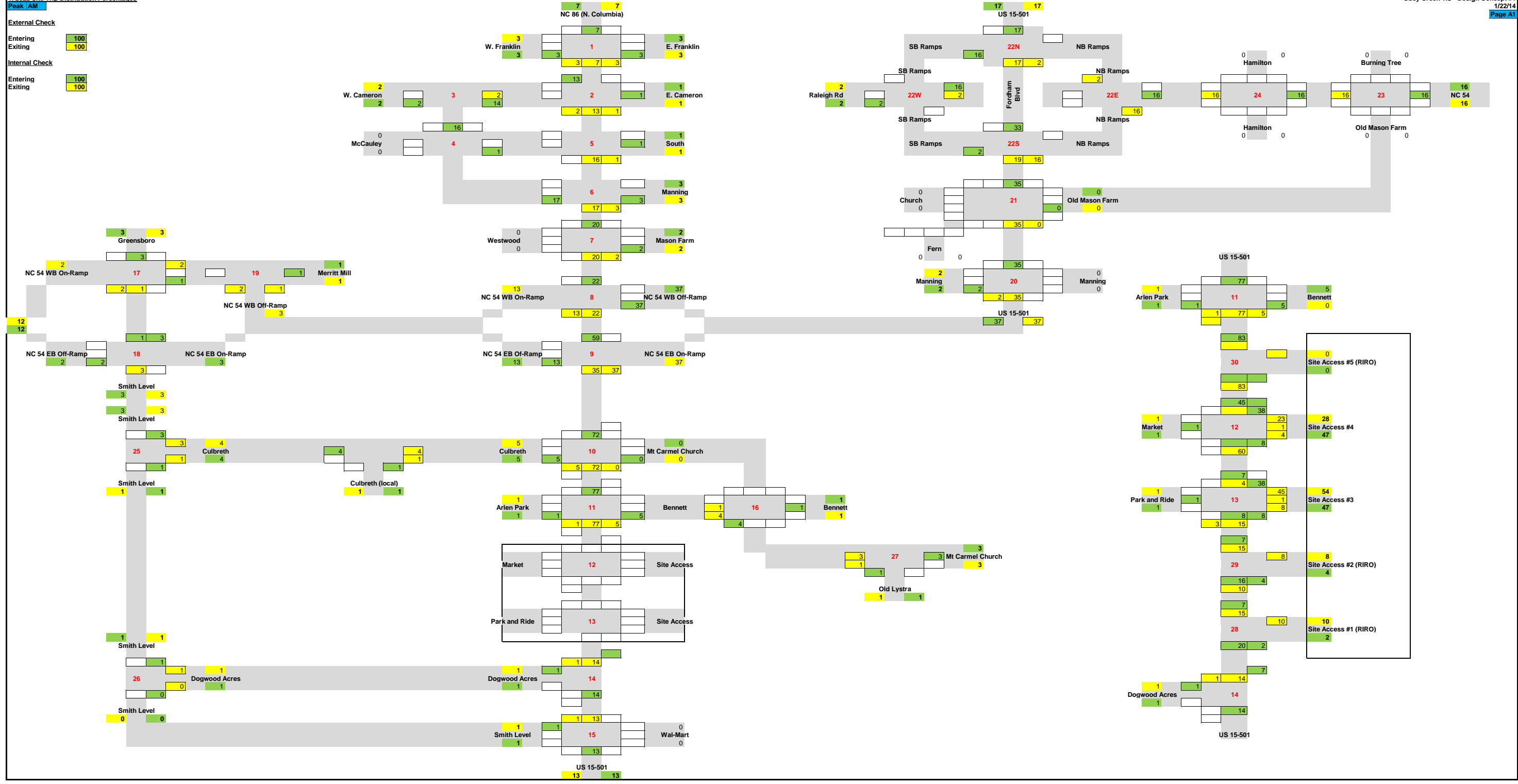
Page A1

External Check

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Exiting 100

Internal Check

Entering 100  
Exiting 100



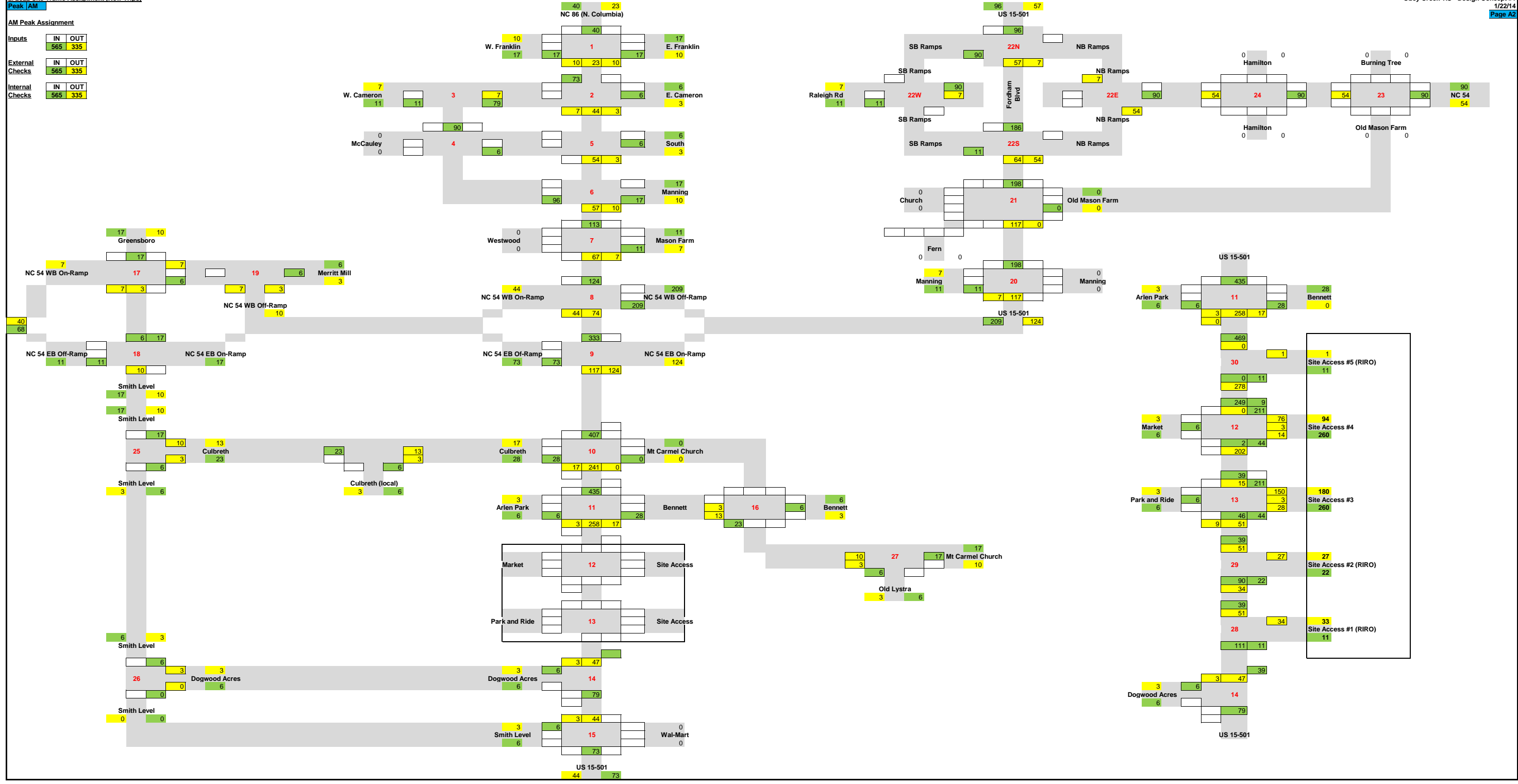
Peak AM

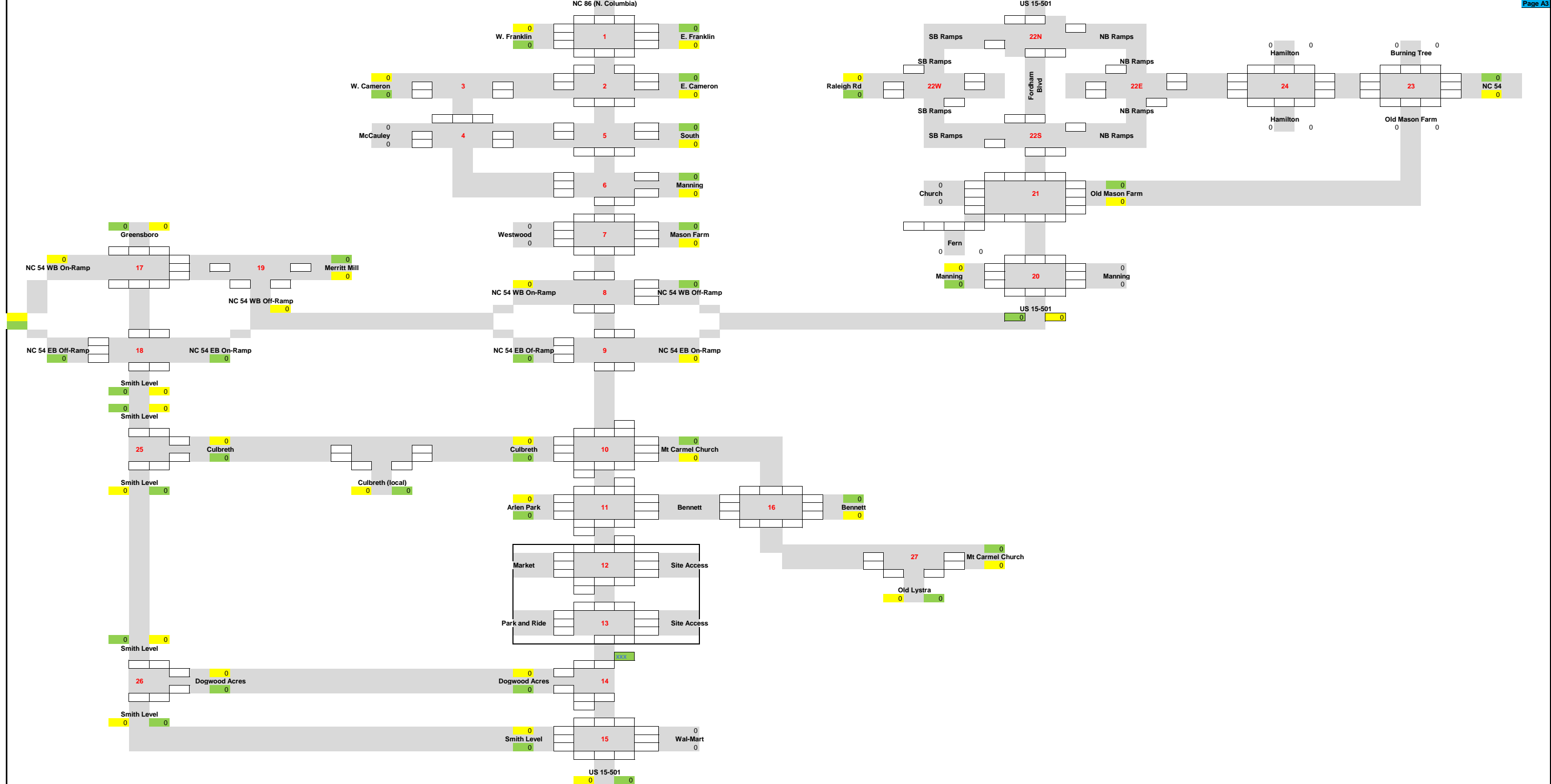
1/22/14  
Page A2

AM Peak Assignment

Inputs	IN	OUT
External Checks	565	335

Internal Checks	IN	OUT
	565	335

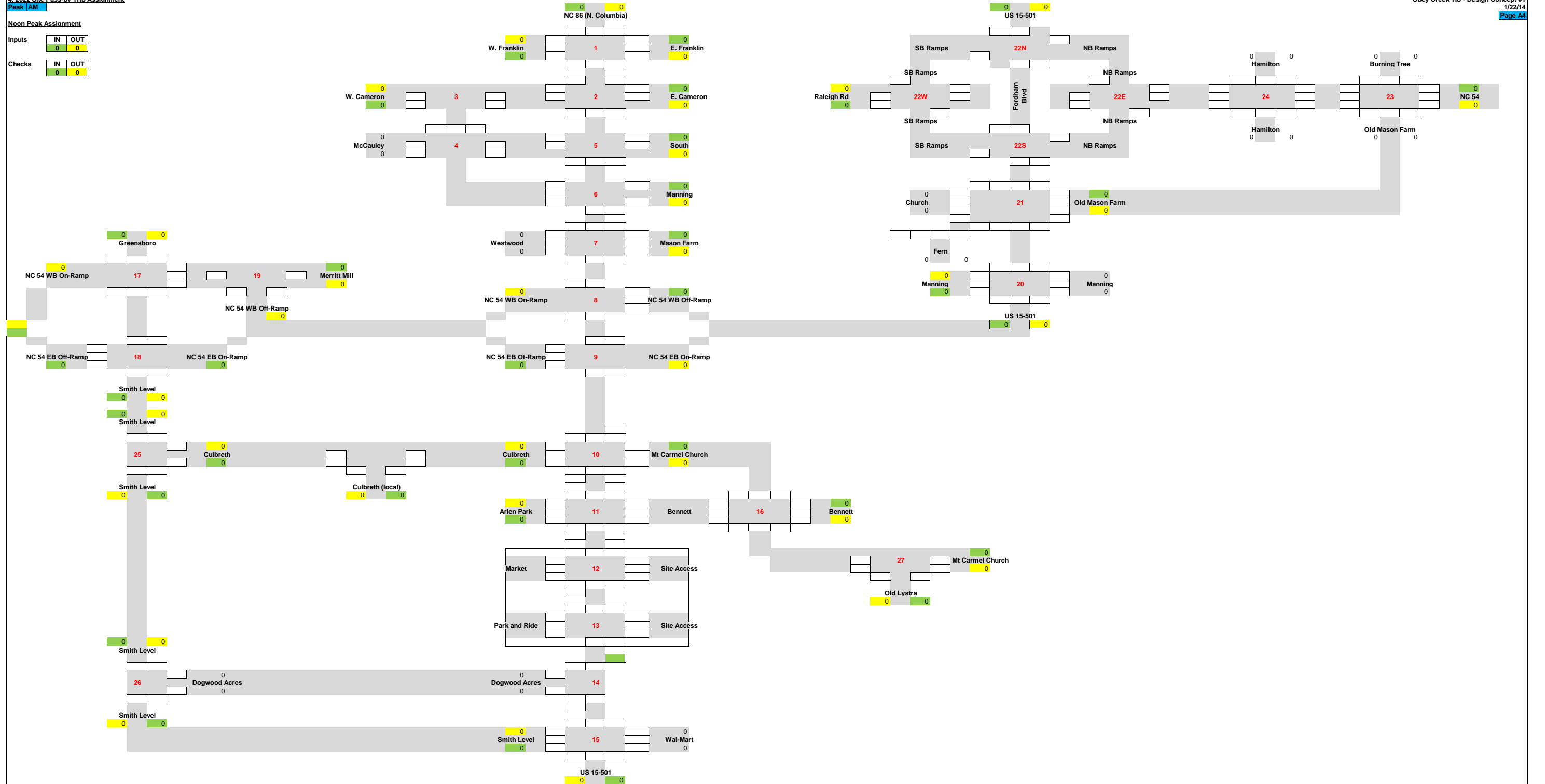




Noon Peak Assignment

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	0	0

Checks	IN	OUT
	0	0



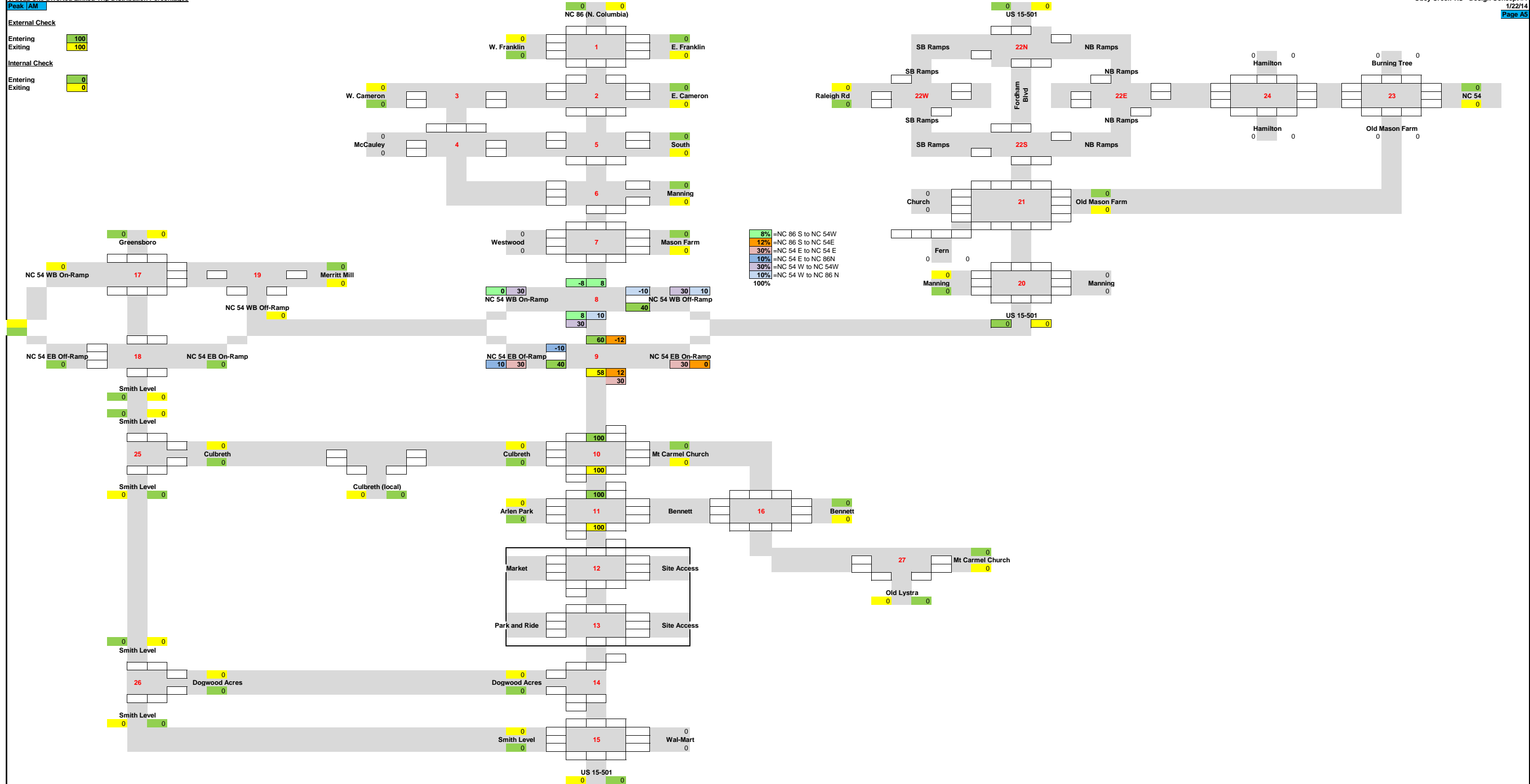


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Exiting 100

Internal Check

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Exiting 0



Peak AM

1/22/14  
Page A6

AM Peak Assignment

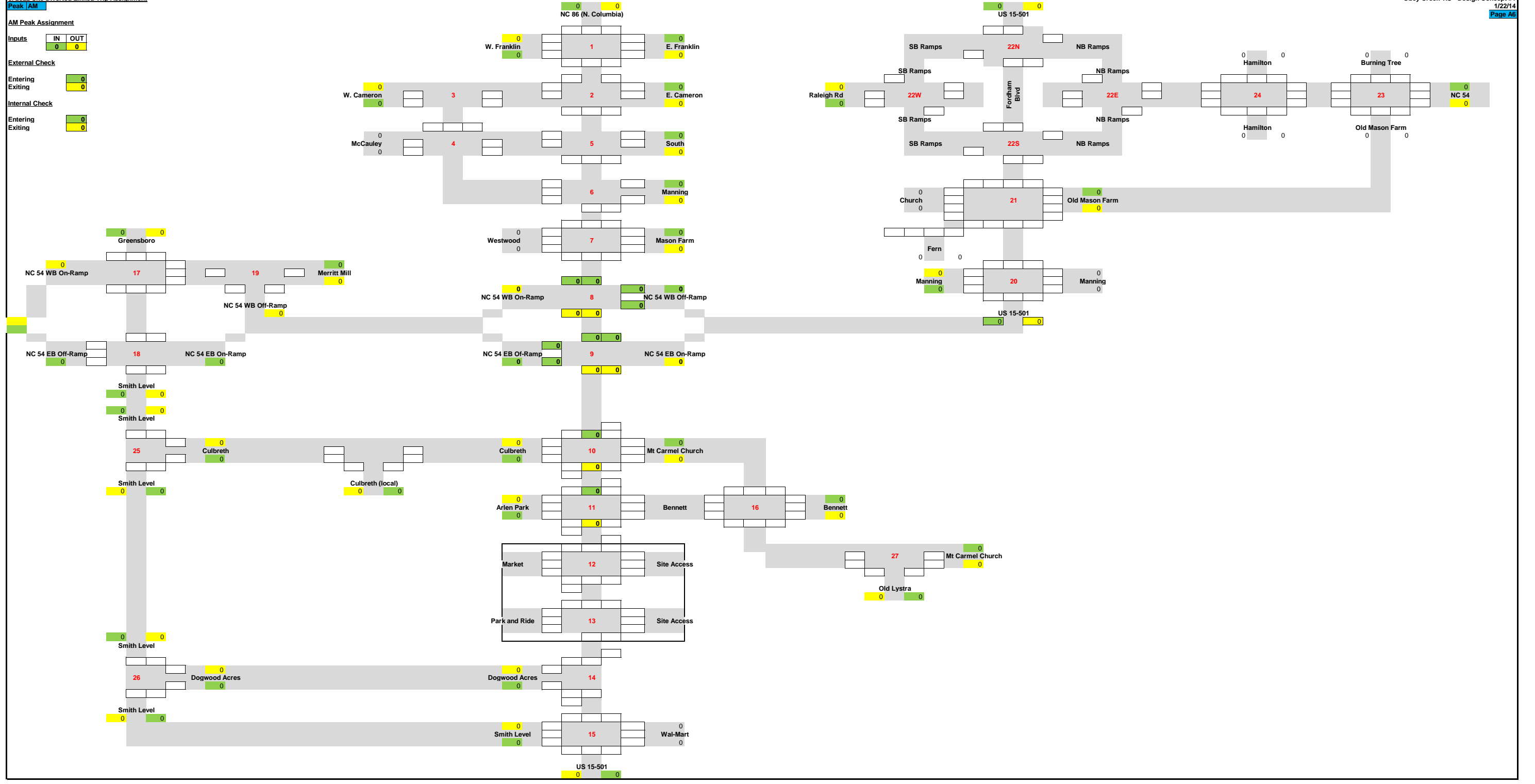
Inputs	IN	OUT
	0	0

External Check

Entering	0
Exiting	0

Internal Check

Entering	0
Exiting	0



AM Peak Primary Trip Assignment

Inputs	IN	OUT
	565	335

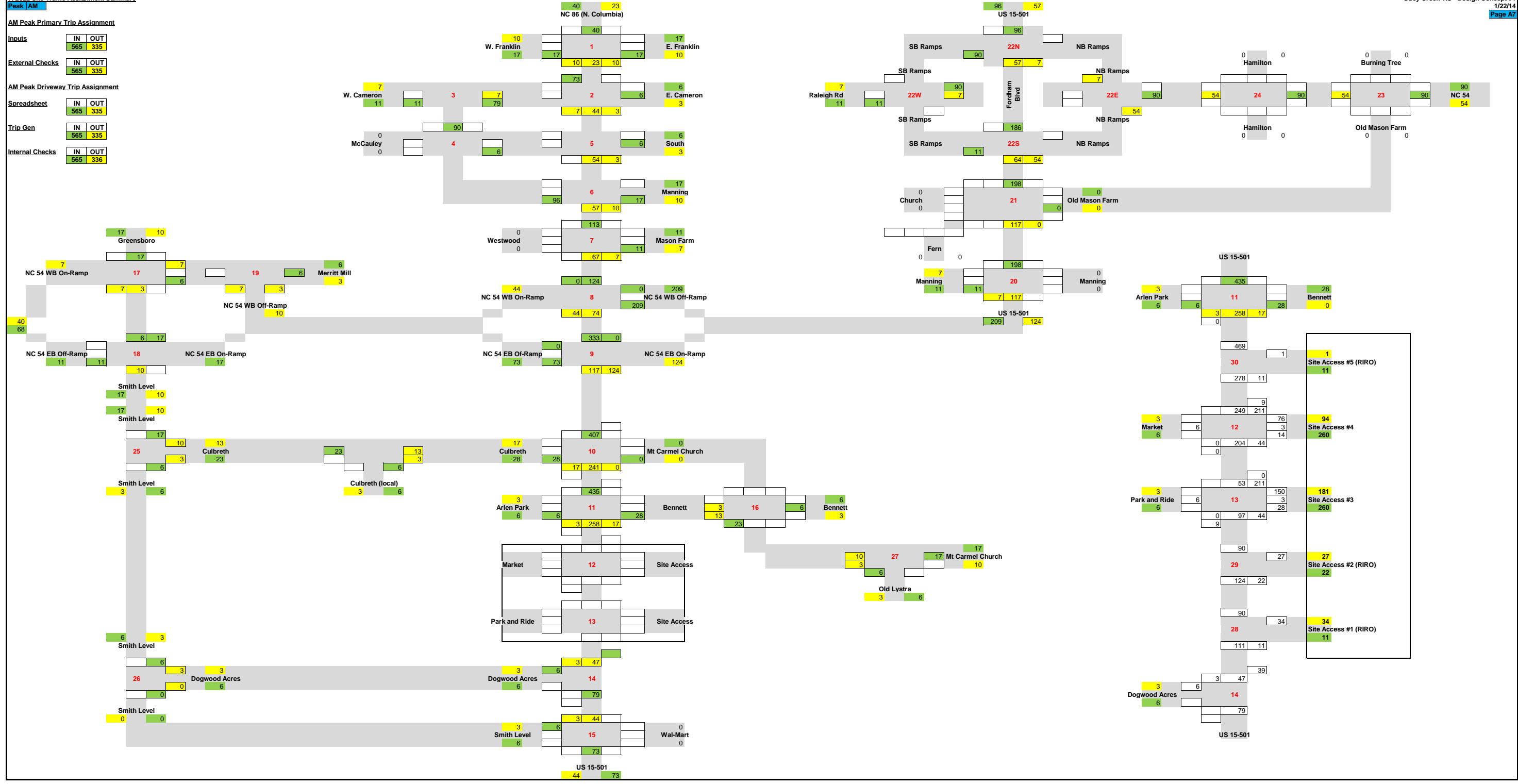
External Checks	IN	OUT
	565	335

AM Peak Driveway Trip Assignment

Spreadsheet	IN	OUT
	565	335

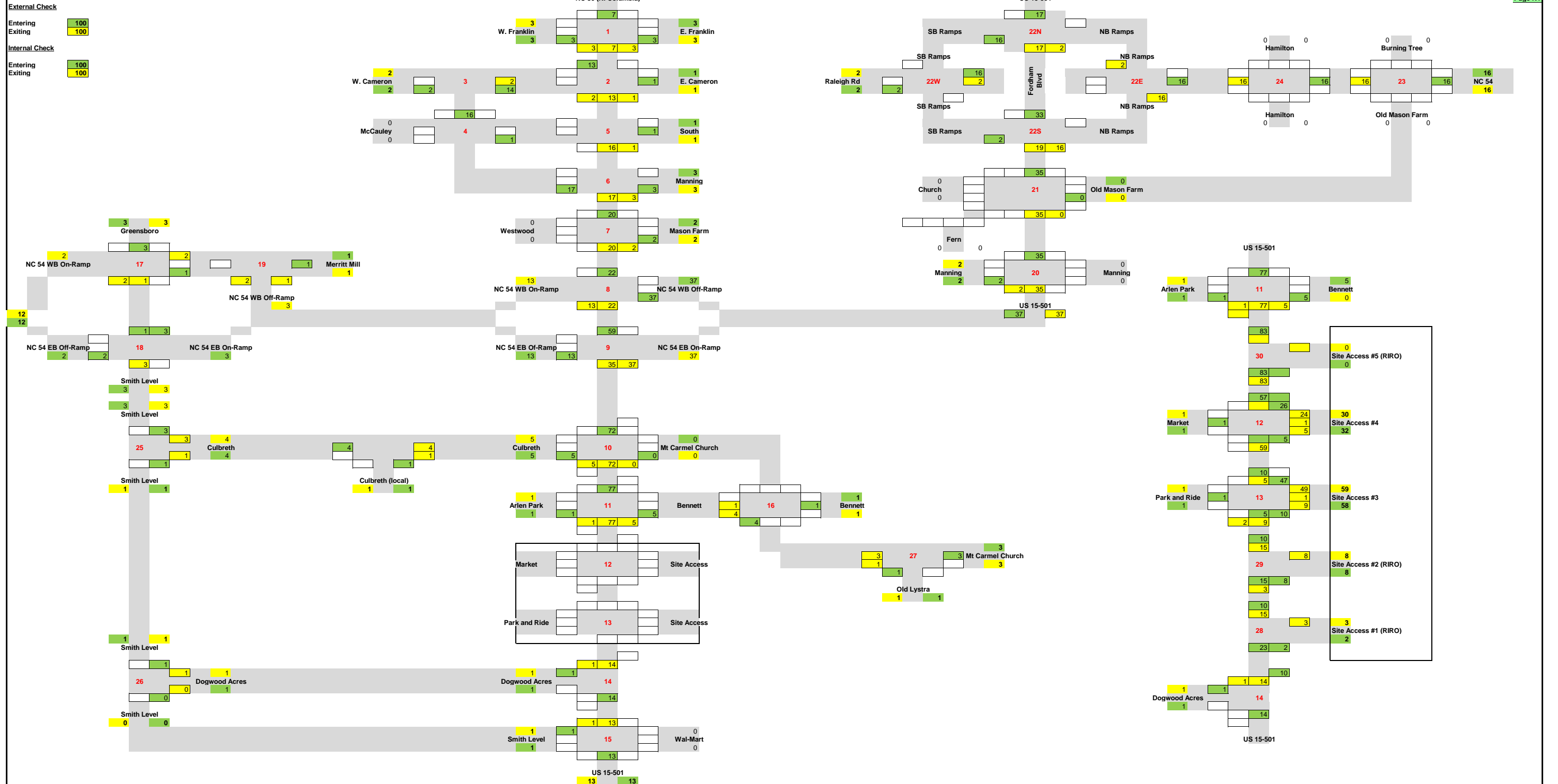
Trip Gen	IN	OUT
	565	335

Internal Checks	IN	OUT
	565	336



1. 2022 Site Trip Distribution Percentages

Peak Noon 1/22/14 Page N1



Peak Noon

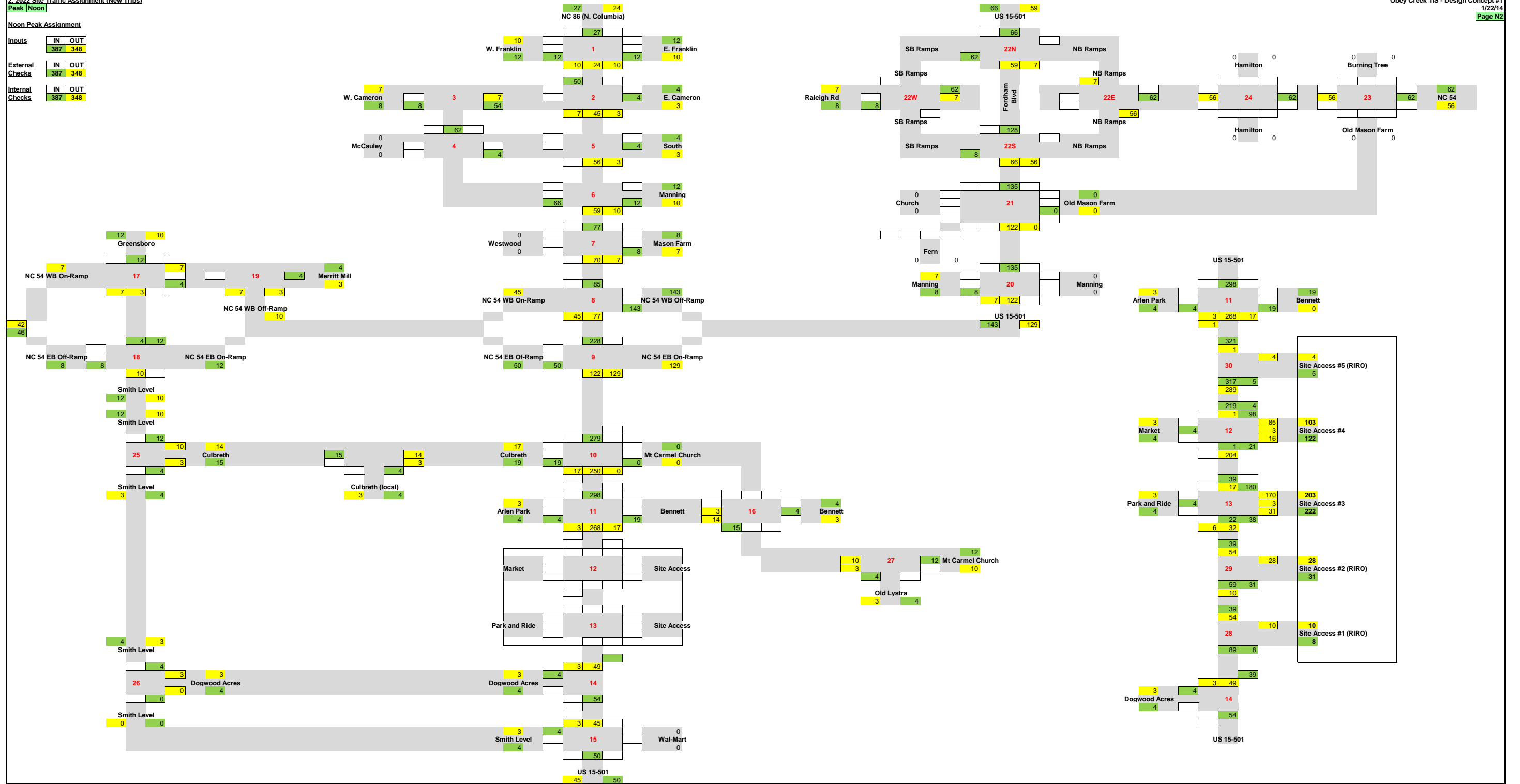
1/22/14

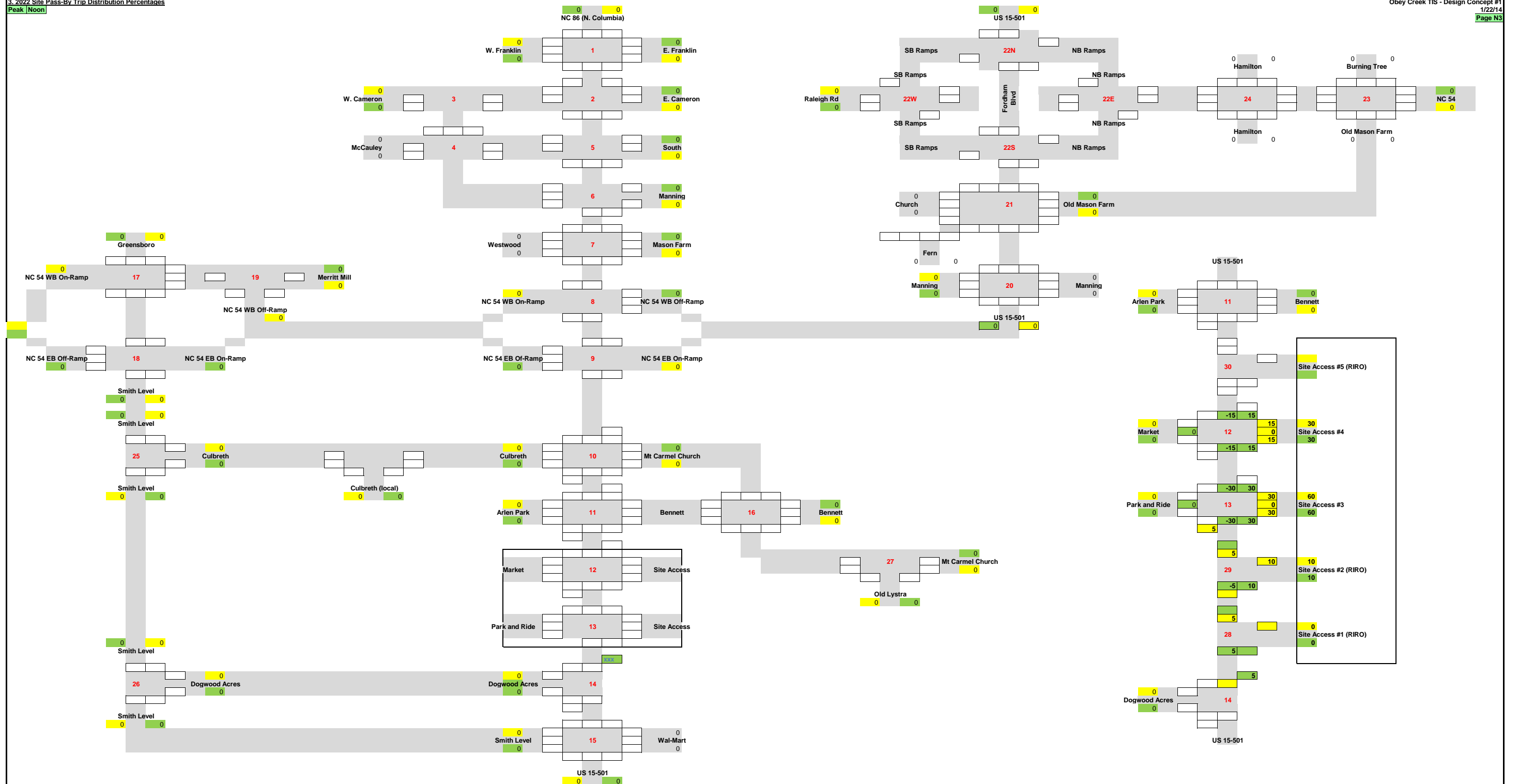
Noon Peak Assignment

Inputs	IN	OUT
External Checks	387	348

External Checks	IN	OUT
Internal Checks	387	348

Internal Checks	IN	OUT
External Checks	387	348



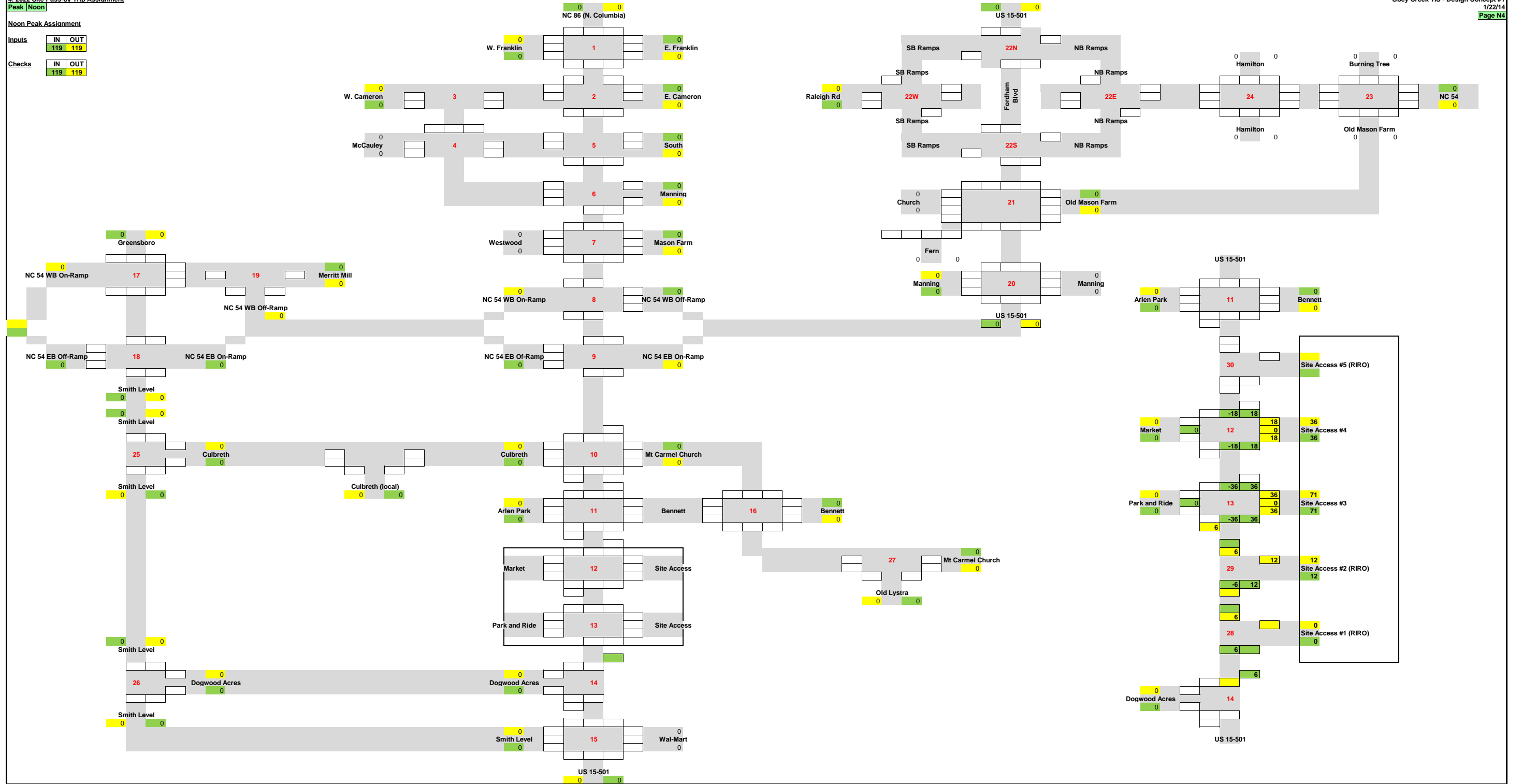


4. 2022 Site Pass-by Trip Assignment

Peak Noon

Noon Peak Assignment

Inputs	IN	OUT
Checks	IN	OUT
	119	119
	119	119

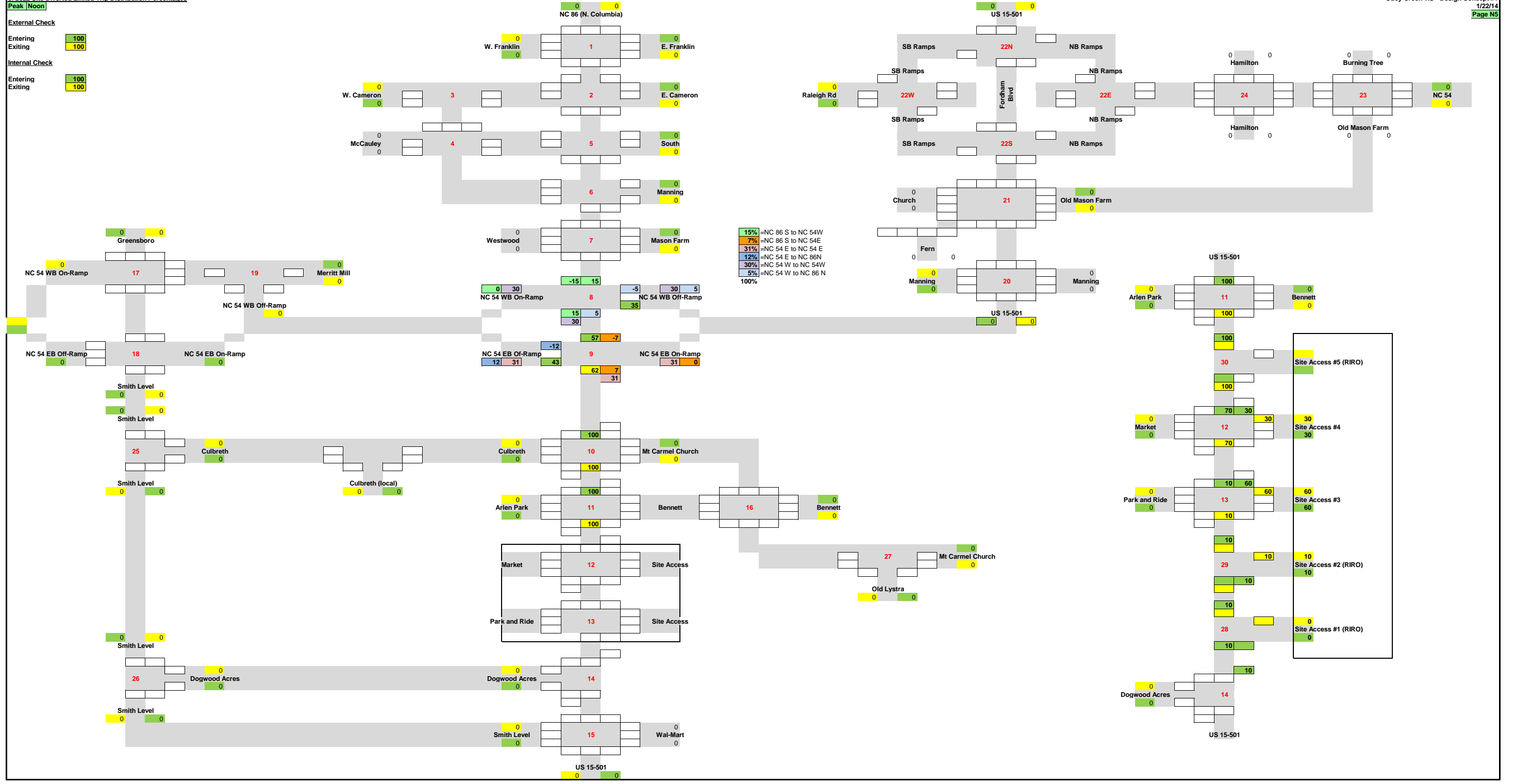


External Check

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Exiting 100

Internal Check

Entering 100  
Exiting 100





Peak Noon

1/22/14

Noon Peak Assignment

Inputs	IN	OUT
	98	98

External Check

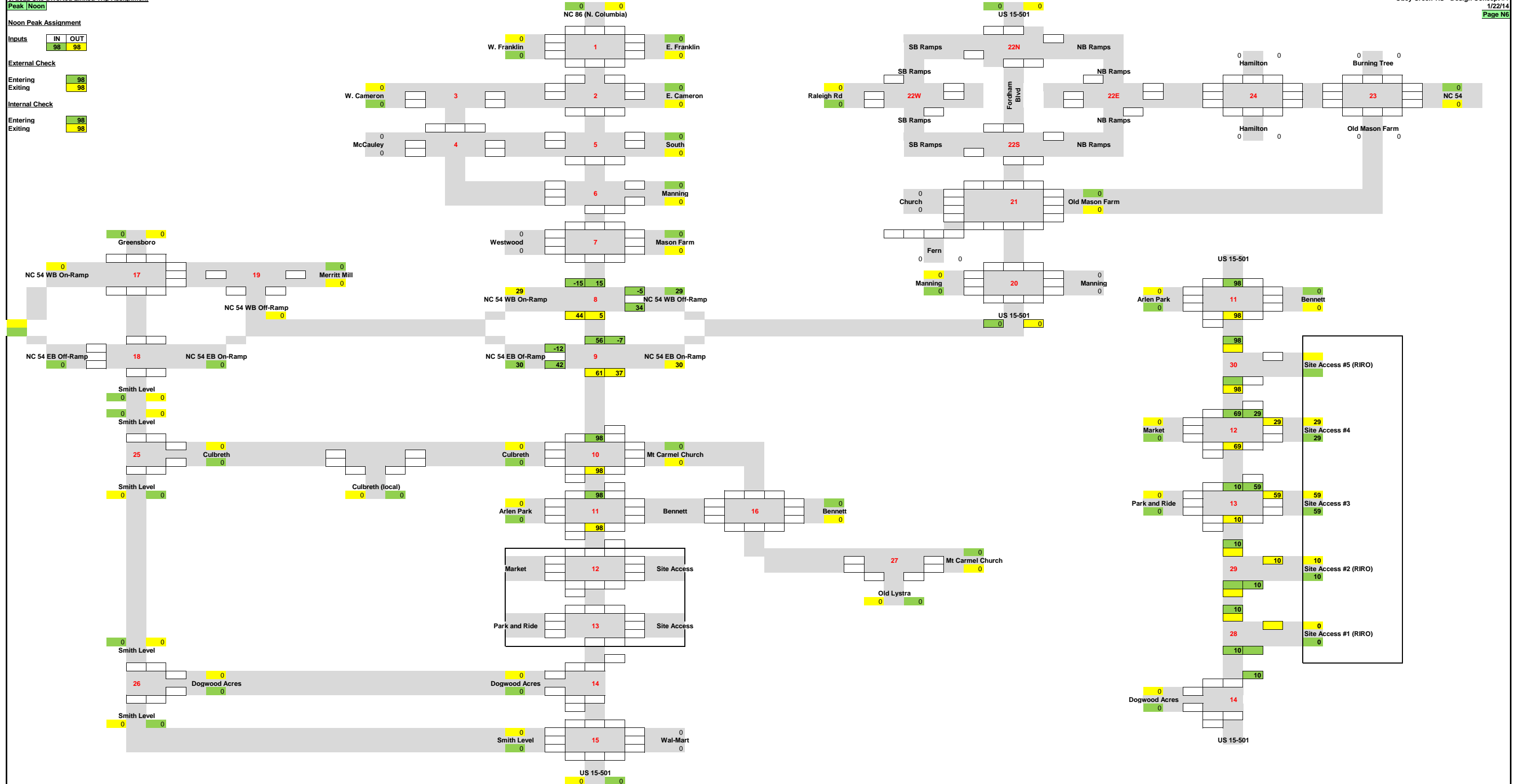
Entering 98

Exiting 98

Internal Check

Entering 98

Exiting 98



7. 2022 Site Traffic Assignment Summary

Peak Noon

Noon Peak Primary Trip Assignment

Inputs	IN	OUT
	387	348

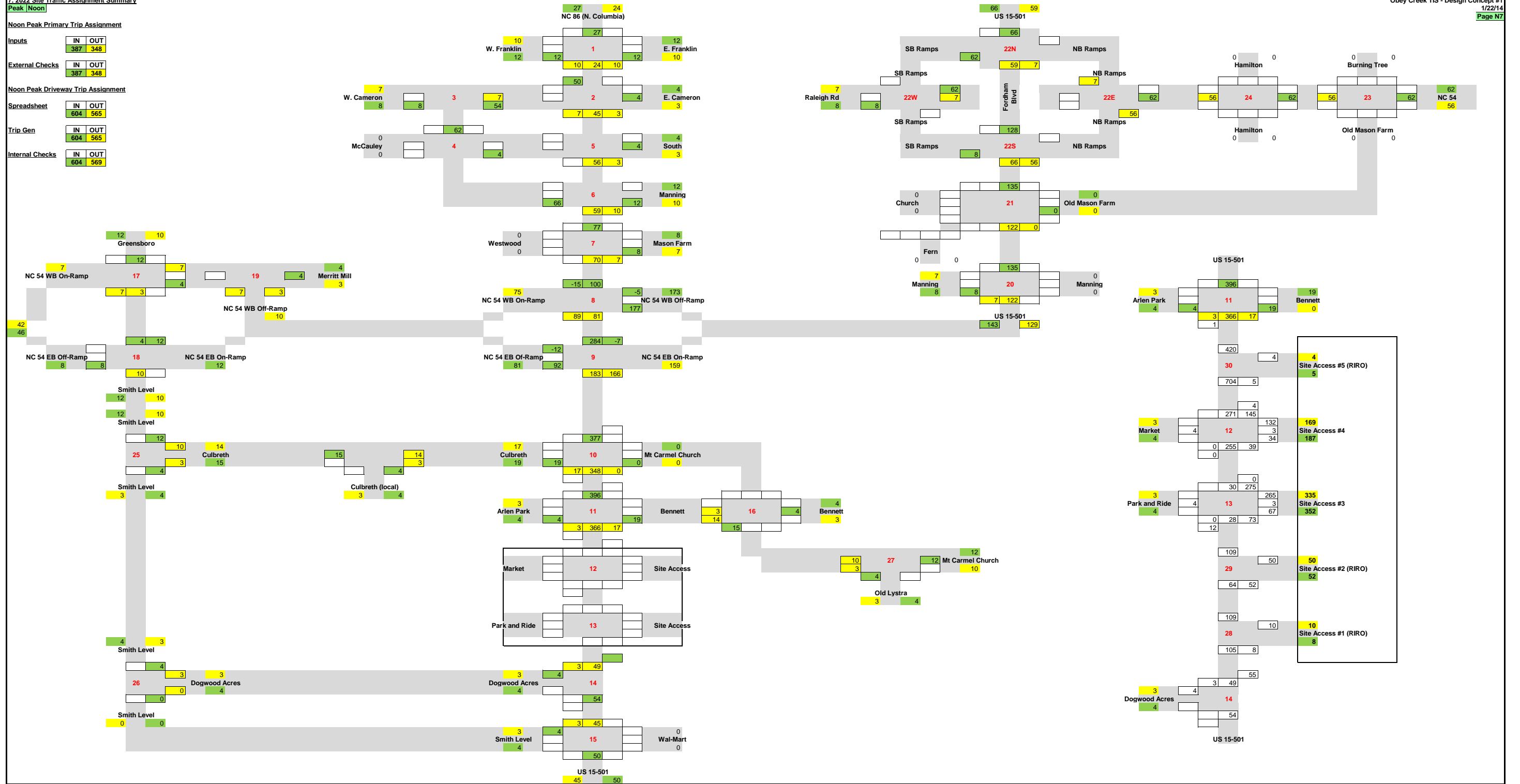
External Checks	IN	OUT
	387	348

Noon Peak Driveway Trip Assignment

Spreadsheet	IN	OUT
	604	565

Trip Gen	IN	OUT
	604	565

Internal Checks	IN	OUT
	604	569

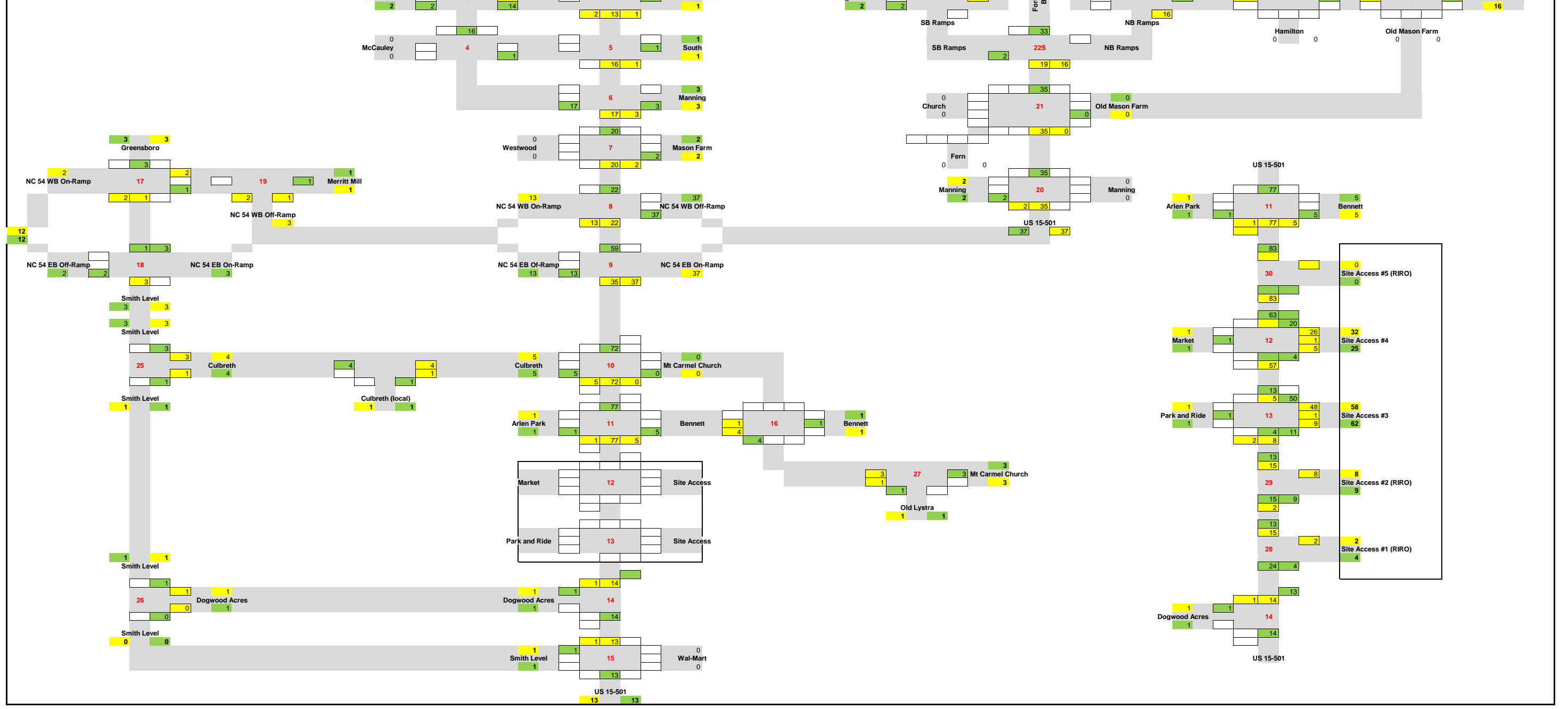


External Check

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Exiting 100

Internal Check

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Exiting 100



Peak PM

1/22/14

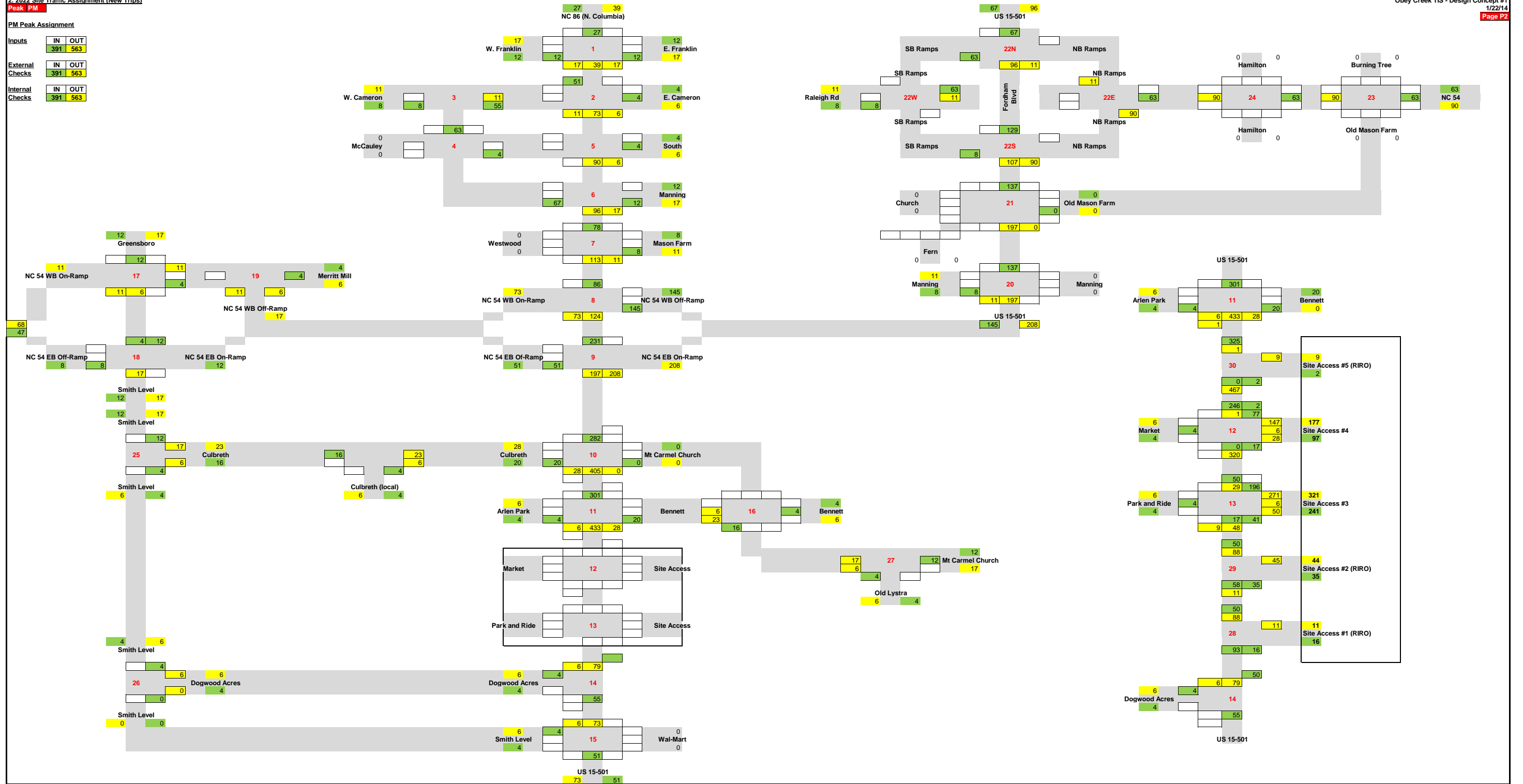
Page P2

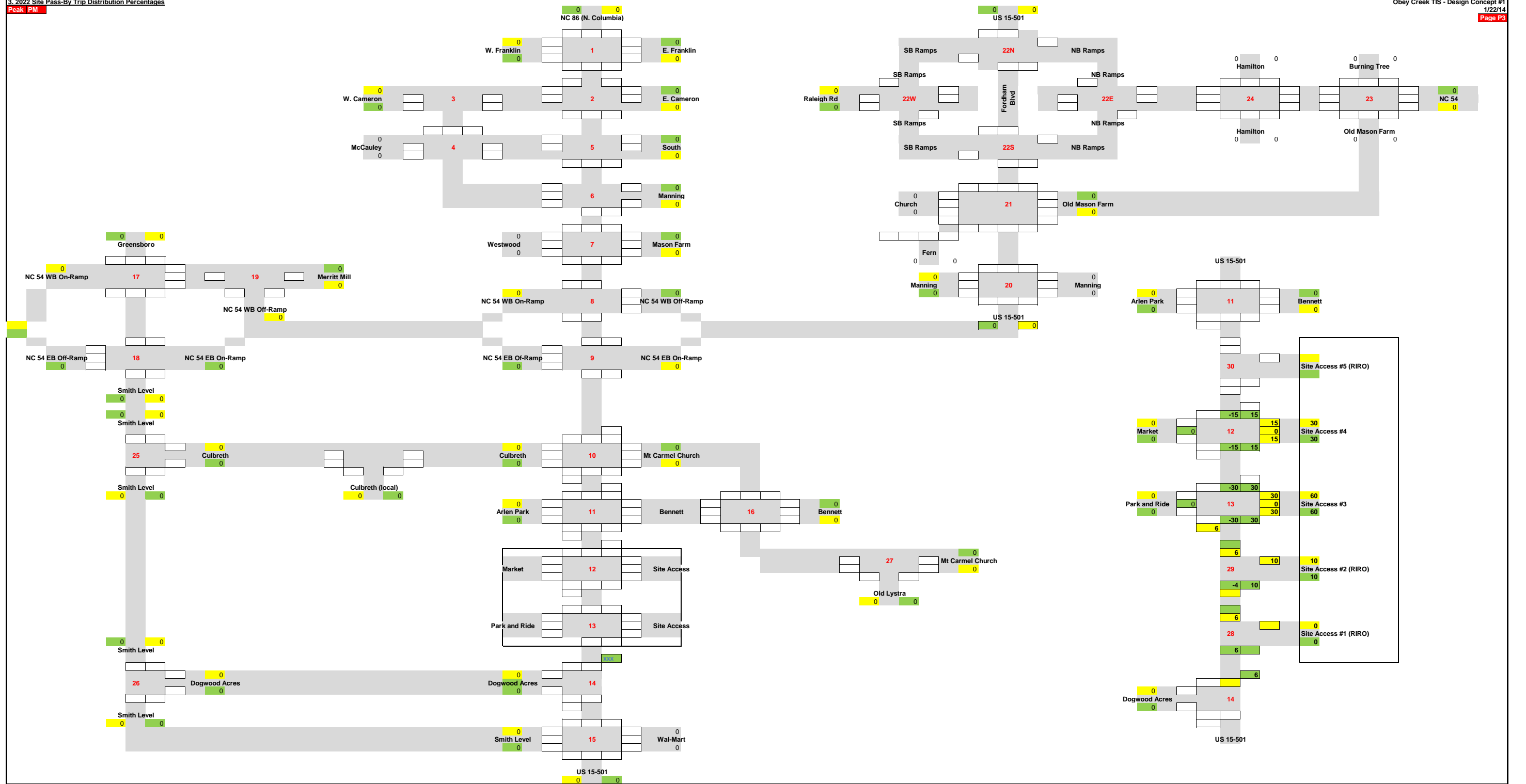
PM Peak Assignment

Inputs	IN	OUT
External Checks	391	563

Internal Checks	IN	OUT
	391	563

Internal Checks	IN	OUT
	391	563





Peak PM

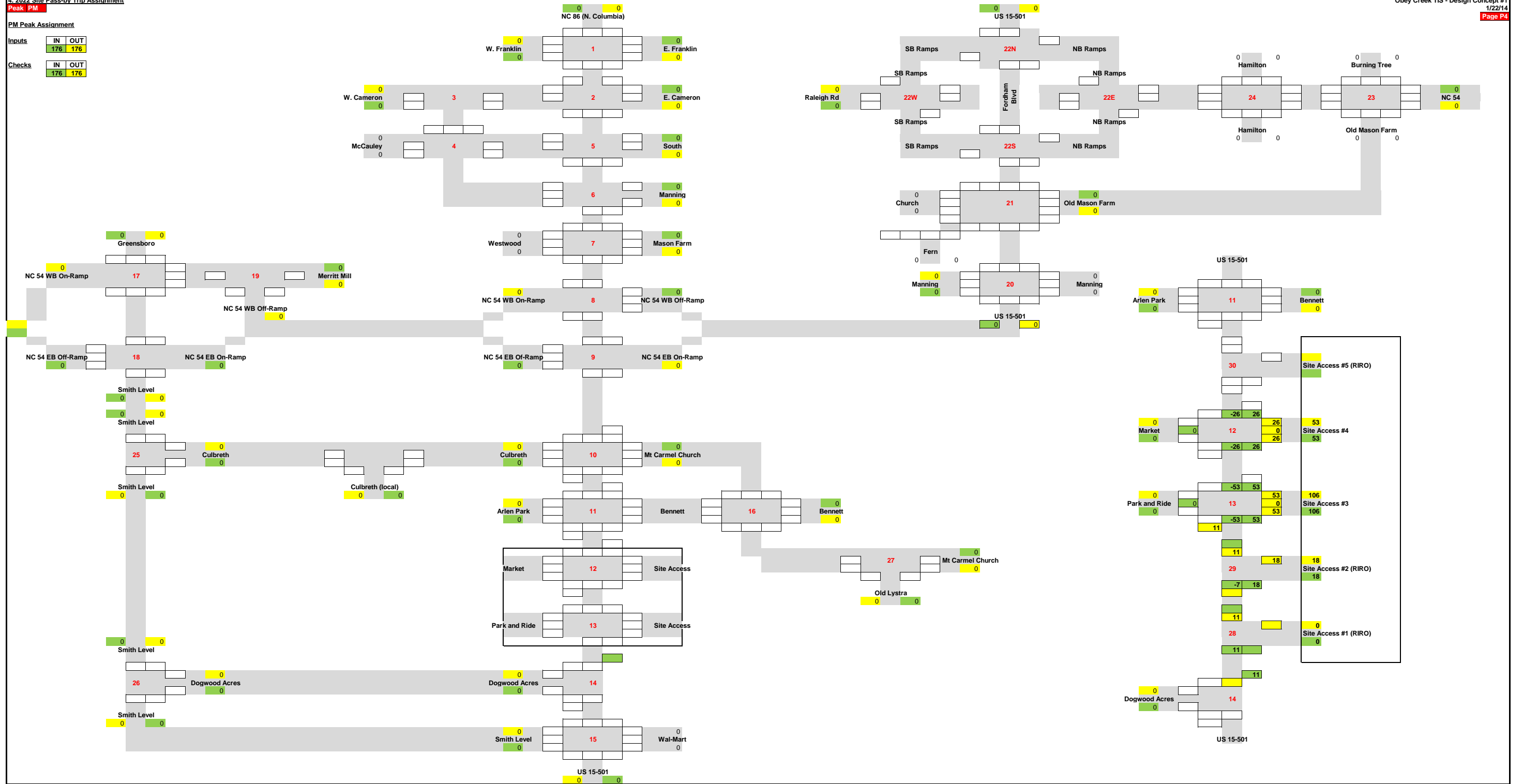
1/22/14

Page P4

PM Peak Assignment

Inputs	IN	OUT
	176	176

Checks	IN	OUT
	176	176



Peak PM

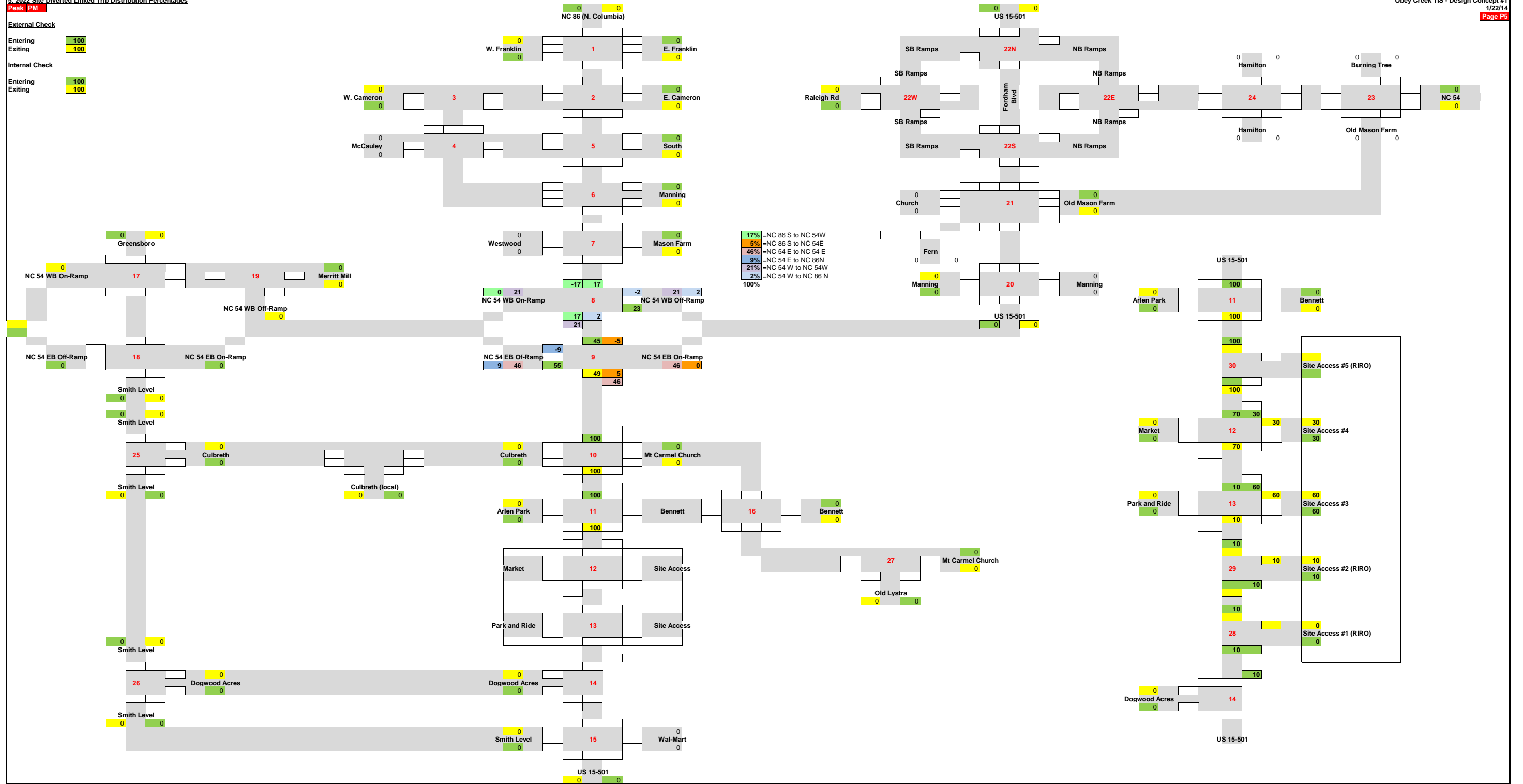
1/22/14  
Page P5

External Check

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Exiting 100

Internal Check

Entering 100  
Exiting 100



PM Peak Assignment

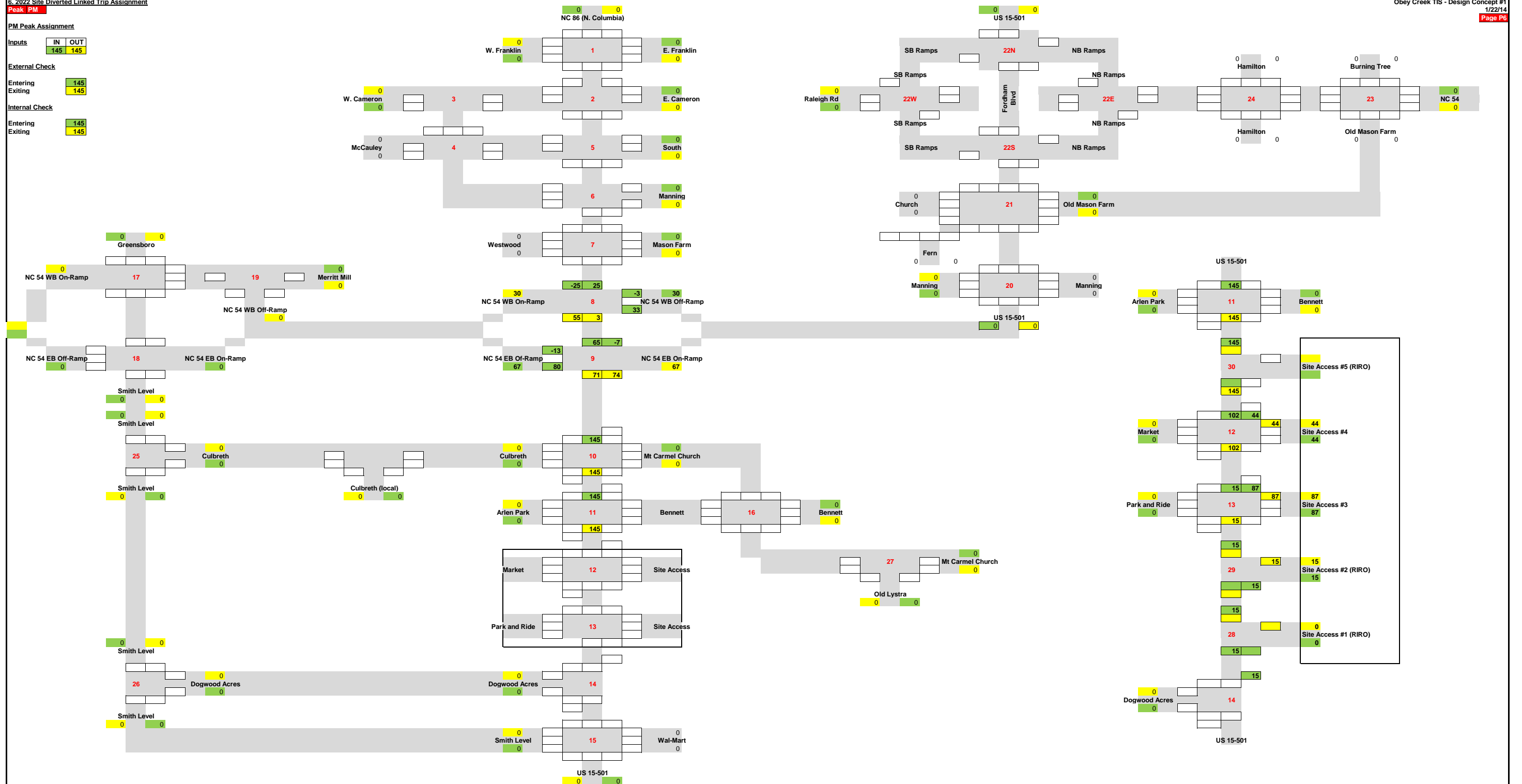
Inputs	IN	OUT
	145	145

External Check

Entering	145
Exiting	145

Internal Check

Entering	145
Exiting	145





Peak PM

1/22/14

Page P7

PM Peak Primary Trip Assignment

Inputs	IN	OUT
	391	563

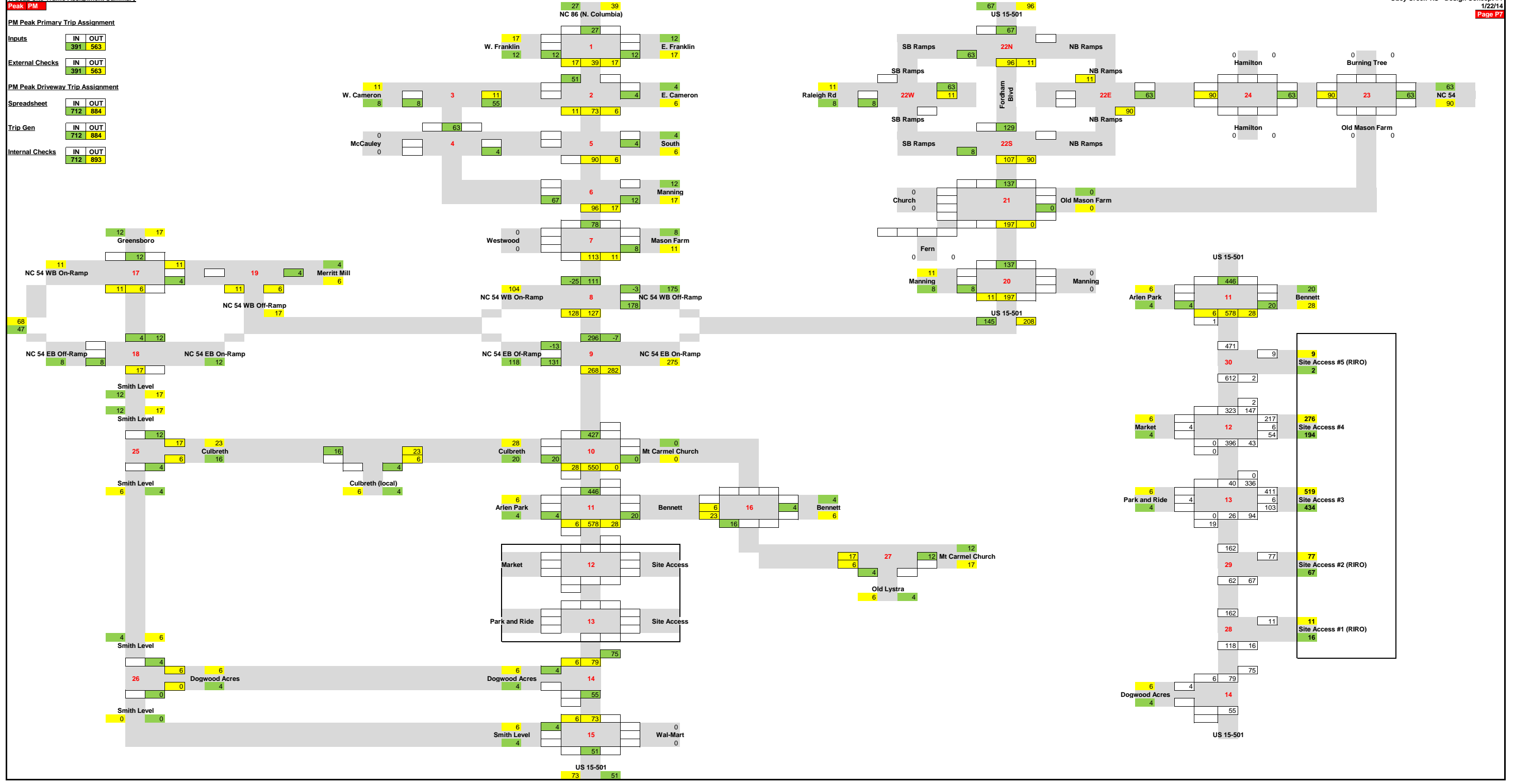
External Checks	IN	OUT
	391	563

PM Peak Driveway Trip Assignment

Spreadsheet	IN	OUT
	712	884

Trip Gen	IN	OUT
	712	884

Internal Checks	IN	OUT
	712	893























## **Appendix E – SYNCHRO Signalized Analysis Output**

## 2022 Without Site

Lanes, Volumes, Timings  
 1: Franklin Street & NC 86 (S. Columbia St)

2/28/2014

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	93	289	57	77	305	62	51	323	94	58	524	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	9	12	13	10	10	13	9	10	10	9	9	11
Storage Length (ft)	225		0	100		0	400		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.84	0.98		0.93	0.95		0.96	0.94		0.87	0.98	
Frt		0.975			0.975			0.966			0.977	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1379	2930	0	1404	2596	0	1354	2552	0	1354	2597	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1161	2930	0	1312	2596	0	1295	2552	0	1176	2597	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		20			20			25			25	
Link Distance (ft)		806			940			972			822	
Travel Time (s)		27.5			32.0			26.5			22.4	
Confl. Peds. (#/hr)	175		62	62		175	63		144	144		63
Peak Hour Factor	0.93	0.93	0.93	0.79	0.79	0.79	0.87	0.87	0.87	0.91	0.91	0.91
Heavy Vehicles (%)	6%	6%	6%	8%	8%	8%	8%	8%	8%	8%	8%	8%
Adj. Flow (vph)	100	311	61	97	386	78	59	371	108	64	576	102
Shared Lane Traffic (%)												
Lane Group Flow (vph)	100	372	0	97	464	0	59	479	0	64	678	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases												
Detector Phase	1	6		5	2		3	8		7	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	15.0	32.0		15.0	32.0		15.0	32.0		15.0	32.0	
Total Split (s)	23.0	38.0	0.0	23.0	38.0	0.0	17.0	51.0	0.0	18.0	52.0	0.0
Total Split (%)	17.7%	29.2%	0.0%	17.7%	29.2%	0.0%	13.1%	39.2%	0.0%	13.8%	40.0%	0.0%
Maximum Green (s)	17.1	31.8		17.6	31.8		11.1	45.1		12.1	46.3	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.3		3.0	3.1	
All-Red Time (s)	2.9	3.2		2.4	3.2		2.9	2.6		2.9	2.6	
Lost Time Adjust (s)	-0.9	-1.2	-2.0	-0.4	-1.2	0.0	-0.9	-0.9	-1.5	-0.9	-0.7	-1.5
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	4.0	5.0	5.0	2.5	5.0	5.0	2.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	3.0		1.0	3.0		1.0	2.0		1.0	2.0	
Recall Mode	None	Min		None	Min		None	C-Max		None	C-Max	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		15.0			15.0			15.0			15.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	13.4	29.4		12.8	28.8		10.0	59.9		10.5	60.4	
Actuated g/C Ratio	0.10	0.23		0.10	0.22		0.08	0.46		0.08	0.46	
v/c Ratio	0.70	0.56		0.70	0.81		0.57	0.41		0.59	0.56	

Lanes, Volumes, Timings  
 1: Franklin Street & NC 86 (S. Columbia St)

2/28/2014

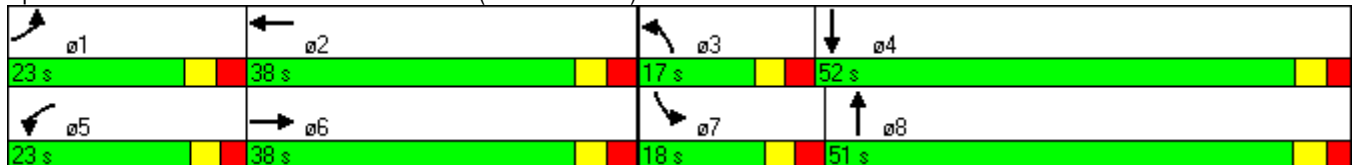


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	80.9	47.6		82.1	59.3		115.2	8.4		78.8	30.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	80.9	47.6		82.1	59.3		115.2	8.4		78.8	30.5	
LOS	F	D		F	E		F	A		E	C	
Approach Delay		54.6			63.2			20.1			34.7	
Approach LOS		D			E			C			C	
Queue Length 50th (ft)	83	145		80	195		53	20		53	225	
Queue Length 95th (ft)	141	193		118	213		m97	98		102	333	
Internal Link Dist (ft)		726			860			892			742	
Turn Bay Length (ft)	225			100			400			100		
Base Capacity (vph)	191	745		194	659		125	1177		135	1207	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.52	0.50		0.50	0.70		0.47	0.41		0.47	0.56	

Intersection Summary

Area Type: CBD  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 51 (39%), Referenced to phase 4:SBT and 8:NBT, Start of Green  
 Natural Cycle: 95  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.81  
 Intersection Signal Delay: 42.3  
 Intersection LOS: D  
 Intersection Capacity Utilization 66.7%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Franklin Street & NC 86 (S. Columbia St)



Lanes, Volumes, Timings  
2: Cameron Avenue & NC 86 (S. Columbia St)

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	11	105	0	0	119	29	100	430	38	64	0	568
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	12	12	12	10	10	10	11	11	12
Storage Length (ft)	110		0	0		0	0		0	150		0
Storage Lanes	1		0	0		0	1		0	1		2
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.88
Ped Bike Factor	0.96				0.99		0.95	0.98		0.92		0.92
Fr <sub>t</sub>					0.974			0.988				0.850
Fl <sub>t</sub> Protected	0.950						0.950			0.950		
Satd. Flow (prot)	1525	1660	0	0	1535	0	1404	2723	0	1454	0	2369
Fl <sub>t</sub> Permitted	0.350						0.950			0.950		
Satd. Flow (perm)	541	1660	0	0	1535	0	1341	2723	0	1338	0	2170
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25				25
Link Distance (ft)		412			1056			839				972
Travel Time (s)		10.7			57.6			22.9				26.5
Confl. Peds. (#/hr)	33		65	65		33	37		103	103		37
Peak Hour Factor	0.77	0.77	1.00	1.00	0.74	0.74	0.79	0.79	0.79	0.96	1.00	0.96
Heavy Vehicles (%)	3%	3%	3%	7%	7%	7%	8%	8%	8%	8%	8%	8%
Adj. Flow (vph)	14	136	0	0	161	39	127	544	48	67	0	592
Shared Lane Traffic (%)												
Lane Group Flow (vph)	14	136	0	0	200	0	127	592	0	67	0	592
Turn Type	Perm						Split			custom		custom
Protected Phases		4			8		2	2		1		1
Permitted Phases	4									1		1
Detector Phase	4	4			8		2	2		1		1
Switch Phase												
Minimum Initial (s)	10.0	10.0			10.0		7.0	7.0		7.0		7.0
Minimum Split (s)	17.0	17.0			17.0		21.0	21.0		15.0		15.0
Total Split (s)	26.0	26.0	0.0	0.0	26.0	0.0	37.0	37.0	0.0	42.0	0.0	42.0
Total Split (%)	20.0%	20.0%	0.0%	0.0%	20.0%	0.0%	28.5%	28.5%	0.0%	32.3%	0.0%	32.3%
Maximum Green (s)	19.8	19.8			19.8		30.8	30.8		36.4		36.4
Yellow Time (s)	3.2	3.2			3.2		3.1	3.1		3.0		3.0
All-Red Time (s)	3.0	3.0			3.0		3.1	3.1		2.6		2.6
Lost Time Adjust (s)	-1.2	-1.2	0.0	0.0	-1.2	0.0	-1.2	-1.2	0.0	-0.6	0.0	-0.6
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	4.0	5.0	5.0	4.0	5.0	4.0	5.0
Lead/Lag							Lag	Lag		Lead		Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0			2.0		2.0	2.0		2.0		2.0
Recall Mode	Min	Min			None		C-Max	C-Max		None		None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	19.7	19.7			19.7		57.5	57.5		37.8		37.8
Actuated g/C Ratio	0.15	0.15			0.15		0.44	0.44		0.29		0.29
v/c Ratio	0.17	0.54			0.86		0.20	0.49		0.16		0.86

Lanes, Volumes, Timings  
 2: Cameron Avenue & NC 86 (S. Columbia St)

2/28/2014

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Flt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	25.0
Total Split (s)	25.0
Total Split (%)	19%
Maximum Green (s)	22.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	15.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	

Lanes, Volumes, Timings  
 2: Cameron Avenue & NC 86 (S. Columbia St)

2/28/2014

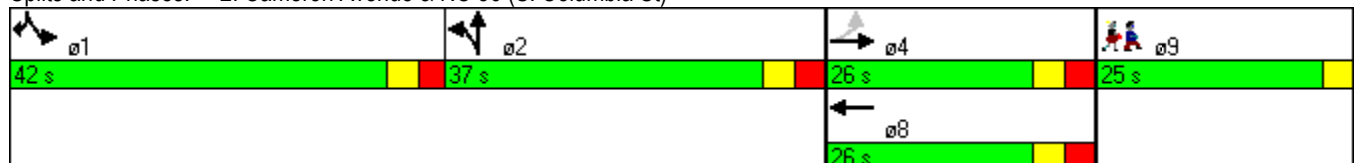


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	17.0	24.4			85.0		18.4	18.9		18.0		42.1
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0		0.2
Total Delay	17.0	24.4			85.0		18.4	18.9		18.0		42.2
LOS	B	C			F		B	B		B		D
Approach Delay		23.7			85.0			18.8				
Approach LOS		C			F			B				
Queue Length 50th (ft)	10	119			165		39	96		43		260
Queue Length 95th (ft)	m11	129			202		84	157		m53		322
Internal Link Dist (ft)		332			976			759			892	
Turn Bay Length (ft)	110									150		
Base Capacity (vph)	87	268			248		621	1204		444		723
Starvation Cap Reductn	0	0			0		0	0		0		0
Spillback Cap Reductn	0	0			0		0	0		0		6
Storage Cap Reductn	0	0			0		0	0		0		0
Reduced v/c Ratio	0.16	0.51			0.81		0.20	0.49		0.15		0.83

Intersection Summary

Area Type: CBD  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 36 (28%), Referenced to phase 2:NBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.86  
 Intersection Signal Delay: 34.9  
 Intersection LOS: C  
 Intersection Capacity Utilization 56.0%  
 ICU Level of Service B  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Cameron Avenue & NC 86 (S. Columbia St)





Lane Group	ø9
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lanes, Volumes, Timings  
3: Cameron Avenue & Pittsboro Street

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↗		↖↗	↖							
Volume (vph)	0	130	177	665	131	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	12	12	12	12	12	12	12	12
Storage Length (ft)	0		0	0		90	0		0	0		0
Storage Lanes	0		0	2		1	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.91		0.86								
Fr t		0.922										
Flt Protected				0.950								
Satd. Flow (prot)	0	1371	0	2821	1583	0	0	0	0	0	0	0
Flt Permitted				0.950								
Satd. Flow (perm)	0	1371	0	2412	1583	0	0	0	0	0	0	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25				25
Link Distance (ft)		258			412			549				191
Travel Time (s)		30.0			10.7			15.0				5.2
Confl. Peds. (#/hr)	57		40	40		57	11					11
Peak Hour Factor	1.00	0.87	0.87	0.92	0.92	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	5%	5%	5%	8%	8%	8%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	0	149	203	723	142	0	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	352	0	723	142	0	0	0	0	0	0	0
Turn Type				Prot								
Protected Phases		2		1	6							
Permitted Phases												
Detector Phase		2		1	6							
Switch Phase												
Minimum Initial (s)		10.0		7.0	10.0							
Minimum Split (s)		20.2		20.0	20.0							
Total Split (s)	0.0	56.0	0.0	52.0	108.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Split (%)	0.0%	43.1%	0.0%	40.0%	83.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)		50.8		46.9	103.0							
Yellow Time (s)		3.1		3.0	3.3							
All-Red Time (s)		2.1		2.1	1.7							
Lost Time Adjust (s)	0.0	-0.2	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	3.9	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		1.0		4.0	1.0							
Recall Mode		None		C-Max	None							
Walk Time (s)		7.0										
Flash Dont Walk (s)		4.0										
Pedestrian Calls (#/hr)		0										
Act Effct Green (s)		38.1		61.9	105.0							
Actuated g/C Ratio		0.29		0.48	0.81							
v/c Ratio		0.88		0.54	0.11							

Lanes, Volumes, Timings  
 3: Cameron Avenue & Pittsboro Street

2/28/2014

Lane Group	ø4
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	4
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	17%
Maximum Green (s)	18.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	9.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	

Lanes, Volumes, Timings  
 3: Cameron Avenue & Pittsboro Street

2/28/2014

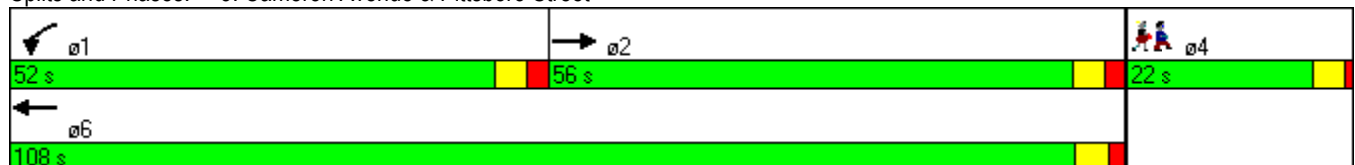


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		65.3		10.1	1.5							
Queue Delay		0.0		0.5	0.0							
Total Delay		65.3		10.6	1.5							
LOS		E		B	A							
Approach Delay		65.3			9.1							
Approach LOS		E			A							
Queue Length 50th (ft)		282		81	10							
Queue Length 95th (ft)		344		198	m27							
Internal Link Dist (ft)		178			332			469			111	
Turn Bay Length (ft)												
Base Capacity (vph)		538		1344	1279							
Starvation Cap Reductn		0		262	0							
Spillback Cap Reductn		0		0	0							
Storage Cap Reductn		0		0	0							
Reduced v/c Ratio		0.65		0.67	0.11							

Intersection Summary

Area Type:	CBD
Cycle Length:	130
Actuated Cycle Length:	130
Offset:	110 (85%), Referenced to phase 1:WBL, Start of Green
Natural Cycle:	80
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.88
Intersection Signal Delay:	25.4
Intersection LOS:	C
Intersection Capacity Utilization:	51.0%
ICU Level of Service:	A
Analysis Period (min):	15
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 3: Cameron Avenue & Pittsboro Street



Lane Group	ø4
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lanes, Volumes, Timings  
4: McCauley Street & Pittsboro Street

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↗		↖	↗						↖↗	
Volume (vph)	0	96	34	43	144	0	0	0	0	163	616	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	200		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor		0.97		0.91							0.99	
Frt		0.965									0.998	
Flt Protected				0.950							0.990	
Satd. Flow (prot)	0	1406	0	1504	1583	0	0	0	0	0	2970	0
Flt Permitted				0.503							0.990	
Satd. Flow (perm)	0	1406	0	726	1583	0	0	0	0	0	2936	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25		25				25			25	
Link Distance (ft)		493		508				1166			270	
Travel Time (s)		13.4		13.9				31.8			7.4	
Confl. Peds. (#/hr)	37		41	41		37	10		13	13		10
Peak Hour Factor	1.00	0.89	0.89	0.87	0.87	1.00	1.00	1.00	1.00	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	8%	8%	8%	2%	2%	2%	8%	8%	8%
Parking (#/hr)		0	0									
Adj. Flow (vph)	0	108	38	49	166	0	0	0	0	177	670	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	146	0	49	166	0	0	0	0	0	856	0
Turn Type				Perm							Perm	
Protected Phases		4			8							6
Permitted Phases				8							6	
Detector Phase		4		8	8						6	6
Switch Phase												
Minimum Initial (s)		7.0		7.0	7.0					10.0	10.0	
Minimum Split (s)		20.0		21.0	21.0					24.0	24.0	
Total Split (s)	0.0	44.0	0.0	44.0	44.0	0.0	0.0	0.0	0.0	86.0	86.0	0.0
Total Split (%)	0.0%	33.8%	0.0%	33.8%	33.8%	0.0%	0.0%	0.0%	0.0%	66.2%	66.2%	0.0%
Maximum Green (s)		39.2		38.4	38.4					80.7	80.7	
Yellow Time (s)		3.3		3.0	3.0					3.3	3.3	
All-Red Time (s)		1.5		2.6	2.6					2.0	2.0	
Lost Time Adjust (s)	0.0	0.2	-0.3	-0.6	-0.6	0.0	0.0	0.0	0.0	-1.1	-0.3	-0.1
Total Lost Time (s)	4.0	5.0	3.7	5.0	5.0	4.0	4.0	4.0	4.0	4.2	5.0	3.9
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0					3.0	3.0	
Recall Mode		None		None	None					C-Max	C-Max	
Walk Time (s)		7.0		7.0	7.0					7.0	7.0	
Flash Dont Walk (s)		6.0		7.0	7.0					8.0	8.0	
Pedestrian Calls (#/hr)		0		0	0					0	0	
Act Effct Green (s)		19.6		19.6	19.6						100.4	
Actuated g/C Ratio		0.15		0.15	0.15						0.77	
v/c Ratio		0.69		0.45	0.69						0.38	

Lanes, Volumes, Timings  
 4: McCauley Street & Pittsboro Street

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		68.0		29.1	34.4							1.7
Queue Delay		0.0		0.0	0.0							0.0
Total Delay		68.0		29.1	34.4							1.7
LOS		E		C	C							A
Approach Delay		68.0			33.2							1.7
Approach LOS		E			C							A
Queue Length 50th (ft)		118		13	68							0
Queue Length 95th (ft)		179		37	111							15
Internal Link Dist (ft)		413			428			1086				190
Turn Bay Length (ft)				200								
Base Capacity (vph)		422		218	475							2267
Starvation Cap Reductn		0		0	0							0
Spillback Cap Reductn		0		0	0							0
Storage Cap Reductn		0		0	0							0
Reduced v/c Ratio		0.35		0.22	0.35							0.38

Intersection Summary

Area Type:	CBD
Cycle Length:	130
Actuated Cycle Length:	130
Offset:	12 (9%), Referenced to phase 6:SBTL, Start of Green
Natural Cycle:	45
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.69
Intersection Signal Delay:	15.2
Intersection LOS:	B
Intersection Capacity Utilization	53.1%
ICU Level of Service	A
Analysis Period (min)	15

Splits and Phases: 4: McCauley Street & Pittsboro Street



Lanes, Volumes, Timings  
5: South Road & NC 86 (S. Columbia St)

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	184	0	0	163	109	58	441	185	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	12	12	13	13	12	11	11	11	11	11
Storage Length (ft)	150		0	0		300	0		0	0		0
Storage Lanes	1		0	0		1	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	0.91	0.91	1.00	1.00	1.00	1.00
Ped Bike Factor	0.97				1.00	0.95		0.99	0.95			
Fr <sub>t</sub>					0.991	0.850			0.850			
Fl <sub>t</sub> Protected	0.950							0.994				
Satd. Flow (prot)	1577	1771	0	0	1535	1321	0	4153	1301	0	0	0
Fl <sub>t</sub> Permitted	0.950							0.994				
Satd. Flow (perm)	1528	1771	0	0	1535	1252	0	4123	1235	0	0	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25				25
Link Distance (ft)		508			646			532				839
Travel Time (s)		13.9			17.6			14.5				22.9
Confl. Peds. (#/hr)	18		78	78		18	20		62	62		20
Peak Hour Factor	0.93	0.93	1.00	1.00	0.88	0.88	0.88	0.88	0.88	1.00	1.00	1.00
Heavy Vehicles (%)	3%	3%	3%	8%	8%	8%	8%	8%	8%	2%	2%	2%
Adj. Flow (vph)	27	198	0	0	185	124	66	501	210	0	0	0
Shared Lane Traffic (%)						10%						
Lane Group Flow (vph)	27	198	0	0	197	112	0	567	210	0	0	0
Turn Type	Split					Perm	Perm		Free			
Protected Phases	4	4			3			2				
Permitted Phases						3	2		Free			
Detector Phase	4	4			3	3	2	2				
Switch Phase												
Minimum Initial (s)	7.0	7.0			7.0	7.0	10.0	10.0				
Minimum Split (s)	24.0	24.0			24.0	24.0	27.0	27.0				
Total Split (s)	41.0	41.0	0.0	0.0	45.0	45.0	44.0	44.0	0.0	0.0	0.0	0.0
Total Split (%)	31.5%	31.5%	0.0%	0.0%	34.6%	34.6%	33.8%	33.8%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)	35.4	35.4			39.5	39.5	38.1	38.1				
Yellow Time (s)	3.5	3.5			3.1	3.1	3.4	3.4				
All-Red Time (s)	2.1	2.1			2.4	2.4	2.5	2.5				
Lost Time Adjust (s)	-0.6	-0.6	0.0	0.0	-0.5	-0.5	-1.5	-0.9	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	5.0	4.4	5.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag			Lead	Lead						
Lead-Lag Optimize?	Yes	Yes			Yes	Yes						
Vehicle Extension (s)	2.0	2.0			2.0	2.0	2.0	2.0				
Recall Mode	None	None			Min	Min	C-Max	C-Max				
Walk Time (s)					7.0	7.0	7.0	7.0				
Flash Dont Walk (s)					10.0	10.0	14.0	14.0				
Pedestrian Calls (#/hr)					0	0	0	0				
Act Effct Green (s)	19.6	19.6			21.8	21.8		73.6	130.0			
Actuated g/C Ratio	0.15	0.15			0.17	0.17		0.57	1.00			
v/c Ratio	0.11	0.74			0.77	0.53		0.24	0.17			



Lanes, Volumes, Timings  
 5: South Road & NC 86 (S. Columbia St)

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	46.0	69.8			70.1	57.6		9.0	0.3			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	46.0	69.8			70.1	57.6		9.0	0.3			
LOS	D	E			E	E		A	A			
Approach Delay		67.0			65.5			6.6				
Approach LOS		E			E			A				
Queue Length 50th (ft)	15	114			168	91		73	0			
Queue Length 95th (ft)	37	238			236	144		84	0			
Internal Link Dist (ft)		428			566			452			759	
Turn Bay Length (ft)	150					300						
Base Capacity (vph)	437	490			472	385		2335	1235			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.06	0.40			0.42	0.29		0.24	0.17			

Intersection Summary

Area Type:	CBD
Cycle Length:	130
Actuated Cycle Length:	130
Offset:	36 (28%), Referenced to phase 2:NBTL, Start of Green
Natural Cycle:	75
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.77
Intersection Signal Delay:	30.9
Intersection LOS:	C
Intersection Capacity Utilization	53.1%
ICU Level of Service	A
Analysis Period (min)	15

Splits and Phases: 5: South Road & NC 86 (S. Columbia St)



Lanes, Volumes, Timings  
6: Manning Drive & NC 86 NB (S. Columbia St)

2/28/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	66	505	0	52	0	214	0	416	352	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			2%			2%			0%	
Storage Length (ft)	125		0	0		75	0		150	0		0
Storage Lanes	1		0	1		1	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	0.88	1.00	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98			0.91					0.96			
Fr <sub>t</sub>						0.850			0.850			
Fl <sub>t</sub> Protected	0.950			0.950								
Satd. Flow (prot)	1512	3023	0	1489	0	2345	0	3093	1384	0	0	0
Fl <sub>t</sub> Permitted	0.950			0.950								
Satd. Flow (perm)	1476	3023	0	1350	0	2345	0	3093	1326	0	0	0
Right Turn on Red	No		No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			35				35
Link Distance (ft)		241			637			222				480
Travel Time (s)		6.6			17.4			4.3				9.4
Confl. Peds. (#/hr)	12		64	64		12	4		18	18		4
Peak Hour Factor	0.88	0.88	1.00	0.87	1.00	0.87	1.00	0.88	0.88	1.00	1.00	1.00
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%	4%	4%	4%	2%	2%	2%
Adj. Flow (vph)	75	574	0	60	0	246	0	473	400	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	75	574	0	60	0	246	0	473	400	0	0	0
Turn Type	Split			Prot		custom			pm+ov			
Protected Phases	4	4		3		3		2	3			
Permitted Phases									2			
Detector Phase	4	4		3		3		2	3			
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0		7.0		10.0	7.0			
Minimum Split (s)	36.0	36.0		22.0		22.0		30.0	22.0			
Total Split (s)	46.0	46.0	0.0	42.0	0.0	42.0	0.0	42.0	42.0	0.0	0.0	0.0
Total Split (%)	35.4%	35.4%	0.0%	32.3%	0.0%	32.3%	0.0%	32.3%	32.3%	0.0%	0.0%	0.0%
Maximum Green (s)	40.3	40.3		36.4		36.4		36.2	36.4			
Yellow Time (s)	3.2	3.2		3.0		3.0		3.4	3.0			
All-Red Time (s)	2.5	2.5		2.6		2.6		2.4	2.6			
Lost Time Adjust (s)	-0.5	-0.5	-0.5	-0.6	-1.0	-0.6	-0.5	-0.8	-0.6	0.0	0.0	0.0
Total Lost Time (s)	5.2	5.2	3.5	5.0	3.0	5.0	3.5	5.0	5.0	4.0	4.0	4.0
Lead/Lag	Lead	Lead		Lag		Lag			Lag			
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		2.0		2.0		3.0	2.0			
Recall Mode	Min	Min		None		None		C-Max	None			
Walk Time (s)	4.0	4.0						4.0				
Flash Dont Walk (s)	16.0	16.0						19.0				
Pedestrian Calls (#/hr)	0	0						0				
Act Effct Green (s)	31.2	31.2		23.4		23.4		60.2	83.6			
Actuated g/C Ratio	0.24	0.24		0.18		0.18		0.46	0.64			
v/c Ratio	0.21	0.79		0.22		0.58		0.33	0.46			

Lanes, Volumes, Timings  
 6: Manning Drive & NC 86 NB (S. Columbia St)

2/28/2014

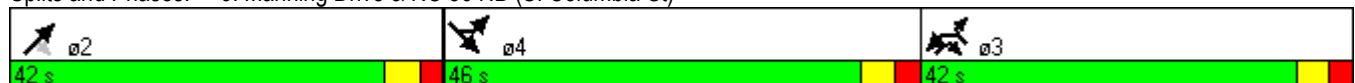
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Control Delay	24.9	38.3		44.1		53.0		18.1	7.3			
Queue Delay	0.0	0.0		0.0		0.0		0.0	0.0			
Total Delay	24.9	38.3		44.1		53.0		18.1	7.3			
LOS	C	D		D		D		B	A			
Approach Delay		36.7						13.1				
Approach LOS		D						B				
Queue Length 50th (ft)	39	210		44		110		87	23			
Queue Length 95th (ft)	47	201		72		132		200	54			
Internal Link Dist (ft)		161				557		142			400	
Turn Bay Length (ft)	125						75		150			
Base Capacity (vph)	475	949		424		667		1433	911			
Starvation Cap Reductn	0	0		0		0		0	0			
Spillback Cap Reductn	0	0		0		0		0	0			
Storage Cap Reductn	0	0		0		0		0	0			
Reduced v/c Ratio	0.16	0.60		0.14		0.37		0.33	0.44			

Intersection Summary

Area Type: CBD  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 122 (94%), Referenced to phase 2:NET, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.79  
 Intersection Signal Delay: 27.9  
 Intersection Capacity Utilization 54.2%  
 Analysis Period (min) 15

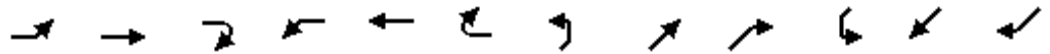
Intersection LOS: C  
 ICU Level of Service A

Splits and Phases: 6: Manning Drive & NC 86 NB (S. Columbia St)



Lanes, Volumes, Timings  
 7: Westwood Drive & NC 86 (S. Columbia St)

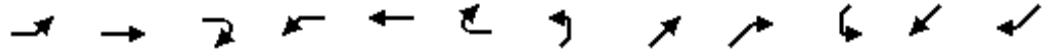
2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↔			↔	↔	↔	↔	↔	↔	↔	↔
Volume (vph)	9	4	6	179	0	83	7	659	337	116	181	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	11	12	12	14	11	11	11
Grade (%)		-3%			-5%			5%				-5%
Storage Length (ft)	0		0	0		150	250		250	0		0
Storage Lanes	0		0	0		1	1		1	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.97			0.97		0.98		0.97		1.00	
Frt		0.960				0.850			0.850		0.997	
Flt Protected		0.976			0.950		0.950			0.950		
Satd. Flow (prot)	0	1724	0	0	1656	1482	1692	1781	1615	1656	1737	0
Flt Permitted		0.976			0.950		0.630			0.191		
Satd. Flow (perm)	0	1724	0	0	1603	1482	1101	1781	1560	333	1737	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			35			25	
Link Distance (ft)		274			592			630			946	
Travel Time (s)		7.5			16.1			12.3			25.8	
Confl. Peds. (#/hr)			19	19			9		5	5		9
Peak Hour Factor	0.71	0.71	0.71	0.74	0.74	0.74	0.90	0.90	0.90	0.91	0.91	0.91
Heavy Vehicles (%)	2%	2%	2%	8%	8%	8%	4%	4%	4%	8%	8%	8%
Adj. Flow (vph)	13	6	8	242	0	112	8	732	374	127	199	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	27	0	0	242	112	8	732	374	127	203	0
Turn Type	Split			Split		pm+ov	Perm		pm+ov	pm+pt		
Protected Phases	4	4		3	3	1		2	3	1	6	
Permitted Phases						3	2		2	6		
Detector Phase	4	4		3	3	1	2	2	3	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	10.0	10.0	7.0	7.0	10.0	
Minimum Split (s)	26.0	26.0		13.0	13.0	13.0	29.0	29.0	13.0	13.0	22.0	
Total Split (s)	26.0	26.0	0.0	27.0	27.0	13.0	64.0	64.0	27.0	13.0	77.0	0.0
Total Split (%)	20.0%	20.0%	0.0%	20.8%	20.8%	10.0%	49.2%	49.2%	20.8%	10.0%	59.2%	0.0%
Maximum Green (s)	19.8	19.8		21.1	21.1	7.7	58.7	58.7	21.1	7.7	71.7	
Yellow Time (s)	3.3	3.3		3.5	3.5	3.6	3.6	3.6	3.5	3.6	3.6	
All-Red Time (s)	2.9	2.9		2.4	2.4	1.7	1.7	1.7	2.4	1.7	1.7	
Lost Time Adjust (s)	0.0	-1.2	-1.3	0.0	-0.9	-0.3	-0.3	-0.3	-0.9	-0.3	-0.3	-0.9
Total Lost Time (s)	6.2	5.0	2.7	5.9	5.0	5.0	5.0	5.0	5.0	5.0	5.0	3.1
Lead/Lag	Lag	Lag		Lead	Lead	Lead	Lag	Lag	Lead	Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	3.0	3.0	2.0	2.0	3.0	
Recall Mode	None	None		None	None	None	C-Min	C-Min	None	None	C-Min	
Walk Time (s)	4.0	4.0					4.0	4.0				
Flash Dont Walk (s)	13.0	13.0					19.0	19.0				
Pedestrian Calls (#/hr)	0	0					0	0				
Act Effct Green (s)		8.7			22.0	33.6	75.0	75.0	97.0	89.5	89.5	
Actuated g/C Ratio		0.07			0.17	0.26	0.58	0.58	0.75	0.69	0.69	

Lanes, Volumes, Timings  
 7: Westwood Drive & NC 86 (S. Columbia St)

2/28/2014

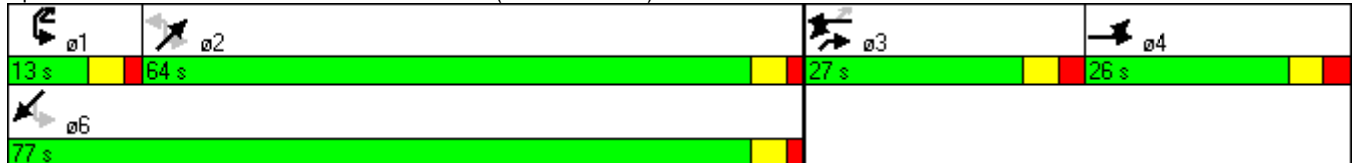


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
v/c Ratio		0.23			0.86	0.29	0.01	0.71	0.32	0.39	0.17	
Control Delay		62.2			80.5	31.0	16.0	27.2	6.0	11.8	7.6	
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		62.2			80.5	31.0	16.0	27.2	6.0	11.8	7.6	
LOS		E			F	C	B	C	A	B	A	
Approach Delay		62.2			64.8			20.0				9.2
Approach LOS		E			E			C				A
Queue Length 50th (ft)		22			194	60	3	492	89	33	55	
Queue Length 95th (ft)		42			238	80	12	705	158	65	88	
Internal Link Dist (ft)		194			512			550			866	
Turn Bay Length (ft)						150	250		250			
Base Capacity (vph)		278			291	385	635	1027	1184	329	1196	
Starvation Cap Reductn		0			0	0	0	0	0	0	0	
Spillback Cap Reductn		0			0	0	0	0	0	0	0	
Storage Cap Reductn		0			0	0	0	0	0	0	0	
Reduced v/c Ratio		0.10			0.83	0.29	0.01	0.71	0.32	0.39	0.17	

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 68 (52%), Referenced to phase 2:NETL and 6:SWTL, Start of Green  
 Natural Cycle: 105  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.86  
 Intersection Signal Delay: 27.4  
 Intersection Capacity Utilization 70.2%  
 Analysis Period (min) 15  
 Intersection LOS: C  
 ICU Level of Service C

Splits and Phases: 7: Westwood Drive & NC 86 (S. Columbia St)



Lanes, Volumes, Timings  
8: US 15-501 Bypass WB Off Ramp & US 15-501

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖	↖	↖	↖	↕	↕		↕	↖
Volume (vph)	0	0	0	536	0	61	326	1251	0	0	284	152
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	275		275	150		0	0		0
Storage Lanes	0		0	1		1	1		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	*0.66	1.00	1.00	0.95	1.00
Ped Bike Factor						0.98	1.00					0.98
Frt						0.850						0.850
Flt Protected				0.950	0.950		0.950					
Satd. Flow (prot)	0	0	0	1665	1665	1568	1752	2435	0	0	3343	1495
Flt Permitted				0.950	0.950		0.543					
Satd. Flow (perm)	0	0	0	1665	1665	1534	1001	2435	0	0	3343	1464
Right Turn on Red				No		No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			35			35				35
Link Distance (ft)		424			893			596				306
Travel Time (s)		9.6			17.4			11.6				6.0
Confl. Peds. (#/hr)	1						1	1		2	2	
Peak Hour Factor	1.00	1.00	1.00	0.92	0.92	0.92	0.87	0.87	1.00	1.00	0.91	0.91
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	8%	8%	8%
Adj. Flow (vph)	0	0	0	583	0	66	375	1438	0	0	312	167
Shared Lane Traffic (%)				50%								
Lane Group Flow (vph)	0	0	0	291	292	66	375	1438	0	0	312	167
Turn Type				Perm		Perm	pm+pt					Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				7.0	7.0	7.0	7.0	10.0			10.0	10.0
Minimum Split (s)				20.0	20.0	20.0	13.0	20.0			20.0	20.0
Total Split (s)	0.0	0.0	0.0	50.0	50.0	50.0	32.0	90.0	0.0	0.0	58.0	58.0
Total Split (%)	0.0%	0.0%	0.0%	35.7%	35.7%	35.7%	22.9%	64.3%	0.0%	0.0%	41.4%	41.4%
Maximum Green (s)				44.2	44.2	44.2	26.2	84.2			52.0	52.0
Yellow Time (s)				3.7	3.7	3.7	3.0	3.7			4.0	4.0
All-Red Time (s)				2.1	2.1	2.1	2.8	2.1			2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	-0.8	-0.8	-0.8	-0.8	-0.8	0.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0	3.0	5.0	5.0
Lead/Lag							Lag				Lead	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Recall Mode				None	None	None	None	C-Max			C-Max	C-Max
Act Effct Green (s)				31.9	31.9	31.9	98.1	98.1			66.1	66.1
Actuated g/C Ratio				0.23	0.23	0.23	0.70	0.70			0.47	0.47
v/c Ratio				0.77	0.77	0.19	0.44	0.84			0.20	0.24
Control Delay				63.4	63.6	42.4	7.5	15.3			23.2	25.0
Queue Delay				0.0	0.0	0.0	0.5	0.9			0.0	0.0
Total Delay				63.4	63.6	42.4	8.0	16.1			23.2	25.0
LOS				E	E	D	A	B			C	C

Lanes, Volumes, Timings  
 8: US 15-501 Bypass WB Off Ramp & US 15-501

2/28/2014

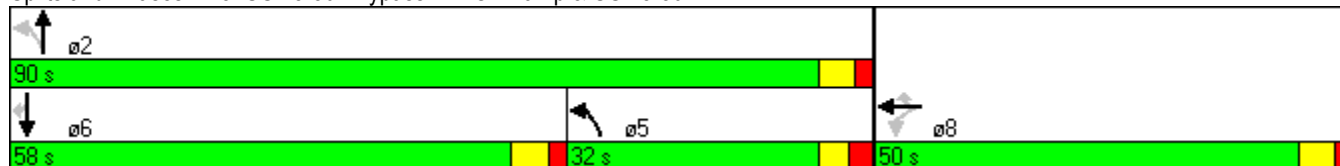


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay					61.4			14.5			23.9	
Approach LOS					E			B			C	
Queue Length 50th (ft)				264	265	49	35	531			85	89
Queue Length 95th (ft)				342	345	84	134	848			134	162
Internal Link Dist (ft)		344			813			516			226	
Turn Bay Length (ft)				275		275	150					
Base Capacity (vph)				535	535	493	847	1707			1579	691
Starvation Cap Reductn				0	0	0	177	87			0	0
Spillback Cap Reductn				0	0	0	0	0			0	0
Storage Cap Reductn				0	0	0	0	0			0	0
Reduced v/c Ratio				0.54	0.55	0.13	0.56	0.89			0.20	0.24

Intersection Summary

Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	140
Offset:	34 (24%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle:	70
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.84
Intersection Signal Delay:	26.3
Intersection LOS:	C
Intersection Capacity Utilization:	62.4%
ICU Level of Service:	B
Analysis Period (min):	15
* User Entered Value	

Splits and Phases: 8: US 15-501 Bypass WB Off Ramp & US 15-501



Lanes, Volumes, Timings

9: NC 54 Bypass (Fordham Blvd) EB Off Ramp & US 15-501

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↙	↗					↑↑		↘	↑↑	
Volume (vph)	482	0	310	0	0	0	0	1110	0	55	786	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		250	0		0	0		0	150		0
Storage Lanes	1		1	0		0	0		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor										1.00		
Frt			0.850									
Flt Protected	0.950	0.950								0.950		
Satd. Flow (prot)	1603	1603	1509	0	0	0	0	3505	0	1687	3374	0
Flt Permitted	0.950	0.950								0.136		
Satd. Flow (perm)	1603	1603	1509	0	0	0	0	3505	0	241	3374	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		847			142			156			596	
Travel Time (s)		19.3			3.2			3.0			11.6	
Confl. Peds. (#/hr)							2		1	1		2
Peak Hour Factor	0.85	0.85	0.85	1.00	1.00	1.00	1.00	0.92	1.00	0.90	0.90	1.00
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	3%	3%	3%	7%	7%	7%
Adj. Flow (vph)	567	0	365	0	0	0	0	1207	0	61	873	0
Shared Lane Traffic (%)	50%											
Lane Group Flow (vph)	283	284	365	0	0	0	0	1207	0	61	873	0
Turn Type	Perm		Perm							pm+pt		
Protected Phases		4						2		1	6	
Permitted Phases	4		4							6		
Detector Phase	4	4	4					2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0					10.0		7.0	10.0	
Minimum Split (s)	14.0	14.0	14.0					15.0		13.0	16.0	
Total Split (s)	52.0	52.0	52.0	0.0	0.0	0.0	0.0	75.0	0.0	13.0	88.0	0.0
Total Split (%)	37.1%	37.1%	37.1%	0.0%	0.0%	0.0%	0.0%	53.6%	0.0%	9.3%	62.9%	0.0%
Maximum Green (s)	45.8	45.8	45.8					70.3		7.5	82.1	
Yellow Time (s)	3.1	3.1	3.1					3.7		3.1	4.3	
All-Red Time (s)	3.1	3.1	3.1					1.0		2.4	1.6	
Lost Time Adjust (s)	-1.2	-1.2	-1.2	0.0	0.0	0.0	0.0	0.3	0.0	-0.5	-0.9	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.0	4.0	4.0	4.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0					3.0		3.0	3.0	
Recall Mode	None	None	None					C-Max		None	C-Max	
Act Effct Green (s)	41.1	41.1	41.1					78.6		88.9	88.9	
Actuated g/C Ratio	0.29	0.29	0.29					0.56		0.64	0.64	
v/c Ratio	0.60	0.60	0.82					0.61		0.26	0.41	
Control Delay	47.3	47.4	61.4					12.7		6.1	3.4	
Queue Delay	0.0	0.0	0.0					0.2		0.0	0.3	
Total Delay	47.3	47.4	61.4					12.9		6.1	3.7	
LOS	D	D	E					B		A	A	



Lanes, Volumes, Timings

9: NC 54 Bypass (Fordham Blvd) EB Off Ramp & US 15-501

2/28/2014

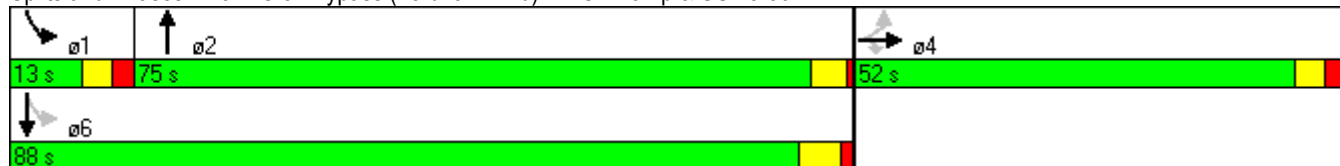


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		52.8						12.9				3.9
Approach LOS		D						B				A
Queue Length 50th (ft)	227	228	303					231		4		30
Queue Length 95th (ft)	295	296	381					m252		m8		35
Internal Link Dist (ft)		767			62			76				516
Turn Bay Length (ft)	250		250							150		
Base Capacity (vph)	538	538	507					1969		236		2142
Starvation Cap Reductn	0	0	0					0		0		646
Spillback Cap Reductn	0	0	0					174		0		0
Storage Cap Reductn	0	0	0					0		0		0
Reduced v/c Ratio	0.53	0.53	0.72					0.67		0.26		0.58

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 6 (4%), Referenced to phase 2:NBT and 6:SBTL, Start of Green  
 Natural Cycle: 70  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.82  
 Intersection Signal Delay: 22.3  
 Intersection LOS: C  
 Intersection Capacity Utilization 62.4%  
 ICU Level of Service B  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: NC 54 Bypass (Fordham Blvd) EB Off Ramp & US 15-501



Lanes, Volumes, Timings  
 10: SR 1994 (Culbreth Road) & US 15-501

2/28/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	229	64	62	15	129	595	61	1485	11	260	814	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			-8%			-2%			2%	
Storage Length (ft)	0		75	425		350	125		75	550		250
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor							1.00					
Fr <sub>t</sub>			0.850			0.850			0.850			0.850
Fl <sub>t</sub> Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1743	1835	1560	1823	1918	1631	1770	3540	1584	1702	3404	1523
Fl <sub>t</sub> Permitted	0.522			0.710			0.258			0.062		
Satd. Flow (perm)	958	1835	1560	1362	1918	1631	480	3540	1584	111	3404	1523
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		526			543			533			635	
Travel Time (s)		10.2			10.6			8.1			9.6	
Confl. Peds. (#/hr)							2					2
Peak Hour Factor	0.89	0.89	0.89	0.91	0.91	0.91	0.94	0.94	0.94	0.98	0.98	0.98
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	5%	5%	5%
Adj. Flow (vph)	257	72	70	16	142	654	65	1580	12	265	831	126
Shared Lane Traffic (%)												
Lane Group Flow (vph)	257	72	70	16	142	654	65	1580	12	265	831	126
Turn Type	pm+pt		Perm	Perm		pt+ov	Perm		Perm	pm+pt		pt+ov
Protected Phases	7	4			8	8 1		2		1	6	6 7
Permitted Phases	4		4	8			2		2	6		
Detector Phase	7	4	4	8	8	8 1	2	2	2	1	6	6 7
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		12.0	12.0	12.0	7.0	12.0	
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0		19.0	19.0	19.0	13.0	26.0	
Total Split (s)	14.0	55.0	55.0	41.0	41.0	61.0	65.0	65.0	65.0	20.0	85.0	99.0
Total Split (%)	10.0%	39.3%	39.3%	29.3%	29.3%	43.6%	46.4%	46.4%	46.4%	14.3%	60.7%	70.7%
Maximum Green (s)	7.6	48.6	48.6	34.1	34.1		58.8	58.8	58.8	14.9	78.8	
Yellow Time (s)	3.0	4.2	4.2	4.5	4.5		4.7	4.7	4.7	3.0	4.7	
All-Red Time (s)	3.4	2.2	2.2	2.4	2.4		1.5	1.5	1.5	2.1	1.5	
Lost Time Adjust (s)	-1.4	-1.4	-1.4	-1.9	-1.9	-1.9	-1.2	-1.2	-1.2	-0.1	-1.2	-1.4
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.8
Lead/Lag	Lead			Lag	Lag		Lead	Lead	Lead	Lag		
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None		C-Max	C-Max	C-Max	None	C-Max	
Walk Time (s)												7.0
Flash Dont Walk (s)												12.0
Pedestrian Calls (#/hr)												0
Act Effct Green (s)	50.0	50.0	50.0	36.0	36.0	51.0	60.0	60.0	60.0	80.0	80.0	94.2
Actuated g/C Ratio	0.36	0.36	0.36	0.26	0.26	0.36	0.43	0.43	0.43	0.57	0.57	0.67
v/c Ratio	0.65	0.11	0.13	0.05	0.29	1.10	0.32	1.04	0.02	1.13	0.43	0.12

Lanes, Volumes, Timings  
 10: SR 1994 (Culbreth Road) & US 15-501

2/28/2014

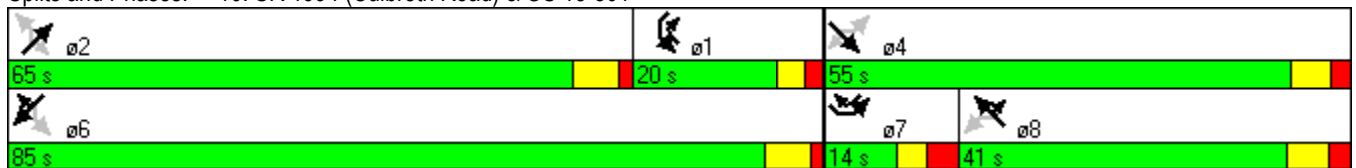


Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Control Delay	44.4	30.8	31.1	39.8	43.7	104.6	26.1	62.8	21.8	143.1	12.7	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.4	30.8	31.1	39.8	43.7	104.6	26.1	62.8	21.8	143.1	12.7	8.8
LOS	D	C	C	D	D	F	C	E	C	F	B	A
Approach Delay	39.6			92.7			61.1			40.6		
Approach LOS	D			F			E			D		
Queue Length 50th (ft)	176	44	43	11	104	~574	23	~796	4	~244	154	35
Queue Length 95th (ft)	254	80	79	31	166	#913	m47	#944	m9	#433	174	m54
Internal Link Dist (ft)	446			463			453			555		
Turn Bay Length (ft)	75			425			350			250		
Base Capacity (vph)	393	655	557	350	493	594	206	1517	679	234	1945	1025
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.11	0.13	0.05	0.29	1.10	0.32	1.04	0.02	1.13	0.43	0.12

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 0 (0%), Referenced to phase 2:NETL and 6:SWTL, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.13  
 Intersection Signal Delay: 59.1      Intersection LOS: E  
 Intersection Capacity Utilization 103.1%      ICU Level of Service G  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: SR 1994 (Culbreth Road) & US 15-501



Lanes, Volumes, Timings  
11: Arlen Park Drive & US 15-501

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	145	23	12	98	18	9	7	6	1399	68	1	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			-7%				-1%			
Storage Length (ft)	75		0	200		0		275		300		275
Storage Lanes	1		0	1		0		1		1		1
Taper Length (ft)	25		25	25		25		25		25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00							
Frt		0.949			0.950					0.850		
Flt Protected	0.950			0.950				0.950				0.950
Satd. Flow (prot)	1761	1751	0	1832	1823	0	0	1761	3522	1576	0	1719
Flt Permitted	0.732			0.734				0.950				0.950
Satd. Flow (perm)	1351	1751	0	1413	1823	0	0	1761	3522	1576	0	1719
Right Turn on Red			No			No				No		
Satd. Flow (RTOR)												
Link Speed (mph)		25			25				45			
Link Distance (ft)		387			478				2738			
Travel Time (s)		10.6			13.0				41.5			
Confl. Peds. (#/hr)	3		1	1		3						
Peak Hour Factor	0.98	0.98	0.98	0.70	0.70	0.70	0.85	0.85	0.85	0.85	0.97	0.97
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	3%	5%	5%
Adj. Flow (vph)	148	23	12	140	26	13	8	7	1646	80	1	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	148	35	0	140	39	0	0	15	1646	80	0	10
Turn Type	Perm			Perm			Prot	Prot		Perm	Prot	Prot
Protected Phases		4			8		5	5	2		1	1
Permitted Phases	4			8						2		
Detector Phase	4	4		8	8		5	5	2	2	1	1
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0	14.0	14.0	7.0	7.0
Minimum Split (s)	60.0	60.0		15.0	15.0		14.0	14.0	21.0	21.0	13.0	13.0
Total Split (s)	60.0	60.0	0.0	60.0	60.0	0.0	14.0	14.0	67.0	67.0	13.0	13.0
Total Split (%)	42.9%	42.9%	0.0%	42.9%	42.9%	0.0%	10.0%	10.0%	47.9%	47.9%	9.3%	9.3%
Maximum Green (s)	53.4	53.4		52.9	52.9		7.4	7.4	60.4	60.4	7.1	7.1
Yellow Time (s)	3.2	3.2		3.8	3.8		3.0	3.0	4.6	4.6	3.0	3.0
All-Red Time (s)	3.4	3.4		3.3	3.3		3.6	3.6	2.0	2.0	2.9	2.9
Lost Time Adjust (s)	-1.6	-1.6	0.0	-2.1	-2.1	-1.2	0.0	-1.6	-1.6	-1.6	0.0	-0.9
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	2.8	6.6	5.0	5.0	5.0	5.9	5.0
Lead/Lag							Lead	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	None	C-Max	C-Max	None	None
Walk Time (s)	4.0	4.0										
Flash Dont Walk (s)	26.0	26.0										
Pedestrian Calls (#/hr)	0	0										
Act Effct Green (s)	22.6	22.6		22.6	22.6			9.0	104.8	104.8		7.9
Actuated g/C Ratio	0.16	0.16		0.16	0.16			0.06	0.75	0.75		0.06
v/c Ratio	0.68	0.12		0.61	0.13			0.13	0.62	0.07		0.10

Lanes, Volumes, Timings  
 11: Arlen Park Drive & US 15-501

2/28/2014



Lane Group	SBT	SBR
Lane Configurations	↑↑	↑
Volume (vph)	814	98
Ideal Flow (vphpl)	1900	1900
Grade (%)	0%	
Storage Length (ft)		325
Storage Lanes		1
Taper Length (ft)		25
Lane Util. Factor	0.95	1.00
Ped Bike Factor		
Flt		0.850
Flt Protected		
Satd. Flow (prot)	3438	1538
Flt Permitted		
Satd. Flow (perm)	3438	1538
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	45	
Link Distance (ft)	1792	
Travel Time (s)	27.2	
Confl. Peds. (#/hr)		
Peak Hour Factor	0.97	0.97
Heavy Vehicles (%)	5%	5%
Adj. Flow (vph)	839	101
Shared Lane Traffic (%)		
Lane Group Flow (vph)	839	101
Turn Type		Perm
Protected Phases	6	
Permitted Phases		6
Detector Phase	6	6
Switch Phase		
Minimum Initial (s)	14.0	14.0
Minimum Split (s)	25.0	25.0
Total Split (s)	66.0	66.0
Total Split (%)	47.1%	47.1%
Maximum Green (s)	59.4	59.4
Yellow Time (s)	4.6	4.6
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)	-1.6	-1.6
Total Lost Time (s)	5.0	5.0
Lead/Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes
Vehicle Extension (s)	3.0	3.0
Recall Mode	C-Max	C-Max
Walk Time (s)	7.0	7.0
Flash Dont Walk (s)	10.0	10.0
Pedestrian Calls (#/hr)	0	0
Act Effct Green (s)	101.6	101.6
Actuated g/C Ratio	0.73	0.73
v/c Ratio	0.34	0.09

Lanes, Volumes, Timings  
 11: Arlen Park Drive & US 15-501

2/28/2014

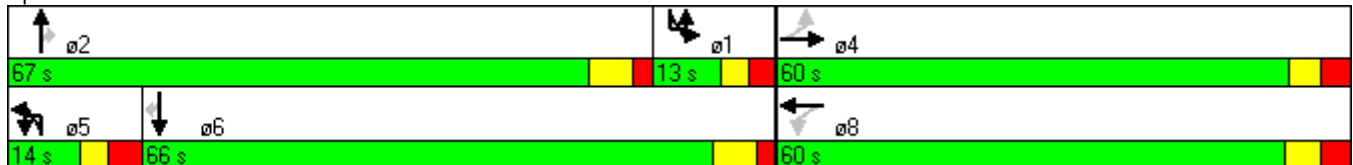


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Control Delay	69.9	48.2		65.2	48.4			68.6	7.1	4.6		43.7
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0		0.0
Total Delay	69.9	48.2		65.2	48.4			68.6	7.1	4.6		43.7
LOS	E	D		E	D			E	A	A		D
Approach Delay		65.8			61.5				7.5			
Approach LOS		E			E				A			
Queue Length 50th (ft)	129	28		120	31			14	227	11		9
Queue Length 95th (ft)	192	57		135	47			m25	318	33		m20
Internal Link Dist (ft)		307			398				2658			
Turn Bay Length (ft)	75			200				275		300		275
Base Capacity (vph)	531	688		555	716			116	2636	1180		98
Starvation Cap Reductn	0	0		0	0			0	0	0		0
Spillback Cap Reductn	0	0		0	0			0	0	0		0
Storage Cap Reductn	0	0		0	0			0	0	0		0
Reduced v/c Ratio	0.28	0.05		0.25	0.05			0.13	0.62	0.07		0.10

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 15 (11%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 140  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.68  
 Intersection Signal Delay: 13.8  
 Intersection LOS: B  
 Intersection Capacity Utilization 62.0%  
 ICU Level of Service B  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 11: Arlen Park Drive & US 15-501



Lanes, Volumes, Timings  
 11: Arlen Park Drive & US 15-501

















2/28/2014



Lane Group	SBT	SBR
Control Delay	6.0	6.0
Queue Delay	0.0	0.0
Total Delay	6.0	6.0
LOS	A	A
Approach Delay	6.4	
Approach LOS	A	
Queue Length 50th (ft)	71	15
Queue Length 95th (ft)	138	42
Internal Link Dist (ft)	1712	
Turn Bay Length (ft)		325
Base Capacity (vph)	2494	1116
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.34	0.09
<b>Intersection Summary</b>		

Lanes, Volumes, Timings  
12: US 15-501 & Market St

2/28/2014

									
Lane Group	NBU	NBL	NBT	SBU	SBT	SBR	SEL	SER	
Lane Configurations									
Volume (vph)	24	150	1133	37	508	347	336	35	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	
Grade (%)			-3%		4%		-3%		
Storage Length (ft)		275		250		300	0	150	
Storage Lanes		1		1		1	1	1	
Taper Length (ft)		25		25		25	25	25	
Lane Util. Factor	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00	
Frt						0.850		0.850	
Flt Protected		0.950		0.950			0.950		
Satd. Flow (prot)	0	1796	3592	1701	3402	1522	1762	1576	
Flt Permitted		0.950		0.227			0.950		
Satd. Flow (perm)	0	1796	3592	406	3402	1522	1762	1576	
Right Turn on Red						No		No	
Satd. Flow (RTOR)									
Link Speed (mph)			45		45		25		
Link Distance (ft)			949		2738		456		
Travel Time (s)			14.4		41.5		12.4		
Peak Hour Factor	0.92	0.92	0.92	0.96	0.96	0.96	0.82	0.82	
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	4%	4%	
Adj. Flow (vph)	26	163	1232	39	529	361	410	43	
Shared Lane Traffic (%)									
Lane Group Flow (vph)	0	189	1232	39	529	361	410	43	
Turn Type	Prot	Prot		Perm		pm+ov		pm+ov	
Protected Phases	5!	5	2		6	4	4	5!	
Permitted Phases				6		6		4	
Detector Phase	5	5	2	6	6	4	4	5	
Switch Phase									
Minimum Initial (s)	7.0	7.0	14.0	14.0	14.0	7.0	7.0	7.0	
Minimum Split (s)	13.0	13.0	21.0	20.0	20.0	14.0	14.0	13.0	
Total Split (s)	32.0	32.0	81.0	49.0	49.0	59.0	59.0	32.0	
Total Split (%)	22.9%	22.9%	57.9%	35.0%	35.0%	42.1%	42.1%	22.9%	
Maximum Green (s)	26.2	26.2	74.6	43.0	43.0	52.9	52.9	26.2	
Yellow Time (s)	3.0	3.0	5.0	4.6	4.6	3.0	3.0	3.0	
All-Red Time (s)	2.8	2.8	1.4	1.4	1.4	3.1	3.1	2.8	
Lost Time Adjust (s)	0.0	-0.8	-1.4	-1.0	-1.0	-1.1	-1.1	-0.8	
Total Lost Time (s)	5.8	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag	Lead	Lead		Lag	Lag			Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes			Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	C-Max	C-Max	C-Max	None	None	None	
Act Effct Green (s)		20.7	89.9	64.1	64.1	109.3	40.1	65.9	
Actuated g/C Ratio		0.15	0.64	0.46	0.46	0.78	0.29	0.47	
v/c Ratio		0.71	0.53	0.21	0.34	0.30	0.81	0.06	
Control Delay		70.9	15.8	32.3	27.5	9.0	58.8	16.5	
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		70.9	15.8	32.3	27.5	9.0	58.8	16.5	
LOS		E	B	C	C	A	E	B	
Approach Delay			23.1		20.5		54.8		



Lanes, Volumes, Timings  
12: US 15-501 & Market St

2/28/2014



Lane Group	NBU	NBL	NBT	SBU	SBT	SBR	SEL	SER
Approach LOS			C		C		D	
Queue Length 50th (ft)		166	305	25	200	122	347	21
Queue Length 95th (ft)		239	445	61	252	132	376	30
Internal Link Dist (ft)			869		2658		376	
Turn Bay Length (ft)		275		250		300		150
Base Capacity (vph)		347	2306	186	1558	1336	680	813
Starvation Cap Reductn		0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0	0	0
Reduced v/c Ratio		0.54	0.53	0.21	0.34	0.27	0.60	0.05

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 2 (1%), Referenced to phase 2:NBT and 6:SBTU, Start of Green  
 Natural Cycle: 55  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.81  
 Intersection Signal Delay: 27.4  
 Intersection LOS: C  
 Intersection Capacity Utilization 74.1%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 ! Phase conflict between lane groups.

Splits and Phases: 12: US 15-501 & Market St



Lanes, Volumes, Timings  
14: Dogwood Acres Dr & US 15-501

2/28/2014



Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Volume (vph)	69	1	7	1352	0	486	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Grade (%)	-1%			-4%		4%	
Storage Length (ft)	0	0	300		275		0
Storage Lanes	1	0	1		1		0
Taper Length (ft)	25	25	25		25		25
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.95	0.95
Frt	0.998					0.994	
Flt Protected	0.953		0.950				
Satd. Flow (prot)	1781	0	1787	3575	1740	3287	0
Flt Permitted	0.953		0.443				
Satd. Flow (perm)	1781	0	834	3575	1740	3287	0
Right Turn on Red		No					No
Satd. Flow (RTOR)							
Link Speed (mph)	25			45		45	
Link Distance (ft)	1150			899		1381	
Travel Time (s)	31.4			13.6		20.9	
Peak Hour Factor	0.88	0.88	0.93	0.93	0.91	0.91	0.91
Heavy Vehicles (%)	2%	2%	3%	3%	7%	7%	7%
Adj. Flow (vph)	78	1	8	1454	0	534	23
Shared Lane Traffic (%)							
Lane Group Flow (vph)	79	0	8	1454	0	557	0
Turn Type			Perm		Perm		
Protected Phases	4			2		6	
Permitted Phases			2		6		
Detector Phase	4		2	2	6	6	
Switch Phase							
Minimum Initial (s)	7.0		12.0	12.0	12.0	12.0	
Minimum Split (s)	13.0		19.0	19.0	19.0	19.0	
Total Split (s)	25.0	0.0	90.0	90.0	90.0	90.0	0.0
Total Split (%)	21.7%	0.0%	78.3%	78.3%	78.3%	78.3%	0.0%
Maximum Green (s)	19.2		83.8	83.8	83.9	83.9	
Yellow Time (s)	3.0		4.9	4.9	4.3	4.3	
All-Red Time (s)	2.8		1.3	1.3	1.8	1.8	
Lost Time Adjust (s)	-0.8	0.0	-1.2	-1.2	-1.1	-1.1	0.0
Total Lost Time (s)	5.0	4.0	5.0	5.0	5.0	5.0	4.0
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	2.0		6.0	6.0	6.0	6.0	
Recall Mode	None		Min	Min	Min	Min	
Act Effct Green (s)	10.2		70.8	70.8		70.8	
Actuated g/C Ratio	0.12		0.83	0.83		0.83	
v/c Ratio	0.37		0.01	0.49		0.21	
Control Delay	45.9		2.6	4.0		2.7	
Queue Delay	0.0		0.0	0.0		0.0	
Total Delay	45.9		2.6	4.0		2.7	
LOS	D		A	A		A	
Approach Delay	45.9			4.0		2.7	

Lanes, Volumes, Timings  
 14: Dogwood Acres Dr & US 15-501

2/28/2014

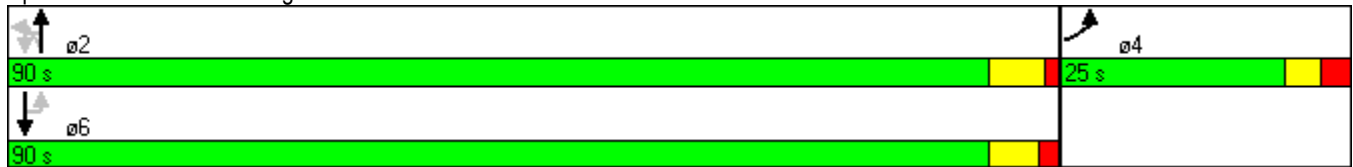


Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Approach LOS	D			A		A	
Queue Length 50th (ft)	43		1	121		33	
Queue Length 95th (ft)	96		4	196		57	
Internal Link Dist (ft)	1070			819		1301	
Turn Bay Length (ft)			300				
Base Capacity (vph)	444		766	3282		3018	
Starvation Cap Reductn	0		0	0		0	
Spillback Cap Reductn	0		0	0		0	
Storage Cap Reductn	0		0	0		0	
Reduced v/c Ratio	0.18		0.01	0.44		0.18	

Intersection Summary

Area Type:	Other
Cycle Length:	115
Actuated Cycle Length:	85.8
Natural Cycle:	40
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.49
Intersection Signal Delay:	5.2
Intersection LOS:	A
Intersection Capacity Utilization	51.5%
ICU Level of Service	A
Analysis Period (min)	15

Splits and Phases: 14: Dogwood Acres Dr & US 15-501



Lanes, Volumes, Timings  
15: Smith Level Road & US 15-501

2/28/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	73	17	232	18	17	19	379	1120	7	47	388	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			1%			-1%				1%
Storage Length (ft)	125		175	150		150	500		250	275		100
Storage Lanes	1		2	2		1	2		1	2		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	0.88	0.97	1.00	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1844	2759	3416	1853	1575	3417	3522	1576	3318	3421	1530
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1752	1844	2759	3416	1853	1575	3417	3522	1576	3318	3421	1530
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			25			45			45	
Link Distance (ft)		800			667			1107			1252	
Travel Time (s)		12.1			18.2			16.8			19.0	
Peak Hour Factor	0.96	0.96	0.96	0.68	0.68	0.68	0.94	0.94	0.94	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	5%	5%	5%
Adj. Flow (vph)	76	18	242	26	25	28	403	1191	7	51	417	35
Shared Lane Traffic (%)												
Lane Group Flow (vph)	76	18	242	26	25	28	403	1191	7	51	417	35
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0	7.0	7.0	12.0	7.0
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0	14.0	14.0	19.0	14.0	14.0	19.0	14.0
Total Split (s)	20.0	25.0	15.0	20.0	25.0	15.0	15.0	90.0	20.0	15.0	90.0	20.0
Total Split (%)	13.3%	16.7%	10.0%	13.3%	16.7%	10.0%	10.0%	60.0%	13.3%	10.0%	60.0%	13.3%
Maximum Green (s)	13.9	18.8	8.3	13.6	18.4	8.7	8.3	83.2	13.6	8.7	83.3	13.9
Yellow Time (s)	3.0	4.0	3.3	3.1	3.8	3.2	3.3	4.7	3.1	3.2	4.5	3.0
All-Red Time (s)	3.1	2.2	3.4	3.3	2.8	3.1	3.4	2.1	3.3	3.1	2.2	3.1
Lost Time Adjust (s)	-1.1	-1.2	-1.7	-1.4	-1.6	-1.3	-1.7	-1.8	-1.4	-1.3	-1.7	-1.1
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	6.0	2.0	2.0	6.0	2.0
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	None
Act Effct Green (s)	12.2	12.2	21.7	13.4	11.1	17.4	12.6	59.1	71.6	10.7	47.4	65.9
Actuated g/C Ratio	0.13	0.13	0.24	0.15	0.12	0.19	0.14	0.65	0.79	0.12	0.52	0.73
v/c Ratio	0.32	0.07	0.37	0.05	0.11	0.09	0.85	0.52	0.01	0.13	0.23	0.03
Control Delay	51.4	48.5	37.8	49.1	52.1	40.3	63.8	14.6	5.6	50.6	12.2	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.4	48.5	37.8	49.1	52.1	40.3	63.8	14.6	5.6	50.6	12.2	5.0
LOS	D	D	D	D	D	D	E	B	A	D	B	A
Approach Delay		41.5			46.9			26.9				15.6

Lanes, Volumes, Timings  
 15: Smith Level Road & US 15-501

2/28/2014



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Approach LOS		D				D			C			B
Queue Length 50th (ft)	47	11	89	6	15	15	~163	270	1	15	74	7
Queue Length 95th (ft)	115	39	146	20	39	37	#361	385	7	43	113	16
Internal Link Dist (ft)		720				587			1027			1172
Turn Bay Length (ft)	125		175	150		150	500		250	275		100
Base Capacity (vph)	365	513	659	771	515	335	475	2980	1305	461	2895	1223
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.04	0.37	0.03	0.05	0.08	0.85	0.40	0.01	0.11	0.14	0.03

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 90.8  
 Natural Cycle: 70  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.85  
 Intersection Signal Delay: 27.2  
 Intersection LOS: C  
 Intersection Capacity Utilization 60.0%  
 ICU Level of Service B  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 15: Smith Level Road & US 15-501

ø1	ø2	ø3	ø4
15 s	90 s	20 s	25 s
ø5	ø6	ø7	ø8
15 s	90 s	20 s	25 s

Lanes, Volumes, Timings

17: Merritt Mill Road / NC 54 WB Off Ramp & Greensboro Street

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖↗	↖		↖	↕↕	↖	↖	↕↕	↖
Volume (vph)	0	0	0	251	37	169	249	415	513	20	376	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			-3%			2%				-3%
Storage Length (ft)	0		0	475		0	225		250	250		0
Storage Lanes	0		0	1		0	1		1	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor					0.99				0.97	1.00		
Fr <sub>t</sub>					0.877				0.850			0.850
Fl <sub>t</sub> Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	0	0	3385	1592	0	1702	3404	1523	1712	3424	1532
Fl <sub>t</sub> Permitted				0.950			0.489			0.472		
Satd. Flow (perm)	0	0	0	3385	1592	0	876	3404	1484	848	3424	1532
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			35			35			35	
Link Distance (ft)		467			767			384			607	
Travel Time (s)		10.6			14.9			7.5			11.8	
Confl. Peds. (#/hr)	2						2		7	7		
Peak Hour Factor	1.00	1.00	1.00	0.92	0.92	0.92	0.86	0.86	0.86	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	5%	5%	5%	5%	5%	5%	7%	7%	7%
Adj. Flow (vph)	0	0	0	273	40	184	290	483	597	22	418	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	273	224	0	290	483	597	22	418	33
Turn Type				Perm			pm+pt		Perm	Perm		Perm
Protected Phases					8		5	2			6	
Permitted Phases				8			2		2	6		6
Detector Phase				8	8		5	2	2	6	6	6
Switch Phase												
Minimum Initial (s)				7.0	7.0		7.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)				14.0	14.0		13.0	16.0	16.0	16.0	16.0	16.0
Total Split (s)	0.0	0.0	0.0	36.0	36.0	0.0	21.0	84.0	84.0	63.0	63.0	63.0
Total Split (%)	0.0%	0.0%	0.0%	30.0%	30.0%	0.0%	17.5%	70.0%	70.0%	52.5%	52.5%	52.5%
Maximum Green (s)				29.5	29.5		15.4	78.0	78.0	57.0	57.0	57.0
Yellow Time (s)				4.2	4.2		3.0	3.9	3.9	3.9	3.9	3.9
All-Red Time (s)				2.3	2.3		2.6	2.1	2.1	2.1	2.1	2.1
Lost Time Adjust (s)	0.0	0.0	0.0	-1.5	-1.5	0.0	-0.6	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.0	4.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag							Lag			Lead	Lead	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode				None	None		None	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)				23.7	23.7		86.3	86.3	86.3	65.3	65.3	65.3
Actuated g/C Ratio				0.20	0.20		0.72	0.72	0.72	0.54	0.54	0.54
v/c Ratio				0.41	0.71		0.39	0.20	0.56	0.05	0.22	0.04
Control Delay				42.9	57.1		2.3	1.1	3.4	15.4	15.5	15.0
Queue Delay				0.0	0.0		1.0	0.0	0.6	0.0	0.0	0.0
Total Delay				42.9	57.1		3.3	1.1	4.0	15.4	15.5	15.0

Lanes, Volumes, Timings

17: Merritt Mill Road / NC 54 WB Off Ramp & Greensboro Street

2/28/2014

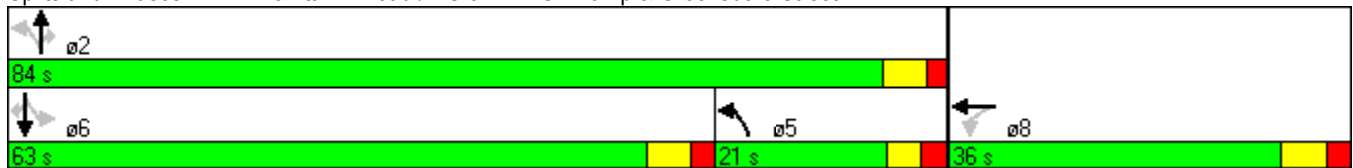


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS				D	E		A	A	A	B	B	B
Approach Delay					49.3			2.8			15.4	
Approach LOS					D			A			B	
Queue Length 50th (ft)				95	164		7	6	15	8	84	11
Queue Length 95th (ft)				127	234		12	10	23	24	131	32
Internal Link Dist (ft)		387			687			304			527	
Turn Bay Length (ft)				475			225		250	250		
Base Capacity (vph)				874	411		740	2449	1067	462	1864	834
Starvation Cap Reductn				0	0		237	0	182	0	0	0
Spillback Cap Reductn				0	0		0	0	0	0	0	0
Storage Cap Reductn				0	0		0	0	0	0	0	0
Reduced v/c Ratio				0.31	0.55		0.58	0.20	0.67	0.05	0.22	0.04

Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	5 (4%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle:	45
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.71
Intersection Signal Delay:	15.2
Intersection LOS:	B
Intersection Capacity Utilization:	49.3%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 17: Merritt Mill Road / NC 54 WB Off Ramp & Greensboro Street



Lanes, Volumes, Timings

18: Smith Level Road & NC 54 Bypass (Fordham Blvd) EB Off Ramp

2/28/2014



Lane Group	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	SEL2	SEL	SER
Lane Configurations				↑↑	↑	↑	↑↑		↑	↑	↑
Volume (vph)	0	0	0	853	258	211	412	0	304	2	335
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)	0%			1%			-2%			-3%	
Storage Length (ft)	0	0	0		125	175		0		250	250
Storage Lanes	0	0	0		1	1		0		1	1
Taper Length (ft)	25	25	25		25	25		25		25	25
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00
Ped Bike Factor					0.96						
Fr <sub>t</sub>					0.850						0.850
Fl <sub>t</sub> Protected						0.950			0.950	0.950	
Satd. Flow (prot)	0	0	0	3421	1530	1704	3408	0	1642	1642	1546
Fl <sub>t</sub> Permitted						0.147			0.950	0.950	
Satd. Flow (perm)	0	0	0	3421	1470	264	3408	0	1642	1642	1546
Right Turn on Red					No			No			No
Satd. Flow (RTOR)											
Link Speed (mph)	30			35			35			35	
Link Distance (ft)	706			414			384			490	
Travel Time (s)	16.0			8.1			7.5			9.5	
Confl. Peds. (#/hr)					5	5					
Peak Hour Factor	1.00	1.00	1.00	0.87	0.87	0.82	0.82	1.00	0.85	0.85	0.85
Heavy Vehicles (%)	2%	2%	5%	5%	5%	7%	7%	7%	6%	6%	6%
Adj. Flow (vph)	0	0	0	980	297	257	502	0	358	2	394
Shared Lane Traffic (%)									50%		
Lane Group Flow (vph)	0	0	0	980	297	257	502	0	179	181	394
Turn Type					Perm	pm+pt			Perm		Perm
Protected Phases				2		1	6			4	
Permitted Phases					2	6			4		4
Detector Phase				2	2	1	6		4	4	4
Switch Phase											
Minimum Initial (s)				10.0	10.0	8.0	10.0		7.0	7.0	7.0
Minimum Split (s)				25.0	25.0	15.0	20.0		14.0	14.0	14.0
Total Split (s)	0.0	0.0	0.0	50.0	50.0	24.0	74.0	0.0	46.0	46.0	46.0
Total Split (%)	0.0%	0.0%	0.0%	41.7%	41.7%	20.0%	61.7%	0.0%	38.3%	38.3%	38.3%
Maximum Green (s)				40.2	40.2	17.7	64.1		39.7	39.7	39.7
Yellow Time (s)				3.8	3.8	3.0	3.9		4.0	4.0	4.0
All-Red Time (s)				6.0	6.0	3.3	6.0		2.3	2.3	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	-4.8	-4.8	-1.3	-4.9	0.0	-1.3	-1.3	-1.3
Total Lost Time (s)	4.0	4.0	4.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0	5.0
Lead/Lag				Lag	Lag	Lead					
Lead-Lag Optimize?				Yes	Yes	Yes					
Vehicle Extension (s)				3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode				C-Max	C-Max	None	C-Max		None	None	None
Walk Time (s)				7.0	7.0						
Flash Dont Walk (s)				8.0	8.0						
Pedestrian Calls (#/hr)				0	0						
Act Effct Green (s)				52.8	52.8	74.1	74.1		35.9	35.9	35.9
Actuated g/C Ratio				0.44	0.44	0.62	0.62		0.30	0.30	0.30
v/c Ratio				0.65	0.46	0.72	0.24		0.36	0.37	0.85



Lanes, Volumes, Timings

18: Smith Level Road & NC 54 Bypass (Fordham Blvd) EB Off Ramp

2/28/2014



Lane Group	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	SEL2	SEL	SER
Control Delay				30.7	28.8	32.9	5.5		34.2	34.3	56.9
Queue Delay				0.0	0.0	0.3	0.0		0.0	0.0	0.0
Total Delay				30.7	28.8	33.2	5.5		34.2	34.3	56.9
LOS				C	C	C	A		C	C	E
Approach Delay				30.3			14.9			46.1	
Approach LOS				C			B			D	
Queue Length 50th (ft)				328	169	59	33		111	113	280
Queue Length 95th (ft)				407	257	159	38		161	162	361
Internal Link Dist (ft)	626			334			304			410	
Turn Bay Length (ft)					125	175			250	250	250
Base Capacity (vph)				1504	646	391	2105		561	561	528
Starvation Cap Reductn				0	0	10	0		0	0	0
Spillback Cap Reductn				8	0	0	0		0	0	0
Storage Cap Reductn				0	0	0	0		0	0	0
Reduced v/c Ratio				0.66	0.46	0.67	0.24		0.32	0.32	0.75

Intersection Summary

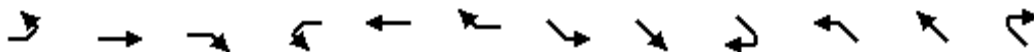
Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle:	65
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.85
Intersection Signal Delay:	30.4
Intersection LOS:	C
Intersection Capacity Utilization	56.2%
ICU Level of Service	B
Analysis Period (min)	15

Splits and Phases: 18: Smith Level Road & NC 54 Bypass (Fordham Blvd) EB Off Ramp



Lanes, Volumes, Timings  
 20: US 15-501 (Fordham Blvd) & Manning Drive

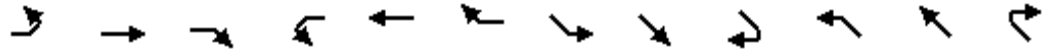
2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	212	2395	2	7	1263	753	266	0	38	17	7	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	9	12
Grade (%)		-5%			0%			-4%			0%	
Storage Length (ft)	400		0	200		1000	0		225	0		75
Storage Lanes	2		0	1		1	0		1	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor									0.99		0.99	
Frt						0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950				0.966	
Satd. Flow (prot)	3519	3628	0	1719	3438	1538	3434	1863	1584	0	1604	1568
Flt Permitted	0.950			0.950			0.950				0.966	
Satd. Flow (perm)	3519	*3811	0	1719	3438	1538	*3819	1863	1564	0	1595	1568
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			35			25	
Link Distance (ft)		579			1498			367			515	
Travel Time (s)		8.8			22.7			7.1			14.0	
Confl. Peds. (#/hr)									3	3		
Peak Hour Factor	0.94	0.94	0.94	0.95	0.95	0.95	0.88	0.88	0.88	0.68	0.68	0.68
Heavy Vehicles (%)	2%	2%	2%	5%	5%	5%	4%	4%	4%	3%	3%	3%
Adj. Flow (vph)	226	2548	2	7	1329	793	302	0	43	25	10	63
Shared Lane Traffic (%)												
Lane Group Flow (vph)	226	2550	0	7	1329	793	302	0	43	0	35	63
Turn Type	Prot			Prot		pm+ov	Split		Free	Split		pm+ov
Protected Phases	5	2		1	6	4	4	4		3	3	1
Permitted Phases						6			Free			3
Detector Phase	5	2		1	6	4	4	4		3	3	1
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0	7.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	14.0	19.0		14.0	19.0	32.0	32.0	32.0		14.0	14.0	14.0
Total Split (s)	24.0	139.0	0.0	14.0	129.0	33.0	33.0	33.0	0.0	14.0	14.0	14.0
Total Split (%)	12.0%	69.5%	0.0%	7.0%	64.5%	16.5%	16.5%	16.5%	0.0%	7.0%	7.0%	7.0%
Maximum Green (s)	17.8	132.9		7.8	122.7	26.8	26.8	26.8		7.8	7.8	7.8
Yellow Time (s)	3.0	4.7		3.0	4.5	3.8	3.8	3.8		3.8	3.8	3.0
All-Red Time (s)	3.2	1.4		3.2	1.8	2.4	2.4	2.4		2.4	2.4	3.2
Lost Time Adjust (s)	-1.2	-1.1	0.0	-1.2	-1.3	-1.2	-1.2	-1.2	0.0	-2.5	-1.2	-1.2
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0	3.7	5.0	5.0
Lead/Lag	Lead	Lead		Lag	Lag	Lag	Lag	Lag		Lead	Lead	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	6.0		1.0	6.0	1.0	1.0	1.0		1.0	1.0	1.0
Recall Mode	None	C-Max		None	C-Max	None	None	None		None	None	None
Walk Time (s)						7.0	7.0	7.0				
Flash Dont Walk (s)						18.0	18.0	18.0				
Pedestrian Calls (#/hr)						0	0	0				
Act Effct Green (s)	16.8	134.0		9.0	126.2	158.1	31.0		200.0		8.7	20.0
Actuated g/C Ratio	0.08	0.67		0.04	0.63	0.79	0.16		1.00		0.04	0.10

Lanes, Volumes, Timings  
 20: US 15-501 (Fordham Blvd) & Manning Drive

2/28/2014

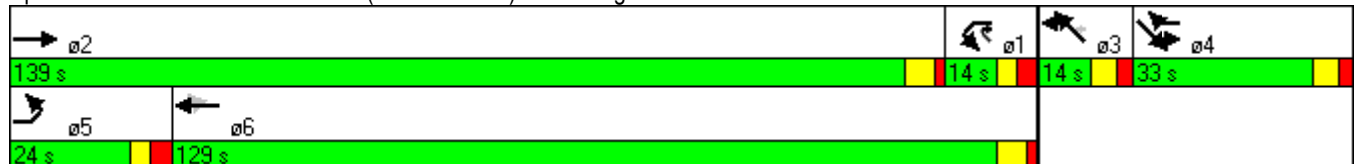


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
v/c Ratio	0.76	1.05		0.09	0.61	0.65	0.57		0.03		0.50	0.40
Control Delay	106.5	65.0		67.0	8.5	2.5	84.0		0.0		117.8	90.8
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0		0.0		0.0	0.0
Total Delay	106.5	65.0		67.0	8.5	2.5	84.0		0.0		117.8	90.8
LOS	F	E		E	A	A	F		A		F	F
Approach Delay		68.4			6.5						100.4	
Approach LOS		E			A						F	
Queue Length 50th (ft)	152	~1912		9	157	58	196		0		46	78
Queue Length 95th (ft)	204	#2001		m10	m196	m85	247		0		69	100
Internal Link Dist (ft)		499			1418			287			435	
Turn Bay Length (ft)	400			200		1000			225			75
Base Capacity (vph)	334	2431		77	2169	1216	532		1564		72	157
Starvation Cap Reductn	0	0		0	0	0	0		0		0	0
Spillback Cap Reductn	0	0		0	0	0	0		0		0	0
Storage Cap Reductn	0	0		0	0	0	0		0		0	0
Reduced v/c Ratio	0.68	1.05		0.09	0.61	0.65	0.57		0.03		0.49	0.40

Intersection Summary

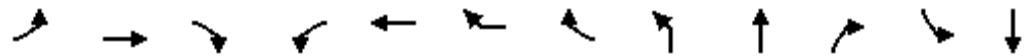
Area Type: Other  
 Cycle Length: 200  
 Actuated Cycle Length: 200  
 Offset: 122 (61%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.05  
 Intersection Signal Delay: 44.7  
 Intersection Capacity Utilization 99.5%  
 Analysis Period (min) 15  
 \* User Entered Value  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 20: US 15-501 (Fordham Blvd) & Manning Drive



Lanes, Volumes, Timings  
 21: Old Mason Farm Road & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↔		↔	↔			↔	↑↑	↔	↔	↑↑
Volume (vph)	11	4	9	88	1	6	11	102	2477	198	22	1805
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			3%				0%			0%
Storage Length (ft)	0		0	50		0		350		300	125	
Storage Lanes	0		0	1		0		1		1	1	
Taper Length (ft)	25		25	25		25		25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	*1.00	1.00	1.00	*1.00
Ped Bike Factor					0.99							
Frt		0.949			0.859					0.850		
Flt Protected		0.978		0.950				0.950			0.950	
Satd. Flow (prot)	0	1729	0	1743	1555	0	0	1770	3725	1583	1770	3725
Flt Permitted		0.839		0.950				0.950			0.950	
Satd. Flow (perm)	0	1483	0	1743	1555	0	0	1770	*3787	1583	1770	*3771
Right Turn on Red			No				No			No		
Satd. Flow (RTOR)												
Link Speed (mph)		30			35				45			45
Link Distance (ft)		305			620				1498			1494
Travel Time (s)		6.9			12.1				22.7			22.6
Confl. Peds. (#/hr)							1					
Peak Hour Factor	0.61	0.61	0.61	0.52	0.52	0.52	0.52	0.96	0.96	0.96	0.87	0.87
Adj. Flow (vph)	18	7	15	169	2	12	21	106	2580	206	25	2075
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	40	0	169	35	0	0	106	2580	206	25	2075
Turn Type	Perm			Split				Prot		pm+ov	Prot	
Protected Phases		7		3	3			5	2	3	1	6
Permitted Phases	7									2		
Detector Phase	7	7		3	3			5	2	3	1	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		7.0	7.0			7.0	12.0	7.0	7.0	12.0
Minimum Split (s)	13.0	13.0		36.0	36.0			14.0	33.0	36.0	15.0	25.0
Total Split (s)	13.0	13.0	0.0	25.0	25.0	0.0	0.0	15.0	122.0	25.0	15.0	122.0
Total Split (%)	6.5%	6.5%	0.0%	12.5%	12.5%	0.0%	0.0%	7.5%	61.0%	12.5%	7.5%	61.0%
Maximum Green (s)	5.8	5.8		18.4	18.4			8.0	115.8	18.4	9.1	115.9
Yellow Time (s)	3.0	3.0		3.6	3.6			3.0	4.6	3.6	3.0	4.4
All-Red Time (s)	4.2	4.2		3.0	3.0			4.0	1.6	3.0	2.9	1.7
Lost Time Adjust (s)	0.0	-2.2	-2.2	-1.6	-1.6	-1.6	-1.6	-2.0	-1.2	-1.6	-0.9	-1.1
Total Lost Time (s)	7.2	5.0	1.8	5.0	5.0	2.4	2.4	5.0	5.0	5.0	5.0	5.0
Lead/Lag				Lead	Lead			Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0	2.0	2.0	2.0	2.0
Recall Mode	None	None		None	None			None	C-Max	None	None	C-Max
Walk Time (s)				4.0	4.0				7.0	4.0		7.0
Flash Dont Walk (s)				25.0	25.0				16.0	25.0		11.0
Pedestrian Calls (#/hr)				0	0				0	0		0
Act Effct Green (s)		8.0		20.0	20.0			10.0	122.6	143.6	9.6	119.6
Actuated g/C Ratio		0.04		0.10	0.10			0.05	0.61	0.72	0.05	0.60
v/c Ratio		0.68		0.97	0.22			1.19	1.13	0.18	0.29	0.93
Control Delay		140.7		147.0	86.9			171.3	85.1	3.6	100.8	45.8

Lanes, Volumes, Timings  
 21: Old Mason Farm Road & US 15-501 (Fordham Blvd)

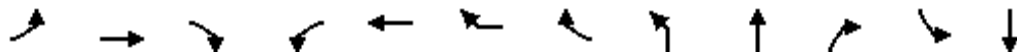
2/28/2014



Lane Group	SBR	SEL2	SEL	SER	SER2
Lane Configurations					
Volume (vph)	3	144	21	51	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900
Grade (%)			2%		
Storage Length (ft)	100		125	0	
Storage Lanes	1		1	0	
Taper Length (ft)	25		25	25	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00
Ped Bike Factor					
Frt	0.850		0.912		
Flt Protected		0.950	0.980		
Satd. Flow (prot)	1583	1664	1566	0	0
Flt Permitted		0.950	0.980		
Satd. Flow (perm)	1583	1664	1566	0	0
Right Turn on Red					No
Satd. Flow (RTOR)					
Link Speed (mph)			25		
Link Distance (ft)			359		
Travel Time (s)			9.8		
Confl. Peds. (#/hr)					
Peak Hour Factor	0.87	0.47	0.47	0.47	0.47
Adj. Flow (vph)	3	306	45	109	30
Shared Lane Traffic (%)		17%			
Lane Group Flow (vph)	3	254	236	0	0
Turn Type	Perm	Split			
Protected Phases		4	4		
Permitted Phases	6				
Detector Phase	6	4	4		
Switch Phase					
Minimum Initial (s)	12.0	5.0	5.0		
Minimum Split (s)	25.0	13.0	13.0		
Total Split (s)	122.0	25.0	25.0	0.0	0.0
Total Split (%)	61.0%	12.5%	12.5%	0.0%	0.0%
Maximum Green (s)	115.9	17.6	17.6		
Yellow Time (s)	4.4	3.0	3.0		
All-Red Time (s)	1.7	4.4	4.4		
Lost Time Adjust (s)	-1.1	-2.4	-2.4	-2.4	0.0
Total Lost Time (s)	5.0	5.0	5.0	1.6	4.0
Lead/Lag	Lead	Lag	Lag		
Lead-Lag Optimize?					
Vehicle Extension (s)	2.0	2.0	2.0		
Recall Mode	C-Max	None	None		
Walk Time (s)	7.0				
Flash Dont Walk (s)	11.0				
Pedestrian Calls (#/hr)	0				
Act Effct Green (s)	119.6	20.0	20.0		
Actuated g/C Ratio	0.60	0.10	0.10		
v/c Ratio	0.00	1.53	1.50		
Control Delay	17.3	318.6	309.7		

Lanes, Volumes, Timings  
 21: Old Mason Farm Road & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL	NBT	NBR	SBL	SBT
Queue Delay		0.0		0.0	0.0			0.0	5.1	0.0	0.0	0.0
Total Delay		140.7		147.0	86.9			171.3	90.1	3.6	100.8	45.8
LOS		F		F	F			F	F	A	F	D
Approach Delay		140.7			136.7				87.0			46.4
Approach LOS		F			F				F			D
Queue Length 50th (ft)		53		226	43			~167	~2023	32	32	1252
Queue Length 95th (ft)		68		177	50			m#173	m#1890	m32	69	1262
Internal Link Dist (ft)		225			540				1418			1414
Turn Bay Length (ft)				50				350		300	125	
Base Capacity (vph)		59		174	156			89	2283	1136	89	2227
Starvation Cap Reductn		0		0	0			0	23	0	0	0
Spillback Cap Reductn		0		0	0			0	0	0	0	0
Storage Cap Reductn		0		0	0			0	0	0	0	0
Reduced v/c Ratio		0.68		0.97	0.22			1.19	1.14	0.18	0.28	0.93

Intersection Summary

Area Type: Other  
 Cycle Length: 200  
 Actuated Cycle Length: 200  
 Offset: 116 (58%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.53  
 Intersection Signal Delay: 93.7  
 Intersection LOS: F  
 Intersection Capacity Utilization 107.3%  
 ICU Level of Service G  
 Analysis Period (min) 15  
 \* User Entered Value  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 21: Old Mason Farm Road & US 15-501 (Fordham Blvd)

122 s	15 s	25 s	25 s	13 s	
122 s	15 s				

Lanes, Volumes, Timings  
 21: Old Mason Farm Road & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	SBR	SEL2	SEL	SER	SER2
Queue Delay	0.0	0.0	0.0		
Total Delay	17.3	318.6	309.7		
LOS	B	F	F		
Approach Delay			314.3		
Approach LOS			F		
Queue Length 50th (ft)	2	~489	~451		
Queue Length 95th (ft)	7	#254	#236		
Internal Link Dist (ft)			279		
Turn Bay Length (ft)	100	125	125		
Base Capacity (vph)	947	166	157		
Starvation Cap Reductn	0	0	0		
Spillback Cap Reductn	0	0	0		
Storage Cap Reductn	0	0	0		
Reduced v/c Ratio	0.00	1.53	1.50		
<b>Intersection Summary</b>					

Lanes, Volumes, Timings  
 22: NC 54 WB On-Ramp & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗↗			↗		↗↗	↗		↗↗	↗
Volume (vph)	0	0	963	0	0	281	0	1401	28	0	1361	181
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		450	0		0			200	0		375
Storage Lanes	0		1	0		1	0		1	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	0.88	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.865			0.850			0.850
Flt Protected												
Satd. Flow (prot)	0	0	2787	0	0	1611	0	3539	1583	0	3539	1583
Flt Permitted												
Satd. Flow (perm)	0	0	2787	0	0	1611	0	3539	1583	0	3539	1583
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)						140			7			76
Link Speed (mph)		30			25			45				45
Link Distance (ft)		694			685			1058				1301
Travel Time (s)		15.8			18.7			16.0				19.7
Peak Hour Factor	1.00	1.00	0.92	1.00	1.00	0.90	1.00	0.90	0.90	1.00	0.82	0.92
Adj. Flow (vph)	0	0	1047	0	0	312	0	1557	31	0	1660	197
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	1047	0	0	312	0	1557	31	0	1660	197
Turn Type			custom			Free			Free			Free
Protected Phases			4					2 4				6
Permitted Phases			4			Free			Free			Free
Detector Phase			4					2 4				6
Switch Phase												
Minimum Initial (s)			7.0									12.0
Minimum Split (s)			13.0									18.0
Total Split (s)	0.0	0.0	77.0	0.0	0.0	0.0	0.0	170.0	0.0	0.0	93.0	0.0
Total Split (%)	0.0%	0.0%	45.3%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	54.7%	0.0%
Maximum Green (s)			71.9									87.2
Yellow Time (s)			3.1									4.5
All-Red Time (s)			2.0									1.3
Lost Time Adjust (s)	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	-0.8	0.0	0.0	-0.8	0.0
Total Lost Time (s)	4.0	4.0	5.0	4.0	4.0	4.0	4.0	5.0	4.0	4.0	5.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)			3.0									6.0
Recall Mode			None									C-Max
Act Effct Green (s)			72.0			170.0		170.0	170.0		88.0	170.0
Actuated g/C Ratio			0.42			1.00		1.00	1.00		0.52	1.00
v/c Ratio			0.89			0.19		0.44	0.02		0.91	0.12
Control Delay			55.6			0.3		0.4	0.0		45.6	0.2
Queue Delay			0.0			0.0		0.0	0.0		0.0	0.0
Total Delay			55.6			0.3		0.4	0.0		45.6	0.2
LOS			E			A		A	A		D	A
Approach Delay								0.4			40.8	
Approach LOS								A			D	
Queue Length 50th (ft)			609			0		0	0		868	0



Lane Group	ø2
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Fr <sub>t</sub>	
Fl <sub>t</sub> Protected	
Satd. Flow (prot)	
Fl <sub>t</sub> Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	12.0
Minimum Split (s)	18.0
Total Split (s)	93.0
Total Split (%)	55%
Maximum Green (s)	87.2
Yellow Time (s)	4.5
All-Red Time (s)	1.3
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	6.0
Recall Mode	Max
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	

Lanes, Volumes, Timings  
 22: NC 54 WB On-Ramp & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)			725			0		0	0		824	0
Internal Link Dist (ft)		614			605			978			1221	
Turn Bay Length (ft)			450						200			375
Base Capacity (vph)			1180			1611		3539	1583		1832	1583
Starvation Cap Reductn			0			0		0	0		0	0
Spillback Cap Reductn			0			0		0	0		0	0
Storage Cap Reductn			0			0		0	0		0	0
Reduced v/c Ratio			0.89			0.19		0.44	0.02		0.91	0.12

Intersection Summary

Area Type:	Other
Cycle Length:	170
Actuated Cycle Length:	170
Offset:	0 (0%), Referenced to phase 6:SBT, Start of Green
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.91
Intersection Signal Delay:	28.0
Intersection LOS:	C
Intersection Capacity Utilization:	79.6%
ICU Level of Service:	D
Analysis Period (min):	15

Splits and Phases: 22: NC 54 WB On-Ramp & US 15-501 (Fordham Blvd)



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Lane Group	ø2
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

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Lanes, Volumes, Timings  
23: NC 54 (Raleigh Road) & Burning Tree Drive

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↗↗↗		↖	↖↖↖			↖	↖		↕	
Volume (vph)	23	1958	40	102	2272	16	17	4	186	33	8	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	275		0	0		450	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			0.99	0.99		0.99	
Frt		0.997			0.999				0.850		0.944	
Flt Protected	0.950			0.950				0.961			0.977	
Satd. Flow (prot)	1770	5066	0	1736	4981	0	0	1773	1568	0	1702	0
Flt Permitted	0.046			0.055				0.783			0.853	
Satd. Flow (perm)	86	5066	0	100	4981	0	0	1434	1547	0	1485	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			25	
Link Distance (ft)		1026			881			637			457	
Travel Time (s)		20.0			17.2			12.4			12.5	
Confl. Peds. (#/hr)	6		8	8		6	9		1	1		9
Peak Hour Factor	0.94	0.94	0.94	0.90	0.90	0.90	0.81	0.81	0.81	0.77	0.77	0.77
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	3%	3%	3%	2%	2%	2%
Adj. Flow (vph)	24	2083	43	113	2524	18	21	5	230	43	10	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	24	2126	0	113	2542	0	0	26	230	0	91	0
Turn Type	pm+pt			pm+pt			Perm		Perm	Perm		
Protected Phases	5	2		1	6			8				4
Permitted Phases	2			6			8		8	4		
Detector Phase	5	2		1	6		8	8	8	4		4
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0		7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.0	32.0		13.0	30.0		48.0	48.0	48.0	46.0	46.0	
Total Split (s)	13.0	85.0	0.0	17.0	89.0	0.0	48.0	48.0	48.0	48.0	48.0	0.0
Total Split (%)	8.7%	56.7%	0.0%	11.3%	59.3%	0.0%	32.0%	32.0%	32.0%	32.0%	32.0%	0.0%
Maximum Green (s)	7.1	78.8		11.1	82.8		41.8	41.8	41.8	41.7	41.7	
Yellow Time (s)	3.0	4.9		3.0	4.9		3.7	3.7	3.7	3.2	3.2	
All-Red Time (s)	2.9	1.3		2.9	1.3		2.5	2.5	2.5	3.1	3.1	
Lost Time Adjust (s)	-0.9	-1.2	0.0	-0.9	-1.2	0.0	0.0	-1.2	-1.2	0.0	-1.3	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	6.2	5.0	5.0	6.3	5.0	4.0
Lead/Lag	Lead	Lead		Lag	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		Min	Min	Min	Min	Min	Min
Walk Time (s)		7.0			7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		18.0			16.0		34.0	34.0	34.0	32.0	32.0	
Pedestrian Calls (#/hr)		0			0		0	0	0	0	0	0
Act Effct Green (s)	94.1	94.1		103.3	103.3			28.9	28.9		28.9	
Actuated g/C Ratio	0.63	0.63		0.69	0.69			0.19	0.19		0.19	
v/c Ratio	0.17	0.67		0.56	0.74			0.09	0.77		0.32	
Control Delay	14.8	11.9		53.5	18.9			47.3	74.0		53.3	

Lanes, Volumes, Timings  
 23: NC 54 (Raleigh Road) & Burning Tree Drive

2/28/2014

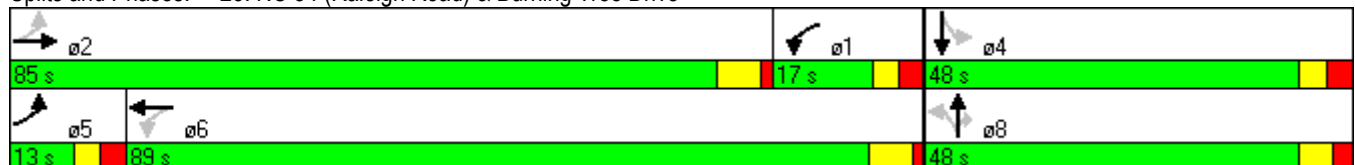


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0			0.0
Total Delay	14.8	11.9		53.5	18.9			47.3	74.0			53.3
LOS	B	B		D	B			D	E			D
Approach Delay		12.0			20.4			71.3				53.3
Approach LOS		B			C			E				D
Queue Length 50th (ft)	5	190		48	606			21	216			77
Queue Length 95th (ft)	m10	282		124	799			41	258			104
Internal Link Dist (ft)		946			801			557				377
Turn Bay Length (ft)	250			275					450			
Base Capacity (vph)	145	3178		200	3429			411	443			426
Starvation Cap Reductn	0	0		0	0			0	0			0
Spillback Cap Reductn	0	0		0	0			0	0			0
Storage Cap Reductn	0	0		0	0			0	0			0
Reduced v/c Ratio	0.17	0.67		0.56	0.74			0.06	0.52			0.21

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 8 (5%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 125  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.77  
 Intersection Signal Delay: 20.0  
 Intersection LOS: B  
 Intersection Capacity Utilization 79.2%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 23: NC 54 (Raleigh Road) & Burning Tree Drive



Lanes, Volumes, Timings  
24: NC 54 (Raleigh Road) & Hamilton Road

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↖↖		↖	↖↖↖		↖	↖	↖	↖	↖	↖
Volume (vph)	35	1885	196	65	2270	23	191	34	104	43	28	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	275		0	250		0	150		150	50		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00		0.98		0.98	0.99	0.98	
Frt		0.986			0.998				0.850		0.917	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	4945	0	1736	4975	0	1736	1827	1553	1719	1632	0
Flt Permitted	0.050			0.050			0.709			0.723		
Satd. Flow (perm)	92	4945	0	91	4975	0	1274	1827	1522	1299	1632	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			25				25
Link Distance (ft)		359			576			537				463
Travel Time (s)		5.4			8.7			14.6				12.6
Confl. Peds. (#/hr)	9		6	6		9	13		6	6		13
Peak Hour Factor	0.88	0.88	0.88	0.89	0.89	0.89	0.65	0.65	0.65	0.86	0.86	0.86
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	4%	4%	4%	5%	5%	5%
Adj. Flow (vph)	40	2142	223	73	2551	26	294	52	160	50	33	41
Shared Lane Traffic (%)												
Lane Group Flow (vph)	40	2365	0	73	2577	0	294	52	160	50	74	0
Turn Type	pm+pt			pm+pt			Perm		Perm	Perm		
Protected Phases	5	2		1	6			8				4
Permitted Phases	2			6			8		8	4		
Detector Phase	5	2		1	6		8	8	8	4		4
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	7.0	7.0	7.0		7.0
Minimum Split (s)	13.0	25.0		13.0	26.0		41.0	41.0	41.0	39.0		39.0
Total Split (s)	13.0	90.0	0.0	13.0	90.0	0.0	47.0	47.0	47.0	47.0		47.0
Total Split (%)	8.7%	60.0%	0.0%	8.7%	60.0%	0.0%	31.3%	31.3%	31.3%	31.3%		31.3%
Maximum Green (s)	7.4	84.4		7.6	84.1		40.6	40.6	40.6	40.5		40.5
Yellow Time (s)	3.0	3.8		3.0	4.1		3.1	3.1	3.1	3.2		3.2
All-Red Time (s)	2.6	1.8		2.4	1.8		3.3	3.3	3.3	3.3		3.3
Lost Time Adjust (s)	-0.6	-0.6	0.0	-0.4	-0.9	0.0	-1.4	-1.4	-1.4	-1.5		-1.5
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0		5.0
Lead/Lag	Lead	Lead		Lag	Lag							
Lead-Lag Optimize?	Yes				Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0		3.0
Recall Mode	None	C-Max		None	C-Max		Min	Min	Min	Min		Min
Walk Time (s)		7.0			7.0		7.0	7.0	7.0	7.0		7.0
Flash Dont Walk (s)		12.0			13.0		27.0	27.0	27.0	25.0		25.0
Pedestrian Calls (#/hr)		0			0		0	0	0	0		0
Act Effct Green (s)	88.3	88.3		91.1	91.1		38.7	38.7	38.7	38.7		38.7
Actuated g/C Ratio	0.59	0.59		0.61	0.61		0.26	0.26	0.26	0.26		0.26
v/c Ratio	0.29	0.81		0.51	0.85		0.89	0.11	0.41	0.15		0.18
Control Delay	19.4	27.9		40.3	17.2		82.2	41.6	48.8	42.7		43.1

Lanes, Volumes, Timings  
 24: NC 54 (Raleigh Road) & Hamilton Road

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.4	27.9		40.3	17.2		82.2	41.6	48.8	42.7	43.1	
LOS	B	C		D	B		F	D	D	D	D	
Approach Delay		27.7			17.8			67.5				42.9
Approach LOS		C			B			E				D
Queue Length 50th (ft)	17	680		22	225		271	38	127	37	55	
Queue Length 95th (ft)	34	715		m43	354		255	53	136	70	94	
Internal Link Dist (ft)		279			496			457				383
Turn Bay Length (ft)	275			250			150		150	50		
Base Capacity (vph)	143	2912		143	3021		357	512	426	364	457	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.81		0.51	0.85		0.82	0.10	0.38	0.14	0.16	

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 120  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.89  
 Intersection Signal Delay: 27.0  
 Intersection LOS: C  
 Intersection Capacity Utilization 81.6%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 24: NC 54 (Raleigh Road) & Hamilton Road



Lanes, Volumes, Timings  
25: Culbreth Road & Smith Level Road

2/28/2014



Lane Group	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Volume (vph)	210	269	574	115	158	369
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	1%		-2%			3%
Storage Length (ft)	125	0		0	225	
Storage Lanes	1	1		0	1	
Taper Length (ft)	25	25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			1.00			
Frt		0.850	0.977			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1710	1530	1831	0	1662	1749
Flt Permitted	0.950				0.169	
Satd. Flow (perm)	1710	1530	1831	0	296	1749
Right Turn on Red		No		No		
Satd. Flow (RTOR)						
Link Speed (mph)	35		35			35
Link Distance (ft)	1150		863			828
Travel Time (s)	22.4		16.8			16.1
Confl. Peds. (#/hr)				1	1	
Peak Hour Factor	0.73	0.73	0.92	0.92	0.85	0.85
Heavy Vehicles (%)	5%	5%	2%	2%	7%	7%
Adj. Flow (vph)	288	368	624	125	186	434
Shared Lane Traffic (%)						
Lane Group Flow (vph)	288	368	749	0	186	434
Turn Type		pm+ov			pm+pt	
Protected Phases	8	1	2		1	6
Permitted Phases		8			6	
Detector Phase	8	1	2		1	6
Switch Phase						
Minimum Initial (s)	7.0	7.0	10.0		7.0	10.0
Minimum Split (s)	25.0	13.0	29.0		13.0	17.0
Total Split (s)	25.0	13.0	52.0	0.0	13.0	65.0
Total Split (%)	27.8%	14.4%	57.8%	0.0%	14.4%	72.2%
Maximum Green (s)	18.7	7.4	45.8		7.4	58.8
Yellow Time (s)	3.0	3.0	4.1		3.0	4.1
All-Red Time (s)	3.3	2.6	2.1		2.6	2.1
Lost Time Adjust (s)	-1.3	-0.6	-1.1	0.0	-0.6	-1.1
Total Lost Time (s)	5.0	5.0	5.1	4.0	5.0	5.1
Lead/Lag		Lead	Lag		Lead	
Lead-Lag Optimize?						
Vehicle Extension (s)	2.0	2.0	3.0		2.0	3.0
Recall Mode	None	None	C-Max		None	C-Max
Walk Time (s)	7.0		7.0			
Flash Dont Walk (s)	11.0		15.0			
Pedestrian Calls (#/hr)	0		0			
Act Effct Green (s)	18.5	31.3	48.6		61.5	61.4
Actuated g/C Ratio	0.21	0.35	0.54		0.68	0.68
v/c Ratio	0.82	0.69	0.76		0.58	0.36



Lanes, Volumes, Timings  
 25: Culbreth Road & Smith Level Road

2/28/2014



Lane Group	WBL	WBR	NET	NER	SWL	SWT
Control Delay	53.7	32.6	23.0		12.9	7.4
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	53.7	32.6	23.0		12.9	7.4
LOS	D	C	C		B	A
Approach Delay	41.9		23.0			9.0
Approach LOS	D		C			A
Queue Length 50th (ft)	154	172	327		35	97
Queue Length 95th (ft)	188	202	489		56	136
Internal Link Dist (ft)	1070		783			748
Turn Bay Length (ft)	125				225	
Base Capacity (vph)	380	535	988		324	1194
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.76	0.69	0.76		0.57	0.36

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	90
Offset:	0 (0%), Referenced to phase 2:NET and 6:SWTL, Start of Green
Natural Cycle:	75
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.82
Intersection Signal Delay:	24.9
Intersection LOS:	C
Intersection Capacity Utilization:	70.2%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 25: Culbreth Road & Smith Level Road



Lanes, Volumes, Timings  
1: Franklin Street & NC 86 (S. Columbia St)

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	154	347	85	80	430	121	121	362	119	117	328	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	9	12	13	10	10	13	9	10	10	9	9	11
Storage Length (ft)	225		0	100		0	400		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.83	0.94		0.85	0.92		0.88	0.91		0.88	0.89	
Frt		0.970			0.967			0.963			0.954	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1392	2826	0	1472	2609	0	1366	2491	0	1366	2324	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1158	2826	0	1257	2609	0	1205	2491	0	1197	2324	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		20			20			25			25	
Link Distance (ft)		806			940			972			822	
Travel Time (s)		27.5			32.0			26.5			22.4	
Confl. Peds. (#/hr)	386		163	163		386	141		305	141		305
Peak Hour Factor	0.88	0.88	0.88	0.95	0.95	0.95	0.95	0.95	0.95	0.88	0.88	0.88
Heavy Vehicles (%)	5%	5%	5%	3%	3%	3%	7%	7%	7%	7%	7%	7%
Adj. Flow (vph)	175	394	97	84	453	127	127	381	125	133	373	166
Shared Lane Traffic (%)												
Lane Group Flow (vph)	175	491	0	84	580	0	127	506	0	133	539	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases												
Detector Phase	1	6		5	2		3	8		7	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	15.0	32.0		15.0	32.0		15.0	32.0		15.0	32.0	
Total Split (s)	26.0	44.0	0.0	20.0	38.0	0.0	21.0	44.0	0.0	22.0	45.0	0.0
Total Split (%)	20.0%	33.8%	0.0%	15.4%	29.2%	0.0%	16.2%	33.8%	0.0%	16.9%	34.6%	0.0%
Maximum Green (s)	20.1	37.8		14.6	31.8		15.1	38.1		16.1	39.3	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.3		3.0	3.1	
All-Red Time (s)	2.9	3.2		2.4	3.2		2.9	2.6		2.9	2.6	
Lost Time Adjust (s)	-0.9	-1.2	-2.0	-0.4	-1.2	0.0	-0.9	-0.9	-1.5	-0.9	-0.7	-1.5
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	4.0	5.0	5.0	2.5	5.0	5.0	2.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	3.0		1.0	3.0		1.0	2.0		1.0	2.0	
Recall Mode	None	Min		None	Min		None	C-Max		None	C-Max	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		15.0			15.0			15.0			15.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	18.9	39.7		11.2	32.0		14.5	43.9		15.2	44.7	
Actuated g/C Ratio	0.15	0.31		0.09	0.25		0.11	0.34		0.12	0.34	
v/c Ratio	0.87	0.57		0.66	0.90		0.84	0.60		0.83	0.68	

Lanes, Volumes, Timings  
 1: Franklin Street & NC 86 (S. Columbia St)

2/28/2014

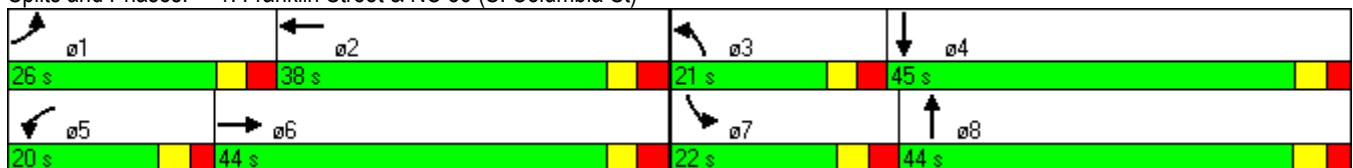


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	90.0	40.9		81.0	66.0		105.0	21.7		93.4	43.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	90.0	40.9		81.0	66.0		105.0	21.7		93.4	43.0	
LOS	F	D		F	E		F	C		F	D	
Approach Delay		53.8			67.9			38.4			53.0	
Approach LOS		D			E			D			D	
Queue Length 50th (ft)	143	176		70	248		80	196		110	215	
Queue Length 95th (ft)	#250	237		124	#348		m#190	m148		#203	277	
Internal Link Dist (ft)		726			860			892			742	
Turn Bay Length (ft)	225			100			400			100		
Base Capacity (vph)	225	884		170	662		168	841		179	798	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.78	0.56		0.49	0.88		0.76	0.60		0.74	0.68	

Intersection Summary

Area Type: CBD  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 20 (15%), Referenced to phase 4:SBT and 8:NBT, Start of Green  
 Natural Cycle: 95  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.90  
 Intersection Signal Delay: 53.5 Intersection LOS: D  
 Intersection Capacity Utilization 71.5% ICU Level of Service C  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Franklin Street & NC 86 (S. Columbia St)



Lanes, Volumes, Timings  
2: Cameron Avenue & NC 86 (S. Columbia St)

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	19	68	0	0	101	55	153	514	49	99	0	484
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	12	12	12	10	10	10	11	11	12
Storage Length (ft)	110		0	0		0	0		0	150		0
Storage Lanes	1		0	0		0	1		0	1		2
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.88
Ped Bike Factor	0.84				0.91		0.88	0.95		0.79		0.79
Fr <sub>t</sub>					0.952			0.987				0.850
Fl <sub>t</sub> Protected	0.950						0.950			0.950		
Satd. Flow (prot)	1510	1644	0	0	1391	0	1417	2671	0	1468	0	2391
Fl <sub>t</sub> Permitted	0.387						0.950			0.950		
Satd. Flow (perm)	516	1644	0	0	1391	0	1251	2671	0	1152	0	1886
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25				25
Link Distance (ft)		412			1056			839				972
Travel Time (s)		10.7			57.6			22.9				26.5
Confl. Peds. (#/hr)	146		190	190		146	102		281	281		102
Peak Hour Factor	0.82	0.82	1.00	1.00	0.80	0.80	0.91	0.91	0.91	0.86	1.00	0.86
Heavy Vehicles (%)	4%	4%	4%	6%	6%	6%	7%	7%	7%	7%	7%	7%
Adj. Flow (vph)	23	83	0	0	126	69	168	565	54	115	0	563
Shared Lane Traffic (%)												
Lane Group Flow (vph)	23	83	0	0	195	0	168	619	0	115	0	563
Turn Type	Perm						Split			custom		custom
Protected Phases		4			8		2	2		1		1
Permitted Phases	4									1		1
Detector Phase	4	4			8		2	2		1		1
Switch Phase												
Minimum Initial (s)	10.0	10.0			10.0		7.0	7.0		7.0		7.0
Minimum Split (s)	17.0	17.0			17.0		21.0	21.0		15.0		15.0
Total Split (s)	27.0	27.0	0.0	0.0	27.0	0.0	39.0	39.0	0.0	39.0	0.0	39.0
Total Split (%)	20.8%	20.8%	0.0%	0.0%	20.8%	0.0%	30.0%	30.0%	0.0%	30.0%	0.0%	30.0%
Maximum Green (s)	20.8	20.8			20.8		32.8	32.8		33.4		33.4
Yellow Time (s)	3.2	3.2			3.2		3.1	3.1		3.0		3.0
All-Red Time (s)	3.0	3.0			3.0		3.1	3.1		2.6		2.6
Lost Time Adjust (s)	-1.2	-1.2	0.0	0.0	-1.2	0.0	-1.2	-1.2	0.0	-0.6	0.0	-0.6
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	4.0	5.0	5.0	4.0	5.0	4.0	5.0
Lead/Lag							Lag	Lag		Lead		Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0			3.0		1.0	1.0		1.0		1.0
Recall Mode	Min	Min			None		C-Max	C-Max		None		None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	21.1	21.1			21.1		58.5	58.5		35.4		35.4
Actuated g/C Ratio	0.16	0.16			0.16		0.45	0.45		0.27		0.27
v/c Ratio	0.27	0.31			0.86		0.26	0.51		0.29		0.86

Lanes, Volumes, Timings  
 2: Cameron Avenue & NC 86 (S. Columbia St)

2/28/2014

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	25.0
Total Split (s)	25.0
Total Split (%)	19%
Maximum Green (s)	22.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	5.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	

Lanes, Volumes, Timings  
 2: Cameron Avenue & NC 86 (S. Columbia St)

2/28/2014

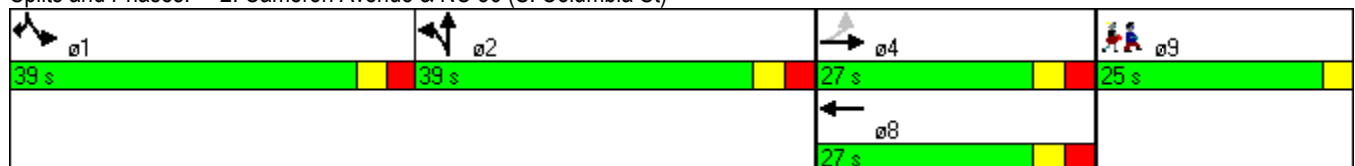


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	23.6	20.1			86.2		13.0	14.2		25.3		45.5
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0		1.2
Total Delay	23.6	20.1			86.2		13.0	14.2		25.3		46.8
LOS	C	C			F		B	B		C		D
Approach Delay		20.9			86.2			13.9				
Approach LOS		C			F			B				
Queue Length 50th (ft)	20	71			161		48	101		64		244
Queue Length 95th (ft)	m23	m86			#237		81	144		m91		288
Internal Link Dist (ft)		332			976			759				892
Turn Bay Length (ft)	110									150		
Base Capacity (vph)	87	278			235		638	1202		416		677
Starvation Cap Reductn	0	0			0		0	0		0		0
Spillback Cap Reductn	0	0			0		0	0		0		27
Storage Cap Reductn	0	0			0		0	0		0		0
Reduced v/c Ratio	0.26	0.30			0.83		0.26	0.51		0.28		0.87

Intersection Summary

Area Type: CBD  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 128 (98%), Referenced to phase 2:NBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.86  
 Intersection Signal Delay: 33.5 Intersection LOS: C  
 Intersection Capacity Utilization 60.1% ICU Level of Service B  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Cameron Avenue & NC 86 (S. Columbia St)



Lane Group	ø9
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lanes, Volumes, Timings  
3: Cameron Avenue & Pittsboro Street

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖		↖↗	↖							
Volume (vph)	0	96	167	572	237	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	12	12	12	12	12	12	12	12
Storage Length (ft)	0		0	0		90	0		0	0		0
Storage Lanes	0		0	2		1	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.79		0.64								
Frt		0.914										
Flt Protected				0.950								
Satd. Flow (prot)	0	1194	0	2874	1613	0	0	0	0	0	0	0
Flt Permitted				0.950								
Satd. Flow (perm)	0	1194	0	1830	1613	0	0	0	0	0	0	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25				25
Link Distance (ft)		258			412			549				191
Travel Time (s)		30.0			10.7			15.0				5.2
Confl. Peds. (#/hr)	182		127	127		182	46		3	3		46
Peak Hour Factor	1.00	0.88	0.88	0.73	0.73	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	0	109	190	784	325	0	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	299	0	784	325	0	0	0	0	0	0	0
Turn Type				Prot								
Protected Phases		2		1	6							
Permitted Phases												
Detector Phase		2		1	6							
Switch Phase												
Minimum Initial (s)		10.0		7.0	10.0							
Minimum Split (s)		20.2		20.0	20.0							
Total Split (s)	0.0	55.0	0.0	53.0	108.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Split (%)	0.0%	42.3%	0.0%	40.8%	83.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)		49.8		47.9	103.0							
Yellow Time (s)		3.1		3.0	3.3							
All-Red Time (s)		2.1		2.1	1.7							
Lost Time Adjust (s)	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.1	3.9	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0							
Recall Mode		None		C-Max	None							
Walk Time (s)		7.0										
Flash Dont Walk (s)		4.0										
Pedestrian Calls (#/hr)		0										
Act Effct Green (s)		38.3		61.6	105.0							
Actuated g/C Ratio		0.29		0.47	0.81							
v/c Ratio		0.85		0.58	0.25							



Lanes, Volumes, Timings  
 3: Cameron Avenue & Pittsboro Street

2/28/2014

Lane Group	ø4
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	4
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	17%
Maximum Green (s)	18.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	9.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	

Lanes, Volumes, Timings  
 3: Cameron Avenue & Pittsboro Street

2/28/2014

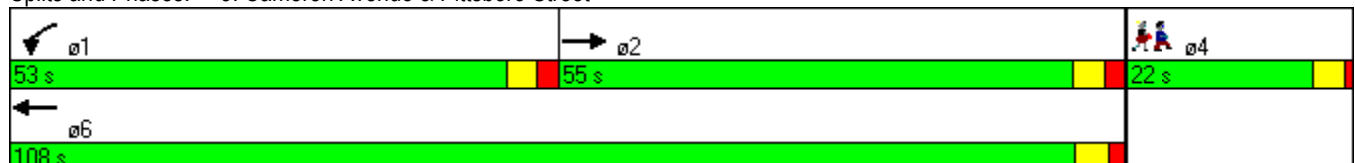


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		64.0		15.7	1.8							
Queue Delay		0.0		0.7	0.8							
Total Delay		64.0		16.4	2.7							
LOS		E		B	A							
Approach Delay		64.0			12.4							
Approach LOS		E			B							
Queue Length 50th (ft)		236		129	24							
Queue Length 95th (ft)		304		167	44							
Internal Link Dist (ft)		178			332			469			111	
Turn Bay Length (ft)												
Base Capacity (vph)		458		1362	1303							
Starvation Cap Reductn		0		267	689							
Spillback Cap Reductn		0		0	0							
Storage Cap Reductn		0		0	0							
Reduced v/c Ratio		0.65		0.72	0.53							

Intersection Summary

Area Type:	CBD
Cycle Length:	130
Actuated Cycle Length:	130
Offset:	71 (55%), Referenced to phase 1:WBL, Start of Green
Natural Cycle:	80
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.85
Intersection Signal Delay:	23.3
Intersection LOS:	C
Intersection Capacity Utilization:	47.8%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 3: Cameron Avenue & Pittsboro Street



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Lane Group	ø4
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

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Lanes, Volumes, Timings  
4: McCauley Street & Pittsboro Street

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↗		↖	↖			↖			↖	↖
Volume (vph)	0	83	19	127	93	0	0	0	0	104	421	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	200		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor		0.94		0.74							0.94	
Frt		0.975									0.994	
Flt Protected				0.950							0.991	
Satd. Flow (prot)	0	1359	0	1504	1583	0	0	0	0	0	2997	0
Flt Permitted				0.628							0.991	
Satd. Flow (perm)	0	1359	0	741	1583	0	0	0	0	0	2827	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25		25				25			25	
Link Distance (ft)		493		508				1166			270	
Travel Time (s)		13.4		13.9				31.8			7.4	
Confl. Peds. (#/hr)	38		104	104		38	37		69	69		37
Peak Hour Factor	1.00	0.84	0.84	0.89	0.89	1.00	1.00	1.00	1.00	0.94	0.94	0.94
Heavy Vehicles (%)	4%	4%	4%	8%	8%	8%	2%	2%	2%	6%	6%	6%
Parking (#/hr)		0	0									
Adj. Flow (vph)	0	99	23	143	104	0	0	0	0	111	448	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	122	0	143	104	0	0	0	0	0	583	0
Turn Type				Perm							Perm	
Protected Phases		4			8							6
Permitted Phases				8							6	
Detector Phase		4		8	8						6	6
Switch Phase												
Minimum Initial (s)		7.0		7.0	7.0					10.0	10.0	
Minimum Split (s)		20.0		20.6	20.6					23.3	23.3	
Total Split (s)	0.0	66.0	0.0	66.0	66.0	0.0	0.0	0.0	0.0	64.0	64.0	0.0
Total Split (%)	0.0%	50.8%	0.0%	50.8%	50.8%	0.0%	0.0%	0.0%	0.0%	49.2%	49.2%	0.0%
Maximum Green (s)		61.2		60.4	60.4					58.7	58.7	
Yellow Time (s)		3.3		3.0	3.0					3.3	3.3	
All-Red Time (s)		1.5		2.6	2.6					2.0	2.0	
Lost Time Adjust (s)	0.0	0.2	-0.3	-0.6	-0.6	0.0	0.0	0.0	0.0	-1.1	-0.3	0.0
Total Lost Time (s)	4.0	5.0	3.7	5.0	5.0	4.0	4.0	4.0	4.0	4.2	5.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0					3.0	3.0	
Recall Mode		None		None	None					C-Max	C-Max	
Walk Time (s)		7.0		7.0	7.0					7.0	7.0	
Flash Dont Walk (s)		6.0		7.0	7.0					8.0	8.0	
Pedestrian Calls (#/hr)		0		0	0					0	0	
Act Effct Green (s)		30.3		30.3	30.3						89.7	
Actuated g/C Ratio		0.23		0.23	0.23						0.69	
v/c Ratio		0.38		0.83	0.28						0.30	

Lanes, Volumes, Timings  
 4: McCauley Street & Pittsboro Street

2/28/2014

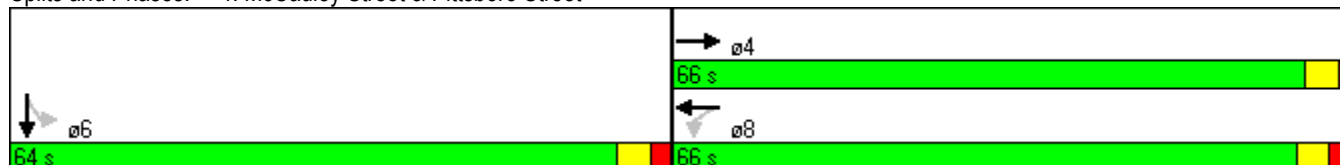


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		42.9		54.2	20.7							3.7
Queue Delay		0.0		0.0	0.0							0.0
Total Delay		42.9		54.2	20.7							3.7
LOS		D		D	C							A
Approach Delay		42.9			40.1							3.7
Approach LOS		D			D							A
Queue Length 50th (ft)		87		47	33							25
Queue Length 95th (ft)		117		70	52							121
Internal Link Dist (ft)		413			428			1086				190
Turn Bay Length (ft)				200								
Base Capacity (vph)		638		348	743							1950
Starvation Cap Reductn		0		0	0							0
Spillback Cap Reductn		0		0	0							0
Storage Cap Reductn		0		0	0							0
Reduced v/c Ratio		0.19		0.41	0.14							0.30

Intersection Summary

Area Type: CBD  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 118 (91%), Referenced to phase 6:SBTL, Start of Green  
 Natural Cycle: 45  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.83  
 Intersection Signal Delay: 18.1  
 Intersection Capacity Utilization 50.0%  
 Analysis Period (min) 15  
 Intersection LOS: B  
 ICU Level of Service A

Splits and Phases: 4: McCauley Street & Pittsboro Street



Lanes, Volumes, Timings  
5: South Road & NC 86 (S. Columbia St)

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	79	125	0	0	163	125	75	523	129	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	12	12	13	13	12	11	11	11	11	11
Storage Length (ft)	150		0	0		300	0		0	0		0
Storage Lanes	1		0	0		1	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	0.91	0.91	1.00	1.00	1.00	1.00
Ped Bike Factor	0.85				0.99	0.79		0.94	0.86			
Fr <sub>t</sub>					0.990	0.850			0.850			
Fl <sub>t</sub> Protected	0.950							0.994				
Satd. Flow (prot)	1593	1788	0	0	1530	1334	0	4153	1301	0	0	0
Fl <sub>t</sub> Permitted	0.950							0.994				
Satd. Flow (perm)	1347	1788	0	0	1530	1051	0	3921	1113	0	0	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25				25
Link Distance (ft)		508			646			532				839
Travel Time (s)		13.9			17.6			14.5				22.9
Confl. Peds. (#/hr)	89		487	487		89	144		254	254		144
Peak Hour Factor	0.74	0.74	1.00	1.00	0.87	0.87	0.73	0.73	0.73	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	7%	7%	7%	8%	8%	8%	2%	2%	2%
Adj. Flow (vph)	107	169	0	0	187	144	103	716	177	0	0	0
Shared Lane Traffic (%)						10%						
Lane Group Flow (vph)	107	169	0	0	201	130	0	819	177	0	0	0
Turn Type	Split					Perm	Perm		Free			
Protected Phases	4	4			3			2				
Permitted Phases						3	2		Free			
Detector Phase	4	4			3	3	2	2				
Switch Phase												
Minimum Initial (s)	7.0	7.0			7.0	7.0	10.0	10.0				
Minimum Split (s)	24.0	24.0			24.0	24.0	27.0	27.0				
Total Split (s)	33.0	33.0	0.0	0.0	43.0	43.0	54.0	54.0	0.0	0.0	0.0	0.0
Total Split (%)	25.4%	25.4%	0.0%	0.0%	33.1%	33.1%	41.5%	41.5%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)	27.4	27.4			37.5	37.5	48.1	48.1				
Yellow Time (s)	3.5	3.5			3.1	3.1	3.4	3.4				
All-Red Time (s)	2.1	2.1			2.4	2.4	2.5	2.5				
Lost Time Adjust (s)	-0.6	-0.6	0.0	0.0	-0.5	-0.5	-1.5	-0.9	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	5.0	4.4	5.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag			Lead	Lead						
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0			2.0	2.0	2.0	2.0				
Recall Mode	Min	Min			Min	Min	C-Max	C-Max				
Walk Time (s)	7.0	7.0			7.0	7.0	7.0	7.0				
Flash Dont Walk (s)	10.0	10.0			10.0	10.0	14.0	14.0				
Pedestrian Calls (#/hr)	0	0			0	0	0	0				
Act Effct Green (s)	17.3	17.3			22.2	22.2		75.5	130.0			
Actuated g/C Ratio	0.13	0.13			0.17	0.17		0.58	1.00			
v/c Ratio	0.50	0.71			0.77	0.73		0.36	0.16			

Lanes, Volumes, Timings  
 5: South Road & NC 86 (S. Columbia St)

2/28/2014

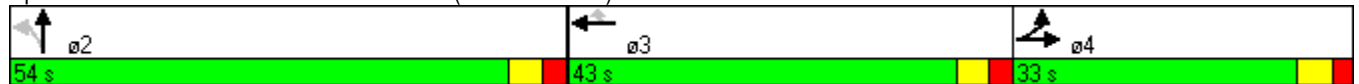


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	57.6	67.2			69.9	72.3		12.6	0.3			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	57.6	67.2			69.9	72.3		12.6	0.3			
LOS	E	E			E	E		B	A			
Approach Delay		63.5			70.8			10.4				
Approach LOS		E			E			B				
Queue Length 50th (ft)	90	144			172	110		142	0			
Queue Length 95th (ft)	121	175			235	167		149	0			
Internal Link Dist (ft)		428			566			452			759	
Turn Bay Length (ft)	150					300						
Base Capacity (vph)	343	385			447	307		2278	1113			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.31	0.44			0.45	0.42		0.36	0.16			

Intersection Summary

Area Type: CBD  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 124 (95%), Referenced to phase 2:NBTL, Start of Green  
 Natural Cycle: 75  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.77  
 Intersection Signal Delay: 32.0  
 Intersection Capacity Utilization 50.0%  
 Analysis Period (min) 15  
 Intersection LOS: C  
 ICU Level of Service A

Splits and Phases: 5: South Road & NC 86 (S. Columbia St)



Lanes, Volumes, Timings  
6: Manning Drive & NC 86 NB (S. Columbia St)

2/28/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	72	260	0	109	0	270	0	341	103	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			2%			2%				0%
Storage Length (ft)	125		0	0		75	0		150	0		0
Storage Lanes	1		0	1		1	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	0.88	1.00	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99			0.93					0.94			
Fr <sub>t</sub>						0.850			0.850			
Fl <sub>t</sub> Protected	0.950			0.950								
Satd. Flow (prot)	1512	3023	0	1475	0	2323	0	3034	1358	0	0	0
Fl <sub>t</sub> Permitted	0.950			0.950								
Satd. Flow (perm)	1491	3023	0	1367	0	2323	0	3034	1274	0	0	0
Right Turn on Red	No		No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			35				35
Link Distance (ft)		241			637			222				480
Travel Time (s)		6.6			17.4			4.3				9.4
Confl. Peds. (#/hr)	7		33	33		7	2		30	30		2
Peak Hour Factor	0.96	0.96	1.00	0.82	1.00	0.82	1.00	0.89	0.89	1.00	1.00	1.00
Heavy Vehicles (%)	8%	8%	8%	9%	9%	9%	6%	6%	6%	2%	2%	2%
Adj. Flow (vph)	75	271	0	133	0	329	0	383	116	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	75	271	0	133	0	329	0	383	116	0	0	0
Turn Type	Split			Prot		custom			pm+ov			
Protected Phases	4	4		3		3		2	3			
Permitted Phases									2			
Detector Phase	4	4		3		3		2	3			
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0		7.0		10.0	7.0			
Minimum Split (s)	36.0	36.0		22.0		22.0		30.0	22.0			
Total Split (s)	42.0	42.0	0.0	45.0	0.0	45.0	0.0	43.0	45.0	0.0	0.0	0.0
Total Split (%)	32.3%	32.3%	0.0%	34.6%	0.0%	34.6%	0.0%	33.1%	34.6%	0.0%	0.0%	0.0%
Maximum Green (s)	36.3	36.3		39.4		39.4		37.2	39.4			
Yellow Time (s)	3.2	3.2		3.0		3.0		3.4	3.0			
All-Red Time (s)	2.5	2.5		2.6		2.6		2.4	2.6			
Lost Time Adjust (s)	-0.7	-0.7	-0.5	-0.6	-1.0	-0.6	0.0	-0.8	-0.6	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	3.5	5.0	3.0	5.0	4.0	5.0	5.0	4.0	4.0	4.0
Lead/Lag	Lead	Lead		Lag		Lag			Lag			
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		2.0		2.0		3.0	2.0			
Recall Mode	Min	Min		None		None		C-Max	None			
Walk Time (s)	4.0	4.0						4.0				
Flash Dont Walk (s)	16.0	16.0						19.0				
Pedestrian Calls (#/hr)	0	0						0				
Act Effct Green (s)	17.7	17.7		23.7		23.7		73.6	97.3			
Actuated g/C Ratio	0.14	0.14		0.18		0.18		0.57	0.75			
v/c Ratio	0.36	0.66		0.49		0.78		0.22	0.12			



Lanes, Volumes, Timings  
 6: Manning Drive & NC 86 NB (S. Columbia St)

2/28/2014

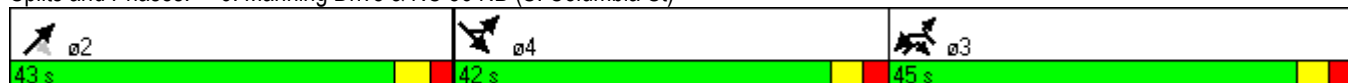


Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Control Delay	39.0	45.7		53.1		63.0		17.0	4.6			
Queue Delay	0.0	0.0		0.0		0.0		0.0	0.0			
Total Delay	39.0	45.7		53.1		63.0		17.0	4.6			
LOS	D	D		D		E		B	A			
Approach Delay		44.2						14.2				
Approach LOS		D						B				
Queue Length 50th (ft)	58	116		102		151		109	34			
Queue Length 95th (ft)	89	143		141		176		91	30			
Internal Link Dist (ft)		161			557			142			400	
Turn Bay Length (ft)	125					75			150			
Base Capacity (vph)	430	860		454		715		1717	1028			
Starvation Cap Reductn	0	0		0		0		0	0			
Spillback Cap Reductn	0	0		0		0		0	0			
Storage Cap Reductn	0	0		0		0		0	0			
Reduced v/c Ratio	0.17	0.32		0.29		0.46		0.22	0.11			

Intersection Summary

Area Type:	CBD
Cycle Length:	130
Actuated Cycle Length:	130
Offset:	105 (81%), Referenced to phase 2:NET, Start of Green
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.78
Intersection Signal Delay:	38.4
Intersection LOS:	D
Intersection Capacity Utilization:	52.2%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 6: Manning Drive & NC 86 NB (S. Columbia St)



Lanes, Volumes, Timings  
7: Westwood Drive & NC 86 (S. Columbia St)

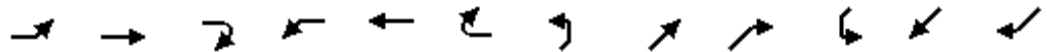
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕	↕	↕	↕	↕	↕	↕	↕
Volume (vph)	1	3	3	178	12	151	1	290	155	88	298	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	11	12	12	14	11	11	11
Grade (%)		-3%			-5%			5%				-5%
Storage Length (ft)	0		0	0		150	250		250	0		0
Storage Lanes	0		0	0		1	1		1	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.97			0.98		0.98		0.97	1.00	1.00	
Frt		0.944				0.850			0.850		0.999	
Flt Protected		0.992			0.955		0.950			0.950		
Satd. Flow (prot)	0	1723	0	0	1665	1482	1645	1731	1570	1656	1741	0
Flt Permitted		0.992			0.955		0.554			0.461		
Satd. Flow (perm)	0	1723	0	0	1623	1482	944	1731	1530	802	1741	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			35			25	
Link Distance (ft)		274			592			630			946	
Travel Time (s)		7.5			16.1			12.3			25.8	
Confl. Peds. (#/hr)			12	12			9		2	2		9
Peak Hour Factor	0.63	0.63	0.63	0.74	0.74	0.74	0.86	0.86	0.86	0.87	0.87	0.87
Heavy Vehicles (%)	2%	2%	2%	8%	8%	8%	7%	7%	7%	8%	8%	8%
Adj. Flow (vph)	2	5	5	241	16	204	1	337	180	101	343	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	12	0	0	257	204	1	337	180	101	345	0
Turn Type	Split			Split		pm+ov	Perm		pm+ov	pm+pt		
Protected Phases	4	4		3	3	1		2	3	1	6	
Permitted Phases						3	2		2	6		
Detector Phase	4	4		3	3	1	2	2	3	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	10.0	10.0	7.0	7.0	10.0	
Minimum Split (s)	26.0	26.0		13.0	13.0	13.0	28.3	28.3	13.0	13.0	22.0	
Total Split (s)	26.0	26.0	0.0	38.0	38.0	16.0	50.0	50.0	38.0	16.0	66.0	0.0
Total Split (%)	20.0%	20.0%	0.0%	29.2%	29.2%	12.3%	38.5%	38.5%	29.2%	12.3%	50.8%	0.0%
Maximum Green (s)	19.8	19.8		32.1	32.1	10.7	44.7	44.7	32.1	10.7	60.7	
Yellow Time (s)	3.3	3.3		3.5	3.5	3.6	3.6	3.6	3.5	3.6	3.6	
All-Red Time (s)	2.9	2.9		2.4	2.4	1.7	1.7	1.7	2.4	1.7	1.7	
Lost Time Adjust (s)	0.0	-1.2	-1.3	0.0	-0.9	-0.3	-0.3	-0.3	-0.9	-0.3	-0.3	-0.9
Total Lost Time (s)	6.2	5.0	2.7	5.9	5.0	5.0	5.0	5.0	5.0	5.0	5.0	3.1
Lead/Lag	Lag	Lag		Lead	Lead	Lead	Lag	Lag	Lead	Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	3.0	3.0	2.0	2.0	3.0	
Recall Mode	None	None		None	None	None	C-Min	C-Min	None	None	C-Min	
Walk Time (s)	4.0	4.0					4.0	4.0				
Flash Dont Walk (s)	13.0	13.0					19.0	19.0				
Pedestrian Calls (#/hr)	0	0					0	0				
Act Effct Green (s)		8.2			25.4	36.9	75.8	75.8	101.2	89.3	89.3	
Actuated g/C Ratio		0.06			0.20	0.28	0.58	0.58	0.78	0.69	0.69	

Lanes, Volumes, Timings  
 7: Westwood Drive & NC 86 (S. Columbia St)

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
v/c Ratio		0.11			0.79	0.48	0.00	0.33	0.15	0.17	0.29	
Control Delay		59.9			66.3	35.5	19.0	18.2	3.8	7.3	7.7	
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		59.9			66.3	35.5	19.0	18.2	3.8	7.3	7.7	
LOS		E			E	D	B	B	A	A	A	
Approach Delay		59.9			52.6			13.2			7.6	
Approach LOS		E			D			B			A	
Queue Length 50th (ft)		10			208	142	0	121	16	16	61	
Queue Length 95th (ft)		21			222	122	4	267	61	47	142	
Internal Link Dist (ft)		194			512			550			866	
Turn Bay Length (ft)						150	250		250			
Base Capacity (vph)		278			426	450	551	1009	1293	623	1195	
Starvation Cap Reductn		0			0	0	0	0	0	0	0	
Spillback Cap Reductn		0			0	0	0	0	0	0	0	
Storage Cap Reductn		0			0	0	0	0	0	0	0	
Reduced v/c Ratio		0.04			0.60	0.45	0.00	0.33	0.14	0.16	0.29	

Intersection Summary

Area Type:	Other
Cycle Length:	130
Actuated Cycle Length:	130
Offset:	106 (82%), Referenced to phase 2:NETL and 6:SWTL, Start of Green
Natural Cycle:	85
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.79
Intersection Signal Delay:	24.5
Intersection LOS:	C
Intersection Capacity Utilization	54.7%
ICU Level of Service	A
Analysis Period (min)	15

Splits and Phases: 7: Westwood Drive & NC 86 (S. Columbia St)

ø1	ø2	ø3	ø4
16 s	50 s	38 s	26 s
ø6			
66 s			

Lanes, Volumes, Timings  
8: US 15-501 Bypass WB Off Ramp & US 15-501

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↶	↷	↶	↶	↶	↶		↶	↶
Volume (vph)	0	0	0	674	10	70	199	447	0	0	370	174
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	275		275	150		0	0		0
Storage Lanes	0		0	1		1	1		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	*0.56	1.00	1.00	0.95	1.00
Ped Bike Factor							1.00					0.98
Frt						0.850						0.850
Flt Protected				0.950	0.954		0.950					
Satd. Flow (prot)	0	0	0	1649	1656	1553	1671	1970	0	0	3374	1509
Flt Permitted				0.950	0.954		0.442					
Satd. Flow (perm)	0	0	0	1649	1656	1553	777	1970	0	0	3374	1476
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			35			35				35
Link Distance (ft)		424			893			596				306
Travel Time (s)		9.6			17.4			11.6				6.0
Confl. Peds. (#/hr)							1		2	2		1
Peak Hour Factor	1.00	1.00	1.00	0.97	0.97	0.97	0.84	0.84	1.00	1.00	0.91	0.91
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	8%	8%	8%	7%	7%	7%
Adj. Flow (vph)	0	0	0	695	10	72	237	532	0	0	407	191
Shared Lane Traffic (%)				49%								
Lane Group Flow (vph)	0	0	0	354	351	72	237	532	0	0	407	191
Turn Type				Perm		Perm	pm+pt					Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				7.0	7.0	7.0	7.0	10.0			10.0	10.0
Minimum Split (s)				20.0	20.0	20.0	13.0	20.0			20.0	20.0
Total Split (s)	0.0	0.0	0.0	56.0	56.0	56.0	29.0	64.0	0.0	0.0	35.0	35.0
Total Split (%)	0.0%	0.0%	0.0%	46.7%	46.7%	46.7%	24.2%	53.3%	0.0%	0.0%	29.2%	29.2%
Maximum Green (s)				50.2	50.2	50.2	23.2	58.2			29.0	29.0
Yellow Time (s)				3.7	3.7	3.7	3.0	3.7			4.0	4.0
All-Red Time (s)				2.1	2.1	2.1	2.8	2.1			2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	-0.8	-0.8	-0.8	-0.8	-0.8	0.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0	3.0	5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Recall Mode				None	None	None	None	C-Max			C-Max	C-Max
Act Effct Green (s)				34.2	34.2	34.2	75.8	75.8			56.7	56.7
Actuated g/C Ratio				0.28	0.28	0.28	0.63	0.63			0.47	0.47
v/c Ratio				0.75	0.75	0.16	0.40	0.43			0.26	0.27
Control Delay				48.7	48.1	30.3	8.5	9.0			22.1	24.1
Queue Delay				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay				48.7	48.1	30.3	8.5	9.0			22.1	24.1
LOS				D	D	C	A	A			C	C

Lanes, Volumes, Timings  
 8: US 15-501 Bypass WB Off Ramp & US 15-501

2/28/2014

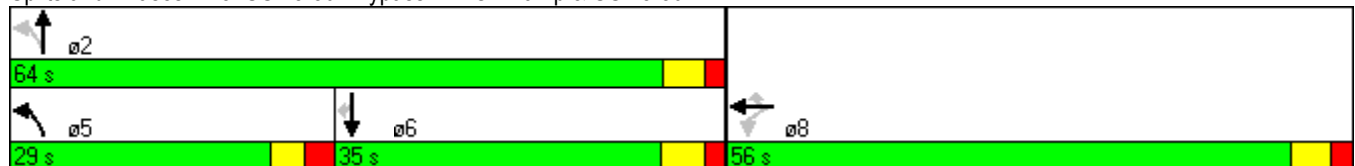


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay					46.7			8.8			22.8	
Approach LOS					D			A			C	
Queue Length 50th (ft)				263	260	42	51	157			96	87
Queue Length 95th (ft)				331	327	69	124	266			172	184
Internal Link Dist (ft)		344			813			516			226	
Turn Bay Length (ft)				275		275	150					
Base Capacity (vph)				701	704	660	670	1245			1594	697
Starvation Cap Reductn				0	0	0	0	0			0	0
Spillback Cap Reductn				0	0	0	0	0			0	0
Storage Cap Reductn				0	0	0	0	0			0	0
Reduced v/c Ratio				0.50	0.50	0.11	0.35	0.43			0.26	0.27

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 94 (78%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 55  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.75  
 Intersection Signal Delay: 26.5  
 Intersection LOS: C  
 Intersection Capacity Utilization 55.8%  
 ICU Level of Service B  
 Analysis Period (min) 15  
 \* User Entered Value

Splits and Phases: 8: US 15-501 Bypass WB Off Ramp & US 15-501



# Lanes, Volumes, Timings

## 9: NC 54 Bypass (Fordham Blvd) EB Off Ramp & US 15-501

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷	↸					↶↷		↶	↷↸	
Volume (vph)	145	0	134	0	0	0	0	498	0	84	929	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		250	0		0	0		0	150		0
Storage Lanes	1		1	0		0	0		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Fr <sub>t</sub>			0.850									
Fl <sub>t</sub> Protected	0.950	0.950								0.950		
Satd. Flow (prot)	1603	1603	1509	0	0	0	0	3471	0	1752	3505	0
Fl <sub>t</sub> Permitted	0.950	0.950								0.417		
Satd. Flow (perm)	1603	1603	1509	0	0	0	0	3471	0	769	3505	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		847			142			156			596	
Travel Time (s)		19.3			3.2			3.0			11.6	
Peak Hour Factor	0.93	0.93	0.93	1.00	1.00	1.00	1.00	0.95	1.00	0.94	0.94	1.00
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	4%	4%	4%	3%	3%	3%
Adj. Flow (vph)	156	0	144	0	0	0	0	524	0	89	988	0
Shared Lane Traffic (%)	50%											
Lane Group Flow (vph)	78	78	144	0	0	0	0	524	0	89	988	0
Turn Type	Perm		Perm							pm+pt		
Protected Phases		4						2		1	6	
Permitted Phases	4		4							6		
Detector Phase	4	4	4					2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0					10.0		7.0	10.0	
Minimum Split (s)	14.0	14.0	14.0					15.0		13.0	16.0	
Total Split (s)	35.0	35.0	35.0	0.0	0.0	0.0	0.0	66.0	0.0	19.0	85.0	0.0
Total Split (%)	29.2%	29.2%	29.2%	0.0%	0.0%	0.0%	0.0%	55.0%	0.0%	15.8%	70.8%	0.0%
Maximum Green (s)	28.8	28.8	28.8					61.3		13.5	79.1	
Yellow Time (s)	3.1	3.1	3.1					3.7		3.1	4.3	
All-Red Time (s)	3.1	3.1	3.1					1.0		2.4	1.6	
Lost Time Adjust (s)	-1.2	-1.2	-1.2	0.0	0.0	0.0	0.0	0.3	0.0	-0.5	-0.9	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.0	4.0	4.0	4.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0					3.0		3.0	3.0	
Recall Mode	None	None	None					C-Max		None	C-Max	
Act Effct Green (s)	18.1	18.1	18.1					78.9		91.9	91.9	
Actuated g/C Ratio	0.15	0.15	0.15					0.66		0.77	0.77	
v/c Ratio	0.32	0.32	0.63					0.23		0.14	0.37	
Control Delay	47.4	47.4	59.5					4.9		4.3	4.4	
Queue Delay	0.0	0.0	0.0					0.0		0.0	0.4	
Total Delay	47.4	47.4	59.5					4.9		4.3	4.7	
LOS	D	D	E					A		A	A	
Approach Delay		53.2						4.9			4.7	
Approach LOS		D						A			A	

Lanes, Volumes, Timings

9: NC 54 Bypass (Fordham Blvd) EB Off Ramp & US 15-501

2/28/2014

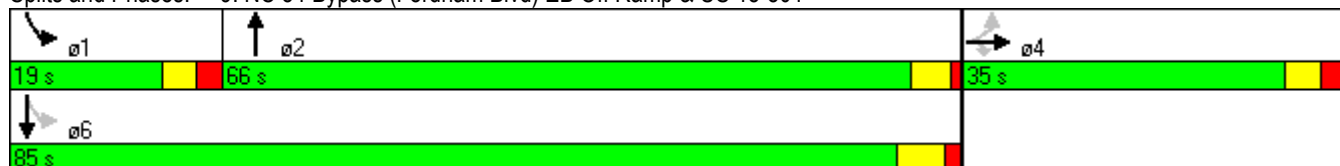


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)	57	57	106					35		5	32	
Queue Length 95th (ft)	101	101	164					67		43	179	
Internal Link Dist (ft)		767			62			76			516	
Turn Bay Length (ft)	250		250							150		
Base Capacity (vph)	401	401	377					2282		703	2684	
Starvation Cap Reductn	0	0	0					0		0	1031	
Spillback Cap Reductn	0	0	0					0		0	0	
Storage Cap Reductn	0	0	0					0		0	0	
Reduced v/c Ratio	0.19	0.19	0.38					0.23		0.13	0.60	

Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	37 (31%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle:	45
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.63
Intersection Signal Delay:	12.4
Intersection LOS:	B
Intersection Capacity Utilization	55.8%
ICU Level of Service	B
Analysis Period (min)	15

Splits and Phases: 9: NC 54 Bypass (Fordham Blvd) EB Off Ramp & US 15-501



Lanes, Volumes, Timings  
 10: SR 1994 (Culbreth Road) & US 15-501

2/28/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	71	33	29	12	25	280	17	818	13	301	813	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			-8%			-2%			2%	
Storage Length (ft)	0		75	425		350	125		75	550		250
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00						1.00					
Fr <sub>t</sub>			0.850			0.850			0.850			0.850
Fl <sub>t</sub> Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1710	1800	1530	1788	1882	1600	1736	3472	1553	1686	3372	1508
Fl <sub>t</sub> Permitted	0.525			0.732			0.278			0.222		
Satd. Flow (perm)	944	1800	1530	1378	1882	1600	508	3472	1553	394	3372	1508
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		526			543			533			635	
Travel Time (s)		10.2			10.6			8.1			9.6	
Confl. Peds. (#/hr)	1					1	1					1
Peak Hour Factor	0.88	0.88	0.88	0.91	0.91	0.91	0.94	0.94	0.94	0.93	0.93	0.93
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	5%	5%	5%	6%	6%	6%
Adj. Flow (vph)	81	38	33	13	27	308	18	870	14	324	874	110
Shared Lane Traffic (%)												
Lane Group Flow (vph)	81	38	33	13	27	308	18	870	14	324	874	110
Turn Type	pm+pt		Perm	Perm		pt+ov	Perm		Perm	pm+pt		pt+ov
Protected Phases	7	4			8	8 1		2		1	6	6 7
Permitted Phases	4		4	8			2		2	6		
Detector Phase	7	4	4	8	8	8 1	2	2	2	1	6	6 7
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		12.0	12.0	12.0	7.0	12.0	
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0		19.0	19.0	19.0	13.0	26.0	
Total Split (s)	14.0	37.0	37.0	23.0	23.0	55.0	51.0	51.0	51.0	32.0	83.0	97.0
Total Split (%)	11.7%	30.8%	30.8%	19.2%	19.2%	45.8%	42.5%	42.5%	42.5%	26.7%	69.2%	80.8%
Maximum Green (s)	7.6	30.6	30.6	16.1	16.1		44.8	44.8	44.8	26.9	76.8	
Yellow Time (s)	3.0	4.2	4.2	4.5	4.5		4.7	4.7	4.7	3.0	4.7	
All-Red Time (s)	3.4	2.2	2.2	2.4	2.4		1.5	1.5	1.5	2.1	1.5	
Lost Time Adjust (s)	-1.4	-1.4	-1.4	-1.9	-1.9	-1.9	-1.2	-1.2	-1.2	-0.1	-1.2	-1.4
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.8
Lead/Lag	Lead			Lag	Lag		Lead	Lead	Lead	Lag		
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None		C-Max	C-Max	C-Max	None	C-Max	
Walk Time (s)												7.0
Flash Dont Walk (s)												12.0
Pedestrian Calls (#/hr)												0
Act Effct Green (s)	26.1	26.1	26.1	12.2	12.2	39.2	51.9	51.9	51.9	83.9	83.9	98.0
Actuated g/C Ratio	0.22	0.22	0.22	0.10	0.10	0.33	0.43	0.43	0.43	0.70	0.70	0.82
v/c Ratio	0.31	0.10	0.10	0.09	0.14	0.59	0.08	0.58	0.02	0.57	0.37	0.09



Lanes, Volumes, Timings  
 10: SR 1994 (Culbreth Road) & US 15-501

2/28/2014

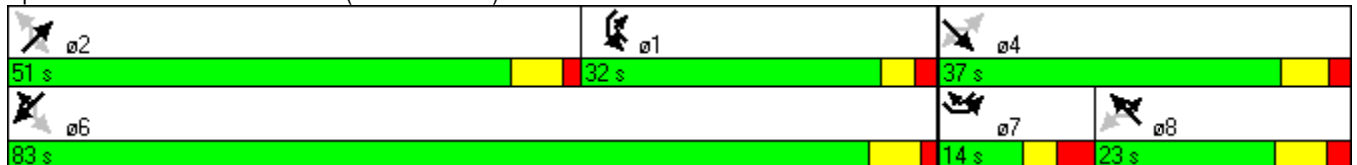


Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Control Delay	41.3	37.3	37.5	49.2	49.8	26.5	15.1	20.9	13.6	25.8	5.4	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.3	37.3	37.5	49.2	49.8	26.5	15.1	20.9	13.6	25.8	5.4	2.1
LOS	D	D	D	D	D	C	B	C	B	C	A	A
Approach Delay	39.5			29.2			20.7			10.2		
Approach LOS	D			C			C			B		
Queue Length 50th (ft)	52	24	21	9	19	149	6	240	5	91	66	12
Queue Length 95th (ft)	92	51	46	29	48	207	20	285	16	232	77	20
Internal Link Dist (ft)	446			463			453			555		
Turn Bay Length (ft)	75			425			350			250		
Base Capacity (vph)	262	480	408	207	282	600	220	1503	672	566	2359	1233
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.08	0.08	0.06	0.10	0.51	0.08	0.58	0.02	0.57	0.37	0.09

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 22 (18%), Referenced to phase 2:NETL and 6:SWTL, Start of Green  
 Natural Cycle: 70  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.59  
 Intersection Signal Delay: 17.8  
 Intersection Capacity Utilization 62.4%  
 Analysis Period (min) 15  
 Intersection LOS: B  
 ICU Level of Service B

Splits and Phases: 10: SR 1994 (Culbreth Road) & US 15-501



Lanes, Volumes, Timings  
11: Arlen Park Drive & US 15-501

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	58	4	9	29	2	0	17	818	13	7	774	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			-7%			-1%			0%	
Storage Length (ft)	75		0	200		0	275		300	275		325
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00						1.00					0.98
Frt		0.900							0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1694	1605	0	1746	1838	0	1728	3455	1546	1703	3406	1524
Flt Permitted	0.757			0.748			0.950			0.950		
Satd. Flow (perm)	1348	1605	0	1375	1838	0	1726	3455	1546	1703	3406	1488
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		387			478			2738			1792	
Travel Time (s)		10.6			13.0			41.5			27.2	
Confl. Peds. (#/hr)	1						1	1				1
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.95	0.95	0.95	0.92	0.92	0.92
Heavy Vehicles (%)	6%	6%	6%	7%	7%	7%	5%	5%	5%	6%	6%	6%
Adj. Flow (vph)	67	5	10	34	2	0	18	861	14	8	841	78
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	15	0	34	2	0	18	861	14	8	841	78
Turn Type	Perm			Perm			Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	14.0	14.0	7.0	14.0	14.0
Minimum Split (s)	60.0	60.0		15.0	15.0		14.0	21.0	21.0	13.0	25.0	25.0
Total Split (s)	60.0	60.0	0.0	60.0	60.0	0.0	14.0	47.0	47.0	13.0	46.0	46.0
Total Split (%)	50.0%	50.0%	0.0%	50.0%	50.0%	0.0%	11.7%	39.2%	39.2%	10.8%	38.3%	38.3%
Maximum Green (s)	53.4	53.4		52.9	52.9		7.4	40.4	40.4	7.1	39.4	39.4
Yellow Time (s)	3.2	3.2		3.8	3.8		3.0	4.6	4.6	3.0	4.6	4.6
All-Red Time (s)	3.4	3.4		3.3	3.3		3.6	2.0	2.0	2.9	2.0	2.0
Lost Time Adjust (s)	-1.6	-1.6	0.0	-2.1	-2.1	-1.2	-1.6	-1.6	-1.6	-0.9	-1.6	-1.6
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	2.8	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag							Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	C-Max
Walk Time (s)	4.0	4.0									7.0	7.0
Flash Dont Walk (s)	26.0	26.0									10.0	10.0
Pedestrian Calls (#/hr)	0	0									0	0
Act Effct Green (s)	13.2	13.2		13.3	13.3		8.8	97.9	97.9	8.0	95.0	95.0
Actuated g/C Ratio	0.11	0.11		0.11	0.11		0.07	0.82	0.82	0.07	0.79	0.79
v/c Ratio	0.45	0.09		0.22	0.01		0.14	0.31	0.01	0.07	0.31	0.07

Lanes, Volumes, Timings  
 11: Arlen Park Drive & US 15-501

2/28/2014

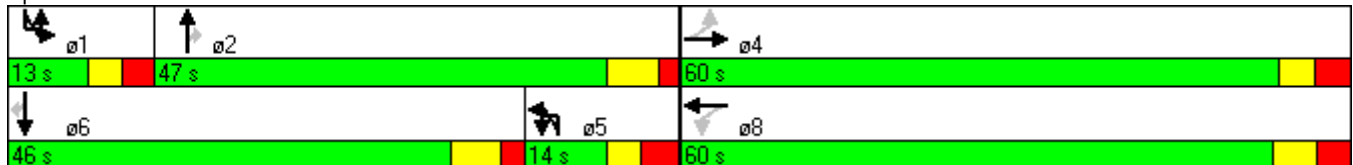


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	58.8	46.8		50.6	44.5		45.4	3.2	3.7	54.4	4.7	2.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.8	46.8		50.6	44.5		45.4	3.2	3.7	54.4	4.7	2.7
LOS	E	D		D	D		D	A	A	D	A	A
Approach Delay		56.6			50.3			4.1			5.0	
Approach LOS		E			D			A			A	
Queue Length 50th (ft)	49	11		25	1		13	46	1	6	97	12
Queue Length 95th (ft)	88	29		53	9		m32	123	m7	m13	234	29
Internal Link Dist (ft)		307			398			2658			1712	
Turn Bay Length (ft)	75			200			275		300	275		325
Base Capacity (vph)	618	736		630	842		130	2819	1261	115	2695	1178
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.02		0.05	0.00		0.14	0.31	0.01	0.07	0.31	0.07

Intersection Summary
















Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 117 (98%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 100  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.45  
 Intersection Signal Delay: 7.6  
 Intersection Capacity Utilization 40.8%  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 11: Arlen Park Drive & US 15-501



Lanes, Volumes, Timings  
12: US 15-501 & Market St

2/28/2014

								
Lane Group	NBU	NBL	NBT	SBU	SBT	SBR	SEL	SER
Lane Configurations								
Volume (vph)	22	49	630	24	604	190	207	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)			-3%		4%		-3%	
Storage Length (ft)		275		250		300	0	150
Storage Lanes		1		1		1	1	1
Taper Length (ft)		25		25		25	25	25
Lane Util. Factor	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Ped Bike Factor							1.00	
Frt						0.850		0.850
Flt Protected		0.950		0.950			0.950	
Satd. Flow (prot)	0	1796	3592	1717	3435	1537	1796	1607
Flt Permitted		0.950		0.385			0.950	
Satd. Flow (perm)	0	1796	3592	696	3435	1537	1791	1607
Right Turn on Red						No		No
Satd. Flow (RTOR)								
Link Speed (mph)			45		45		25	
Link Distance (ft)			949		2738		456	
Travel Time (s)			14.4		41.5		12.4	
Confl. Peds. (#/hr)							4	
Peak Hour Factor	0.90	0.90	0.90	0.92	0.92	0.92	0.69	0.69
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%
Adj. Flow (vph)	24	54	700	26	657	207	300	70
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	78	700	26	657	207	300	70
Turn Type	Prot	Prot		Perm		pm+ov		pm+ov
Protected Phases	5!	5	2		6	4	4	5!
Permitted Phases				6		6		4
Detector Phase	5	5	2	6	6	4	4	5
Switch Phase								
Minimum Initial (s)	7.0	7.0	14.0	14.0	14.0	7.0	7.0	7.0
Minimum Split (s)	13.0	13.0	21.0	20.0	20.0	14.0	14.0	13.0
Total Split (s)	21.0	21.0	72.0	51.0	51.0	48.0	48.0	21.0
Total Split (%)	17.5%	17.5%	60.0%	42.5%	42.5%	40.0%	40.0%	17.5%
Maximum Green (s)	15.2	15.2	65.6	45.0	45.0	41.9	41.9	15.2
Yellow Time (s)	3.0	3.0	5.0	4.6	4.6	3.0	3.0	3.0
All-Red Time (s)	2.8	2.8	1.4	1.4	1.4	3.1	3.1	2.8
Lost Time Adjust (s)	0.0	-0.8	-1.4	-1.0	-1.0	-1.1	-1.1	-0.8
Total Lost Time (s)	5.8	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead		Lag	Lag			Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes			Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Max	C-Max	C-Max	None	None	None
Act Effct Green (s)		11.4	83.1	66.7	66.7	98.6	26.9	43.3
Actuated g/C Ratio		0.10	0.69	0.56	0.56	0.82	0.22	0.36
v/c Ratio		0.46	0.28	0.07	0.34	0.16	0.75	0.12
Control Delay		59.2	8.1	5.3	6.7	1.5	54.4	23.4
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		59.2	8.1	5.3	6.7	1.5	54.4	23.4

Lanes, Volumes, Timings  
 12: US 15-501 & Market St

2/28/2014

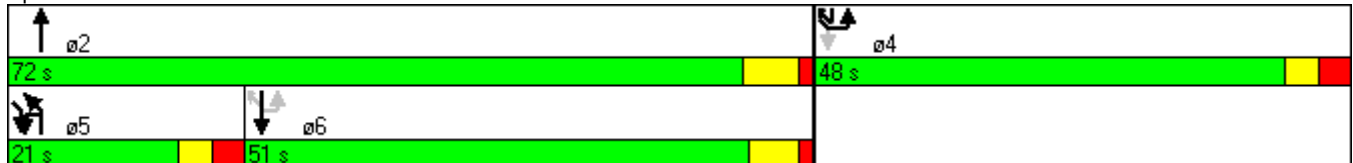


Lane Group	NBU	NBL	NBT	SBU	SBT	SBR	SEL	SER
LOS		E	A	A	A	A	D	C
Approach Delay			13.2		5.5		48.6	
Approach LOS			B		A		D	
Queue Length 50th (ft)		58	97	5	62	9	218	36
Queue Length 95th (ft)		106	160	9	149	30	208	43
Internal Link Dist (ft)			869		2658		376	
Turn Bay Length (ft)		275		250		300		150
Base Capacity (vph)		239	2488	387	1909	1452	644	641
Starvation Cap Reductn		0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0	0	0
Reduced v/c Ratio		0.33	0.28	0.07	0.34	0.14	0.47	0.11

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 4 (3%), Referenced to phase 2:NBT and 6:SBTU, Start of Green  
 Natural Cycle: 50  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.75  
 Intersection Signal Delay: 16.2  
 Intersection LOS: B  
 Intersection Capacity Utilization 53.0%  
 ICU Level of Service A  
 Analysis Period (min) 15  
 ! Phase conflict between lane groups.

Splits and Phases: 12: US 15-501 & Market St



Lanes, Volumes, Timings  
 14: Dogwood Acres Dr & US 15-501

2/28/2014



Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Volume (vph)	22	9	8	676	3	638	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Grade (%)	-1%			-4%		4%	
Storage Length (ft)	0	0	300		275		0
Storage Lanes	1	0	1		1		0
Taper Length (ft)	25	25	25		25		25
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.95	0.95
Ped Bike Factor	1.00						
Frt	0.961					0.996	
Flt Protected	0.966		0.950		0.950		
Satd. Flow (prot)	1738	0	1753	3507	1701	3388	0
Flt Permitted	0.966		0.392		0.370		
Satd. Flow (perm)	1736	0	724	3507	662	3388	0
Right Turn on Red	No						No
Satd. Flow (RTOR)							
Link Speed (mph)	25			45		45	
Link Distance (ft)	1150			899		1381	
Travel Time (s)	31.4			13.6		20.9	
Confl. Peds. (#/hr)	1						
Peak Hour Factor	0.88	0.88	0.91	0.91	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	5%	5%	4%	4%	4%
Adj. Flow (vph)	25	10	9	743	3	665	19
Shared Lane Traffic (%)							
Lane Group Flow (vph)	35	0	9	743	3	684	0
Turn Type	Perm			Perm			
Protected Phases	4			2		6	
Permitted Phases			2		6		
Detector Phase	4		2	2	6	6	
Switch Phase							
Minimum Initial (s)	7.0		12.0	12.0	12.0	12.0	
Minimum Split (s)	13.0		19.0	19.0	19.0	19.0	
Total Split (s)	25.0	0.0	90.0	90.0	90.0	90.0	0.0
Total Split (%)	21.7%	0.0%	78.3%	78.3%	78.3%	78.3%	0.0%
Maximum Green (s)	19.2		83.8	83.8	83.9	83.9	
Yellow Time (s)	3.0		4.9	4.9	4.3	4.3	
All-Red Time (s)	2.8		1.3	1.3	1.8	1.8	
Lost Time Adjust (s)	-0.8	0.0	-1.2	-1.2	-1.1	-1.1	0.0
Total Lost Time (s)	5.0	4.0	5.0	5.0	5.0	5.0	4.0
Lead/Lag							
Lead-Lag Optimize?							
Vehicle Extension (s)	2.0		6.0	6.0	6.0	6.0	
Recall Mode	None		Min	Min	Min	Min	
Act Effct Green (s)	8.2		40.0	40.0	40.0	40.0	
Actuated g/C Ratio	0.18		0.88	0.88	0.88	0.88	
v/c Ratio	0.11		0.01	0.24	0.01	0.23	
Control Delay	21.7		2.5	2.1	2.7	2.1	
Queue Delay	0.0		0.0	0.0	0.0	0.0	
Total Delay	21.7		2.5	2.1	2.7	2.1	

Lanes, Volumes, Timings  
 14: Dogwood Acres Dr & US 15-501

2/28/2014



Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
LOS	C		A	A	A	A	
Approach Delay	21.7			2.1		2.1	
Approach LOS	C			A		A	
Queue Length 50th (ft)	7		0	0	0	0	
Queue Length 95th (ft)	33		4	59	2	55	
Internal Link Dist (ft)	1070			819		1301	
Turn Bay Length (ft)			300		275		
Base Capacity (vph)	803		724	3507	662	3388	
Starvation Cap Reductn	0		0	0	0	0	
Spillback Cap Reductn	0		0	0	0	0	
Storage Cap Reductn	0		0	0	0	0	
Reduced v/c Ratio	0.04		0.01	0.21	0.00	0.20	

Intersection Summary

























Area Type:	Other
Cycle Length:	115
Actuated Cycle Length:	45.6
Natural Cycle:	40
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.24
Intersection Signal Delay:	2.6
Intersection LOS:	A
Intersection Capacity Utilization:	32.9%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 14: Dogwood Acres Dr & US 15-501



Lanes, Volumes, Timings  
15: Smith Level Road & US 15-501

2/28/2014

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	30	46	181	78	37	62	226	650	27	45	600	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			1%			-1%				1%
Storage Length (ft)	125		175	150		150	500		250	275		100
Storage Lanes	1		2	2		1	2		1	2		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	0.88	0.97	1.00	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Ped Bike Factor			0.98	1.00					0.99	1.00		
Fr <sub>t</sub>			0.850			0.850			0.850			0.850
Fl <sub>t</sub> Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1718	1809	2706	3383	1835	1560	3320	3423	1531	3287	3389	1516
Fl <sub>t</sub> Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1718	1809	2645	3367	1835	1560	3320	3423	1512	3279	3389	1516
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			25			45				45
Link Distance (ft)		800			667			1107				1252
Travel Time (s)		12.1			18.2			16.8				19.0
Confl. Peds. (#/hr)			1	1					1	1		
Peak Hour Factor	0.85	0.85	0.85	0.83	0.83	0.83	0.82	0.82	0.82	0.93	0.93	0.93
Heavy Vehicles (%)	4%	4%	4%	3%	3%	3%	6%	6%	6%	6%	6%	6%
Adj. Flow (vph)	35	54	213	94	45	75	276	793	33	48	645	31
Shared Lane Traffic (%)												
Lane Group Flow (vph)	35	54	213	94	45	75	276	793	33	48	645	31
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0	7.0	7.0	12.0	7.0
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0	14.0	14.0	19.0	14.0	14.0	19.0	14.0
Total Split (s)	20.0	25.0	15.0	20.0	25.0	15.0	15.0	90.0	20.0	15.0	90.0	20.0
Total Split (%)	13.3%	16.7%	10.0%	13.3%	16.7%	10.0%	10.0%	60.0%	13.3%	10.0%	60.0%	13.3%
Maximum Green (s)	13.9	18.8	8.3	13.6	18.4	8.7	8.3	83.2	13.6	8.7	83.3	13.9
Yellow Time (s)	3.0	4.0	3.3	3.1	3.8	3.2	3.3	4.7	3.1	3.2	4.5	3.0
All-Red Time (s)	3.1	2.2	3.4	3.3	2.8	3.1	3.4	2.1	3.3	3.1	2.2	3.1
Lost Time Adjust (s)	-1.1	-1.2	-1.7	-1.4	-1.6	-1.3	-1.7	-1.8	-1.4	-1.3	-1.7	-1.1
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	6.0	2.0	2.0	6.0	2.0
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	None
Act Effct Green (s)	11.9	9.7	17.6	9.7	10.2	17.1	11.0	39.8	44.4	9.2	31.0	48.4
Actuated g/C Ratio	0.16	0.13	0.24	0.13	0.14	0.23	0.15	0.54	0.61	0.13	0.42	0.66
v/c Ratio	0.13	0.23	0.33	0.21	0.18	0.21	0.55	0.43	0.04	0.12	0.45	0.03
Control Delay	36.2	37.5	24.5	36.1	36.1	26.5	39.6	16.4	6.9	36.3	17.7	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.2	37.5	24.5	36.1	36.1	26.5	39.6	16.4	6.9	36.3	17.7	7.3



Lanes, Volumes, Timings  
 15: Smith Level Road & US 15-501

2/28/2014



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
LOS	D	D	C	D	D	C	D	B	A	D	B	A
Approach Delay		28.2			32.7			21.9			18.5	
Approach LOS		C			C			C			B	
Queue Length 50th (ft)	16	24	43	21	20	27	65	147	6	10	118	6
Queue Length 95th (ft)	46	63	84	46	53	64	#122	192	16	31	177	18
Internal Link Dist (ft)		720			587			1027			1172	
Turn Bay Length (ft)	125		175	150		150	500		250	275		100
Base Capacity (vph)	419	544	644	763	552	402	499	3356	1009	494	3323	1124
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.10	0.33	0.12	0.08	0.19	0.55	0.24	0.03	0.10	0.19	0.03

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 73.3  
 Natural Cycle: 65  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.55  
 Intersection Signal Delay: 22.6  
 Intersection LOS: C  
 Intersection Capacity Utilization 45.2%  
 ICU Level of Service A  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 15: Smith Level Road & US 15-501

ø1	ø2	ø3	ø4
15 s	90 s	20 s	25 s
ø5	ø6	ø7	ø8
15 s	90 s	20 s	25 s

Lanes, Volumes, Timings

17: Merritt Mill Road / NC 54 WB Off Ramp & Greensboro Street

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖↖	↖		↖	↗↗	↗	↖	↗↗	↗
Volume (vph)	0	0	0	187	76	160	121	253	188	35	418	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			-3%			2%			-3%	
Storage Length (ft)	0		0	475		0	225		250	250		0
Storage Lanes	0		0	1		0	1		1	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor									0.98	1.00		
Fr <sub>t</sub>					0.898				0.850			0.850
Fl <sub>t</sub> Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	0	0	3291	1604	0	1718	3436	1537	1745	3490	1561
Fl <sub>t</sub> Permitted				0.950			0.410			0.584		
Satd. Flow (perm)	0	0	0	3291	1604	0	742	3436	1505	1072	3490	1561
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			35			35			35	
Link Distance (ft)		467			767			384			607	
Travel Time (s)		10.6			14.9			7.5			11.8	
Confl. Peds. (#/hr)	2								1	1		
Peak Hour Factor	1.00	1.00	1.00	0.83	0.83	0.83	0.93	0.93	0.93	0.78	0.78	0.78
Heavy Vehicles (%)	2%	2%	2%	8%	8%	8%	4%	4%	4%	5%	5%	5%
Adj. Flow (vph)	0	0	0	225	92	193	130	272	202	45	536	54
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	225	285	0	130	272	202	45	536	54
Turn Type				Perm			pm+pt		Perm	Perm		Perm
Protected Phases					8		5	2			6	
Permitted Phases				8			2		2	6		6
Detector Phase				8	8		5	2	2	6	6	6
Switch Phase												
Minimum Initial (s)				7.0	7.0		7.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)				14.0	14.0		13.0	16.0	16.0	16.0	16.0	16.0
Total Split (s)	0.0	0.0	0.0	49.0	49.0	0.0	19.0	61.0	61.0	42.0	42.0	42.0
Total Split (%)	0.0%	0.0%	0.0%	44.5%	44.5%	0.0%	17.3%	55.5%	55.5%	38.2%	38.2%	38.2%
Maximum Green (s)				42.5	42.5		13.4	55.0	55.0	36.0	36.0	36.0
Yellow Time (s)				4.2	4.2		3.0	3.9	3.9	3.9	3.9	3.9
All-Red Time (s)				2.3	2.3		2.6	2.1	2.1	2.1	2.1	2.1
Lost Time Adjust (s)	0.0	0.0	0.0	-1.5	-1.5	0.0	-0.6	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.0	4.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag							Lag			Lead	Lead	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode				None	None		None	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)				27.3	27.3		72.7	72.7	72.7	53.7	53.7	53.7
Actuated g/C Ratio				0.25	0.25		0.66	0.66	0.66	0.49	0.49	0.49
v/c Ratio				0.28	0.72		0.21	0.12	0.20	0.09	0.31	0.07
Control Delay				32.8	47.3		4.4	2.2	3.2	18.5	18.9	18.0
Queue Delay				0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay				32.8	47.3		4.4	2.2	3.2	18.5	18.9	18.0

Lanes, Volumes, Timings

17: Merritt Mill Road / NC 54 WB Off Ramp & Greensboro Street

2/28/2014

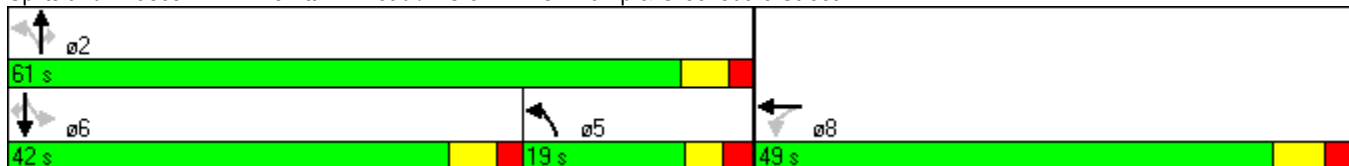


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS				C	D		A	A	A	B	B	B
Approach Delay					40.9			3.0			18.8	
Approach LOS					D			A			B	
Queue Length 50th (ft)				65	184		4	4	7	16	116	20
Queue Length 95th (ft)				80	224		33	9	15	38	154	42
Internal Link Dist (ft)		387			687			304			527	
Turn Bay Length (ft)				475			225		250	250		
Base Capacity (vph)				1316	642		614	2270	995	523	1703	762
Starvation Cap Reductn				0	0		0	0	0	0	0	0
Spillback Cap Reductn				0	0		0	0	0	0	0	0
Storage Cap Reductn				0	0		0	0	0	0	0	0
Reduced v/c Ratio				0.17	0.44		0.21	0.12	0.20	0.09	0.31	0.07

Intersection Summary

Area Type:	Other
Cycle Length:	110
Actuated Cycle Length:	110
Offset:	44 (40%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle:	50
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.72
Intersection Signal Delay:	19.8
Intersection LOS:	B
Intersection Capacity Utilization:	48.0%
ICU Level of Service:	A
Analysis Period (min):	15












Splits and Phases: 17: Merritt Mill Road / NC 54 WB Off Ramp & Greensboro Street



Lanes, Volumes, Timings

18: Smith Level Road & NC 54 Bypass (Fordham Blvd) EB Off Ramp

2/28/2014

											
Lane Group	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	SEL2	SEL	SER
Lane Configurations				↑↑	↑	↑	↑↑		↑	↓	↑
Volume (vph)	0	0	0	429	120	225	385	0	90	0	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)	0%			1%			-2%			-3%	
Storage Length (ft)	0	0	0		125	175		0		250	250
Storage Lanes	0	0	0		1	1		0		1	1
Taper Length (ft)	25	25	25		25	25		25		25	25
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00
Ped Bike Factor					0.97	1.00					0.99
Frt					0.850						0.850
Flt Protected						0.950			0.950	0.950	
Satd. Flow (prot)	0	0	0	3357	1502	1704	3408	0	1627	1627	1532
Flt Permitted						0.442			0.950	0.950	
Satd. Flow (perm)	0	0	0	3357	1461	791	3408	0	1627	1627	1512
Right Turn on Red					No			No			No
Satd. Flow (RTOR)											
Link Speed (mph)	30			35			35			35	
Link Distance (ft)	706			414			384			490	
Travel Time (s)	16.0			8.1			7.5			9.5	
Confl. Peds. (#/hr)			1		2	2		1			1
Peak Hour Factor	1.00	1.00	1.00	0.95	0.95	0.82	0.82	1.00	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Adj. Flow (vph)	0	0	0	452	126	274	470	0	95	0	141
Shared Lane Traffic (%)									50%		
Lane Group Flow (vph)	0	0	0	452	126	274	470	0	47	48	141
Turn Type					Perm	pm+pt			Perm		Perm
Protected Phases				2		1	6			4	
Permitted Phases					2	6			4		4
Detector Phase				2	2	1	6		4	4	4
Switch Phase											
Minimum Initial (s)				10.0	10.0	8.0	10.0		7.0	7.0	7.0
Minimum Split (s)				25.0	25.0	15.0	20.0		14.0	14.0	14.0
Total Split (s)	0.0	0.0	0.0	43.0	43.0	33.0	76.0	0.0	34.0	34.0	34.0
Total Split (%)	0.0%	0.0%	0.0%	39.1%	39.1%	30.0%	69.1%	0.0%	30.9%	30.9%	30.9%
Maximum Green (s)				33.2	33.2	26.7	66.1		27.7	27.7	27.7
Yellow Time (s)				3.8	3.8	3.0	3.9		4.0	4.0	4.0
All-Red Time (s)				6.0	6.0	3.3	6.0		2.3	2.3	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	-4.8	-4.8	-1.3	-4.9	0.0	-1.3	-1.3	-1.3
Total Lost Time (s)	4.0	4.0	4.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0	5.0
Lead/Lag				Lag	Lag	Lead					
Lead-Lag Optimize?				Yes	Yes	Yes					
Vehicle Extension (s)				3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode				C-Max	C-Max	None	C-Max		None	None	None
Walk Time (s)				7.0	7.0						
Flash Dont Walk (s)				8.0	8.0						
Pedestrian Calls (#/hr)				0	0						
Act Effct Green (s)				65.7	65.7	83.1	83.1		16.9	16.9	16.9
Actuated g/C Ratio				0.60	0.60	0.76	0.76		0.15	0.15	0.15
v/c Ratio				0.23	0.14	0.39	0.18		0.19	0.19	0.61

Lanes, Volumes, Timings

18: Smith Level Road & NC 54 Bypass (Fordham Blvd) EB Off Ramp

2/28/2014



Lane Group	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	SEL2	SEL	SER
Control Delay				11.8	12.0	5.0	1.3		40.2	40.3	53.8
Queue Delay				0.0	0.0	0.1	0.0		0.0	0.0	0.0
Total Delay				11.8	12.0	5.0	1.3		40.2	40.3	53.8
LOS				B	B	A	A		D	D	D
Approach Delay				11.8			2.7			48.4	
Approach LOS				B			A			D	
Queue Length 50th (ft)				72	36	19	7		30	31	94
Queue Length 95th (ft)				127	83	44	9		63	64	151
Internal Link Dist (ft)	626			334			304			410	
Turn Bay Length (ft)					125	175			250	250	250
Base Capacity (vph)				2006	873	830	2575		429	429	399
Starvation Cap Reductn				0	0	49	0		0	0	0
Spillback Cap Reductn				0	0	0	0		0	0	0
Storage Cap Reductn				0	0	0	0		0	0	0
Reduced v/c Ratio				0.23	0.14	0.35	0.18		0.11	0.11	0.35

Intersection Summary

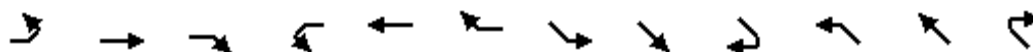
Area Type:	Other
Cycle Length:	110
Actuated Cycle Length:	110
Offset:	44 (40%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle:	55
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.61
Intersection Signal Delay:	13.0
Intersection LOS:	B
Intersection Capacity Utilization	43.5%
ICU Level of Service	A
Analysis Period (min)	15

Splits and Phases: 18: Smith Level Road & NC 54 Bypass (Fordham Blvd) EB Off Ramp



Lanes, Volumes, Timings  
 20: US 15-501 (Fordham Blvd) & Manning Drive

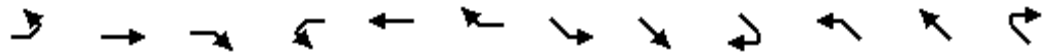
2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	99	1395	4	11	1382	438	606	2	101	14	3	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	9	12
Grade (%)		-5%			0%			-4%			0%	
Storage Length (ft)	400		0	200		1000	0		225	0		75
Storage Lanes	2		0	1		1	0		1	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00					0.99		0.99	
Frt						0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950				0.961	
Satd. Flow (prot)	3418	3524	0	1736	3471	1553	3502	1900	1615	0	1595	1568
Flt Permitted	0.950			0.950			0.950				0.961	
Satd. Flow (perm)	3418	*3811	0	1729	3471	1553	*3819	1900	1592	0	1578	1568
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			35			25	
Link Distance (ft)		579			1499			367			515	
Travel Time (s)		8.8			22.7			7.1			14.0	
Confl. Peds. (#/hr)			4	4					7	7		
Peak Hour Factor	0.86	0.86	0.86	0.91	0.91	0.91	0.86	0.86	0.86	0.77	0.77	0.77
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	2%	2%	2%	3%	3%	3%
Adj. Flow (vph)	115	1622	5	12	1519	481	705	2	117	18	4	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	115	1627	0	12	1519	481	705	2	117	0	22	23
Turn Type	Prot			Prot		pm+ov	Split		Free	Split		pm+ov
Protected Phases	5	2		1	6	4	4	4		3	3	1
Permitted Phases						6			Free			3
Detector Phase	5	2		1	6	4	4	4		3	3	1
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0	7.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	14.0	19.0		14.0	19.0	32.0	32.0	32.0		14.0	14.0	14.0
Total Split (s)	14.0	89.0	0.0	14.0	89.0	43.0	43.0	43.0	0.0	14.0	14.0	14.0
Total Split (%)	8.8%	55.6%	0.0%	8.8%	55.6%	26.9%	26.9%	26.9%	0.0%	8.8%	8.8%	8.8%
Maximum Green (s)	7.8	82.9		7.8	82.7	36.8	36.8	36.8		7.8	7.8	7.8
Yellow Time (s)	3.0	4.7		3.0	4.5	3.8	3.8	3.8		3.8	3.8	3.0
All-Red Time (s)	3.2	1.4		3.2	1.8	2.4	2.4	2.4		2.4	2.4	3.2
Lost Time Adjust (s)	-1.2	-1.1	0.0	-1.2	-1.3	-1.2	-1.2	-1.2	0.0	-2.5	-1.2	-1.2
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0	3.7	5.0	5.0
Lead/Lag	Lead	Lead		Lag	Lag	Lag	Lag	Lag		Lead	Lead	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	6.0		1.0	6.0	1.0	1.0	1.0		1.0	1.0	1.0
Recall Mode	None	C-Max		None	C-Max	None	None	None		None	None	None
Walk Time (s)						7.0	7.0	7.0				
Flash Dont Walk (s)						18.0	18.0	18.0				
Pedestrian Calls (#/hr)						0	0	0				
Act Effct Green (s)	8.8	89.6		8.7	84.2	130.1	43.9	43.9	160.0		8.4	16.8
Actuated g/C Ratio	0.06	0.56		0.05	0.53	0.81	0.27	0.27	1.00		0.05	0.10

Lanes, Volumes, Timings  
 20: US 15-501 (Fordham Blvd) & Manning Drive

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
v/c Ratio	0.61	0.82		0.13	0.83	0.38	0.73	0.00	0.07		0.26	0.14
Control Delay	88.2	34.4		54.5	21.0	2.1	59.0	46.5	0.1		80.9	63.4
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	88.2	34.4		54.5	21.0	2.1	59.0	46.5	0.1		80.9	63.4
LOS	F	C		D	C	A	E	D	A		F	E
Approach Delay		38.0			16.7			50.6			71.9	
Approach LOS		D			B			D			E	
Queue Length 50th (ft)	61	773		12	273	37	363	2	0		23	21
Queue Length 95th (ft)	93	812		m15	m333	m58	419	9	0		47	43
Internal Link Dist (ft)		499			1419			287			435	
Turn Bay Length (ft)	400			200		1000			225			75
Base Capacity (vph)	192	1973		98	1827	1263	961	522	1592		90	167
Starvation Cap Reductn	0	0		0	0	0	0	0	0		0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0		0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0		0	0
Reduced v/c Ratio	0.60	0.82		0.12	0.83	0.38	0.73	0.00	0.07		0.24	0.14

Intersection Summary

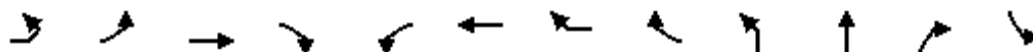
Area Type: Other  
 Cycle Length: 160  
 Actuated Cycle Length: 160  
 Offset: 15 (9%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.83  
 Intersection Signal Delay: 31.3      Intersection LOS: C  
 Intersection Capacity Utilization 75.0%      ICU Level of Service D  
 Analysis Period (min) 15  
 \* User Entered Value  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 20: US 15-501 (Fordham Blvd) & Manning Drive



Lanes, Volumes, Timings  
 21: Old Mason Farm Road & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL	NBT	NBR	SBL
Lane Configurations			↔		↗	↘			↖	↑↑	↗	↖
Volume (vph)	4	13	6	11	158	4	7	39	21	1859	133	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)			0%			3%				0%		
Storage Length (ft)		0		0	50		0		350		300	125
Storage Lanes		0		0	1		0		1		1	1
Taper Length (ft)		25		25	25		25		25		25	25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	*1.00	1.00	1.00
Ped Bike Factor						0.99						
Frt			0.957			0.862					0.850	
Flt Protected			0.976		0.950				0.950			0.950
Satd. Flow (prot)	0	0	1740	0	1743	1562	0	0	1770	3725	1583	1770
Flt Permitted			0.808		0.950				0.950			0.950
Satd. Flow (perm)	0	0	1440	0	1743	1562	0	0	1770	*3787	1583	1770
Right Turn on Red				No				No			No	
Satd. Flow (RTOR)												
Link Speed (mph)			30			35				45		
Link Distance (ft)			305			620				1499		
Travel Time (s)			6.9			12.1				22.7		
Confl. Peds. (#/hr)								1				
Peak Hour Factor	0.70	0.70	0.70	0.70	0.77	0.77	0.77	0.77	0.90	0.90	0.90	0.95
Adj. Flow (vph)	6	19	9	16	205	5	9	51	23	2066	148	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	50	0	205	65	0	0	23	2066	148	42
Turn Type	Perm	Perm			Split				Prot		pm+ov	Prot
Protected Phases			7		3	3			5	2	3	1
Permitted Phases	7	7									2	
Detector Phase	7	7	7		3	3			5	2	3	1
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0		7.0	7.0			7.0	12.0	7.0	7.0
Minimum Split (s)	13.0	13.0	13.0		36.0	36.0			14.0	33.0	36.0	15.0
Total Split (s)	13.0	13.0	13.0	0.0	25.0	25.0	0.0	0.0	15.0	94.0	25.0	15.0
Total Split (%)	8.1%	8.1%	8.1%	0.0%	15.6%	15.6%	0.0%	0.0%	9.4%	58.8%	15.6%	9.4%
Maximum Green (s)	5.8	5.8	5.8		18.4	18.4			8.0	87.8	18.4	9.1
Yellow Time (s)	3.0	3.0	3.0		3.6	3.6			3.0	4.6	3.6	3.0
All-Red Time (s)	4.2	4.2	4.2		3.0	3.0			4.0	1.6	3.0	2.9
Lost Time Adjust (s)	0.0	0.0	-2.2	-2.2	-1.6	-1.6	-1.6	-1.6	-2.0	-1.2	-1.6	-0.9
Total Lost Time (s)	7.2	7.2	5.0	1.8	5.0	5.0	2.4	2.4	5.0	5.0	5.0	5.0
Lead/Lag					Lead	Lead			Lead	Lag	Lead	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0			2.0	2.0	2.0	2.0
Recall Mode	None	None	None		None	None			None	C-Max	None	None
Walk Time (s)					4.0	4.0				7.0	4.0	
Flash Dont Walk (s)					25.0	25.0				16.0	25.0	
Pedestrian Calls (#/hr)					0	0				0	0	
Act Effct Green (s)			8.0		20.0	20.0			9.3	95.2	120.2	9.0
Actuated g/C Ratio			0.05		0.12	0.12			0.06	0.60	0.75	0.06
v/c Ratio			0.69		0.94	0.33			0.22	0.93	0.12	0.42
Control Delay			117.2		115.3	69.2			84.3	25.6	2.7	85.7



Lanes, Volumes, Timings  
 21: Old Mason Farm Road & US 15-501 (Fordham Blvd)

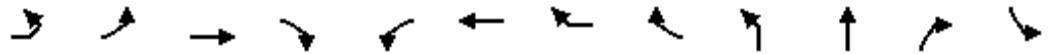
2/28/2014



Lane Group	SBT	SBR	SEL2	SEL	SER	SER2
Lane Configurations	↑↑	↑	↙	↘		
Volume (vph)	1631	10	53	12	30	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	0%			2%		
Storage Length (ft)		100		125	0	
Storage Lanes		1		1	0	
Taper Length (ft)		25		25	25	
Lane Util. Factor	*1.00	1.00	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt		0.850		0.901		
Flt Protected			0.950	0.983		
Satd. Flow (prot)	3725	1583	1664	1552	0	0
Flt Permitted			0.950	0.983		
Satd. Flow (perm)	*3771	1583	1664	1552	0	0
Right Turn on Red						No
Satd. Flow (RTOR)						
Link Speed (mph)	45			25		
Link Distance (ft)	1494			359		
Travel Time (s)	22.6			9.8		
Confl. Peds. (#/hr)						
Peak Hour Factor	0.95	0.95	0.72	0.72	0.72	0.72
Adj. Flow (vph)	1717	11	74	17	42	4
Shared Lane Traffic (%)			10%			
Lane Group Flow (vph)	1717	11	67	70	0	0
Turn Type		Perm	Split			
Protected Phases	6		4	4		
Permitted Phases		6				
Detector Phase	6	6	4	4		
Switch Phase						
Minimum Initial (s)	12.0	12.0	5.0	5.0		
Minimum Split (s)	25.0	25.0	13.0	13.0		
Total Split (s)	94.0	94.0	13.0	13.0	0.0	0.0
Total Split (%)	58.8%	58.8%	8.1%	8.1%	0.0%	0.0%
Maximum Green (s)	87.9	87.9	5.6	5.6		
Yellow Time (s)	4.4	4.4	3.0	3.0		
All-Red Time (s)	1.7	1.7	4.4	4.4		
Lost Time Adjust (s)	-1.1	-1.1	-2.4	-2.4	-2.4	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	1.6	4.0
Lead/Lag	Lag	Lag	Lag	Lag		
Lead-Lag Optimize?						
Vehicle Extension (s)	2.0	2.0	2.0	2.0		
Recall Mode	C-Max	C-Max	None	None		
Walk Time (s)	7.0	7.0				
Flash Dont Walk (s)	11.0	11.0				
Pedestrian Calls (#/hr)	0	0				
Act Effct Green (s)	97.9	97.9	8.0	8.0		
Actuated g/C Ratio	0.61	0.61	0.05	0.05		
v/c Ratio	0.75	0.01	0.81	0.90		
Control Delay	27.1	15.6	129.0	149.2		

Lanes, Volumes, Timings  
 21: Old Mason Farm Road & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL	NBT	NBR	SBL
Queue Delay			0.0		0.0	0.0			0.0	0.0	0.0	0.0
Total Delay			117.2		115.3	69.2			84.3	25.6	2.7	85.7
LOS			F		F	E			F	C	A	F
Approach Delay			117.2			104.2				24.7		
Approach LOS			F			F				C		
Queue Length 50th (ft)			53		216	63			22	698	24	43
Queue Length 95th (ft)			#82		#293	98			m28	#1229	m26	88
Internal Link Dist (ft)			225			540				1419		
Turn Bay Length (ft)					50				350		300	125
Base Capacity (vph)			72		218	195			111	2216	1189	111
Starvation Cap Reductn			0		0	0			0	0	0	0
Spillback Cap Reductn			0		0	0			0	0	0	0
Storage Cap Reductn			0		0	0			0	0	0	0
Reduced v/c Ratio			0.69		0.94	0.33			0.21	0.93	0.12	0.38

Intersection Summary

Area Type:	Other
Cycle Length:	160
Actuated Cycle Length:	160
Offset:	0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle:	150
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.94
Intersection Signal Delay:	35.5
Intersection LOS:	D
Intersection Capacity Utilization:	83.8%
ICU Level of Service:	E
Analysis Period (min):	15
* User Entered Value	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 21: Old Mason Farm Road & US 15-501 (Fordham Blvd)

ø1	ø2	ø3	ø4	ø7
15 s	94 s	25 s	13 s	13 s
ø5	ø6			
15 s	94 s			

Lanes, Volumes, Timings  
 21: Old Mason Farm Road & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	SBT	SBR	SEL2	SEL	SER	SER2
Queue Delay	0.0	0.0	0.0	0.0		
Total Delay	27.1	15.6	129.0	149.2		
LOS	C	B	F	F		
Approach Delay	28.4			139.3		
Approach LOS	C			F		
Queue Length 50th (ft)	708	5	74	77		
Queue Length 95th (ft)	818	15	#120	#132		
Internal Link Dist (ft)	1414			279		
Turn Bay Length (ft)		100	125	125		
Base Capacity (vph)	2278	968	83	78		
Starvation Cap Reductn	0	0	0	0		
Spillback Cap Reductn	0	0	0	0		
Storage Cap Reductn	0	0	0	0		
Reduced v/c Ratio	0.75	0.01	0.81	0.90		
<b>Intersection Summary</b>						

Lanes, Volumes, Timings  
 22: NC 54 WB On-Ramp & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↑↑			↑		↑↑	↑		↑↑	↑
Volume (vph)	0	0	675	0	0	386	0	1163	25	0	1307	153
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		450	0		0			200	0		375
Storage Lanes	0		1	0		1	0		1	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	0.88	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.865			0.850			0.850
Flt Protected												
Satd. Flow (prot)	0	0	2787	0	0	1611	0	3539	1583	0	3539	1583
Flt Permitted												
Satd. Flow (perm)	0	0	2787	0	0	1611	0	3539	1583	0	3539	1583
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)						201			8			67
Link Speed (mph)		30			25			45				45
Link Distance (ft)		694			685			1058				1301
Travel Time (s)		15.8			18.7			16.0				19.7
Peak Hour Factor	1.00	1.00	0.92	1.00	1.00	0.90	1.00	0.90	0.90	1.00	0.82	0.92
Adj. Flow (vph)	0	0	734	0	0	429	0	1292	28	0	1594	166
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	734	0	0	429	0	1292	28	0	1594	166
Turn Type			custom			Free			Free			Free
Protected Phases			4					2 4				6
Permitted Phases			4			Free			Free			Free
Detector Phase			4					2 4				6
Switch Phase												
Minimum Initial (s)			7.0									12.0
Minimum Split (s)			13.0									18.0
Total Split (s)	0.0	0.0	68.0	0.0	0.0	0.0	0.0	170.0	0.0	0.0	102.0	0.0
Total Split (%)	0.0%	0.0%	40.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	60.0%	0.0%
Maximum Green (s)			62.9									96.2
Yellow Time (s)			3.1									4.5
All-Red Time (s)			2.0									1.3
Lost Time Adjust (s)	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	-0.8	0.0	0.0	-0.8	0.0
Total Lost Time (s)	4.0	4.0	5.0	4.0	4.0	4.0	4.0	5.0	4.0	4.0	5.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)			3.0									6.0
Recall Mode			C-Max									Max
Act Effct Green (s)			63.0			170.0		170.0	170.0		97.0	170.0
Actuated g/C Ratio			0.37			1.00		1.00	1.00		0.57	1.00
v/c Ratio			0.71			0.27		0.37	0.02		0.79	0.10
Control Delay			50.3			0.4		0.3	0.0		32.2	0.1
Queue Delay			0.0			0.0		0.0	0.0		0.0	0.0
Total Delay			50.3			0.4		0.3	0.0		32.2	0.1
LOS			D			A		A	A		C	A
Approach Delay								0.3			29.2	
Approach LOS								A			C	
Queue Length 50th (ft)			397			0		0	0		710	0

Lane Group	ø2
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Fr <sub>t</sub>	
Fl <sub>t</sub> Protected	
Satd. Flow (prot)	
Fl <sub>t</sub> Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	12.0
Minimum Split (s)	18.0
Total Split (s)	102.0
Total Split (%)	60%
Maximum Green (s)	96.2
Yellow Time (s)	4.5
All-Red Time (s)	1.3
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	6.0
Recall Mode	Max
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	

Lanes, Volumes, Timings  
 22: NC 54 WB On-Ramp & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)			483			0		0	0		680	0
Internal Link Dist (ft)		614			605			978			1221	
Turn Bay Length (ft)			450						200			375
Base Capacity (vph)			1033			1611		3539	1583		2019	1583
Starvation Cap Reductn			0			0		0	0		0	0
Spillback Cap Reductn			0			0		0	0		0	0
Storage Cap Reductn			0			0		0	0		0	0
Reduced v/c Ratio			0.71			0.27		0.37	0.02		0.79	0.10

Intersection Summary

Area Type:	Other
Cycle Length:	170
Actuated Cycle Length:	170
Offset:	0 (0%), Referenced to phase 4:NBT, Start of Green
Natural Cycle:	60
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.79
Intersection Signal Delay:	20.9
Intersection LOS:	C
Intersection Capacity Utilization	68.1%
ICU Level of Service	C
Analysis Period (min)	15

Splits and Phases: 22: NC 54 WB On-Ramp & US 15-501 (Fordham Blvd)

φ2 102 s	φ4 68 s
φ6 102 s	

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Lane Group	ø2
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

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Lanes, Volumes, Timings  
 23: NC 54 (Raleigh Road) & Burning Tree Drive

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↕↕↕		↖	↕↕↕			↖	↖		↕↕	
Volume (vph)	35	1615	44	79	1592	16	31	6	140	25	9	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	275		0	0		450	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			1.00				0.99
Frt		0.996			0.998				0.850			0.936
Flt Protected	0.950			0.950				0.960				0.981
Satd. Flow (prot)	1736	4964	0	1752	5024	0	0	1754	1553	0	1651	0
Flt Permitted	0.094			0.085				0.753				0.871
Satd. Flow (perm)	172	4964	0	157	5024	0	0	1374	1553	0	1466	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35				25
Link Distance (ft)		1026			881			637				457
Travel Time (s)		20.0			17.2			12.4				12.5
Confl. Peds. (#/hr)	5		3	3		5	2					2
Peak Hour Factor	0.85	0.85	0.85	0.96	0.96	0.96	0.83	0.83	0.83	0.74	0.74	0.74
Heavy Vehicles (%)	4%	4%	4%	3%	3%	3%	4%	4%	4%	5%	5%	5%
Adj. Flow (vph)	41	1900	52	82	1658	17	37	7	169	34	12	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	41	1952	0	82	1675	0	0	44	169	0	88	0
Turn Type	pm+pt			pm+pt			Perm		Perm	Perm		
Protected Phases	5	2		1	6			8				4
Permitted Phases	2			6			8		8	4		
Detector Phase	5	2		1	6		8	8	8	4		4
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0		7.0	7.0	7.0	7.0		7.0
Minimum Split (s)	13.0	32.0		13.0	30.0		48.0	48.0	48.0	46.0		46.0
Total Split (s)	13.0	59.0	0.0	13.0	59.0	0.0	48.0	48.0	48.0	48.0		48.0
Total Split (%)	10.8%	49.2%	0.0%	10.8%	49.2%	0.0%	40.0%	40.0%	40.0%	40.0%		40.0%
Maximum Green (s)	7.1	52.8		7.1	52.8		41.8	41.8	41.8	41.7		41.7
Yellow Time (s)	3.0	4.9		3.0	4.9		3.7	3.7	3.7	3.2		3.2
All-Red Time (s)	2.9	1.3		2.9	1.3		2.5	2.5	2.5	3.1		3.1
Lost Time Adjust (s)	-0.9	-1.2	0.0	-0.9	-1.2	0.0	0.0	-1.2	-1.2	0.0		-1.3
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	6.2	5.0	5.0	6.3		5.0
Lead/Lag	Lead	Lead		Lag	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0		3.0
Recall Mode	None	C-Max		None	C-Max		Min	Min	Min	Min		Min
Walk Time (s)		7.0			7.0		7.0	7.0	7.0	7.0		7.0
Flash Dont Walk (s)		18.0			16.0		34.0	34.0	34.0	32.0		32.0
Pedestrian Calls (#/hr)		0			0		0	0	0	0		0
Act Effct Green (s)	79.9	79.9		79.7	79.7			19.7	19.7			19.7
Actuated g/C Ratio	0.67	0.67		0.66	0.66			0.16	0.16			0.16
v/c Ratio	0.19	0.59		0.39	0.50			0.19	0.66			0.37
Control Delay	7.0	5.4		29.7	12.1			43.0	58.8			47.3



Lanes, Volumes, Timings  
 23: NC 54 (Raleigh Road) & Burning Tree Drive

2/28/2014

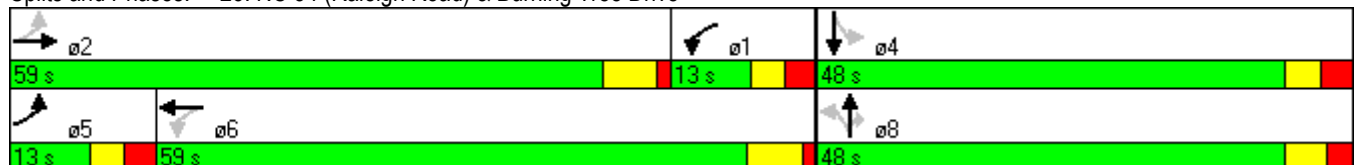


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0			0.0
Total Delay	7.0	5.4		29.7	12.1			43.0	58.8			47.3
LOS	A	A		C	B			D	E			D
Approach Delay		5.5			12.9			55.5				47.3
Approach LOS		A			B			E				D
Queue Length 50th (ft)	5	117		22	234			30	124			61
Queue Length 95th (ft)	m11	121		50	332			56	169			85
Internal Link Dist (ft)		946			801			557				377
Turn Bay Length (ft)	250			275					450			
Base Capacity (vph)	221	3304		211	3337			492	556			525
Starvation Cap Reductn	0	0		0	0			0	0			0
Spillback Cap Reductn	0	0		0	0			0	0			0
Storage Cap Reductn	0	0		0	0			0	0			0
Reduced v/c Ratio	0.19	0.59		0.39	0.50			0.09	0.30			0.17

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 19 (16%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 105  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.66  
 Intersection Signal Delay: 12.3  
 Intersection Capacity Utilization 62.5%  
 Analysis Period (min) 15  
 Intersection LOS: B  
 ICU Level of Service B  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 23: NC 54 (Raleigh Road) & Burning Tree Drive



Lanes, Volumes, Timings  
 24: NC 54 (Raleigh Road) & Hamilton Road

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↗↗↗		↗	↗↗↗		↗	↗	↗	↗	↗	↗
Volume (vph)	37	1502	40	102	1503	29	156	16	88	54	16	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	275		0	250		0	150		150	50		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00	1.00		0.99		0.98	0.99	0.99	
Frt		0.996			0.997				0.850		0.898	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	4964	0	1752	5019	0	1752	1845	1568	1736	1621	0
Flt Permitted	0.086			0.102			0.716			0.746		
Satd. Flow (perm)	157	4964	0	188	5019	0	1314	1845	1539	1354	1621	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			25				25
Link Distance (ft)		359			576			537				463
Travel Time (s)		5.4			8.7			14.6				12.6
Confl. Peds. (#/hr)	1		3	3		1	5		6	6		5
Peak Hour Factor	0.88	0.88	0.88	0.92	0.92	0.92	0.87	0.87	0.87	0.82	0.82	0.82
Heavy Vehicles (%)	4%	4%	4%	3%	3%	3%	3%	3%	3%	4%	4%	4%
Adj. Flow (vph)	42	1707	45	111	1634	32	179	18	101	66	20	43
Shared Lane Traffic (%)												
Lane Group Flow (vph)	42	1752	0	111	1666	0	179	18	101	66	63	0
Turn Type	pm+pt			pm+pt			Perm		Perm	Perm		
Protected Phases	5	2		1	6			8				4
Permitted Phases	2			6			8		8	4		
Detector Phase	5	2		1	6		8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	13.0	25.0		13.0	26.0		41.0	41.0	41.0	39.0	39.0	
Total Split (s)	13.0	63.0	0.0	16.0	66.0	0.0	41.0	41.0	41.0	41.0	41.0	0.0
Total Split (%)	10.8%	52.5%	0.0%	13.3%	55.0%	0.0%	34.2%	34.2%	34.2%	34.2%	34.2%	0.0%
Maximum Green (s)	7.4	57.4		10.6	60.1		34.6	34.6	34.6	34.5	34.5	
Yellow Time (s)	3.0	3.8		3.0	4.1		3.1	3.1	3.1	3.2	3.2	
All-Red Time (s)	2.6	1.8		2.4	1.8		3.3	3.3	3.3	3.3	3.3	
Lost Time Adjust (s)	-0.6	-0.6	0.0	-0.4	-0.9	0.0	-1.4	-1.4	-1.4	-1.5	-1.5	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0
Lead/Lag	Lead	Lead		Lag	Lag							
Lead-Lag Optimize?	Yes				Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		Min	Min	Min	Min	Min	
Walk Time (s)		7.0			7.0		7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)		12.0			13.0		27.0	27.0	27.0	25.0	25.0	
Pedestrian Calls (#/hr)		0			0		0	0	0	0	0	
Act Effct Green (s)	70.8	70.8		76.3	76.3		23.2	23.2	23.2	23.2	23.2	
Actuated g/C Ratio	0.59	0.59		0.64	0.64		0.19	0.19	0.19	0.19	0.19	
v/c Ratio	0.21	0.60		0.42	0.52		0.70	0.05	0.34	0.25	0.20	
Control Delay	14.9	17.6		22.0	10.6		59.2	36.1	43.0	41.1	39.6	

Lanes, Volumes, Timings  
 24: NC 54 (Raleigh Road) & Hamilton Road

2/28/2014

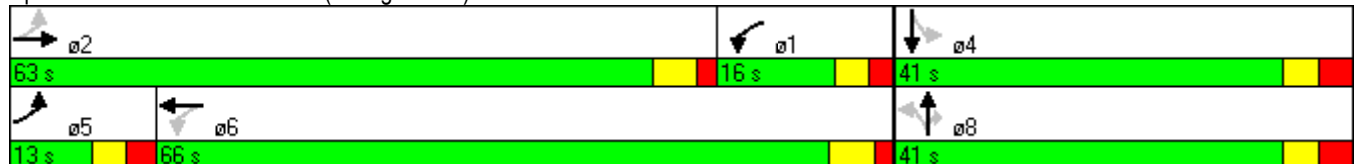


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.9	17.6		22.0	10.6		59.2	36.1	43.0	41.1	39.6	
LOS	B	B		C	B		E	D	D	D	D	
Approach Delay		17.5			11.3			52.3				40.4
Approach LOS		B			B			D				D
Queue Length 50th (ft)	13	296		27	169		131	12	68	44	41	
Queue Length 95th (ft)	34	399		51	188		185	29	106	71	68	
Internal Link Dist (ft)		279			496			457				383
Turn Bay Length (ft)	275			250			150		150	50		
Base Capacity (vph)	201	2928		263	3191		394	554	462	406	486	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.60		0.42	0.52		0.45	0.03	0.22	0.16	0.13	

Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.70
Intersection Signal Delay:	18.1
Intersection LOS:	B
Intersection Capacity Utilization:	65.9%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 24: NC 54 (Raleigh Road) & Hamilton Road



Lanes, Volumes, Timings  
25: Culbreth Road & Smith Level Road

2/28/2014



Lane Group	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Volume (vph)	51	108	320	51	103	286
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	1%		-2%			3%
Storage Length (ft)	125	0		0	225	
Storage Lanes	1	1		0	1	
Taper Length (ft)	25	25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00					
Frt		0.850	0.981			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1694	1516	1759	0	1710	1800
Flt Permitted	0.950				0.448	
Satd. Flow (perm)	1690	1516	1759	0	806	1800
Right Turn on Red		No		No		
Satd. Flow (RTOR)						
Link Speed (mph)	35		35			35
Link Distance (ft)	1150		863			828
Travel Time (s)	22.4		16.8			16.1
Confl. Peds. (#/hr)	1					
Peak Hour Factor	0.85	0.85	0.91	0.91	0.81	0.81
Heavy Vehicles (%)	6%	6%	7%	7%	4%	4%
Adj. Flow (vph)	60	127	352	56	127	353
Shared Lane Traffic (%)						
Lane Group Flow (vph)	60	127	408	0	127	353
Turn Type		pm+ov			pm+pt	
Protected Phases	8	1	2		1	6
Permitted Phases		8			6	
Detector Phase	8	1	2		1	6
Switch Phase						
Minimum Initial (s)	7.0	7.0	10.0		7.0	10.0
Minimum Split (s)	25.0	13.0	29.0		13.0	17.0
Total Split (s)	27.0	15.0	48.0	0.0	15.0	63.0
Total Split (%)	30.0%	16.7%	53.3%	0.0%	16.7%	70.0%
Maximum Green (s)	20.7	9.4	41.8		9.4	56.8
Yellow Time (s)	3.0	3.0	4.1		3.0	4.1
All-Red Time (s)	3.3	2.6	2.1		2.6	2.1
Lost Time Adjust (s)	-1.3	-0.6	-1.2	0.0	-0.6	-1.2
Total Lost Time (s)	5.0	5.0	5.0	4.0	5.0	5.0
Lead/Lag		Lead	Lag		Lead	
Lead-Lag Optimize?						
Vehicle Extension (s)	2.0	2.0	3.0		2.0	3.0
Recall Mode	None	None	C-Max		None	C-Max
Walk Time (s)	7.0		7.0			
Flash Dont Walk (s)	11.0		15.0			
Pedestrian Calls (#/hr)	0		0			
Act Effct Green (s)	9.6	19.7	60.3		73.1	74.1
Actuated g/C Ratio	0.11	0.22	0.67		0.81	0.82
v/c Ratio	0.33	0.38	0.35		0.17	0.24

Lanes, Volumes, Timings  
 25: Culbreth Road & Smith Level Road

2/28/2014



Lane Group	WBL	WBR	NET	NER	SWL	SWT
Control Delay	41.9	31.7	8.4		3.0	3.0
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	41.9	31.7	8.4		3.0	3.0
LOS	D	C	A		A	A
Approach Delay	35.0		8.4			3.0
Approach LOS	C		A			A
Queue Length 50th (ft)	32	60	94		12	40
Queue Length 95th (ft)	64	97	167		25	66
Internal Link Dist (ft)	1070		783			748
Turn Bay Length (ft)	125				225	
Base Capacity (vph)	414	369	1179		755	1481
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.14	0.34	0.35		0.17	0.24

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	90
Offset:	0 (0%), Referenced to phase 2:NET and 6:SWTL, Start of Green
Natural Cycle:	70
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.38
Intersection Signal Delay:	10.6
Intersection LOS:	B
Intersection Capacity Utilization:	44.1%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 25: Culbreth Road & Smith Level Road



Lanes, Volumes, Timings  
1: Franklin Street & NC 86 (S. Columbia St)

2/28/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	204	474	106	146	576	106	113	586	148	90	501	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	9	12	13	10	10	13	9	10	10	9	9	11
Storage Length (ft)	225		0	100		0	400		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.87	0.93		0.86	0.94		0.88	0.93		0.88	0.93	
Frt		0.973			0.977			0.970			0.968	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1419	2867	0	1486	2727	0	1379	2573	0	1406	2527	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1238	2867	0	1282	2727	0	1207	2573	0	1233	2527	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		20			20			25			25	
Link Distance (ft)		806			940			972			822	
Travel Time (s)		27.5			32.0			26.5			22.4	
Confl. Peds. (#/hr)	391		301	301		391	220		302	302		220
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.96	0.96	0.96	0.93	0.93	0.93
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	6%	6%	6%	4%	4%	4%
Adj. Flow (vph)	240	558	125	172	678	125	118	610	154	97	539	149
Shared Lane Traffic (%)												
Lane Group Flow (vph)	240	683	0	172	803	0	118	764	0	97	688	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases												
Detector Phase	1	6		5	2		3	8		7	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	15.0	32.0		15.0	32.0		15.0	32.0		15.0	32.0	
Total Split (s)	29.0	50.0	0.0	26.0	47.0	0.0	18.0	49.0	0.0	15.0	46.0	0.0
Total Split (%)	20.7%	35.7%	0.0%	18.6%	33.6%	0.0%	12.9%	35.0%	0.0%	10.7%	32.9%	0.0%
Maximum Green (s)	23.1	43.8		20.6	40.8		12.1	43.1		9.1	40.3	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.3		3.0	3.1	
All-Red Time (s)	2.9	3.2		2.4	3.2		2.9	2.6		2.9	2.6	
Lost Time Adjust (s)	-0.9	-1.2	-2.0	-0.4	-1.2	-2.0	-0.9	-0.9	-1.5	-0.9	-0.7	-1.5
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0	2.5	5.0	5.0	2.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	3.0		1.0	3.0		1.0	2.0		1.0	2.0	
Recall Mode	None	Min		None	Min		None	C-Max		None	C-Max	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		15.0			15.0			15.0			15.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	24.0	47.4		18.6	42.0		12.9	44.0		10.0	41.1	
Actuated g/C Ratio	0.17	0.34		0.13	0.30		0.09	0.31		0.07	0.29	
v/c Ratio	0.99	0.70		0.87	0.98		0.93	0.94		0.97	0.93	

Lanes, Volumes, Timings  
 1: Franklin Street & NC 86 (S. Columbia St)

2/28/2014

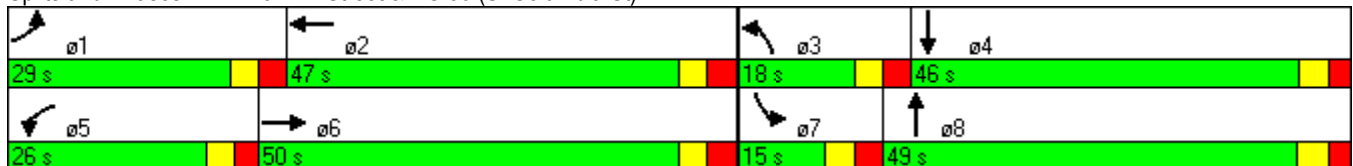


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	111.9	45.5		96.2	75.7		124.3	54.8		145.8	67.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	111.9	45.5		96.2	75.7		124.3	54.8		145.8	67.7	
LOS	F	D		F	E		F	D		F	E	
Approach Delay		62.8			79.3			64.1			77.3	
Approach LOS		E			E			E			E	
Queue Length 50th (ft)	221	291		153	382		89	360		90	321	
Queue Length 95th (ft)	#364	340		#241	#471		m#222	m#494		#209	#443	
Internal Link Dist (ft)		726			860			892			742	
Turn Bay Length (ft)	225			100			400			100		
Base Capacity (vph)	243	970		223	818		128	809		100	741	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.99	0.70		0.77	0.98		0.92	0.94		0.97	0.93	

Intersection Summary

Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 41 (29%), Referenced to phase 4:SBT and 8:NBT, Start of Green  
 Natural Cycle: 115  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.99  
 Intersection Signal Delay: 70.8 Intersection LOS: E  
 Intersection Capacity Utilization 82.9% ICU Level of Service E  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Franklin Street & NC 86 (S. Columbia St)



Lanes, Volumes, Timings  
 2: Cameron Avenue & NC 86 (S. Columbia St)

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	11	105	0	0	204	29	228	427	38	64	0	534
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	12	12	12	10	10	10	11	11	12
Storage Length (ft)	110		0	0		0	0		0	150		0
Storage Lanes	1		0	0		0	1		0	1		2
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.88
Ped Bike Factor	0.98				0.99		0.95	0.98		0.91		0.91
Fr <sub>t</sub>					0.983			0.988				0.850
Fl <sub>t</sub> Protected	0.950						0.950			0.950		
Satd. Flow (prot)	1510	1644	0	0	1604	0	1378	2673	0	1468	0	2391
Fl <sub>t</sub> Permitted	0.235						0.950			0.950		
Satd. Flow (perm)	365	1644	0	0	1604	0	1315	2673	0	1335	0	2179
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25				25
Link Distance (ft)		412			1056			839				972
Travel Time (s)		10.7			57.6			22.9				26.5
Confl. Peds. (#/hr)	33		65	65		33	37		103	103		37
Peak Hour Factor	0.77	0.77	1.00	1.00	0.82	0.82	0.84	0.84	0.84	0.91	1.00	0.91
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	10%	10%	10%	7%	7%	7%
Adj. Flow (vph)	14	136	0	0	249	35	271	508	45	70	0	587
Shared Lane Traffic (%)												
Lane Group Flow (vph)	14	136	0	0	284	0	271	553	0	70	0	587
Turn Type	Perm						Split			custom		custom
Protected Phases		4			8		2	2		1		1
Permitted Phases	4									1		1
Detector Phase	4	4			8		2	2		1		1
Switch Phase												
Minimum Initial (s)	10.0	10.0			10.0		7.0	7.0		7.0		7.0
Minimum Split (s)	17.0	17.0			17.0		21.0	21.0		15.0		15.0
Total Split (s)	33.0	33.0	0.0	0.0	33.0	0.0	39.0	39.0	0.0	42.0	0.0	42.0
Total Split (%)	23.6%	23.6%	0.0%	0.0%	23.6%	0.0%	27.9%	27.9%	0.0%	30.0%	0.0%	30.0%
Maximum Green (s)	26.8	26.8			26.8		32.8	32.8		36.4		36.4
Yellow Time (s)	3.2	3.2			3.2		3.1	3.1		3.0		3.0
All-Red Time (s)	3.0	3.0			3.0		3.1	3.1		2.6		2.6
Lost Time Adjust (s)	-1.2	-1.2	0.0	0.0	-1.2	0.0	-1.2	-1.2	0.0	-0.6	0.0	-0.6
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	4.0	5.0	5.0	4.0	5.0	4.0	5.0
Lead/Lag							Lag	Lag		Lead		Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0			2.0		2.0	2.0		2.0		2.0
Recall Mode	Min	Min			None		C-Max	C-Max		None		None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	27.0	27.0			27.0		57.7	57.7		40.3		40.3
Actuated g/C Ratio	0.19	0.19			0.19		0.41	0.41		0.29		0.29
v/c Ratio	0.20	0.43			0.92		0.48	0.50		0.17		0.85



Lanes, Volumes, Timings  
 2: Cameron Avenue & NC 86 (S. Columbia St)

2/28/2014

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Flt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	26.0
Total Split (s)	26.0
Total Split (%)	19%
Maximum Green (s)	23.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	15.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	

Lanes, Volumes, Timings  
 2: Cameron Avenue & NC 86 (S. Columbia St)

2/28/2014

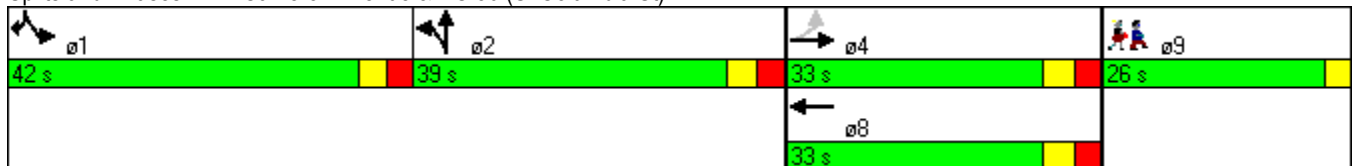


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	26.4	19.9			88.9		22.9	22.0		16.8		32.9
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0		0.0
Total Delay	26.4	19.9			88.9		22.9	22.0		16.8		32.9
LOS	C	B			F		C	C		B		C
Approach Delay		20.5			88.9			22.3				
Approach LOS		C			F			C				
Queue Length 50th (ft)	2	27			254		172	188		31		259
Queue Length 95th (ft)	m9	84			#356		98	94		m35		m290
Internal Link Dist (ft)		332			976			759			892	
Turn Bay Length (ft)	110									150		
Base Capacity (vph)	73	329			321		568	1101		432		704
Starvation Cap Reductn	0	0			0		0	0		0		0
Spillback Cap Reductn	0	0			0		0	0		0		0
Storage Cap Reductn	0	0			0		0	0		0		0
Reduced v/c Ratio	0.19	0.41			0.88		0.48	0.50		0.16		0.83

Intersection Summary

Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 16 (11%), Referenced to phase 2:NBTL, Start of Green  
 Natural Cycle: 100  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.92  
 Intersection Signal Delay: 35.1  
 Intersection LOS: D  
 Intersection Capacity Utilization 64.7%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Cameron Avenue & NC 86 (S. Columbia St)



Lane Group	ø9
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lanes, Volumes, Timings  
3: Cameron Avenue & Pittsboro Street

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↗		↖↗	↖							
Volume (vph)	0	146	148	564	387	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	12	12	12	12	12	12	12	12
Storage Length (ft)	0		0	0		90	0		0	0		0
Storage Lanes	0		0	2		1	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.83		0.66								
Fr t		0.932										
Flt Protected				0.950								
Satd. Flow (prot)	0	1298	0	2874	1613	0	0	0	0	0	0	0
Flt Permitted				0.950								
Satd. Flow (perm)	0	1298	0	1902	1613	0	0	0	0	0	0	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25				25
Link Distance (ft)		258			412			549				191
Travel Time (s)		30.0			10.7			15.0				5.2
Confl. Peds. (#/hr)	191		120	120		191	98					98
Peak Hour Factor	1.00	0.83	0.83	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	6%	6%	6%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	0	176	178	594	407	0	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	354	0	594	407	0	0	0	0	0	0	0
Turn Type				Prot								
Protected Phases		2		1	6							
Permitted Phases												
Detector Phase		2		1	6							
Switch Phase												
Minimum Initial (s)		10.0		7.0	10.0							
Minimum Split (s)		20.2		20.0	20.0							
Total Split (s)	0.0	68.0	0.0	50.0	118.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Split (%)	0.0%	48.6%	0.0%	35.7%	84.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)		62.8		44.9	113.0							
Yellow Time (s)		3.1		3.0	3.3							
All-Red Time (s)		2.1		2.1	1.7							
Lost Time Adjust (s)	0.0	-0.2	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	3.9	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		1.0		4.0	1.0							
Recall Mode		None		C-Max	None							
Walk Time (s)		7.0										
Flash Dont Walk (s)		4.0										
Pedestrian Calls (#/hr)		0										
Act Effct Green (s)		44.2		65.8	115.0							
Actuated g/C Ratio		0.32		0.47	0.82							
v/c Ratio		0.86		0.44	0.31							

Lanes, Volumes, Timings  
 3: Cameron Avenue & Pittsboro Street

2/28/2014

Lane Group	ø4
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	4
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	16%
Maximum Green (s)	18.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	1.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	9.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	

Lanes, Volumes, Timings  
 3: Cameron Avenue & Pittsboro Street

2/28/2014

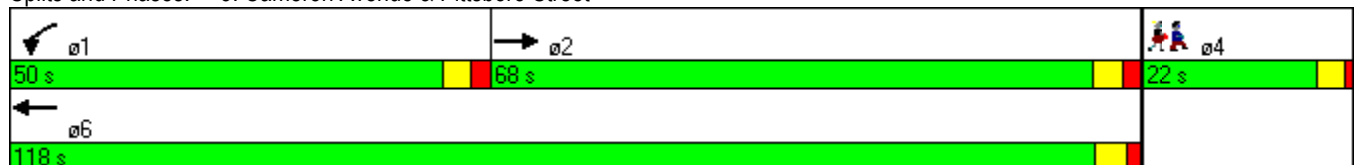


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		64.7		17.9	4.7							
Queue Delay		0.0		0.8	1.5							
Total Delay		64.7		18.7	6.2							
LOS		E		B	A							
Approach Delay		64.7			13.6							
Approach LOS		E			B							
Queue Length 50th (ft)		302		148	85							
Queue Length 95th (ft)		335		m300	m164							
Internal Link Dist (ft)		178			332			469			111	
Turn Bay Length (ft)												
Base Capacity (vph)		584		1351	1325							
Starvation Cap Reductn		0		450	708							
Spillback Cap Reductn		0		0	0							
Storage Cap Reductn		0		0	0							
Reduced v/c Ratio		0.61		0.66	0.66							

Intersection Summary

Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 125 (89%), Referenced to phase 1:WBL, Start of Green  
 Natural Cycle: 75  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.86  
 Intersection Signal Delay: 27.0  
 Intersection LOS: C  
 Intersection Capacity Utilization 48.1%  
 ICU Level of Service A  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Cameron Avenue & Pittsboro Street



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Lane Group	ø4
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

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Lanes, Volumes, Timings  
4: McCauley Street & Pittsboro Street

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↗		↖	↖						↖	↗
Volume (vph)	0	112	27	249	191	0	0	0	0	253	554	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	200		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor		0.97		0.88							0.95	
Frt		0.974									0.996	
Flt Protected				0.950							0.985	
Satd. Flow (prot)	0	1422	0	1577	1660	0	0	0	0	0	2992	0
Flt Permitted				0.647							0.985	
Satd. Flow (perm)	0	1422	0	941	1660	0	0	0	0	0	2852	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25		25		25		25		25		25
Link Distance (ft)		493		552		1169		261		7.1		7.1
Travel Time (s)		13.4		15.1		31.9		7.1		7.1		7.1
Confl. Peds. (#/hr)	81		98	98		81	67		66	66		67
Peak Hour Factor	1.00	0.80	0.80	0.92	0.92	1.00	1.00	1.00	1.00	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	6%	6%	6%
Parking (#/hr)		0	0									
Adj. Flow (vph)	0	140	34	271	208	0	0	0	0	281	616	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	174	0	271	208	0	0	0	0	0	924	0
Turn Type				Perm							Perm	
Protected Phases		4			8							6
Permitted Phases				8							6	
Detector Phase		4		8	8						6	6
Switch Phase												
Minimum Initial (s)		7.0		7.0	7.0					10.0	10.0	
Minimum Split (s)		21.0		21.0	21.0					24.0	24.0	
Total Split (s)	0.0	34.0	0.0	34.0	34.0	0.0	0.0	0.0	0.0	36.0	36.0	0.0
Total Split (%)	0.0%	48.6%	0.0%	48.6%	48.6%	0.0%	0.0%	0.0%	0.0%	51.4%	51.4%	0.0%
Maximum Green (s)		29.2		28.4	28.4					30.7	30.7	
Yellow Time (s)		3.3		3.0	3.0					3.3	3.3	
All-Red Time (s)		1.5		2.6	2.6					2.0	2.0	
Lost Time Adjust (s)	0.0	0.2	-0.3	-0.6	-0.6	0.0	0.0	0.0	0.0	-1.1	-0.3	0.0
Total Lost Time (s)	4.0	5.0	3.7	5.0	5.0	4.0	4.0	4.0	4.0	4.2	5.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0					3.0	3.0	
Recall Mode		None		None	None					C-Max	C-Max	
Walk Time (s)		7.0		7.0	7.0					7.0	7.0	
Flash Dont Walk (s)		6.0		7.0	7.0					8.0	8.0	
Pedestrian Calls (#/hr)		0		0	0					0	0	
Act Effct Green (s)		24.4		24.4	24.4						35.6	
Actuated g/C Ratio		0.35		0.35	0.35						0.51	
v/c Ratio		0.35		0.83	0.36						0.64	



Lanes, Volumes, Timings  
 4: McCauley Street & Pittsboro Street

2/28/2014

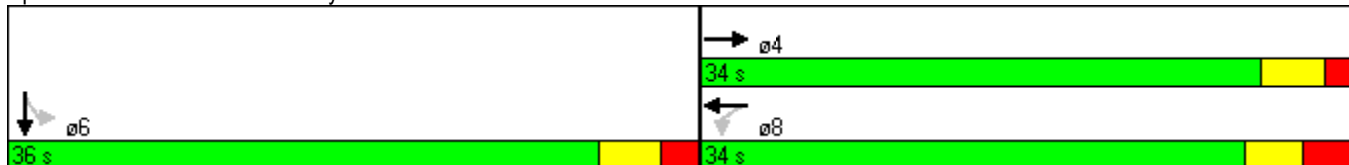


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		17.7		41.5	20.4							16.0
Queue Delay		0.0		0.0	0.0							0.0
Total Delay		17.7		41.5	20.4							16.0
LOS		B		D	C							B
Approach Delay		17.7			32.3							16.0
Approach LOS		B			C							B
Queue Length 50th (ft)		52		77	59							277
Queue Length 95th (ft)		79		220	101							354
Internal Link Dist (ft)		413			472			1089				181
Turn Bay Length (ft)				200								
Base Capacity (vph)		589		390	688							1450
Starvation Cap Reductn		0		0	0							0
Spillback Cap Reductn		0		0	0							0
Storage Cap Reductn		0		0	0							0
Reduced v/c Ratio		0.30		0.69	0.30							0.64

Intersection Summary

Area Type:	CBD
Cycle Length:	70
Actuated Cycle Length:	70
Offset:	4 (6%), Referenced to phase 6:SBTL, Start of Green
Natural Cycle:	45
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.83
Intersection Signal Delay:	21.2
Intersection LOS:	C
Intersection Capacity Utilization:	64.8%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 4: McCauley Street & Pittsboro Street



Lanes, Volumes, Timings  
 5: South Road & NC 86 (S. Columbia St)

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	69	269	0	0	322	207	124	649	198	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	12	12	13	13	12	11	11	11	11	11
Storage Length (ft)	150		0	0		300	0		0	0		0
Storage Lanes	1		0	0		1	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	0.91	0.91	1.00	1.00	1.00	1.00
Ped Bike Factor	0.90				0.99	0.82		0.97	0.91			
Fr <sub>t</sub>					0.991	0.850			0.850			
Fl <sub>t</sub> Protected	0.950							0.992				
Satd. Flow (prot)	1593	1788	0	0	1598	1385	0	4107	1289	0	0	0
Fl <sub>t</sub> Permitted	0.950							0.992				
Satd. Flow (perm)	1429	1788	0	0	1598	1141	0	3990	1174	0	0	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25				25
Link Distance (ft)		552			646			532				839
Travel Time (s)		15.1			17.6			14.5				22.9
Confl. Peds. (#/hr)	68		218	218		68	53		141	141		53
Peak Hour Factor	0.94	0.94	1.00	1.00	0.97	0.97	0.94	0.94	0.94	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	9%	9%	9%	2%	2%	2%
Adj. Flow (vph)	73	286	0	0	332	213	132	690	211	0	0	0
Shared Lane Traffic (%)						10%						
Lane Group Flow (vph)	73	286	0	0	353	192	0	822	211	0	0	0
Turn Type	Split					Perm	Perm		Free			
Protected Phases	4	4			3			2				
Permitted Phases						3	2		Free			
Detector Phase	4	4			3	3	2	2				
Switch Phase												
Minimum Initial (s)	7.0	7.0			7.0	7.0	10.0	10.0				
Minimum Split (s)	24.0	24.0			24.0	24.0	27.0	27.0				
Total Split (s)	41.0	41.0	0.0	0.0	52.0	52.0	47.0	47.0	0.0	0.0	0.0	0.0
Total Split (%)	29.3%	29.3%	0.0%	0.0%	37.1%	37.1%	33.6%	33.6%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)	35.4	35.4			46.5	46.5	41.1	41.1				
Yellow Time (s)	3.5	3.5			3.1	3.1	3.4	3.4				
All-Red Time (s)	2.1	2.1			2.4	2.4	2.5	2.5				
Lost Time Adjust (s)	-0.6	-0.6	0.0	0.0	-0.5	-0.5	-1.5	-0.9	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	5.0	4.4	5.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag			Lead	Lead						
Lead-Lag Optimize?	Yes	Yes			Yes	Yes						
Vehicle Extension (s)	2.0	2.0			2.0	2.0	2.0	2.0				
Recall Mode	None	None			Min	Min	C-Max	C-Max				
Walk Time (s)	7.0	7.0			7.0	7.0	7.0	7.0				
Flash Dont Walk (s)	10.0	10.0			10.0	10.0	14.0	14.0				
Pedestrian Calls (#/hr)	0	0			0	0	0	0				
Act Effct Green (s)	27.4	27.4			36.2	36.2		61.4	140.0			
Actuated g/C Ratio	0.20	0.20			0.26	0.26		0.44	1.00			
v/c Ratio	0.23	0.82			0.85	0.65		0.47	0.18			

Lanes, Volumes, Timings  
 5: South Road & NC 86 (S. Columbia St)

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	41.8	63.5			68.1	55.7		24.0	0.3			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	41.8	63.5			68.1	55.7		24.0	0.3			
LOS	D	E			E	E		C	A			
Approach Delay		59.1			63.7			19.2				
Approach LOS		E			E			B				
Queue Length 50th (ft)	55	223			323	164		106	0			
Queue Length 95th (ft)	m79	320			410	233		290	0			
Internal Link Dist (ft)		472			566			452			759	
Turn Bay Length (ft)	150					300						
Base Capacity (vph)	410	460			536	383		1749	1174			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.18	0.62			0.66	0.50		0.47	0.18			

Intersection Summary

Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 126 (90%), Referenced to phase 2:NBTL, Start of Green  
 Natural Cycle: 75  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.85  
 Intersection Signal Delay: 39.1  
 Intersection LOS: D  
 Intersection Capacity Utilization 64.8%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: South Road & NC 86 (S. Columbia St)



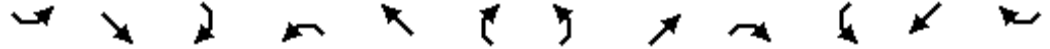
Lanes, Volumes, Timings  
6: Manning Drive & NC 86 NB (S. Columbia St)

2/28/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	82	245	0	218	0	486	0	460	74	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			2%			2%			0%	
Storage Length (ft)	125		0	0		75	0		150	0		0
Storage Lanes	1		0	1		1	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	0.88	1.00	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99			0.84					0.93			
Fr <sub>t</sub>						0.850			0.850			
Fl <sub>t</sub> Protected	0.950			0.950								
Satd. Flow (prot)	1512	3023	0	1489	0	2345	0	3034	1358	0	0	0
Fl <sub>t</sub> Permitted	0.950			0.950								
Satd. Flow (perm)	1496	3023	0	1246	0	2345	0	3034	1266	0	0	0
Right Turn on Red	No		No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			35				35
Link Distance (ft)		241			637			222				480
Travel Time (s)		6.6			17.4			4.3				9.4
Confl. Peds. (#/hr)	5		67	67		5	1		31	31		1
Peak Hour Factor	0.94	0.94	1.00	0.85	1.00	0.85	1.00	0.87	0.87	1.00	1.00	1.00
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%	6%	6%	6%	2%	2%	2%
Adj. Flow (vph)	87	261	0	256	0	572	0	529	85	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	87	261	0	256	0	572	0	529	85	0	0	0
Turn Type	Split			Prot		custom			pm+ov			
Protected Phases	4	4		3		3		2	3			
Permitted Phases									2			
Detector Phase	4	4		3		3		2	3			
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0		7.0		10.0	7.0			
Minimum Split (s)	36.0	36.0		22.0		22.0		30.0	22.0			
Total Split (s)	38.0	38.0	0.0	57.0	0.0	57.0	0.0	45.0	57.0	0.0	0.0	0.0
Total Split (%)	27.1%	27.1%	0.0%	40.7%	0.0%	40.7%	0.0%	32.1%	40.7%	0.0%	0.0%	0.0%
Maximum Green (s)	32.3	32.3		51.4		51.4		39.2	51.4			
Yellow Time (s)	3.2	3.2		3.0		3.0		3.4	3.0			
All-Red Time (s)	2.5	2.5		2.6		2.6		2.4	2.6			
Lost Time Adjust (s)	-0.7	-0.7	-0.5	-0.6	0.0	-0.6	-0.5	-0.8	-0.6	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	3.5	5.0	4.0	5.0	3.5	5.0	5.0	4.0	4.0	4.0
Lead/Lag	Lead	Lead		Lag		Lag			Lag			
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		2.0		2.0		3.0	2.0			
Recall Mode	Min	Min		None		None		C-Max	None			
Walk Time (s)	4.0	4.0						4.0				
Flash Dont Walk (s)	16.0	16.0						19.0				
Pedestrian Calls (#/hr)	0	0						0				
Act Effct Green (s)	18.1	18.1		40.6		40.6		66.3	106.9			
Actuated g/C Ratio	0.13	0.13		0.29		0.29		0.47	0.76			
v/c Ratio	0.45	0.67		0.59		0.84		0.37	0.09			

Lanes, Volumes, Timings  
 6: Manning Drive & NC 86 NB (S. Columbia St)

2/28/2014



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Control Delay	53.1	55.8		47.6		58.1		23.4	4.4			
Queue Delay	0.0	0.0		0.0		0.0		0.0	0.0			
Total Delay	53.1	55.8		47.6		58.1		23.4	4.4			
LOS	D	E		D		E		C	A			
Approach Delay		55.1						20.8				
Approach LOS		E						C				
Queue Length 50th (ft)	64	107		200		278		92	6			
Queue Length 95th (ft)	m102	150		249		302		170	37			
Internal Link Dist (ft)		161			557			142			400	
Turn Bay Length (ft)	125					75			150			
Base Capacity (vph)	356	713		553		871		1437	1041			
Starvation Cap Reductn	0	0		0		0		0	0			
Spillback Cap Reductn	0	0		0		0		0	0			
Storage Cap Reductn	0	0		0		0		0	0			
Reduced v/c Ratio	0.24	0.37		0.46		0.66		0.37	0.08			

Intersection Summary

Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 0 (0%), Referenced to phase 2:NET, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.84  
 Intersection Signal Delay: 43.2  
 Intersection LOS: D  
 Intersection Capacity Utilization 59.9%  
 ICU Level of Service B  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Manning Drive & NC 86 NB (S. Columbia St)



Lanes, Volumes, Timings  
7: Westwood Drive & NC 86 (S. Columbia St)

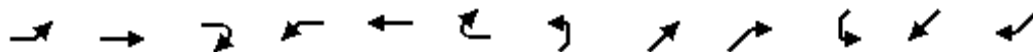
2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕	↕	↕	↕	↕	↕	↕	↕
Volume (vph)	3	4	13	390	7	171	9	350	107	83	669	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	11	12	12	14	11	11	11
Grade (%)		-3%			-5%			5%				-5%
Storage Length (ft)	0		0	0		150	250		250	0		0
Storage Lanes	0		0	0		1	1		1	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.83			0.85	0.97			0.92		1.00	
Frt		0.913				0.850			0.850		0.999	
Flt Protected		0.993			0.953		0.950			0.950		
Satd. Flow (prot)	0	1387	0	0	1759	1569	1615	1700	1541	1671	1757	0
Flt Permitted		0.993			0.953		0.265			0.381		
Satd. Flow (perm)	0	1385	0	0	1496	1528	450	1700	1414	670	1757	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			35				25
Link Distance (ft)		274			592			630				946
Travel Time (s)		7.5			16.1			12.3				25.8
Confl. Peds. (#/hr)	4		59	59		4	21		21	21		21
Peak Hour Factor	0.59	0.59	0.59	0.92	0.92	0.92	0.90	0.90	0.90	0.93	0.93	0.93
Heavy Vehicles (%)	5%	5%	5%	2%	2%	2%	9%	9%	9%	7%	7%	7%
Adj. Flow (vph)	5	7	22	424	8	186	10	389	119	89	719	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	34	0	0	432	186	10	389	119	89	723	0
Turn Type	Split			Split		pm+ov	Perm		pm+ov	pm+pt		
Protected Phases	4	4		3	3	1		2	3	1	6	
Permitted Phases						3	2		2	6		
Detector Phase	4	4		3	3	1	2	2	3	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	10.0	10.0	7.0	7.0	10.0	
Minimum Split (s)	26.0	26.0		13.0	13.0	13.0	29.0	29.0	13.0	13.0	22.0	
Total Split (s)	26.0	26.0	0.0	44.0	44.0	13.0	57.0	57.0	44.0	13.0	70.0	0.0
Total Split (%)	18.6%	18.6%	0.0%	31.4%	31.4%	9.3%	40.7%	40.7%	31.4%	9.3%	50.0%	0.0%
Maximum Green (s)	19.8	19.8		38.1	38.1	7.7	51.7	51.7	38.1	7.7	64.7	
Yellow Time (s)	3.3	3.3		3.5	3.5	3.6	3.6	3.6	3.5	3.6	3.6	
All-Red Time (s)	2.9	2.9		2.4	2.4	1.7	1.7	1.7	2.4	1.7	1.7	
Lost Time Adjust (s)	0.0	-1.2	-1.3	0.0	-0.9	-0.3	-0.3	-0.3	-0.9	-0.3	-0.3	-0.9
Total Lost Time (s)	6.2	5.0	2.7	5.9	5.0	5.0	5.0	5.0	5.0	5.0	5.0	3.1
Lead/Lag	Lag	Lag		Lead	Lead	Lead	Lag	Lag	Lead	Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	3.0	3.0	2.0	2.0	3.0	
Recall Mode	None	None		None	None	None	C-Min	C-Min	None	None	C-Min	
Walk Time (s)	4.0	4.0					4.0	4.0				
Flash Dont Walk (s)	13.0	13.0					19.0	19.0				
Pedestrian Calls (#/hr)	0	0					0	0				
Act Effct Green (s)		9.8			37.8	46.6	68.9	68.9	106.7	82.7	82.7	
Actuated g/C Ratio		0.07			0.27	0.33	0.49	0.49	0.76	0.59	0.59	

Lanes, Volumes, Timings  
7: Westwood Drive & NC 86 (S. Columbia St)

2/28/2014

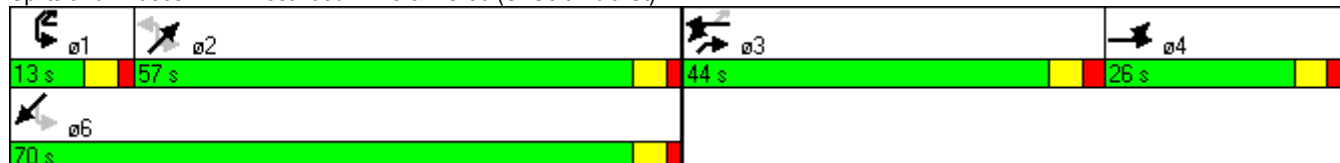


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
v/c Ratio		0.35			0.91	0.36	0.05	0.46	0.11	0.19	0.70	
Control Delay		71.6			73.3	27.1	5.0	8.4	1.1	12.4	25.5	
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		71.6			73.3	27.1	5.0	8.4	1.1	12.4	25.5	
LOS		E			E	C	A	A	A	B	C	
Approach Delay		71.6			59.4			6.7			24.0	
Approach LOS		E			E			A			C	
Queue Length 50th (ft)		30			363	93	1	33	2	35	595	
Queue Length 95th (ft)		43			#567	138	m3	269	13	65	756	
Internal Link Dist (ft)		194			512			550			866	
Turn Bay Length (ft)						150	250		250			
Base Capacity (vph)		208			500	514	222	837	1134	461	1038	
Starvation Cap Reductn		0			0	0	0	0	0	0	0	
Spillback Cap Reductn		0			0	0	0	0	0	0	0	
Storage Cap Reductn		0			0	0	0	0	0	0	0	
Reduced v/c Ratio		0.16			0.86	0.36	0.05	0.46	0.10	0.19	0.70	

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 137 (98%), Referenced to phase 2:NETL and 6:SWTL, Start of Green  
 Natural Cycle: 95  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.91  
 Intersection Signal Delay: 31.3  
 Intersection Capacity Utilization 84.9%  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: Westwood Drive & NC 86 (S. Columbia St)



Lanes, Volumes, Timings  
8: US 15-501 Bypass WB Off Ramp & US 15-501

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖	↖	↖	↖	↕	↖		↕	↖
Volume (vph)	0	0	0	1062	1	47	367	477	0	0	896	365
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	275		275	150		0	0		0
Storage Lanes	0		0	1		1	1		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	*0.58	1.00	1.00	0.95	1.00
Ped Bike Factor				1.00	1.00		1.00					0.97
Frt						0.850						0.850
Flt Protected				0.950	0.952		0.950					
Satd. Flow (prot)	0	0	0	1681	1685	1583	1671	2041	0	0	3471	1553
Flt Permitted				0.950	0.952		0.081					
Satd. Flow (perm)	0	0	0	1680	1683	1583	142	2041	0	0	3471	1512
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			35			35				35
Link Distance (ft)		424			893			596				306
Travel Time (s)		9.6			17.4			11.6				6.0
Confl. Peds. (#/hr)			1	1			4		3	3		4
Peak Hour Factor	1.00	1.00	1.00	0.95	0.95	0.95	0.88	0.88	1.00	1.00	0.94	0.94
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	8%	8%	8%	4%	4%	4%
Adj. Flow (vph)	0	0	0	1118	1	49	417	542	0	0	953	388
Shared Lane Traffic (%)				50%								
Lane Group Flow (vph)	0	0	0	559	560	49	417	542	0	0	953	388
Turn Type				Perm		Perm	pm+pt					Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				7.0	7.0	7.0	7.0	10.0			10.0	10.0
Minimum Split (s)				20.0	20.0	20.0	13.0	20.0			20.0	20.0
Total Split (s)	0.0	0.0	0.0	55.0	55.0	55.0	37.0	85.0	0.0	0.0	48.0	48.0
Total Split (%)	0.0%	0.0%	0.0%	39.3%	39.3%	39.3%	26.4%	60.7%	0.0%	0.0%	34.3%	34.3%
Maximum Green (s)				49.2	49.2	49.2	31.2	79.2			42.0	42.0
Yellow Time (s)				3.7	3.7	3.7	3.0	3.7			4.0	4.0
All-Red Time (s)				2.1	2.1	2.1	2.8	2.1			2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	-0.8	-0.8	-0.8	-0.8	-0.8	0.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0	3.0	5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Recall Mode				None	None	None	None	C-Max			C-Max	C-Max
Act Effct Green (s)				49.1	49.1	49.1	80.9	80.9			44.2	44.2
Actuated g/C Ratio				0.35	0.35	0.35	0.58	0.58			0.32	0.32
v/c Ratio				0.95	0.95	0.09	0.97	0.46			0.87	0.81
Control Delay				70.8	70.8	30.6	77.1	37.6			49.5	52.4
Queue Delay				0.0	0.0	0.0	0.0	0.0			0.1	0.0
Total Delay				70.8	70.8	30.6	77.1	37.6			49.6	52.4
LOS				E	E	C	E	D			D	D



Lanes, Volumes, Timings  
 8: US 15-501 Bypass WB Off Ramp & US 15-501

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay					69.1			54.8			50.4	
Approach LOS					E			D			D	
Queue Length 50th (ft)				514	514	29	321	359			466	347
Queue Length 95th (ft)				#755	#756	60	#511	521			#550	m#467
Internal Link Dist (ft)		344			813			516			226	
Turn Bay Length (ft)				275		275	150					
Base Capacity (vph)				600	601	565	432	1180			1096	477
Starvation Cap Reductn				0	0	0	0	0			0	0
Spillback Cap Reductn				0	0	0	0	0			6	0
Storage Cap Reductn				0	0	0	0	0			0	0
Reduced v/c Ratio				0.93	0.93	0.09	0.97	0.46			0.87	0.81

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 104 (74%), Referenced to phase 2:NBTL and 6:SBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.97  
 Intersection Signal Delay: 57.9  
 Intersection LOS: E  
 Intersection Capacity Utilization 87.7%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 \* User Entered Value  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: US 15-501 Bypass WB Off Ramp & US 15-501



# Lanes, Volumes, Timings

## 9: NC 54 Bypass (Fordham Blvd) EB Off Ramp & US 15-501

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷	↸					↶↷		↶	↷↸	
Volume (vph)	176	0	274	0	0	0	0	693	0	114	1818	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		250	0		0	0		0	150		0
Storage Lanes	1		1	0		0	0		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor										1.00		
Frt			0.850									
Flt Protected	0.950	0.950								0.950		
Satd. Flow (prot)	1588	1588	1495	0	0	0	0	3471	0	1770	3539	0
Flt Permitted	0.950	0.950								0.286		
Satd. Flow (perm)	1588	1588	1495	0	0	0	0	3471	0	532	3539	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		847			142			156			596	
Travel Time (s)		19.3			3.2			3.0			11.6	
Confl. Peds. (#/hr)							4		3	3		4
Peak Hour Factor	0.86	0.86	0.86	1.00	1.00	1.00	1.00	0.89	1.00	0.92	0.92	1.00
Heavy Vehicles (%)	8%	8%	8%	2%	2%	2%	4%	4%	4%	2%	2%	2%
Adj. Flow (vph)	205	0	319	0	0	0	0	779	0	124	1976	0
Shared Lane Traffic (%)	50%											
Lane Group Flow (vph)	102	103	319	0	0	0	0	779	0	124	1976	0
Turn Type	Perm		Perm							pm+pt		
Protected Phases		4						2		1	6	
Permitted Phases	4		4							6		
Detector Phase	4	4	4					2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0					10.0		7.0	10.0	
Minimum Split (s)	14.0	14.0	14.0					15.0		13.0	16.0	
Total Split (s)	44.0	44.0	44.0	0.0	0.0	0.0	0.0	83.0	0.0	13.0	96.0	0.0
Total Split (%)	31.4%	31.4%	31.4%	0.0%	0.0%	0.0%	0.0%	59.3%	0.0%	9.3%	68.6%	0.0%
Maximum Green (s)	37.8	37.8	37.8					78.3		7.5	90.1	
Yellow Time (s)	3.1	3.1	3.1					3.7		3.1	4.3	
All-Red Time (s)	3.1	3.1	3.1					1.0		2.4	1.6	
Lost Time Adjust (s)	-1.2	-1.2	-1.2	0.0	0.0	0.0	0.0	0.3	0.0	-0.5	-0.9	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.0	4.0	4.0	4.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0					3.0		3.0	3.0	
Recall Mode	None	None	None					C-Max		None	C-Max	
Act Effct Green (s)	34.7	34.7	34.7					82.0		95.3	95.3	
Actuated g/C Ratio	0.25	0.25	0.25					0.59		0.68	0.68	
v/c Ratio	0.26	0.26	0.86					0.38		0.29	0.82	
Control Delay	42.8	42.9	72.2					8.9		1.1	3.4	
Queue Delay	0.0	0.0	0.0					0.0		0.0	1.0	
Total Delay	42.8	42.9	72.2					8.9		1.1	4.4	
LOS	D	D	E					A		A	A	

Lanes, Volumes, Timings

9: NC 54 Bypass (Fordham Blvd) EB Off Ramp & US 15-501

2/28/2014

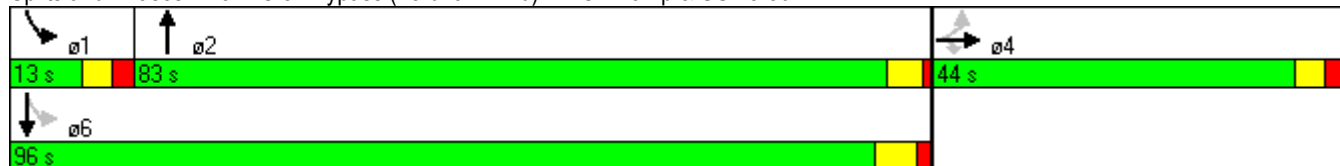


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		60.7						8.9				4.2
Approach LOS		E						A				A
Queue Length 50th (ft)	76	77	272					134		1		20
Queue Length 95th (ft)	123	125	363					184		m3		192
Internal Link Dist (ft)		767			62			76				516
Turn Bay Length (ft)	250		250							150		
Base Capacity (vph)	442	442	416					2034		436		2408
Starvation Cap Reductn	0	0	0					0		0		199
Spillback Cap Reductn	0	0	0					0		0		0
Storage Cap Reductn	0	0	0					0		0		0
Reduced v/c Ratio	0.23	0.23	0.77					0.38		0.28		0.89

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 136 (97%), Referenced to phase 2:NBT and 6:SBTL, Start of Green  
 Natural Cycle: 70  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.86  
 Intersection Signal Delay: 14.0  
 Intersection LOS: B  
 Intersection Capacity Utilization 87.7%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: NC 54 Bypass (Fordham Blvd) EB Off Ramp & US 15-501



Lanes, Volumes, Timings  
 10: SR 1994 (Culbreth Road) & US 15-501

2/28/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	130	96	57	12	75	320	57	982	31	521	1336	235
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			-8%			-2%			2%	
Storage Length (ft)	0		75	425		350	125		75	550		250
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.99	1.00								
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1726	1817	1544	1823	1918	1631	1753	3506	1568	1752	3504	1567
Flt Permitted	0.438			0.686			0.117			0.140		
Satd. Flow (perm)	796	1817	1523	1312	1918	1631	216	3506	1568	258	3504	1567
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		526			543			533			635	
Travel Time (s)		10.2			10.6			8.1			9.6	
Confl. Peds. (#/hr)			1	1			1					1
Peak Hour Factor	0.87	0.87	0.87	0.89	0.89	0.89	0.93	0.93	0.93	0.92	0.92	0.92
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	2%	2%	2%
Adj. Flow (vph)	149	110	66	13	84	360	61	1056	33	566	1452	255
Shared Lane Traffic (%)												
Lane Group Flow (vph)	149	110	66	13	84	360	61	1056	33	566	1452	255
Turn Type	pm+pt		Perm	Perm		pt+ov	Perm		Perm	pm+pt		pt+ov
Protected Phases	7	4			8	8 1		2		1	6	6 7
Permitted Phases	4		4	8			2		2	6		
Detector Phase	7	4	4	8	8	8 1	2	2	2	1	6	6 7
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		12.0	12.0	12.0	7.0	12.0	
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0		19.0	19.0	19.0	13.0	26.0	
Total Split (s)	14.0	31.0	31.0	17.0	17.0	62.0	64.0	64.0	64.0	45.0	109.0	123.0
Total Split (%)	10.0%	22.1%	22.1%	12.1%	12.1%	44.3%	45.7%	45.7%	45.7%	32.1%	77.9%	87.9%
Maximum Green (s)	7.6	24.6	24.6	10.1	10.1		57.8	57.8	57.8	39.9	102.8	
Yellow Time (s)	3.0	4.2	4.2	4.5	4.5		4.7	4.7	4.7	3.0	4.7	
All-Red Time (s)	3.4	2.2	2.2	2.4	2.4		1.5	1.5	1.5	2.1	1.5	
Lost Time Adjust (s)	-1.4	-1.4	-1.4	-1.9	-1.9	-1.9	-1.2	-1.2	-1.2	-0.1	-1.2	-1.4
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.8
Lead/Lag	Lead			Lag	Lag		Lead	Lead	Lead	Lag		
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None		C-Max	C-Max	C-Max	None	C-Max	
Walk Time (s)												7.0
Flash Dont Walk (s)												12.0
Pedestrian Calls (#/hr)												0
Act Effct Green (s)	25.7	25.7	25.7	11.7	11.7	51.7	59.3	59.3	59.3	104.3	104.3	118.5
Actuated g/C Ratio	0.18	0.18	0.18	0.08	0.08	0.37	0.42	0.42	0.42	0.74	0.74	0.85
v/c Ratio	0.72	0.33	0.24	0.12	0.53	0.60	0.67	0.71	0.05	0.91	0.56	0.19

Lanes, Volumes, Timings  
 10: SR 1994 (Culbreth Road) & US 15-501

2/28/2014

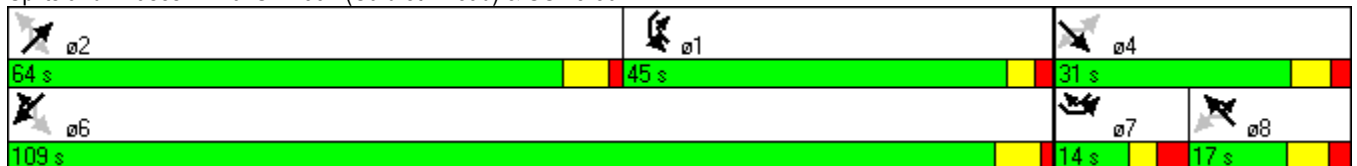


Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Control Delay	72.1	52.7	51.2	61.9	73.8	28.4	62.8	30.7	18.5	39.2	3.6	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.1	52.7	51.2	61.9	73.8	28.4	62.8	30.7	18.5	39.2	3.6	1.4
LOS	E	D	D	E	E	C	E	C	B	D	A	A
Approach Delay	61.3			37.7			32.0			12.2		
Approach LOS	E			D			C			B		
Queue Length 50th (ft)	122	88	52	11	74	202	38	447	16	259	108	20
Queue Length 95th (ft)	#198	142	95	33	130	281	#129	406	35	#598	123	m19
Internal Link Dist (ft)	446			463			453			555		
Turn Bay Length (ft)			75	425			350	125	75	550		
Base Capacity (vph)	206	337	283	112	164	606	91	1486	664	619	2611	1327
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.33	0.23	0.12	0.51	0.59	0.67	0.71	0.05	0.91	0.56	0.19

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 117 (84%), Referenced to phase 2:NETL and 6:SWTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.91  
 Intersection Signal Delay: 24.2  
 Intersection LOS: C  
 Intersection Capacity Utilization 82.4%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: SR 1994 (Culbreth Road) & US 15-501



Lanes, Volumes, Timings  
11: Arlen Park Drive & US 15-501

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	112	28	15	51	17	2	7	15	936	98	2	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			-7%				-1%			
Storage Length (ft)	75		0	200		0		275		300		275
Storage Lanes	1		0	1		0		1		1		1
Taper Length (ft)	25		25	25		25		25		25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Frt		0.947			0.983					0.850		
Flt Protected	0.950			0.950				0.950				0.950
Satd. Flow (prot)	1761	1755	0	1779	1841	0	0	1761	3522	1576	0	1770
Flt Permitted	0.740			0.724				0.950				0.950
Satd. Flow (perm)	1372	1755	0	1356	1841	0	0	1761	3522	1576	0	1770
Right Turn on Red			No			No				No		
Satd. Flow (RTOR)												
Link Speed (mph)		25			25				45			
Link Distance (ft)		387			478				2738			
Travel Time (s)		10.6			13.0				41.5			
Peak Hour Factor	0.84	0.84	0.84	0.75	0.75	0.75	0.97	0.97	0.97	0.97	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	5%	5%	5%	3%	3%	3%	3%	2%	2%
Adj. Flow (vph)	133	33	18	68	23	3	7	15	965	101	2	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	133	51	0	68	26	0	0	22	965	101	0	19
Turn Type	Perm			Perm			Prot	Prot		Perm	Prot	Prot
Protected Phases		4			8		5	5	2		1	1
Permitted Phases	4			8						2		
Detector Phase	4	4		8	8		5	5	2	2	1	1
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0	14.0	14.0	7.0	7.0
Minimum Split (s)	60.0	60.0		15.0	15.0		14.0	14.0	21.0	21.0	13.0	13.0
Total Split (s)	60.0	60.0	0.0	60.0	60.0	0.0	14.0	14.0	67.0	67.0	13.0	13.0
Total Split (%)	42.9%	42.9%	0.0%	42.9%	42.9%	0.0%	10.0%	10.0%	47.9%	47.9%	9.3%	9.3%
Maximum Green (s)	53.4	53.4		52.9	52.9		7.4	7.4	60.4	60.4	7.1	7.1
Yellow Time (s)	3.2	3.2		3.8	3.8		3.0	3.0	4.6	4.6	3.0	3.0
All-Red Time (s)	3.4	3.4		3.3	3.3		3.6	3.6	2.0	2.0	2.9	2.9
Lost Time Adjust (s)	-1.6	-1.6	0.0	-2.1	-2.1	-1.2	0.0	-1.6	-1.6	-1.6	0.0	-0.9
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	2.8	6.6	5.0	5.0	5.0	5.9	5.0
Lead/Lag							Lead	Lead	Lag	Lag	Lead	Lead
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	None	C-Max	C-Max	None	None
Walk Time (s)	4.0	4.0										
Flash Dont Walk (s)	26.0	26.0										
Pedestrian Calls (#/hr)	0	0										
Act Effct Green (s)	20.8	20.8		20.8	20.8			9.4	100.9	100.9		8.5
Actuated g/C Ratio	0.15	0.15		0.15	0.15			0.07	0.72	0.72		0.06
v/c Ratio	0.66	0.20		0.34	0.10			0.19	0.38	0.09		0.18
Control Delay	70.4	51.7		56.2	49.2			65.7	5.5	5.2		73.1
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0		0.0

Lanes, Volumes, Timings  
 11: Arlen Park Drive & US 15-501

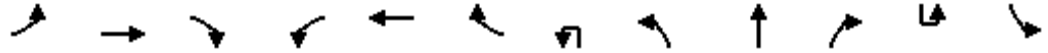
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Lane Group	SBT	SBR
Lane Configurations	↑↑	↑
Volume (vph)	1289	154
Ideal Flow (vphpl)	1900	1900
Grade (%)	0%	
Storage Length (ft)		325
Storage Lanes		1
Taper Length (ft)		25
Lane Util. Factor	0.95	1.00
Fr <sub>t</sub>		0.850
Flt Protected		
Satd. Flow (prot)	3539	1583
Flt Permitted		
Satd. Flow (perm)	3539	1583
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	45	
Link Distance (ft)	1792	
Travel Time (s)	27.2	
Peak Hour Factor	0.92	0.92
Heavy Vehicles (%)	2%	2%
Adj. Flow (vph)	1401	167
Shared Lane Traffic (%)		
Lane Group Flow (vph)	1401	167
Turn Type		Perm
Protected Phases	6	
Permitted Phases		6
Detector Phase	6	6
Switch Phase		
Minimum Initial (s)	14.0	14.0
Minimum Split (s)	25.0	25.0
Total Split (s)	66.0	66.0
Total Split (%)	47.1%	47.1%
Maximum Green (s)	59.4	59.4
Yellow Time (s)	4.6	4.6
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)	-1.6	-1.6
Total Lost Time (s)	5.0	5.0
Lead/Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes
Vehicle Extension (s)	3.0	3.0
Recall Mode	C-Max	C-Max
Walk Time (s)	7.0	7.0
Flash Dont Walk (s)	10.0	10.0
Pedestrian Calls (#/hr)	0	0
Act Effct Green (s)	100.3	100.3
Actuated g/C Ratio	0.72	0.72
v/c Ratio	0.55	0.15
Control Delay	6.5	4.1
Queue Delay	0.0	0.0

Lanes, Volumes, Timings  
 11: Arlen Park Drive & US 15-501

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Total Delay	70.4	51.7		56.2	49.2			65.7	5.5	5.2		73.1
LOS	E	D		E	D			E	A	A		E
Approach Delay		65.2			54.2				6.7			
Approach LOS		E			D				A			
Queue Length 50th (ft)	116	41		56	21			20	101	17		16
Queue Length 95th (ft)	163	72		82	39			m41	155	m36		m31
Internal Link Dist (ft)		307			398				2658			
Turn Bay Length (ft)	75			200				275		300		275
Base Capacity (vph)	539	689		533	723			120	2539	1136		108
Starvation Cap Reductn	0	0		0	0			0	0	0		0
Spillback Cap Reductn	0	0		0	0			0	0	0		0
Storage Cap Reductn	0	0		0	0			0	0	0		0
Reduced v/c Ratio	0.25	0.07		0.13	0.04			0.18	0.38	0.09		0.18

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 64 (46%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 120  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.66  
 Intersection Signal Delay: 12.0  
 Intersection LOS: B  
 Intersection Capacity Utilization 56.8%  
 ICU Level of Service B  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 11: Arlen Park Drive & US 15-501






















Lane Group	SBT	SBR
Total Delay	6.5	4.1
LOS	A	A
Approach Delay	7.0	
Approach LOS	A	
Queue Length 50th (ft)	191	28
Queue Length 95th (ft)	423	72
Internal Link Dist (ft)	1712	
Turn Bay Length (ft)		325
Base Capacity (vph)	2536	1134
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.55	0.15
<b>Intersection Summary</b>		

Lanes, Volumes, Timings  
12: US 15-501 & Market St

2/28/2014

								
Lane Group	NBU	NBL	NBT	SBU	SBT	SBR	SEL	SER
Lane Configurations								
Volume (vph)	2	101	611	28	1075	251	397	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)			-3%		4%		-3%	
Storage Length (ft)		275		250		300	0	150
Storage Lanes		1		1		1	1	1
Taper Length (ft)		25		25		25	25	25
Lane Util. Factor	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Ped Bike Factor		1.00						
Frt						0.850		0.850
Flt Protected		0.950		0.950			0.950	
Satd. Flow (prot)	0	1601	3557	1734	3468	1552	1779	1591
Flt Permitted		0.950		0.405			0.950	
Satd. Flow (perm)	0	1600	3557	739	3468	1552	1779	1591
Right Turn on Red						No		No
Satd. Flow (RTOR)								
Link Speed (mph)			45		45		25	
Link Distance (ft)			949		2738		456	
Travel Time (s)			14.4		41.5		12.4	
Confl. Peds. (#/hr)	1							
Peak Hour Factor	0.94	0.94	0.94	0.95	0.95	0.95	0.92	0.92
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	3%	3%
Parking (#/hr)		0						
Adj. Flow (vph)	2	107	650	29	1132	264	432	115
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	109	650	29	1132	264	432	115
Turn Type	Prot	Prot		Perm		pm+ov		pm+ov
Protected Phases	5!	5	2		6	4	4	5!
Permitted Phases				6		6		4
Detector Phase	5	5	2	6	6	4	4	5
Switch Phase								
Minimum Initial (s)	7.0	7.0	14.0	14.0	14.0	7.0	7.0	7.0
Minimum Split (s)	13.0	13.0	21.0	20.0	20.0	14.0	14.0	13.0
Total Split (s)	22.0	22.0	87.0	65.0	65.0	53.0	53.0	22.0
Total Split (%)	15.7%	15.7%	62.1%	46.4%	46.4%	37.9%	37.9%	15.7%
Maximum Green (s)	16.2	16.2	80.6	59.0	59.0	46.9	46.9	16.2
Yellow Time (s)	3.0	3.0	5.0	4.6	4.6	3.0	3.0	3.0
All-Red Time (s)	2.8	2.8	1.4	1.4	1.4	3.1	3.1	2.8
Lost Time Adjust (s)	0.0	-0.8	-1.4	-1.0	-1.0	-1.1	-1.1	-0.8
Total Lost Time (s)	5.8	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead		Lag	Lag			Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes			Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Max	C-Max	C-Max	None	None	None
Act Effct Green (s)		14.7	89.9	70.2	70.2	115.3	40.1	59.8
Actuated g/C Ratio		0.10	0.64	0.50	0.50	0.82	0.29	0.43
v/c Ratio		0.65	0.28	0.08	0.65	0.21	0.85	0.17
Control Delay		77.6	12.1	11.2	17.6	1.8	62.4	23.4
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0

Lanes, Volumes, Timings  
12: US 15-501 & Market St

2/28/2014



Lane Group	NBU	NBL	NBT	SBU	SBT	SBR	SEL	SER
Total Delay		77.6	12.1	11.2	17.6	1.8	62.4	23.4
LOS		E	B	B	B	A	E	C
Approach Delay			21.5		14.5		54.2	
Approach LOS			C		B		D	
Queue Length 50th (ft)		96	130	6	376	17	370	63
Queue Length 95th (ft)		161	188	m10	422	8	470	92
Internal Link Dist (ft)			869		2658		376	
Turn Bay Length (ft)		275		250		300		150
Base Capacity (vph)		196	2284	370	1738	1365	610	708
Starvation Cap Reductn		0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0	0	0
Reduced v/c Ratio		0.56	0.28	0.08	0.65	0.19	0.71	0.16

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 88 (63%), Referenced to phase 2:NBT and 6:SBTU, Start of Green  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.85  
 Intersection Signal Delay: 24.4  
 Intersection LOS: C  
 Intersection Capacity Utilization 70.0%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.  
 ! Phase conflict between lane groups.

Splits and Phases: 12: US 15-501 & Market St



Lanes, Volumes, Timings  
 14: Dogwood Acres Dr & US 15-501

2/28/2014



Lane Group	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR
Lane Configurations								
Volume (vph)	55	12	4	13	687	17	1225	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)	-1%				-4%		4%	
Storage Length (ft)	0	0		300		275		0
Storage Lanes	1	0		1		1		0
Taper Length (ft)	25	25		25		25		25
Lane Util. Factor	1.00	1.00	0.95	1.00	0.95	1.00	0.95	0.95
Frt	0.975						0.990	
Flt Protected	0.961			0.950		0.950		
Satd. Flow (prot)	1754	0	0	1770	3541	1734	3434	0
Flt Permitted	0.961			0.164		0.332		
Satd. Flow (perm)	1754	0	0	306	3541	606	3434	0
Right Turn on Red	No							No
Satd. Flow (RTOR)								
Link Speed (mph)	25				45		45	
Link Distance (ft)	1150				899		1381	
Travel Time (s)	31.4				13.6		20.9	
Peak Hour Factor	0.76	0.76	0.82	0.82	0.82	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	4%	4%	4%	2%	2%	2%
Adj. Flow (vph)	72	16	5	16	838	18	1332	97
Shared Lane Traffic (%)								
Lane Group Flow (vph)	88	0	0	21	838	18	1429	0
Turn Type			Perm	Perm	Perm			
Protected Phases	4				2	6		
Permitted Phases			2	2	6			
Detector Phase	4	2		2	2	6	6	
Switch Phase								
Minimum Initial (s)	7.0		12.0	12.0	12.0	12.0	12.0	
Minimum Split (s)	13.0		19.0	19.0	19.0	19.0	19.0	
Total Split (s)	25.0	0.0	90.0	90.0	90.0	90.0	90.0	0.0
Total Split (%)	21.7%	0.0%	78.3%	78.3%	78.3%	78.3%	78.3%	0.0%
Maximum Green (s)	19.2		83.8	83.8	83.8	83.9	83.9	
Yellow Time (s)	3.0		4.9	4.9	4.9	4.3	4.3	
All-Red Time (s)	2.8		1.3	1.3	1.3	1.8	1.8	
Lost Time Adjust (s)	-0.8	0.0	0.0	-1.2	-1.2	-1.1	-1.1	0.0
Total Lost Time (s)	5.0	4.0	6.2	5.0	5.0	5.0	5.0	4.0
Lead/Lag								
Lead-Lag Optimize?								
Vehicle Extension (s)	2.0		6.0	6.0	6.0	6.0	6.0	
Recall Mode	None		Min	Min	Min	Min	Min	
Act Effct Green (s)	10.7			69.6	69.6	69.6	69.6	
Actuated g/C Ratio	0.13			0.82	0.82	0.82	0.82	
v/c Ratio	0.40			0.08	0.29	0.04	0.51	
Control Delay	45.6			3.6	3.1	2.9	4.4	
Queue Delay	0.0			0.0	0.0	0.0	0.0	
Total Delay	45.6			3.6	3.1	2.9	4.4	
LOS	D			A	A	A	A	
Approach Delay	45.6				3.1	4.4		

Lanes, Volumes, Timings  
 14: Dogwood Acres Dr & US 15-501

2/28/2014



Lane Group	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR
Approach LOS	D			A			A	
Queue Length 50th (ft)	46			2	55	2	124	
Queue Length 95th (ft)	90			8	84	7	208	
Internal Link Dist (ft)	1070			819			1301	
Turn Bay Length (ft)				300		275		
Base Capacity (vph)	443			283	3276	561	3177	
Starvation Cap Reductn	0			0	0	0	0	
Spillback Cap Reductn	0			0	0	0	0	
Storage Cap Reductn	0			0	0	0	0	
Reduced v/c Ratio	0.20			0.07	0.26	0.03	0.45	

Intersection Summary

Area Type:	Other
Cycle Length:	115
Actuated Cycle Length:	85
Natural Cycle:	40
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.51
Intersection Signal Delay:	5.5
Intersection LOS:	A
Intersection Capacity Utilization	50.9%
ICU Level of Service	A
Analysis Period (min)	15

Splits and Phases: 14: Dogwood Acres Dr & US 15-501



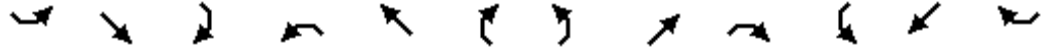
Lanes, Volumes, Timings  
15: Smith Level Road & US 15-501

2/28/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	40	63	372	134	52	71	302	524	22	92	1027	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			1%			-1%			1%	
Storage Length (ft)	125		175	150		150	500		250	275		100
Storage Lanes	1		2	2		1	2		1	2		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	0.88	0.97	1.00	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1844	2759	3416	1853	1575	3384	3489	1561	3416	3522	1575
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1752	1844	2759	3416	1853	1575	3384	3489	1561	3416	3522	1575
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			25			45			45	
Link Distance (ft)		800			667			1107			1252	
Travel Time (s)		12.1			18.2			16.8			19.0	
Peak Hour Factor	0.97	0.97	0.97	0.89	0.89	0.89	0.88	0.88	0.88	0.98	0.98	0.98
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	4%	4%	4%	2%	2%	2%
Adj. Flow (vph)	41	65	384	151	58	80	343	595	25	94	1048	66
Shared Lane Traffic (%)												
Lane Group Flow (vph)	41	65	384	151	58	80	343	595	25	94	1048	66
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0	7.0	7.0	12.0	7.0
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0	14.0	14.0	19.0	14.0	14.0	19.0	14.0
Total Split (s)	20.0	25.0	15.0	20.0	25.0	15.0	15.0	90.0	20.0	15.0	90.0	20.0
Total Split (%)	13.3%	16.7%	10.0%	13.3%	16.7%	10.0%	10.0%	60.0%	13.3%	10.0%	60.0%	13.3%
Maximum Green (s)	13.9	18.8	8.3	13.6	18.4	8.7	8.3	83.2	13.6	8.7	83.3	13.9
Yellow Time (s)	3.0	4.0	3.3	3.1	3.8	3.2	3.3	4.7	3.1	3.2	4.5	3.0
All-Red Time (s)	3.1	2.2	3.4	3.3	2.8	3.1	3.4	2.1	3.3	3.1	2.2	3.1
Lost Time Adjust (s)	-1.1	-1.2	-1.7	-1.4	-1.6	-1.3	-1.7	-1.8	-1.4	-1.3	-1.7	-1.1
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	6.0	2.0	2.0	6.0	2.0
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	None
Act Effct Green (s)	9.2	10.1	21.9	10.9	11.8	26.3	10.5	47.8	63.9	9.3	46.5	61.0
Actuated g/C Ratio	0.10	0.11	0.23	0.11	0.12	0.28	0.11	0.50	0.67	0.10	0.49	0.64
v/c Ratio	0.24	0.33	0.60	0.39	0.25	0.18	0.92	0.34	0.02	0.28	0.61	0.07
Control Delay	50.4	50.3	38.9	46.6	46.1	32.8	75.7	15.3	6.1	48.7	19.6	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.4	50.3	38.9	46.6	46.1	32.8	75.7	15.3	6.1	48.7	19.6	7.4
LOS	D	D	D	D	D	C	E	B	A	D	B	A
Approach Delay		41.4			42.7			36.6			21.2	

Lanes, Volumes, Timings  
 15: Smith Level Road & US 15-501

2/28/2014



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Approach LOS		D			D			D			C	
Queue Length 50th (ft)	24	38	115	44	33	38	108	110	5	28	237	15
Queue Length 95th (ft)	68	95	214	91	83	93	#263	170	14	64	344	33
Internal Link Dist (ft)		720			587			1027			1172	
Turn Bay Length (ft)	125		175	150		150	500		250	275		100
Base Capacity (vph)	291	408	635	567	410	456	374	3034	1130	378	3063	1119
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.16	0.60	0.27	0.14	0.18	0.92	0.20	0.02	0.25	0.34	0.06

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 95.1  
 Natural Cycle: 65  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.92  
 Intersection Signal Delay: 31.7  
 Intersection LOS: C  
 Intersection Capacity Utilization 60.0%  
 ICU Level of Service B  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

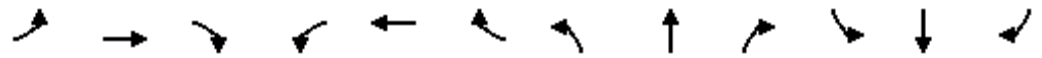
Splits and Phases: 15: Smith Level Road & US 15-501

ø1	ø2	ø3	ø4
15 s	90 s	20 s	25 s
ø5	ø6	ø7	ø8
15 s	90 s	20 s	25 s

Lanes, Volumes, Timings

17: Merritt Mill Road / NC 54 WB Off Ramp & Greensboro Street

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖↗	↖		↖	↖↗	↖	↖	↖↗	↖↗
Volume (vph)	0	0	0	594	263	247	326	350	218	41	552	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			-3%			2%				-3%
Storage Length (ft)	0		0	475		0	225		250	250		0
Storage Lanes	0		0	1		0	1		1	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor							1.00		0.98	1.00		0.98
Fr <sub>t</sub>					0.927				0.850			0.850
Fl <sub>t</sub> Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	0	0	3485	1753	0	1752	3504	1567	1796	3592	1607
Fl <sub>t</sub> Permitted				0.950			0.275			0.493		
Satd. Flow (perm)	0	0	0	3485	1753	0	507	3504	1530	927	3592	1571
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			35			35			35	
Link Distance (ft)		467			767			384			607	
Travel Time (s)		10.6			14.9			7.5			11.8	
Confl. Peds. (#/hr)	2						1		4	4		1
Peak Hour Factor	1.00	1.00	1.00	0.92	0.92	0.92	0.92	0.92	0.92	0.94	0.94	0.94
Adj. Flow (vph)	0	0	0	646	286	268	354	380	237	44	587	63
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	646	554	0	354	380	237	44	587	63
Turn Type				Perm			pm+pt		Perm	Perm		Perm
Protected Phases					8		5	2			6	
Permitted Phases				8			2		2	6		6
Detector Phase				8	8		5	2	2	6	6	6
Switch Phase												
Minimum Initial (s)				7.0	7.0		7.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)				14.0	14.0		13.0	16.0	16.0	16.0	16.0	16.0
Total Split (s)	0.0	0.0	0.0	56.0	56.0	0.0	32.0	64.0	64.0	32.0	32.0	32.0
Total Split (%)	0.0%	0.0%	0.0%	46.7%	46.7%	0.0%	26.7%	53.3%	53.3%	26.7%	26.7%	26.7%
Maximum Green (s)				49.5	49.5		26.4	58.0	58.0	26.0	26.0	26.0
Yellow Time (s)				4.2	4.2		3.0	3.9	3.9	3.9	3.9	3.9
All-Red Time (s)				2.3	2.3		2.6	2.1	2.1	2.1	2.1	2.1
Lost Time Adjust (s)	0.0	0.0	0.0	-1.5	-1.5	0.0	-0.6	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.0	4.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag							Lag			Lead	Lead	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode				None	None		None	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)				46.2	46.2		63.8	63.8	63.8	31.8	31.8	31.8
Actuated g/C Ratio				0.38	0.38		0.53	0.53	0.53	0.26	0.26	0.26
v/c Ratio				0.48	0.82		0.64	0.20	0.29	0.18	0.62	0.15
Control Delay				28.6	43.8		22.3	4.0	5.0	39.4	43.2	37.6
Queue Delay				0.0	0.0		0.0	0.0	0.4	0.0	0.0	0.0
Total Delay				28.6	43.8		22.3	4.0	5.5	39.4	43.2	37.6
LOS				C	D		C	A	A	D	D	D



Lanes, Volumes, Timings

17: Merritt Mill Road / NC 54 WB Off Ramp & Greensboro Street

2/28/2014

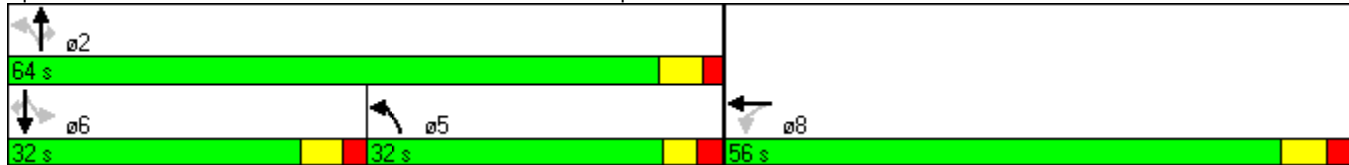


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay					35.6			11.1			42.5	
Approach LOS					D			B			D	
Queue Length 50th (ft)				185	368		165	58	96	27	217	39
Queue Length 95th (ft)				229	497		235	7	10	63	288	80
Internal Link Dist (ft)		387			687			304			527	
Turn Bay Length (ft)				475			225		250	250		
Base Capacity (vph)				1481	745		550	1864	814	246	953	417
Starvation Cap Reductn				0	0		0	0	253	0	0	0
Spillback Cap Reductn				0	0		0	0	0	0	0	0
Storage Cap Reductn				0	0		0	0	0	0	0	0
Reduced v/c Ratio				0.44	0.74		0.64	0.20	0.42	0.18	0.62	0.15

Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	4 (3%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle:	60
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.82
Intersection Signal Delay:	29.0
Intersection LOS:	C
Intersection Capacity Utilization	74.8%
ICU Level of Service	D
Analysis Period (min)	15












Splits and Phases: 17: Merritt Mill Road / NC 54 WB Off Ramp & Greensboro Street



Lanes, Volumes, Timings

18: Smith Level Road & NC 54 Bypass (Fordham Blvd) EB Off Ramp

2/28/2014

											
Lane Group	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	SEL2	SEL	SER
Lane Configurations				↑↑	↑	↑	↑↑		↑	↓	↑
Volume (vph)	0	0	0	743	165	305	836	0	126	0	245
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)	0%			1%			-2%			-3%	
Storage Length (ft)	0	0	0		125	175		0		250	250
Storage Lanes	0	0	0		1	1		0		1	1
Taper Length (ft)	25	25	25		25	25		25		25	25
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00
Ped Bike Factor					0.96						0.99
Frt					0.850						0.850
Flt Protected						0.950			0.950	0.950	
Satd. Flow (prot)	0	0	0	3522	1575	1787	3575	0	1690	1690	1591
Flt Permitted						0.236			0.950	0.950	
Satd. Flow (perm)	0	0	0	3522	1513	444	3575	0	1690	1690	1571
Right Turn on Red					No			No			No
Satd. Flow (RTOR)											
Link Speed (mph)	30			35			35			35	
Link Distance (ft)	706			414			384			490	
Travel Time (s)	16.0			8.1			7.5			9.5	
Confl. Peds. (#/hr)			1		5	5		1			1
Peak Hour Factor	1.00	1.00	1.00	0.90	0.90	0.92	0.92	1.00	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	3%	3%	3%
Adj. Flow (vph)	0	0	0	826	183	332	909	0	135	0	263
Shared Lane Traffic (%)									50%		
Lane Group Flow (vph)	0	0	0	826	183	332	909	0	67	68	263
Turn Type					Perm	pm+pt			Perm		Perm
Protected Phases				2		1	6			4	
Permitted Phases					2	6			4		4
Detector Phase				2	2	1	6		4	4	4
Switch Phase											
Minimum Initial (s)				10.0	10.0	8.0	10.0		7.0	7.0	7.0
Minimum Split (s)				25.0	25.0	15.0	20.0		14.0	14.0	14.0
Total Split (s)	0.0	0.0	0.0	48.0	48.0	33.0	81.0	0.0	39.0	39.0	39.0
Total Split (%)	0.0%	0.0%	0.0%	40.0%	40.0%	27.5%	67.5%	0.0%	32.5%	32.5%	32.5%
Maximum Green (s)				38.2	38.2	26.7	71.1		32.7	32.7	32.7
Yellow Time (s)				3.8	3.8	3.0	3.9		4.0	4.0	4.0
All-Red Time (s)				6.0	6.0	3.3	6.0		2.3	2.3	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	-4.8	-4.8	-1.3	-4.9	0.0	-1.3	-1.3	-1.3
Total Lost Time (s)	4.0	4.0	4.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0	5.0
Lead/Lag				Lag	Lag	Lead					
Lead-Lag Optimize?				Yes	Yes	Yes					
Vehicle Extension (s)				3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode				C-Max	C-Max	None	C-Max		None	None	None
Walk Time (s)				7.0	7.0						
Flash Dont Walk (s)				8.0	8.0						
Pedestrian Calls (#/hr)				0	0						
Act Effct Green (s)				60.4	60.4	83.6	83.6		26.4	26.4	26.4
Actuated g/C Ratio				0.50	0.50	0.70	0.70		0.22	0.22	0.22
v/c Ratio				0.47	0.24	0.65	0.36		0.18	0.18	0.76

Lanes, Volumes, Timings

18: Smith Level Road & NC 54 Bypass (Fordham Blvd) EB Off Ramp

2/28/2014



Lane Group	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	SEL2	SEL	SER
Control Delay				22.9	21.3	17.6	1.8		37.0	37.1	57.7
Queue Delay				0.0	0.0	0.3	0.2		0.0	0.0	0.0
Total Delay				22.9	21.3	17.9	2.0		37.0	37.1	57.7
LOS				C	C	B	A		D	D	E
Approach Delay				22.6			6.2			50.7	
Approach LOS				C			A			D	
Queue Length 50th (ft)				209	77	60	0		44	45	191
Queue Length 95th (ft)				351	166	230	140		80	81	267
Internal Link Dist (ft)	626			334			304			410	
Turn Bay Length (ft)					125	175			250	250	250
Base Capacity (vph)				1774	762	623	2491		479	479	445
Starvation Cap Reductn				0	0	44	713		0	0	0
Spillback Cap Reductn				0	0	0	0		0	0	0
Storage Cap Reductn				0	0	0	0		0	0	0
Reduced v/c Ratio				0.47	0.24	0.57	0.51		0.14	0.14	0.59

Intersection Summary

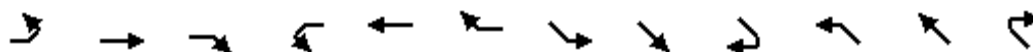
Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle:	60
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.76
Intersection Signal Delay:	19.1
Intersection LOS:	B
Intersection Capacity Utilization	56.0%
ICU Level of Service	B
Analysis Period (min)	15

Splits and Phases: 18: Smith Level Road & NC 54 Bypass (Fordham Blvd) EB Off Ramp



Lanes, Volumes, Timings  
 20: US 15-501 (Fordham Blvd) & Manning Drive

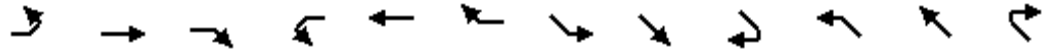
2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	110	1777	4	12	2113	265	671	7	163	14	3	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	9	12
Grade (%)		-5%			0%			-4%			0%	
Storage Length (ft)	400		0	200		1000	0		225	0		75
Storage Lanes	2		0	1		1	0		1	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00					0.99		0.99	
Frt						0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950				0.961	
Satd. Flow (prot)	3485	3592	0	1770	3539	1583	3502	1900	1615	0	1611	1583
Flt Permitted	0.950			0.950			0.950				0.961	
Satd. Flow (perm)	3485	*3811	0	1768	3539	1583	*3819	1900	1593	0	1596	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			35			25	
Link Distance (ft)		579			1499			367			515	
Travel Time (s)		8.8			22.7			7.1			14.0	
Confl. Peds. (#/hr)			1	1					5	5		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.85	0.85	0.85	0.84	0.84	0.84
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	115	1851	4	12	2201	276	789	8	192	17	4	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	115	1855	0	12	2201	276	789	8	192	0	21	24
Turn Type	Prot			Prot		pm+ov	Split		Free	Split		pm+ov
Protected Phases	5	2		1	6	4	4	4		3	3	1
Permitted Phases						6			Free			3
Detector Phase	5	2		1	6	4	4	4		3	3	1
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0	7.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	14.0	19.0		14.0	19.0	32.0	32.0	32.0		14.0	14.0	14.0
Total Split (s)	14.0	117.0	0.0	14.0	117.0	45.0	45.0	45.0	0.0	14.0	14.0	14.0
Total Split (%)	7.4%	61.6%	0.0%	7.4%	61.6%	23.7%	23.7%	23.7%	0.0%	7.4%	7.4%	7.4%
Maximum Green (s)	7.8	110.9		7.8	110.7	38.8	38.8	38.8		7.8	7.8	7.8
Yellow Time (s)	3.0	4.7		3.0	4.5	3.8	3.8	3.8		3.8	3.8	3.0
All-Red Time (s)	3.2	1.4		3.2	1.8	2.4	2.4	2.4		2.4	2.4	3.2
Lost Time Adjust (s)	-1.2	-1.1	0.0	-1.2	-1.3	-1.2	-1.2	-1.2	0.0	-2.5	-1.2	-1.2
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0	3.7	5.0	5.0
Lead/Lag	Lead	Lead		Lag	Lag	Lag	Lag	Lag		Lead	Lead	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	6.0		1.0	6.0	1.0	1.0	1.0		1.0	1.0	1.0
Recall Mode	None	C-Max		None	C-Max	None	None	None		None	None	None
Walk Time (s)						7.0	7.0	7.0				
Flash Dont Walk (s)						18.0	18.0	18.0				
Pedestrian Calls (#/hr)						0	0	0				
Act Effct Green (s)	8.8	114.8		8.8	112.2	160.0	45.9	45.9	190.0		8.4	17.0
Actuated g/C Ratio	0.05	0.60		0.05	0.59	0.84	0.24	0.24	1.00		0.04	0.09

Lanes, Volumes, Timings  
 20: US 15-501 (Fordham Blvd) & Manning Drive

2/28/2014

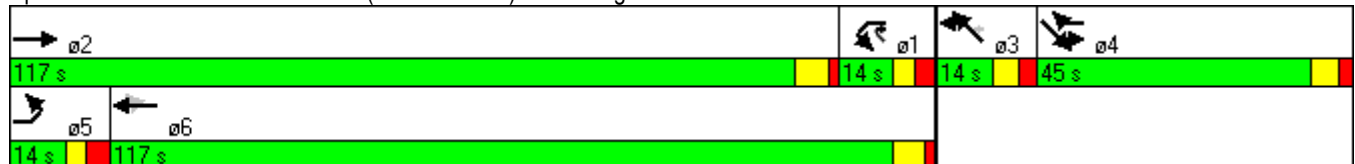


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
v/c Ratio	0.71	0.85		0.15	1.05	0.21	0.93	0.02	0.12		0.30	0.17
Control Delay	112.1	36.6		55.8	40.7	0.6	87.0	59.1	0.2		98.6	79.3
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	112.1	36.6		55.8	40.7	0.6	87.0	59.1	0.2		98.6	79.3
LOS	F	D		E	D	A	F	E	A		F	E
Approach Delay		41.0			36.4			69.9			88.3	
Approach LOS		D			D			E			F	
Queue Length 50th (ft)	74	1010		14	~1555	11	~550	8	0		26	27
Queue Length 95th (ft)	#120	1118		m14	m118	m8	#630	24	0		56	58
Internal Link Dist (ft)		499			1419			287			435	
Turn Bay Length (ft)	400			200		1000			225			75
Base Capacity (vph)	165	2170		84	2089	1333	845	459	1593		76	143
Starvation Cap Reductn	0	0		0	0	0	0	0	0		0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0		0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0		0	0
Reduced v/c Ratio	0.70	0.85		0.14	1.05	0.21	0.93	0.02	0.12		0.28	0.17

Intersection Summary

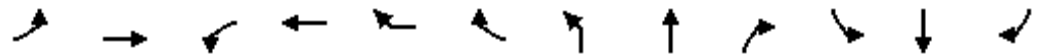
Area Type: Other  
 Cycle Length: 190  
 Actuated Cycle Length: 190  
 Offset: 12 (6%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.05  
 Intersection Signal Delay: 44.5 Intersection LOS: D  
 Intersection Capacity Utilization 92.6% ICU Level of Service F  
 Analysis Period (min) 15  
 \* User Entered Value  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 20: US 15-501 (Fordham Blvd) & Manning Drive



Lanes, Volumes, Timings  
 21: Old Mason Farm Road & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	EBL	EBT	WBL	WBT	WBR	WBR2	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗	↖			↖	↕	↗	↖	↕	↗
Volume (vph)	9	3	84	3	3	47	21	2322	119	40	2242	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%		3%				0%			0%	
Storage Length (ft)	0		50		0		350		300	125		100
Storage Lanes	0		1		0		1		1	1		1
Taper Length (ft)	25		25		25		25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	*1.00	1.00	1.00	*1.00	1.00
Ped Bike Factor				0.99								
Fr <sub>t</sub>				0.857					0.850			0.850
Fl <sub>t</sub> Protected		0.964	0.950				0.950			0.950		
Satd. Flow (prot)	0	1796	1743	1552	0	0	1770	3725	1583	1770	3725	1583
Fl <sub>t</sub> Permitted		0.742	0.950				0.950			0.950		
Satd. Flow (perm)	0	1382	1743	1552	0	0	1770	*3787	1583	1770	*3771	1583
Right Turn on Red							No		No			
Satd. Flow (RTOR)												
Link Speed (mph)		30		35				45				45
Link Distance (ft)		305		620				1499				1494
Travel Time (s)		6.9		12.1				22.7				22.6
Confl. Peds. (#/hr)							1					
Peak Hour Factor	0.39	0.39	0.86	0.86	0.86	0.86	0.92	0.92	0.92	0.90	0.90	0.90
Adj. Flow (vph)	23	8	98	3	3	55	23	2524	129	44	2491	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	31	98	61	0	0	23	2524	129	44	2491	14
Turn Type	Perm		Split				Prot		pm+ov	Prot		Perm
Protected Phases		7	3	3			5	2	3	1	6	
Permitted Phases	7								2			6
Detector Phase	7	7	3	3			5	2	3	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	7.0	7.0			7.0	12.0	7.0	7.0	12.0	12.0
Minimum Split (s)	13.0	13.0	36.0	36.0			14.0	33.0	36.0	15.0	25.0	25.0
Total Split (s)	13.0	13.0	25.0	25.0	0.0	0.0	18.0	109.0	25.0	18.0	109.0	109.0
Total Split (%)	6.8%	6.8%	13.2%	13.2%	0.0%	0.0%	9.5%	57.4%	13.2%	9.5%	57.4%	57.4%
Maximum Green (s)	5.8	5.8	18.4	18.4			11.0	102.8	18.4	12.1	102.9	102.9
Yellow Time (s)	3.0	3.0	3.6	3.6			3.0	4.6	3.6	3.0	4.4	4.4
All-Red Time (s)	4.2	4.2	3.0	3.0			4.0	1.6	3.0	2.9	1.7	1.7
Lost Time Adjust (s)	0.0	-2.2	-1.6	-1.6	-1.6	-1.6	-2.0	-1.2	-1.6	-0.9	-1.1	-1.1
Total Lost Time (s)	7.2	5.0	5.0	5.0	2.4	2.4	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag			Lead	Lead			Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0	2.0	2.0			2.0	2.0	2.0	2.0	2.0	2.0
Recall Mode	None	None	None	None			None	C-Max	None	None	C-Max	C-Max
Walk Time (s)			4.0	4.0				7.0	4.0		7.0	7.0
Flash Dont Walk (s)			25.0	25.0				16.0	25.0		11.0	11.0
Pedestrian Calls (#/hr)			0	0				0	0		0	0
Act Effct Green (s)		8.1	16.1	16.1			9.8	113.6	130.8	12.0	118.8	118.8
Actuated g/C Ratio		0.04	0.08	0.08			0.05	0.60	0.69	0.06	0.63	0.63
v/c Ratio		0.53	0.66	0.46			0.25	1.13	0.12	0.39	1.07	0.01
Control Delay		119.2	104.9	93.3			102.3	92.1	3.4	95.5	74.4	18.3

Lanes, Volumes, Timings  
 21: Old Mason Farm Road & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	SEL2	SEL	SER	SER2
Lane Configurations				
Volume (vph)	51	6	63	1
Ideal Flow (vphpl)	1900	1900	1900	1900
Grade (%)		2%		
Storage Length (ft)		125	0	
Storage Lanes		1	0	
Taper Length (ft)		25	25	
Lane Util. Factor	0.95	0.95	1.00	1.00
Ped Bike Factor				
Frt		0.872		
Flt Protected	0.950	0.993		
Satd. Flow (prot)	1664	1517	0	0
Flt Permitted	0.950	0.993		
Satd. Flow (perm)	1664	1517	0	0
Right Turn on Red				No
Satd. Flow (RTOR)				
Link Speed (mph)		25		
Link Distance (ft)		359		
Travel Time (s)		9.8		
Confl. Peds. (#/hr)				
Peak Hour Factor	0.59	0.59	0.59	0.59
Adj. Flow (vph)	86	10	107	2
Shared Lane Traffic (%)	10%			
Lane Group Flow (vph)	77	128	0	0
Turn Type	Split			
Protected Phases	4	4		
Permitted Phases				
Detector Phase	4	4		
Switch Phase				
Minimum Initial (s)	5.0	5.0		
Minimum Split (s)	13.0	13.0		
Total Split (s)	25.0	25.0	0.0	0.0
Total Split (%)	13.2%	13.2%	0.0%	0.0%
Maximum Green (s)	17.6	17.6		
Yellow Time (s)	3.0	3.0		
All-Red Time (s)	4.4	4.4		
Lost Time Adjust (s)	-2.4	-2.4	-2.4	0.0
Total Lost Time (s)	5.0	5.0	1.6	4.0
Lead/Lag	Lag	Lag		
Lead-Lag Optimize?				
Vehicle Extension (s)	2.0	2.0		
Recall Mode	None	None		
Walk Time (s)				
Flash Dont Walk (s)				
Pedestrian Calls (#/hr)				
Act Effct Green (s)	20.2	20.2		
Actuated g/C Ratio	0.11	0.11		
v/c Ratio	0.44	0.80		
Control Delay	87.4	113.4		

Lanes, Volumes, Timings  
 21: Old Mason Farm Road & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	EBL	EBT	WBL	WBT	WBR	WBR2	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay		0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		119.2	104.9	93.3			102.3	92.1	3.4	95.5	74.4	18.3
LOS		F	F	F			F	F	A	F	E	B
Approach Delay		119.3		100.5				87.9			74.4	
Approach LOS		F		F				F			E	
Queue Length 50th (ft)		39	121	74			27	~1937	23	54	~1850	7
Queue Length 95th (ft)		35	180	123			m31	#2036	m24	102	#1980	21
Internal Link Dist (ft)		225		540				1419			1414	
Turn Bay Length (ft)			50				350		300	125		100
Base Capacity (vph)		60	183	163			121	2228	1122	121	2330	990
Starvation Cap Reductn		0	0	0			0	0	0	0	0	0
Spillback Cap Reductn		0	0	0			0	0	0	0	0	0
Storage Cap Reductn		0	0	0			0	0	0	0	0	0
Reduced v/c Ratio		0.52	0.54	0.37			0.19	1.13	0.11	0.36	1.07	0.01

Intersection Summary

Area Type: Other  
 Cycle Length: 190  
 Actuated Cycle Length: 190  
 Offset: 188 (99%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.13  
 Intersection Signal Delay: 82.9  
 Intersection Capacity Utilization 88.2%  
 Analysis Period (min) 15  
 \* User Entered Value  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 21: Old Mason Farm Road & US 15-501 (Fordham Blvd)

109 s	18 s	25 s	25 s	18 s	109 s



Lanes, Volumes, Timings  
 21: Old Mason Farm Road & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	SEL2	SEL	SER	SER2
Queue Delay	0.0	0.0		
Total Delay	87.4	113.4		
LOS	F	F		
Approach Delay		103.7		
Approach LOS		F		
Queue Length 50th (ft)	94	164		
Queue Length 95th (ft)	105	161		
Internal Link Dist (ft)		279		
Turn Bay Length (ft)	125	125		
Base Capacity (vph)	184	168		
Starvation Cap Reductn	0	0		
Spillback Cap Reductn	0	0		
Storage Cap Reductn	0	0		
Reduced v/c Ratio	0.42	0.76		
<b>Intersection Summary</b>				

Lanes, Volumes, Timings  
 22: NC 54 WB On-Ramp & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↑↑			↑		↑↑	↑		↑↑	↑
Volume (vph)	0	0	1012	0	0	429	0	1653	21	0	1595	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		450	0		0			200	0		375
Storage Lanes	0		1	0		1	0		1	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	0.88	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.865			0.850			0.850
Flt Protected												
Satd. Flow (prot)	0	0	2787	0	0	1611	0	3539	1583	0	3539	1583
Flt Permitted												
Satd. Flow (perm)	0	0	2787	0	0	1611	0	3539	1583	0	3539	1583
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)						95			5			33
Link Speed (mph)		30			25			45				45
Link Distance (ft)		694			685			1058				1301
Travel Time (s)		15.8			18.7			16.0				19.7
Peak Hour Factor	0.92	0.92	0.92	0.90	0.92	0.90	0.92	0.90	0.90	0.90	0.82	0.92
Adj. Flow (vph)	0	0	1100	0	0	477	0	1837	23	0	1945	100
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	1100	0	0	477	0	1837	23	0	1945	100
Turn Type			custom			Free			Free			Free
Protected Phases			4					2 4				6
Permitted Phases			4			Free			Free			Free
Detector Phase			4					2 4				6
Switch Phase												
Minimum Initial (s)			7.0									12.0
Minimum Split (s)			13.0									18.0
Total Split (s)	0.0	0.0	73.0	0.0	0.0	0.0	0.0	170.0	0.0	0.0	97.0	0.0
Total Split (%)	0.0%	0.0%	42.9%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	57.1%	0.0%
Maximum Green (s)			67.9									91.2
Yellow Time (s)			3.1									4.5
All-Red Time (s)			2.0									1.3
Lost Time Adjust (s)	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	-0.8	0.0	0.0	-0.8	0.0
Total Lost Time (s)	4.0	4.0	5.0	4.0	4.0	4.0	4.0	5.0	4.0	4.0	5.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)			3.0									6.0
Recall Mode			C-Max									Max
Act Effct Green (s)			68.0			170.0		170.0	170.0		92.0	170.0
Actuated g/C Ratio			0.40			1.00		1.00	1.00		0.54	1.00
v/c Ratio			0.99			0.30		0.52	0.01		1.02	0.06
Control Delay			73.8			0.5		0.5	0.0		62.7	0.1
Queue Delay			0.0			0.0		0.0	0.0		0.0	0.0
Total Delay			73.8			0.5		0.5	0.0		62.7	0.1
LOS			E			A		A	A		E	A
Approach Delay								0.5			59.7	
Approach LOS								A			E	
Queue Length 50th (ft)			688			0		0	0		~1198	0

Lane Group	ø2
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Fr <sub>t</sub>	
Fl <sub>t</sub> Protected	
Satd. Flow (prot)	
Fl <sub>t</sub> Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	12.0
Minimum Split (s)	18.0
Total Split (s)	97.0
Total Split (%)	57%
Maximum Green (s)	91.2
Yellow Time (s)	4.5
All-Red Time (s)	1.3
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	6.0
Recall Mode	Max
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	

Lanes, Volumes, Timings  
 22: NC 54 WB On-Ramp & US 15-501 (Fordham Blvd)

2/28/2014

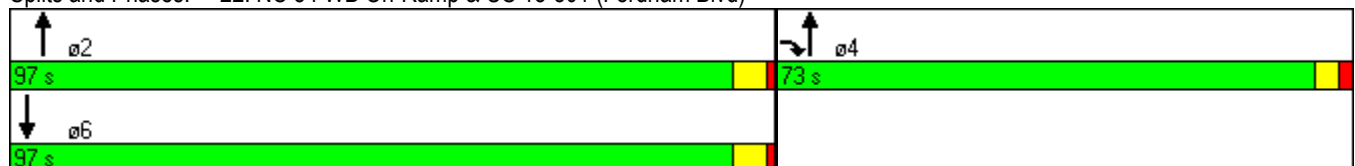


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)			#863			0		0	0		1042	0
Internal Link Dist (ft)		614			605			978			1221	
Turn Bay Length (ft)			450						200			375
Base Capacity (vph)			1115			1611		3539	1583		1915	1583
Starvation Cap Reductn			0			0		0	0		0	0
Spillback Cap Reductn			0			0		0	0		0	0
Storage Cap Reductn			0			0		0	0		0	0
Reduced v/c Ratio			0.99			0.30		0.52	0.01		1.02	0.06

Intersection Summary

Area Type: Other  
 Cycle Length: 170  
 Actuated Cycle Length: 170  
 Offset: 0 (0%), Referenced to phase 4:NBT, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.02  
 Intersection Signal Delay: 37.3  
 Intersection LOS: D  
 Intersection Capacity Utilization 87.8%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 22: NC 54 WB On-Ramp & US 15-501 (Fordham Blvd)



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Lane Group	ø2
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

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Lanes, Volumes, Timings  
 23: NC 54 (Raleigh Road) & Burning Tree Drive

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	66	2331	30	165	2237	53	30	13	188	29	34	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	275		0	0		450	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			0.99			0.99	
Frt		0.998			0.997				0.850		0.945	
Flt Protected	0.950			0.950				0.966			0.987	
Satd. Flow (prot)	1770	5071	0	1770	5063	0	0	1799	1583	0	1722	0
Flt Permitted	0.050			0.050				0.733			0.906	
Satd. Flow (perm)	93	5071	0	93	5063	0	0	1358	1583	0	1581	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			25	
Link Distance (ft)		1026			881			637			457	
Travel Time (s)		20.0			17.2			12.4			12.5	
Confl. Peds. (#/hr)	14		18	18		14	9					9
Peak Hour Factor	0.95	0.95	0.95	0.89	0.89	0.89	0.86	0.86	0.86	0.83	0.83	0.83
Adj. Flow (vph)	69	2454	32	185	2513	60	35	15	219	35	41	52
Shared Lane Traffic (%)												
Lane Group Flow (vph)	69	2486	0	185	2573	0	0	50	219	0	128	0
Turn Type	pm+pt			pm+pt			Perm		Perm	Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8		8	4		
Detector Phase	5	2		1	6		8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0		7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	13.0	32.0		13.0	30.0		48.0	48.0	48.0	46.0	46.0	
Total Split (s)	13.0	77.0	0.0	15.0	79.0	0.0	48.0	48.0	48.0	48.0	48.0	0.0
Total Split (%)	9.3%	55.0%	0.0%	10.7%	56.4%	0.0%	34.3%	34.3%	34.3%	34.3%	34.3%	0.0%
Maximum Green (s)	7.1	70.8		9.1	72.8		41.8	41.8	41.8	41.7	41.7	
Yellow Time (s)	3.0	4.9		3.0	4.9		3.7	3.7	3.7	3.2	3.2	
All-Red Time (s)	2.9	1.3		2.9	1.3		2.5	2.5	2.5	3.1	3.1	
Lost Time Adjust (s)	-0.9	-1.2	0.0	-0.9	-1.2	0.0	0.0	-1.2	-1.2	0.0	-1.3	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	6.2	5.0	5.0	6.3	5.0	4.0
Lead/Lag	Lead	Lead		Lag	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		Min	Min	Min	Min	Min	
Walk Time (s)		7.0			7.0		7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)		18.0			16.0		34.0	34.0	34.0	32.0	32.0	
Pedestrian Calls (#/hr)		0			0		0	0	0	0	0	
Act Effct Green (s)	89.0	89.0		92.6	92.6			26.0	26.0		26.0	
Actuated g/C Ratio	0.64	0.64		0.66	0.66			0.19	0.19		0.19	
v/c Ratio	0.42	0.77		1.02	0.77			0.20	0.74		0.44	
Control Delay	38.0	7.8		120.8	20.4			47.6	68.5		53.8	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	

Lanes, Volumes, Timings  
 23: NC 54 (Raleigh Road) & Burning Tree Drive

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	38.0	7.8		120.8	20.4			47.6	68.5		53.8	
LOS	D	A		F	C			D	E		D	
Approach Delay		8.6			27.2			64.6			53.8	
Approach LOS		A			C			E			D	
Queue Length 50th (ft)	18	142		~128	578			39	190		104	
Queue Length 95th (ft)	m49	190		#295	782			70	249		144	
Internal Link Dist (ft)		946			801			557			377	
Turn Bay Length (ft)	250			275					450			
Base Capacity (vph)	166	3222		182	3349			417	486		486	
Starvation Cap Reductn	0	0		0	0			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.42	0.77		1.02	0.77			0.12	0.45		0.26	

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 22 (16%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 125  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.02  
 Intersection Signal Delay: 21.2  
 Intersection LOS: C  
 Intersection Capacity Utilization 85.5%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 23: NC 54 (Raleigh Road) & Burning Tree Drive



Lanes, Volumes, Timings  
24: NC 54 (Raleigh Road) & Hamilton Road

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↖↖		↖	↖↖↖		↖	↖	↖	↖	↖	↖
Volume (vph)	53	2222	71	103	2104	58	171	28	112	57	21	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	275		0	250		0	150		150	50		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00		0.99		0.96	0.97	0.98	
Frt		0.995			0.996				0.850		0.898	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	5050	0	1770	5059	0	1770	1863	1583	1770	1647	0
Flt Permitted	0.049			0.049			0.714			0.738		
Satd. Flow (perm)	91	5050	0	91	5059	0	1317	1863	1516	1334	1647	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			25			25	
Link Distance (ft)		359			576			537			463	
Travel Time (s)		5.4			8.7			14.6			12.6	
Confl. Peds. (#/hr)	7		11	11		7	8		25	25		8
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.99	0.99	0.99
Adj. Flow (vph)	56	2364	76	110	2238	62	182	30	119	58	21	45
Shared Lane Traffic (%)												
Lane Group Flow (vph)	56	2440	0	110	2300	0	182	30	119	58	66	0
Turn Type	pm+pt			pm+pt			Perm		Perm	Perm		
Protected Phases	5	2		1	6			8				4
Permitted Phases	2			6			8		8	4		
Detector Phase	5	2		1	6		8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	13.0	25.0		13.0	26.0		41.0	41.0	41.0	39.0	39.0	
Total Split (s)	13.0	84.0	0.0	15.0	86.0	0.0	41.0	41.0	41.0	41.0	41.0	0.0
Total Split (%)	9.3%	60.0%	0.0%	10.7%	61.4%	0.0%	29.3%	29.3%	29.3%	29.3%	29.3%	0.0%
Maximum Green (s)	7.4	78.4		9.6	80.1		34.6	34.6	34.6	34.5	34.5	
Yellow Time (s)	3.0	3.8		3.0	4.1		3.1	3.1	3.1	3.2	3.2	
All-Red Time (s)	2.6	1.8		2.4	1.8		3.3	3.3	3.3	3.3	3.3	
Lost Time Adjust (s)	-0.6	-0.6	0.0	-0.4	-0.9	0.0	-1.4	-1.4	-1.4	-1.5	-1.5	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0
Lead/Lag	Lead	Lead		Lag	Lag							
Lead-Lag Optimize?	Yes			Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		Min	Min	Min	Min	Min	
Walk Time (s)		7.0			7.0		7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)		12.0			13.0		27.0	27.0	27.0	25.0	25.0	
Pedestrian Calls (#/hr)		0			0		0	0	0	0	0	
Act Effct Green (s)	88.9	88.9		93.5	93.5		26.1	26.1	26.1	26.1	26.1	
Actuated g/C Ratio	0.64	0.64		0.67	0.67		0.19	0.19	0.19	0.19	0.19	
v/c Ratio	0.37	0.76		0.61	0.68		0.74	0.09	0.42	0.23	0.21	
Control Delay	20.6	21.2		45.3	15.7		70.7	44.2	53.2	48.1	47.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	



Lanes, Volumes, Timings  
 24: NC 54 (Raleigh Road) & Hamilton Road

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	20.6	21.2		45.3	15.7		70.7	44.2	53.2	48.1	47.5	
LOS	C	C		D	B		E	D	D	D	D	
Approach Delay		21.2			17.1			62.0				47.8
Approach LOS		C			B			E				D
Queue Length 50th (ft)	18	541		38	247		158	23	97	45	52	
Queue Length 95th (ft)	51	728		m79	441		227	48	147	82	89	
Internal Link Dist (ft)		279			496			457				383
Turn Bay Length (ft)	275			250			150		150	50		
Base Capacity (vph)	155	3206		181	3378		339	479	390	343	424	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.76		0.61	0.68		0.54	0.06	0.31	0.17	0.16	

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.76  
 Intersection Signal Delay: 22.5  
 Intersection LOS: C  
 Intersection Capacity Utilization 85.9%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 24: NC 54 (Raleigh Road) & Hamilton Road



Lanes, Volumes, Timings  
25: Culbreth Road & Smith Level Road

2/28/2014



Lane Group	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Volume (vph)	108	239	470	83	207	673
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	1%		-2%			3%
Storage Length (ft)	125	0		0	225	
Storage Lanes	1	1		0	1	
Taper Length (ft)	25	25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00					
Frt		0.850	0.980			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1744	1560	1844	0	1743	1835
Flt Permitted	0.950				0.316	
Satd. Flow (perm)	1739	1560	1844	0	580	1835
Right Turn on Red		No		No		
Satd. Flow (RTOR)						
Link Speed (mph)	35		35			35
Link Distance (ft)	1150		863			828
Travel Time (s)	22.4		16.8			16.1
Confl. Peds. (#/hr)	1					
Peak Hour Factor	0.95	0.95	0.86	0.86	0.98	0.98
Heavy Vehicles (%)	3%	3%	2%	2%	2%	2%
Adj. Flow (vph)	114	252	547	97	211	687
Shared Lane Traffic (%)						
Lane Group Flow (vph)	114	252	644	0	211	687
Turn Type		pm+ov			pm+pt	
Protected Phases	8	1	2		1	6
Permitted Phases		8			6	
Detector Phase	8	1	2		1	6
Switch Phase						
Minimum Initial (s)	7.0	7.0	10.0		7.0	10.0
Minimum Split (s)	25.0	13.0	29.0		13.0	17.0
Total Split (s)	25.0	15.0	50.0	0.0	15.0	65.0
Total Split (%)	27.8%	16.7%	55.6%	0.0%	16.7%	72.2%
Maximum Green (s)	18.7	9.4	43.8		9.4	58.8
Yellow Time (s)	3.0	3.0	4.1		3.0	4.1
All-Red Time (s)	3.3	2.6	2.1		2.6	2.1
Lost Time Adjust (s)	-1.3	-0.6	-1.2	-1.2	-0.6	-1.2
Total Lost Time (s)	5.0	5.0	5.0	2.8	5.0	5.0
Lead/Lag		Lag	Lead		Lag	
Lead-Lag Optimize?						
Vehicle Extension (s)	2.0	2.0	3.0		2.0	3.0
Recall Mode	None	None	C-Max		None	C-Max
Walk Time (s)	7.0		7.0			
Flash Dont Walk (s)	11.0		15.0			
Pedestrian Calls (#/hr)	0		0			
Act Effct Green (s)	11.8	24.1	55.9		70.9	71.9
Actuated g/C Ratio	0.13	0.27	0.62		0.79	0.80
v/c Ratio	0.50	0.60	0.56		0.36	0.47

Lanes, Volumes, Timings  
 25: Culbreth Road & Smith Level Road

2/28/2014



Lane Group	WBL	WBR	NET	NER	SWL	SWT
Control Delay	43.3	33.8	14.0		7.0	5.6
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	43.3	33.8	14.0		7.0	5.6
LOS	D	C	B		A	A
Approach Delay	36.8		14.0			5.9
Approach LOS	D		B			A
Queue Length 50th (ft)	61	120	210		26	119
Queue Length 95th (ft)	108	182	330		56	227
Internal Link Dist (ft)	1070		783			748
Turn Bay Length (ft)	125				225	
Base Capacity (vph)	388	418	1145		586	1466
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.29	0.60	0.56		0.36	0.47

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	90
Offset:	0 (0%), Referenced to phase 2:NET and 6:SWTL, Start of Green
Natural Cycle:	70
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.60
Intersection Signal Delay:	14.5
Intersection LOS:	B
Intersection Capacity Utilization:	59.7%
ICU Level of Service:	B
Analysis Period (min):	15





















Splits and Phases: 25: Culbreth Road & Smith Level Road



## 2022 With Site

Lanes, Volumes, Timings  
 1: Franklin Street & NC 86 (S. Columbia St)

2/28/2014

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	93	289	74	94	305	62	61	346	104	58	564	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	9	12	13	10	10	13	9	10	10	9	9	11
Storage Length (ft)	225		0	100		0	400		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.84	0.98		0.94	0.95		0.96	0.94		0.88	0.98	
Frt		0.969			0.975			0.965			0.979	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1379	2897	0	1404	2596	0	1354	2545	0	1354	2605	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1161	2897	0	1314	2596	0	1298	2545	0	1185	2605	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		20			20			25			25	
Link Distance (ft)		806			940			972			822	
Travel Time (s)		27.5			32.0			26.5			22.4	
Confl. Peds. (#/hr)	175		62	62		175	63		144	144		63
Peak Hour Factor	0.93	0.93	0.93	0.79	0.79	0.79	0.87	0.87	0.87	0.91	0.91	0.91
Heavy Vehicles (%)	6%	6%	6%	8%	8%	8%	8%	8%	8%	8%	8%	8%
Adj. Flow (vph)	100	311	80	119	386	78	70	398	120	64	620	102
Shared Lane Traffic (%)												
Lane Group Flow (vph)	100	391	0	119	464	0	70	518	0	64	722	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases												
Detector Phase	1	6		5	2		3	8		7	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	15.0	32.0		15.0	32.0		15.0	32.0		15.0	32.0	
Total Split (s)	23.0	38.0	0.0	23.0	38.0	0.0	17.0	51.0	0.0	18.0	52.0	0.0
Total Split (%)	17.7%	29.2%	0.0%	17.7%	29.2%	0.0%	13.1%	39.2%	0.0%	13.8%	40.0%	0.0%
Maximum Green (s)	17.1	31.8		17.6	31.8		11.1	45.1		12.1	46.3	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.3		3.0	3.1	
All-Red Time (s)	2.9	3.2		2.4	3.2		2.9	2.6		2.9	2.6	
Lost Time Adjust (s)	-0.9	-1.2	-2.0	-0.4	-1.2	0.0	-0.9	-0.9	-1.5	-0.9	-0.7	-1.5
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	4.0	5.0	5.0	2.5	5.0	5.0	2.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	3.0		1.0	3.0		1.0	2.0		1.0	2.0	
Recall Mode	None	Min		None	Min		None	C-Max		None	C-Max	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		15.0			15.0			15.0			15.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	13.4	28.1		14.1	28.8		10.6	59.9		10.5	59.8	
Actuated g/C Ratio	0.10	0.22		0.11	0.22		0.08	0.46		0.08	0.46	
v/c Ratio	0.70	0.62		0.78	0.81		0.64	0.44		0.59	0.60	

Lanes, Volumes, Timings  
 1: Franklin Street & NC 86 (S. Columbia St)

2/28/2014

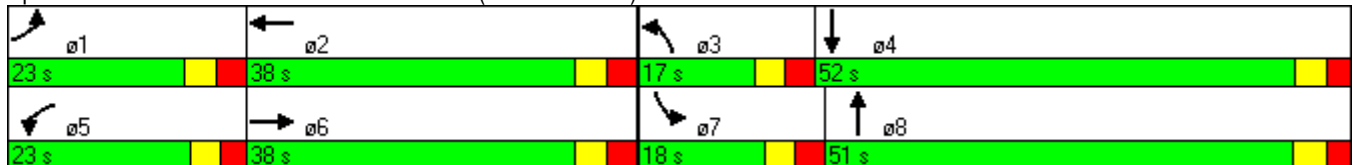


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	80.9	50.4		87.9	59.3		114.5	6.9		78.8	32.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	80.9	50.4		87.9	59.3		114.5	6.9		78.8	32.0	
LOS	F	D		F	E		F	A		E	C	
Approach Delay		56.6			65.1			19.7				35.8
Approach LOS		E			E			B				D
Queue Length 50th (ft)	83	157		99	195		63	20		53	248	
Queue Length 95th (ft)	141	203		141	213		m102	m30		102	361	
Internal Link Dist (ft)		726			860			892			742	
Turn Bay Length (ft)	225			100			400			100		
Base Capacity (vph)	191	735		194	659		127	1173		135	1198	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.52	0.53		0.61	0.70		0.55	0.44		0.47	0.60	

Intersection Summary

Area Type: CBD  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 51 (39%), Referenced to phase 4:SBT and 8:NBT, Start of Green  
 Natural Cycle: 95  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.81  
 Intersection Signal Delay: 43.1  
 Intersection LOS: D  
 Intersection Capacity Utilization 67.9%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Franklin Street & NC 86 (S. Columbia St)



Lanes, Volumes, Timings  
2: Cameron Avenue & NC 86 (S. Columbia St)

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑			↗		↖	↕		↖		↗
Volume (vph)	11	105	0	0	124	29	106	474	41	64	0	642
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	12	12	12	10	10	10	11	11	12
Storage Length (ft)	110		0	0		0	0		0	150		0
Storage Lanes	1		0	0		0	1		0	1		2
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.88
Ped Bike Factor	0.96				0.99		0.95	0.98		0.93		0.92
Fr <sub>t</sub>					0.975			0.988				0.850
Fl <sub>t</sub> Protected	0.950						0.950			0.950		
Satd. Flow (prot)	1525	1660	0	0	1537	0	1404	2724	0	1454	0	2369
Fl <sub>t</sub> Permitted	0.338						0.950			0.950		
Satd. Flow (perm)	523	1660	0	0	1537	0	1341	2724	0	1348	0	2170
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25				25
Link Distance (ft)		412			1056			839				972
Travel Time (s)		10.7			57.6			22.9				26.5
Confl. Peds. (#/hr)	33		65	65		33	37		103	103		37
Peak Hour Factor	0.77	0.77	1.00	1.00	0.74	0.74	0.79	0.79	0.79	0.96	1.00	0.96
Heavy Vehicles (%)	3%	3%	3%	7%	7%	7%	8%	8%	8%	8%	8%	8%
Adj. Flow (vph)	14	136	0	0	168	39	134	600	52	67	0	669
Shared Lane Traffic (%)												
Lane Group Flow (vph)	14	136	0	0	207	0	134	652	0	67	0	669
Turn Type	Perm						Split			custom		custom
Protected Phases		4			8		2	2		1		1
Permitted Phases	4									1		1
Detector Phase	4	4			8		2	2		1		1
Switch Phase												
Minimum Initial (s)	10.0	10.0			10.0		7.0	7.0		7.0		7.0
Minimum Split (s)	17.0	17.0			17.0		21.0	21.0		15.0		15.0
Total Split (s)	26.0	26.0	0.0	0.0	26.0	0.0	37.0	37.0	0.0	42.0	0.0	42.0
Total Split (%)	20.0%	20.0%	0.0%	0.0%	20.0%	0.0%	28.5%	28.5%	0.0%	32.3%	0.0%	32.3%
Maximum Green (s)	19.8	19.8			19.8		30.8	30.8		36.4		36.4
Yellow Time (s)	3.2	3.2			3.2		3.1	3.1		3.0		3.0
All-Red Time (s)	3.0	3.0			3.0		3.1	3.1		2.6		2.6
Lost Time Adjust (s)	-1.2	-1.2	0.0	0.0	-1.2	0.0	-1.2	-1.2	0.0	-0.6	0.0	-0.6
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	4.0	5.0	5.0	4.0	5.0	4.0	5.0
Lead/Lag							Lag	Lag		Lead		Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0			2.0		2.0	2.0		2.0		2.0
Recall Mode	Min	Min			None		C-Max	C-Max		None		None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	20.1	20.1			20.1		50.8	50.8		44.1		44.1
Actuated g/C Ratio	0.15	0.15			0.15		0.39	0.39		0.34		0.34
v/c Ratio	0.17	0.53			0.87		0.24	0.61		0.14		0.83

Lanes, Volumes, Timings  
 2: Cameron Avenue & NC 86 (S. Columbia St)

2/28/2014

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	25.0
Total Split (s)	25.0
Total Split (%)	19%
Maximum Green (s)	22.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	15.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	



Lanes, Volumes, Timings  
 2: Cameron Avenue & NC 86 (S. Columbia St)

2/28/2014

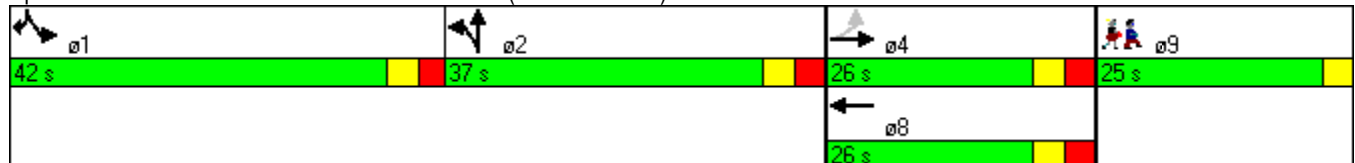


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	16.5	23.1			86.8		23.4	26.9		16.5		36.8
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0		0.7
Total Delay	16.5	23.1			86.8		23.4	26.9		16.5		37.5
LOS	B	C			F		C	C		B		D
Approach Delay		22.5			86.8			26.3				
Approach LOS		C			F			C				
Queue Length 50th (ft)	10	118			171		41	106		42		293
Queue Length 95th (ft)	m10	122			210		95	191		m46		367
Internal Link Dist (ft)		332			976			759			892	
Turn Bay Length (ft)	110									150		
Base Capacity (vph)	84	268			248		549	1065		493		803
Starvation Cap Reductn	0	0			0		0	0		0		0
Spillback Cap Reductn	0	0			0		0	0		0		22
Storage Cap Reductn	0	0			0		0	0		0		0
Reduced v/c Ratio	0.17	0.51			0.83		0.24	0.61		0.14		0.86

Intersection Summary

Area Type: CBD  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 36 (28%), Referenced to phase 2:NBT, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.87  
 Intersection Signal Delay: 36.3  
 Intersection LOS: D  
 Intersection Capacity Utilization 59.3%  
 ICU Level of Service B  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Cameron Avenue & NC 86 (S. Columbia St)



Lane Group	ø9
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lanes, Volumes, Timings  
3: Cameron Avenue & Pittsboro Street

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	130	188	744	137	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	12	12	12	12	12	12	12	12
Storage Length (ft)	0		0	0		90	0		0	0		0
Storage Lanes	0		0	2		1	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.91		0.86								
Fr t		0.920										
Fl t Protected				0.950								
Satd. Flow (prot)	0	1364	0	2821	1583	0	0	0	0	0	0	0
Fl t Permitted				0.950								
Satd. Flow (perm)	0	1364	0	2419	1583	0	0	0	0	0	0	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25				25
Link Distance (ft)		258			412			549				191
Travel Time (s)		30.0			10.7			15.0				5.2
Confl. Peds. (#/hr)	57		40	40		57	11					11
Peak Hour Factor	1.00	0.87	0.87	0.92	0.92	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	5%	5%	5%	8%	8%	8%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	0	149	216	809	149	0	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	365	0	809	149	0	0	0	0	0	0	0
Turn Type				Prot								
Protected Phases		2		1	6							
Permitted Phases												
Detector Phase		2		1	6							
Switch Phase												
Minimum Initial (s)		10.0		7.0	10.0							
Minimum Split (s)		20.2		20.0	20.0							
Total Split (s)	0.0	56.0	0.0	52.0	108.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Split (%)	0.0%	43.1%	0.0%	40.0%	83.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)		50.8		46.9	103.0							
Yellow Time (s)		3.1		3.0	3.3							
All-Red Time (s)		2.1		2.1	1.7							
Lost Time Adjust (s)	0.0	-0.2	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	3.9	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		1.0		4.0	1.0							
Recall Mode		None		C-Max	None							
Walk Time (s)		7.0										
Flash Dont Walk (s)		4.0										
Pedestrian Calls (#/hr)		0										
Act Effct Green (s)		39.4		60.6	105.0							
Actuated g/C Ratio		0.30		0.47	0.81							
v/c Ratio		0.88		0.62	0.12							

Lanes, Volumes, Timings  
 3: Cameron Avenue & Pittsboro Street

2/28/2014

Lane Group	ø4
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	4
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	17%
Maximum Green (s)	18.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	9.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	

Lanes, Volumes, Timings  
 3: Cameron Avenue & Pittsboro Street

2/28/2014

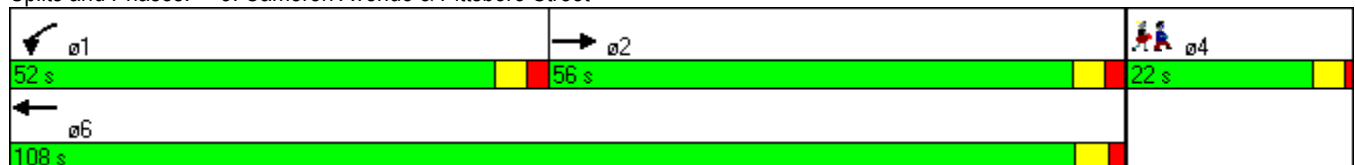


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		65.0		12.0	1.6							
Queue Delay		0.0		0.5	0.0							
Total Delay		65.0		12.5	1.6							
LOS		E		B	A							
Approach Delay		65.0			10.8							
Approach LOS		E			B							
Queue Length 50th (ft)		291		115	12							
Queue Length 95th (ft)		355		244	m29							
Internal Link Dist (ft)		178			332			469			111	
Turn Bay Length (ft)												
Base Capacity (vph)		535		1315	1279							
Starvation Cap Reductn		0		180	0							
Spillback Cap Reductn		0		0	0							
Storage Cap Reductn		0		0	0							
Reduced v/c Ratio		0.68		0.71	0.12							

Intersection Summary

Area Type:	CBD
Cycle Length:	130
Actuated Cycle Length:	130
Offset:	110 (85%), Referenced to phase 1:WBL, Start of Green
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.88
Intersection Signal Delay:	25.8
Intersection LOS:	C
Intersection Capacity Utilization:	54.3%
ICU Level of Service:	A
Analysis Period (min):	15
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 3: Cameron Avenue & Pittsboro Street



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Lane Group	ø4
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

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Lanes, Volumes, Timings  
4: McCauley Street & Pittsboro Street

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↗		↖	↖			↖			↖	↖
Volume (vph)	0	96	34	49	144	0	0	0	0	163	706	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	200		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor		0.97		0.91							0.99	
Frt		0.965									0.999	
Flt Protected				0.950							0.991	
Satd. Flow (prot)	0	1406	0	1504	1583	0	0	0	0	0	2977	0
Flt Permitted				0.503							0.991	
Satd. Flow (perm)	0	1406	0	726	1583	0	0	0	0	0	2945	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25		25				25			25	
Link Distance (ft)		493		508				1166			270	
Travel Time (s)		13.4		13.9				31.8			7.4	
Confl. Peds. (#/hr)	37		41	41		37	10		13	13		10
Peak Hour Factor	1.00	0.89	0.89	0.87	0.87	1.00	1.00	1.00	1.00	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	8%	8%	8%	2%	2%	2%	8%	8%	8%
Parking (#/hr)		0	0									
Adj. Flow (vph)	0	108	38	56	166	0	0	0	0	177	767	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	146	0	56	166	0	0	0	0	0	953	0
Turn Type				Perm							Perm	
Protected Phases		4			8							6
Permitted Phases				8							6	
Detector Phase		4		8	8						6	6
Switch Phase												
Minimum Initial (s)		7.0		7.0	7.0					10.0	10.0	
Minimum Split (s)		20.0		21.0	21.0					24.0	24.0	
Total Split (s)	0.0	44.0	0.0	44.0	44.0	0.0	0.0	0.0	0.0	86.0	86.0	0.0
Total Split (%)	0.0%	33.8%	0.0%	33.8%	33.8%	0.0%	0.0%	0.0%	0.0%	66.2%	66.2%	0.0%
Maximum Green (s)		39.2		38.4	38.4					80.7	80.7	
Yellow Time (s)		3.3		3.0	3.0					3.3	3.3	
All-Red Time (s)		1.5		2.6	2.6					2.0	2.0	
Lost Time Adjust (s)	0.0	0.2	-0.3	-0.6	-0.6	0.0	0.0	0.0	0.0	-1.1	-0.3	-0.1
Total Lost Time (s)	4.0	5.0	3.7	5.0	5.0	4.0	4.0	4.0	4.0	4.2	5.0	3.9
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0					3.0	3.0	
Recall Mode		None		None	None					C-Max	C-Max	
Walk Time (s)		7.0		7.0	7.0					7.0	7.0	
Flash Dont Walk (s)		6.0		7.0	7.0					8.0	8.0	
Pedestrian Calls (#/hr)		0		0	0					0	0	
Act Effct Green (s)		19.6		19.6	19.6						100.4	
Actuated g/C Ratio		0.15		0.15	0.15						0.77	
v/c Ratio		0.69		0.51	0.69						0.42	

Lanes, Volumes, Timings  
 4: McCauley Street & Pittsboro Street

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		68.0		31.5	32.7							1.5
Queue Delay		0.0		0.0	0.0							0.0
Total Delay		68.0		31.5	32.7							1.5
LOS		E		C	C							A
Approach Delay		68.0			32.4							1.5
Approach LOS		E			C							A
Queue Length 50th (ft)		118		16	64							1
Queue Length 95th (ft)		179		42	106							20
Internal Link Dist (ft)		413			428			1086				190
Turn Bay Length (ft)				200								
Base Capacity (vph)		422		218	475							2273
Starvation Cap Reductn		0		0	0							0
Spillback Cap Reductn		0		0	0							0
Storage Cap Reductn		0		0	0							0
Reduced v/c Ratio		0.35		0.26	0.35							0.42

Intersection Summary

Area Type:	CBD
Cycle Length:	130
Actuated Cycle Length:	130
Offset:	12 (9%), Referenced to phase 6:SBTL, Start of Green
Natural Cycle:	45
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.69
Intersection Signal Delay:	14.1
Intersection LOS:	B
Intersection Capacity Utilization	55.9%
ICU Level of Service	B
Analysis Period (min)	15

Splits and Phases: 4: McCauley Street & Pittsboro Street





Lanes, Volumes, Timings  
5: South Road & NC 86 (S. Columbia St)

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	184	0	0	169	109	58	495	188	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	12	12	13	13	12	11	11	11	11	11
Storage Length (ft)	150		0	0		300	0		0	0		0
Storage Lanes	1		0	0		1	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	0.91	0.91	1.00	1.00	1.00	1.00
Ped Bike Factor	0.97				1.00	0.95		0.99	0.95			
Fr <sub>t</sub>					0.991	0.850			0.850			
Fl <sub>t</sub> Protected	0.950							0.995				
Satd. Flow (prot)	1577	1771	0	0	1536	1321	0	4158	1301	0	0	0
Fl <sub>t</sub> Permitted	0.950							0.995				
Satd. Flow (perm)	1528	1771	0	0	1536	1252	0	4130	1235	0	0	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		508			646			532			839	
Travel Time (s)		13.9			17.6			14.5			22.9	
Confl. Peds. (#/hr)	18		78	78		18	20		62	62		20
Peak Hour Factor	0.93	0.93	1.00	1.00	0.88	0.88	0.88	0.88	0.88	1.00	1.00	1.00
Heavy Vehicles (%)	3%	3%	3%	8%	8%	8%	8%	8%	8%	2%	2%	2%
Adj. Flow (vph)	27	198	0	0	192	124	66	562	214	0	0	0
Shared Lane Traffic (%)						10%						
Lane Group Flow (vph)	27	198	0	0	204	112	0	628	214	0	0	0
Turn Type	Split					Perm	Perm		Free			
Protected Phases	4	4			3			2				
Permitted Phases						3	2		Free			
Detector Phase	4	4			3	3	2	2				
Switch Phase												
Minimum Initial (s)	7.0	7.0			7.0	7.0	10.0	10.0				
Minimum Split (s)	24.0	24.0			24.0	24.0	27.0	27.0				
Total Split (s)	41.0	41.0	0.0	0.0	45.0	45.0	44.0	44.0	0.0	0.0	0.0	0.0
Total Split (%)	31.5%	31.5%	0.0%	0.0%	34.6%	34.6%	33.8%	33.8%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)	35.4	35.4			39.5	39.5	38.1	38.1				
Yellow Time (s)	3.5	3.5			3.1	3.1	3.4	3.4				
All-Red Time (s)	2.1	2.1			2.4	2.4	2.5	2.5				
Lost Time Adjust (s)	-0.6	-0.6	0.0	0.0	-0.5	-0.5	-1.5	-0.9	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	5.0	4.4	5.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag			Lead	Lead						
Lead-Lag Optimize?	Yes	Yes			Yes	Yes						
Vehicle Extension (s)	2.0	2.0			2.0	2.0	2.0	2.0				
Recall Mode	None	None			Min	Min	C-Max	C-Max				
Walk Time (s)					7.0	7.0	7.0	7.0				
Flash Dont Walk (s)					10.0	10.0	14.0	14.0				
Pedestrian Calls (#/hr)					0	0	0	0				
Act Effct Green (s)	19.6	19.6			22.4	22.4		73.0	130.0			
Actuated g/C Ratio	0.15	0.15			0.17	0.17		0.56	1.00			
v/c Ratio	0.11	0.74			0.77	0.52		0.27	0.17			

Lanes, Volumes, Timings  
 5: South Road & NC 86 (S. Columbia St)

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	45.7	69.4			69.8	56.3		8.6	0.3			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	45.7	69.4			69.8	56.3		8.6	0.3			
LOS	D	E			E	E		A	A			
Approach Delay		66.5			65.0			6.5				
Approach LOS		E			E			A				
Queue Length 50th (ft)	15	114			174	91		74	0			
Queue Length 95th (ft)	m38	244			243	143		84	0			
Internal Link Dist (ft)		428			566			452			759	
Turn Bay Length (ft)	150					300						
Base Capacity (vph)	437	490			473	385		2320	1235			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.06	0.40			0.43	0.29		0.27	0.17			

Intersection Summary

Area Type: CBD  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 36 (28%), Referenced to phase 2:NBTL, Start of Green  
 Natural Cycle: 75  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.77  
 Intersection Signal Delay: 29.6  
 Intersection LOS: C  
 Intersection Capacity Utilization 55.9%  
 ICU Level of Service B  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: South Road & NC 86 (S. Columbia St)















Lanes, Volumes, Timings  
6: Manning Drive & NC 86 NB (S. Columbia St)

2/28/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	66	505	0	69	0	214	0	473	362	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			2%			2%				0%
Storage Length (ft)	125		0	0		75	0		150	0		0
Storage Lanes	1		0	1		1	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	0.88	1.00	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98			0.91					0.96			
Fr <sub>t</sub>						0.850			0.850			
Fl <sub>t</sub> Protected	0.950			0.950								
Satd. Flow (prot)	1512	3023	0	1489	0	2345	0	3093	1384	0	0	0
Fl <sub>t</sub> Permitted	0.950			0.950								
Satd. Flow (perm)	1476	3023	0	1350	0	2345	0	3093	1326	0	0	0
Right Turn on Red	No		No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			35				35
Link Distance (ft)		241			637			222				480
Travel Time (s)		6.6			17.4			4.3				9.4
Confl. Peds. (#/hr)	12		64	64		12	4		18	18		4
Peak Hour Factor	0.88	0.88	1.00	0.87	1.00	0.87	1.00	0.88	0.88	1.00	1.00	1.00
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%	4%	4%	4%	2%	2%	2%
Adj. Flow (vph)	75	574	0	79	0	246	0	538	411	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	75	574	0	79	0	246	0	538	411	0	0	0
Turn Type	Split			Prot		custom			pm+ov			
Protected Phases	4	4		3		3		2	3			
Permitted Phases									2			
Detector Phase	4	4		3		3		2	3			
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0		7.0		10.0	7.0			
Minimum Split (s)	36.0	36.0		22.0		22.0		30.0	22.0			
Total Split (s)	46.0	46.0	0.0	42.0	0.0	42.0	0.0	42.0	42.0	0.0	0.0	0.0
Total Split (%)	35.4%	35.4%	0.0%	32.3%	0.0%	32.3%	0.0%	32.3%	32.3%	0.0%	0.0%	0.0%
Maximum Green (s)	40.3	40.3		36.4		36.4		36.2	36.4			
Yellow Time (s)	3.2	3.2		3.0		3.0		3.4	3.0			
All-Red Time (s)	2.5	2.5		2.6		2.6		2.4	2.6			
Lost Time Adjust (s)	-0.5	-0.5	-0.5	-0.6	-1.0	-0.6	-0.5	-0.8	-0.6	0.0	0.0	0.0
Total Lost Time (s)	5.2	5.2	3.5	5.0	3.0	5.0	3.5	5.0	5.0	4.0	4.0	4.0
Lead/Lag	Lead	Lead		Lag		Lag			Lag			
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		2.0		2.0		3.0	2.0			
Recall Mode	Min	Min		None		None		C-Max	None			
Walk Time (s)	4.0	4.0						4.0				
Flash Dont Walk (s)	16.0	16.0						19.0				
Pedestrian Calls (#/hr)	0	0						0				
Act Effct Green (s)	31.2	31.2		24.5		24.5		59.1	83.6			
Actuated g/C Ratio	0.24	0.24		0.19		0.19		0.45	0.64			
v/c Ratio	0.21	0.79		0.28		0.56		0.38	0.48			

Lanes, Volumes, Timings  
 6: Manning Drive & NC 86 NB (S. Columbia St)

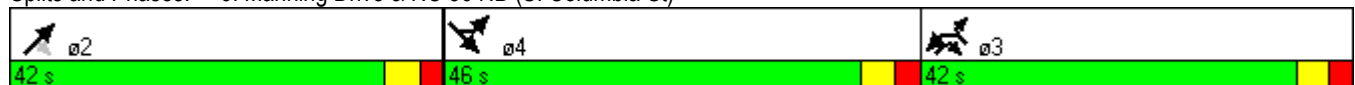
2/28/2014

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Control Delay	26.7	40.1		44.6		51.1		14.8	4.3			
Queue Delay	0.0	0.0		0.0		0.0		0.0	0.0			
Total Delay	26.7	40.1		44.6		51.1		14.8	4.3			
LOS	C	D		D		D		B	A			
Approach Delay		38.6						10.3				
Approach LOS		D						B				
Queue Length 50th (ft)	36	211		58		109		101	31			
Queue Length 95th (ft)	50	207		88		129		248	m50			
Internal Link Dist (ft)		161			557			142			400	
Turn Bay Length (ft)	125					75			150			
Base Capacity (vph)	475	949		429		674		1407	911			
Starvation Cap Reductn	0	0		0		0		0	0			
Spillback Cap Reductn	0	0		0		0		0	0			
Storage Cap Reductn	0	0		0		0		0	0			
Reduced v/c Ratio	0.16	0.60		0.18		0.36		0.38	0.45			

Intersection Summary

Area Type: CBD  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 122 (94%), Referenced to phase 2:NET, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.79  
 Intersection Signal Delay: 26.4 Intersection LOS: C  
 Intersection Capacity Utilization 54.2% ICU Level of Service A  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Manning Drive & NC 86 NB (S. Columbia St)



Lanes, Volumes, Timings  
7: Westwood Drive & NC 86 (S. Columbia St)

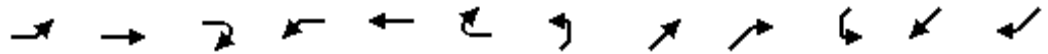
2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↔			↔	↔	↔	↔	↔	↔	↔	↔
Volume (vph)	9	4	6	191	0	83	7	726	344	116	294	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	11	12	12	14	11	11	11
Grade (%)		-3%			-5%			5%				-5%
Storage Length (ft)	0		0	0		150	250		250	0		0
Storage Lanes	0		0	0		1	1		1	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.97			0.97		0.98		0.97		1.00	
Frt		0.960				0.850			0.850		0.998	
Flt Protected		0.976			0.950		0.950			0.950		
Satd. Flow (prot)	0	1724	0	0	1656	1482	1692	1781	1615	1656	1739	0
Flt Permitted		0.976			0.950		0.563			0.133		
Satd. Flow (perm)	0	1724	0	0	1604	1482	987	1781	1560	232	1739	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			35			25	
Link Distance (ft)		274			592			630			946	
Travel Time (s)		7.5			16.1			12.3			25.8	
Confl. Peds. (#/hr)			19	19			9		5	5		9
Peak Hour Factor	0.71	0.71	0.71	0.74	0.74	0.74	0.90	0.90	0.90	0.91	0.91	0.91
Heavy Vehicles (%)	2%	2%	2%	8%	8%	8%	4%	4%	4%	8%	8%	8%
Adj. Flow (vph)	13	6	8	258	0	112	8	807	382	127	323	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	27	0	0	258	112	8	807	382	127	327	0
Turn Type	Split			Split		pm+ov	Perm		pm+ov	pm+pt		
Protected Phases	4	4		3	3	1		2	3	1	6	
Permitted Phases						3	2		2	6		
Detector Phase	4	4		3	3	1	2	2	3	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	10.0	10.0	7.0	7.0	10.0	
Minimum Split (s)	26.0	26.0		13.0	13.0	13.0	29.0	29.0	13.0	13.0	22.0	
Total Split (s)	26.0	26.0	0.0	27.0	27.0	13.0	64.0	64.0	27.0	13.0	77.0	0.0
Total Split (%)	20.0%	20.0%	0.0%	20.8%	20.8%	10.0%	49.2%	49.2%	20.8%	10.0%	59.2%	0.0%
Maximum Green (s)	19.8	19.8		21.1	21.1	7.7	58.7	58.7	21.1	7.7	71.7	
Yellow Time (s)	3.3	3.3		3.5	3.5	3.6	3.6	3.6	3.5	3.6	3.6	
All-Red Time (s)	2.9	2.9		2.4	2.4	1.7	1.7	1.7	2.4	1.7	1.7	
Lost Time Adjust (s)	0.0	-1.2	-1.3	0.0	-0.9	-0.3	-0.3	-0.3	-0.9	-0.3	-0.3	-0.9
Total Lost Time (s)	6.2	5.0	2.7	5.9	5.0	5.0	5.0	5.0	5.0	5.0	5.0	3.1
Lead/Lag	Lag	Lag		Lead	Lead	Lead	Lag	Lag	Lead	Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	3.0	3.0	2.0	2.0	3.0	
Recall Mode	None	None		None	None	None	C-Min	C-Min	None	None	C-Min	
Walk Time (s)	4.0	4.0					4.0	4.0				
Flash Dont Walk (s)	13.0	13.0					19.0	19.0				
Pedestrian Calls (#/hr)	0	0					0	0				
Act Effct Green (s)		8.7			21.9	35.2	73.4	73.4	95.3	89.7	89.7	
Actuated g/C Ratio		0.07			0.17	0.27	0.56	0.56	0.73	0.69	0.69	

Lanes, Volumes, Timings  
 7: Westwood Drive & NC 86 (S. Columbia St)

2/28/2014

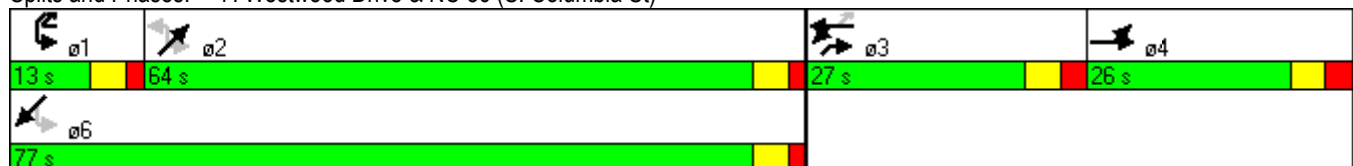


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
v/c Ratio		0.23			0.93	0.28	0.01	0.80	0.33	0.45	0.27	
Control Delay		62.2			91.4	29.7	17.0	32.5	6.9	15.4	8.1	
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		62.2			91.4	29.7	17.0	32.5	6.9	15.4	8.1	
LOS		E			F	C	B	C	A	B	A	
Approach Delay		62.2			72.7			24.2			10.1	
Approach LOS		E			E			C			B	
Queue Length 50th (ft)		22			217	61	3	568	99	31	88	
Queue Length 95th (ft)		42			#269	77	13	#919	175	79	145	
Internal Link Dist (ft)		194			512			550			866	
Turn Bay Length (ft)						150	250		250			
Base Capacity (vph)		278			283	402	557	1006	1157	286	1200	
Starvation Cap Reductn		0			0	0	0	0	0	0	0	
Spillback Cap Reductn		0			0	0	0	0	0	0	0	
Storage Cap Reductn		0			0	0	0	0	0	0	0	
Reduced v/c Ratio		0.10			0.91	0.28	0.01	0.80	0.33	0.44	0.27	

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 68 (52%), Referenced to phase 2:NETL and 6:SWTL, Start of Green  
 Natural Cycle: 115  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.93  
 Intersection Signal Delay: 30.4  
 Intersection LOS: C  
 Intersection Capacity Utilization 74.4%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 7: Westwood Drive & NC 86 (S. Columbia St)



Lanes, Volumes, Timings  
 8: US 15-501 Bypass WB Off Ramp & US 15-501

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↶	↶	↶	↶	↶↶			↶↶	↶
Volume (vph)	0	0	0	745	0	61	370	1325	0	0	409	152
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	275		275	150		0	0		0
Storage Lanes	0		0	1		1	1		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	*0.66	1.00	1.00	0.95	1.00
Ped Bike Factor						0.98	1.00					0.98
Frt						0.850						0.850
Flt Protected				0.950	0.950		0.950					
Satd. Flow (prot)	0	0	0	1665	1665	1568	1752	2435	0	0	3343	1495
Flt Permitted				0.950	0.950		0.435					
Satd. Flow (perm)	0	0	0	1665	1665	1534	802	2435	0	0	3343	1464
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			35			35				35
Link Distance (ft)		424			893			596				306
Travel Time (s)		9.6			17.4			11.6				6.0
Confl. Peds. (#/hr)	1						1	1		2	2	1
Peak Hour Factor	1.00	1.00	1.00	0.92	0.92	0.92	0.87	0.87	1.00	1.00	0.91	0.91
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	8%	8%	8%
Adj. Flow (vph)	0	0	0	810	0	66	425	1523	0	0	449	167
Shared Lane Traffic (%)				50%								
Lane Group Flow (vph)	0	0	0	405	405	66	425	1523	0	0	449	167
Turn Type				Perm		Perm	pm+pt					Perm
Protected Phases					8		5	2				6
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2				6
Switch Phase												
Minimum Initial (s)				7.0	7.0	7.0	7.0	10.0			10.0	10.0
Minimum Split (s)				20.0	20.0	20.0	13.0	20.0			20.0	20.0
Total Split (s)	0.0	0.0	0.0	50.0	50.0	50.0	32.0	90.0	0.0	0.0	58.0	58.0
Total Split (%)	0.0%	0.0%	0.0%	35.7%	35.7%	35.7%	22.9%	64.3%	0.0%	0.0%	41.4%	41.4%
Maximum Green (s)				44.2	44.2	44.2	26.2	84.2			52.0	52.0
Yellow Time (s)				3.7	3.7	3.7	3.0	3.7			4.0	4.0
All-Red Time (s)				2.1	2.1	2.1	2.8	2.1			2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	-0.8	-0.8	-0.8	-0.8	-0.8	0.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0	3.0	5.0	5.0
Lead/Lag							Lag				Lead	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Recall Mode				None	None	None	None	C-Max			C-Max	C-Max
Act Effct Green (s)				40.0	40.0	40.0	90.0	90.0			58.0	58.0
Actuated g/C Ratio				0.29	0.29	0.29	0.64	0.64			0.41	0.41
v/c Ratio				0.85	0.85	0.15	0.61	0.97			0.32	0.28
Control Delay				64.2	64.2	36.4	16.2	31.3			29.5	30.1
Queue Delay				0.0	0.0	0.0	0.0	5.1			0.0	0.0
Total Delay				64.2	64.2	36.4	16.2	36.4			29.5	30.1
LOS				E	E	D	B	D			C	C

Lanes, Volumes, Timings  
 8: US 15-501 Bypass WB Off Ramp & US 15-501

2/28/2014

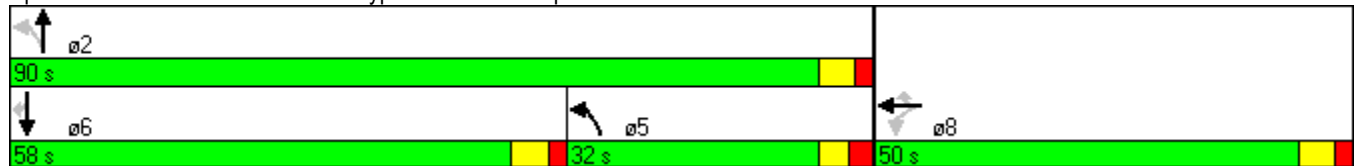


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay					62.1			32.0				29.7
Approach LOS					E			C				C
Queue Length 50th (ft)				358	358	44	110	837			148	102
Queue Length 95th (ft)				486	486	81	157	#1242			200	168
Internal Link Dist (ft)		344			813			516			226	
Turn Bay Length (ft)				275		275	150					
Base Capacity (vph)				535	535	493	699	1566			1386	607
Starvation Cap Reductn				0	0	0	0	43			0	0
Spillback Cap Reductn				0	0	0	0	0			0	0
Storage Cap Reductn				0	0	0	0	0			0	0
Reduced v/c Ratio				0.76	0.76	0.13	0.61	1.00			0.32	0.28

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 34 (24%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.97  
 Intersection Signal Delay: 39.2  
 Intersection LOS: D  
 Intersection Capacity Utilization 67.0%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 \* User Entered Value  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 8: US 15-501 Bypass WB Off Ramp & US 15-501





# Lanes, Volumes, Timings

## 9: NC 54 Bypass (Fordham Blvd) EB Off Ramp & US 15-501

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	482	0	383	0	0	0	0	1227	0	55	1119	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		250	0		0	0		0	150		0
Storage Lanes	1		1	0		0	0		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor										1.00		
Frt			0.850									
Flt Protected	0.950	0.950								0.950		
Satd. Flow (prot)	1603	1603	1509	0	0	0	0	3505	0	1687	3374	0
Flt Permitted	0.950	0.950								0.092		
Satd. Flow (perm)	1603	1603	1509	0	0	0	0	3505	0	163	3374	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		847			142			156			596	
Travel Time (s)		19.3			3.2			3.0			11.6	
Confl. Peds. (#/hr)							2		1	1		2
Peak Hour Factor	0.85	0.85	0.85	1.00	1.00	1.00	1.00	0.92	1.00	0.90	0.90	1.00
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	3%	3%	3%	7%	7%	7%
Adj. Flow (vph)	567	0	451	0	0	0	0	1334	0	61	1243	0
Shared Lane Traffic (%)	50%											
Lane Group Flow (vph)	283	284	451	0	0	0	0	1334	0	61	1243	0
Turn Type	Perm		Perm							pm+pt		
Protected Phases		4						2		1	6	
Permitted Phases	4		4							6		
Detector Phase	4	4	4					2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0					10.0		7.0	10.0	
Minimum Split (s)	14.0	14.0	14.0					15.0		13.0	16.0	
Total Split (s)	52.0	52.0	52.0	0.0	0.0	0.0	0.0	75.0	0.0	13.0	88.0	0.0
Total Split (%)	37.1%	37.1%	37.1%	0.0%	0.0%	0.0%	0.0%	53.6%	0.0%	9.3%	62.9%	0.0%
Maximum Green (s)	45.8	45.8	45.8					70.3		7.5	82.1	
Yellow Time (s)	3.1	3.1	3.1					3.7		3.1	4.3	
All-Red Time (s)	3.1	3.1	3.1					1.0		2.4	1.6	
Lost Time Adjust (s)	-1.2	-1.2	-1.2	0.0	0.0	0.0	0.0	0.3	0.0	-0.5	-0.9	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.0	4.0	4.0	4.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0					3.0		3.0	3.0	
Recall Mode	None	None	None					C-Max		None	C-Max	
Act Effct Green (s)	45.6	45.6	45.6					74.1		84.4	84.4	
Actuated g/C Ratio	0.33	0.33	0.33					0.53		0.60	0.60	
v/c Ratio	0.54	0.54	0.92					0.72		0.33	0.61	
Control Delay	42.9	43.0	70.1					13.2		11.5	4.5	
Queue Delay	0.0	0.0	0.0					2.2		0.0	0.6	
Total Delay	42.9	43.0	70.1					15.5		11.5	5.1	
LOS	D	D	E					B		B	A	

Lanes, Volumes, Timings

9: NC 54 Bypass (Fordham Blvd) EB Off Ramp & US 15-501

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		55.0						15.5				5.4
Approach LOS		D						B				A
Queue Length 50th (ft)	218	220	389					286		4		44
Queue Length 95th (ft)	295	296	#530					m216		m6		48
Internal Link Dist (ft)		767			62			76				516
Turn Bay Length (ft)	250		250							150		
Base Capacity (vph)	538	538	507					1856		186		2035
Starvation Cap Reductn	0	0	0					0		0		405
Spillback Cap Reductn	2	2	0					369		0		0
Storage Cap Reductn	0	0	0					0		0		0
Reduced v/c Ratio	0.53	0.53	0.89					0.90		0.33		0.76

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 6 (4%), Referenced to phase 2:NBT and 6:SBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.92  
 Intersection Signal Delay: 22.9  
 Intersection LOS: C  
 Intersection Capacity Utilization 67.0%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: NC 54 Bypass (Fordham Blvd) EB Off Ramp & US 15-501



Lanes, Volumes, Timings  
 10: SR 1994 (Culbreth Road) & US 15-501

2/28/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	229	64	90	15	129	595	78	1727	11	260	1221	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			-8%			-2%			2%	
Storage Length (ft)	0		75	425		350	125		75	550		250
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Fr <sub>t</sub>			0.850			0.850			0.850			0.850
Fl <sub>t</sub> Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1743	1835	1560	1823	1918	1631	1770	3540	1584	1702	3404	1523
Fl <sub>t</sub> Permitted	0.522			0.710			0.114			0.062		
Satd. Flow (perm)	958	1835	1560	1362	1918	1631	212	3540	1584	111	3404	1523
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		526			543			533			635	
Travel Time (s)		10.2			10.6			8.1			9.6	
Confl. Peds. (#/hr)							2					2
Peak Hour Factor	0.89	0.89	0.89	0.91	0.91	0.91	0.94	0.94	0.94	0.98	0.98	0.98
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	5%	5%	5%
Adj. Flow (vph)	257	72	101	16	142	654	83	1837	12	265	1246	126
Shared Lane Traffic (%)												
Lane Group Flow (vph)	257	72	101	16	142	654	83	1837	12	265	1246	126
Turn Type	pm+pt		Perm	Perm		pt+ov	Perm		Perm	pm+pt		pt+ov
Protected Phases	7	4			8	8 1		2		1	6	6 7
Permitted Phases	4		4	8			2		2	6		
Detector Phase	7	4	4	8	8	8 1	2	2	2	1	6	6 7
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		12.0	12.0	12.0	7.0	12.0	
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0		19.0	19.0	19.0	13.0	26.0	
Total Split (s)	14.0	55.0	55.0	41.0	41.0	61.0	65.0	65.0	65.0	20.0	85.0	99.0
Total Split (%)	10.0%	39.3%	39.3%	29.3%	29.3%	43.6%	46.4%	46.4%	46.4%	14.3%	60.7%	70.7%
Maximum Green (s)	7.6	48.6	48.6	34.1	34.1		58.8	58.8	58.8	14.9	78.8	
Yellow Time (s)	3.0	4.2	4.2	4.5	4.5		4.7	4.7	4.7	3.0	4.7	
All-Red Time (s)	3.4	2.2	2.2	2.4	2.4		1.5	1.5	1.5	2.1	1.5	
Lost Time Adjust (s)	-1.4	-1.4	-1.4	-1.9	-1.9	-1.9	-1.2	-1.2	-1.2	-0.1	-1.2	-1.4
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.8
Lead/Lag	Lead			Lag	Lag		Lead	Lead	Lead	Lag		
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None		C-Max	C-Max	C-Max	None	C-Max	
Walk Time (s)												7.0
Flash Dont Walk (s)												12.0
Pedestrian Calls (#/hr)												0
Act Effct Green (s)	50.0	50.0	50.0	36.0	36.0	51.0	60.0	60.0	60.0	80.0	80.0	94.2
Actuated g/C Ratio	0.36	0.36	0.36	0.26	0.26	0.36	0.43	0.43	0.43	0.57	0.57	0.67
v/c Ratio	0.65	0.11	0.18	0.05	0.29	1.10	0.91	1.21	0.02	1.13	0.64	0.12

Lanes, Volumes, Timings  
 10: SR 1994 (Culbreth Road) & US 15-501

2/28/2014

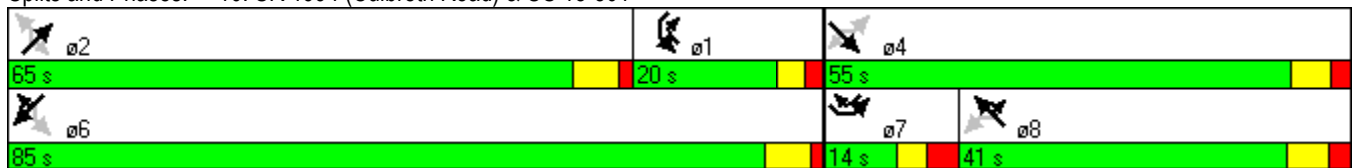


Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Control Delay	44.4	30.8	32.1	39.8	43.7	104.6	89.9	127.4	23.3	133.0	13.2	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.4	30.8	32.1	39.8	43.7	104.6	89.9	127.4	23.3	133.0	13.2	7.1
LOS	D	C	C	D	D	F	F	F	C	F	B	A
Approach Delay		39.2			92.7			125.1			32.1	
Approach LOS		D			F			F			C	
Queue Length 50th (ft)	176	44	63	11	104	~574	51	~1058	4	~226	281	31
Queue Length 95th (ft)	254	80	108	31	166	#913	m#124	#1200	m8	m#396	324	m44
Internal Link Dist (ft)		446			463			453			555	
Turn Bay Length (ft)			75	425		350	125		75	550		250
Base Capacity (vph)	393	655	557	350	493	594	91	1517	679	234	1945	1025
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.11	0.18	0.05	0.29	1.10	0.91	1.21	0.02	1.13	0.64	0.12

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 0 (0%), Referenced to phase 2:NETL and 6:SWTL, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.21  
 Intersection Signal Delay: 80.3  
 Intersection LOS: F  
 Intersection Capacity Utilization 109.8%  
 ICU Level of Service H  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: SR 1994 (Culbreth Road) & US 15-501



Lanes, Volumes, Timings  
 11: Arlen Park Drive & US 15-501

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	145	23	18	127	18	9	7	9	1657	84	1	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			-7%				-1%			
Storage Length (ft)	75		0	200		0		275		300		275
Storage Lanes	1		0	1		0		1		1		1
Taper Length (ft)	25		25	25		25		25		25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Ped Bike Factor	1.00	0.99		1.00	1.00							
Frt		0.934			0.950					0.850		
Flt Protected	0.950			0.950				0.950				0.950
Satd. Flow (prot)	1761	1721	0	1832	1823	0	0	1761	3522	1576	0	1719
Flt Permitted	0.732			0.730				0.950				0.950
Satd. Flow (perm)	1351	1721	0	1406	1823	0	0	1761	3522	1576	0	1719
Right Turn on Red			No			No				No		
Satd. Flow (RTOR)												
Link Speed (mph)		25			25				45			
Link Distance (ft)		387			478				2738			
Travel Time (s)		10.6			13.0				41.5			
Confl. Peds. (#/hr)	3		1	1		3						
Peak Hour Factor	0.98	0.98	0.98	0.70	0.70	0.70	0.85	0.85	0.85	0.85	0.97	0.97
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	3%	5%	5%
Adj. Flow (vph)	148	23	18	181	26	13	8	11	1949	99	1	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	148	41	0	181	39	0	0	19	1949	99	0	10
Turn Type	Perm			Perm			Prot	Prot		Perm	Prot	Prot
Protected Phases		4			8		5	5	2		1	1
Permitted Phases	4			8						2		
Detector Phase	4	4		8	8		5	5	2	2	1	1
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0	14.0	14.0	7.0	7.0
Minimum Split (s)	60.0	60.0		15.0	15.0		14.0	14.0	21.0	21.0	13.0	13.0
Total Split (s)	60.0	60.0	0.0	60.0	60.0	0.0	14.0	14.0	67.0	67.0	13.0	13.0
Total Split (%)	42.9%	42.9%	0.0%	42.9%	42.9%	0.0%	10.0%	10.0%	47.9%	47.9%	9.3%	9.3%
Maximum Green (s)	53.4	53.4		52.9	52.9		7.4	7.4	60.4	60.4	7.1	7.1
Yellow Time (s)	3.2	3.2		3.8	3.8		3.0	3.0	4.6	4.6	3.0	3.0
All-Red Time (s)	3.4	3.4		3.3	3.3		3.6	3.6	2.0	2.0	2.9	2.9
Lost Time Adjust (s)	-1.6	-1.6	0.0	-2.1	-2.1	-1.2	0.0	-1.6	-1.6	-1.6	0.0	-0.9
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	2.8	6.6	5.0	5.0	5.0	5.9	5.0
Lead/Lag							Lead	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	None	C-Max	C-Max	None	None
Walk Time (s)	4.0	4.0										
Flash Dont Walk (s)	26.0	26.0										
Pedestrian Calls (#/hr)	0	0										
Act Effct Green (s)	25.8	25.8		25.8	25.8			9.2	101.6	101.6		7.9
Actuated g/C Ratio	0.18	0.18		0.18	0.18			0.07	0.73	0.73		0.06
v/c Ratio	0.59	0.13		0.70	0.12			0.16	0.76	0.09		0.10

Lanes, Volumes, Timings  
 11: Arlen Park Drive & US 15-501

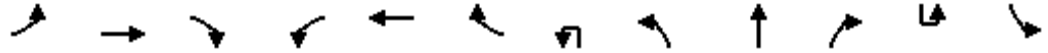
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Lane Group	SBT	SBR
Lane Configurations	↑↑	↑
Volume (vph)	1215	98
Ideal Flow (vphpl)	1900	1900
Grade (%)	0%	
Storage Length (ft)		325
Storage Lanes		1
Taper Length (ft)		25
Lane Util. Factor	0.95	1.00
Ped Bike Factor		
Flt		0.850
Flt Protected		
Satd. Flow (prot)	3438	1538
Flt Permitted		
Satd. Flow (perm)	3438	1538
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	45	
Link Distance (ft)	1792	
Travel Time (s)	27.2	
Confl. Peds. (#/hr)		
Peak Hour Factor	0.97	0.97
Heavy Vehicles (%)	5%	5%
Adj. Flow (vph)	1253	101
Shared Lane Traffic (%)		
Lane Group Flow (vph)	1253	101
Turn Type		Perm
Protected Phases	6	
Permitted Phases		6
Detector Phase	6	6
Switch Phase		
Minimum Initial (s)	14.0	14.0
Minimum Split (s)	25.0	25.0
Total Split (s)	66.0	66.0
Total Split (%)	47.1%	47.1%
Maximum Green (s)	59.4	59.4
Yellow Time (s)	4.6	4.6
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)	-1.6	-1.6
Total Lost Time (s)	5.0	5.0
Lead/Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes
Vehicle Extension (s)	3.0	3.0
Recall Mode	C-Max	C-Max
Walk Time (s)	7.0	7.0
Flash Dont Walk (s)	10.0	10.0
Pedestrian Calls (#/hr)	0	0
Act Effct Green (s)	95.4	95.4
Actuated g/C Ratio	0.68	0.68
v/c Ratio	0.53	0.10

Lanes, Volumes, Timings  
 11: Arlen Park Drive & US 15-501

2/28/2014

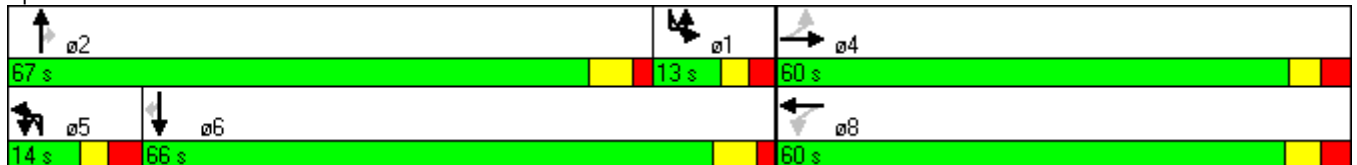


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Control Delay	61.0	45.6		66.8	45.3			77.7	7.6	2.4		48.9
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0		0.0
Total Delay	61.0	45.6		66.8	45.3			77.7	7.6	2.4		48.9
LOS	E	D		E	D			E	A	A		D
Approach Delay		57.7			63.0				8.0			
Approach LOS		E			E				A			
Queue Length 50th (ft)	125	32		156	30			17	48	5		7
Queue Length 95th (ft)	185	62		165	46			m16	m874	m14		m12
Internal Link Dist (ft)		307			398				2658			
Turn Bay Length (ft)	75			200				275		300		275
Base Capacity (vph)	531	676		552	716			119	2555	1143		98
Starvation Cap Reductn	0	0		0	0			0	0	0		0
Spillback Cap Reductn	0	0		0	0			0	0	0		0
Storage Cap Reductn	0	0		0	0			0	0	0		0
Reduced v/c Ratio	0.28	0.06		0.33	0.05			0.16	0.76	0.09		0.10

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 13 (9%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.76  
 Intersection Signal Delay: 14.7  
 Intersection LOS: B  
 Intersection Capacity Utilization 69.2%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 11: Arlen Park Drive & US 15-501



Lanes, Volumes, Timings  
 11: Arlen Park Drive & US 15-501

2/28/2014























Lane Group	SBT	SBR
Control Delay	10.9	9.8
Queue Delay	0.0	0.0
Total Delay	10.9	9.8
LOS	B	A
Approach Delay	11.1	
Approach LOS	B	
Queue Length 50th (ft)	181	23
Queue Length 95th (ft)	288	m59
Internal Link Dist (ft)	1712	
Turn Bay Length (ft)		325
Base Capacity (vph)	2343	1048
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.53	0.10
<b>Intersection Summary</b>		



Lanes, Volumes, Timings  
12: US 15-501 & Market St

2/28/2014

												
Lane Group	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	SEL	SET	SER	NWL
Lane Configurations												
Volume (vph)	24	120	1404	44	46	211	758	347	269	6	35	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)			-3%				4%			-3%		
Storage Length (ft)		275		0		250		300	150		0	250
Storage Lanes		1		0		1		1	1		0	1
Taper Length (ft)		25		25		25		25	25		25	25
Lane Util. Factor	0.95	1.00	0.95	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00
Frt			0.995					0.850		0.871		
Flt Protected		0.950				0.950			0.950			0.950
Satd. Flow (prot)	0	1796	3574	0	0	1728	3402	1522	1762	1619	0	1770
Flt Permitted		0.950				0.950			0.950			0.724
Satd. Flow (perm)	0	1796	3574	0	0	1728	3402	1522	1762	1619	0	1349
Right Turn on Red				No				No			No	
Satd. Flow (RTOR)												
Link Speed (mph)			45				45			25		
Link Distance (ft)			949				2738			456		
Travel Time (s)			14.4				41.5			12.4		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.96	0.92	0.96	0.96	0.82	0.92	0.82	0.92
Heavy Vehicles (%)	2%	2%	2%	2%	4%	2%	4%	4%	4%	2%	4%	2%
Adj. Flow (vph)	26	130	1526	48	48	229	790	361	328	7	43	15
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	156	1574	0	0	277	790	361	328	50	0	15
Turn Type	Prot	Prot			Prot	Prot		pm+ov	Prot			Perm
Protected Phases	5	5	2		1	1	6	7	7	4		
Permitted Phases								6				8
Detector Phase	5	5	2		1	1	6	7	7	4		8
Switch Phase												
Minimum Initial (s)	7.0	7.0	14.0		7.0	7.0	14.0	7.0	7.0	7.0		7.0
Minimum Split (s)	13.0	13.0	21.0		14.0	14.0	20.0	14.0	14.0	14.0		14.0
Total Split (s)	25.0	25.0	68.0	0.0	27.0	27.0	70.0	31.0	31.0	45.0	0.0	14.0
Total Split (%)	17.9%	17.9%	48.6%	0.0%	19.3%	19.3%	50.0%	22.1%	22.1%	32.1%	0.0%	10.0%
Maximum Green (s)	19.2	19.2	61.6		20.0	20.0	64.0	24.9	24.9	38.9		7.0
Yellow Time (s)	3.0	3.0	5.0		5.0	5.0	4.6	3.0	3.0	3.0		5.0
All-Red Time (s)	2.8	2.8	1.4		2.0	2.0	1.4	3.1	3.1	3.1		2.0
Lost Time Adjust (s)	0.0	-0.8	-1.4	0.0	-1.0	-2.0	-1.0	-1.1	-1.1	-1.1	-0.8	-2.0
Total Lost Time (s)	5.8	5.0	5.0	4.0	6.0	5.0	5.0	5.0	5.0	5.0	3.2	5.0
Lead/Lag	Lead	Lead	Lag		Lead	Lead	Lag	Lead	Lead			Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes			Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0		3.0
Recall Mode	None	None	C-Max		None	None	C-Max	None	None	None		None
Act Effct Green (s)		17.2	63.0			22.0	67.8	98.8	26.0	40.0		9.0
Actuated g/C Ratio		0.12	0.45			0.16	0.48	0.71	0.19	0.29		0.06
v/c Ratio		0.71	0.98			1.02	0.48	0.34	1.00	0.11		0.17
Control Delay		92.0	31.2			123.0	15.2	8.2	106.8	37.8		66.9
Queue Delay		0.0	0.0			0.0	0.0	0.0	0.0	0.0		0.0
Total Delay		92.0	31.2			123.0	15.2	8.2	106.8	37.8		66.9
LOS		F	C			F	B	A	F	D		E
Approach Delay			36.7				34.3			97.7		

Lanes, Volumes, Timings  
12: US 15-501 & Market St

2/28/2014



Lane Group	NWT	NWR
Lane Configurations	3	76
Volume (vph)	3	76
Ideal Flow (vphpl)	1900	1900
Grade (%)	0%	
Storage Length (ft)		0
Storage Lanes		0
Taper Length (ft)		25
Lane Util. Factor	1.00	1.00
Frt	0.855	
Flt Protected		
Satd. Flow (prot)	1593	0
Flt Permitted		
Satd. Flow (perm)	1593	0
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	25	
Link Distance (ft)	391	
Travel Time (s)	10.7	
Peak Hour Factor	0.92	0.92
Heavy Vehicles (%)	2%	2%
Adj. Flow (vph)	3	83
Shared Lane Traffic (%)		
Lane Group Flow (vph)	86	0
Turn Type		
Protected Phases	8	
Permitted Phases		
Detector Phase	8	
Switch Phase		
Minimum Initial (s)	7.0	
Minimum Split (s)	14.0	
Total Split (s)	14.0	0.0
Total Split (%)	10.0%	0.0%
Maximum Green (s)	7.0	
Yellow Time (s)	5.0	
All-Red Time (s)	2.0	
Lost Time Adjust (s)	-2.0	0.0
Total Lost Time (s)	5.0	4.0
Lead/Lag	Lag	
Lead-Lag Optimize?	Yes	
Vehicle Extension (s)	3.0	
Recall Mode	None	
Act Effct Green (s)	9.0	
Actuated g/C Ratio	0.06	
v/c Ratio	0.84	
Control Delay	118.0	
Queue Delay	0.0	
Total Delay	118.0	
LOS	F	
Approach Delay	110.4	

Lanes, Volumes, Timings  
12: US 15-501 & Market St

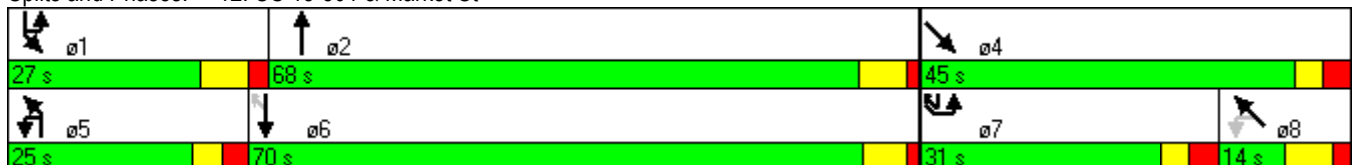
2/28/2014

Lane Group	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	SEL	SET	SER	NWL
Approach LOS			D				C			F		
Queue Length 50th (ft)		147	753			~275	128	95	~303	34		13
Queue Length 95th (ft)		m181	#895			#459	211	164	#433	68		38
Internal Link Dist (ft)			869				2658			376		
Turn Bay Length (ft)		275				250		300	150			250
Base Capacity (vph)		257	1608			272	1648	1074	327	463		87
Starvation Cap Reductn		0	0			0	0	0	0	0		0
Spillback Cap Reductn		0	0			0	0	0	0	0		0
Storage Cap Reductn		0	0			0	0	0	0	0		0
Reduced v/c Ratio		0.61	0.98			1.02	0.48	0.34	1.00	0.11		0.17

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 69 (49%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 120  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.02  
 Intersection Signal Delay: 44.1 Intersection LOS: D  
 Intersection Capacity Utilization 88.5% ICU Level of Service E  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 12: US 15-501 & Market St





Lane Group	NWT	NWR
Approach LOS	F	
Queue Length 50th (ft)	79	
Queue Length 95th (ft)	#181	
Internal Link Dist (ft)	311	
Turn Bay Length (ft)		
Base Capacity (vph)	102	
Starvation Cap Reductn	0	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.84	
<b>Intersection Summary</b>		

Lanes, Volumes, Timings  
 13: Park and Ride Access & US 15-501

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	67	6	17	28	3	150	9	30	1375	44	211	539
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%				-3%			4%
Storage Length (ft)	0		0	0		0		250		0	200	
Storage Lanes	1		0	0		0		1		0	1	
Taper Length (ft)	25		25	25		25		25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	0.95	1.00	0.95
Frt		0.890			0.888				0.995			
Flt Protected	0.950				0.992			0.950			0.950	
Satd. Flow (prot)	1687	1601	0	0	1641	0	0	1796	3574	0	1734	3338
Flt Permitted	0.373				0.948			0.950			0.950	
Satd. Flow (perm)	662	1601	0	0	1568	0	0	1796	3574	0	1734	3338
Right Turn on Red			No			No				No		
Satd. Flow (RTOR)												
Link Speed (mph)		25			25				45			45
Link Distance (ft)		442			465				923			949
Travel Time (s)		12.1			12.7				14.0			14.4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	7%	2%	7%	2%	2%	2%	2%	2%	2%	2%	2%	6%
Adj. Flow (vph)	74	7	19	31	3	167	10	33	1528	49	234	599
Shared Lane Traffic (%)												
Lane Group Flow (vph)	74	26	0	0	201	0	0	43	1577	0	234	599
Turn Type	Perm			Perm			Prot	Prot			Prot	
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Detector Phase	4	4		8	8		5	5	2		1	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0	12.0		7.0	12.0
Minimum Split (s)	20.0	20.0		20.0	20.0		20.0	20.0	19.0		14.0	19.0
Total Split (s)	31.0	31.0	0.0	31.0	31.0	0.0	20.0	20.0	78.0	0.0	31.0	89.0
Total Split (%)	22.1%	22.1%	0.0%	22.1%	22.1%	0.0%	14.3%	14.3%	55.7%	0.0%	22.1%	63.6%
Maximum Green (s)	24.0	24.0		24.0	24.0		13.0	13.0	71.0		24.0	82.0
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0		5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	0.0	-2.0	-2.0	0.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	7.0	5.0	2.0	7.0	5.0	5.0	2.0	5.0	5.0
Lead/Lag							Lead	Lead	Lead		Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None		None	None		None	None	C-Max		None	C-Max
Act Effct Green (s)	23.2	23.2			23.2			11.0	75.8		26.0	93.6
Actuated g/C Ratio	0.17	0.17			0.17			0.08	0.54		0.19	0.67
v/c Ratio	0.68	0.10			0.78			0.30	0.81		0.73	0.27
Control Delay	83.8	48.9			75.8			77.9	22.2		48.7	2.9
Queue Delay	0.0	0.0			0.0			0.0	0.0		0.0	0.0
Total Delay	83.8	48.9			75.8			77.9	22.2		48.7	2.9
LOS	F	D			E			E	C		D	A
Approach Delay		74.7			75.8				23.6			14.5

Lanes, Volumes, Timings  
 13: Park and Ride Access & US 15-501

2/28/2014

Lane Group	SBR
Lane Configurations	
Volume (vph)	82
Ideal Flow (vphpl)	1900
Grade (%)	
Storage Length (ft)	150
Storage Lanes	1
Taper Length (ft)	25
Lane Util. Factor	1.00
Frt	0.850
Flt Protected	
Satd. Flow (prot)	1493
Flt Permitted	
Satd. Flow (perm)	1493
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	6%
Adj. Flow (vph)	91
Shared Lane Traffic (%)	
Lane Group Flow (vph)	91
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Detector Phase	6
Switch Phase	
Minimum Initial (s)	12.0
Minimum Split (s)	19.0
Total Split (s)	89.0
Total Split (%)	63.6%
Maximum Green (s)	82.0
Yellow Time (s)	5.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	5.0
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Recall Mode	C-Max
Act Effct Green (s)	93.6
Actuated g/C Ratio	0.67
v/c Ratio	0.09
Control Delay	2.9
Queue Delay	0.0
Total Delay	2.9
LOS	A
Approach Delay	

Lanes, Volumes, Timings  
 13: Park and Ride Access & US 15-501

2/28/2014

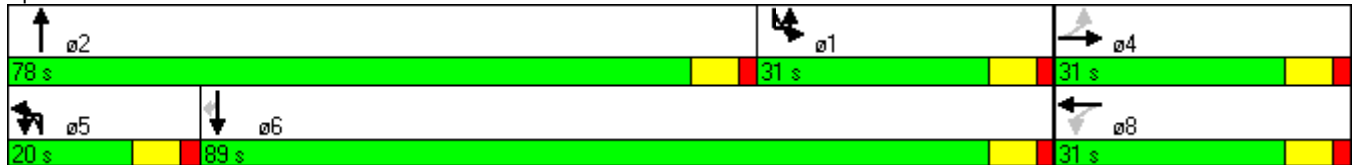


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Approach LOS		E			E				C			B
Queue Length 50th (ft)	63	20			175			41	334		209	24
Queue Length 95th (ft)	#131	48			264			m70	364		#319	33
Internal Link Dist (ft)		362			385				843			869
Turn Bay Length (ft)								250			200	
Base Capacity (vph)	123	297			291			192	1936		322	2232
Starvation Cap Reductn	0	0			0			0	0		0	0
Spillback Cap Reductn	0	0			0			0	0		0	0
Storage Cap Reductn	0	0			0			0	0		0	0
Reduced v/c Ratio	0.60	0.09			0.69			0.22	0.81		0.73	0.27

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 65 (46%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.81  
 Intersection Signal Delay: 26.2 Intersection LOS: C  
 Intersection Capacity Utilization 81.2% ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 13: Park and Ride Access & US 15-501





Lane Group	SBR
Approach LOS	
Queue Length 50th (ft)	7
Queue Length 95th (ft)	m13
Internal Link Dist (ft)	
Turn Bay Length (ft)	150
Base Capacity (vph)	998
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.09
Intersection Summary	



Lanes, Volumes, Timings  
14: Dogwood Acres Dr & US 15-501

2/28/2014



Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Volume (vph)	74	1	7	1431	39	533	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Grade (%)	-1%			-4%		4%	
Storage Length (ft)	0	0	300		0		0
Storage Lanes	1	0	1		1		0
Taper Length (ft)	25	25	25		25		25
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.95	0.95
Frt	0.998					0.994	
Flt Protected	0.953		0.950		0.950		
Satd. Flow (prot)	1781	0	1787	3575	1734	3287	0
Flt Permitted	0.953		0.420		0.950		
Satd. Flow (perm)	1781	0	790	3575	1734	3287	0
Right Turn on Red	No						No
Satd. Flow (RTOR)							
Link Speed (mph)	25			45		45	
Link Distance (ft)	1150			899		125	
Travel Time (s)	31.4			13.6		1.9	
Peak Hour Factor	0.88	0.88	0.93	0.93	0.90	0.91	0.91
Heavy Vehicles (%)	2%	2%	3%	3%	2%	7%	7%
Adj. Flow (vph)	84	1	8	1539	43	586	26
Shared Lane Traffic (%)							
Lane Group Flow (vph)	85	0	8	1539	43	612	0
Turn Type	Perm				Prot		
Protected Phases	4			2	1	6	
Permitted Phases			2				
Detector Phase	4		2	2	1	6	
Switch Phase							
Minimum Initial (s)	7.0		12.0	12.0	7.0	12.0	
Minimum Split (s)	13.0		19.0	19.0	14.0	19.0	
Total Split (s)	22.0	0.0	100.0	100.0	18.0	118.0	0.0
Total Split (%)	15.7%	0.0%	71.4%	71.4%	12.9%	84.3%	0.0%
Maximum Green (s)	16.2		93.8	93.8	11.0	111.9	
Yellow Time (s)	3.0		4.9	4.9	5.0	4.3	
All-Red Time (s)	2.8		1.3	1.3	2.0	1.8	
Lost Time Adjust (s)	-0.8	0.0	-1.2	-1.2	-1.1	-1.1	0.0
Total Lost Time (s)	5.0	4.0	5.0	5.0	5.9	5.0	4.0
Lead/Lag			Lead	Lead	Lag		
Lead-Lag Optimize?			Yes	Yes	Yes		
Vehicle Extension (s)	2.0		6.0	6.0	3.0	6.0	
Recall Mode	None		C-Max	C-Max	None	C-Max	
Act Effct Green (s)	12.0		103.6	103.6	11.3	118.0	
Actuated g/C Ratio	0.09		0.74	0.74	0.08	0.84	
v/c Ratio	0.56		0.01	0.58	0.31	0.22	
Control Delay	74.7		6.9	10.6	48.8	1.0	
Queue Delay	0.0		0.0	0.0	0.0	0.0	
Total Delay	74.7		6.9	10.6	48.8	1.0	
LOS	E		A	B	D	A	
Approach Delay	74.7			10.6		4.1	

Lanes, Volumes, Timings  
 14: Dogwood Acres Dr & US 15-501

2/28/2014

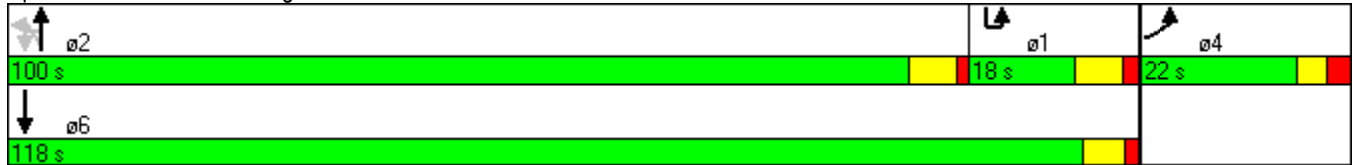


Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Approach LOS	E		B		A		
Queue Length 50th (ft)	76		2	334	39	18	
Queue Length 95th (ft)	127		8	445	m81	23	
Internal Link Dist (ft)	1070			819		45	
Turn Bay Length (ft)			300				
Base Capacity (vph)	216		585	2646	150	2771	
Starvation Cap Reductn	0		0	0	0	0	
Spillback Cap Reductn	0		0	0	0	0	
Storage Cap Reductn	0		0	0	0	0	
Reduced v/c Ratio	0.39		0.01	0.58	0.29	0.22	

Intersection Summary

























Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 52 (37%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.58  
 Intersection Signal Delay: 11.1 Intersection LOS: B  
 Intersection Capacity Utilization 53.7% ICU Level of Service A  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: Dogwood Acres Dr & US 15-501



Lanes, Volumes, Timings  
15: Smith Level Road & US 15-501

2/28/2014

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	79	17	232	18	17	19	379	1194	7	47	432	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			1%			-1%				1%
Storage Length (ft)	125		175	150		150	500		250	275		100
Storage Lanes	1		2	2		1	2		1	2		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	0.88	0.97	1.00	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1844	2759	3416	1853	1575	3417	3522	1576	3318	3421	1530
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1752	1844	2759	3416	1853	1575	3417	3522	1576	3318	3421	1530
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			25			45				45
Link Distance (ft)		800			667			1107				1252
Travel Time (s)		12.1			18.2			16.8				19.0
Peak Hour Factor	0.96	0.96	0.96	0.68	0.68	0.68	0.94	0.94	0.94	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	5%	5%	5%
Adj. Flow (vph)	82	18	242	26	25	28	403	1270	7	51	465	40
Shared Lane Traffic (%)												
Lane Group Flow (vph)	82	18	242	26	25	28	403	1270	7	51	465	40
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0	7.0	7.0	12.0	7.0
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0	14.0	14.0	19.0	14.0	14.0	19.0	14.0
Total Split (s)	20.0	25.0	15.0	20.0	25.0	15.0	15.0	90.0	20.0	15.0	90.0	20.0
Total Split (%)	13.3%	16.7%	10.0%	13.3%	16.7%	10.0%	10.0%	60.0%	13.3%	10.0%	60.0%	13.3%
Maximum Green (s)	13.9	18.8	8.3	13.6	18.4	8.7	8.3	83.2	13.6	8.7	83.3	13.9
Yellow Time (s)	3.0	4.0	3.3	3.1	3.8	3.2	3.3	4.7	3.1	3.2	4.5	3.0
All-Red Time (s)	3.1	2.2	3.4	3.3	2.8	3.1	3.4	2.1	3.3	3.1	2.2	3.1
Lost Time Adjust (s)	-1.1	-1.2	-1.7	-1.4	-1.6	-1.3	-1.7	-1.8	-1.4	-1.3	-1.7	-1.1
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	6.0	2.0	2.0	6.0	2.0
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	None
Act Effct Green (s)	12.6	12.5	21.9	13.4	11.0	17.3	12.5	65.2	77.8	10.6	53.6	72.4
Actuated g/C Ratio	0.13	0.13	0.23	0.14	0.11	0.18	0.13	0.67	0.80	0.11	0.55	0.74
v/c Ratio	0.36	0.08	0.39	0.06	0.12	0.10	0.92	0.54	0.01	0.14	0.25	0.04
Control Delay	55.7	51.8	41.5	52.6	56.1	43.9	75.6	14.5	5.3	54.4	11.9	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.7	51.8	41.5	52.6	56.1	43.9	75.6	14.5	5.3	54.4	11.9	4.7
LOS	E	D	D	D	E	D	E	B	A	D	B	A
Approach Delay		45.5			50.7			29.1				15.3

Lanes, Volumes, Timings  
 15: Smith Level Road & US 15-501

2/28/2014



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Approach LOS		D				D			C			B
Queue Length 50th (ft)	55	12	97	7	17	16	~186	304	1	17	85	8
Queue Length 95th (ft)	128	40	153	21	41	38	#381	420	7	45	125	18
Internal Link Dist (ft)		720				587			1027			1172
Turn Bay Length (ft)	125		175	150		150	500		250	275		100
Base Capacity (vph)	339	475	622	720	477	312	440	2874	1318	428	2792	1236
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.04	0.39	0.04	0.05	0.09	0.92	0.44	0.01	0.12	0.17	0.03

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 97.3  
 Natural Cycle: 75  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.92  
 Intersection Signal Delay: 29.0  
 Intersection LOS: C  
 Intersection Capacity Utilization 62.4%  
 ICU Level of Service B  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 15: Smith Level Road & US 15-501

ø1	ø2	ø3	ø4
15 s	90 s	20 s	25 s
ø5	ø6	ø7	ø8
15 s	90 s	20 s	25 s

Lanes, Volumes, Timings

17: Merritt Mill Road / NC 54 WB Off Ramp & Greensboro Street

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖↗	↖		↖	↕↕	↖	↖	↕↕	↖
Volume (vph)	0	0	0	257	37	176	255	418	513	20	393	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			-3%			2%				-3%
Storage Length (ft)	0		0	475		0	225		250	250		0
Storage Lanes	0		0	1		0	1		1	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor					0.99				0.97	1.00		
Fr <sub>t</sub>					0.876				0.850			0.850
Fl <sub>t</sub> Protected				0.950			0.950		0.950			
Satd. Flow (prot)	0	0	0	3385	1590	0	1702	3404	1523	1712	3424	1532
Fl <sub>t</sub> Permitted				0.950			0.476		0.470			
Satd. Flow (perm)	0	0	0	3385	1590	0	853	3404	1484	844	3424	1532
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			35			35				35
Link Distance (ft)		467			767			384				607
Travel Time (s)		10.6			14.9			7.5				11.8
Confl. Peds. (#/hr)	2						2		7	7		
Peak Hour Factor	1.00	1.00	1.00	0.92	0.92	0.92	0.86	0.86	0.86	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	5%	5%	5%	5%	5%	5%	7%	7%	7%
Adj. Flow (vph)	0	0	0	279	40	191	297	486	597	22	437	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	279	231	0	297	486	597	22	437	33
Turn Type				Perm			pm+pt		Perm	Perm		Perm
Protected Phases					8		5	2				6
Permitted Phases				8			2		2	6		6
Detector Phase				8	8		5	2	2	6		6
Switch Phase												
Minimum Initial (s)				7.0	7.0		7.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)				14.0	14.0		13.0	16.0	16.0	16.0	16.0	16.0
Total Split (s)	0.0	0.0	0.0	36.0	36.0	0.0	21.0	84.0	84.0	63.0	63.0	63.0
Total Split (%)	0.0%	0.0%	0.0%	30.0%	30.0%	0.0%	17.5%	70.0%	70.0%	52.5%	52.5%	52.5%
Maximum Green (s)				29.5	29.5		15.4	78.0	78.0	57.0	57.0	57.0
Yellow Time (s)				4.2	4.2		3.0	3.9	3.9	3.9	3.9	3.9
All-Red Time (s)				2.3	2.3		2.6	2.1	2.1	2.1	2.1	2.1
Lost Time Adjust (s)	0.0	0.0	0.0	-1.5	-1.5	0.0	-0.6	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.0	4.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag							Lag			Lead	Lead	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode				None	None		None	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)				24.3	24.3		85.7	85.7	85.7	64.7	64.7	64.7
Actuated g/C Ratio				0.20	0.20		0.71	0.71	0.71	0.54	0.54	0.54
v/c Ratio				0.41	0.72		0.41	0.20	0.56	0.05	0.24	0.04
Control Delay				42.4	56.8		2.4	1.0	3.2	15.7	15.9	15.2
Queue Delay				0.0	0.0		1.1	0.0	0.7	0.0	0.0	0.0
Total Delay				42.4	56.8		3.5	1.0	3.9	15.7	15.9	15.2

Lanes, Volumes, Timings

17: Merritt Mill Road / NC 54 WB Off Ramp & Greensboro Street

2/28/2014

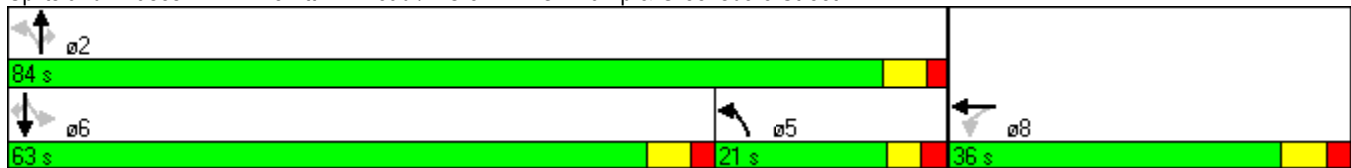


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS				D	E		A	A	A	B	B	B
Approach Delay					49.0			2.8			15.8	
Approach LOS					D			A			B	
Queue Length 50th (ft)				96	167		8	6	16	8	91	12
Queue Length 95th (ft)				129	241		12	10	22	24	137	32
Internal Link Dist (ft)		387			687			304			527	
Turn Bay Length (ft)				475			225		250	250		
Base Capacity (vph)				874	411		723	2432	1060	455	1847	826
Starvation Cap Reductn				0	0		229	0	189	0	0	0
Spillback Cap Reductn				0	0		0	0	0	0	0	0
Storage Cap Reductn				0	0		0	0	0	0	0	0
Reduced v/c Ratio				0.32	0.56		0.60	0.20	0.69	0.05	0.24	0.04

Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	5 (4%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle:	45
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.72
Intersection Signal Delay:	15.4
Intersection LOS:	B
Intersection Capacity Utilization:	50.5%
ICU Level of Service:	A
Analysis Period (min):	15












Splits and Phases: 17: Merritt Mill Road / NC 54 WB Off Ramp & Greensboro Street



Lanes, Volumes, Timings

18: Smith Level Road & NC 54 Bypass (Fordham Blvd) EB Off Ramp

2/28/2014

											
Lane Group	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	SEL2	SEL	SER
Lane Configurations				↑↑	↑	↑	↑↑		↑	↓	↑
Volume (vph)	0	0	0	863	258	228	418	0	304	2	346
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)	0%			1%			-2%			-3%	
Storage Length (ft)	0	0	0		125	175		0		250	250
Storage Lanes	0	0	0		1	1		0		1	1
Taper Length (ft)	25	25	25		25	25		25		25	25
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00
Ped Bike Factor					0.96						
Frt					0.850						0.850
Flt Protected						0.950			0.950	0.950	
Satd. Flow (prot)	0	0	0	3421	1530	1704	3408	0	1642	1642	1546
Flt Permitted						0.133			0.950	0.950	
Satd. Flow (perm)	0	0	0	3421	1470	239	3408	0	1642	1642	1546
Right Turn on Red					No			No			No
Satd. Flow (RTOR)											
Link Speed (mph)	30			35			35			35	
Link Distance (ft)	706			414			384			490	
Travel Time (s)	16.0			8.1			7.5			9.5	
Confl. Peds. (#/hr)					5	5					
Peak Hour Factor	1.00	1.00	1.00	0.87	0.87	0.82	0.82	1.00	0.85	0.85	0.85
Heavy Vehicles (%)	2%	2%	5%	5%	5%	7%	7%	7%	6%	6%	6%
Adj. Flow (vph)	0	0	0	992	297	278	510	0	358	2	407
Shared Lane Traffic (%)									50%		
Lane Group Flow (vph)	0	0	0	992	297	278	510	0	179	181	407
Turn Type					Perm	pm+pt			Perm		Perm
Protected Phases				2		1	6			4	
Permitted Phases					2	6			4		4
Detector Phase				2	2	1	6		4	4	4
Switch Phase											
Minimum Initial (s)				10.0	10.0	8.0	10.0		7.0	7.0	7.0
Minimum Split (s)				25.0	25.0	15.0	20.0		14.0	14.0	14.0
Total Split (s)	0.0	0.0	0.0	50.0	50.0	24.0	74.0	0.0	46.0	46.0	46.0
Total Split (%)	0.0%	0.0%	0.0%	41.7%	41.7%	20.0%	61.7%	0.0%	38.3%	38.3%	38.3%
Maximum Green (s)				40.2	40.2	17.7	64.1		39.7	39.7	39.7
Yellow Time (s)				3.8	3.8	3.0	3.9		4.0	4.0	4.0
All-Red Time (s)				6.0	6.0	3.3	6.0		2.3	2.3	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	-4.8	-4.8	-1.3	-4.9	0.0	-1.3	-1.3	-1.3
Total Lost Time (s)	4.0	4.0	4.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0	5.0
Lead/Lag				Lag	Lag	Lead					
Lead-Lag Optimize?				Yes	Yes	Yes					
Vehicle Extension (s)				3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode				C-Max	C-Max	None	C-Max		None	None	None
Walk Time (s)				7.0	7.0						
Flash Dont Walk (s)				8.0	8.0						
Pedestrian Calls (#/hr)				0	0						
Act Effct Green (s)				50.9	50.9	73.4	73.4		36.6	36.6	36.6
Actuated g/C Ratio				0.42	0.42	0.61	0.61		0.30	0.30	0.30
v/c Ratio				0.68	0.48	0.77	0.24		0.36	0.36	0.86

Lanes, Volumes, Timings

18: Smith Level Road & NC 54 Bypass (Fordham Blvd) EB Off Ramp

2/28/2014



Lane Group	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	SEL2	SEL	SER
Control Delay				32.6	30.2	40.7	5.7		33.7	33.8	57.7
Queue Delay				0.0	0.0	0.4	0.2		0.0	0.0	0.0
Total Delay				32.6	30.2	41.1	5.9		33.7	33.8	57.7
LOS				C	C	D	A		C	C	E
Approach Delay				32.0			18.3			46.4	
Approach LOS				C			B			D	
Queue Length 50th (ft)				352	178	80	34		110	111	288
Queue Length 95th (ft)				414	257	216	39		161	162	376
Internal Link Dist (ft)	626			334			304			410	
Turn Bay Length (ft)					125	175			250	250	250
Base Capacity (vph)				1450	623	383	2085		561	561	528
Starvation Cap Reductn				0	0	9	883		0	0	0
Spillback Cap Reductn				0	0	0	0		0	0	0
Storage Cap Reductn				0	0	0	0		0	0	0
Reduced v/c Ratio				0.68	0.48	0.74	0.42		0.32	0.32	0.77

Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle:	70
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.86
Intersection Signal Delay:	32.1
Intersection LOS:	C
Intersection Capacity Utilization	57.5%
ICU Level of Service	B
Analysis Period (min)	15

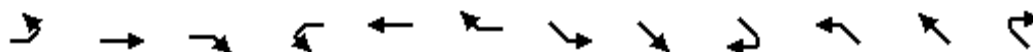
Splits and Phases: 18: Smith Level Road & NC 54 Bypass (Fordham Blvd) EB Off Ramp





Lanes, Volumes, Timings  
 20: US 15-501 (Fordham Blvd) & Manning Drive

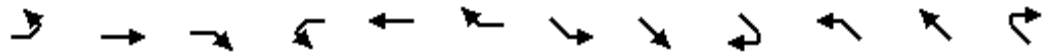
2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations	↔↔	↕↔		↔	↕↕	↔	↔↔	↕	↔		↕↔	↔
Volume (vph)	218	2512	2	7	1461	753	266	0	49	17	7	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	9	12
Grade (%)		-5%			0%			-4%			0%	
Storage Length (ft)	400		0	200		1000	0		225	0		75
Storage Lanes	2		0	1		1	0		1	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor									0.99		0.99	
Frt						0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950				0.966	
Satd. Flow (prot)	3519	3628	0	1719	3438	1538	3434	1863	1584	0	1604	1568
Flt Permitted	0.950			0.950			0.950				0.966	
Satd. Flow (perm)	3519	*3811	0	1719	3438	1538	*3819	1863	1564	0	1595	1568
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			35				25
Link Distance (ft)		579			1498			367				515
Travel Time (s)		8.8			22.7			7.1				14.0
Confl. Peds. (#/hr)									3	3		
Peak Hour Factor	0.94	0.94	0.94	0.95	0.95	0.95	0.88	0.88	0.88	0.68	0.68	0.68
Heavy Vehicles (%)	2%	2%	2%	5%	5%	5%	4%	4%	4%	3%	3%	3%
Adj. Flow (vph)	232	2672	2	7	1538	793	302	0	56	25	10	63
Shared Lane Traffic (%)												
Lane Group Flow (vph)	232	2674	0	7	1538	793	302	0	56	0	35	63
Turn Type	Prot			Prot		pm+ov	Split		Free	Split		pm+ov
Protected Phases	5	2		1	6	4	4	4		3	3	1
Permitted Phases						6			Free			3
Detector Phase	5	2		1	6	4	4	4		3	3	1
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0	7.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	14.0	19.0		14.0	19.0	32.0	32.0	32.0		14.0	14.0	14.0
Total Split (s)	24.0	139.0	0.0	14.0	129.0	33.0	33.0	33.0	0.0	14.0	14.0	14.0
Total Split (%)	12.0%	69.5%	0.0%	7.0%	64.5%	16.5%	16.5%	16.5%	0.0%	7.0%	7.0%	7.0%
Maximum Green (s)	17.8	132.9		7.8	122.7	26.8	26.8	26.8		7.8	7.8	7.8
Yellow Time (s)	3.0	4.7		3.0	4.5	3.8	3.8	3.8		3.8	3.8	3.0
All-Red Time (s)	3.2	1.4		3.2	1.8	2.4	2.4	2.4		2.4	2.4	3.2
Lost Time Adjust (s)	-1.2	-1.1	0.0	-1.2	-1.3	-1.2	-1.2	-1.2	0.0	-2.5	-1.2	-1.2
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0	3.7	5.0	5.0
Lead/Lag	Lead	Lead		Lag	Lag	Lag	Lag	Lag		Lead	Lead	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	6.0		1.0	6.0	1.0	1.0	1.0		1.0	1.0	1.0
Recall Mode	None	C-Max		None	C-Max	None	None	None		None	None	None
Walk Time (s)						7.0	7.0	7.0				
Flash Dont Walk (s)						18.0	18.0	18.0				
Pedestrian Calls (#/hr)						0	0	0				
Act Effct Green (s)	17.0	134.0		9.0	126.0	157.9	31.0		200.0		8.7	20.0
Actuated g/C Ratio	0.08	0.67		0.04	0.63	0.79	0.16		1.00		0.04	0.10

Lanes, Volumes, Timings  
 20: US 15-501 (Fordham Blvd) & Manning Drive

2/28/2014

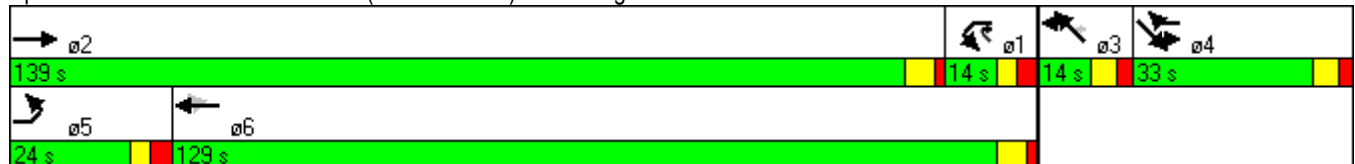


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
v/c Ratio	0.78	1.10		0.09	0.71	0.65	0.57		0.04		0.50	0.40
Control Delay	107.1	84.2		67.3	9.2	2.1	84.0		0.0		117.8	90.8
Queue Delay	0.0	12.1		0.0	0.0	0.0	0.0		0.0		0.0	0.0
Total Delay	107.1	96.3		67.3	9.2	2.1	84.0		0.0		117.8	90.8
LOS	F	F		E	A	A	F		A		F	F
Approach Delay		97.2			6.9						100.4	
Approach LOS		F			A						F	
Queue Length 50th (ft)	156	~2090		9	205	81	196		0		46	78
Queue Length 95th (ft)	208	#2173		m7	m197	m78	247		0		69	100
Internal Link Dist (ft)		499			1418			287			435	
Turn Bay Length (ft)	400			200		1000			225			75
Base Capacity (vph)	334	2431		77	2166	1215	532		1564		72	157
Starvation Cap Reductn	0	0		0	0	0	0		0		0	0
Spillback Cap Reductn	0	60		0	0	0	0		0		0	0
Storage Cap Reductn	0	0		0	0	0	0		0		0	0
Reduced v/c Ratio	0.69	1.13		0.09	0.71	0.65	0.57		0.04		0.49	0.40

Intersection Summary

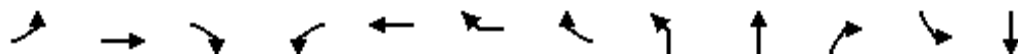
Area Type: Other  
 Cycle Length: 200  
 Actuated Cycle Length: 200  
 Offset: 122 (61%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.10  
 Intersection Signal Delay: 58.6  
 Intersection LOS: E  
 Intersection Capacity Utilization 102.7%  
 ICU Level of Service G  
 Analysis Period (min) 15  
 \* User Entered Value  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 20: US 15-501 (Fordham Blvd) & Manning Drive



Lanes, Volumes, Timings  
 21: Old Mason Farm Road & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↕		↖	↗			↖	↕	↗	↖	↕
Volume (vph)	11	4	9	88	1	6	11	102	2594	198	22	2003
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			3%				0%			0%
Storage Length (ft)	0		0	50		0		350		300	125	
Storage Lanes	0		0	1		0		1		1	1	
Taper Length (ft)	25		25	25		25		25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	*1.00	1.00	1.00	*1.00
Ped Bike Factor					0.99							
Frt		0.949			0.859					0.850		
Flt Protected		0.978		0.950				0.950			0.950	
Satd. Flow (prot)	0	1729	0	1743	1555	0	0	1770	3725	1583	1770	3725
Flt Permitted		0.839		0.950				0.950			0.950	
Satd. Flow (perm)	0	1483	0	1743	1555	0	0	1770	*3787	1583	1770	*3771
Right Turn on Red			No				No			No		
Satd. Flow (RTOR)												
Link Speed (mph)		30			35				45			45
Link Distance (ft)		305			620				1498			1494
Travel Time (s)		6.9			12.1				22.7			22.6
Confl. Peds. (#/hr)							1					
Peak Hour Factor	0.61	0.61	0.61	0.52	0.52	0.52	0.52	0.96	0.96	0.96	0.87	0.87
Adj. Flow (vph)	18	7	15	169	2	12	21	106	2702	206	25	2302
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	40	0	169	35	0	0	106	2702	206	25	2302
Turn Type	Perm			Split				Prot		pm+ov	Prot	
Protected Phases		7		3	3			5	2	3	1	6
Permitted Phases	7									2		
Detector Phase	7	7		3	3			5	2	3	1	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		7.0	7.0			7.0	12.0	7.0	7.0	12.0
Minimum Split (s)	13.0	13.0		36.0	36.0			14.0	33.0	36.0	15.0	25.0
Total Split (s)	13.0	13.0	0.0	25.0	25.0	0.0	0.0	15.0	122.0	25.0	15.0	122.0
Total Split (%)	6.5%	6.5%	0.0%	12.5%	12.5%	0.0%	0.0%	7.5%	61.0%	12.5%	7.5%	61.0%
Maximum Green (s)	5.8	5.8		18.4	18.4			8.0	115.8	18.4	9.1	115.9
Yellow Time (s)	3.0	3.0		3.6	3.6			3.0	4.6	3.6	3.0	4.4
All-Red Time (s)	4.2	4.2		3.0	3.0			4.0	1.6	3.0	2.9	1.7
Lost Time Adjust (s)	0.0	-2.2	-2.2	-1.6	-1.6	-1.6	-1.6	-2.0	-1.2	-1.6	-0.9	-1.1
Total Lost Time (s)	7.2	5.0	1.8	5.0	5.0	2.4	2.4	5.0	5.0	5.0	5.0	5.0
Lead/Lag				Lead	Lead			Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0	2.0	2.0	2.0	2.0
Recall Mode	None	None		None	None			None	C-Max	None	None	C-Max
Walk Time (s)				4.0	4.0				7.0	4.0		7.0
Flash Dont Walk (s)				25.0	25.0				16.0	25.0		11.0
Pedestrian Calls (#/hr)				0	0				0	0		0
Act Effct Green (s)		8.0		20.0	20.0			10.0	122.6	143.6	9.6	119.6
Actuated g/C Ratio		0.04		0.10	0.10			0.05	0.61	0.72	0.05	0.60
v/c Ratio		0.68		0.97	0.22			1.19	1.18	0.18	0.29	1.03
Control Delay		140.7		147.0	86.9			156.3	107.4	3.5	100.8	67.2

Lanes, Volumes, Timings  
 21: Old Mason Farm Road & US 15-501 (Fordham Blvd)

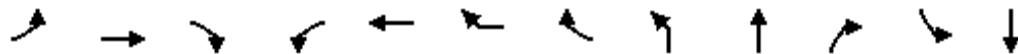
2/28/2014



Lane Group	SBR	SEL2	SEL	SER	SER2
Lane Configurations					
Volume (vph)	3	144	21	51	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900
Grade (%)			2%		
Storage Length (ft)	100		125	0	
Storage Lanes	1		1	0	
Taper Length (ft)	25		25	25	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00
Ped Bike Factor					
Frt	0.850		0.912		
Flt Protected		0.950	0.980		
Satd. Flow (prot)	1583	1664	1566	0	0
Flt Permitted		0.950	0.980		
Satd. Flow (perm)	1583	1664	1566	0	0
Right Turn on Red					No
Satd. Flow (RTOR)					
Link Speed (mph)			25		
Link Distance (ft)			359		
Travel Time (s)			9.8		
Confl. Peds. (#/hr)					
Peak Hour Factor	0.87	0.47	0.47	0.47	0.47
Adj. Flow (vph)	3	306	45	109	30
Shared Lane Traffic (%)		17%			
Lane Group Flow (vph)	3	254	236	0	0
Turn Type	Perm	Split			
Protected Phases		4	4		
Permitted Phases	6				
Detector Phase	6	4	4		
Switch Phase					
Minimum Initial (s)	12.0	5.0	5.0		
Minimum Split (s)	25.0	13.0	13.0		
Total Split (s)	122.0	25.0	25.0	0.0	0.0
Total Split (%)	61.0%	12.5%	12.5%	0.0%	0.0%
Maximum Green (s)	115.9	17.6	17.6		
Yellow Time (s)	4.4	3.0	3.0		
All-Red Time (s)	1.7	4.4	4.4		
Lost Time Adjust (s)	-1.1	-2.4	-2.4	-2.4	0.0
Total Lost Time (s)	5.0	5.0	5.0	1.6	4.0
Lead/Lag	Lead	Lag	Lag		
Lead-Lag Optimize?					
Vehicle Extension (s)	2.0	2.0	2.0		
Recall Mode	C-Max	None	None		
Walk Time (s)	7.0				
Flash Dont Walk (s)	11.0				
Pedestrian Calls (#/hr)	0				
Act Effct Green (s)	119.6	20.0	20.0		
Actuated g/C Ratio	0.60	0.10	0.10		
v/c Ratio	0.00	1.53	1.50		
Control Delay	17.3	318.6	309.7		

Lanes, Volumes, Timings  
 21: Old Mason Farm Road & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL	NBT	NBR	SBL	SBT
Queue Delay		0.0		0.0	0.0			0.0	5.1	0.0	0.0	0.0
Total Delay		140.7		147.0	86.9			156.3	112.5	3.5	100.8	67.2
LOS		F		F	F			F	F	A	F	E
Approach Delay		140.7			136.7				106.6			67.5
Approach LOS		F			F				F			E
Queue Length 50th (ft)		53		226	43			~167	~2190	32	32	~1650
Queue Length 95th (ft)		68		177	50			m#163	m#1903	m30	69	#1640
Internal Link Dist (ft)		225			540				1418			1414
Turn Bay Length (ft)				50				350		300	125	
Base Capacity (vph)		59		174	156			89	2283	1136	89	2227
Starvation Cap Reductn		0		0	0			0	22	0	0	0
Spillback Cap Reductn		0		0	0			0	0	0	0	0
Storage Cap Reductn		0		0	0			0	0	0	0	0
Reduced v/c Ratio		0.68		0.97	0.22			1.19	1.20	0.18	0.28	1.03

Intersection Summary

Area Type: Other  
 Cycle Length: 200  
 Actuated Cycle Length: 200  
 Offset: 116 (58%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.53  
 Intersection Signal Delay: 109.6  
 Intersection Capacity Utilization 110.5%  
 Analysis Period (min) 15  
 \* User Entered Value  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 21: Old Mason Farm Road & US 15-501 (Fordham Blvd)

122 s	15 s	25 s	25 s	13 s		

Lanes, Volumes, Timings  
 21: Old Mason Farm Road & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	SBR	SEL2	SEL	SER	SER2
Queue Delay	0.0	0.0	0.0		
Total Delay	17.3	318.6	309.7		
LOS	B	F	F		
Approach Delay			314.3		
Approach LOS			F		
Queue Length 50th (ft)	2	~489	~451		
Queue Length 95th (ft)	7	#254	#236		
Internal Link Dist (ft)			279		
Turn Bay Length (ft)	100	125	125		
Base Capacity (vph)	947	166	157		
Starvation Cap Reductn	0	0	0		
Spillback Cap Reductn	0	0	0		
Storage Cap Reductn	0	0	0		
Reduced v/c Ratio	0.00	1.53	1.50		
<b>Intersection Summary</b>					

Lanes, Volumes, Timings  
 22: NC 54 WB On-Ramp & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↑↑			↑		↑↑	↑		↑↑	↑
Volume (vph)	0	0	1054	0	0	281	0	1458	34	0	1457	181
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		450	0		0			200	0		375
Storage Lanes	0		1	0		1	0		1	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	0.88	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.865			0.850			0.850
Flt Protected												
Satd. Flow (prot)	0	0	2787	0	0	1611	0	3539	1583	0	3539	1583
Flt Permitted												
Satd. Flow (perm)	0	0	2787	0	0	1611	0	3539	1583	0	3539	1583
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)						129			8			71
Link Speed (mph)		30			25			45				45
Link Distance (ft)		694			685			1058				1301
Travel Time (s)		15.8			18.7			16.0				19.7
Peak Hour Factor	1.00	1.00	0.92	1.00	1.00	0.90	1.00	0.90	0.90	1.00	0.82	0.92
Adj. Flow (vph)	0	0	1146	0	0	312	0	1620	38	0	1777	197
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	1146	0	0	312	0	1620	38	0	1777	197
Turn Type			custom			Free			Free			Free
Protected Phases			4					2 4				6
Permitted Phases			4			Free			Free			Free
Detector Phase			4					2 4				6
Switch Phase												
Minimum Initial (s)			7.0									12.0
Minimum Split (s)			13.0									18.0
Total Split (s)	0.0	0.0	77.0	0.0	0.0	0.0	0.0	170.0	0.0	0.0	93.0	0.0
Total Split (%)	0.0%	0.0%	45.3%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	54.7%	0.0%
Maximum Green (s)			71.9									87.2
Yellow Time (s)			3.1									4.5
All-Red Time (s)			2.0									1.3
Lost Time Adjust (s)	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	-0.8	0.0	0.0	-0.8	0.0
Total Lost Time (s)	4.0	4.0	5.0	4.0	4.0	4.0	4.0	5.0	4.0	4.0	5.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)			3.0									6.0
Recall Mode			None									C-Max
Act Effct Green (s)			72.0			170.0		170.0	170.0		88.0	170.0
Actuated g/C Ratio			0.42			1.00		1.00	1.00		0.52	1.00
v/c Ratio			0.97			0.19		0.46	0.02		0.97	0.12
Control Delay			67.7			0.3		0.4	0.0		54.6	0.2
Queue Delay			0.0			0.0		0.0	0.0		0.0	0.0
Total Delay			67.7			0.3		0.4	0.0		54.6	0.2
LOS			E			A		A	A		D	A
Approach Delay								0.4			49.1	
Approach LOS								A			D	
Queue Length 50th (ft)			706			0		0	0		991	0

Lane Group	ø2
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	12.0
Minimum Split (s)	18.0
Total Split (s)	93.0
Total Split (%)	55%
Maximum Green (s)	87.2
Yellow Time (s)	4.5
All-Red Time (s)	1.3
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	6.0
Recall Mode	Max
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	



Lanes, Volumes, Timings  
 22: NC 54 WB On-Ramp & US 15-501 (Fordham Blvd)

2/28/2014

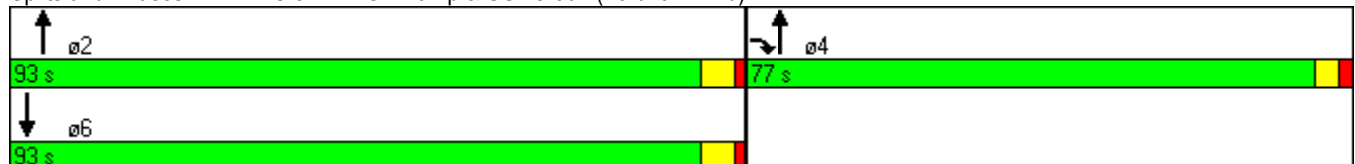


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)			#880			0		0	0		928	0
Internal Link Dist (ft)		614			605			978			1221	
Turn Bay Length (ft)			450						200			375
Base Capacity (vph)			1180			1611		3539	1583		1832	1583
Starvation Cap Reductn			0			0		0	0		0	0
Spillback Cap Reductn			0			0		0	0		0	0
Storage Cap Reductn			0			0		0	0		0	0
Reduced v/c Ratio			0.97			0.19		0.46	0.02		0.97	0.12

Intersection Summary

Area Type: Other  
 Cycle Length: 170  
 Actuated Cycle Length: 170  
 Offset: 0 (0%), Referenced to phase 6:SBT, Start of Green  
 Natural Cycle: 100  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.97  
 Intersection Signal Delay: 34.4  
 Intersection LOS: C  
 Intersection Capacity Utilization 85.5%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 22: NC 54 WB On-Ramp & US 15-501 (Fordham Blvd)



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Lane Group	ø2
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

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Lanes, Volumes, Timings  
 23: NC 54 (Raleigh Road) & Burning Tree Drive

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	2011	40	102	2362	16	17	4	186	33	8	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	275		0	0		450	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			0.99	0.99		0.99	
Frt		0.997			0.999				0.850		0.944	
Flt Protected	0.950			0.950				0.961			0.977	
Satd. Flow (prot)	1770	5066	0	1736	4981	0	0	1773	1568	0	1702	0
Flt Permitted	0.046			0.050				0.783			0.853	
Satd. Flow (perm)	86	5066	0	91	4981	0	0	1434	1547	0	1485	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			25	
Link Distance (ft)		1026			881			637			457	
Travel Time (s)		20.0			17.2			12.4			12.5	
Confl. Peds. (#/hr)	6		8	8		6	9		1	1		9
Peak Hour Factor	0.94	0.94	0.94	0.90	0.90	0.90	0.81	0.81	0.81	0.77	0.77	0.77
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	3%	3%	3%	2%	2%	2%
Adj. Flow (vph)	24	2139	43	113	2624	18	21	5	230	43	10	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	24	2182	0	113	2642	0	0	26	230	0	91	0
Turn Type	pm+pt			pm+pt			Perm		Perm	Perm		
Protected Phases	5	2		1	6			8				4
Permitted Phases	2			6			8		8	4		
Detector Phase	5	2		1	6		8	8	8	4		4
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0		7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.0	32.0		13.0	30.0		48.0	48.0	48.0	46.0	46.0	
Total Split (s)	13.0	85.0	0.0	17.0	89.0	0.0	48.0	48.0	48.0	48.0	48.0	0.0
Total Split (%)	8.7%	56.7%	0.0%	11.3%	59.3%	0.0%	32.0%	32.0%	32.0%	32.0%	32.0%	0.0%
Maximum Green (s)	7.1	78.8		11.1	82.8		41.8	41.8	41.8	41.7	41.7	
Yellow Time (s)	3.0	4.9		3.0	4.9		3.7	3.7	3.7	3.2	3.2	
All-Red Time (s)	2.9	1.3		2.9	1.3		2.5	2.5	2.5	3.1	3.1	
Lost Time Adjust (s)	-0.9	-1.2	0.0	-0.9	-1.2	0.0	0.0	-1.2	-1.2	0.0	-1.3	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	6.2	5.0	5.0	6.3	5.0	4.0
Lead/Lag	Lead	Lead		Lag	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		Min	Min	Min	Min	Min	Min
Walk Time (s)		7.0			7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		18.0			16.0		34.0	34.0	34.0	32.0	32.0	
Pedestrian Calls (#/hr)		0			0		0	0	0	0	0	0
Act Effct Green (s)	94.1	94.1		103.3	103.3			28.9	28.9		28.9	
Actuated g/C Ratio	0.63	0.63		0.69	0.69			0.19	0.19		0.19	
v/c Ratio	0.17	0.69		0.58	0.77			0.09	0.77		0.32	
Control Delay	14.9	12.8		56.4	19.9			47.3	74.0		53.3	

Lanes, Volumes, Timings  
 23: NC 54 (Raleigh Road) & Burning Tree Drive

2/28/2014

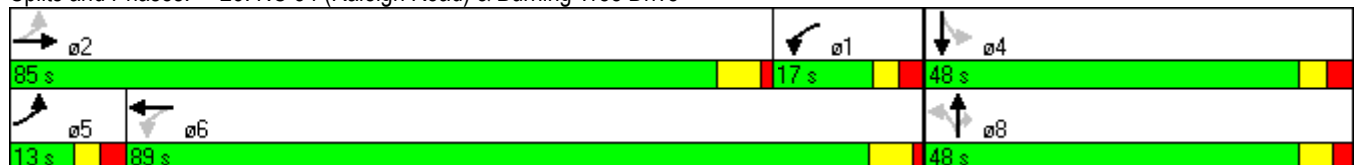


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0			0.0
Total Delay	14.9	12.8		56.4	19.9			47.3	74.0			53.3
LOS	B	B		E	B			D	E			D
Approach Delay		12.8			21.4			71.3				53.3
Approach LOS		B			C			E				D
Queue Length 50th (ft)	6	210		54	657			21	216			77
Queue Length 95th (ft)	m10	302		129	864			41	258			104
Internal Link Dist (ft)		946			801			557				377
Turn Bay Length (ft)	250			275					450			
Base Capacity (vph)	145	3178		194	3429			411	443			426
Starvation Cap Reductn	0	0		0	0			0	0			0
Spillback Cap Reductn	0	0		0	0			0	0			0
Storage Cap Reductn	0	0		0	0			0	0			0
Reduced v/c Ratio	0.17	0.69		0.58	0.77			0.06	0.52			0.21

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 8 (5%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 135  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.77  
 Intersection Signal Delay: 20.8  
 Intersection LOS: C  
 Intersection Capacity Utilization 81.0%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 23: NC 54 (Raleigh Road) & Burning Tree Drive



Lanes, Volumes, Timings  
 24: NC 54 (Raleigh Road) & Hamilton Road

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↖↖		↖	↖↖↖		↖	↖	↖	↖	↖	↖
Volume (vph)	35	1938	196	65	2360	23	191	34	104	43	28	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	275		0	250		0	150		150	50		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00		0.98		0.98	0.99	0.98	
Frt		0.986			0.999				0.850		0.917	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	4946	0	1736	4980	0	1736	1827	1553	1719	1632	0
Flt Permitted	0.050			0.050			0.709			0.723		
Satd. Flow (perm)	92	4946	0	91	4980	0	1274	1827	1522	1299	1632	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			25				25
Link Distance (ft)		359			576			537				463
Travel Time (s)		5.4			8.7			14.6				12.6
Confl. Peds. (#/hr)	9		6	6		9	13		6	6		13
Peak Hour Factor	0.88	0.88	0.88	0.89	0.89	0.89	0.65	0.65	0.65	0.86	0.86	0.86
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	4%	4%	4%	5%	5%	5%
Adj. Flow (vph)	40	2202	223	73	2652	26	294	52	160	50	33	41
Shared Lane Traffic (%)												
Lane Group Flow (vph)	40	2425	0	73	2678	0	294	52	160	50	74	0
Turn Type	pm+pt			pm+pt			Perm		Perm	Perm		
Protected Phases	5	2		1	6			8				4
Permitted Phases	2			6			8		8	4		
Detector Phase	5	2		1	6		8	8	8	4		4
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	7.0	7.0	7.0		7.0
Minimum Split (s)	13.0	25.0		13.0	26.0		41.0	41.0	41.0	39.0		39.0
Total Split (s)	13.0	90.0	0.0	13.0	90.0	0.0	47.0	47.0	47.0	47.0		47.0
Total Split (%)	8.7%	60.0%	0.0%	8.7%	60.0%	0.0%	31.3%	31.3%	31.3%	31.3%		31.3%
Maximum Green (s)	7.4	84.4		7.6	84.1		40.6	40.6	40.6	40.5		40.5
Yellow Time (s)	3.0	3.8		3.0	4.1		3.1	3.1	3.1	3.2		3.2
All-Red Time (s)	2.6	1.8		2.4	1.8		3.3	3.3	3.3	3.3		3.3
Lost Time Adjust (s)	-0.6	-0.6	0.0	-0.4	-0.9	0.0	-1.4	-1.4	-1.4	-1.5		-1.5
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0		5.0
Lead/Lag	Lead	Lead		Lag	Lag							
Lead-Lag Optimize?	Yes				Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0		3.0
Recall Mode	None	C-Max		None	C-Max		Min	Min	Min	Min		Min
Walk Time (s)		7.0			7.0		7.0	7.0	7.0	7.0		7.0
Flash Dont Walk (s)		12.0			13.0		27.0	27.0	27.0	25.0		25.0
Pedestrian Calls (#/hr)		0			0		0	0	0	0		0
Act Effct Green (s)	88.3	88.3		91.1	91.1		38.7	38.7	38.7	38.7		38.7
Actuated g/C Ratio	0.59	0.59		0.61	0.61		0.26	0.26	0.26	0.26		0.26
v/c Ratio	0.29	0.83		0.51	0.89		0.89	0.11	0.41	0.15		0.18
Control Delay	19.4	28.8		41.0	19.0		82.2	41.6	48.8	42.7		43.1

Lanes, Volumes, Timings  
 24: NC 54 (Raleigh Road) & Hamilton Road

2/28/2014

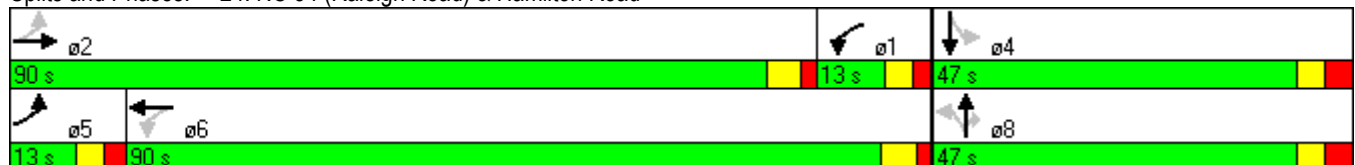


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.4	28.8		41.0	19.0		82.2	41.6	48.8	42.7	43.1	
LOS	B	C		D	B		F	D	D	D	D	
Approach Delay		28.7			19.6			67.5				42.9
Approach LOS		C			B			E				D
Queue Length 50th (ft)	17	714		21	233		271	38	127	37	55	
Queue Length 95th (ft)	34	748		m40	387		255	53	136	70	94	
Internal Link Dist (ft)		279			496			457				383
Turn Bay Length (ft)	275			250			150		150	50		
Base Capacity (vph)	143	2913		143	3024		357	512	426	364	457	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.83		0.51	0.89		0.82	0.10	0.38	0.14	0.16	

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 120  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.89  
 Intersection Signal Delay: 28.1  
 Intersection LOS: C  
 Intersection Capacity Utilization 81.6%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 24: NC 54 (Raleigh Road) & Hamilton Road



Lanes, Volumes, Timings  
25: Culbreth Road & Smith Level Road

2/28/2014



Lane Group	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Volume (vph)	214	279	574	121	175	369
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	1%		-2%			3%
Storage Length (ft)	125	0		0	225	
Storage Lanes	1	1		0	1	
Taper Length (ft)	25	25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			1.00			
Frt		0.850	0.976			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1710	1530	1829	0	1662	1749
Flt Permitted	0.950				0.163	
Satd. Flow (perm)	1710	1530	1829	0	285	1749
Right Turn on Red		No		No		
Satd. Flow (RTOR)						
Link Speed (mph)	35		35			35
Link Distance (ft)	1150		863			828
Travel Time (s)	22.4		16.8			16.1
Confl. Peds. (#/hr)				1	1	
Peak Hour Factor	0.73	0.73	0.92	0.92	0.85	0.85
Heavy Vehicles (%)	5%	5%	2%	2%	7%	7%
Adj. Flow (vph)	293	382	624	132	206	434
Shared Lane Traffic (%)						
Lane Group Flow (vph)	293	382	756	0	206	434
Turn Type		pm+ov			pm+pt	
Protected Phases	8	1	2		1	6
Permitted Phases		8			6	
Detector Phase	8	1	2		1	6
Switch Phase						
Minimum Initial (s)	7.0	7.0	10.0		7.0	10.0
Minimum Split (s)	25.0	13.0	29.0		13.0	17.0
Total Split (s)	25.0	13.0	52.0	0.0	13.0	65.0
Total Split (%)	27.8%	14.4%	57.8%	0.0%	14.4%	72.2%
Maximum Green (s)	18.7	7.4	45.8		7.4	58.8
Yellow Time (s)	3.0	3.0	4.1		3.0	4.1
All-Red Time (s)	3.3	2.6	2.1		2.6	2.1
Lost Time Adjust (s)	-1.3	-0.6	-1.1	0.0	-0.6	-1.1
Total Lost Time (s)	5.0	5.0	5.1	4.0	5.0	5.1
Lead/Lag		Lead	Lag		Lead	
Lead-Lag Optimize?						
Vehicle Extension (s)	2.0	2.0	3.0		2.0	3.0
Recall Mode	None	None	C-Max		None	C-Max
Walk Time (s)	7.0		7.0			
Flash Dont Walk (s)	11.0		15.0			
Pedestrian Calls (#/hr)	0		0			
Act Effct Green (s)	18.6	31.6	48.3		61.4	61.3
Actuated g/C Ratio	0.21	0.35	0.54		0.68	0.68
v/c Ratio	0.83	0.71	0.77		0.65	0.36

Lanes, Volumes, Timings  
 25: Culbreth Road & Smith Level Road

2/28/2014



Lane Group	WBL	WBR	NET	NER	SWL	SWT
Control Delay	54.6	33.4	23.7		17.0	7.4
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	54.6	33.4	23.7		17.0	7.4
LOS	D	C	C		B	A
Approach Delay	42.6		23.7			10.5
Approach LOS	D		C			B
Queue Length 50th (ft)	157	180	332		39	97
Queue Length 95th (ft)	191	210	497		69	136
Internal Link Dist (ft)	1070		783			748
Turn Bay Length (ft)	125				225	
Base Capacity (vph)	380	539	981		318	1191
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.77	0.71	0.77		0.65	0.36

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	90
Offset:	0 (0%), Referenced to phase 2:NET and 6:SWTL, Start of Green
Natural Cycle:	80
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.83
Intersection Signal Delay:	25.8
Intersection LOS:	C
Intersection Capacity Utilization:	71.7%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 25: Culbreth Road & Smith Level Road





Lanes, Volumes, Timings  
 1: Franklin Street & NC 86 (S. Columbia St)

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	154	347	97	91	430	121	131	386	130	117	355	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	9	12	13	10	10	13	9	10	10	9	9	11
Storage Length (ft)	225		0	100		0	400		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.83	0.94		0.86	0.92		0.89	0.91		0.88	0.90	
Fr <sub>t</sub>		0.967			0.967			0.962			0.956	
Fl <sub>t</sub> Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1392	2799	0	1472	2609	0	1366	2483	0	1366	2343	0
Fl <sub>t</sub> Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1158	2799	0	1261	2609	0	1211	2483	0	1206	2343	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		20			20			25			25	
Link Distance (ft)		806			940			972			822	
Travel Time (s)		27.5			32.0			26.5			22.4	
Confl. Peds. (#/hr)	386		163	163		386	141		305	141		305
Peak Hour Factor	0.88	0.88	0.88	0.95	0.95	0.95	0.95	0.95	0.95	0.88	0.88	0.88
Heavy Vehicles (%)	5%	5%	5%	3%	3%	3%	7%	7%	7%	7%	7%	7%
Adj. Flow (vph)	175	394	110	96	453	127	138	406	137	133	403	166
Shared Lane Traffic (%)												
Lane Group Flow (vph)	175	504	0	96	580	0	138	543	0	133	569	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases												
Detector Phase	1	6		5	2		3	8		7	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	15.0	32.0		15.0	32.0		15.0	32.0		15.0	32.0	
Total Split (s)	26.0	44.0	0.0	20.0	38.0	0.0	21.0	44.0	0.0	22.0	45.0	0.0
Total Split (%)	20.0%	33.8%	0.0%	15.4%	29.2%	0.0%	16.2%	33.8%	0.0%	16.9%	34.6%	0.0%
Maximum Green (s)	20.1	37.8		14.6	31.8		15.1	38.1		16.1	39.3	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.3		3.0	3.1	
All-Red Time (s)	2.9	3.2		2.4	3.2		2.9	2.6		2.9	2.6	
Lost Time Adjust (s)	-0.9	-1.2	-2.0	-0.4	-1.2	0.0	-0.9	-0.9	-1.5	-0.9	-0.7	-1.5
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	4.0	5.0	5.0	2.5	5.0	5.0	2.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	3.0		1.0	3.0		1.0	2.0		1.0	2.0	
Recall Mode	None	Min		None	Min		None	C-Max		None	C-Max	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		15.0			15.0			15.0			15.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	18.9	39.0		11.8	32.0		15.1	43.9		15.2	44.0	
Actuated g/C Ratio	0.15	0.30		0.09	0.25		0.12	0.34		0.12	0.34	
v/c Ratio	0.87	0.60		0.72	0.90		0.87	0.65		0.83	0.72	

Lanes, Volumes, Timings  
 1: Franklin Street & NC 86 (S. Columbia St)

2/28/2014

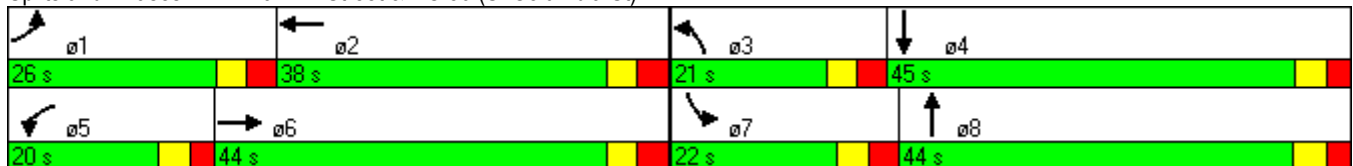


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	90.0	42.2		84.9	66.0		117.4	20.2		93.4	45.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	90.0	42.2		84.9	66.0		117.4	20.2		93.4	45.0	
LOS	F	D		F	E		F	C		F	D	
Approach Delay		54.5			68.7			39.9			54.1	
Approach LOS		D			E			D			D	
Queue Length 50th (ft)	143	184		80	248		99	216		110	230	
Queue Length 95th (ft)	#250	244		139	#348		m#213	m177		#203	295	
Internal Link Dist (ft)		726			860			892			742	
Turn Bay Length (ft)	225			100			400			100		
Base Capacity (vph)	225	861		170	662		168	839		179	793	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.78	0.59		0.56	0.88		0.82	0.65		0.74	0.72	

Intersection Summary

Area Type: CBD  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 20 (15%), Referenced to phase 4:SBT and 8:NBT, Start of Green  
 Natural Cycle: 95  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.90  
 Intersection Signal Delay: 54.3 Intersection LOS: D  
 Intersection Capacity Utilization 72.4% ICU Level of Service C  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Franklin Street & NC 86 (S. Columbia St)



Lanes, Volumes, Timings  
2: Cameron Avenue & NC 86 (S. Columbia St)

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	19	68	0	0	105	55	160	559	52	99	0	534
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	12	12	12	10	10	10	11	11	12
Storage Length (ft)	110		0	0		0	0		0	150		0
Storage Lanes	1		0	0		0	1		0	1		2
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.88
Ped Bike Factor	0.84				0.91		0.88	0.96		0.80		0.79
Fr <sub>t</sub>					0.953			0.987				0.850
Fl <sub>t</sub> Protected	0.950						0.950			0.950		
Satd. Flow (prot)	1510	1644	0	0	1396	0	1417	2674	0	1468	0	2391
Fl <sub>t</sub> Permitted	0.376						0.950			0.950		
Satd. Flow (perm)	503	1644	0	0	1396	0	1251	2674	0	1174	0	1886
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25				25
Link Distance (ft)		412			1056			839				972
Travel Time (s)		10.7			57.6			22.9				26.5
Confl. Peds. (#/hr)	146		190	190		146	102		281	281		102
Peak Hour Factor	0.82	0.82	1.00	1.00	0.80	0.80	0.91	0.91	0.91	0.86	1.00	0.86
Heavy Vehicles (%)	4%	4%	4%	6%	6%	6%	7%	7%	7%	7%	7%	7%
Adj. Flow (vph)	23	83	0	0	131	69	176	614	57	115	0	621
Shared Lane Traffic (%)												
Lane Group Flow (vph)	23	83	0	0	200	0	176	671	0	115	0	621
Turn Type	Perm						Split			custom		custom
Protected Phases		4			8		2	2		1		1
Permitted Phases	4									1		1
Detector Phase	4	4			8		2	2		1		1
Switch Phase												
Minimum Initial (s)	10.0	10.0			10.0		7.0	7.0		7.0		7.0
Minimum Split (s)	17.0	17.0			17.0		21.0	21.0		15.0		15.0
Total Split (s)	27.0	27.0	0.0	0.0	27.0	0.0	39.0	39.0	0.0	39.0	0.0	39.0
Total Split (%)	20.8%	20.8%	0.0%	0.0%	20.8%	0.0%	30.0%	30.0%	0.0%	30.0%	0.0%	30.0%
Maximum Green (s)	20.8	20.8			20.8		32.8	32.8		33.4		33.4
Yellow Time (s)	3.2	3.2			3.2		3.1	3.1		3.0		3.0
All-Red Time (s)	3.0	3.0			3.0		3.1	3.1		2.6		2.6
Lost Time Adjust (s)	-1.2	-1.2	0.0	0.0	-1.2	0.0	-1.2	-1.2	0.0	-0.6	0.0	-0.6
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	4.0	5.0	5.0	4.0	5.0	4.0	5.0
Lead/Lag							Lag	Lag		Lead		Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0			3.0		1.0	1.0		1.0		1.0
Recall Mode	Min	Min			None		C-Max	C-Max		None		None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	21.2	21.2			21.2		53.3	53.3		40.4		40.4
Actuated g/C Ratio	0.16	0.16			0.16		0.41	0.41		0.31		0.31
v/c Ratio	0.28	0.31			0.88		0.30	0.61		0.25		0.83

Lanes, Volumes, Timings  
 2: Cameron Avenue & NC 86 (S. Columbia St)

2/28/2014

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	25.0
Total Split (s)	25.0
Total Split (%)	19%
Maximum Green (s)	22.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	5.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	

Lanes, Volumes, Timings  
 2: Cameron Avenue & NC 86 (S. Columbia St)

2/28/2014

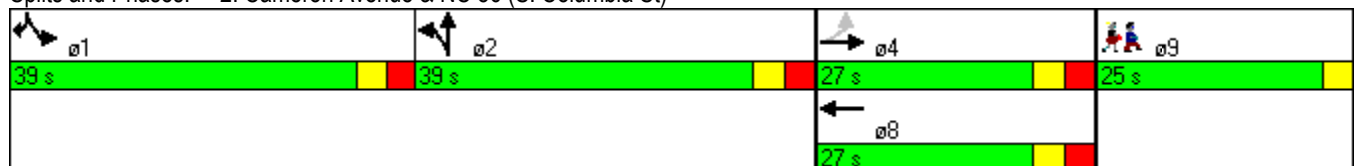


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	23.2	19.4			88.1		17.0	19.2		22.8		39.7
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0		1.8
Total Delay	23.2	19.4			88.1		17.0	19.2		22.8		41.5
LOS	C	B			F		B	B		C		D
Approach Delay		20.2			88.1			18.7				
Approach LOS		C			F			B				
Queue Length 50th (ft)	20	71			165		53	107		61		269
Queue Length 95th (ft)	m21	m79			#245		96	167		m84		317
Internal Link Dist (ft)		332			976			759				892
Turn Bay Length (ft)	110									150		
Base Capacity (vph)	85	278			236		581	1097		457		744
Starvation Cap Reductn	0	0			0		0	0		0		0
Spillback Cap Reductn	0	0			0		0	0		0		41
Storage Cap Reductn	0	0			0		0	0		0		0
Reduced v/c Ratio	0.27	0.30			0.85		0.30	0.61		0.25		0.88

Intersection Summary

Area Type: CBD  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 128 (98%), Referenced to phase 2:NBTL, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.88  
 Intersection Signal Delay: 33.9 Intersection LOS: C  
 Intersection Capacity Utilization 62.5% ICU Level of Service B  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Cameron Avenue & NC 86 (S. Columbia St)



Lane Group	ø9
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lanes, Volumes, Timings  
3: Cameron Avenue & Pittsboro Street

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↗		↖↗	↖			↑	↗	↖	↓	↖
Volume (vph)	0	96	175	626	244	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	12	12	12	12	12	12	12	12
Storage Length (ft)	0		0	0		90	0		0	0		0
Storage Lanes	0		0	2		1	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.78		0.64								
Frt		0.913										
Flt Protected				0.950								
Satd. Flow (prot)	0	1187	0	2874	1613	0	0	0	0	0	0	0
Flt Permitted				0.950								
Satd. Flow (perm)	0	1187	0	1843	1613	0	0	0	0	0	0	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25				25
Link Distance (ft)		258			412			549				191
Travel Time (s)		30.0			10.7			15.0				5.2
Confl. Peds. (#/hr)	182		127	127		182	46		3	3		46
Peak Hour Factor	1.00	0.88	0.88	0.73	0.73	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	0	109	199	858	334	0	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	308	0	858	334	0	0	0	0	0	0	0
Turn Type				Prot								
Protected Phases		2		1	6							
Permitted Phases												
Detector Phase		2		1	6							
Switch Phase												
Minimum Initial (s)		10.0		7.0	10.0							
Minimum Split (s)		20.2		20.0	20.0							
Total Split (s)	0.0	55.0	0.0	53.0	108.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Split (%)	0.0%	42.3%	0.0%	40.8%	83.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)		49.8		47.9	103.0							
Yellow Time (s)		3.1		3.0	3.3							
All-Red Time (s)		2.1		2.1	1.7							
Lost Time Adjust (s)	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.1	3.9	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0							
Recall Mode		None		C-Max	None							
Walk Time (s)		7.0										
Flash Dont Walk (s)		4.0										
Pedestrian Calls (#/hr)		0										
Act Effct Green (s)		39.2		60.7	105.0							
Actuated g/C Ratio		0.30		0.47	0.81							
v/c Ratio		0.86		0.64	0.26							

Lanes, Volumes, Timings  
 3: Cameron Avenue & Pittsboro Street

2/28/2014

Lane Group	ø4
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	4
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	17%
Maximum Green (s)	18.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	9.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	



Lanes, Volumes, Timings  
 3: Cameron Avenue & Pittsboro Street

2/28/2014

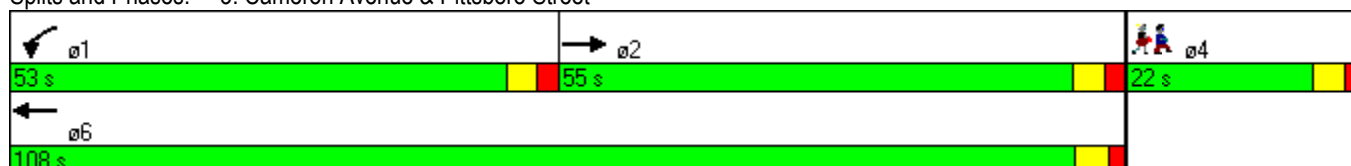


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		64.5		17.7	1.8							
Queue Delay		0.0		0.8	0.8							
Total Delay		64.5		18.5	2.7							
LOS		E		B	A							
Approach Delay		64.5			14.1							
Approach LOS		E			B							
Queue Length 50th (ft)		243		156	26							
Queue Length 95th (ft)		316		187	44							
Internal Link Dist (ft)		178			332			469			111	
Turn Bay Length (ft)												
Base Capacity (vph)		456		1341	1303							
Starvation Cap Reductn		0		213	678							
Spillback Cap Reductn		0		0	0							
Storage Cap Reductn		0		0	0							
Reduced v/c Ratio		0.68		0.76	0.53							

Intersection Summary

Area Type:	CBD
Cycle Length:	130
Actuated Cycle Length:	130
Offset:	71 (55%), Referenced to phase 1:WBL, Start of Green
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.86
Intersection Signal Delay:	24.4
Intersection LOS:	C
Intersection Capacity Utilization:	50.1%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 3: Cameron Avenue & Pittsboro Street



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Lane Group	ø4
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

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Lanes, Volumes, Timings  
4: McCauley Street & Pittsboro Street

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↗		↖	↖			↖			↖	↖
Volume (vph)	0	83	19	131	93	0	0	0	0	104	483	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	200		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor		0.94		0.74							0.94	
Frt		0.975									0.994	
Flt Protected				0.950							0.992	
Satd. Flow (prot)	0	1359	0	1504	1583	0	0	0	0	0	3003	0
Flt Permitted				0.631							0.992	
Satd. Flow (perm)	0	1359	0	744	1583	0	0	0	0	0	2849	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25		25				25			25	
Link Distance (ft)		493		508				1166			270	
Travel Time (s)		13.4		13.9				31.8			7.4	
Confl. Peds. (#/hr)	38		104	104		38	37		69	69		37
Peak Hour Factor	1.00	0.84	0.84	0.89	0.89	1.00	1.00	1.00	1.00	0.94	0.94	0.94
Heavy Vehicles (%)	4%	4%	4%	8%	8%	8%	2%	2%	2%	6%	6%	6%
Parking (#/hr)		0	0									
Adj. Flow (vph)	0	99	23	147	104	0	0	0	0	111	514	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	122	0	147	104	0	0	0	0	0	649	0
Turn Type				Perm							Perm	
Protected Phases		4			8							6
Permitted Phases				8							6	
Detector Phase		4		8	8						6	6
Switch Phase												
Minimum Initial (s)		7.0		7.0	7.0					10.0	10.0	
Minimum Split (s)		20.0		20.6	20.6					23.3	23.3	
Total Split (s)	0.0	66.0	0.0	66.0	66.0	0.0	0.0	0.0	0.0	64.0	64.0	0.0
Total Split (%)	0.0%	50.8%	0.0%	50.8%	50.8%	0.0%	0.0%	0.0%	0.0%	49.2%	49.2%	0.0%
Maximum Green (s)		61.2		60.4	60.4					58.7	58.7	
Yellow Time (s)		3.3		3.0	3.0					3.3	3.3	
All-Red Time (s)		1.5		2.6	2.6					2.0	2.0	
Lost Time Adjust (s)	0.0	0.2	-0.3	-0.6	-0.6	0.0	0.0	0.0	0.0	-1.1	-0.3	0.0
Total Lost Time (s)	4.0	5.0	3.7	5.0	5.0	4.0	4.0	4.0	4.0	4.2	5.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0					3.0	3.0	
Recall Mode		None		None	None					C-Max	C-Max	
Walk Time (s)		7.0		7.0	7.0					7.0	7.0	
Flash Dont Walk (s)		6.0		7.0	7.0					8.0	8.0	
Pedestrian Calls (#/hr)		0		0	0					0	0	
Act Effct Green (s)		31.0		31.0	31.0						89.0	
Actuated g/C Ratio		0.24		0.24	0.24						0.68	
v/c Ratio		0.38		0.83	0.28						0.33	

Lanes, Volumes, Timings  
 4: McCauley Street & Pittsboro Street

2/28/2014

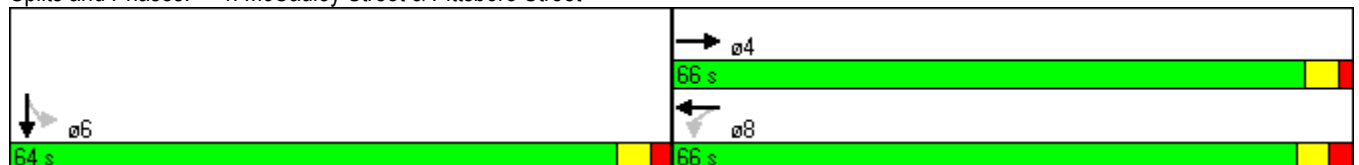


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		42.1		52.5	19.6							3.8
Queue Delay		0.0		0.0	0.0							0.0
Total Delay		42.1		52.5	19.6							3.8
LOS		D		D	B							A
Approach Delay		42.1			38.9							3.8
Approach LOS		D			D							A
Queue Length 50th (ft)		87		47	33							25
Queue Length 95th (ft)		115		71	51							142
Internal Link Dist (ft)		413			428			1086				190
Turn Bay Length (ft)				200								
Base Capacity (vph)		638		349	743							1950
Starvation Cap Reductn		0		0	0							0
Spillback Cap Reductn		0		0	0							0
Storage Cap Reductn		0		0	0							0
Reduced v/c Ratio		0.19		0.42	0.14							0.33

Intersection Summary

Area Type: CBD  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 118 (91%), Referenced to phase 6:SBTL, Start of Green  
 Natural Cycle: 45  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.83  
 Intersection Signal Delay: 17.0  
 Intersection Capacity Utilization 50.4%  
 Analysis Period (min) 15  
 Intersection LOS: B  
 ICU Level of Service A

Splits and Phases: 4: McCauley Street & Pittsboro Street



Lanes, Volumes, Timings  
5: South Road & NC 86 (S. Columbia St)

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	79	125	0	0	167	125	75	579	132	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	12	12	13	13	12	11	11	11	11	11
Storage Length (ft)	150		0	0		300	0		0	0		0
Storage Lanes	1		0	0		1	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	0.91	0.91	1.00	1.00	1.00	1.00
Ped Bike Factor	0.85				0.99	0.79		0.95	0.86			
Fr <sub>t</sub>					0.990	0.850			0.850			
Fl <sub>t</sub> Protected	0.950							0.994				
Satd. Flow (prot)	1593	1788	0	0	1531	1334	0	4153	1301	0	0	0
Fl <sub>t</sub> Permitted	0.950							0.994				
Satd. Flow (perm)	1348	1788	0	0	1531	1051	0	3941	1113	0	0	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25				25
Link Distance (ft)		508			646			532				839
Travel Time (s)		13.9			17.6			14.5				22.9
Confl. Peds. (#/hr)	89		487	487		89	144		254	254		144
Peak Hour Factor	0.74	0.74	1.00	1.00	0.87	0.87	0.73	0.73	0.73	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	7%	7%	7%	8%	8%	8%	2%	2%	2%
Adj. Flow (vph)	107	169	0	0	192	144	103	793	181	0	0	0
Shared Lane Traffic (%)						10%						
Lane Group Flow (vph)	107	169	0	0	206	130	0	896	181	0	0	0
Turn Type	Split					Perm	Perm		Free			
Protected Phases	4	4			3			2				
Permitted Phases						3	2		Free			
Detector Phase	4	4			3	3	2	2				
Switch Phase												
Minimum Initial (s)	7.0	7.0			7.0	7.0	10.0	10.0				
Minimum Split (s)	24.0	24.0			24.0	24.0	27.0	27.0				
Total Split (s)	33.0	33.0	0.0	0.0	43.0	43.0	54.0	54.0	0.0	0.0	0.0	0.0
Total Split (%)	25.4%	25.4%	0.0%	0.0%	33.1%	33.1%	41.5%	41.5%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)	27.4	27.4			37.5	37.5	48.1	48.1				
Yellow Time (s)	3.5	3.5			3.1	3.1	3.4	3.4				
All-Red Time (s)	2.1	2.1			2.4	2.4	2.5	2.5				
Lost Time Adjust (s)	-0.6	-0.6	0.0	0.0	-0.5	-0.5	-1.5	-0.9	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	5.0	4.4	5.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag			Lead	Lead						
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0			2.0	2.0	2.0	2.0				
Recall Mode	Min	Min			Min	Min	C-Max	C-Max				
Walk Time (s)	7.0	7.0			7.0	7.0	7.0	7.0				
Flash Dont Walk (s)	10.0	10.0			10.0	10.0	14.0	14.0				
Pedestrian Calls (#/hr)	0	0			0	0	0	0				
Act Effct Green (s)	17.3	17.3			22.5	22.5		75.2	130.0			
Actuated g/C Ratio	0.13	0.13			0.17	0.17		0.58	1.00			
v/c Ratio	0.50	0.71			0.78	0.71		0.39	0.16			

Lanes, Volumes, Timings  
 5: South Road & NC 86 (S. Columbia St)

2/28/2014

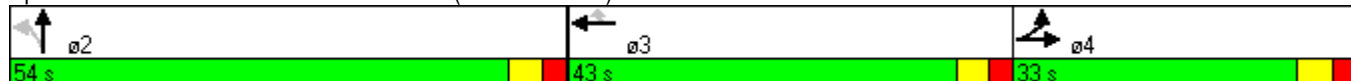


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	57.9	67.3			70.1	70.8		13.7	0.3			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	57.9	67.3			70.1	70.8		13.7	0.3			
LOS	E	E			E	E		B	A			
Approach Delay		63.6			70.3			11.5				
Approach LOS		E			E			B				
Queue Length 50th (ft)	90	144			176	110		149	0			
Queue Length 95th (ft)	120	175			241	167		167	0			
Internal Link Dist (ft)		428			566			452			759	
Turn Bay Length (ft)	150					300						
Base Capacity (vph)	343	385			448	307		2279	1113			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.31	0.44			0.46	0.42		0.39	0.16			

Intersection Summary




















Area Type:	CBD
Cycle Length:	130
Actuated Cycle Length:	130
Offset:	124 (95%), Referenced to phase 2:NBTL, Start of Green
Natural Cycle:	75
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.78
Intersection Signal Delay:	31.7
Intersection LOS:	C
Intersection Capacity Utilization	50.4%
ICU Level of Service	A
Analysis Period (min)	15

Splits and Phases: 5: South Road & NC 86 (S. Columbia St)



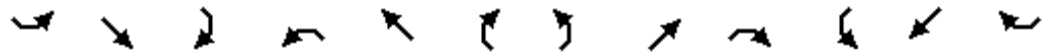
Lanes, Volumes, Timings  
6: Manning Drive & NC 86 NB (S. Columbia St)

2/28/2014

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	72	260	0	121	0	270	0	400	113	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			2%			2%			0%	
Storage Length (ft)	125		0	0		75	0		150	0		0
Storage Lanes	1		0	1		1	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	0.88	1.00	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99			0.93					0.94			
Fr <sub>t</sub>						0.850			0.850			
Fl <sub>t</sub> Protected	0.950			0.950								
Satd. Flow (prot)	1512	3023	0	1475	0	2323	0	3034	1358	0	0	0
Fl <sub>t</sub> Permitted	0.950			0.950								
Satd. Flow (perm)	1491	3023	0	1367	0	2323	0	3034	1274	0	0	0
Right Turn on Red	No		No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			35				35
Link Distance (ft)		241			637			222				480
Travel Time (s)		6.6			17.4			4.3				9.4
Confl. Peds. (#/hr)	7		33	33		7	2		30	30		2
Peak Hour Factor	0.96	0.96	1.00	0.82	1.00	0.82	1.00	0.89	0.89	1.00	1.00	1.00
Heavy Vehicles (%)	8%	8%	8%	9%	9%	9%	6%	6%	6%	2%	2%	2%
Adj. Flow (vph)	75	271	0	148	0	329	0	449	127	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	75	271	0	148	0	329	0	449	127	0	0	0
Turn Type	Split			Prot		custom			pm+ov			
Protected Phases	4	4		3		3		2	3			
Permitted Phases									2			
Detector Phase	4	4		3		3		2	3			
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0		7.0		10.0	7.0			
Minimum Split (s)	36.0	36.0		22.0		22.0		30.0	22.0			
Total Split (s)	42.0	42.0	0.0	45.0	0.0	45.0	0.0	43.0	45.0	0.0	0.0	0.0
Total Split (%)	32.3%	32.3%	0.0%	34.6%	0.0%	34.6%	0.0%	33.1%	34.6%	0.0%	0.0%	0.0%
Maximum Green (s)	36.3	36.3		39.4		39.4		37.2	39.4			
Yellow Time (s)	3.2	3.2		3.0		3.0		3.4	3.0			
All-Red Time (s)	2.5	2.5		2.6		2.6		2.4	2.6			
Lost Time Adjust (s)	-0.7	-0.7	-0.5	-0.6	-1.0	-0.6	0.0	-0.8	-0.6	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	3.5	5.0	3.0	5.0	4.0	5.0	5.0	4.0	4.0	4.0
Lead/Lag	Lead	Lead		Lag		Lag			Lag			
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		2.0		2.0		3.0	2.0			
Recall Mode	Min	Min		None		None		C-Max	None			
Walk Time (s)	4.0	4.0						4.0				
Flash Dont Walk (s)	16.0	16.0						19.0				
Pedestrian Calls (#/hr)	0	0						0				
Act Effct Green (s)	17.7	17.7		23.7		23.7		73.6	97.3			
Actuated g/C Ratio	0.14	0.14		0.18		0.18		0.57	0.75			
v/c Ratio	0.36	0.66		0.55		0.78		0.26	0.13			

Lanes, Volumes, Timings  
 6: Manning Drive & NC 86 NB (S. Columbia St)

2/28/2014

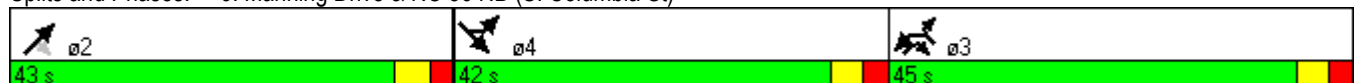


Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Control Delay	37.0	43.7		55.2		63.0		17.0	4.8			
Queue Delay	0.0	0.0		0.0		0.0		0.0	0.0			
Total Delay	37.0	43.7		55.2		63.0		17.0	4.8			
LOS	D	D		E		E		B	A			
Approach Delay		42.3						14.3				
Approach LOS		D						B				
Queue Length 50th (ft)	56	113		115		151		92	31			
Queue Length 95th (ft)	81	131		155		176		133	44			
Internal Link Dist (ft)		161			557			142			400	
Turn Bay Length (ft)	125					75			150			
Base Capacity (vph)	430	860		454		715		1717	1028			
Starvation Cap Reductn	0	0		0		0		0	0			
Spillback Cap Reductn	0	0		0		0		0	0			
Storage Cap Reductn	0	0		0		0		0	0			
Reduced v/c Ratio	0.17	0.32		0.33		0.46		0.26	0.12			

Intersection Summary

Area Type:	CBD
Cycle Length:	130
Actuated Cycle Length:	130
Offset:	105 (81%), Referenced to phase 2:NET, Start of Green
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.78
Intersection Signal Delay:	37.0
Intersection LOS:	D
Intersection Capacity Utilization:	52.9%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 6: Manning Drive & NC 86 NB (S. Columbia St)





Lanes, Volumes, Timings  
 7: Westwood Drive & NC 86 (S. Columbia St)

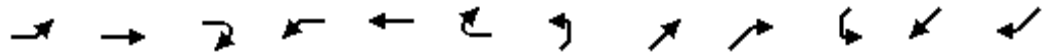
2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↔			↔	↔	↔	↑	↔	↔	↔	↔
Volume (vph)	1	3	3	186	12	151	1	359	162	88	375	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	11	12	12	14	11	11	11
Grade (%)		-3%			-5%			5%				-5%
Storage Length (ft)	0		0	0		150	250		250	0		0
Storage Lanes	0		0	0		1	1		1	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.97			0.98		0.99		0.97		1.00	
Frt		0.944				0.850			0.850		0.999	
Flt Protected		0.992			0.955		0.950			0.950		
Satd. Flow (prot)	0	1723	0	0	1665	1482	1645	1731	1570	1656	1741	0
Flt Permitted		0.992			0.955		0.511			0.397		
Satd. Flow (perm)	0	1723	0	0	1624	1482	873	1731	1530	692	1741	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			35			25	
Link Distance (ft)		274			592			630			946	
Travel Time (s)		7.5			16.1			12.3			25.8	
Confl. Peds. (#/hr)			12	12			9		2	2		9
Peak Hour Factor	0.63	0.63	0.63	0.74	0.74	0.74	0.86	0.86	0.86	0.87	0.87	0.87
Heavy Vehicles (%)	2%	2%	2%	8%	8%	8%	7%	7%	7%	8%	8%	8%
Adj. Flow (vph)	2	5	5	251	16	204	1	417	188	101	431	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	12	0	0	267	204	1	417	188	101	433	0
Turn Type	Split			Split		pm+ov	Perm		pm+ov	pm+pt		
Protected Phases	4	4		3	3	1		2	3	1	6	
Permitted Phases						3	2		2	6		
Detector Phase	4	4		3	3	1	2	2	3	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	10.0	10.0	7.0	7.0	10.0	
Minimum Split (s)	26.0	26.0		13.0	13.0	13.0	28.3	28.3	13.0	13.0	22.0	
Total Split (s)	26.0	26.0	0.0	38.0	38.0	16.0	50.0	50.0	38.0	16.0	66.0	0.0
Total Split (%)	20.0%	20.0%	0.0%	29.2%	29.2%	12.3%	38.5%	38.5%	29.2%	12.3%	50.8%	0.0%
Maximum Green (s)	19.8	19.8		32.1	32.1	10.7	44.7	44.7	32.1	10.7	60.7	
Yellow Time (s)	3.3	3.3		3.5	3.5	3.6	3.6	3.6	3.5	3.6	3.6	
All-Red Time (s)	2.9	2.9		2.4	2.4	1.7	1.7	1.7	2.4	1.7	1.7	
Lost Time Adjust (s)	0.0	-1.2	-1.3	0.0	-0.9	-0.3	-0.3	-0.3	-0.9	-0.3	-0.3	-0.9
Total Lost Time (s)	6.2	5.0	2.7	5.9	5.0	5.0	5.0	5.0	5.0	5.0	5.0	3.1
Lead/Lag	Lag	Lag		Lead	Lead	Lead	Lag	Lag	Lead	Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	3.0	3.0	2.0	2.0	3.0	
Recall Mode	None	None		None	None	None	C-Min	C-Min	None	None	C-Min	
Walk Time (s)	4.0	4.0					4.0	4.0				
Flash Dont Walk (s)	13.0	13.0					19.0	19.0				
Pedestrian Calls (#/hr)	0	0					0	0				
Act Effct Green (s)		8.2			26.5	38.0	74.7	74.7	101.2	88.2	88.2	
Actuated g/C Ratio		0.06			0.20	0.29	0.57	0.57	0.78	0.68	0.68	

Lanes, Volumes, Timings  
 7: Westwood Drive & NC 86 (S. Columbia St)

2/28/2014

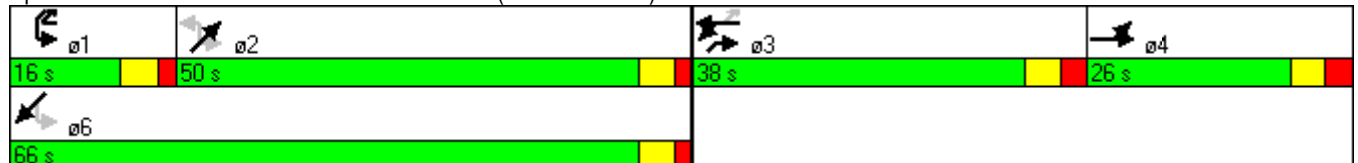


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
v/c Ratio		0.11			0.79	0.47	0.00	0.42	0.16	0.19	0.37	
Control Delay		59.9			64.9	34.3	20.0	20.5	3.8	8.2	9.9	
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		59.9			64.9	34.3	20.0	20.5	3.8	8.2	9.9	
LOS		E			E	C	B	C	A	A	A	
Approach Delay		59.9			51.6			15.3			9.5	
Approach LOS		E			D			B			A	
Queue Length 50th (ft)		10			216	141	0	162	17	17	84	
Queue Length 95th (ft)		21			226	118	4	350	64	49	337	
Internal Link Dist (ft)		194			512			550			866	
Turn Bay Length (ft)						150	250		250			
Base Capacity (vph)		278			430	463	502	995	1284	552	1182	
Starvation Cap Reductn		0			0	0	0	0	0	0	0	
Spillback Cap Reductn		0			0	0	0	0	0	0	0	
Storage Cap Reductn		0			0	0	0	0	0	0	0	
Reduced v/c Ratio		0.04			0.62	0.44	0.00	0.42	0.15	0.18	0.37	

Intersection Summary

Area Type:	Other
Cycle Length:	130
Actuated Cycle Length:	130
Offset:	106 (82%), Referenced to phase 2:NETL and 6:SWTL, Start of Green
Natural Cycle:	85
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.79
Intersection Signal Delay:	24.3
Intersection LOS:	C
Intersection Capacity Utilization	58.3%
ICU Level of Service	B
Analysis Period (min)	15

Splits and Phases: 7: Westwood Drive & NC 86 (S. Columbia St)



Lanes, Volumes, Timings  
 8: US 15-501 Bypass WB Off Ramp & US 15-501

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↶	↷	↶	↶	↶	↶		↶	↶
Volume (vph)	0	0	0	851	10	65	289	529	0	0	469	159
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	275		275	150		0	0		0
Storage Lanes	0		0	1		1	1		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	*0.57	1.00	1.00	0.95	1.00
Ped Bike Factor							1.00					0.98
Frt						0.850						0.850
Flt Protected				0.950	0.953		0.950					
Satd. Flow (prot)	0	0	0	1649	1654	1553	1671	2006	0	0	3374	1509
Flt Permitted				0.950	0.953		0.337					
Satd. Flow (perm)	0	0	0	1649	1654	1553	593	2006	0	0	3374	1476
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			35			35				35
Link Distance (ft)		424			893			596				306
Travel Time (s)		9.6			17.4			11.6				6.0
Confl. Peds. (#/hr)							1		2	2		1
Peak Hour Factor	1.00	1.00	1.00	0.97	0.97	0.97	0.84	0.84	1.00	1.00	0.91	0.91
Heavy Vehicles (%)	2%	2%	2%	4%	4%	4%	8%	8%	8%	7%	7%	7%
Adj. Flow (vph)	0	0	0	877	10	67	344	630	0	0	515	175
Shared Lane Traffic (%)				49%								
Lane Group Flow (vph)	0	0	0	447	440	67	344	630	0	0	515	175
Turn Type				Perm		Perm	pm+pt					Perm
Protected Phases					8		5	2				6
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2				6
Switch Phase												
Minimum Initial (s)				7.0	7.0	7.0	7.0	10.0			10.0	10.0
Minimum Split (s)				20.0	20.0	20.0	13.0	20.0			20.0	20.0
Total Split (s)	0.0	0.0	0.0	56.0	56.0	56.0	29.0	64.0	0.0	0.0	35.0	35.0
Total Split (%)	0.0%	0.0%	0.0%	46.7%	46.7%	46.7%	24.2%	53.3%	0.0%	0.0%	29.2%	29.2%
Maximum Green (s)				50.2	50.2	50.2	23.2	58.2			29.0	29.0
Yellow Time (s)				3.7	3.7	3.7	3.0	3.7			4.0	4.0
All-Red Time (s)				2.1	2.1	2.1	2.8	2.1			2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	-0.8	-0.8	-0.8	-0.8	-0.8	0.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0	3.0	5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Recall Mode				None	None	None	None	C-Max			C-Max	C-Max
Act Effct Green (s)				41.1	41.1	41.1	68.9	68.9			44.5	44.5
Actuated g/C Ratio				0.34	0.34	0.34	0.57	0.57			0.37	0.37
v/c Ratio				0.79	0.78	0.13	0.67	0.55			0.41	0.32
Control Delay				45.5	44.5	25.1	16.8	13.0			32.1	33.1
Queue Delay				0.4	0.4	0.0	0.0	0.0			0.0	0.0
Total Delay				45.9	44.9	25.1	16.8	13.0			32.1	33.1
LOS				D	D	C	B	B			C	C

Lanes, Volumes, Timings  
 8: US 15-501 Bypass WB Off Ramp & US 15-501

2/28/2014

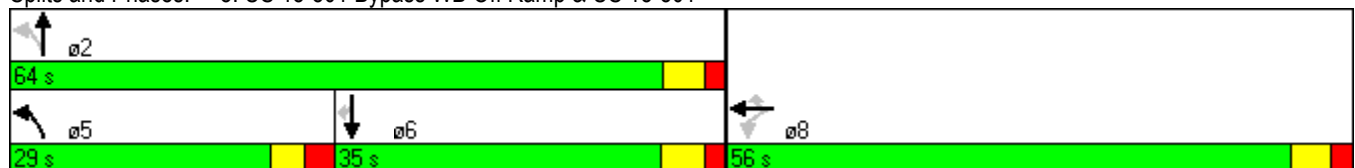


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay					44.0			14.4			32.4	
Approach LOS					D			B			C	
Queue Length 50th (ft)				324	316	35	119	241			156	97
Queue Length 95th (ft)				404	395	61	223	406			245	188
Internal Link Dist (ft)		344			813			516			226	
Turn Bay Length (ft)				275		275	150					
Base Capacity (vph)				701	703	660	556	1151			1252	548
Starvation Cap Reductn				0	0	0	0	0			0	0
Spillback Cap Reductn				48	48	0	0	0			0	0
Storage Cap Reductn				0	0	0	0	0			0	0
Reduced v/c Ratio				0.68	0.67	0.10	0.62	0.55			0.41	0.32

Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	94 (78%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle:	60
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.79
Intersection Signal Delay:	29.9
Intersection LOS:	C
Intersection Capacity Utilization:	65.7%
ICU Level of Service:	C
Analysis Period (min):	15
* User Entered Value	

Splits and Phases: 8: US 15-501 Bypass WB Off Ramp & US 15-501



# Lanes, Volumes, Timings

## 9: NC 54 Bypass (Fordham Blvd) EB Off Ramp & US 15-501

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↙	↗					↑↑		↘	↑↑	
Volume (vph)	133	0	227	0	0	0	0	681	0	77	1214	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		250	0		0	0		0	150		0
Storage Lanes	1		1	0		0	0		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Fr <sub>t</sub>			0.850									
Fl <sub>t</sub> Protected	0.950	0.950								0.950		
Satd. Flow (prot)	1603	1603	1509	0	0	0	0	3471	0	1752	3505	0
Fl <sub>t</sub> Permitted	0.950	0.950								0.319		
Satd. Flow (perm)	1603	1603	1509	0	0	0	0	3471	0	588	3505	0
Right Turn on Red			No				No			No		No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		847			142			156			596	
Travel Time (s)		19.3			3.2			3.0			11.6	
Peak Hour Factor	0.93	0.93	0.93	1.00	1.00	1.00	1.00	0.95	1.00	0.94	0.94	1.00
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	4%	4%	4%	3%	3%	3%
Adj. Flow (vph)	143	0	244	0	0	0	0	717	0	82	1291	0
Shared Lane Traffic (%)	50%											
Lane Group Flow (vph)	71	72	244	0	0	0	0	717	0	82	1291	0
Turn Type	Perm		Perm							pm+pt		
Protected Phases		4						2		1	6	
Permitted Phases	4		4							6		
Detector Phase	4	4	4					2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0					10.0		7.0	10.0	
Minimum Split (s)	14.0	14.0	14.0					15.0		13.0	16.0	
Total Split (s)	35.0	35.0	35.0	0.0	0.0	0.0	0.0	66.0	0.0	19.0	85.0	0.0
Total Split (%)	29.2%	29.2%	29.2%	0.0%	0.0%	0.0%	0.0%	55.0%	0.0%	15.8%	70.8%	0.0%
Maximum Green (s)	28.8	28.8	28.8					61.3		13.5	79.1	
Yellow Time (s)	3.1	3.1	3.1					3.7		3.1	4.3	
All-Red Time (s)	3.1	3.1	3.1					1.0		2.4	1.6	
Lost Time Adjust (s)	-1.2	-1.2	-1.2	0.0	0.0	0.0	0.0	0.3	0.0	-0.5	-0.9	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.0	4.0	4.0	4.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0					3.0		3.0	3.0	
Recall Mode	None	None	None					C-Max		None	C-Max	
Act Effct Green (s)	25.0	25.0	25.0					74.3		85.0	85.0	
Actuated g/C Ratio	0.21	0.21	0.21					0.62		0.71	0.71	
v/c Ratio	0.21	0.22	0.78					0.33		0.17	0.52	
Control Delay	39.2	39.2	61.3					5.0		7.7	11.7	
Queue Delay	0.0	0.0	0.0					0.0		0.0	1.3	
Total Delay	39.2	39.2	61.3					5.0		7.7	13.0	
LOS	D	D	E					A		A	B	
Approach Delay		53.1						5.0			12.7	
Approach LOS		D						A			B	

Lanes, Volumes, Timings

9: NC 54 Bypass (Fordham Blvd) EB Off Ramp & US 15-501

2/28/2014

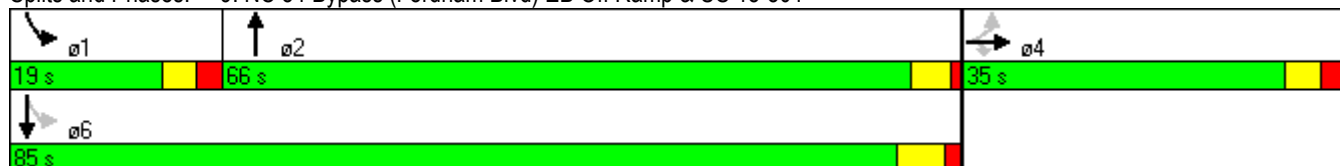


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)	48	48	179					51		16	142	
Queue Length 95th (ft)	88	89	263					72		m42	577	
Internal Link Dist (ft)		767			62			76			516	
Turn Bay Length (ft)	250		250							150		
Base Capacity (vph)	401	401	377					2149		552	2482	
Starvation Cap Reductn	0	0	0					0		0	914	
Spillback Cap Reductn	0	0	0					0		0	0	
Storage Cap Reductn	0	0	0					0		0	0	
Reduced v/c Ratio	0.18	0.18	0.65					0.33		0.15	0.82	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 37 (31%), Referenced to phase 2:NBT and 6:SBTL, Start of Green  
 Natural Cycle: 50  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.78  
 Intersection Signal Delay: 16.8  
 Intersection LOS: B  
 Intersection Capacity Utilization 65.7%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: NC 54 Bypass (Fordham Blvd) EB Off Ramp & US 15-501



Lanes, Volumes, Timings  
 10: SR 1994 (Culbreth Road) & US 15-501

2/28/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	71	33	48	12	25	280	34	1167	13	301	1190	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			-8%			-2%			2%	
Storage Length (ft)	0		75	425		350	125		75	550		250
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00											
Fr <sub>t</sub>			0.850			0.850			0.850			0.850
Fl <sub>t</sub> Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1710	1800	1530	1788	1882	1600	1736	3472	1553	1686	3372	1508
Fl <sub>t</sub> Permitted	0.525			0.732			0.147			0.092		
Satd. Flow (perm)	944	1800	1530	1378	1882	1600	269	3472	1553	163	3372	1508
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		526			543			533			635	
Travel Time (s)		10.2			10.6			8.1			9.6	
Confl. Peds. (#/hr)	1					1	1					1
Peak Hour Factor	0.88	0.88	0.88	0.91	0.91	0.91	0.94	0.94	0.94	0.93	0.93	0.93
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	5%	5%	5%	6%	6%	6%
Adj. Flow (vph)	81	38	55	13	27	308	36	1241	14	324	1280	110
Shared Lane Traffic (%)												
Lane Group Flow (vph)	81	38	55	13	27	308	36	1241	14	324	1280	110
Turn Type	pm+pt		Perm	Perm		pt+ov	Perm		Perm	pm+pt		pt+ov
Protected Phases	7	4			8	8 1		2		1	6	6 7
Permitted Phases	4		4	8			2		2	6		
Detector Phase	7	4	4	8	8	8 1	2	2	2	1	6	6 7
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		12.0	12.0	12.0	7.0	12.0	
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0		19.0	19.0	19.0	13.0	26.0	
Total Split (s)	14.0	37.0	37.0	23.0	23.0	55.0	51.0	51.0	51.0	32.0	83.0	97.0
Total Split (%)	11.7%	30.8%	30.8%	19.2%	19.2%	45.8%	42.5%	42.5%	42.5%	26.7%	69.2%	80.8%
Maximum Green (s)	7.6	30.6	30.6	16.1	16.1		44.8	44.8	44.8	26.9	76.8	
Yellow Time (s)	3.0	4.2	4.2	4.5	4.5		4.7	4.7	4.7	3.0	4.7	
All-Red Time (s)	3.4	2.2	2.2	2.4	2.4		1.5	1.5	1.5	2.1	1.5	
Lost Time Adjust (s)	-1.4	-1.4	-1.4	-1.9	-1.9	-1.9	-1.2	-1.2	-1.2	-0.1	-1.2	-1.4
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.8
Lead/Lag	Lead			Lag	Lag		Lead	Lead	Lead	Lag		
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None		C-Max	C-Max	C-Max	None	C-Max	
Walk Time (s)												7.0
Flash Dont Walk (s)												12.0
Pedestrian Calls (#/hr)												0
Act Effct Green (s)	26.1	26.1	26.1	12.2	12.2	39.2	51.9	51.9	51.9	83.9	83.9	98.0
Actuated g/C Ratio	0.22	0.22	0.22	0.10	0.10	0.33	0.43	0.43	0.43	0.70	0.70	0.82
v/c Ratio	0.31	0.10	0.17	0.09	0.14	0.59	0.31	0.83	0.02	0.71	0.54	0.09

Lanes, Volumes, Timings  
 10: SR 1994 (Culbreth Road) & US 15-501

2/28/2014

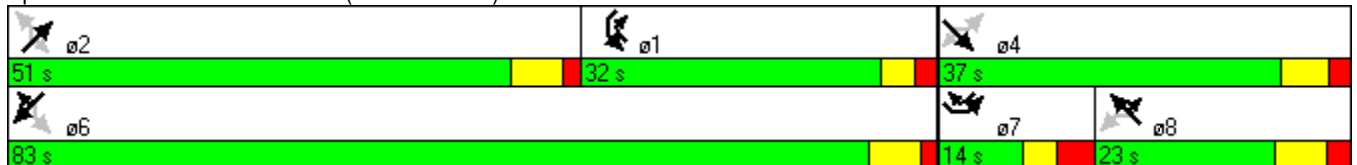


Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Control Delay	41.3	37.3	38.7	49.2	49.8	26.5	19.8	20.0	11.9	40.3	5.5	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.3	37.3	38.7	49.2	49.8	26.5	19.8	20.0	11.9	40.3	5.5	2.0
LOS	D	D	D	D	D	C	B	C	B	D	A	A
Approach Delay	39.6			29.2			19.9			11.9		
Approach LOS	D			C			B			B		
Queue Length 50th (ft)	52	24	35	9	19	149	8	196	3	202	150	12
Queue Length 95th (ft)	92	51	68	29	48	207	30	384	m9	302	108	m18
Internal Link Dist (ft)	446			463			453			555		
Turn Bay Length (ft)	75			425			350			250		
Base Capacity (vph)	262	480	408	207	282	600	117	1503	672	457	2359	1233
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.08	0.13	0.06	0.10	0.51	0.31	0.83	0.02	0.71	0.54	0.09

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 22 (18%), Referenced to phase 2:NETL and 6:SWTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.83  
 Intersection Signal Delay: 17.9  
 Intersection LOS: B  
 Intersection Capacity Utilization 72.0%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: SR 1994 (Culbreth Road) & US 15-501





Lanes, Volumes, Timings  
11: Arlen Park Drive & US 15-501

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	58	4	13	48	2	0	6	6	1167	44	7	1170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			-7%				-1%			0%
Storage Length (ft)	75		0	200		0		275		300	275	
Storage Lanes	1		0	1		0		1		1	1	
Taper Length (ft)	25		25	25		25		25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor	1.00							1.00				
Frt		0.888								0.850		
Flt Protected	0.950			0.950				0.950			0.950	
Satd. Flow (prot)	1694	1584	0	1746	1838	0	0	1728	3455	1546	1703	3406
Flt Permitted	0.757			0.744				0.950			0.950	
Satd. Flow (perm)	1348	1584	0	1367	1838	0	0	1726	3455	1546	1703	3406
Right Turn on Red			No			No				No		
Satd. Flow (RTOR)												
Link Speed (mph)		25			25				45			45
Link Distance (ft)		387			478				2738			1792
Travel Time (s)		10.6			13.0				41.5			27.2
Confl. Peds. (#/hr)	1						1	1	1			
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.95	0.95	0.95	0.95	0.92	0.92
Heavy Vehicles (%)	6%	6%	6%	7%	7%	7%	5%	5%	5%	5%	6%	6%
Adj. Flow (vph)	67	5	15	56	2	0	6	6	1228	46	8	1272
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	20	0	56	2	0	0	12	1228	46	8	1272
Turn Type	Perm			Perm			Prot	Prot		Perm	Prot	
Protected Phases		4			8		5	5	2			1
Permitted Phases	4			8						2		
Detector Phase	4	4		8	8		5	5	2	2	1	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0	14.0	14.0	7.0	14.0
Minimum Split (s)	60.0	60.0		15.0	15.0		14.0	14.0	21.0	21.0	13.0	25.0
Total Split (s)	60.0	60.0	0.0	60.0	60.0	0.0	14.0	14.0	47.0	47.0	13.0	46.0
Total Split (%)	50.0%	50.0%	0.0%	50.0%	50.0%	0.0%	11.7%	11.7%	39.2%	39.2%	10.8%	38.3%
Maximum Green (s)	53.4	53.4		52.9	52.9		7.4	7.4	40.4	40.4	7.1	39.4
Yellow Time (s)	3.2	3.2		3.8	3.8		3.0	3.0	4.6	4.6	3.0	4.6
All-Red Time (s)	3.4	3.4		3.3	3.3		3.6	3.6	2.0	2.0	2.9	2.0
Lost Time Adjust (s)	-1.6	-1.6	0.0	-2.1	-2.1	-1.2	0.0	-1.6	-1.6	-1.6	-0.9	-1.6
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	2.8	6.6	5.0	5.0	5.0	5.0	5.0
Lead/Lag							Lag	Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	None	C-Max	C-Max	None	C-Max
Walk Time (s)	4.0	4.0										7.0
Flash Dont Walk (s)	26.0	26.0										10.0
Pedestrian Calls (#/hr)	0	0										0
Act Effct Green (s)	13.2	13.2		13.3	13.3			8.8	97.9	97.9	8.0	95.0
Actuated g/C Ratio	0.11	0.11		0.11	0.11			0.07	0.82	0.82	0.07	0.79
v/c Ratio	0.45	0.11		0.37	0.01			0.10	0.44	0.04	0.07	0.47

Lanes, Volumes, Timings  
 11: Arlen Park Drive & US 15-501

2/28/2014

Lane Group	SBR
Lane Configurations	7
Volume (vph)	72
Ideal Flow (vphpl)	1900
Grade (%)	
Storage Length (ft)	325
Storage Lanes	1
Taper Length (ft)	25
Lane Util. Factor	1.00
Ped Bike Factor	0.98
Frt	0.850
Flt Protected	
Satd. Flow (prot)	1524
Flt Permitted	
Satd. Flow (perm)	1488
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	1
Peak Hour Factor	0.92
Heavy Vehicles (%)	6%
Adj. Flow (vph)	78
Shared Lane Traffic (%)	
Lane Group Flow (vph)	78
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Detector Phase	6
Switch Phase	
Minimum Initial (s)	14.0
Minimum Split (s)	25.0
Total Split (s)	46.0
Total Split (%)	38.3%
Maximum Green (s)	39.4
Yellow Time (s)	4.6
All-Red Time (s)	2.0
Lost Time Adjust (s)	-1.6
Total Lost Time (s)	5.0
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Recall Mode	C-Max
Walk Time (s)	7.0
Flash Dont Walk (s)	10.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	95.0
Actuated g/C Ratio	0.79
v/c Ratio	0.07

Lanes, Volumes, Timings  
 11: Arlen Park Drive & US 15-501

2/28/2014

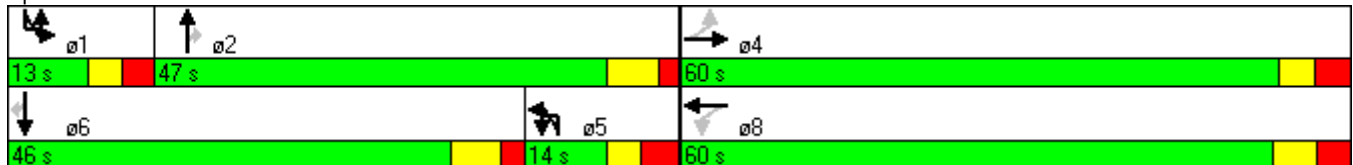


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Control Delay	58.8	47.6		55.3	44.5			31.3	1.2	1.2	61.4	5.7
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	0.0
Total Delay	58.8	47.6		55.3	44.5			31.3	1.2	1.2	61.4	5.7
LOS	E	D		E	D			C	A	A	E	A
Approach Delay		56.2			54.9				1.5			5.8
Approach LOS		E			D				A			A
Queue Length 50th (ft)	49	14		41	1			8	14	1	5	392
Queue Length 95th (ft)	88	36		76	9			m10	70	m4	m11	306
Internal Link Dist (ft)		307			398				2658			1712
Turn Bay Length (ft)	75			200				275		300	275	
Base Capacity (vph)	618	726		627	842			130	2819	1261	115	2695
Starvation Cap Reductn	0	0		0	0			0	0	0	0	0
Spillback Cap Reductn	0	0		0	0			0	0	0	0	0
Storage Cap Reductn	0	0		0	0			0	0	0	0	0
Reduced v/c Ratio	0.11	0.03		0.09	0.00			0.09	0.44	0.04	0.07	0.47

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 117 (98%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 120  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.47  
 Intersection Signal Delay: 6.4  
 Intersection LOS: A  
 Intersection Capacity Utilization 50.6%  
 ICU Level of Service A  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 11: Arlen Park Drive & US 15-501





Lane Group	SBR
Control Delay	1.9
Queue Delay	0.0
Total Delay	1.9
LOS	A
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	8
Queue Length 95th (ft)	20
Internal Link Dist (ft)	
Turn Bay Length (ft)	325
Base Capacity (vph)	1178
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.07
Intersection Summary	

Lanes, Volumes, Timings  
12: US 15-501 & Market St

2/28/2014

Lane Group	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	SEL	SET	SER	NWL
Lane Configurations												
Volume (vph)	22	39	927	39	28	145	875	190	165	4	48	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)			-3%				4%			-3%		
Storage Length (ft)		275		0		250		300	150		0	0
Storage Lanes		1		0		1		1	1		0	1
Taper Length (ft)		25		25		25		25	25		25	25
Lane Util. Factor	0.95	1.00	0.95	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor									0.99			
Fr <sub>t</sub>			0.994					0.850		0.858		
Fl <sub>t</sub> Protected		0.950				0.950			0.950			0.950
Satd. Flow (prot)	0	1796	3571	0	0	1732	3435	1537	1796	1622	0	1770
Fl <sub>t</sub> Permitted		0.950				0.950			0.950			0.709
Satd. Flow (perm)	0	1796	3571	0	0	1732	3435	1537	1787	1622	0	1321
Right Turn on Red				No				No			No	
Satd. Flow (RTOR)												
Link Speed (mph)			45				45			25		
Link Distance (ft)			942				2738			456		
Travel Time (s)			14.3				41.5			12.4		
Confl. Peds. (#/hr)									4			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.92	0.92	0.92	0.92	0.69	0.90	0.69	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	3%	2%	3%	3%	2%	2%	2%	2%
Adj. Flow (vph)	24	43	1030	43	30	158	951	207	239	4	70	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	67	1073	0	0	188	951	207	239	74	0	38
Turn Type	Prot	Prot			Prot	Prot		pm+ov	Prot			Perm
Protected Phases	5	5	2		1	1	6	7	7	4		
Permitted Phases								6				8
Detector Phase	5	5	2		1	1	6	7	7	4		8
Switch Phase												
Minimum Initial (s)	7.0	7.0	14.0		7.0	7.0	14.0	7.0	7.0	7.0		7.0
Minimum Split (s)	13.0	13.0	21.0		14.0	14.0	20.0	14.0	14.0	14.0		14.0
Total Split (s)	15.0	15.0	50.0	0.0	25.0	25.0	60.0	29.0	29.0	45.0	0.0	16.0
Total Split (%)	12.5%	12.5%	41.7%	0.0%	20.8%	20.8%	50.0%	24.2%	24.2%	37.5%	0.0%	13.3%
Maximum Green (s)	9.2	9.2	43.6		18.0	18.0	54.0	22.9	22.9	38.9		9.0
Yellow Time (s)	3.0	3.0	5.0		5.0	5.0	4.6	3.0	3.0	3.0		5.0
All-Red Time (s)	2.8	2.8	1.4		2.0	2.0	1.4	3.1	3.1	3.1		2.0
Lost Time Adjust (s)	0.0	-0.8	-1.4	0.0	-1.0	-2.0	-1.0	-1.1	-0.1	-0.1	-0.8	-2.0
Total Lost Time (s)	5.8	5.0	5.0	4.0	6.0	5.0	5.0	5.0	6.0	6.0	3.2	5.0
Lead/Lag	Lead	Lead	Lead		Lag	Lag	Lag	Lead	Lead			Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes			Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0		3.0
Recall Mode	None	None	C-Max		None	None	C-Max	None	None	None		None
Act Effct Green (s)		9.4	45.0			20.0	58.2	84.1	19.9	39.0		14.1
Actuated g/C Ratio		0.08	0.38			0.17	0.48	0.70	0.17	0.32		0.12
v/c Ratio		0.48	0.80			0.65	0.57	0.19	0.80	0.14		0.25
Control Delay		77.5	15.2			38.1	11.5	2.0	67.8	29.6		54.8
Queue Delay		0.0	0.0			0.0	0.0	0.0	0.0	0.0		0.0
Total Delay		77.5	15.2			38.1	11.5	2.0	67.8	29.6		54.8

Lanes, Volumes, Timings  
12: US 15-501 & Market St

2/28/2014



Lane Group	NWT	NWR
Lane Configurations	↗	
Volume (vph)	3	132
Ideal Flow (vphpl)	1900	1900
Grade (%)	0%	
Storage Length (ft)		0
Storage Lanes		0
Taper Length (ft)		25
Lane Util. Factor	1.00	1.00
Ped Bike Factor		
Frt	0.853	
Flt Protected		
Satd. Flow (prot)	1589	0
Flt Permitted		
Satd. Flow (perm)	1589	0
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	25	
Link Distance (ft)	528	
Travel Time (s)	14.4	
Confl. Peds. (#/hr)		
Peak Hour Factor	0.90	0.90
Heavy Vehicles (%)	2%	2%
Adj. Flow (vph)	3	147
Shared Lane Traffic (%)		
Lane Group Flow (vph)	150	0
Turn Type		
Protected Phases	8	
Permitted Phases		
Detector Phase	8	
Switch Phase		
Minimum Initial (s)	7.0	
Minimum Split (s)	14.0	
Total Split (s)	16.0	0.0
Total Split (%)	13.3%	0.0%
Maximum Green (s)	9.0	
Yellow Time (s)	5.0	
All-Red Time (s)	2.0	
Lost Time Adjust (s)	-2.0	0.0
Total Lost Time (s)	5.0	4.0
Lead/Lag	Lag	
Lead-Lag Optimize?	Yes	
Vehicle Extension (s)	3.0	
Recall Mode	None	
Act Effct Green (s)	14.1	
Actuated g/C Ratio	0.12	
v/c Ratio	0.81	
Control Delay	83.1	
Queue Delay	0.0	
Total Delay	83.1	

Lanes, Volumes, Timings  
12: US 15-501 & Market St

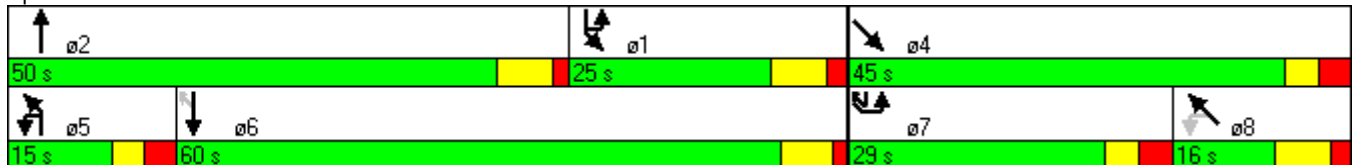
2/28/2014

Lane Group	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	SEL	SET	SER	NWL
LOS		E	B			D	B	A	E	C		D
Approach Delay			18.9				13.8			58.8		
Approach LOS			B				B			E		
Queue Length 50th (ft)		54	157			103	53	8	178	40		28
Queue Length 95th (ft)		m75	200			193	173	7	193	78		65
Internal Link Dist (ft)			862				2658			376		
Turn Bay Length (ft)		275				250		300	150			
Base Capacity (vph)		150	1339			289	1665	1117	344	527		155
Starvation Cap Reductn		0	0			0	0	0	0	0		0
Spillback Cap Reductn		0	0			0	0	0	0	0		0
Storage Cap Reductn		0	0			0	0	0	0	0		0
Reduced v/c Ratio		0.45	0.80			0.65	0.57	0.19	0.69	0.14		0.25

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 90 (75%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.81  
 Intersection Signal Delay: 24.4 Intersection LOS: C  
 Intersection Capacity Utilization 71.4% ICU Level of Service C  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 12: US 15-501 & Market St





Lane Group	NWT	NWR
LOS	F	
Approach Delay	77.4	
Approach LOS	E	
Queue Length 50th (ft)	116	
Queue Length 95th (ft)	#260	
Internal Link Dist (ft)	448	
Turn Bay Length (ft)		
Base Capacity (vph)	186	
Starvation Cap Reductn	0	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.81	
<b>Intersection Summary</b>		



Lanes, Volumes, Timings  
 13: Park and Ride Access & US 15-501

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	41	4	19	67	3	265	12	10	720	73	275	695
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%				-3%			4%
Storage Length (ft)	0		0	0		0		250		0	200	
Storage Lanes	1		0	0		0		1		0	1	
Taper Length (ft)	25		25	25		25		25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	0.95	1.00	0.95
Frt		0.869			0.893				0.986			
Flt Protected	0.950				0.990			0.950			0.950	
Satd. Flow (prot)	1770	1619	0	0	1647	0	0	1780	3480	0	1734	3338
Flt Permitted	0.371				0.927			0.950			0.950	
Satd. Flow (perm)	691	1619	0	0	1542	0	0	1780	3480	0	1734	3338
Right Turn on Red			No			No				No		
Satd. Flow (RTOR)												
Link Speed (mph)		25			25				45			45
Link Distance (ft)		442			435				926			942
Travel Time (s)		12.1			11.9				14.0			14.3
Peak Hour Factor	0.71	0.90	0.71	0.90	0.90	0.90	0.90	0.90	0.92	0.90	0.90	0.95
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	4%	4%	2%	2%	6%
Adj. Flow (vph)	58	4	27	74	3	294	13	11	783	81	306	732
Shared Lane Traffic (%)												
Lane Group Flow (vph)	58	31	0	0	371	0	0	24	864	0	306	732
Turn Type	Perm			Perm			Prot	Prot			Prot	
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Detector Phase	4	4		8	8		5	5	2		1	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0	12.0		7.0	12.0
Minimum Split (s)	14.0	14.0		14.0	14.0		14.0	14.0	19.0		14.0	19.0
Total Split (s)	43.0	43.0	0.0	43.0	43.0	0.0	14.0	14.0	43.0	0.0	34.0	63.0
Total Split (%)	35.8%	35.8%	0.0%	35.8%	35.8%	0.0%	11.7%	11.7%	35.8%	0.0%	28.3%	52.5%
Maximum Green (s)	36.0	36.0		36.0	36.0		7.0	7.0	36.0		27.0	56.0
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0		5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	0.0	-2.0	-2.0	0.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	7.0	5.0	2.0	7.0	5.0	5.0	2.0	5.0	5.0
Lead/Lag							Lead	Lead	Lead		Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None		None	None		None	None	C-Max		None	C-Max
Act Effct Green (s)	34.1	34.1			34.1			9.0	41.9		29.0	67.5
Actuated g/C Ratio	0.28	0.28			0.28			0.08	0.35		0.24	0.56
v/c Ratio	0.30	0.07			0.85			0.18	0.71		0.73	0.39
Control Delay	36.5	29.8			58.4			73.8	30.6		36.8	11.7
Queue Delay	0.0	0.0			0.0			0.0	0.0		0.0	0.0
Total Delay	36.5	29.8			58.4			73.8	30.6		36.8	11.7
LOS	D	C			E			E	C		D	B
Approach Delay		34.2			58.4				31.8			19.1

Lanes, Volumes, Timings  
 13: Park and Ride Access & US 15-501

2/28/2014

Lane Group	SBR
Lane Configurations	9
Volume (vph)	9
Ideal Flow (vphpl)	1900
Grade (%)	
Storage Length (ft)	150
Storage Lanes	1
Taper Length (ft)	25
Lane Util. Factor	1.00
Frt	0.850
Flt Protected	
Satd. Flow (prot)	1493
Flt Permitted	
Satd. Flow (perm)	1493
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.95
Heavy Vehicles (%)	6%
Adj. Flow (vph)	9
Shared Lane Traffic (%)	
Lane Group Flow (vph)	9
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Detector Phase	6
Switch Phase	
Minimum Initial (s)	12.0
Minimum Split (s)	19.0
Total Split (s)	63.0
Total Split (%)	52.5%
Maximum Green (s)	56.0
Yellow Time (s)	5.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	5.0
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Recall Mode	C-Max
Act Effct Green (s)	67.5
Actuated g/C Ratio	0.56
v/c Ratio	0.01
Control Delay	14.1
Queue Delay	0.0
Total Delay	14.1
LOS	B
Approach Delay	

Lanes, Volumes, Timings  
 13: Park and Ride Access & US 15-501

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Approach LOS		C			E				C			B
Queue Length 50th (ft)	34	17			264			19	194		148	73
Queue Length 95th (ft)	55	40			#384			49	230		289	131
Internal Link Dist (ft)		362			355				846			862
Turn Bay Length (ft)								250			200	
Base Capacity (vph)	219	513			488			134	1216		419	1878
Starvation Cap Reductn	0	0			0			0	0		0	0
Spillback Cap Reductn	0	0			0			0	0		0	0
Storage Cap Reductn	0	0			0			0	0		0	0
Reduced v/c Ratio	0.26	0.06			0.76			0.18	0.71		0.73	0.39

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 86 (72%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.85  
 Intersection Signal Delay: 30.4 Intersection LOS: C  
 Intersection Capacity Utilization 76.8% ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 13: Park and Ride Access & US 15-501





Lane Group	SBR
Approach LOS	
Queue Length 50th (ft)	2
Queue Length 95th (ft)	m5
Internal Link Dist (ft)	
Turn Bay Length (ft)	150
Base Capacity (vph)	840
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.01
Intersection Summary	

Lanes, Volumes, Timings  
 14: Dogwood Acres Dr & US 15-501

2/28/2014



Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Volume (vph)	26	9	8	730	55	686	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Grade (%)	-1%			-4%		4%	
Storage Length (ft)	0	0	300		0		0
Storage Lanes	1	0	1		1		0
Taper Length (ft)	25	25	25		25		25
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.95	0.95
Ped Bike Factor	1.00						
Frt	0.966					0.996	
Flt Protected	0.964		0.950		0.950		
Satd. Flow (prot)	1743	0	1753	3507	1734	3388	0
Flt Permitted	0.964		0.372		0.950		
Satd. Flow (perm)	1740	0	687	3507	1734	3388	0
Right Turn on Red		No					No
Satd. Flow (RTOR)							
Link Speed (mph)	25			45		45	
Link Distance (ft)	1150			899		122	
Travel Time (s)	31.4			13.6		1.8	
Confl. Peds. (#/hr)	1						
Peak Hour Factor	0.88	0.88	0.91	0.91	0.90	0.96	0.96
Heavy Vehicles (%)	2%	2%	5%	5%	2%	4%	4%
Adj. Flow (vph)	30	10	9	802	61	715	22
Shared Lane Traffic (%)							
Lane Group Flow (vph)	40	0	9	802	61	737	0
Turn Type			Perm		Prot		
Protected Phases	4			2	1	6	
Permitted Phases			2				
Detector Phase	4		2	2	1	6	
Switch Phase							
Minimum Initial (s)	7.0		12.0	12.0	7.0	12.0	
Minimum Split (s)	13.0		19.0	19.0	14.0	19.0	
Total Split (s)	21.0	0.0	74.0	74.0	25.0	99.0	0.0
Total Split (%)	17.5%	0.0%	61.7%	61.7%	20.8%	82.5%	0.0%
Maximum Green (s)	15.2		67.8	67.8	18.0	92.9	
Yellow Time (s)	3.0		4.9	4.9	5.0	4.3	
All-Red Time (s)	2.8		1.3	1.3	2.0	1.8	
Lost Time Adjust (s)	-0.8	0.0	-1.2	-1.2	-2.0	-1.1	0.0
Total Lost Time (s)	5.0	4.0	5.0	5.0	5.0	5.0	4.0
Lead/Lag			Lead	Lead	Lag		
Lead-Lag Optimize?			Yes	Yes	Yes		
Vehicle Extension (s)	2.0		6.0	6.0	3.0	6.0	
Recall Mode	None		C-Max	C-Max	None	C-Max	
Act Effct Green (s)	8.8		84.8	84.8	17.8	104.8	
Actuated g/C Ratio	0.07		0.71	0.71	0.15	0.87	
v/c Ratio	0.31		0.02	0.32	0.24	0.25	
Control Delay	59.0		8.8	9.5	28.7	0.9	
Queue Delay	0.0		0.0	0.0	0.0	0.0	
Total Delay	59.0		8.8	9.5	28.7	0.9	

Lanes, Volumes, Timings  
 14: Dogwood Acres Dr & US 15-501

2/28/2014



Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
LOS	E		A	A	C	A	
Approach Delay	59.0			9.5		3.0	
Approach LOS	E			A		A	
Queue Length 50th (ft)	30		2	140	33	18	
Queue Length 95th (ft)	64		9	191	m73	22	
Internal Link Dist (ft)	1070			819		42	
Turn Bay Length (ft)			300				
Base Capacity (vph)	232		486	2478	289	2959	
Starvation Cap Reductn	0		0	0	0	0	
Spillback Cap Reductn	0		0	0	0	0	
Storage Cap Reductn	0		0	0	0	0	
Reduced v/c Ratio	0.17		0.02	0.32	0.21	0.25	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 72 (60%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 50  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.32  
 Intersection Signal Delay: 7.6  
 Intersection LOS: A  
 Intersection Capacity Utilization 48.0%  
 ICU Level of Service A  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: Dogwood Acres Dr & US 15-501



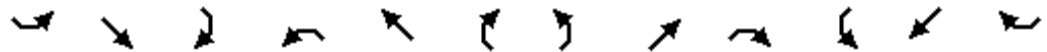
Lanes, Volumes, Timings  
15: Smith Level Road & US 15-501

2/28/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	34	46	181	78	37	62	226	700	27	45	645	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			1%			-1%			1%	
Storage Length (ft)	125		175	150		150	500		250	275		100
Storage Lanes	1		2	2		1	2		1	2		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	0.88	0.97	1.00	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Ped Bike Factor			0.98	1.00					0.99	1.00		
Fr <sub>t</sub>			0.850			0.850			0.850			0.850
Fl <sub>t</sub> Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1718	1809	2706	3383	1835	1560	3320	3423	1531	3287	3389	1516
Fl <sub>t</sub> Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1718	1809	2645	3367	1835	1560	3320	3423	1512	3279	3389	1516
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			25			45			45	
Link Distance (ft)		800			667			1107			1252	
Travel Time (s)		12.1			18.2			16.8			19.0	
Confl. Peds. (#/hr)			1	1					1	1		
Peak Hour Factor	0.85	0.85	0.85	0.83	0.83	0.83	0.82	0.82	0.82	0.93	0.93	0.93
Heavy Vehicles (%)	4%	4%	4%	3%	3%	3%	6%	6%	6%	6%	6%	6%
Adj. Flow (vph)	40	54	213	94	45	75	276	854	33	48	694	34
Shared Lane Traffic (%)												
Lane Group Flow (vph)	40	54	213	94	45	75	276	854	33	48	694	34
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0	7.0	7.0	12.0	7.0
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0	14.0	14.0	19.0	14.0	14.0	19.0	14.0
Total Split (s)	20.0	25.0	15.0	20.0	25.0	15.0	15.0	90.0	20.0	15.0	90.0	20.0
Total Split (%)	13.3%	16.7%	10.0%	13.3%	16.7%	10.0%	10.0%	60.0%	13.3%	10.0%	60.0%	13.3%
Maximum Green (s)	13.9	18.8	8.3	13.6	18.4	8.7	8.3	83.2	13.6	8.7	83.3	13.9
Yellow Time (s)	3.0	4.0	3.3	3.1	3.8	3.2	3.3	4.7	3.1	3.2	4.5	3.0
All-Red Time (s)	3.1	2.2	3.4	3.3	2.8	3.1	3.4	2.1	3.3	3.1	2.2	3.1
Lost Time Adjust (s)	-1.1	-1.2	-1.7	-1.4	-1.6	-1.3	-1.7	-1.8	-1.4	-1.3	-1.7	-1.1
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	6.0	2.0	2.0	6.0	2.0
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	None
Act Effct Green (s)	12.1	9.8	17.7	9.8	10.2	17.0	11.1	42.5	47.0	9.3	33.5	51.2
Actuated g/C Ratio	0.16	0.13	0.23	0.13	0.13	0.22	0.15	0.56	0.62	0.12	0.44	0.67
v/c Ratio	0.15	0.23	0.34	0.22	0.18	0.21	0.57	0.45	0.04	0.12	0.46	0.03
Control Delay	37.8	39.3	26.2	37.8	38.2	28.5	41.8	16.3	6.7	38.1	17.5	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.8	39.3	26.2	37.8	38.2	28.5	41.8	16.3	6.7	38.1	17.5	6.9

Lanes, Volumes, Timings  
 15: Smith Level Road & US 15-501

2/28/2014



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
LOS	D	D	C	D	D	C	D	B	A	D	B	A
Approach Delay		30.1			34.6			22.1			18.3	
Approach LOS		C			C			C			B	
Queue Length 50th (ft)	19	25	46	22	21	28	68	162	6	11	130	7
Queue Length 95th (ft)	53	65	90	48	55	69	#132	211	16	32	193	19
Internal Link Dist (ft)		720			587			1027			1172	
Turn Bay Length (ft)	125		175	150		150	500		250	275		100
Base Capacity (vph)	406	528	626	741	536	387	484	3312	1024	480	3279	1137
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.10	0.34	0.13	0.08	0.19	0.57	0.26	0.03	0.10	0.21	0.03

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 76.1  
 Natural Cycle: 65  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.57  
 Intersection Signal Delay: 23.0  
 Intersection LOS: C  
 Intersection Capacity Utilization 46.6%  
 ICU Level of Service A  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 15: Smith Level Road & US 15-501

ø1	ø2	ø3	ø4
15 s	90 s	20 s	25 s
ø5	ø6	ø7	ø8
15 s	90 s	20 s	25 s



Lanes, Volumes, Timings

17: Merritt Mill Road / NC 54 WB Off Ramp & Greensboro Street

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↗↘	↗		↗	↗↗	↗	↗	↗↗	↗
Volume (vph)	0	0	0	191	76	167	128	257	188	35	430	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			-3%			2%				-3%
Storage Length (ft)	0		0	475		0	225		250	250		0
Storage Lanes	0		0	1		0	1		1	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor									0.98	1.00		
Fr <sub>t</sub>					0.897				0.850			0.850
Fl <sub>t</sub> Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	0	0	3291	1602	0	1718	3436	1537	1745	3490	1561
Fl <sub>t</sub> Permitted				0.950			0.400			0.582		
Satd. Flow (perm)	0	0	0	3291	1602	0	723	3436	1505	1068	3490	1561
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			35			35			35	
Link Distance (ft)		467			767			384			607	
Travel Time (s)		10.6			14.9			7.5			11.8	
Confl. Peds. (#/hr)	2								1	1		
Peak Hour Factor	1.00	1.00	1.00	0.83	0.83	0.83	0.93	0.93	0.93	0.78	0.78	0.78
Heavy Vehicles (%)	2%	2%	2%	8%	8%	8%	4%	4%	4%	5%	5%	5%
Adj. Flow (vph)	0	0	0	230	92	201	138	276	202	45	551	54
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	230	293	0	138	276	202	45	551	54
Turn Type				Perm			pm+pt		Perm	Perm		Perm
Protected Phases					8		5	2			6	
Permitted Phases				8			2		2	6		6
Detector Phase				8	8		5	2	2	6	6	6
Switch Phase												
Minimum Initial (s)				7.0	7.0		7.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)				14.0	14.0		13.0	16.0	16.0	16.0	16.0	16.0
Total Split (s)	0.0	0.0	0.0	49.0	49.0	0.0	19.0	61.0	61.0	42.0	42.0	42.0
Total Split (%)	0.0%	0.0%	0.0%	44.5%	44.5%	0.0%	17.3%	55.5%	55.5%	38.2%	38.2%	38.2%
Maximum Green (s)				42.5	42.5		13.4	55.0	55.0	36.0	36.0	36.0
Yellow Time (s)				4.2	4.2		3.0	3.9	3.9	3.9	3.9	3.9
All-Red Time (s)				2.3	2.3		2.6	2.1	2.1	2.1	2.1	2.1
Lost Time Adjust (s)	0.0	0.0	0.0	-1.5	-1.5	0.0	-0.6	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.0	4.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag							Lag			Lead	Lead	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode				None	None		None	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)				27.9	27.9		72.1	72.1	72.1	53.1	53.1	53.1
Actuated g/C Ratio				0.25	0.25		0.66	0.66	0.66	0.48	0.48	0.48
v/c Ratio				0.28	0.72		0.23	0.12	0.20	0.09	0.33	0.07
Control Delay				32.4	47.0		4.6	2.1	3.1	18.9	19.4	18.4
Queue Delay				0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay				32.4	47.0		4.6	2.1	3.1	18.9	19.4	18.4

Lanes, Volumes, Timings

17: Merritt Mill Road / NC 54 WB Off Ramp & Greensboro Street

2/28/2014

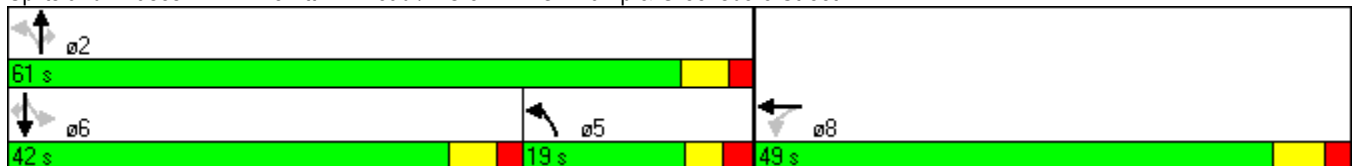


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS				C	D		A	A	A	B	B	B
Approach Delay					40.6			3.0			19.3	
Approach LOS					D			A			B	
Queue Length 50th (ft)				67	189		20	5	7	17	122	20
Queue Length 95th (ft)				81	228		33	10	14	38	160	43
Internal Link Dist (ft)		387			687			304			527	
Turn Bay Length (ft)				475			225		250	250		
Base Capacity (vph)				1316	641		600	2251	986	515	1684	753
Starvation Cap Reductn				0	0		0	0	0	0	0	0
Spillback Cap Reductn				0	0		0	0	0	0	0	0
Storage Cap Reductn				0	0		0	0	0	0	0	0
Reduced v/c Ratio				0.17	0.46		0.23	0.12	0.20	0.09	0.33	0.07

Intersection Summary

Area Type:	Other
Cycle Length:	110
Actuated Cycle Length:	110
Offset:	44 (40%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle:	50
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.72
Intersection Signal Delay:	19.9
Intersection LOS:	B
Intersection Capacity Utilization	48.4%
ICU Level of Service	A
Analysis Period (min)	15












Splits and Phases: 17: Merritt Mill Road / NC 54 WB Off Ramp & Greensboro Street



Lanes, Volumes, Timings

18: Smith Level Road & NC 54 Bypass (Fordham Blvd) EB Off Ramp

2/28/2014

											
Lane Group	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	SEL2	SEL	SER
Lane Configurations				↑↑	↑	↑	↑↑		↑	↓	↑
Volume (vph)	0	0	0	440	120	236	389	0	90	0	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)	0%			1%			-2%			-3%	
Storage Length (ft)	0	0	0		125	175		0		250	250
Storage Lanes	0	0	0		1	1		0		1	1
Taper Length (ft)	25	25	25		25	25		25		25	25
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00
Ped Bike Factor					0.97	1.00					0.99
Frt					0.850						0.850
Flt Protected						0.950			0.950	0.950	
Satd. Flow (prot)	0	0	0	3357	1502	1704	3408	0	1627	1627	1532
Flt Permitted						0.434			0.950	0.950	
Satd. Flow (perm)	0	0	0	3357	1461	776	3408	0	1627	1627	1512
Right Turn on Red					No			No			No
Satd. Flow (RTOR)											
Link Speed (mph)	30			35			35			35	
Link Distance (ft)	706			414			384			490	
Travel Time (s)	16.0			8.1			7.5			9.5	
Confl. Peds. (#/hr)			1		2	2		1			1
Peak Hour Factor	1.00	1.00	1.00	0.95	0.95	0.82	0.82	1.00	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Adj. Flow (vph)	0	0	0	463	126	288	474	0	95	0	148
Shared Lane Traffic (%)									50%		
Lane Group Flow (vph)	0	0	0	463	126	288	474	0	47	48	148
Turn Type					Perm	pm+pt			Perm		Perm
Protected Phases				2		1	6			4	
Permitted Phases					2	6			4		4
Detector Phase				2	2	1	6		4	4	4
Switch Phase											
Minimum Initial (s)				10.0	10.0	8.0	10.0		7.0	7.0	7.0
Minimum Split (s)				25.0	25.0	15.0	20.0		14.0	14.0	14.0
Total Split (s)	0.0	0.0	0.0	43.0	43.0	33.0	76.0	0.0	34.0	34.0	34.0
Total Split (%)	0.0%	0.0%	0.0%	39.1%	39.1%	30.0%	69.1%	0.0%	30.9%	30.9%	30.9%
Maximum Green (s)				33.2	33.2	26.7	66.1		27.7	27.7	27.7
Yellow Time (s)				3.8	3.8	3.0	3.9		4.0	4.0	4.0
All-Red Time (s)				6.0	6.0	3.3	6.0		2.3	2.3	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	-4.8	-4.8	-1.3	-4.9	0.0	-1.3	-1.3	-1.3
Total Lost Time (s)	4.0	4.0	4.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0	5.0
Lead/Lag				Lag	Lag	Lead					
Lead-Lag Optimize?				Yes	Yes	Yes					
Vehicle Extension (s)				3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode				C-Max	C-Max	None	C-Max		None	None	None
Walk Time (s)				7.0	7.0						
Flash Dont Walk (s)				8.0	8.0						
Pedestrian Calls (#/hr)				0	0						
Act Effct Green (s)				64.8	64.8	82.6	82.6		17.4	17.4	17.4
Actuated g/C Ratio				0.59	0.59	0.75	0.75		0.16	0.16	0.16
v/c Ratio				0.23	0.15	0.42	0.19		0.18	0.19	0.62

Lanes, Volumes, Timings

18: Smith Level Road & NC 54 Bypass (Fordham Blvd) EB Off Ramp

2/28/2014

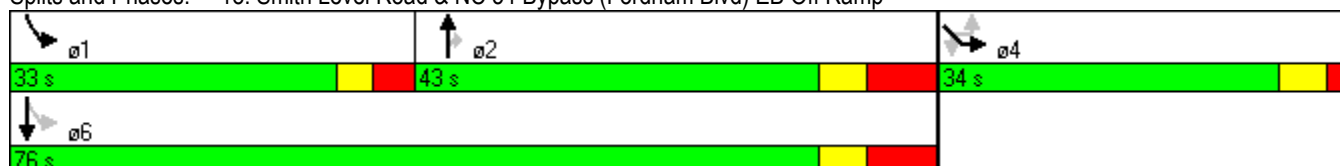


Lane Group	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	SEL2	SEL	SER
Control Delay				12.3	12.6	6.0	1.3		39.7	39.8	53.9
Queue Delay				0.0	0.0	0.1	0.0		0.0	0.0	0.0
Total Delay				12.3	12.6	6.1	1.3		39.7	39.8	53.9
LOS				B	B	A	A		D	D	D
Approach Delay				12.4			3.1			48.4	
Approach LOS				B			A			D	
Queue Length 50th (ft)				76	37	24	7		30	31	99
Queue Length 95th (ft)				133	85	52	9		63	64	156
Internal Link Dist (ft)	626			334			304			410	
Turn Bay Length (ft)					125	175			250	250	250
Base Capacity (vph)				1979	861	819	2560		429	429	399
Starvation Cap Reductn				0	0	47	0		0	0	0
Spillback Cap Reductn				0	0	0	0		0	0	0
Storage Cap Reductn				0	0	0	0		0	0	0
Reduced v/c Ratio				0.23	0.15	0.37	0.19		0.11	0.11	0.37

Intersection Summary

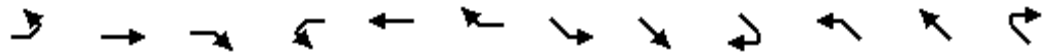
Area Type:	Other
Cycle Length:	110
Actuated Cycle Length:	110
Offset:	44 (40%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle:	55
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.62
Intersection Signal Delay:	13.4
Intersection LOS:	B
Intersection Capacity Utilization	44.2%
ICU Level of Service	A
Analysis Period (min)	15

Splits and Phases: 18: Smith Level Road & NC 54 Bypass (Fordham Blvd) EB Off Ramp



Lanes, Volumes, Timings  
 20: US 15-501 (Fordham Blvd) & Manning Drive

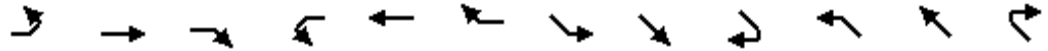
2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	106	1516	4	11	1517	438	606	2	109	14	3	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	9	12
Grade (%)		-5%			0%			-4%			0%	
Storage Length (ft)	400		0	200		1000	0		225	0		75
Storage Lanes	2		0	1		1	0		1	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00					0.99		0.99	
Frt						0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950				0.961	
Satd. Flow (prot)	3418	3524	0	1736	3471	1553	3502	1900	1615	0	1595	1568
Flt Permitted	0.950			0.950			0.950				0.961	
Satd. Flow (perm)	3418	*3811	0	1730	3471	1553	*3819	1900	1592	0	1578	1568
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			35			25	
Link Distance (ft)		579			1501			367			515	
Travel Time (s)		8.8			22.7			7.1			14.0	
Confl. Peds. (#/hr)			4	4					7	7		
Peak Hour Factor	0.86	0.86	0.86	0.91	0.91	0.91	0.86	0.86	0.86	0.77	0.77	0.77
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	2%	2%	2%	3%	3%	3%
Adj. Flow (vph)	123	1763	5	12	1667	481	705	2	127	18	4	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	123	1768	0	12	1667	481	705	2	127	0	22	23
Turn Type	Prot			Prot		pm+ov	Split		Free	Split		pm+ov
Protected Phases	5	2		1	6	4	4	4		3	3	1
Permitted Phases						6			Free			3
Detector Phase	5	2		1	6	4	4	4		3	3	1
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0	7.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	14.0	19.0		14.0	19.0	32.0	32.0	32.0		14.0	14.0	14.0
Total Split (s)	14.0	89.0	0.0	14.0	89.0	43.0	43.0	43.0	0.0	14.0	14.0	14.0
Total Split (%)	8.8%	55.6%	0.0%	8.8%	55.6%	26.9%	26.9%	26.9%	0.0%	8.8%	8.8%	8.8%
Maximum Green (s)	7.8	82.9		7.8	82.7	36.8	36.8	36.8		7.8	7.8	7.8
Yellow Time (s)	3.0	4.7		3.0	4.5	3.8	3.8	3.8		3.8	3.8	3.0
All-Red Time (s)	3.2	1.4		3.2	1.8	2.4	2.4	2.4		2.4	2.4	3.2
Lost Time Adjust (s)	-1.2	-1.1	0.0	-1.2	-1.3	-1.2	-1.2	-1.2	0.0	-2.5	-1.2	-1.2
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0	3.7	5.0	5.0
Lead/Lag	Lead	Lead		Lag	Lag	Lag	Lag	Lag		Lead	Lead	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	6.0		1.0	6.0	1.0	1.0	1.0		1.0	1.0	1.0
Recall Mode	None	C-Max		None	C-Max	None	None	None		None	None	None
Walk Time (s)						7.0	7.0	7.0				
Flash Dont Walk (s)						18.0	18.0	18.0				
Pedestrian Calls (#/hr)						0	0	0				
Act Effct Green (s)	8.8	89.6		8.7	84.2	130.1	43.9	43.9	160.0		8.4	16.8
Actuated g/C Ratio	0.06	0.56		0.05	0.53	0.81	0.27	0.27	1.00		0.05	0.10

Lanes, Volumes, Timings  
 20: US 15-501 (Fordham Blvd) & Manning Drive

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
v/c Ratio	0.65	0.90		0.13	0.91	0.38	0.73	0.00	0.08		0.26	0.14
Control Delay	90.6	39.2		56.1	25.9	2.3	59.0	46.5	0.1		80.9	63.4
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	90.6	39.2		56.1	25.9	2.3	59.0	46.5	0.1		80.9	63.4
LOS	F	D		E	C	A	E	D	A		F	E
Approach Delay		42.5			20.8			50.0			71.9	
Approach LOS		D			C			D			E	
Queue Length 50th (ft)	66	908		12	346	38	363	2	0		23	21
Queue Length 95th (ft)	99	945		m14	m549	m97	419	9	0		47	43
Internal Link Dist (ft)		499			1421			287			435	
Turn Bay Length (ft)	400			200		1000			225			75
Base Capacity (vph)	192	1973		98	1826	1263	961	522	1592		90	167
Starvation Cap Reductn	0	0		0	0	0	0	0	0		0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0		0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0		0	0
Reduced v/c Ratio	0.64	0.90		0.12	0.91	0.38	0.73	0.00	0.08		0.24	0.14

Intersection Summary

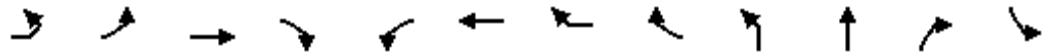
Area Type: Other  
 Cycle Length: 160  
 Actuated Cycle Length: 160  
 Offset: 15 (9%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 120  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.91  
 Intersection Signal Delay: 34.6      Intersection LOS: C  
 Intersection Capacity Utilization 78.4%      ICU Level of Service D  
 Analysis Period (min) 15  
 \* User Entered Value  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 20: US 15-501 (Fordham Blvd) & Manning Drive



Lanes, Volumes, Timings  
 21: Old Mason Farm Road & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL	NBT	NBR	SBL
Lane Configurations			↔		↗	↘			↖	↑↑	↗	↖
Volume (vph)	4	13	6	11	158	4	7	39	21	1981	133	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)			0%			3%				0%		
Storage Length (ft)		0		0	50		0		350		300	125
Storage Lanes		0		0	1		0		1		1	1
Taper Length (ft)		25		25	25		25		25		25	25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	*1.00	1.00	1.00
Ped Bike Factor						0.99						
Frt			0.957			0.862					0.850	
Flt Protected			0.976		0.950				0.950			0.950
Satd. Flow (prot)	0	0	1740	0	1743	1562	0	0	1770	3725	1583	1770
Flt Permitted			0.808		0.950				0.950			0.950
Satd. Flow (perm)	0	0	1440	0	1743	1562	0	0	1770	*3787	1583	1770
Right Turn on Red				No				No			No	
Satd. Flow (RTOR)												
Link Speed (mph)			30			35				45		
Link Distance (ft)			305			620				1501		
Travel Time (s)			6.9			12.1				22.7		
Confl. Peds. (#/hr)								1				
Peak Hour Factor	0.70	0.70	0.70	0.70	0.77	0.77	0.77	0.77	0.90	0.90	0.90	0.95
Adj. Flow (vph)	6	19	9	16	205	5	9	51	23	2201	148	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	50	0	205	65	0	0	23	2201	148	42
Turn Type	Perm	Perm			Split				Prot		pm+ov	Prot
Protected Phases			7		3	3			5	2	3	1
Permitted Phases	7	7									2	
Detector Phase	7	7	7		3	3			5	2	3	1
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0		7.0	7.0			7.0	12.0	7.0	7.0
Minimum Split (s)	13.0	13.0	13.0		36.0	36.0			14.0	33.0	36.0	15.0
Total Split (s)	13.0	13.0	13.0	0.0	19.0	19.0	0.0	0.0	15.0	94.0	19.0	15.0
Total Split (%)	8.1%	8.1%	8.1%	0.0%	11.9%	11.9%	0.0%	0.0%	9.4%	58.8%	11.9%	9.4%
Maximum Green (s)	5.8	5.8	5.8		12.4	12.4			8.0	87.8	12.4	9.1
Yellow Time (s)	3.0	3.0	3.0		3.6	3.6			3.0	4.6	3.6	3.0
All-Red Time (s)	4.2	4.2	4.2		3.0	3.0			4.0	1.6	3.0	2.9
Lost Time Adjust (s)	0.0	0.0	-2.2	-2.2	-1.6	-1.6	-1.6	-1.6	-2.0	-1.2	-1.6	-0.9
Total Lost Time (s)	7.2	7.2	5.0	1.8	5.0	5.0	2.4	2.4	5.0	5.0	5.0	5.0
Lead/Lag					Lead	Lead			Lead	Lag	Lead	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0			2.0	2.0	2.0	2.0
Recall Mode	None	None	None		None	None			None	C-Max	None	None
Walk Time (s)					4.0	4.0				7.0	4.0	
Flash Dont Walk (s)					25.0	25.0				16.0	25.0	
Pedestrian Calls (#/hr)					0	0				0	0	
Act Effct Green (s)			8.4		14.0	14.0			9.3	96.2	115.2	9.0
Actuated g/C Ratio			0.05		0.09	0.09			0.06	0.60	0.72	0.06
v/c Ratio			0.66		1.34	0.47			0.22	0.98	0.13	0.42
Control Delay			110.8		241.8	81.6			82.9	33.0	2.8	85.7

Lanes, Volumes, Timings  
 21: Old Mason Farm Road & US 15-501 (Fordham Blvd)

2/28/2014

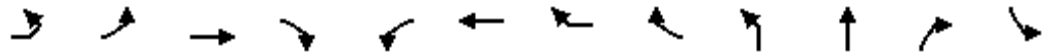


Lane Group	SBT	SBR	SEL2	SEL	SER	SER2
Lane Configurations	↑↑	↑	↙	↘		
Volume (vph)	1767	10	53	12	30	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	0%			2%		
Storage Length (ft)		100		125	0	
Storage Lanes		1		1	0	
Taper Length (ft)		25		25	25	
Lane Util. Factor	*1.00	1.00	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt		0.850		0.901		
Flt Protected			0.950	0.983		
Satd. Flow (prot)	3725	1583	1664	1552	0	0
Flt Permitted			0.950	0.983		
Satd. Flow (perm)	*3771	1583	1664	1552	0	0
Right Turn on Red						No
Satd. Flow (RTOR)						
Link Speed (mph)	45			25		
Link Distance (ft)	1494			359		
Travel Time (s)	22.6			9.8		
Confl. Peds. (#/hr)						
Peak Hour Factor	0.95	0.95	0.72	0.72	0.72	0.72
Adj. Flow (vph)	1860	11	74	17	42	4
Shared Lane Traffic (%)			10%			
Lane Group Flow (vph)	1860	11	67	70	0	0
Turn Type		Perm	Split			
Protected Phases	6		4	4		
Permitted Phases		6				
Detector Phase	6	6	4	4		
Switch Phase						
Minimum Initial (s)	12.0	12.0	5.0	5.0		
Minimum Split (s)	25.0	25.0	13.0	13.0		
Total Split (s)	94.0	94.0	19.0	19.0	0.0	0.0
Total Split (%)	58.8%	58.8%	11.9%	11.9%	0.0%	0.0%
Maximum Green (s)	87.9	87.9	11.6	11.6		
Yellow Time (s)	4.4	4.4	3.0	3.0		
All-Red Time (s)	1.7	1.7	4.4	4.4		
Lost Time Adjust (s)	-1.1	-1.1	-2.4	-2.4	-2.4	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	1.6	4.0
Lead/Lag	Lag	Lag	Lag	Lag		
Lead-Lag Optimize?						
Vehicle Extension (s)	2.0	2.0	2.0	2.0		
Recall Mode	C-Max	C-Max	None	None		
Walk Time (s)	7.0	7.0				
Flash Dont Walk (s)	11.0	11.0				
Pedestrian Calls (#/hr)	0	0				
Act Effct Green (s)	98.9	98.9	12.6	12.6		
Actuated g/C Ratio	0.62	0.62	0.08	0.08		
v/c Ratio	0.81	0.01	0.51	0.57		
Control Delay	29.4	15.6	84.2	89.4		



Lanes, Volumes, Timings  
 21: Old Mason Farm Road & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL	NBT	NBR	SBL
Queue Delay			0.0		0.0	0.0			0.0	0.0	0.0	0.0
Total Delay			110.8		241.8	81.6			82.9	33.0	2.8	85.7
LOS			F		F	F			F	C	A	F
Approach Delay			110.8			203.2				31.6		
Approach LOS			F			F				C		
Queue Length 50th (ft)			53		~279	66			22	~1240	22	43
Queue Length 95th (ft)			#82		#364	103			m26	#1372	m23	88
Internal Link Dist (ft)			225			540				1421		
Turn Bay Length (ft)					50				350		300	125
Base Capacity (vph)			76		153	137			111	2240	1140	111
Starvation Cap Reductn			0		0	0			0	0	0	0
Spillback Cap Reductn			0		0	0			0	0	0	0
Storage Cap Reductn			0		0	0			0	0	0	0
Reduced v/c Ratio			0.66		1.34	0.47			0.21	0.98	0.13	0.38

Intersection Summary

Area Type: Other  
 Cycle Length: 160  
 Actuated Cycle Length: 160  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.34  
 Intersection Signal Delay: 43.4  
 Intersection LOS: D  
 Intersection Capacity Utilization 87.1%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 \* User Entered Value  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 21: Old Mason Farm Road & US 15-501 (Fordham Blvd)

ø1	ø2	ø3	ø4	ø7
15 s	94 s	19 s	19 s	13 s
ø5	ø6			
15 s	94 s			

Lanes, Volumes, Timings  
 21: Old Mason Farm Road & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	SBT	SBR	SEL2	SEL	SER	SER2
Queue Delay	0.0	0.0	0.0	0.0		
Total Delay	29.4	15.6	84.2	89.4		
LOS	C	B	F	F		
Approach Delay	30.5			86.9		
Approach LOS	C			F		
Queue Length 50th (ft)	825	5	71	74		
Queue Length 95th (ft)	951	15	102	106		
Internal Link Dist (ft)	1414			279		
Turn Bay Length (ft)		100	125	125		
Base Capacity (vph)	2302	978	146	136		
Starvation Cap Reductn	0	0	0	0		
Spillback Cap Reductn	0	0	0	0		
Storage Cap Reductn	0	0	0	0		
Reduced v/c Ratio	0.81	0.01	0.46	0.51		
<b>Intersection Summary</b>						

Lanes, Volumes, Timings  
 22: NC 54 WB On-Ramp & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗↗			↗		↗↗	↗		↗↗	↗
Volume (vph)	0	0	737	0	0	386	0	1222	32	0	1373	153
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		450	0		0			200	0		375
Storage Lanes	0		1	0		1	0		1	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	0.88	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.865			0.850			0.850
Flt Protected												
Satd. Flow (prot)	0	0	2787	0	0	1611	0	3539	1583	0	3539	1583
Flt Permitted												
Satd. Flow (perm)	0	0	2787	0	0	1611	0	3539	1583	0	3539	1583
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)						184			10			64
Link Speed (mph)		30			25			45				45
Link Distance (ft)		694			685			1058				1301
Travel Time (s)		15.8			18.7			16.0				19.7
Peak Hour Factor	1.00	1.00	0.92	1.00	1.00	0.90	1.00	0.90	0.90	1.00	0.82	0.92
Adj. Flow (vph)	0	0	801	0	0	429	0	1358	36	0	1674	166
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	801	0	0	429	0	1358	36	0	1674	166
Turn Type			custom			Free			Free			Free
Protected Phases			4					2 4				6
Permitted Phases			4			Free			Free			Free
Detector Phase			4					2 4				6
Switch Phase												
Minimum Initial (s)			7.0									12.0
Minimum Split (s)			13.0									18.0
Total Split (s)	0.0	0.0	68.0	0.0	0.0	0.0	0.0	170.0	0.0	0.0	102.0	0.0
Total Split (%)	0.0%	0.0%	40.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	60.0%	0.0%
Maximum Green (s)			62.9									96.2
Yellow Time (s)			3.1									4.5
All-Red Time (s)			2.0									1.3
Lost Time Adjust (s)	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	-0.8	0.0	0.0	-0.8	0.0
Total Lost Time (s)	4.0	4.0	5.0	4.0	4.0	4.0	4.0	5.0	4.0	4.0	5.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)			3.0									6.0
Recall Mode			C-Max									Max
Act Effct Green (s)			63.0			170.0		170.0	170.0		97.0	170.0
Actuated g/C Ratio			0.37			1.00		1.00	1.00		0.57	1.00
v/c Ratio			0.78			0.27		0.38	0.02		0.83	0.10
Control Delay			53.5			0.4		0.3	0.0		34.3	0.1
Queue Delay			0.0			0.0		0.0	0.0		0.0	0.0
Total Delay			53.5			0.4		0.3	0.0		34.3	0.1
LOS			D			A		A	A		C	A
Approach Delay								0.3			31.2	
Approach LOS								A			C	
Queue Length 50th (ft)			448			0		0	0		778	0

Lane Group	ø2
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Fr <sub>t</sub>	
Fl <sub>t</sub> Protected	
Satd. Flow (prot)	
Fl <sub>t</sub> Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	12.0
Minimum Split (s)	18.0
Total Split (s)	102.0
Total Split (%)	60%
Maximum Green (s)	96.2
Yellow Time (s)	4.5
All-Red Time (s)	1.3
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	6.0
Recall Mode	Max
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	

Lanes, Volumes, Timings  
 22: NC 54 WB On-Ramp & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)			542			0		0	0		738	0
Internal Link Dist (ft)		614			605			978			1221	
Turn Bay Length (ft)			450						200			375
Base Capacity (vph)			1033			1611		3539	1583		2019	1583
Starvation Cap Reductn			0			0		0	0		0	0
Spillback Cap Reductn			0			0		0	0		0	0
Storage Cap Reductn			0			0		0	0		0	0
Reduced v/c Ratio			0.78			0.27		0.38	0.02		0.83	0.10

Intersection Summary

Area Type:	Other
Cycle Length:	170
Actuated Cycle Length:	170
Offset:	0 (0%), Referenced to phase 4:NBT, Start of Green
Natural Cycle:	65
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.83
Intersection Signal Delay:	22.6
Intersection LOS:	C
Intersection Capacity Utilization	72.1%
ICU Level of Service	C
Analysis Period (min)	15

Splits and Phases: 22: NC 54 WB On-Ramp & US 15-501 (Fordham Blvd)

 102 s	 68 s
 102 s	

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Lane Group	ø2
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

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Lanes, Volumes, Timings  
 23: NC 54 (Raleigh Road) & Burning Tree Drive

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↕↕↕		↖	↕↕↕			↖	↖		↕↕	
Volume (vph)	35	1670	44	79	1654	16	31	6	140	25	9	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	275		0	0		450	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			1.00				0.99
Frt		0.996			0.999				0.850			0.936
Flt Protected	0.950			0.950				0.960				0.981
Satd. Flow (prot)	1736	4964	0	1752	5029	0	0	1754	1553	0	1651	0
Flt Permitted	0.086			0.077				0.753			0.871	
Satd. Flow (perm)	157	4964	0	142	5029	0	0	1374	1553	0	1466	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35				25
Link Distance (ft)		1026			881			637				457
Travel Time (s)		20.0			17.2			12.4				12.5
Confl. Peds. (#/hr)	5		3	3		5	2					2
Peak Hour Factor	0.85	0.85	0.85	0.96	0.96	0.96	0.83	0.83	0.83	0.74	0.74	0.74
Heavy Vehicles (%)	4%	4%	4%	3%	3%	3%	4%	4%	4%	5%	5%	5%
Adj. Flow (vph)	41	1965	52	82	1723	17	37	7	169	34	12	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	41	2017	0	82	1740	0	0	44	169	0	88	0
Turn Type	pm+pt			pm+pt			Perm		Perm	Perm		
Protected Phases	5	2		1	6			8				4
Permitted Phases	2			6			8		8	4		
Detector Phase	5	2		1	6		8	8	8	4		4
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0		7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.0	32.0		13.0	30.0		48.0	48.0	48.0	46.0	46.0	
Total Split (s)	13.0	59.0	0.0	13.0	59.0	0.0	48.0	48.0	48.0	48.0	48.0	0.0
Total Split (%)	10.8%	49.2%	0.0%	10.8%	49.2%	0.0%	40.0%	40.0%	40.0%	40.0%	40.0%	0.0%
Maximum Green (s)	7.1	52.8		7.1	52.8		41.8	41.8	41.8	41.7	41.7	
Yellow Time (s)	3.0	4.9		3.0	4.9		3.7	3.7	3.7	3.2	3.2	
All-Red Time (s)	2.9	1.3		2.9	1.3		2.5	2.5	2.5	3.1	3.1	
Lost Time Adjust (s)	-0.9	-1.2	0.0	-0.9	-1.2	0.0	0.0	-1.2	-1.2	0.0	-1.3	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	6.2	5.0	5.0	6.3	5.0	4.0
Lead/Lag	Lead	Lead		Lag	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		Min	Min	Min	Min	Min	Min
Walk Time (s)		7.0			7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		18.0			16.0		34.0	34.0	34.0	32.0	32.0	
Pedestrian Calls (#/hr)		0			0		0	0	0	0	0	0
Act Effct Green (s)	79.9	79.9		79.7	79.7			19.7	19.7			19.7
Actuated g/C Ratio	0.67	0.67		0.66	0.66			0.16	0.16			0.16
v/c Ratio	0.19	0.61		0.41	0.52			0.19	0.66			0.37
Control Delay	8.7	5.5		32.2	12.4			43.0	58.8			47.3

Lanes, Volumes, Timings  
 23: NC 54 (Raleigh Road) & Burning Tree Drive

2/28/2014

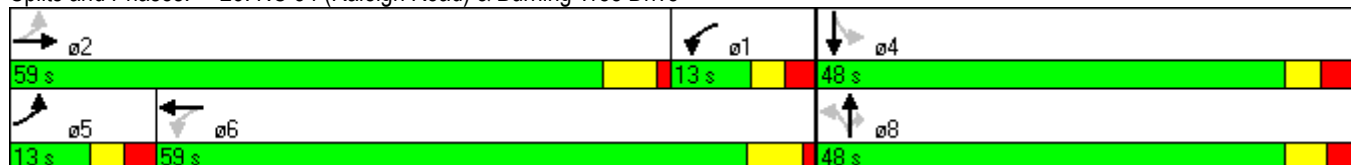


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0			0.0
Total Delay	8.7	5.5		32.2	12.4			43.0	58.8			47.3
LOS	A	A		C	B			D	E			D
Approach Delay		5.6			13.3			55.5				47.3
Approach LOS		A			B			E				D
Queue Length 50th (ft)	5	119		22	247			30	124			61
Queue Length 95th (ft)	m11	123		55	350			56	169			85
Internal Link Dist (ft)		946			801			557				377
Turn Bay Length (ft)	250			275					450			
Base Capacity (vph)	212	3304		202	3340			492	556			525
Starvation Cap Reductn	0	0		0	0			0	0			0
Spillback Cap Reductn	0	0		0	0			0	0			0
Storage Cap Reductn	0	0		0	0			0	0			0
Reduced v/c Ratio	0.19	0.61		0.41	0.52			0.09	0.30			0.17

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 19 (16%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 105  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.66  
 Intersection Signal Delay: 12.3  
 Intersection Capacity Utilization 63.5%  
 Analysis Period (min) 15  
 Intersection LOS: B  
 ICU Level of Service B  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 23: NC 54 (Raleigh Road) & Burning Tree Drive





Lanes, Volumes, Timings  
 24: NC 54 (Raleigh Road) & Hamilton Road

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↗↗↗		↗	↗↗↗		↗	↗	↗	↗	↗	↗
Volume (vph)	37	1557	40	102	1565	29	156	16	88	54	16	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	275		0	250		0	150		150	50		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00	1.00		0.99		0.98	0.99	0.99	
Frt		0.996			0.997				0.850		0.898	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	4964	0	1752	5019	0	1752	1845	1568	1736	1621	0
Flt Permitted	0.078			0.092			0.716			0.746		
Satd. Flow (perm)	142	4964	0	170	5019	0	1314	1845	1539	1354	1621	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			25			25	
Link Distance (ft)		359			576			537			463	
Travel Time (s)		5.4			8.7			14.6			12.6	
Confl. Peds. (#/hr)	1		3	3		1	5		6	6		5
Peak Hour Factor	0.88	0.88	0.88	0.92	0.92	0.92	0.87	0.87	0.87	0.82	0.82	0.82
Heavy Vehicles (%)	4%	4%	4%	3%	3%	3%	3%	3%	3%	4%	4%	4%
Adj. Flow (vph)	42	1769	45	111	1701	32	179	18	101	66	20	43
Shared Lane Traffic (%)												
Lane Group Flow (vph)	42	1814	0	111	1733	0	179	18	101	66	63	0
Turn Type	pm+pt			pm+pt			Perm		Perm	Perm		
Protected Phases	5	2		1	6			8				4
Permitted Phases	2			6			8		8	4		
Detector Phase	5	2		1	6		8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	13.0	25.0		13.0	26.0		41.0	41.0	41.0	39.0	39.0	
Total Split (s)	13.0	63.0	0.0	16.0	66.0	0.0	41.0	41.0	41.0	41.0	41.0	0.0
Total Split (%)	10.8%	52.5%	0.0%	13.3%	55.0%	0.0%	34.2%	34.2%	34.2%	34.2%	34.2%	0.0%
Maximum Green (s)	7.4	57.4		10.6	60.1		34.6	34.6	34.6	34.5	34.5	
Yellow Time (s)	3.0	3.8		3.0	4.1		3.1	3.1	3.1	3.2	3.2	
All-Red Time (s)	2.6	1.8		2.4	1.8		3.3	3.3	3.3	3.3	3.3	
Lost Time Adjust (s)	-0.6	-0.6	0.0	-0.4	-0.9	0.0	-1.4	-1.4	-1.4	-1.5	-1.5	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0
Lead/Lag	Lead	Lead		Lag	Lag							
Lead-Lag Optimize?	Yes				Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		Min	Min	Min	Min	Min	
Walk Time (s)		7.0			7.0		7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)		12.0			13.0		27.0	27.0	27.0	25.0	25.0	
Pedestrian Calls (#/hr)		0			0		0	0	0	0	0	
Act Effct Green (s)	70.8	70.8		76.3	76.3		23.2	23.2	23.2	23.2	23.2	
Actuated g/C Ratio	0.59	0.59		0.64	0.64		0.19	0.19	0.19	0.19	0.19	
v/c Ratio	0.22	0.62		0.44	0.54		0.70	0.05	0.34	0.25	0.20	
Control Delay	15.2	18.0		24.0	11.1		59.2	36.1	43.0	41.1	39.6	

Lanes, Volumes, Timings  
 24: NC 54 (Raleigh Road) & Hamilton Road

2/28/2014

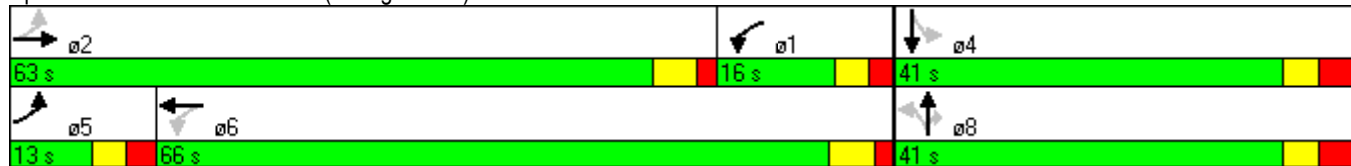


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.2	18.0		24.0	11.1		59.2	36.1	43.0	41.1	39.6	
LOS	B	B		C	B		E	D	D	D	D	
Approach Delay		18.0			11.8			52.3				40.4
Approach LOS		B			B			D				D
Queue Length 50th (ft)	13	313		28	175		131	12	68	44	41	
Queue Length 95th (ft)	34	420		55	205		185	29	106	71	68	
Internal Link Dist (ft)		279			496			457				383
Turn Bay Length (ft)	275			250			150		150	50		
Base Capacity (vph)	193	2928		253	3191		394	554	462	406	486	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.62		0.44	0.54		0.45	0.03	0.22	0.16	0.13	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.70  
 Intersection Signal Delay: 18.4  
 Intersection Capacity Utilization 67.0%  
 Analysis Period (min) 15  
 Intersection LOS: B  
 ICU Level of Service C

Splits and Phases: 24: NC 54 (Raleigh Road) & Hamilton Road



Lanes, Volumes, Timings  
25: Culbreth Road & Smith Level Road

2/28/2014



Lane Group	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Volume (vph)	54	119	320	54	115	286
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	1%		-2%			3%
Storage Length (ft)	125	0		0	225	
Storage Lanes	1	1		0	1	
Taper Length (ft)	25	25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00					
Frt		0.850	0.981			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1694	1516	1759	0	1710	1800
Flt Permitted	0.950				0.445	
Satd. Flow (perm)	1690	1516	1759	0	801	1800
Right Turn on Red		No		No		
Satd. Flow (RTOR)						
Link Speed (mph)	35		35			35
Link Distance (ft)	1150		863			828
Travel Time (s)	22.4		16.8			16.1
Confl. Peds. (#/hr)	1					
Peak Hour Factor	0.85	0.85	0.91	0.91	0.81	0.81
Heavy Vehicles (%)	6%	6%	7%	7%	4%	4%
Adj. Flow (vph)	64	140	352	59	142	353
Shared Lane Traffic (%)						
Lane Group Flow (vph)	64	140	411	0	142	353
Turn Type		pm+ov			pm+pt	
Protected Phases	8	1	2		1	6
Permitted Phases		8			6	
Detector Phase	8	1	2		1	6
Switch Phase						
Minimum Initial (s)	7.0	7.0	10.0		7.0	10.0
Minimum Split (s)	25.0	13.0	29.0		13.0	17.0
Total Split (s)	27.0	15.0	48.0	0.0	15.0	63.0
Total Split (%)	30.0%	16.7%	53.3%	0.0%	16.7%	70.0%
Maximum Green (s)	20.7	9.4	41.8		9.4	56.8
Yellow Time (s)	3.0	3.0	4.1		3.0	4.1
All-Red Time (s)	3.3	2.6	2.1		2.6	2.1
Lost Time Adjust (s)	-1.3	-0.6	-1.2	0.0	-0.6	-1.2
Total Lost Time (s)	5.0	5.0	5.0	4.0	5.0	5.0
Lead/Lag		Lead	Lag		Lead	
Lead-Lag Optimize?						
Vehicle Extension (s)	2.0	2.0	3.0		2.0	3.0
Recall Mode	None	None	C-Max		None	C-Max
Walk Time (s)	7.0		7.0			
Flash Dont Walk (s)	11.0		15.0			
Pedestrian Calls (#/hr)	0		0			
Act Effct Green (s)	9.7	19.9	60.1		72.9	73.9
Actuated g/C Ratio	0.11	0.22	0.67		0.81	0.82
v/c Ratio	0.35	0.42	0.35		0.20	0.24

Lanes, Volumes, Timings  
 25: Culbreth Road & Smith Level Road

2/28/2014

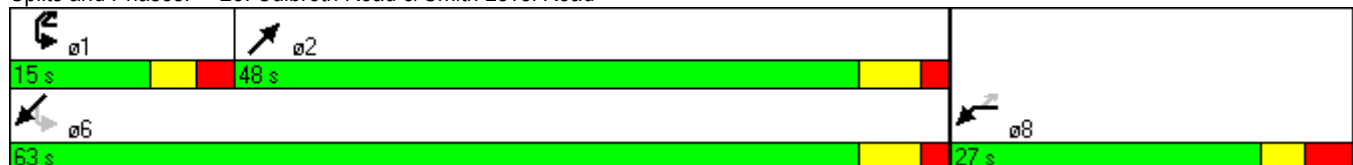


Lane Group	WBL	WBR	NET	NER	SWL	SWT
Control Delay	42.1	32.3	8.6		3.1	3.1
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	42.1	32.3	8.6		3.1	3.1
LOS	D	C	A		A	A
Approach Delay	35.4		8.6			3.1
Approach LOS	D		A			A
Queue Length 50th (ft)	35	67	96		14	40
Queue Length 95th (ft)	67	106	172		28	68
Internal Link Dist (ft)	1070		783			748
Turn Bay Length (ft)	125				225	
Base Capacity (vph)	414	372	1174		750	1478
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.15	0.38	0.35		0.19	0.24

Intersection Summary





















Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	90
Offset:	0 (0%), Referenced to phase 2:NET and 6:SWTL, Start of Green
Natural Cycle:	70
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.42
Intersection Signal Delay:	11.1
Intersection LOS:	B
Intersection Capacity Utilization:	44.8%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 25: Culbreth Road & Smith Level Road



Lanes, Volumes, Timings  
 1: Franklin Street & NC 86 (S. Columbia St)

2/28/2014

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	204	474	118	158	576	106	130	625	165	90	528	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	9	12	13	10	10	13	9	10	10	9	9	11
Storage Length (ft)	225		0	100		0	400		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor	0.87	0.93		0.87	0.94		0.88	0.92		0.89	0.93	
Frt		0.970			0.977			0.969			0.969	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1419	2840	0	1486	2727	0	1379	2563	0	1406	2538	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1238	2840	0	1286	2727	0	1214	2563	0	1247	2538	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		20			20			25			25	
Link Distance (ft)		806			940			972			822	
Travel Time (s)		27.5			32.0			26.5			22.4	
Confl. Peds. (#/hr)	391		301	301		391	220		302	302		220
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.96	0.96	0.96	0.93	0.93	0.93
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	6%	6%	6%	4%	4%	4%
Adj. Flow (vph)	240	558	139	186	678	125	135	651	172	97	568	149
Shared Lane Traffic (%)												
Lane Group Flow (vph)	240	697	0	186	803	0	135	823	0	97	717	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases												
Detector Phase	1	6		5	2		3	8		7	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	15.0	32.0		15.0	32.0		15.0	32.0		15.0	32.0	
Total Split (s)	29.0	50.0	0.0	26.0	47.0	0.0	18.0	49.0	0.0	15.0	46.0	0.0
Total Split (%)	20.7%	35.7%	0.0%	18.6%	33.6%	0.0%	12.9%	35.0%	0.0%	10.7%	32.9%	0.0%
Maximum Green (s)	23.1	43.8		20.6	40.8		12.1	43.1		9.1	40.3	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.3		3.0	3.1	
All-Red Time (s)	2.9	3.2		2.4	3.2		2.9	2.6		2.9	2.6	
Lost Time Adjust (s)	-0.9	-1.2	-2.0	-0.4	-1.2	-2.0	-0.9	-0.9	-1.5	-0.9	-0.7	-1.5
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0	2.5	5.0	5.0	2.5
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	3.0		1.0	3.0		1.0	2.0		1.0	2.0	
Recall Mode	None	Min		None	Min		None	C-Max		None	C-Max	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		15.0			15.0			15.0			15.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	24.0	46.6		19.4	42.0		13.0	44.0		10.0	41.0	
Actuated g/C Ratio	0.17	0.33		0.14	0.30		0.09	0.31		0.07	0.29	
v/c Ratio	0.99	0.74		0.90	0.98		1.05	1.02		0.97	0.97	

Lanes, Volumes, Timings  
 1: Franklin Street & NC 86 (S. Columbia St)

2/28/2014

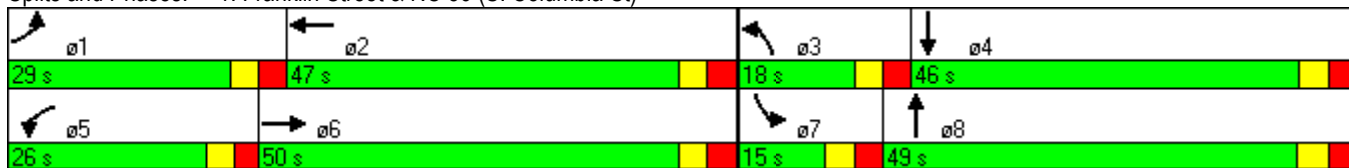


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	111.9	47.3		100.4	75.7		158.8	67.1		145.8	74.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	111.9	47.3		100.4	75.7		158.8	67.1		145.8	74.2	
LOS	F	D		F	E		F	E		F	E	
Approach Delay		63.9			80.4			80.0				82.7
Approach LOS		E			F			F				F
Queue Length 50th (ft)	221	300		167	382		~126	~425		90	340	
Queue Length 95th (ft)	#364	349		#271	#471		m#264	m#558		#209	#471	
Internal Link Dist (ft)		726			860			892			742	
Turn Bay Length (ft)	225			100			400			100		
Base Capacity (vph)	243	945		223	818		128	806		100	743	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.99	0.74		0.83	0.98		1.05	1.02		0.97	0.97	

Intersection Summary

Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 41 (29%), Referenced to phase 4:SBT and 8:NBT, Start of Green  
 Natural Cycle: 115  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.05  
 Intersection Signal Delay: 76.6      Intersection LOS: E  
 Intersection Capacity Utilization 84.8%      ICU Level of Service E  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Franklin Street & NC 86 (S. Columbia St)



Lanes, Volumes, Timings  
2: Cameron Avenue & NC 86 (S. Columbia St)

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	11	105	0	0	208	29	239	500	43	64	0	584
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	12	12	12	10	10	10	11	11	12
Storage Length (ft)	110		0	0		0	0		0	150		0
Storage Lanes	1		0	0		0	1		0	1		2
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.88
Ped Bike Factor	0.98				0.99		0.95	0.98		0.92		0.91
Fr <sub>t</sub>					0.984			0.988				0.850
Fl <sub>t</sub> Protected	0.950						0.950			0.950		
Satd. Flow (prot)	1510	1644	0	0	1606	0	1378	2675	0	1468	0	2391
Fl <sub>t</sub> Permitted	0.226						0.950			0.950		
Satd. Flow (perm)	351	1644	0	0	1606	0	1315	2675	0	1351	0	2179
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25				25
Link Distance (ft)		412			1056			839				972
Travel Time (s)		10.7			57.6			22.9				26.5
Confl. Peds. (#/hr)	33		65	65		33	37		103	103		37
Peak Hour Factor	0.77	0.77	1.00	1.00	0.82	0.82	0.84	0.84	0.84	0.91	1.00	0.91
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	10%	10%	10%	7%	7%	7%
Adj. Flow (vph)	14	136	0	0	254	35	285	595	51	70	0	642
Shared Lane Traffic (%)												
Lane Group Flow (vph)	14	136	0	0	289	0	285	646	0	70	0	642
Turn Type	Perm						Split			custom		custom
Protected Phases		4			8		2	2		1		1
Permitted Phases	4									1		1
Detector Phase	4	4			8		2	2		1		1
Switch Phase												
Minimum Initial (s)	10.0	10.0			10.0		7.0	7.0		7.0		7.0
Minimum Split (s)	17.0	17.0			17.0		21.0	21.0		15.0		15.0
Total Split (s)	33.0	33.0	0.0	0.0	33.0	0.0	39.0	39.0	0.0	42.0	0.0	42.0
Total Split (%)	23.6%	23.6%	0.0%	0.0%	23.6%	0.0%	27.9%	27.9%	0.0%	30.0%	0.0%	30.0%
Maximum Green (s)	26.8	26.8			26.8		32.8	32.8		36.4		36.4
Yellow Time (s)	3.2	3.2			3.2		3.1	3.1		3.0		3.0
All-Red Time (s)	3.0	3.0			3.0		3.1	3.1		2.6		2.6
Lost Time Adjust (s)	-1.2	-1.2	0.0	0.0	-1.2	0.0	-1.2	-1.2	0.0	-0.6	0.0	-0.6
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	4.0	5.0	5.0	4.0	5.0	4.0	5.0
Lead/Lag							Lag	Lag		Lead		Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0			2.0		2.0	2.0		2.0		2.0
Recall Mode	Min	Min			None		C-Max	C-Max		None		None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	27.1	27.1			27.1		51.8	51.8		46.0		46.0
Actuated g/C Ratio	0.19	0.19			0.19		0.37	0.37		0.33		0.33
v/c Ratio	0.21	0.43			0.93		0.56	0.65		0.14		0.82

Lanes, Volumes, Timings  
 2: Cameron Avenue & NC 86 (S. Columbia St)

2/28/2014

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	26.0
Total Split (s)	26.0
Total Split (%)	19%
Maximum Green (s)	23.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	15.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	



Lanes, Volumes, Timings  
 2: Cameron Avenue & NC 86 (S. Columbia St)

2/28/2014

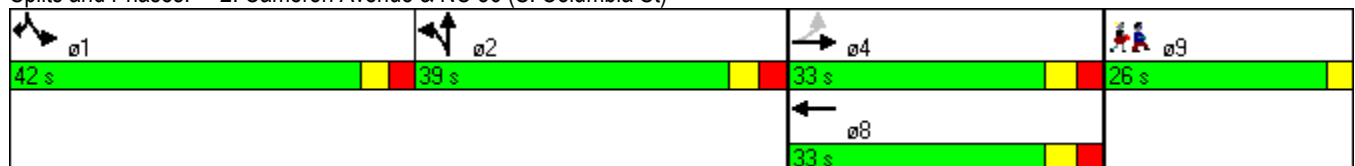


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	29.0	21.6			90.9		25.9	26.7		15.6		28.1
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0		1.4
Total Delay	29.0	21.6			90.9		25.9	26.7		15.6		29.5
LOS	C	C			F		C	C		B		C
Approach Delay		22.3			90.9			26.5				
Approach LOS		C			F			C				
Queue Length 50th (ft)	2	28			259		208	264		30		281
Queue Length 95th (ft)	m9	87			#364		93	98		m33		m314
Internal Link Dist (ft)		332			976			759				892
Turn Bay Length (ft)	110									150		
Base Capacity (vph)	70	329			321		510	990		483		786
Starvation Cap Reductn	0	0			0		0	0		0		0
Spillback Cap Reductn	0	0			0		0	0		0		43
Storage Cap Reductn	0	0			0		0	0		0		0
Reduced v/c Ratio	0.20	0.41			0.90		0.56	0.65		0.14		0.86

Intersection Summary

Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 16 (11%), Referenced to phase 2:NBTL, Start of Green  
 Natural Cycle: 130  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.93  
 Intersection Signal Delay: 35.7  
 Intersection LOS: D  
 Intersection Capacity Utilization 67.6%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Cameron Avenue & NC 86 (S. Columbia St)



Lane Group	ø9
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Lanes, Volumes, Timings  
3: Cameron Avenue & Pittsboro Street

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↗		↖↗	↖							
Volume (vph)	0	146	156	619	398	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	12	12	12	12	12	12	12	12
Storage Length (ft)	0		0	0		90	0		0	0		0
Storage Lanes	0		0	2		1	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.83		0.67								
Fr t		0.930										
Flt Protected				0.950								
Satd. Flow (prot)	0	1288	0	2874	1613	0	0	0	0	0	0	0
Flt Permitted				0.950								
Satd. Flow (perm)	0	1288	0	1916	1613	0	0	0	0	0	0	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25				25
Link Distance (ft)		258			412			549				191
Travel Time (s)		30.0			10.7			15.0				5.2
Confl. Peds. (#/hr)	191		120	120		191	98					98
Peak Hour Factor	1.00	0.83	0.83	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	6%	6%	6%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	0	176	188	652	419	0	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	364	0	652	419	0	0	0	0	0	0	0
Turn Type				Prot								
Protected Phases		2		1	6							
Permitted Phases												
Detector Phase		2		1	6							
Switch Phase												
Minimum Initial (s)		10.0		7.0	10.0							
Minimum Split (s)		20.2		20.0	20.0							
Total Split (s)	0.0	68.0	0.0	50.0	118.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Split (%)	0.0%	48.6%	0.0%	35.7%	84.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)		62.8		44.9	113.0							
Yellow Time (s)		3.1		3.0	3.3							
All-Red Time (s)		2.1		2.1	1.7							
Lost Time Adjust (s)	0.0	-0.2	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	3.9	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		1.0		4.0	1.0							
Recall Mode		None		C-Max	None							
Walk Time (s)		7.0										
Flash Dont Walk (s)		4.0										
Pedestrian Calls (#/hr)		0										
Act Effct Green (s)		45.6		64.4	115.0							
Actuated g/C Ratio		0.33		0.46	0.82							
v/c Ratio		0.87		0.49	0.32							

Lanes, Volumes, Timings  
 3: Cameron Avenue & Pittsboro Street

2/28/2014

Lane Group	ø4
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	4
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	16%
Maximum Green (s)	18.0
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	1.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	9.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	

Lanes, Volumes, Timings  
 3: Cameron Avenue & Pittsboro Street

2/28/2014

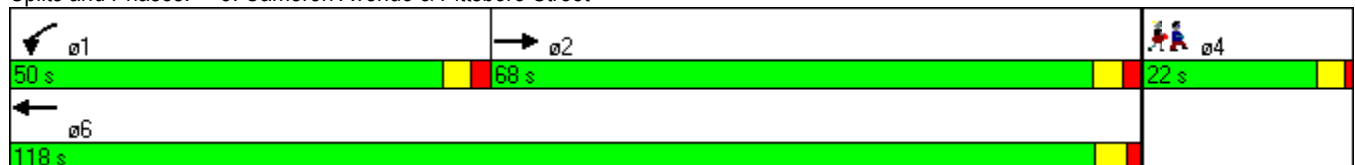


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		64.0		20.0	4.5							
Queue Delay		0.0		1.1	1.7							
Total Delay		64.0		21.1	6.2							
LOS		E		C	A							
Approach Delay		64.0			15.3							
Approach LOS		E			B							
Queue Length 50th (ft)		310		184	90							
Queue Length 95th (ft)		342		m342	m163							
Internal Link Dist (ft)		178			332			469			111	
Turn Bay Length (ft)												
Base Capacity (vph)		580		1322	1325							
Starvation Cap Reductn		0		415	711							
Spillback Cap Reductn		0		0	0							
Storage Cap Reductn		0		0	0							
Reduced v/c Ratio		0.63		0.72	0.68							

Intersection Summary

Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 125 (89%), Referenced to phase 1:WBL, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.87  
 Intersection Signal Delay: 27.6  
 Intersection LOS: C  
 Intersection Capacity Utilization 50.5%  
 ICU Level of Service A  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Cameron Avenue & Pittsboro Street



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Lane Group	ø4
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

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Lanes, Volumes, Timings  
4: McCauley Street & Pittsboro Street

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	112	27	253	191	0	0	0	0	253	617	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	200		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor		0.97		0.88							0.95	
Frt		0.974									0.996	
Flt Protected				0.950							0.986	
Satd. Flow (prot)	0	1422	0	1577	1660	0	0	0	0	0	2996	0
Flt Permitted				0.647							0.986	
Satd. Flow (perm)	0	1422	0	941	1660	0	0	0	0	0	2866	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25		25				25			25	
Link Distance (ft)		493		552				1169			261	
Travel Time (s)		13.4		15.1				31.9			7.1	
Confl. Peds. (#/hr)	81		98	98		81	67		66	66		67
Peak Hour Factor	1.00	0.80	0.80	0.92	0.92	1.00	1.00	1.00	1.00	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	6%	6%	6%
Parking (#/hr)		0	0									
Adj. Flow (vph)	0	140	34	275	208	0	0	0	0	281	686	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	174	0	275	208	0	0	0	0	0	994	0
Turn Type				Perm							Perm	
Protected Phases		4			8							6
Permitted Phases				8							6	
Detector Phase		4		8	8						6	6
Switch Phase												
Minimum Initial (s)		7.0		7.0	7.0					10.0	10.0	
Minimum Split (s)		21.0		21.0	21.0					24.0	24.0	
Total Split (s)	0.0	34.0	0.0	34.0	34.0	0.0	0.0	0.0	0.0	36.0	36.0	0.0
Total Split (%)	0.0%	48.6%	0.0%	48.6%	48.6%	0.0%	0.0%	0.0%	0.0%	51.4%	51.4%	0.0%
Maximum Green (s)		29.2		28.4	28.4					30.7	30.7	
Yellow Time (s)		3.3		3.0	3.0					3.3	3.3	
All-Red Time (s)		1.5		2.6	2.6					2.0	2.0	
Lost Time Adjust (s)	0.0	0.2	-0.3	-0.6	-0.6	0.0	0.0	0.0	0.0	-1.1	-0.3	0.0
Total Lost Time (s)	4.0	5.0	3.7	5.0	5.0	4.0	4.0	4.0	4.0	4.2	5.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0					3.0	3.0	
Recall Mode		None		None	None					C-Max	C-Max	
Walk Time (s)		7.0		7.0	7.0					7.0	7.0	
Flash Dont Walk (s)		6.0		7.0	7.0					8.0	8.0	
Pedestrian Calls (#/hr)		0		0	0					0	0	
Act Effct Green (s)		24.6		24.6	24.6						35.4	
Actuated g/C Ratio		0.35		0.35	0.35						0.51	
v/c Ratio		0.35		0.83	0.36						0.69	

Lanes, Volumes, Timings  
 4: McCauley Street & Pittsboro Street

2/28/2014

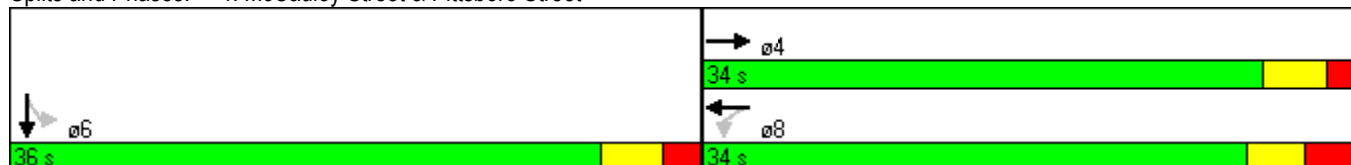


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		17.6		41.6	20.0							17.9
Queue Delay		0.0		0.0	0.0							0.0
Total Delay		17.6		41.6	20.0							17.9
LOS		B		D	B							B
Approach Delay		17.6			32.3							17.9
Approach LOS		B			C							B
Queue Length 50th (ft)		51		78	58							310
Queue Length 95th (ft)		79		256	103							207
Internal Link Dist (ft)		413			472			1089				181
Turn Bay Length (ft)				200								
Base Capacity (vph)		589		390	688							1448
Starvation Cap Reductn		0		0	0							0
Spillback Cap Reductn		0		0	0							0
Storage Cap Reductn		0		0	0							0
Reduced v/c Ratio		0.30		0.71	0.30							0.69

Intersection Summary

Area Type:	CBD
Cycle Length:	70
Actuated Cycle Length:	70
Offset:	4 (6%), Referenced to phase 6:SBTL, Start of Green
Natural Cycle:	50
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.83
Intersection Signal Delay:	22.1
Intersection LOS:	C
Intersection Capacity Utilization:	67.0%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 4: McCauley Street & Pittsboro Street





Lanes, Volumes, Timings  
5: South Road & NC 86 (S. Columbia St)

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	69	269	0	0	326	207	124	739	204	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	12	12	13	13	12	11	11	11	11	11
Storage Length (ft)	150		0	0		300	0		0	0		0
Storage Lanes	1		0	0		1	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	0.91	0.91	1.00	1.00	1.00	1.00
Ped Bike Factor	0.90				0.99	0.82		0.97	0.91			
Fr <sub>t</sub>					0.991	0.850			0.850			
Fl <sub>t</sub> Protected	0.950							0.993				
Satd. Flow (prot)	1593	1788	0	0	1598	1385	0	4111	1289	0	0	0
Fl <sub>t</sub> Permitted	0.950							0.993				
Satd. Flow (perm)	1430	1788	0	0	1598	1141	0	4007	1174	0	0	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25				25
Link Distance (ft)		552			646			532				839
Travel Time (s)		15.1			17.6			14.5				22.9
Confl. Peds. (#/hr)	68		218	218		68	53		141	141		53
Peak Hour Factor	0.94	0.94	1.00	1.00	0.97	0.97	0.94	0.94	0.94	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	9%	9%	9%	2%	2%	2%
Adj. Flow (vph)	73	286	0	0	336	213	132	786	217	0	0	0
Shared Lane Traffic (%)						10%						
Lane Group Flow (vph)	73	286	0	0	357	192	0	918	217	0	0	0
Turn Type	Split					Perm	Perm		Free			
Protected Phases	4	4			3			2				
Permitted Phases						3	2		Free			
Detector Phase	4	4			3	3	2	2				
Switch Phase												
Minimum Initial (s)	7.0	7.0			7.0	7.0	10.0	10.0				
Minimum Split (s)	24.0	24.0			24.0	24.0	27.0	27.0				
Total Split (s)	41.0	41.0	0.0	0.0	52.0	52.0	47.0	47.0	0.0	0.0	0.0	0.0
Total Split (%)	29.3%	29.3%	0.0%	0.0%	37.1%	37.1%	33.6%	33.6%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)	35.4	35.4			46.5	46.5	41.1	41.1				
Yellow Time (s)	3.5	3.5			3.1	3.1	3.4	3.4				
All-Red Time (s)	2.1	2.1			2.4	2.4	2.5	2.5				
Lost Time Adjust (s)	-0.6	-0.6	0.0	0.0	-0.5	-0.5	-1.5	-0.9	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	4.0	5.0	5.0	4.4	5.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag			Lead	Lead						
Lead-Lag Optimize?	Yes	Yes			Yes	Yes						
Vehicle Extension (s)	2.0	2.0			2.0	2.0	2.0	2.0				
Recall Mode	None	None			Min	Min	C-Max	C-Max				
Walk Time (s)	7.0	7.0			7.0	7.0	7.0	7.0				
Flash Dont Walk (s)	10.0	10.0			10.0	10.0	14.0	14.0				
Pedestrian Calls (#/hr)	0	0			0	0	0	0				
Act Effct Green (s)	27.4	27.4			36.5	36.5		61.1	140.0			
Actuated g/C Ratio	0.20	0.20			0.26	0.26		0.44	1.00			
v/c Ratio	0.23	0.82			0.86	0.64		0.53	0.18			

Lanes, Volumes, Timings  
 5: South Road & NC 86 (S. Columbia St)

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	41.2	62.1			68.1	55.2		28.6	0.3			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	41.2	62.1			68.1	55.2		28.6	0.3			
LOS	D	E			E	E		C	A			
Approach Delay		57.9			63.6			23.2				
Approach LOS		E			E			C				
Queue Length 50th (ft)	56	223			327	164		140	0			
Queue Length 95th (ft)	m74	308			415	232		347	0			
Internal Link Dist (ft)		472			566			452			759	
Turn Bay Length (ft)	150					300						
Base Capacity (vph)	410	460			536	383		1748	1174			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.18	0.62			0.67	0.50		0.53	0.18			

Intersection Summary

Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 126 (90%), Referenced to phase 2:NBTL, Start of Green  
 Natural Cycle: 75  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.86  
 Intersection Signal Delay: 40.1  
 Intersection LOS: D  
 Intersection Capacity Utilization 67.0%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: South Road & NC 86 (S. Columbia St)



Lanes, Volumes, Timings  
6: Manning Drive & NC 86 NB (S. Columbia St)

2/28/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	82	245	0	230	0	486	0	556	91	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			2%			2%				0%
Storage Length (ft)	125		0	0		75	0		150	0		0
Storage Lanes	1		0	1		1	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	0.88	1.00	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99			0.84					0.93			
Fr <sub>t</sub>						0.850			0.850			
Fl <sub>t</sub> Protected	0.950			0.950								
Satd. Flow (prot)	1512	3023	0	1489	0	2345	0	3034	1358	0	0	0
Fl <sub>t</sub> Permitted	0.950			0.950								
Satd. Flow (perm)	1496	3023	0	1246	0	2345	0	3034	1266	0	0	0
Right Turn on Red	No		No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			35				35
Link Distance (ft)		241			637			222				480
Travel Time (s)		6.6			17.4			4.3				9.4
Confl. Peds. (#/hr)	5		67	67		5	1		31	31		1
Peak Hour Factor	0.94	0.94	1.00	0.85	1.00	0.85	1.00	0.87	0.87	1.00	1.00	1.00
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%	6%	6%	6%	2%	2%	2%
Adj. Flow (vph)	87	261	0	271	0	572	0	639	105	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	87	261	0	271	0	572	0	639	105	0	0	0
Turn Type	Split			Prot		custom			pm+ov			
Protected Phases	4	4		3		3		2	3			
Permitted Phases									2			
Detector Phase	4	4		3		3		2	3			
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0		7.0		10.0	7.0			
Minimum Split (s)	36.0	36.0		22.0		22.0		30.0	22.0			
Total Split (s)	38.0	38.0	0.0	57.0	0.0	57.0	0.0	45.0	57.0	0.0	0.0	0.0
Total Split (%)	27.1%	27.1%	0.0%	40.7%	0.0%	40.7%	0.0%	32.1%	40.7%	0.0%	0.0%	0.0%
Maximum Green (s)	32.3	32.3		51.4		51.4		39.2	51.4			
Yellow Time (s)	3.2	3.2		3.0		3.0		3.4	3.0			
All-Red Time (s)	2.5	2.5		2.6		2.6		2.4	2.6			
Lost Time Adjust (s)	-0.7	-0.7	-0.5	-0.6	0.0	-0.6	-0.5	-0.8	-0.6	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	3.5	5.0	4.0	5.0	3.5	5.0	5.0	4.0	4.0	4.0
Lead/Lag	Lead	Lead		Lag		Lag			Lag			
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		2.0		2.0		3.0	2.0			
Recall Mode	Min	Min		None		None		C-Max	None			
Walk Time (s)	4.0	4.0						4.0				
Flash Dont Walk (s)	16.0	16.0						19.0				
Pedestrian Calls (#/hr)	0	0						0				
Act Effct Green (s)	18.1	18.1		40.7		40.7		66.2	106.9			
Actuated g/C Ratio	0.13	0.13		0.29		0.29		0.47	0.76			
v/c Ratio	0.45	0.67		0.63		0.84		0.45	0.11			

Lanes, Volumes, Timings  
 6: Manning Drive & NC 86 NB (S. Columbia St)

2/28/2014



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Control Delay	53.1	56.2		48.9		57.7		27.9	5.9			
Queue Delay	0.0	0.0		0.0		0.0		0.0	0.0			
Total Delay	53.1	56.2		48.9		57.7		27.9	5.9			
LOS	D	E		D		E		C	A			
Approach Delay		55.5						24.8				
Approach LOS		E						C				
Queue Length 50th (ft)	63	106		215		278		141	20			
Queue Length 95th (ft)	m97	151		263		301		248	62			
Internal Link Dist (ft)		161			557			142			400	
Turn Bay Length (ft)	125					75			150			
Base Capacity (vph)	356	713		553		871		1435	1040			
Starvation Cap Reductn	0	0		0		0		0	0			
Spillback Cap Reductn	0	0		0		0		0	0			
Storage Cap Reductn	0	0		0		0		0	0			
Reduced v/c Ratio	0.24	0.37		0.49		0.66		0.45	0.10			

Intersection Summary

Area Type: CBD  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 0 (0%), Referenced to phase 2:NET, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.84  
 Intersection Signal Delay: 43.4  
 Intersection LOS: D  
 Intersection Capacity Utilization 60.7%  
 ICU Level of Service B  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Manning Drive & NC 86 NB (S. Columbia St)



Lanes, Volumes, Timings  
7: Westwood Drive & NC 86 (S. Columbia St)

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↔			↔	↔	↔	↔	↔	↔	↔	↔
Volume (vph)	3	4	13	398	7	171	9	463	119	83	747	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	11	11	12	12	14	11	11	11
Grade (%)		-3%			-5%			5%				-5%
Storage Length (ft)	0		0	0		150	250		250	0		0
Storage Lanes	0		0	0		1	1		1	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.83			0.85	0.97			0.92		1.00	
Frt		0.913				0.850			0.850		0.999	
Flt Protected		0.993			0.953		0.950			0.950		
Satd. Flow (prot)	0	1387	0	0	1759	1569	1615	1700	1541	1671	1757	0
Flt Permitted		0.993			0.953		0.201			0.281		
Satd. Flow (perm)	0	1385	0	0	1501	1528	342	1700	1414	494	1757	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			35			25	
Link Distance (ft)		274			592			630			946	
Travel Time (s)		7.5			16.1			12.3			25.8	
Confl. Peds. (#/hr)	4		59	59		4	21		21	21		21
Peak Hour Factor	0.59	0.59	0.59	0.92	0.92	0.92	0.90	0.90	0.90	0.93	0.93	0.93
Heavy Vehicles (%)	5%	5%	5%	2%	2%	2%	9%	9%	9%	7%	7%	7%
Adj. Flow (vph)	5	7	22	433	8	186	10	514	132	89	803	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	34	0	0	441	186	10	514	132	89	807	0
Turn Type	Split			Split		pm+ov	Perm		pm+ov	pm+pt		
Protected Phases	4	4		3	3	1		2	3	1	6	
Permitted Phases						3	2		2	6		
Detector Phase	4	4		3	3	1	2	2	3	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	10.0	10.0	7.0	7.0	10.0	
Minimum Split (s)	26.0	26.0		13.0	13.0	13.0	29.0	29.0	13.0	13.0	22.0	
Total Split (s)	26.0	26.0	0.0	44.0	44.0	13.0	57.0	57.0	44.0	13.0	70.0	0.0
Total Split (%)	18.6%	18.6%	0.0%	31.4%	31.4%	9.3%	40.7%	40.7%	31.4%	9.3%	50.0%	0.0%
Maximum Green (s)	19.8	19.8		38.1	38.1	7.7	51.7	51.7	38.1	7.7	64.7	
Yellow Time (s)	3.3	3.3		3.5	3.5	3.6	3.6	3.6	3.5	3.6	3.6	
All-Red Time (s)	2.9	2.9		2.4	2.4	1.7	1.7	1.7	2.4	1.7	1.7	
Lost Time Adjust (s)	0.0	-1.2	-1.3	0.0	-0.9	-0.3	-0.3	-0.3	-0.9	-0.3	-0.3	-0.9
Total Lost Time (s)	6.2	5.0	2.7	5.9	5.0	5.0	5.0	5.0	5.0	5.0	5.0	3.1
Lead/Lag	Lag	Lag		Lead	Lead	Lead	Lag	Lag	Lead	Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	3.0	3.0	2.0	2.0	3.0	
Recall Mode	None	None		None	None	None	C-Min	C-Min	None	None	C-Min	
Walk Time (s)	4.0	4.0					4.0	4.0				
Flash Dont Walk (s)	13.0	13.0					19.0	19.0				
Pedestrian Calls (#/hr)	0	0					0	0				
Act Effct Green (s)		9.8			37.4	46.2	69.3	69.3	106.8	83.1	83.1	
Actuated g/C Ratio		0.07			0.27	0.33	0.50	0.50	0.76	0.59	0.59	

Lanes, Volumes, Timings  
 7: Westwood Drive & NC 86 (S. Columbia St)

2/28/2014

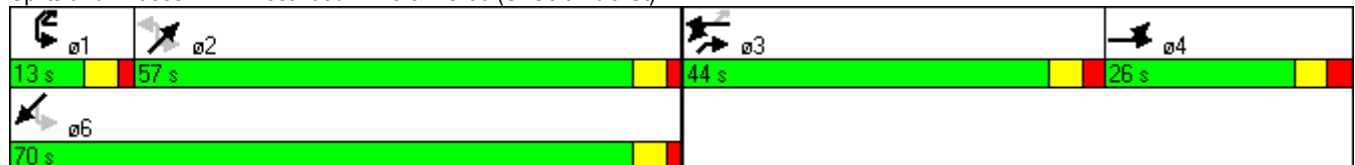


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
v/c Ratio		0.35			0.94	0.37	0.06	0.61	0.12	0.24	0.77	
Control Delay		71.6			78.4	27.4	4.1	8.0	0.7	13.0	29.8	
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		71.6			78.4	27.4	4.1	8.0	0.7	13.0	29.8	
LOS		E			E	C	A	A	A	B	C	
Approach Delay		71.6			63.3			6.4			28.1	
Approach LOS		E			E			A			C	
Queue Length 50th (ft)		30			388	99	1	31	1	37	672	
Queue Length 95th (ft)		43			#584	138	m2	327	11	64	#916	
Internal Link Dist (ft)		194			512			550			866	
Turn Bay Length (ft)						150	250		250			
Base Capacity (vph)		208			490	510	169	842	1130	369	1043	
Starvation Cap Reductn		0			0	0	0	0	0	0	0	
Spillback Cap Reductn		0			0	0	0	0	0	0	0	
Storage Cap Reductn		0			0	0	0	0	0	0	0	
Reduced v/c Ratio		0.16			0.90	0.36	0.06	0.61	0.12	0.24	0.77	

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 137 (98%), Referenced to phase 2:NETL and 6:SWTL, Start of Green  
 Natural Cycle: 115  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.94  
 Intersection Signal Delay: 32.3 Intersection LOS: C  
 Intersection Capacity Utilization 89.5% ICU Level of Service E  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: Westwood Drive & NC 86 (S. Columbia St)



Lanes, Volumes, Timings  
 8: US 15-501 Bypass WB Off Ramp & US 15-501

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖	↖	↖	↖	↕	↖		↕	↖
Volume (vph)	0	0	0	1240	1	44	495	603	0	0	1007	340
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	275		275	150		0	0		0
Storage Lanes	0		0	1		1	1		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	*0.58	1.00	1.00	0.95	1.00
Ped Bike Factor				1.00	1.00		1.00					0.97
Frt						0.850						0.850
Flt Protected				0.950	0.952		0.950					
Satd. Flow (prot)	0	0	0	1681	1685	1583	1671	2041	0	0	3471	1553
Flt Permitted				0.950	0.952		0.083					
Satd. Flow (perm)	0	0	0	1680	1683	1583	146	2041	0	0	3471	1512
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			35			35				35
Link Distance (ft)		424			893			596				306
Travel Time (s)		9.6			17.4			11.6				6.0
Confl. Peds. (#/hr)			1	1			4		3	3		4
Peak Hour Factor	1.00	1.00	1.00	0.95	0.95	0.95	0.88	0.88	1.00	1.00	0.94	0.94
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	8%	8%	8%	4%	4%	4%
Adj. Flow (vph)	0	0	0	1305	1	46	562	685	0	0	1071	362
Shared Lane Traffic (%)				50%								
Lane Group Flow (vph)	0	0	0	652	654	46	562	685	0	0	1071	362
Turn Type				Perm		Perm	pm+pt					Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Detector Phase				8	8	8	5	2			6	6
Switch Phase												
Minimum Initial (s)				7.0	7.0	7.0	7.0	10.0			10.0	10.0
Minimum Split (s)				20.0	20.0	20.0	13.0	20.0			20.0	20.0
Total Split (s)	0.0	0.0	0.0	55.0	55.0	55.0	37.0	85.0	0.0	0.0	48.0	48.0
Total Split (%)	0.0%	0.0%	0.0%	39.3%	39.3%	39.3%	26.4%	60.7%	0.0%	0.0%	34.3%	34.3%
Maximum Green (s)				49.2	49.2	49.2	31.2	79.2			42.0	42.0
Yellow Time (s)				3.7	3.7	3.7	3.0	3.7			4.0	4.0
All-Red Time (s)				2.1	2.1	2.1	2.8	2.1			2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	-0.8	-0.8	-0.8	-0.8	-0.8	0.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.0	4.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0	3.0	5.0	5.0
Lead/Lag							Lead				Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Recall Mode				None	None	None	None	C-Max			C-Max	C-Max
Act Effct Green (s)				50.0	50.0	50.0	80.0	80.0			43.0	43.0
Actuated g/C Ratio				0.36	0.36	0.36	0.57	0.57			0.31	0.31
v/c Ratio				1.09	1.09	0.08	1.30	0.59			1.00	0.78
Control Delay				104.8	105.3	30.5	185.5	48.3			68.9	50.0
Queue Delay				5.8	5.9	0.0	0.0	0.0			38.3	0.0
Total Delay				110.7	111.1	30.5	185.5	48.3			107.2	50.0
LOS				F	F	C	F	D			F	D

Lanes, Volumes, Timings  
 8: US 15-501 Bypass WB Off Ramp & US 15-501

2/28/2014

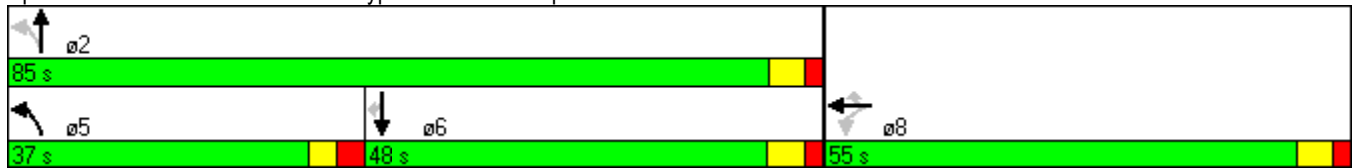


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay					108.2			110.1			92.8	
Approach LOS					F			F			F	
Queue Length 50th (ft)				~700	~703	28	~603	559			~513	282
Queue Length 95th (ft)				#952	#953	58	#804	654			m#666	m393
Internal Link Dist (ft)		344			813			516			226	
Turn Bay Length (ft)				275		275	150					
Base Capacity (vph)				600	601	565	432	1166			1066	464
Starvation Cap Reductn				0	0	0	0	0			0	0
Spillback Cap Reductn				8	8	0	0	0			101	0
Storage Cap Reductn				0	0	0	0	0			0	0
Reduced v/c Ratio				1.10	1.10	0.08	1.30	0.59			1.11	0.78

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 104 (74%), Referenced to phase 2:NBTL and 6:SBT, Start of Green  
 Natural Cycle: 120  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.30  
 Intersection Signal Delay: 103.3      Intersection LOS: F  
 Intersection Capacity Utilization 111.2%      ICU Level of Service H  
 Analysis Period (min) 15  
 \* User Entered Value  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: US 15-501 Bypass WB Off Ramp & US 15-501





# Lanes, Volumes, Timings

## 9: NC 54 Bypass (Fordham Blvd) EB Off Ramp & US 15-501

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	163	0	405	0	0	0	0	961	0	107	2114	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		250	0		0	0		0	150		0
Storage Lanes	1		1	0		0	0		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor										1.00		
Frt			0.850									
Flt Protected	0.950	0.950								0.950		
Satd. Flow (prot)	1588	1588	1495	0	0	0	0	3471	0	1770	3539	0
Flt Permitted	0.950	0.950								0.173		
Satd. Flow (perm)	1588	1588	1495	0	0	0	0	3471	0	322	3539	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		847			142			156			596	
Travel Time (s)		19.3			3.2			3.0			11.6	
Confl. Peds. (#/hr)							4		3	3		4
Peak Hour Factor	0.86	0.86	0.86	1.00	1.00	1.00	1.00	0.89	1.00	0.92	0.92	1.00
Heavy Vehicles (%)	8%	8%	8%	2%	2%	2%	4%	4%	4%	2%	2%	2%
Adj. Flow (vph)	190	0	471	0	0	0	0	1080	0	116	2298	0
Shared Lane Traffic (%)	50%											
Lane Group Flow (vph)	95	95	471	0	0	0	0	1080	0	116	2298	0
Turn Type	Perm		Perm							pm+pt		
Protected Phases		4						2		1	6	
Permitted Phases	4		4							6		
Detector Phase	4	4	4					2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0					10.0		7.0	10.0	
Minimum Split (s)	14.0	14.0	14.0					15.0		13.0	16.0	
Total Split (s)	44.0	44.0	44.0	0.0	0.0	0.0	0.0	83.0	0.0	13.0	96.0	0.0
Total Split (%)	31.4%	31.4%	31.4%	0.0%	0.0%	0.0%	0.0%	59.3%	0.0%	9.3%	68.6%	0.0%
Maximum Green (s)	37.8	37.8	37.8					78.3		7.5	90.1	
Yellow Time (s)	3.1	3.1	3.1					3.7		3.1	4.3	
All-Red Time (s)	3.1	3.1	3.1					1.0		2.4	1.6	
Lost Time Adjust (s)	-1.2	-1.2	-1.2	0.0	0.0	0.0	0.0	0.3	0.0	-0.5	-0.9	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.0	4.0	4.0	4.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0					3.0		3.0	3.0	
Recall Mode	None	None	None					C-Max		None	C-Max	
Act Effct Green (s)	39.0	39.0	39.0					78.1		91.0	91.0	
Actuated g/C Ratio	0.28	0.28	0.28					0.56		0.65	0.65	
v/c Ratio	0.21	0.21	1.13					0.56		0.40	1.00	
Control Delay	40.4	40.4	130.7					8.4		0.8	11.1	
Queue Delay	0.0	0.0	0.0					0.0		0.0	25.2	
Total Delay	40.4	40.4	130.7					8.4		0.8	36.3	
LOS	D	D	F					A		A	D	

Lanes, Volumes, Timings

9: NC 54 Bypass (Fordham Blvd) EB Off Ramp & US 15-501

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		104.8						8.4				34.6
Approach LOS		F						A				C
Queue Length 50th (ft)	70	70	~497					161		3		452
Queue Length 95th (ft)	115	115	#667					m175		m2		m237
Internal Link Dist (ft)		767			62			76				516
Turn Bay Length (ft)	250		250							150		
Base Capacity (vph)	442	442	416					1936		292		2300
Starvation Cap Reductn	0	0	0					0		0		154
Spillback Cap Reductn	0	0	0					0		0		0
Storage Cap Reductn	0	0	0					0		0		0
Reduced v/c Ratio	0.21	0.21	1.13					0.56		0.40		1.07

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 136 (97%), Referenced to phase 2:NBT and 6:SBTL, Start of Green  
 Natural Cycle: 120  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.13  
 Intersection Signal Delay: 39.0  
 Intersection LOS: D  
 Intersection Capacity Utilization 111.2%  
 ICU Level of Service H  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: NC 54 Bypass (Fordham Blvd) EB Off Ramp & US 15-501



Lanes, Volumes, Timings  
 10: SR 1994 (Culbreth Road) & US 15-501

2/28/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	130	96	77	12	75	320	85	1532	31	521	1763	235
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			-8%			-2%			2%	
Storage Length (ft)	0		75	425		350	125		75	550		250
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.99	1.00								
Fr <sub>t</sub>			0.850			0.850			0.850			0.850
Fl <sub>t</sub> Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1726	1817	1544	1823	1918	1631	1753	3506	1568	1752	3504	1567
Fl <sub>t</sub> Permitted	0.438			0.686			0.067			0.062		
Satd. Flow (perm)	796	1817	1523	1312	1918	1631	124	3506	1568	114	3504	1567
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		526			543			533			635	
Travel Time (s)		10.2			10.6			8.1			9.6	
Confl. Peds. (#/hr)			1	1			1					1
Peak Hour Factor	0.87	0.87	0.87	0.89	0.89	0.89	0.93	0.93	0.93	0.92	0.92	0.92
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	2%	2%	2%
Adj. Flow (vph)	149	110	89	13	84	360	91	1647	33	566	1916	255
Shared Lane Traffic (%)												
Lane Group Flow (vph)	149	110	89	13	84	360	91	1647	33	566	1916	255
Turn Type	pm+pt		Perm	Perm		pt+ov	Perm		Perm	pm+pt		pt+ov
Protected Phases	7	4			8	8 1		2		1	6	6 7
Permitted Phases	4		4	8			2		2	6		
Detector Phase	7	4	4	8	8	8 1	2	2	2	1	6	6 7
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		12.0	12.0	12.0	7.0	12.0	
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0		19.0	19.0	19.0	13.0	26.0	
Total Split (s)	14.0	31.0	31.0	17.0	17.0	62.0	64.0	64.0	64.0	45.0	109.0	123.0
Total Split (%)	10.0%	22.1%	22.1%	12.1%	12.1%	44.3%	45.7%	45.7%	45.7%	32.1%	77.9%	87.9%
Maximum Green (s)	7.6	24.6	24.6	10.1	10.1		57.8	57.8	57.8	39.9	102.8	
Yellow Time (s)	3.0	4.2	4.2	4.5	4.5		4.7	4.7	4.7	3.0	4.7	
All-Red Time (s)	3.4	2.2	2.2	2.4	2.4		1.5	1.5	1.5	2.1	1.5	
Lost Time Adjust (s)	-1.4	-1.4	-1.4	-1.9	-1.9	-1.9	-1.2	-1.2	-1.2	-0.1	-1.2	-1.4
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.8
Lead/Lag	Lead			Lag	Lag		Lead	Lead	Lead	Lag		
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None		C-Max	C-Max	C-Max	None	C-Max	
Walk Time (s)												7.0
Flash Dont Walk (s)												12.0
Pedestrian Calls (#/hr)												0
Act Effct Green (s)	25.7	25.7	25.7	11.7	11.7	51.7	59.3	59.3	59.3	104.3	104.3	118.5
Actuated g/C Ratio	0.18	0.18	0.18	0.08	0.08	0.37	0.42	0.42	0.42	0.74	0.74	0.85
v/c Ratio	0.72	0.33	0.32	0.12	0.53	0.60	1.75	1.11	0.05	1.02	0.73	0.19

Lanes, Volumes, Timings  
 10: SR 1994 (Culbreth Road) & US 15-501

2/28/2014

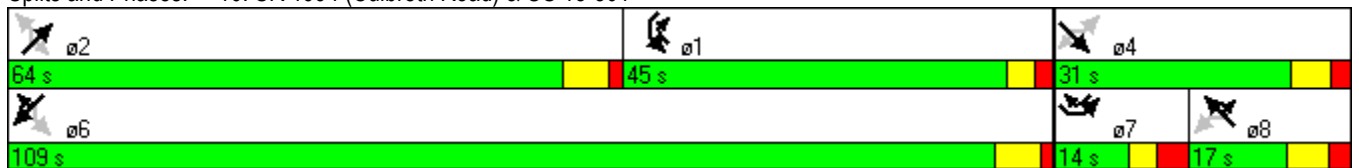


Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Control Delay	72.1	52.7	53.1	61.9	73.8	28.4	420.0	95.4	18.7	51.8	4.4	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.1	52.7	53.1	61.9	73.8	28.4	420.0	95.4	18.7	51.8	4.4	1.2
LOS	E	D	D	E	E	C	F	F	B	D	A	A
Approach Delay	61.1			37.7			110.7			13.9		
Approach LOS	E			D			F			B		
Queue Length 50th (ft)	122	88	71	11	74	202	~120	~910	20	~492	198	19
Queue Length 95th (ft)	#198	142	121	33	130	281	m#222	#1059	m29	m#444	m193	m19
Internal Link Dist (ft)	446			463			453			555		
Turn Bay Length (ft)	75			425			350			250		
Base Capacity (vph)	206	337	283	112	164	606	52	1486	664	553	2611	1327
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.33	0.31	0.12	0.51	0.59	1.75	1.11	0.05	1.02	0.73	0.19

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 117 (84%), Referenced to phase 2:NETL and 6:SWTL, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.75  
 Intersection Signal Delay: 51.3      Intersection LOS: D  
 Intersection Capacity Utilization 97.6%      ICU Level of Service F  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: SR 1994 (Culbreth Road) & US 15-501



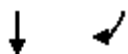
Lanes, Volumes, Timings  
11: Arlen Park Drive & US 15-501

2/28/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	112	28	19	70	17	2	7	21	1514	126	2	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			-7%				-1%			
Storage Length (ft)	75		0	200		0		275		300		275
Storage Lanes	1		0	1		0		1		1		1
Taper Length (ft)	25		25	25		25		25		25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Frt		0.938			0.983					0.850		
Flt Protected	0.950			0.950				0.950				0.950
Satd. Flow (prot)	1761	1739	0	1779	1841	0	0	1761	3522	1576	0	1770
Flt Permitted	0.740			0.720				0.950				0.950
Satd. Flow (perm)	1372	1739	0	1348	1841	0	0	1761	3522	1576	0	1770
Right Turn on Red			No			No				No		
Satd. Flow (RTOR)												
Link Speed (mph)		25			25				45			
Link Distance (ft)		387			478				2738			
Travel Time (s)		10.6			13.0				41.5			
Peak Hour Factor	0.84	0.84	0.84	0.75	0.75	0.75	0.97	0.97	0.97	0.97	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	5%	5%	5%	3%	3%	3%	3%	2%	2%
Adj. Flow (vph)	133	33	23	93	23	3	7	22	1561	130	2	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	133	56	0	93	26	0	0	29	1561	130	0	19
Turn Type	Perm			Perm			Prot	Prot		Perm	Prot	Prot
Protected Phases		4			8		5	5	2		1	1
Permitted Phases	4			8						2		
Detector Phase	4	4		8	8		5	5	2	2	1	1
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0	14.0	14.0	7.0	7.0
Minimum Split (s)	60.0	60.0		15.0	15.0		14.0	14.0	21.0	21.0	13.0	13.0
Total Split (s)	60.0	60.0	0.0	60.0	60.0	0.0	14.0	14.0	67.0	67.0	13.0	13.0
Total Split (%)	42.9%	42.9%	0.0%	42.9%	42.9%	0.0%	10.0%	10.0%	47.9%	47.9%	9.3%	9.3%
Maximum Green (s)	53.4	53.4		52.9	52.9		7.4	7.4	60.4	60.4	7.1	7.1
Yellow Time (s)	3.2	3.2		3.8	3.8		3.0	3.0	4.6	4.6	3.0	3.0
All-Red Time (s)	3.4	3.4		3.3	3.3		3.6	3.6	2.0	2.0	2.9	2.9
Lost Time Adjust (s)	-1.6	-1.6	0.0	-2.1	-2.1	-1.2	0.0	-1.6	-1.6	-1.6	0.0	-0.9
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	2.8	6.6	5.0	5.0	5.0	5.9	5.0
Lead/Lag							Lead	Lead	Lag	Lag	Lead	Lead
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	None	C-Max	C-Max	None	None
Walk Time (s)	4.0	4.0										
Flash Dont Walk (s)	26.0	26.0										
Pedestrian Calls (#/hr)	0	0										
Act Effct Green (s)	20.8	20.8		20.8	20.8			9.8	100.9	100.9		8.5
Actuated g/C Ratio	0.15	0.15		0.15	0.15			0.07	0.72	0.72		0.06
v/c Ratio	0.66	0.22		0.47	0.10			0.24	0.61	0.11		0.18
Control Delay	70.4	52.2		60.7	49.2			77.6	6.1	4.3		71.9
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0		0.0

Lanes, Volumes, Timings  
 11: Arlen Park Drive & US 15-501

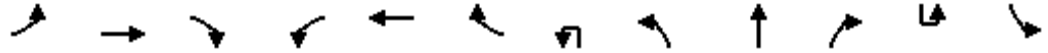
2/28/2014



Lane Group	SBT	SBR
Lane Configurations	↑↑	↑
Volume (vph)	1736	154
Ideal Flow (vphpl)	1900	1900
Grade (%)	0%	
Storage Length (ft)		325
Storage Lanes		1
Taper Length (ft)		25
Lane Util. Factor	0.95	1.00
Fr <sub>t</sub>		0.850
Flt Protected		
Satd. Flow (prot)	3539	1583
Flt Permitted		
Satd. Flow (perm)	3539	1583
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	45	
Link Distance (ft)	1792	
Travel Time (s)	27.2	
Peak Hour Factor	0.92	0.92
Heavy Vehicles (%)	2%	2%
Adj. Flow (vph)	1887	167
Shared Lane Traffic (%)		
Lane Group Flow (vph)	1887	167
Turn Type		Perm
Protected Phases	6	
Permitted Phases		6
Detector Phase	6	6
Switch Phase		
Minimum Initial (s)	14.0	14.0
Minimum Split (s)	25.0	25.0
Total Split (s)	66.0	66.0
Total Split (%)	47.1%	47.1%
Maximum Green (s)	59.4	59.4
Yellow Time (s)	4.6	4.6
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)	-1.6	-1.6
Total Lost Time (s)	5.0	5.0
Lead/Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes
Vehicle Extension (s)	3.0	3.0
Recall Mode	C-Max	C-Max
Walk Time (s)	7.0	7.0
Flash Dont Walk (s)	10.0	10.0
Pedestrian Calls (#/hr)	0	0
Act Effct Green (s)	99.9	99.9
Actuated g/C Ratio	0.71	0.71
v/c Ratio	0.75	0.15
Control Delay	11.6	4.5
Queue Delay	0.0	0.0

Lanes, Volumes, Timings  
 11: Arlen Park Drive & US 15-501

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Total Delay	70.4	52.2		60.7	49.2			77.6	6.1	4.3		71.9
LOS	E	D		E	D			E	A	A		E
Approach Delay		65.0			58.2				7.2			
Approach LOS		E			E				A			
Queue Length 50th (ft)	116	46		79	21			28	124	19		16
Queue Length 95th (ft)	163	77		105	39			m31	m350	m23		m23
Internal Link Dist (ft)		307			398				2658			
Turn Bay Length (ft)	75			200				275		300		275
Base Capacity (vph)	539	683		530	723			125	2539	1136		108
Starvation Cap Reductn	0	0		0	0			0	0	0		0
Spillback Cap Reductn	0	0		0	0			0	0	0		0
Storage Cap Reductn	0	0		0	0			0	0	0		0
Reduced v/c Ratio	0.25	0.08		0.18	0.04			0.23	0.61	0.11		0.18

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 64 (46%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.75  
 Intersection Signal Delay: 13.5  
 Intersection LOS: B  
 Intersection Capacity Utilization 69.2%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 11: Arlen Park Drive & US 15-501

ø1	ø2	ø4
13 s	67 s	60 s
ø5	ø6	ø8
14 s	66 s	60 s



Lane Group	SBT	SBR
Total Delay	11.6	4.5
LOS	B	A
Approach Delay	11.5	
Approach LOS	B	
Queue Length 50th (ft)	486	34
Queue Length 95th (ft)	945	m75
Internal Link Dist (ft)	1712	
Turn Bay Length (ft)		325
Base Capacity (vph)	2525	1129
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.75	0.15
<b>Intersection Summary</b>		



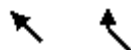
Lanes, Volumes, Timings  
12: US 15-501 & Market St

2/28/2014

Lane Group	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	SEL	SET	SER	NWL
Lane Configurations												
Volume (vph)	2	81	1086	43	29	147	1398	251	318	4	106	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)			-3%				4%			-3%		
Storage Length (ft)		275		0		250		300	150		0	250
Storage Lanes		1		0		1		1	1		0	1
Taper Length (ft)		25		25		25		25	25		25	25
Lane Util. Factor	0.95	1.00	0.95	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00										
Fr <sub>t</sub>			0.994					0.850		0.855		
Fl <sub>t</sub> Protected		0.950				0.950			0.950			0.950
Satd. Flow (prot)	0	1779	3537	0	0	1734	3468	1552	1779	1601	0	1770
Fl <sub>t</sub> Permitted		0.950				0.950			0.950			0.681
Satd. Flow (perm)	0	1778	3537	0	0	1734	3468	1552	1779	1601	0	1269
Right Turn on Red				No				No			No	
Satd. Flow (RTOR)												
Link Speed (mph)			45				45			25		
Link Distance (ft)			942				2738			456		
Travel Time (s)			14.3				41.5			12.4		
Confl. Peds. (#/hr)	1											
Peak Hour Factor	0.94	0.94	0.94	0.90	0.95	0.90	0.95	0.95	0.92	0.90	0.92	0.90
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	2%	2%	3%	2%	3%	2%
Adj. Flow (vph)	2	86	1155	48	31	163	1472	264	346	4	115	60
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	88	1203	0	0	194	1472	264	346	119	0	60
Turn Type	Prot	Prot			Prot	Prot		pm+ov	Prot			Perm
Protected Phases	5	5	2		1	1	6	7	7	4		
Permitted Phases								6				8
Detector Phase	5	5	2		1	1	6	7	7	4		8
Switch Phase												
Minimum Initial (s)	7.0	7.0	14.0		7.0	7.0	14.0	7.0	7.0	7.0		7.0
Minimum Split (s)	13.0	13.0	21.0		14.0	14.0	20.0	14.0	14.0	14.0		14.0
Total Split (s)	13.0	13.0	59.0	0.0	21.0	21.0	67.0	33.0	33.0	60.0	0.0	27.0
Total Split (%)	9.3%	9.3%	42.1%	0.0%	15.0%	15.0%	47.9%	23.6%	23.6%	42.9%	0.0%	19.3%
Maximum Green (s)	7.2	7.2	52.6		14.0	14.0	61.0	26.9	26.9	53.9		20.0
Yellow Time (s)	3.0	3.0	5.0		5.0	5.0	4.6	3.0	3.0	3.0		5.0
All-Red Time (s)	2.8	2.8	1.4		2.0	2.0	1.4	3.1	3.1	3.1		2.0
Lost Time Adjust (s)	0.0	-0.8	-1.4	0.0	-1.0	-2.0	-1.0	-1.1	-1.1	-1.1	-0.8	-2.0
Total Lost Time (s)	5.8	5.0	5.0	4.0	6.0	5.0	5.0	5.0	5.0	5.0	3.2	5.0
Lead/Lag	Lag	Lag	Lag		Lead	Lead	Lead	Lead	Lead			Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes			Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0		3.0
Recall Mode	None	None	C-Max		None	None	C-Max	None	None	None		None
Act Effct Green (s)		8.0	54.0			16.0	62.0	90.0	28.0	55.0		22.0
Actuated g/C Ratio		0.06	0.39			0.11	0.44	0.64	0.20	0.39		0.16
v/c Ratio		0.86	0.88			0.98	0.96	0.26	0.97	0.19		0.30
Control Delay		70.5	21.0			102.3	43.9	8.6	96.4	28.9		56.9
Queue Delay		0.0	0.0			0.0	0.0	0.0	0.0	0.0		0.0
Total Delay		70.5	21.0			102.3	43.9	8.6	96.4	28.9		56.9

Lanes, Volumes, Timings  
12: US 15-501 & Market St

2/28/2014



Lane Group	NWT	NWR
Lane Configurations		
Volume (vph)	6	217
Ideal Flow (vphpl)	1900	1900
Grade (%)	0%	
Storage Length (ft)		0
Storage Lanes		0
Taper Length (ft)		25
Lane Util. Factor	1.00	1.00
Ped Bike Factor		
Frt	0.854	
Flt Protected		
Satd. Flow (prot)	1591	0
Flt Permitted		
Satd. Flow (perm)	1591	0
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	25	
Link Distance (ft)	364	
Travel Time (s)	9.9	
Confl. Peds. (#/hr)		
Peak Hour Factor	0.90	0.90
Heavy Vehicles (%)	2%	2%
Adj. Flow (vph)	7	241
Shared Lane Traffic (%)		
Lane Group Flow (vph)	248	0
Turn Type		
Protected Phases	8	
Permitted Phases		
Detector Phase	8	
Switch Phase		
Minimum Initial (s)	7.0	
Minimum Split (s)	14.0	
Total Split (s)	27.0	0.0
Total Split (%)	19.3%	0.0%
Maximum Green (s)	20.0	
Yellow Time (s)	5.0	
All-Red Time (s)	2.0	
Lost Time Adjust (s)	-2.0	0.0
Total Lost Time (s)	5.0	4.0
Lead/Lag	Lag	
Lead-Lag Optimize?	Yes	
Vehicle Extension (s)	3.0	
Recall Mode	None	
Act Effct Green (s)	22.0	
Actuated g/C Ratio	0.16	
v/c Ratio	0.99	
Control Delay	113.2	
Queue Delay	0.0	
Total Delay	113.2	

Lanes, Volumes, Timings  
 12: US 15-501 & Market St

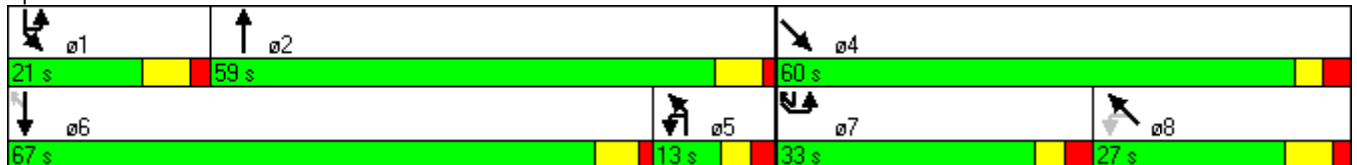
2/28/2014

Lane Group	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	SEL	SET	SER	NWL
LOS		E	C			F	D	A	F	C		E
Approach Delay			24.4				45.0			79.1		
Approach LOS			C				D			E		
Queue Length 50th (ft)		85	355			178	717	118	316	71		49
Queue Length 95th (ft)		m89	m370			m#304	#852	m155	#516	118		96
Internal Link Dist (ft)			862				2658			376		
Turn Bay Length (ft)		275				250		300	150			250
Base Capacity (vph)		102	1364			198	1536	998	356	629		199
Starvation Cap Reductn		0	0			0	0	0	0	0		0
Spillback Cap Reductn		0	0			0	0	0	0	0		0
Storage Cap Reductn		0	0			0	0	0	0	0		0
Reduced v/c Ratio		0.86	0.88			0.98	0.96	0.26	0.97	0.19		0.30

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 138 (99%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.99  
 Intersection Signal Delay: 46.7 Intersection LOS: D  
 Intersection Capacity Utilization 92.5% ICU Level of Service F  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 12: US 15-501 & Market St





Lane Group	NWT	NWR
LOS	F	
Approach Delay	102.2	
Approach LOS	F	
Queue Length 50th (ft)	229	
Queue Length 95th (ft)	#408	
Internal Link Dist (ft)	284	
Turn Bay Length (ft)		
Base Capacity (vph)	250	
Starvation Cap Reductn	0	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.99	
<b>Intersection Summary</b>		

Lanes, Volumes, Timings  
13: Park and Ride Access & US 15-501

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	79	4	124	103	6	411	19	20	720	94	336	1151
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%				-3%			4%
Storage Length (ft)	0		0	0		0		250		0	200	
Storage Lanes	1		0	0		0		1		0	1	
Taper Length (ft)	25		25	25		25		25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	0.95	1.00	0.95
Frt		0.853			0.893				0.982			
Flt Protected	0.950				0.990			0.950			0.950	
Satd. Flow (prot)	1770	1589	0	0	1647	0	0	1770	3438	0	1734	3468
Flt Permitted	0.341				0.843			0.950			0.950	
Satd. Flow (perm)	635	1589	0	0	1402	0	0	1770	3438	0	1734	3468
Right Turn on Red			No			No				No		
Satd. Flow (RTOR)												
Link Speed (mph)		25			25				45			45
Link Distance (ft)		442			451				795			942
Travel Time (s)		12.1			12.3				12.0			14.3
Peak Hour Factor	0.90	0.90	0.72	0.90	0.90	0.90	0.90	0.90	0.92	0.90	0.90	0.91
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	5%	5%	2%	2%	2%
Adj. Flow (vph)	88	4	172	114	7	457	21	22	783	104	373	1265
Shared Lane Traffic (%)												
Lane Group Flow (vph)	88	176	0	0	578	0	0	43	887	0	373	1265
Turn Type	Perm			Perm			Prot	Prot			Prot	
Protected Phases		4			8		5	5	2		1	6
Permitted Phases	4			8								
Detector Phase	4	4		8	8		5	5	2		1	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0	14.0		7.0	14.0
Minimum Split (s)	14.0	14.0		14.0	14.0		14.0	14.0	21.0		14.0	21.0
Total Split (s)	62.0	62.0	0.0	62.0	62.0	0.0	14.0	14.0	42.0	0.0	36.0	64.0
Total Split (%)	44.3%	44.3%	0.0%	44.3%	44.3%	0.0%	10.0%	10.0%	30.0%	0.0%	25.7%	45.7%
Maximum Green (s)	55.0	55.0		55.0	55.0		7.0	7.0	35.0		29.0	57.0
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0		5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	0.0	-2.0	-2.0	0.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	7.0	5.0	2.0	7.0	5.0	5.0	2.0	5.0	5.0
Lead/Lag							Lag	Lag	Lead		Lag	Lead
Lead-Lag Optimize?							Yes	Yes	Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None		None	None		None	None	C-Max		None	C-Max
Act Effct Green (s)	57.0	57.0			57.0			9.0	37.0		31.0	61.8
Actuated g/C Ratio	0.41	0.41			0.41			0.06	0.26		0.22	0.44
v/c Ratio	0.34	0.27			1.01			0.38	0.98		0.97	0.83
Control Delay	33.3	29.1			81.9			66.1	65.2		66.5	12.1
Queue Delay	0.0	0.0			0.0			0.0	0.0		0.0	0.0
Total Delay	33.3	29.1			81.9			66.1	65.2		66.5	12.1
LOS	C	C			F			E	E		E	B
Approach Delay		30.5			81.9				65.2			23.6

Lanes, Volumes, Timings  
 13: Park and Ride Access & US 15-501

2/28/2014

Lane Group	SBR
Lane Configurations	
Volume (vph)	72
Ideal Flow (vphpl)	1900
Grade (%)	
Storage Length (ft)	150
Storage Lanes	1
Taper Length (ft)	25
Lane Util. Factor	1.00
Frt	0.850
Flt Protected	
Satd. Flow (prot)	1552
Flt Permitted	
Satd. Flow (perm)	1552
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.91
Heavy Vehicles (%)	2%
Adj. Flow (vph)	79
Shared Lane Traffic (%)	
Lane Group Flow (vph)	79
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Detector Phase	6
Switch Phase	
Minimum Initial (s)	14.0
Minimum Split (s)	21.0
Total Split (s)	64.0
Total Split (%)	45.7%
Maximum Green (s)	57.0
Yellow Time (s)	5.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	5.0
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Recall Mode	C-Max
Act Effct Green (s)	61.8
Actuated g/C Ratio	0.44
v/c Ratio	0.12
Control Delay	5.6
Queue Delay	0.0
Total Delay	5.6
LOS	A
Approach Delay	

Lanes, Volumes, Timings  
 13: Park and Ride Access & US 15-501

2/28/2014

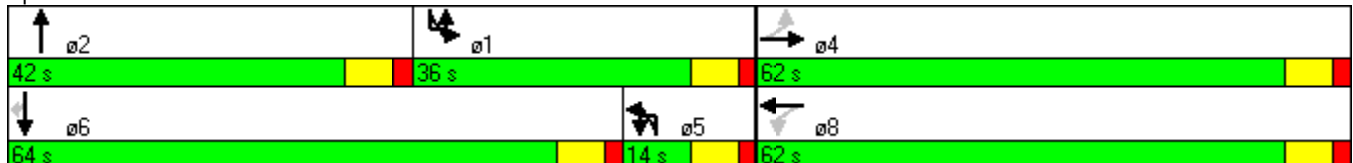


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Approach LOS		C			F				E			C
Queue Length 50th (ft)	55	106			~537			38	429		362	238
Queue Length 95th (ft)	104	165			#785			81	#549		m#409	m261
Internal Link Dist (ft)		362			371				715			862
Turn Bay Length (ft)								250			200	
Base Capacity (vph)	259	647			571			114	909		384	1531
Starvation Cap Reductn	0	0			0			0	0		0	0
Spillback Cap Reductn	0	0			0			0	0		0	0
Storage Cap Reductn	0	0			0			0	0		0	0
Reduced v/c Ratio	0.34	0.27			1.01			0.38	0.98		0.97	0.83

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 135 (96%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.01  
 Intersection Signal Delay: 44.9 Intersection LOS: D  
 Intersection Capacity Utilization 97.4% ICU Level of Service F  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 13: Park and Ride Access & US 15-501





Lane Group	SBR
Approach LOS	
Queue Length 50th (ft)	9
Queue Length 95th (ft)	m11
Internal Link Dist (ft)	
Turn Bay Length (ft)	150
Base Capacity (vph)	685
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.12
Intersection Summary	



Lanes, Volumes, Timings  
14: Dogwood Acres Dr & US 15-501

2/28/2014



Lane Group	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR
Lane Configurations								
Volume (vph)	59	12	4	13	742	75	1304	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)	-1%				-4%		4%	
Storage Length (ft)	0	0		300		0		0
Storage Lanes	1	0		1		1		0
Taper Length (ft)	25	25		25		25		25
Lane Util. Factor	1.00	1.00	0.95	1.00	0.95	1.00	0.95	0.95
Frt	0.977						0.990	
Flt Protected	0.960			0.950		0.950		
Satd. Flow (prot)	1756	0	0	1770	3541	1734	3434	0
Flt Permitted	0.960			0.146		0.950		
Satd. Flow (perm)	1756	0	0	272	3541	1734	3434	0
Right Turn on Red	No							No
Satd. Flow (RTOR)								
Link Speed (mph)	25				45		45	
Link Distance (ft)	1150				899		130	
Travel Time (s)	31.4				13.6		2.0	
Peak Hour Factor	0.76	0.76	0.82	0.82	0.82	0.90	0.92	0.92
Heavy Vehicles (%)	2%	2%	4%	4%	4%	2%	2%	2%
Adj. Flow (vph)	78	16	5	16	905	83	1417	102
Shared Lane Traffic (%)								
Lane Group Flow (vph)	94	0	0	21	905	83	1519	0
Turn Type			Perm	Perm			Prot	
Protected Phases	4				2	1	6	
Permitted Phases			2	2				
Detector Phase	4		2	2	2	1	6	
Switch Phase								
Minimum Initial (s)	7.0		12.0	12.0	12.0	7.0	12.0	
Minimum Split (s)	13.0		19.0	19.0	19.0	14.0	19.0	
Total Split (s)	26.0	0.0	90.0	90.0	90.0	24.0	114.0	0.0
Total Split (%)	18.6%	0.0%	64.3%	64.3%	64.3%	17.1%	81.4%	0.0%
Maximum Green (s)	20.2		83.8	83.8	83.8	17.0	107.9	
Yellow Time (s)	3.0		4.9	4.9	4.9	5.0	4.3	
All-Red Time (s)	2.8		1.3	1.3	1.3	2.0	1.8	
Lost Time Adjust (s)	-0.8	0.0	0.0	-1.2	-1.2	-2.0	-1.1	0.0
Total Lost Time (s)	5.0	4.0	6.2	5.0	5.0	5.0	5.0	4.0
Lead/Lag			Lead	Lead	Lead	Lag		
Lead-Lag Optimize?			Yes	Yes	Yes	Yes		
Vehicle Extension (s)	2.0		6.0	6.0	6.0	3.0	6.0	
Recall Mode	None		C-Max	C-Max	C-Max	None	C-Max	
Act Effct Green (s)	12.7			93.3	93.3	19.0	117.3	
Actuated g/C Ratio	0.09			0.67	0.67	0.14	0.84	
v/c Ratio	0.59			0.12	0.38	0.35	0.53	
Control Delay	75.5			11.5	11.4	50.9	2.0	
Queue Delay	0.0			0.0	0.0	0.0	0.0	
Total Delay	75.5			11.5	11.4	50.9	2.0	
LOS	E			B	B	D	A	
Approach Delay	75.5				11.4		4.5	

Lanes, Volumes, Timings  
 14: Dogwood Acres Dr & US 15-501

2/28/2014



Lane Group	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR
Approach LOS	E				B		A	
Queue Length 50th (ft)	84			6	181	76	63	
Queue Length 95th (ft)	116			18	215	m100	m92	
Internal Link Dist (ft)	1070				819		50	
Turn Bay Length (ft)				300				
Base Capacity (vph)	263			181	2360	235	2878	
Starvation Cap Reductn	0			0	0	0	0	
Spillback Cap Reductn	0			0	0	0	0	
Storage Cap Reductn	0			0	0	0	0	
Reduced v/c Ratio	0.36			0.12	0.38	0.35	0.53	

**Intersection Summary**

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 130 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 50  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.59  
 Intersection Signal Delay: 9.5  
 Intersection LOS: A  
 Intersection Capacity Utilization 67.4%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: Dogwood Acres Dr & US 15-501



Lanes, Volumes, Timings  
15: Smith Level Road & US 15-501

2/28/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	44	63	372	134	52	71	302	575	22	92	1101	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			1%			-1%			1%	
Storage Length (ft)	125		175	150		150	500		250	275		100
Storage Lanes	1		2	2		1	2		1	2		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	0.88	0.97	1.00	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1844	2759	3416	1853	1575	3384	3489	1561	3416	3522	1575
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1752	1844	2759	3416	1853	1575	3384	3489	1561	3416	3522	1575
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			25			45			45	
Link Distance (ft)		800			667			1107			1252	
Travel Time (s)		12.1			18.2			16.8			19.0	
Peak Hour Factor	0.97	0.97	0.97	0.89	0.89	0.89	0.88	0.88	0.88	0.98	0.98	0.98
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	4%	4%	4%	2%	2%	2%
Adj. Flow (vph)	45	65	384	151	58	80	343	653	25	94	1123	72
Shared Lane Traffic (%)												
Lane Group Flow (vph)	45	65	384	151	58	80	343	653	25	94	1123	72
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0	7.0	7.0	12.0	7.0
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0	14.0	14.0	19.0	14.0	14.0	19.0	14.0
Total Split (s)	20.0	25.0	15.0	20.0	25.0	15.0	15.0	90.0	20.0	15.0	90.0	20.0
Total Split (%)	13.3%	16.7%	10.0%	13.3%	16.7%	10.0%	10.0%	60.0%	13.3%	10.0%	60.0%	13.3%
Maximum Green (s)	13.9	18.8	8.3	13.6	18.4	8.7	8.3	83.2	13.6	8.7	83.3	13.9
Yellow Time (s)	3.0	4.0	3.3	3.1	3.8	3.2	3.3	4.7	3.1	3.2	4.5	3.0
All-Red Time (s)	3.1	2.2	3.4	3.3	2.8	3.1	3.4	2.1	3.3	3.1	2.2	3.1
Lost Time Adjust (s)	-1.1	-1.2	-1.7	-1.4	-1.6	-1.3	-1.7	-1.8	-1.4	-1.3	-1.7	-1.1
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	6.0	2.0	2.0	6.0	2.0
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	None
Act Effct Green (s)	9.5	10.3	22.1	11.2	11.9	26.6	10.5	53.0	69.4	9.4	51.8	66.6
Actuated g/C Ratio	0.09	0.10	0.22	0.11	0.12	0.26	0.10	0.53	0.69	0.09	0.51	0.66
v/c Ratio	0.27	0.35	0.64	0.40	0.26	0.19	0.97	0.36	0.02	0.30	0.62	0.07
Control Delay	54.2	54.1	42.9	49.8	49.8	36.1	89.7	15.1	5.9	52.2	19.5	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.2	54.1	42.9	49.8	49.8	36.1	89.7	15.1	5.9	52.2	19.5	7.1
LOS	D	D	D	D	D	D	F	B	A	D	B	A
Approach Delay		45.4			46.0			39.9			21.2	

Lanes, Volumes, Timings  
 15: Smith Level Road & US 15-501

2/28/2014



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Approach LOS		D			D			D			C	
Queue Length 50th (ft)	28	40	125	48	35	41	~123	125	5	30	265	16
Queue Length 95th (ft)	78	101	231	97	88	101	#287	190	14	69	383	35
Internal Link Dist (ft)		720			587			1027			1172	
Turn Bay Length (ft)	125		175	150		150	500		250	275		100
Base Capacity (vph)	275	385	604	535	387	433	354	2900	1146	357	2928	1138
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.17	0.64	0.28	0.15	0.18	0.97	0.23	0.02	0.26	0.38	0.06

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 100.9  
 Natural Cycle: 70  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.97  
 Intersection Signal Delay: 33.6  
 Intersection LOS: C  
 Intersection Capacity Utilization 62.0%  
 ICU Level of Service B  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 15: Smith Level Road & US 15-501

ø1	ø2	ø3	ø4
15 s	90 s	20 s	25 s
ø5	ø6	ø7	ø8
15 s	90 s	20 s	25 s

Lanes, Volumes, Timings

17: Merritt Mill Road / NC 54 WB Off Ramp & Greensboro Street

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖↗	↖		↖	↖↗	↖	↖	↖↗	↖
Volume (vph)	0	0	0	598	263	258	337	356	218	41	564	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			-3%			2%				-3%
Storage Length (ft)	0		0	475		0	225		250	250		0
Storage Lanes	0		0	1		0	1		1	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor							1.00		0.98	1.00		0.98
Fr <sub>t</sub>					0.926				0.850			0.850
Fl <sub>t</sub> Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	0	0	3485	1751	0	1752	3504	1567	1796	3592	1607
Fl <sub>t</sub> Permitted				0.950			0.263			0.486		
Satd. Flow (perm)	0	0	0	3485	1751	0	485	3504	1530	914	3592	1571
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			35			35				35
Link Distance (ft)		467			767			384				607
Travel Time (s)		10.6			14.9			7.5				11.8
Confl. Peds. (#/hr)	2						1		4	4		1
Peak Hour Factor	1.00	1.00	1.00	0.92	0.92	0.92	0.92	0.92	0.92	0.94	0.94	0.94
Adj. Flow (vph)	0	0	0	650	286	280	366	387	237	44	600	63
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	650	566	0	366	387	237	44	600	63
Turn Type				Perm			pm+pt		Perm	Perm		Perm
Protected Phases					8		5	2			6	
Permitted Phases				8			2		2	6		6
Detector Phase				8	8		5	2	2	6	6	6
Switch Phase												
Minimum Initial (s)				7.0	7.0		7.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)				14.0	14.0		13.0	16.0	16.0	16.0	16.0	16.0
Total Split (s)	0.0	0.0	0.0	56.0	56.0	0.0	32.0	64.0	64.0	32.0	32.0	32.0
Total Split (%)	0.0%	0.0%	0.0%	46.7%	46.7%	0.0%	26.7%	53.3%	53.3%	26.7%	26.7%	26.7%
Maximum Green (s)				49.5	49.5		26.4	58.0	58.0	26.0	26.0	26.0
Yellow Time (s)				4.2	4.2		3.0	3.9	3.9	3.9	3.9	3.9
All-Red Time (s)				2.3	2.3		2.6	2.1	2.1	2.1	2.1	2.1
Lost Time Adjust (s)	0.0	0.0	0.0	-1.5	-1.5	0.0	-0.6	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.0	4.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag							Lag			Lead	Lead	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode				None	None		None	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)				46.6	46.6		63.4	63.4	63.4	31.4	31.4	31.4
Actuated g/C Ratio				0.39	0.39		0.53	0.53	0.53	0.26	0.26	0.26
v/c Ratio				0.48	0.83		0.68	0.21	0.29	0.18	0.64	0.15
Control Delay				28.4	44.5		23.5	3.7	4.5	39.7	44.0	37.8
Queue Delay				0.0	0.0		0.0	0.0	0.4	0.0	0.0	0.0
Total Delay				28.4	44.5		23.5	3.7	4.9	39.7	44.0	37.8
LOS				C	D		C	A	A	D	D	D

Lanes, Volumes, Timings

17: Merritt Mill Road / NC 54 WB Off Ramp & Greensboro Street

2/28/2014

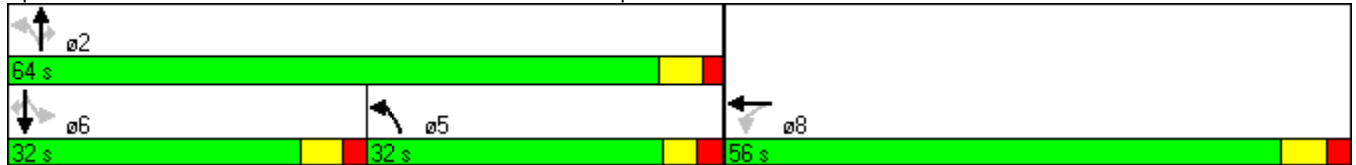


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay					35.9			11.3			43.2	
Approach LOS					D			B			D	
Queue Length 50th (ft)				185	376		172	45	72	27	224	39
Queue Length 95th (ft)				231	513		252	7	10	63	295	80
Internal Link Dist (ft)		387			687			304			527	
Turn Bay Length (ft)				475			225		250	250		
Base Capacity (vph)				1481	744		542	1852	809	240	941	411
Starvation Cap Reductn				0	0		0	0	248	0	0	0
Spillback Cap Reductn				0	0		0	0	0	0	0	0
Storage Cap Reductn				0	0		0	0	0	0	0	0
Reduced v/c Ratio				0.44	0.76		0.68	0.21	0.42	0.18	0.64	0.15

Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	4 (3%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle:	60
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.83
Intersection Signal Delay:	29.3
Intersection LOS:	C
Intersection Capacity Utilization	76.4%
ICU Level of Service	D
Analysis Period (min)	15












Splits and Phases: 17: Merritt Mill Road / NC 54 WB Off Ramp & Greensboro Street



Lanes, Volumes, Timings

18: Smith Level Road & NC 54 Bypass (Fordham Blvd) EB Off Ramp

2/28/2014

											
Lane Group	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	SEL2	SEL	SER
Lane Configurations				↑↑	↑	↑	↑↑		↑	↓	↑
Volume (vph)	0	0	0	760	165	316	840	0	126	0	253
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)	0%			1%			-2%			-3%	
Storage Length (ft)	0	0	0		125	175		0		250	250
Storage Lanes	0	0	0		1	1		0		1	1
Taper Length (ft)	25	25	25		25	25		25		25	25
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00
Ped Bike Factor					0.96						0.99
Frt					0.850						0.850
Flt Protected						0.950			0.950	0.950	
Satd. Flow (prot)	0	0	0	3522	1575	1787	3575	0	1690	1690	1591
Flt Permitted						0.224			0.950	0.950	
Satd. Flow (perm)	0	0	0	3522	1513	421	3575	0	1690	1690	1571
Right Turn on Red					No			No			No
Satd. Flow (RTOR)											
Link Speed (mph)	30			35			35			35	
Link Distance (ft)	706			414			384			490	
Travel Time (s)	16.0			8.1			7.5			9.5	
Confl. Peds. (#/hr)			1		5	5		1			1
Peak Hour Factor	1.00	1.00	1.00	0.90	0.90	0.92	0.92	1.00	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	3%	3%	3%
Adj. Flow (vph)	0	0	0	844	183	343	913	0	135	0	272
Shared Lane Traffic (%)									50%		
Lane Group Flow (vph)	0	0	0	844	183	343	913	0	67	68	272
Turn Type					Perm	pm+pt			Perm		Perm
Protected Phases				2		1	6			4	
Permitted Phases					2	6			4		4
Detector Phase				2	2	1	6		4	4	4
Switch Phase											
Minimum Initial (s)				10.0	10.0	8.0	10.0		7.0	7.0	7.0
Minimum Split (s)				25.0	25.0	15.0	20.0		14.0	14.0	14.0
Total Split (s)	0.0	0.0	0.0	48.0	48.0	33.0	81.0	0.0	39.0	39.0	39.0
Total Split (%)	0.0%	0.0%	0.0%	40.0%	40.0%	27.5%	67.5%	0.0%	32.5%	32.5%	32.5%
Maximum Green (s)				38.2	38.2	26.7	71.1		32.7	32.7	32.7
Yellow Time (s)				3.8	3.8	3.0	3.9		4.0	4.0	4.0
All-Red Time (s)				6.0	6.0	3.3	6.0		2.3	2.3	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	-4.8	-4.8	-1.3	-4.9	0.0	-1.3	-1.3	-1.3
Total Lost Time (s)	4.0	4.0	4.0	5.0	5.0	5.0	5.0	4.0	5.0	5.0	5.0
Lead/Lag				Lag	Lag	Lead					
Lead-Lag Optimize?				Yes	Yes	Yes					
Vehicle Extension (s)				3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode				C-Max	C-Max	None	C-Max		None	None	None
Walk Time (s)				7.0	7.0						
Flash Dont Walk (s)				8.0	8.0						
Pedestrian Calls (#/hr)				0	0						
Act Effct Green (s)				59.0	59.0	83.1	83.1		26.9	26.9	26.9
Actuated g/C Ratio				0.49	0.49	0.69	0.69		0.22	0.22	0.22
v/c Ratio				0.49	0.25	0.67	0.37		0.18	0.18	0.77

Lanes, Volumes, Timings

18: Smith Level Road & NC 54 Bypass (Fordham Blvd) EB Off Ramp

2/28/2014



Lane Group	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	SEL2	SEL	SER
Control Delay				24.0	22.1	20.2	1.9		36.7	36.7	58.1
Queue Delay				0.0	0.0	0.3	0.2		0.0	0.0	0.0
Total Delay				24.0	22.1	20.5	2.1		36.7	36.7	58.1
LOS				C	C	C	A		D	D	E
Approach Delay				23.7			7.1			51.0	
Approach LOS				C			A			D	
Queue Length 50th (ft)				224	80	70	0		44	45	198
Queue Length 95th (ft)				360	166	248	137		80	81	278
Internal Link Dist (ft)	626			334			304			410	
Turn Bay Length (ft)					125	175			250	250	250
Base Capacity (vph)				1731	744	610	2476		479	479	445
Starvation Cap Reductn				0	0	42	720		0	0	0
Spillback Cap Reductn				0	0	0	0		0	0	0
Storage Cap Reductn				0	0	0	0		0	0	0
Reduced v/c Ratio				0.49	0.25	0.60	0.52		0.14	0.14	0.61

Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle:	60
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.77
Intersection Signal Delay:	20.1
Intersection LOS:	C
Intersection Capacity Utilization	57.1%
ICU Level of Service	B
Analysis Period (min)	15

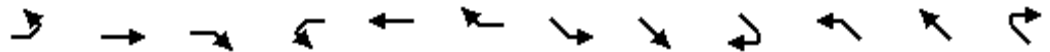
Splits and Phases: 18: Smith Level Road & NC 54 Bypass (Fordham Blvd) EB Off Ramp





Lanes, Volumes, Timings  
 20: US 15-501 (Fordham Blvd) & Manning Drive

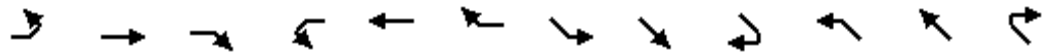
2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	121	1974	4	12	2249	265	671	7	171	14	3	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	9	12
Grade (%)		-5%			0%			-4%			0%	
Storage Length (ft)	400		0	200		1000	0		225	0		75
Storage Lanes	2		0	1		1	0		1	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00					0.99		0.99	
Frt						0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950				0.961	
Satd. Flow (prot)	3485	3592	0	1770	3539	1583	3502	1900	1615	0	1611	1583
Flt Permitted	0.950			0.950			0.950				0.961	
Satd. Flow (perm)	3485	*3811	0	1769	3539	1583	*3819	1900	1593	0	1596	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			35			25	
Link Distance (ft)		579			1496			367			515	
Travel Time (s)		8.8			22.7			7.1			14.0	
Confl. Peds. (#/hr)			1	1					5	5		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.85	0.85	0.85	0.84	0.84	0.84
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	126	2056	4	12	2343	276	789	8	201	17	4	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	126	2060	0	12	2343	276	789	8	201	0	21	24
Turn Type	Prot			Prot		pm+ov	Split		Free	Split		pm+ov
Protected Phases	5	2		1	6	4	4	4		3	3	1
Permitted Phases						6			Free			3
Detector Phase	5	2		1	6	4	4	4		3	3	1
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0	7.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	14.0	19.0		14.0	19.0	32.0	32.0	32.0		14.0	14.0	14.0
Total Split (s)	14.0	117.0	0.0	14.0	117.0	45.0	45.0	45.0	0.0	14.0	14.0	14.0
Total Split (%)	7.4%	61.6%	0.0%	7.4%	61.6%	23.7%	23.7%	23.7%	0.0%	7.4%	7.4%	7.4%
Maximum Green (s)	7.8	110.9		7.8	110.7	38.8	38.8	38.8		7.8	7.8	7.8
Yellow Time (s)	3.0	4.7		3.0	4.5	3.8	3.8	3.8		3.8	3.8	3.0
All-Red Time (s)	3.2	1.4		3.2	1.8	2.4	2.4	2.4		2.4	2.4	3.2
Lost Time Adjust (s)	-1.2	-1.1	0.0	-1.2	-1.3	-1.2	-1.2	-1.2	0.0	-2.5	-1.2	-1.2
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0	3.7	5.0	5.0
Lead/Lag	Lead	Lead		Lag	Lag	Lag	Lag	Lag		Lead	Lead	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	6.0		1.0	6.0	1.0	1.0	1.0		1.0	1.0	1.0
Recall Mode	None	C-Max		None	C-Max	None	None	None		None	None	None
Walk Time (s)						7.0	7.0	7.0				
Flash Dont Walk (s)						18.0	18.0	18.0				
Pedestrian Calls (#/hr)						0	0	0				
Act Effct Green (s)	8.9	114.8		8.8	112.1	160.0	45.9	45.9	190.0		8.4	17.0
Actuated g/C Ratio	0.05	0.60		0.05	0.59	0.84	0.24	0.24	1.00		0.04	0.09

Lanes, Volumes, Timings  
 20: US 15-501 (Fordham Blvd) & Manning Drive

2/28/2014

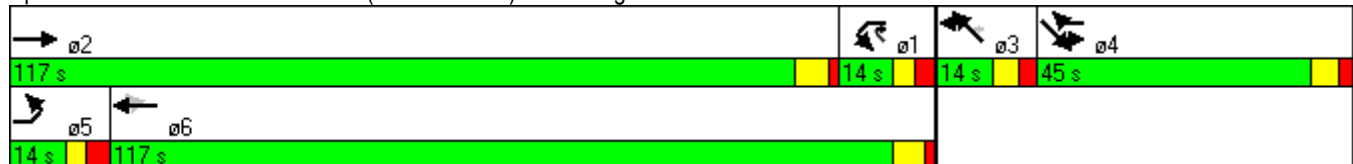


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
v/c Ratio	0.77	0.95		0.15	1.12	0.21	0.93	0.02	0.13		0.30	0.17
Control Delay	117.6	46.0		55.8	72.1	0.6	87.0	59.1	0.2		98.6	79.3
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	117.6	46.0		55.8	72.1	0.6	87.0	59.1	0.2		98.6	79.3
LOS	F	D		E	E	A	F	E	A		F	E
Approach Delay		50.2			64.5			69.2			88.3	
Approach LOS		D			E			E			F	
Queue Length 50th (ft)	81	1271		14	~1748	11	~550	8	0		26	27
Queue Length 95th (ft)	#136	#1480		m14	m#125	m7	#630	24	0		56	58
Internal Link Dist (ft)		499			1416			287			435	
Turn Bay Length (ft)	400			200		1000			225			75
Base Capacity (vph)	165	2170		84	2088	1333	845	459	1593		76	143
Starvation Cap Reductn	0	0		0	0	0	0	0	0		0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0		0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0		0	0
Reduced v/c Ratio	0.76	0.95		0.14	1.12	0.21	0.93	0.02	0.13		0.28	0.17

Intersection Summary

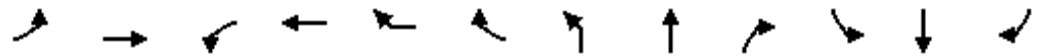
Area Type: Other  
 Cycle Length: 190  
 Actuated Cycle Length: 190  
 Offset: 16 (8%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.12  
 Intersection Signal Delay: 60.1 Intersection LOS: E  
 Intersection Capacity Utilization 96.3% ICU Level of Service F  
 Analysis Period (min) 15  
 \* User Entered Value  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 20: US 15-501 (Fordham Blvd) & Manning Drive



Lanes, Volumes, Timings  
 21: Old Mason Farm Road & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	EBL	EBT	WBL	WBT	WBR	WBR2	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↗	↖			↗	↕	↗	↗	↕	↗
Volume (vph)	9	3	84	3	3	47	21	2519	119	40	2379	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%		3%				0%			0%	
Storage Length (ft)	0		50		0		350		300	125		100
Storage Lanes	0		1		0		1		1	1		1
Taper Length (ft)	25		25		25		25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	*1.00	1.00	1.00	*1.00	1.00
Ped Bike Factor				0.99								
Fr <sub>t</sub>				0.857					0.850			0.850
Fl <sub>t</sub> Protected		0.964	0.950				0.950			0.950		
Satd. Flow (prot)	0	1796	1743	1552	0	0	1770	3725	1583	1770	3725	1583
Fl <sub>t</sub> Permitted		0.742	0.950				0.950			0.950		
Satd. Flow (perm)	0	1382	1743	1552	0	0	1770	*3787	1583	1770	*3771	1583
Right Turn on Red							No		No			
Satd. Flow (RTOR)												
Link Speed (mph)		30		35				45				45
Link Distance (ft)		305		620				1496				1494
Travel Time (s)		6.9		12.1				22.7				22.6
Confl. Peds. (#/hr)							1					
Peak Hour Factor	0.39	0.39	0.86	0.86	0.86	0.86	0.92	0.92	0.92	0.90	0.90	0.90
Adj. Flow (vph)	23	8	98	3	3	55	23	2738	129	44	2643	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	31	98	61	0	0	23	2738	129	44	2643	14
Turn Type	Perm		Split				Prot		pm+ov	Prot		Perm
Protected Phases		7	3	3			5	2	3	1	6	
Permitted Phases	7								2			6
Detector Phase	7	7	3	3			5	2	3	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	7.0	7.0			7.0	12.0	7.0	7.0	12.0	12.0
Minimum Split (s)	13.0	13.0	36.0	36.0			14.0	33.0	36.0	15.0	25.0	25.0
Total Split (s)	13.0	13.0	25.0	25.0	0.0	0.0	14.0	111.0	25.0	16.0	113.0	113.0
Total Split (%)	6.8%	6.8%	13.2%	13.2%	0.0%	0.0%	7.4%	58.4%	13.2%	8.4%	59.5%	59.5%
Maximum Green (s)	5.8	5.8	18.4	18.4			7.0	104.8	18.4	10.1	106.9	106.9
Yellow Time (s)	3.0	3.0	3.6	3.6			3.0	4.6	3.6	3.0	4.4	4.4
All-Red Time (s)	4.2	4.2	3.0	3.0			4.0	1.6	3.0	2.9	1.7	1.7
Lost Time Adjust (s)	0.0	-2.2	-1.6	-1.6	-1.6	-1.6	-2.0	-1.2	-1.6	-0.9	-1.1	-1.1
Total Lost Time (s)	7.2	5.0	5.0	5.0	2.4	2.4	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag			Lead	Lead			Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0	2.0	2.0			2.0	2.0	2.0	2.0	2.0	2.0
Recall Mode	None	None	None	None			None	C-Max	None	None	C-Max	C-Max
Walk Time (s)			4.0	4.0				7.0	4.0		7.0	7.0
Flash Dont Walk (s)			25.0	25.0				16.0	25.0		11.0	11.0
Pedestrian Calls (#/hr)			0	0				0	0		0	0
Act Effct Green (s)		8.1	16.1	16.1			9.0	115.2	132.4	10.4	119.6	119.6
Actuated g/C Ratio		0.04	0.08	0.08			0.05	0.61	0.70	0.05	0.63	0.63
v/c Ratio		0.53	0.66	0.46			0.27	1.21	0.12	0.46	1.13	0.01
Control Delay		119.2	104.9	93.3			101.3	126.4	3.4	102.0	96.2	17.5

Lanes, Volumes, Timings  
 21: Old Mason Farm Road & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	SEL2	SEL	SER	SER2
Lane Configurations				
Volume (vph)	51	6	63	1
Ideal Flow (vphpl)	1900	1900	1900	1900
Grade (%)		2%		
Storage Length (ft)		125	0	
Storage Lanes		1	0	
Taper Length (ft)		25	25	
Lane Util. Factor	0.95	0.95	1.00	1.00
Ped Bike Factor				
Frt		0.872		
Flt Protected	0.950	0.993		
Satd. Flow (prot)	1664	1517	0	0
Flt Permitted	0.950	0.993		
Satd. Flow (perm)	1664	1517	0	0
Right Turn on Red				No
Satd. Flow (RTOR)				
Link Speed (mph)		25		
Link Distance (ft)		359		
Travel Time (s)		9.8		
Confl. Peds. (#/hr)				
Peak Hour Factor	0.59	0.59	0.59	0.59
Adj. Flow (vph)	86	10	107	2
Shared Lane Traffic (%)	10%			
Lane Group Flow (vph)	77	128	0	0
Turn Type	Split			
Protected Phases	4	4		
Permitted Phases				
Detector Phase	4	4		
Switch Phase				
Minimum Initial (s)	5.0	5.0		
Minimum Split (s)	13.0	13.0		
Total Split (s)	25.0	25.0	0.0	0.0
Total Split (%)	13.2%	13.2%	0.0%	0.0%
Maximum Green (s)	17.6	17.6		
Yellow Time (s)	3.0	3.0		
All-Red Time (s)	4.4	4.4		
Lost Time Adjust (s)	-2.4	-2.4	-2.4	0.0
Total Lost Time (s)	5.0	5.0	1.6	4.0
Lead/Lag	Lag	Lag		
Lead-Lag Optimize?				
Vehicle Extension (s)	2.0	2.0		
Recall Mode	None	None		
Walk Time (s)				
Flash Dont Walk (s)				
Pedestrian Calls (#/hr)				
Act Effct Green (s)	20.2	20.2		
Actuated g/C Ratio	0.11	0.11		
v/c Ratio	0.44	0.80		
Control Delay	87.4	113.4		

Lanes, Volumes, Timings  
 21: Old Mason Farm Road & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	EBL	EBT	WBL	WBT	WBR	WBR2	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay		0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		119.2	104.9	93.3			101.3	126.4	3.4	102.0	96.2	17.5
LOS		F	F	F			F	F	A	F	F	B
Approach Delay		119.3		100.5				120.7			95.9	
Approach LOS		F		F				F			F	
Queue Length 50th (ft)		39	121	74			28	~2195	19	54	~2047	7
Queue Length 95th (ft)		35	180	123			m29	#2278	m20	103	#2133	20
Internal Link Dist (ft)		225		540				1416			1414	
Turn Bay Length (ft)			50				350		300	125		100
Base Capacity (vph)		60	183	163			84	2259	1135	102	2345	997
Starvation Cap Reductn		0	0	0			0	0	0	0	0	0
Spillback Cap Reductn		0	0	0			0	0	0	0	0	0
Storage Cap Reductn		0	0	0			0	0	0	0	0	0
Reduced v/c Ratio		0.52	0.54	0.37			0.27	1.21	0.11	0.43	1.13	0.01

Intersection Summary

Area Type: Other  
 Cycle Length: 190  
 Actuated Cycle Length: 190  
 Offset: 188 (99%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.21  
 Intersection Signal Delay: 108.4  
 Intersection Capacity Utilization 93.6%  
 Analysis Period (min) 15  
 \* User Entered Value  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 21: Old Mason Farm Road & US 15-501 (Fordham Blvd)

111 s	16 s	25 s	25 s	13 s
14 s	113 s			

Lanes, Volumes, Timings  
 21: Old Mason Farm Road & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	SEL2	SEL	SER	SER2
Queue Delay	0.0	0.0		
Total Delay	87.4	113.4		
LOS	F	F		
Approach Delay		103.7		
Approach LOS		F		
Queue Length 50th (ft)	94	164		
Queue Length 95th (ft)	105	161		
Internal Link Dist (ft)		279		
Turn Bay Length (ft)	125	125		
Base Capacity (vph)	184	168		
Starvation Cap Reductn	0	0		
Spillback Cap Reductn	0	0		
Storage Cap Reductn	0	0		
Reduced v/c Ratio	0.42	0.76		
<b>Intersection Summary</b>				

Lanes, Volumes, Timings  
 22: NC 54 WB On-Ramp & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↑↑			↑		↑↑	↑		↑↑	↑
Volume (vph)	0	0	1074	0	0	429	0	1748	32	0	1661	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		450	0		0			200	0		375
Storage Lanes	0		1	0		1	0		1	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	0.88	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.865			0.850			0.850
Flt Protected												
Satd. Flow (prot)	0	0	2787	0	0	1611	0	3539	1583	0	3539	1583
Flt Permitted												
Satd. Flow (perm)	0	0	2787	0	0	1611	0	3539	1583	0	3539	1583
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)						82			7			32
Link Speed (mph)		30			25			45				45
Link Distance (ft)		694			685			1058				1301
Travel Time (s)		15.8			18.7			16.0				19.7
Peak Hour Factor	0.92	0.92	0.92	0.90	0.92	0.90	0.92	0.90	0.90	0.90	0.82	0.92
Adj. Flow (vph)	0	0	1167	0	0	477	0	1942	36	0	2026	100
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	1167	0	0	477	0	1942	36	0	2026	100
Turn Type			custom			Free			Free			Free
Protected Phases			4					2 4				6
Permitted Phases			4			Free			Free			Free
Detector Phase			4					2 4				6
Switch Phase												
Minimum Initial (s)			7.0									12.0
Minimum Split (s)			13.0									18.0
Total Split (s)	0.0	0.0	73.0	0.0	0.0	0.0	0.0	170.0	0.0	0.0	97.0	0.0
Total Split (%)	0.0%	0.0%	42.9%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	57.1%	0.0%
Maximum Green (s)			67.9									91.2
Yellow Time (s)			3.1									4.5
All-Red Time (s)			2.0									1.3
Lost Time Adjust (s)	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	-0.8	0.0	0.0	-0.8	0.0
Total Lost Time (s)	4.0	4.0	5.0	4.0	4.0	4.0	4.0	5.0	4.0	4.0	5.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)			3.0									6.0
Recall Mode			C-Max									Max
Act Effct Green (s)			68.0			170.0		170.0	170.0		92.0	170.0
Actuated g/C Ratio			0.40			1.00		1.00	1.00		0.54	1.00
v/c Ratio			1.05			0.30		0.55	0.02		1.06	0.06
Control Delay			88.5			0.5		0.6	0.0		75.6	0.1
Queue Delay			0.0			0.0		0.0	0.0		0.0	0.0
Total Delay			88.5			0.5		0.6	0.0		75.6	0.1
LOS			F			A		A	A		E	A
Approach Delay								0.6			72.0	
Approach LOS								A			E	
Queue Length 50th (ft)			~798			0		0	0		~1296	0

Lane Group	ø2
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Fr <sub>t</sub>	
Fl <sub>t</sub> Protected	
Satd. Flow (prot)	
Fl <sub>t</sub> Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	12.0
Minimum Split (s)	18.0
Total Split (s)	97.0
Total Split (%)	57%
Maximum Green (s)	91.2
Yellow Time (s)	4.5
All-Red Time (s)	1.3
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	6.0
Recall Mode	Max
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	



Lanes, Volumes, Timings  
 22: NC 54 WB On-Ramp & US 15-501 (Fordham Blvd)

2/28/2014

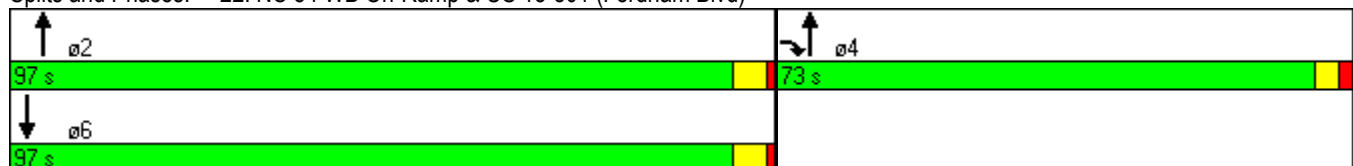


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)			#950			0		0	0		#1193	0
Internal Link Dist (ft)		614			605			978			1221	
Turn Bay Length (ft)			450						200			375
Base Capacity (vph)			1115			1611		3539	1583		1915	1583
Starvation Cap Reductn			0			0		0	0		0	0
Spillback Cap Reductn			0			0		0	0		0	0
Storage Cap Reductn			0			0		0	0		0	0
Reduced v/c Ratio			1.05			0.30		0.55	0.02		1.06	0.06

Intersection Summary

Area Type: Other  
 Cycle Length: 170  
 Actuated Cycle Length: 170  
 Offset: 0 (0%), Referenced to phase 4:NBT, Start of Green  
 Natural Cycle: 140  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.06  
 Intersection Signal Delay: 44.9  
 Intersection LOS: D  
 Intersection Capacity Utilization 91.8%  
 ICU Level of Service F  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 22: NC 54 WB On-Ramp & US 15-501 (Fordham Blvd)



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Lane Group	ø2
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

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Lanes, Volumes, Timings  
 23: NC 54 (Raleigh Road) & Burning Tree Drive

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	66	2421	30	165	2300	53	30	13	188	29	34	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	275		0	0		450	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			0.99			0.99	
Frt		0.998			0.997				0.850		0.945	
Flt Protected	0.950			0.950				0.966			0.987	
Satd. Flow (prot)	1770	5071	0	1770	5063	0	0	1799	1583	0	1722	0
Flt Permitted	0.050			0.050				0.733			0.906	
Satd. Flow (perm)	93	5071	0	93	5063	0	0	1358	1583	0	1581	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			25	
Link Distance (ft)		1026			881			637			457	
Travel Time (s)		20.0			17.2			12.4			12.5	
Confl. Peds. (#/hr)	14		18	18		14	9					9
Peak Hour Factor	0.95	0.95	0.95	0.89	0.89	0.89	0.86	0.86	0.86	0.83	0.83	0.83
Adj. Flow (vph)	69	2548	32	185	2584	60	35	15	219	35	41	52
Shared Lane Traffic (%)												
Lane Group Flow (vph)	69	2580	0	185	2644	0	0	50	219	0	128	0
Turn Type	pm+pt			pm+pt			Perm		Perm	Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8		8	4		
Detector Phase	5	2		1	6		8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0		7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	13.0	32.0		13.0	30.0		48.0	48.0	48.0	46.0	46.0	
Total Split (s)	13.0	77.0	0.0	15.0	79.0	0.0	48.0	48.0	48.0	48.0	48.0	0.0
Total Split (%)	9.3%	55.0%	0.0%	10.7%	56.4%	0.0%	34.3%	34.3%	34.3%	34.3%	34.3%	0.0%
Maximum Green (s)	7.1	70.8		9.1	72.8		41.8	41.8	41.8	41.7	41.7	
Yellow Time (s)	3.0	4.9		3.0	4.9		3.7	3.7	3.7	3.2	3.2	
All-Red Time (s)	2.9	1.3		2.9	1.3		2.5	2.5	2.5	3.1	3.1	
Lost Time Adjust (s)	-0.9	-1.2	0.0	-0.9	-1.2	0.0	0.0	-1.2	-1.2	0.0	-1.3	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	6.2	5.0	5.0	6.3	5.0	4.0
Lead/Lag	Lead	Lead		Lag	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		Min	Min	Min	Min	Min	
Walk Time (s)		7.0			7.0		7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)		18.0			16.0		34.0	34.0	34.0	32.0	32.0	
Pedestrian Calls (#/hr)		0			0		0	0	0	0	0	
Act Effct Green (s)	89.0	89.0		92.6	92.6			26.0	26.0		26.0	
Actuated g/C Ratio	0.64	0.64		0.66	0.66			0.19	0.19		0.19	
v/c Ratio	0.42	0.80		1.02	0.79			0.20	0.74		0.44	
Control Delay	36.9	8.6		120.8	21.2			47.6	68.5		53.8	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	

Lanes, Volumes, Timings  
 23: NC 54 (Raleigh Road) & Burning Tree Drive

2/28/2014

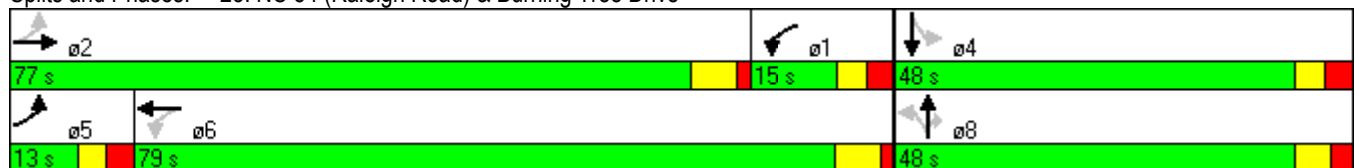


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	36.9	8.6		120.8	21.2			47.6	68.5		53.8	
LOS	D	A		F	C			D	E		D	
Approach Delay		9.3			27.7			64.6			53.8	
Approach LOS		A			C			E			D	
Queue Length 50th (ft)	18	145		~128	613			39	190		104	
Queue Length 95th (ft)	m45	220		#295	826			70	249		144	
Internal Link Dist (ft)		946			801			557			377	
Turn Bay Length (ft)	250			275					450			
Base Capacity (vph)	166	3222		182	3349			417	486		486	
Starvation Cap Reductn	0	0		0	0			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.42	0.80		1.02	0.79			0.12	0.45		0.26	

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 22 (16%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 135  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.02  
 Intersection Signal Delay: 21.7  
 Intersection LOS: C  
 Intersection Capacity Utilization 87.2%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 23: NC 54 (Raleigh Road) & Burning Tree Drive



Lanes, Volumes, Timings  
 24: NC 54 (Raleigh Road) & Hamilton Road

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↗↗↗		↗	↗↗↗		↗	↗	↗	↗	↗	↗
Volume (vph)	53	2312	71	103	2167	58	171	28	112	57	21	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	275		0	250		0	150		150	50		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00		0.99		0.96	0.97	0.98	
Frt		0.996			0.996				0.850		0.898	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	5056	0	1770	5059	0	1770	1863	1583	1770	1647	0
Flt Permitted	0.049			0.049			0.714			0.738		
Satd. Flow (perm)	91	5056	0	91	5059	0	1317	1863	1516	1334	1647	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			25			25	
Link Distance (ft)		359			576			537			463	
Travel Time (s)		5.4			8.7			14.6			12.6	
Confl. Peds. (#/hr)	7		11	11		7	8		25	25		8
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.99	0.99	0.99
Adj. Flow (vph)	56	2460	76	110	2305	62	182	30	119	58	21	45
Shared Lane Traffic (%)												
Lane Group Flow (vph)	56	2536	0	110	2367	0	182	30	119	58	66	0
Turn Type	pm+pt			pm+pt			Perm		Perm	Perm		
Protected Phases	5	2		1	6			8				4
Permitted Phases	2			6			8		8	4		
Detector Phase	5	2		1	6		8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	13.0	25.0		13.0	26.0		41.0	41.0	41.0	39.0	39.0	
Total Split (s)	13.0	84.0	0.0	15.0	86.0	0.0	41.0	41.0	41.0	41.0	41.0	0.0
Total Split (%)	9.3%	60.0%	0.0%	10.7%	61.4%	0.0%	29.3%	29.3%	29.3%	29.3%	29.3%	0.0%
Maximum Green (s)	7.4	78.4		9.6	80.1		34.6	34.6	34.6	34.5	34.5	
Yellow Time (s)	3.0	3.8		3.0	4.1		3.1	3.1	3.1	3.2	3.2	
All-Red Time (s)	2.6	1.8		2.4	1.8		3.3	3.3	3.3	3.3	3.3	
Lost Time Adjust (s)	-0.6	-0.6	0.0	-0.4	-0.9	0.0	-1.4	-1.4	-1.4	-1.5	-1.5	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	4.0
Lead/Lag	Lead	Lead		Lag	Lag							
Lead-Lag Optimize?	Yes				Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		Min	Min	Min	Min	Min	
Walk Time (s)		7.0			7.0		7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)		12.0			13.0		27.0	27.0	27.0	25.0	25.0	
Pedestrian Calls (#/hr)		0			0		0	0	0	0	0	
Act Effct Green (s)	88.9	88.9		93.5	93.5		26.1	26.1	26.1	26.1	26.1	
Actuated g/C Ratio	0.64	0.64		0.67	0.67		0.19	0.19	0.19	0.19	0.19	
v/c Ratio	0.37	0.79		0.61	0.70		0.74	0.09	0.42	0.23	0.21	
Control Delay	20.6	22.2		45.7	16.3		70.7	44.2	53.2	48.1	47.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	

Lanes, Volumes, Timings  
 24: NC 54 (Raleigh Road) & Hamilton Road

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	20.6	22.2		45.7	16.3		70.7	44.2	53.2	48.1	47.5	
LOS	C	C		D	B		E	D	D	D	D	
Approach Delay		22.2			17.6			62.0				47.8
Approach LOS		C			B			E				D
Queue Length 50th (ft)	18	582		38	269		158	23	97	45	52	
Queue Length 95th (ft)	51	782		m75	453		227	48	147	82	89	
Internal Link Dist (ft)		279			496			457			383	
Turn Bay Length (ft)	275			250			150		150	50		
Base Capacity (vph)	155	3210		181	3378		339	479	390	343	424	
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.36	0.79		0.61	0.70		0.54	0.06	0.31	0.17	0.16	

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.79  
 Intersection Signal Delay: 23.1  
 Intersection LOS: C  
 Intersection Capacity Utilization 87.7%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 24: NC 54 (Raleigh Road) & Hamilton Road



Lanes, Volumes, Timings  
25: Culbreth Road & Smith Level Road

2/28/2014



Lane Group	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Volume (vph)	114	256	470	86	219	673
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	1%		-2%			3%
Storage Length (ft)	125	0		0	225	
Storage Lanes	1	1		0	1	
Taper Length (ft)	25	25		25	25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00					
Frt		0.850	0.979			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1744	1560	1842	0	1743	1835
Flt Permitted	0.950				0.305	
Satd. Flow (perm)	1739	1560	1842	0	560	1835
Right Turn on Red		No		No		
Satd. Flow (RTOR)						
Link Speed (mph)	35		35			35
Link Distance (ft)	1150		863			828
Travel Time (s)	22.4		16.8			16.1
Confl. Peds. (#/hr)	1					
Peak Hour Factor	0.95	0.95	0.86	0.86	0.98	0.98
Heavy Vehicles (%)	3%	3%	2%	2%	2%	2%
Adj. Flow (vph)	120	269	547	100	223	687
Shared Lane Traffic (%)						
Lane Group Flow (vph)	120	269	647	0	223	687
Turn Type		pm+ov			pm+pt	
Protected Phases	8	1	2		1	6
Permitted Phases		8			6	
Detector Phase	8	1	2		1	6
Switch Phase						
Minimum Initial (s)	7.0	7.0	10.0		7.0	10.0
Minimum Split (s)	25.0	13.0	29.0		13.0	17.0
Total Split (s)	25.0	15.0	50.0	0.0	15.0	65.0
Total Split (%)	27.8%	16.7%	55.6%	0.0%	16.7%	72.2%
Maximum Green (s)	18.7	9.4	43.8		9.4	58.8
Yellow Time (s)	3.0	3.0	4.1		3.0	4.1
All-Red Time (s)	3.3	2.6	2.1		2.6	2.1
Lost Time Adjust (s)	-1.3	-0.6	-1.2	-1.2	-0.6	-1.2
Total Lost Time (s)	5.0	5.0	5.0	2.8	5.0	5.0
Lead/Lag		Lag	Lead		Lag	
Lead-Lag Optimize?						
Vehicle Extension (s)	2.0	2.0	3.0		2.0	3.0
Recall Mode	None	None	C-Max		None	C-Max
Walk Time (s)	7.0		7.0			
Flash Dont Walk (s)	11.0		15.0			
Pedestrian Calls (#/hr)	0		0			
Act Effct Green (s)	12.1	27.1	52.9		67.9	67.9
Actuated g/C Ratio	0.13	0.30	0.59		0.75	0.75
v/c Ratio	0.51	0.57	0.60		0.40	0.50

Lanes, Volumes, Timings  
 25: Culbreth Road & Smith Level Road

2/28/2014



Lane Group	WBL	WBR	NET	NER	SWL	SWT
Control Delay	43.4	31.5	15.4		8.3	6.2
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	43.4	31.5	15.4		8.3	6.2
LOS	D	C	B		A	A
Approach Delay	35.1		15.4			6.8
Approach LOS	D		B			A
Queue Length 50th (ft)	65	129	214		28	122
Queue Length 95th (ft)	113	194	336		60	232
Internal Link Dist (ft)	1070		783			748
Turn Bay Length (ft)	125				225	
Base Capacity (vph)	388	469	1084		554	1385
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.31	0.57	0.60		0.40	0.50

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	90
Offset:	0 (0%), Referenced to phase 2:NET and 6:SWTL, Start of Green
Natural Cycle:	70
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.60
Intersection Signal Delay:	15.3
Intersection LOS:	B
Intersection Capacity Utilization:	60.9%
ICU Level of Service:	B
Analysis Period (min):	15

Splits and Phases: 25: Culbreth Road & Smith Level Road

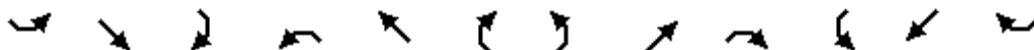




## **2022 With Site Mitigated**

Lanes, Volumes, Timings  
 20: Manning Drive & US 15-501 (Fordham Blvd)

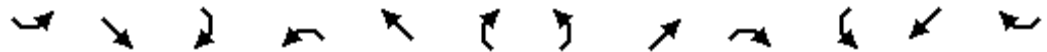
2/28/2014



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations	↔↔		↔	↔		↔		↔↔↔			↔↔	↔
Volume (vph)	266	0	49	17	0	50	0	2730	9	0	1468	978
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	9	12	12	12	12	12	12	12
Grade (%)		-4%			0%			-5%			0%	
Storage Length (ft)	0		225	0		75	0		0	0		0
Storage Lanes	0		1	1		1	2		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	*0.70	0.91	1.00	0.95	1.00
Ped Bike Factor			0.99	0.99								
Fr <sub>t</sub>			0.850			0.850		0.999				0.850
Fl <sub>t</sub> Protected	0.950			0.950								
Satd. Flow (prot)	3434	0	1584	1752	0	1568	0	4006	0	0	3438	1538
Fl <sub>t</sub> Permitted	0.950			0.950								
Satd. Flow (perm)	*3819	0	1564	1742	0	1568	0	*3811	0	0	3438	1538
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			25			45				45
Link Distance (ft)		382			515			584				704
Travel Time (s)		7.4			14.0			8.8				10.7
Confl. Peds. (#/hr)			3	3								
Peak Hour Factor	0.88	1.00	0.88	0.68	1.00	0.68	1.00	0.94	0.94	1.00	0.95	0.95
Heavy Vehicles (%)	4%	4%	4%	3%	3%	3%	2%	2%	2%	5%	5%	5%
Adj. Flow (vph)	302	0	56	25	0	74	0	2904	10	0	1545	1029
Shared Lane Traffic (%)												
Lane Group Flow (vph)	302	0	56	25	0	74	0	2914	0	0	1545	1029
Turn Type	Prot		Free	Prot		Free						Free
Protected Phases	3			3				2				6
Permitted Phases			Free			Free						Free
Detector Phase	3			3				2				6
Switch Phase												
Minimum Initial (s)	7.0			7.0				12.0				12.0
Minimum Split (s)	32.0			32.0				19.0				19.0
Total Split (s)	32.0	0.0	0.0	32.0	0.0	0.0	0.0	128.0	0.0	0.0	128.0	0.0
Total Split (%)	20.0%	0.0%	0.0%	20.0%	0.0%	0.0%	0.0%	80.0%	0.0%	0.0%	80.0%	0.0%
Maximum Green (s)	25.0			25.0				121.0				121.0
Yellow Time (s)	5.0			5.0				5.0				5.0
All-Red Time (s)	2.0			2.0				2.0				2.0
Lost Time Adjust (s)	-2.0	0.0	0.0	-2.0	0.0	0.0	0.0	-2.0	0.0	-1.2	-2.0	0.0
Total Lost Time (s)	5.0	4.0	4.0	5.0	4.0	4.0	4.0	5.0	4.0	2.8	5.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0			1.0				6.0				6.0
Recall Mode	None			None				C-Max				C-Max
Walk Time (s)	7.0			7.0								
Flash Dont Walk (s)	18.0			18.0								
Pedestrian Calls (#/hr)	0			0								
Act Effct Green (s)	19.5		160.0	19.5		160.0		130.5			130.5	160.0
Actuated g/C Ratio	0.12		1.00	0.12		1.00		0.82			0.82	1.00

Lanes, Volumes, Timings  
 20: Manning Drive & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
v/c Ratio	0.72		0.04	0.12		0.05		0.89			0.55	0.67
Control Delay	77.5		0.0	62.1		0.1		15.4			2.6	1.6
Queue Delay	1.4		0.0	0.0		0.0		0.0			0.5	0.0
Total Delay	78.9		0.0	62.1		0.1		15.5			3.1	1.6
LOS	E		A	E		A		B			A	A
Approach Delay								15.5			2.5	
Approach LOS								B			A	
Queue Length 50th (ft)	159		0	24		0		832			63	0
Queue Length 95th (ft)	201		0	41		0		1127			114	0
Internal Link Dist (ft)		302				435		504			624	
Turn Bay Length (ft)			225				75					
Base Capacity (vph)	579		1564	296		1568		3267			2804	1538
Starvation Cap Reductn	0		0	0		0		0			702	0
Spillback Cap Reductn	128		0	0		70		11			0	0
Storage Cap Reductn	0		0	0		0		0			0	0
Reduced v/c Ratio	0.67		0.04	0.08		0.05		0.89			0.74	0.67

Intersection Summary

Area Type: Other  
 Cycle Length: 160  
 Actuated Cycle Length: 160  
 Offset: 17 (11%), Referenced to phase 2:NET and 6:SWT, Start of Green  
 Natural Cycle: 130  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.89  
 Intersection Signal Delay: 12.9 Intersection LOS: B  
 Intersection Capacity Utilization 68.9% ICU Level of Service C  
 Analysis Period (min) 15  
 \* User Entered Value

Splits and Phases: 20: Manning Drive & US 15-501 (Fordham Blvd)

2	3
128 s	32 s
6	
128 s	

Lanes, Volumes, Timings  
 21: Old Mason Farm Road & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	EBR	WBR2	SER	SER2	NET	NER	SWT	SWR	SWR2
Lane Configurations	↗	↗	↗↘		↕	↗	↕	↘	
Volume (vph)	24	105	216	14	2853	246	2112	7	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)					0%		0%		
Storage Length (ft)	0		0			300		100	
Storage Lanes	1		2			1		1	
Taper Length (ft)	25		25			25		25	
Lane Util. Factor	1.00	1.00	0.88	1.00	*1.00	1.00	*1.00	1.00	0.95
Ped Bike Factor		0.99							
Frt	0.865	0.865	0.850			0.850		0.850	
Flt Protected									
Satd. Flow (prot)	1611	1587	2759	0	3725	1583	3725	1583	0
Flt Permitted									
Satd. Flow (perm)	1611	1564	2759	0	*3787	1583	*3771	1583	0
Right Turn on Red	No	No		No		No			No
Satd. Flow (RTOR)									
Link Speed (mph)					45		45		
Link Distance (ft)					789		916		
Travel Time (s)					12.0		13.9		
Confl. Peds. (#/hr)		1							
Peak Hour Factor	0.61	0.52	0.47	0.47	0.96	0.96	0.87	0.87	0.87
Adj. Flow (vph)	39	202	460	30	2972	256	2428	8	1
Shared Lane Traffic (%)									
Lane Group Flow (vph)	39	202	490	0	2972	256	2428	9	0
Turn Type	custom	custom	custom			Free		Perm	
Protected Phases	3	4	4		2		6		
Permitted Phases	3	4	4		3	Free		6	
Detector Phase	3	4	4		2		6	6	
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0		12.0		12.0	12.0	
Minimum Split (s)	14.0	14.0	14.0		33.0		25.0	25.0	
Total Split (s)	14.0	25.0	25.0	0.0	121.0	0.0	121.0	121.0	0.0
Total Split (%)	8.8%	15.6%	15.6%	0.0%	75.6%	0.0%	75.6%	75.6%	0.0%
Maximum Green (s)	7.0	18.0	18.0		114.0		114.0	114.0	
Yellow Time (s)	5.0	5.0	5.0		5.0		5.0	5.0	
All-Red Time (s)	2.0	2.0	2.0		2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	0.0	-2.0	0.0	-2.0	-2.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes								
Vehicle Extension (s)	3.0	2.0	2.0		2.0		2.0	2.0	
Recall Mode	None	None	None		C-Max		C-Max	C-Max	
Walk Time (s)					7.0		7.0	7.0	
Flash Dont Walk (s)					16.0		11.0	11.0	
Pedestrian Calls (#/hr)					0		0	0	
Act Effct Green (s)	9.0	22.8	22.8		123.2	160.0	116.0	116.0	
Actuated g/C Ratio	0.06	0.14	0.14		0.77	1.00	0.72	0.72	
v/c Ratio	0.43	0.89	1.25		1.04	0.16	0.90	0.01	
Control Delay	87.9	104.2	182.8		29.2	0.0	9.2	2.0	

Lanes, Volumes, Timings  
 21: Old Mason Farm Road & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	EBR	WBR2	SER	SER2	NET	NER	SWT	SWR	SWR2
Queue Delay	0.0	0.0	0.0		34.8	0.0	1.5	0.0	
Total Delay	87.9	104.2	182.8		64.1	0.0	10.6	2.0	
LOS	F	F	F		E	A	B	A	
Approach Delay					59.0		10.6		
Approach LOS					E		B		
Queue Length 50th (ft)	40	~223	~390		~1273	0	469	1	
Queue Length 95th (ft)	56	169	185		m750	m0	401	m1	
Internal Link Dist (ft)					709		836		
Turn Bay Length (ft)						300		100	
Base Capacity (vph)	91	226	393		2871	1583	2701	1148	
Starvation Cap Reductn	0	0	0		213	0	132	0	
Spillback Cap Reductn	0	0	0		0	0	36	0	
Storage Cap Reductn	0	0	0		0	0	0	0	
Reduced v/c Ratio	0.43	0.89	1.25		1.12	0.16	0.95	0.01	

Intersection Summary

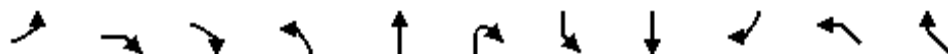
Area Type: Other  
 Cycle Length: 160  
 Actuated Cycle Length: 160  
 Offset: 5 (3%), Referenced to phase 2:NET and 6:SWT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.25  
 Intersection Signal Delay: 51.7  
 Intersection LOS: D  
 Intersection Capacity Utilization 94.0%  
 ICU Level of Service F  
 Analysis Period (min) 15  
 \* User Entered Value  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 21: Old Mason Farm Road & US 15-501 (Fordham Blvd)

ø2	ø3	ø4
121 s	14 s	25 s
ø6		
121 s		

Lanes, Volumes, Timings  
 22: NC 54 WB On-Ramp & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	EBL	EBR	EBR2	NBL	NBT	NBR	SBL	SBT	SBR	NWL	NWR	ø2
Lane Configurations			↑↑	↑	↑↑			↑↑	↑		↑	
Volume (vph)	0	0	1054	34	1458	0	0	1457	181	0	281	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	0	450		150		0	0		375	0	0	
Storage Lanes	0	1		1		0	0		1	0	1	
Taper Length (ft)	25	25		25		25	25		25	25	25	
Lane Util. Factor	1.00	1.00	0.88	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	
Frt			0.850						0.850		0.865	
Flt Protected				0.950								
Satd. Flow (prot)	0	0	2787	1770	3539	0	0	3539	1583	0	1611	
Flt Permitted				0.950								
Satd. Flow (perm)	0	0	2787	1770	3539	0	0	3539	1583	0	1611	
Right Turn on Red			No			Yes			No		Yes	
Satd. Flow (RTOR)												129
Link Speed (mph)	30				45			45		25		
Link Distance (ft)	694				1058			487		592		
Travel Time (s)	15.8				16.0			7.4		16.1		
Peak Hour Factor	1.00	1.00	0.92	1.00	0.90	0.90	1.00	0.82	0.92	1.00	0.90	
Adj. Flow (vph)	0	0	1146	34	1620	0	0	1777	197	0	312	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	1146	34	1620	0	0	1777	197	0	312	
Turn Type			custom	Prot					Perm		Free	
Protected Phases			4	4	2 4			6				2
Permitted Phases			4						6		Free	
Detector Phase			4	4	2 4			6	6			
Switch Phase												
Minimum Initial (s)			7.0	7.0				12.0	12.0			12.0
Minimum Split (s)			13.0	13.0				18.0	18.0			18.0
Total Split (s)	0.0	0.0	72.0	72.0	160.0	0.0	0.0	88.0	88.0	0.0	0.0	88.0
Total Split (%)	0.0%	0.0%	45.0%	45.0%	100.0%	0.0%	0.0%	55.0%	55.0%	0.0%	0.0%	55%
Maximum Green (s)			66.9	66.9				82.2	82.2			82.2
Yellow Time (s)			3.1	3.1				4.5	4.5			4.5
All-Red Time (s)			2.0	2.0				1.3	1.3			1.3
Lost Time Adjust (s)	0.0	0.0	-0.1	-0.1	-0.8	0.0	0.0	-0.8	-0.8	0.0	0.0	
Total Lost Time (s)	4.0	4.0	5.0	5.0	5.0	4.0	4.0	5.0	5.0	4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)			3.0	3.0				6.0	6.0			6.0
Recall Mode			None	None				C-Max	C-Max			Max
Act Effct Green (s)			67.0	67.0	160.0			83.0	83.0		160.0	
Actuated g/C Ratio			0.42	0.42	1.00			0.52	0.52		1.00	
v/c Ratio			0.98	0.05	0.46			0.97	0.24		0.19	
Control Delay			67.9	27.6	0.2			51.8	22.1		0.3	
Queue Delay			10.8	0.0	0.0			0.0	0.0		0.0	
Total Delay			78.6	27.6	0.2			51.8	22.1		0.3	
LOS			E	C	A			D	C		A	
Approach Delay					0.8			48.9				
Approach LOS					A			D				
Queue Length 50th (ft)			668	18	0			926	111		0	

Lanes, Volumes, Timings  
 22: NC 54 WB On-Ramp & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	EBL	EBR	EBR2	NBL	NBT	NBR	SBL	SBT	SBR	NWL	NWR	ø2
Queue Length 95th (ft)			#844	m24	0			875	165		0	
Internal Link Dist (ft)	614				978			407		512		
Turn Bay Length (ft)			450	150					375			
Base Capacity (vph)			1167	741	3539			1836	821		1611	
Starvation Cap Reductn			49	0	0			0	0		0	
Spillback Cap Reductn			0	0	0			0	0		0	
Storage Cap Reductn			0	0	0			0	0		0	
Reduced v/c Ratio			1.03	0.05	0.46			0.97	0.24		0.19	

Intersection Summary

Area Type: Other

Cycle Length: 160

Actuated Cycle Length: 160

Offset: 147 (92%), Referenced to phase 6:SBT, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.98

Intersection Signal Delay: 37.0

Intersection LOS: D

Intersection Capacity Utilization Err%

ICU Level of Service H

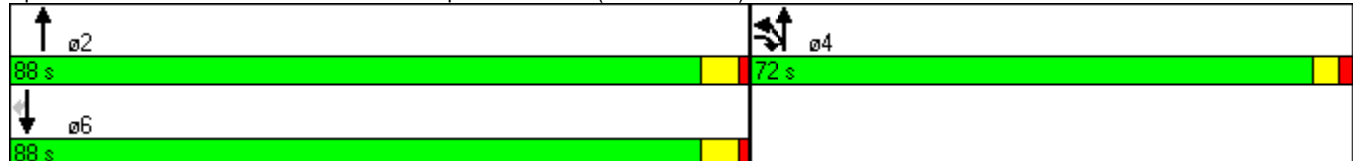
Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 22: NC 54 WB On-Ramp & US 15-501 (Fordham Blvd)



Lanes, Volumes, Timings  
 221: NC 54 (Raleigh Road) & NC 54 WB On-Ramp

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗		↑↑	↗			↗			↗
Volume (vph)	0	691	23	0	1301	1054	0	0	295	0	0	215
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	0		0	0		0	0		0
Storage Lanes	0		1	0		1	0		1	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.98			0.98						
Frt			0.850			0.850			0.865			0.865
Flt Protected												
Satd. Flow (prot)	0	3406	1524	0	3471	1553	0	0	1611	0	0	1611
Flt Permitted												
Satd. Flow (perm)	0	3406	1491	0	3471	1519	0	0	1611	0	0	1611
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			30				30
Link Distance (ft)		468			434			601				694
Travel Time (s)		7.1			6.6			13.7				15.8
Confl. Peds. (#/hr)	4		3	3		4						
Peak Hour Factor	1.00	0.83	0.83	1.00	0.85	0.85	1.00	1.00	0.74	1.00	1.00	0.96
Heavy Vehicles (%)	6%	6%	6%	4%	4%	4%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	0	833	28	0	1531	1240	0	0	399	0	0	224
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	833	28	0	1531	1240	0	0	399	0	0	224
Turn Type			Free			Free			custom			Free
Protected Phases		2			6 8				8			
Permitted Phases			Free			Free			8			Free
Detector Phase		2			6 8				8			
Switch Phase												
Minimum Initial (s)		12.0							7.0			
Minimum Split (s)		19.0							14.0			
Total Split (s)	0.0	36.0	0.0	0.0	75.0	0.0	0.0	0.0	39.0	0.0	0.0	0.0
Total Split (%)	0.0%	48.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	52.0%	0.0%	0.0%	0.0%
Maximum Green (s)		29.0							32.0			
Yellow Time (s)		5.0							5.0			
All-Red Time (s)		2.0							2.0			
Lost Time Adjust (s)	0.0	-2.0	0.0	0.0	0.0	0.0	0.0	0.0	-2.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	4.0	4.0	7.0	4.0	4.0	4.0	5.0	4.0	4.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0							3.0			
Recall Mode		C-Max							None			
Act Effct Green (s)		33.7	75.0		75.0	75.0			31.3			75.0
Actuated g/C Ratio		0.45	1.00		1.00	1.00			0.42			1.00
v/c Ratio		0.54	0.02		0.44	0.82			0.59			0.14
Control Delay		17.5	0.0		0.2	15.2			20.5			0.2
Queue Delay		0.0	0.0		0.0	0.0			0.0			0.0
Total Delay		17.5	0.0		0.2	15.2			20.5			0.2
LOS		B	A		A	B			C			A



Lanes, Volumes, Timings  
 221: NC 54 (Raleigh Road) & NC 54 WB On-Ramp

2/28/2014

Lane Group	ø6
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	6
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	12.0
Minimum Split (s)	19.0
Total Split (s)	36.0
Total Split (%)	48%
Maximum Green (s)	29.0
Yellow Time (s)	5.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	

Lanes, Volumes, Timings  
 221: NC 54 (Raleigh Road) & NC 54 WB On-Ramp

2/28/2014

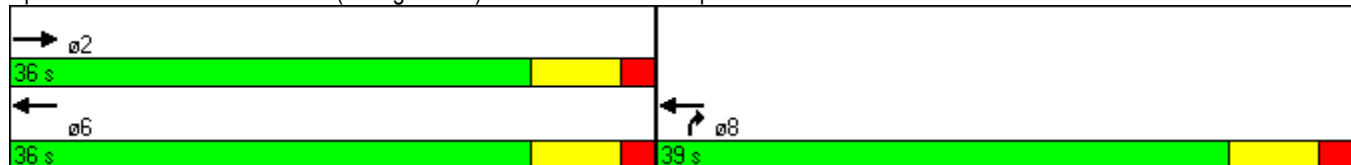


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		17.0			6.9							
Approach LOS		B			A							
Queue Length 50th (ft)		153	0		0	990			129			0
Queue Length 95th (ft)		186	0		0	728			158			0
Internal Link Dist (ft)		388			354			521			614	
Turn Bay Length (ft)			150									
Base Capacity (vph)		1529	1491		3434	1519			730			1611
Starvation Cap Reductn		0	0		0	0			0			0
Spillback Cap Reductn		0	0		0	0			0			0
Storage Cap Reductn		0	0		0	0			0			0
Reduced v/c Ratio		0.54	0.02		0.45	0.82			0.55			0.14

Intersection Summary

Area Type: Other  
 Cycle Length: 75  
 Actuated Cycle Length: 75  
 Offset: 32 (43%), Referenced to phase 2:EBT, Start of Green  
 Natural Cycle: 40  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.82  
 Intersection Signal Delay: 9.9  
 Intersection LOS: A  
 Intersection Capacity Utilization 45.7%  
 ICU Level of Service A  
 Analysis Period (min) 15

Splits and Phases: 221: NC 54 (Raleigh Road) & NC 54 WB On-Ramp



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Lane Group	ø6
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

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Lanes, Volumes, Timings  
 31: Median U-Turn #1 & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEU	NEL	NET	NER	SWU	SWL
Lane Configurations							⬆		⬆⬆		⬆	
Volume (vph)	0	0	0	0	0	0	242	0	2804	0	181	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0		0		0		250
Storage Lanes	0		0	0		0		1		0		1
Taper Length (ft)	25		25	25		25		25		25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00
Frt												
Flt Protected							0.950					0.950
Satd. Flow (prot)	0	0	0	0	0	0	1770	0	3539	0	1770	0
Flt Permitted							0.950					0.950
Satd. Flow (perm)	0	0	0	0	0	0	1770	0	3539	0	1770	0
Right Turn on Red			No				No				No	
Satd. Flow (RTOR)												
Link Speed (mph)		30			30				45			
Link Distance (ft)		113			84				704			
Travel Time (s)		2.6			1.9				10.7			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.90	0.92	0.90	0.92	0.90	0.92
Adj. Flow (vph)	0	0	0	0	0	0	269	0	3116	0	201	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	269	0	3116	0	201	0
Turn Type							Prot				Prot	
Protected Phases							5		2		1	
Permitted Phases												
Detector Phase							5		2		1	
Switch Phase												
Minimum Initial (s)							7.0		12.0		7.0	
Minimum Split (s)							14.0		23.0		14.0	
Total Split (s)	0.0	0.0	0.0	0.0	0.0	0.0	40.0	0.0	138.0	0.0	22.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	25.0%	0.0%	86.3%	0.0%	13.8%	0.0%
Maximum Green (s)							33.0		131.0		15.0	
Yellow Time (s)							5.0		5.0		5.0	
All-Red Time (s)							2.0		2.0		2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	-2.0	0.0	-2.0	0.0	-2.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	5.0	4.0	5.0	4.0	5.0	4.0
Lead/Lag							Lead		Lag		Lead	
Lead-Lag Optimize?							Yes		Yes		Yes	
Vehicle Extension (s)							3.0		3.0		3.0	
Recall Mode							None		C-Max		None	
Act Effct Green (s)							30.4		133.0		17.0	
Actuated g/C Ratio							0.19		0.83		0.11	
v/c Ratio							0.80		1.06		1.07	
Control Delay							71.1		43.1		121.6	
Queue Delay							0.0		14.7		0.0	
Total Delay							71.1		57.8		121.6	
LOS							E		E		F	
Approach Delay									58.9			
Approach LOS									E			
Queue Length 50th (ft)							278		~1883		~237	

Lanes, Volumes, Timings  
 31: Median U-Turn #1 & US 15-501 (Fordham Blvd)

2/28/2014

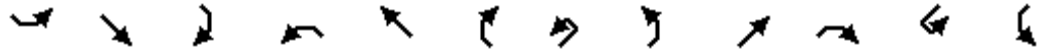


Lane Group	SWT	SWR
Lane Configurations	↑↑↑	
Volume (vph)	2172	0
Ideal Flow (vphpl)	1900	1900
Storage Length (ft)		300
Storage Lanes		1
Taper Length (ft)		25
Lane Util. Factor	*0.70	1.00
Frt		
Flt Protected		
Satd. Flow (prot)	3912	0
Flt Permitted		
Satd. Flow (perm)	3912	0
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	45	
Link Distance (ft)	789	
Travel Time (s)	12.0	
Peak Hour Factor	0.90	0.92
Adj. Flow (vph)	2413	0
Shared Lane Traffic (%)		
Lane Group Flow (vph)	2413	0
Turn Type		
Protected Phases	6	
Permitted Phases		
Detector Phase	6	
Switch Phase		
Minimum Initial (s)	12.0	
Minimum Split (s)	23.0	
Total Split (s)	120.0	0.0
Total Split (%)	75.0%	0.0%
Maximum Green (s)	113.0	
Yellow Time (s)	5.0	
All-Red Time (s)	2.0	
Lost Time Adjust (s)	-2.0	0.0
Total Lost Time (s)	5.0	4.0
Lead/Lag	Lag	
Lead-Lag Optimize?	Yes	
Vehicle Extension (s)	3.0	
Recall Mode	C-Max	
Act Effct Green (s)	119.6	
Actuated g/C Ratio	0.75	
v/c Ratio	0.82	
Control Delay	9.0	
Queue Delay	0.7	
Total Delay	9.6	
LOS	A	
Approach Delay	18.3	
Approach LOS	B	
Queue Length 50th (ft)	416	

Lanes, Volumes, Timings

31: Median U-Turn #1 & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEU	NEL	NET	NER	SWU	SWL
Queue Length 95th (ft)							m321		#1966		m#266	
Internal Link Dist (ft)		33			4				624			
Turn Bay Length (ft)											250	
Base Capacity (vph)							387		2942		188	
Starvation Cap Reductn							0		0		0	
Spillback Cap Reductn							0		93		0	
Storage Cap Reductn							0		0		0	
Reduced v/c Ratio							0.70		1.09		1.07	

Intersection Summary

Area Type: Other  
 Cycle Length: 160  
 Actuated Cycle Length: 160  
 Offset: 2 (1%), Referenced to phase 2:NET and 6:SWT, Start of Green  
 Natural Cycle: 140  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.07  
 Intersection Signal Delay: 41.2      Intersection LOS: D  
 Intersection Capacity Utilization 95.9%      ICU Level of Service F  
 Analysis Period (min) 15  
 \* User Entered Value  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 31: Median U-Turn #1 & US 15-501 (Fordham Blvd)



Lanes, Volumes, Timings  
31: Median U-Turn #1 & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	SWT	SWR
Queue Length 95th (ft)	m594	
Internal Link Dist (ft)	709	
Turn Bay Length (ft)		
Base Capacity (vph)	2925	
Starvation Cap Reductn	210	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.89	
Intersection Summary		

Lanes, Volumes, Timings  
 32: US 15-501 (Fordham Blvd) & Median U-Turn #2

2/28/2014



Lane Group	NBU	NBL	NBT	SBT	SBR	SEL	SER
Lane Configurations		↩	↕	↕			
Volume (vph)	91	107	2723	2240	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		250			0	0	0
Storage Lanes		1			0	0	0
Taper Length (ft)		25			25	25	25
Lane Util. Factor	0.95	1.00	0.95	0.95	1.00	1.00	1.00
Fr <sub>t</sub>							
Fl <sub>t</sub> Protected		0.950					
Satd. Flow (prot)	0	1770	3539	3539	0	0	0
Fl <sub>t</sub> Permitted		0.950					
Satd. Flow (perm)	0	1770	3539	3539	0	0	0
Right Turn on Red					No		No
Satd. Flow (RTOR)							
Link Speed (mph)			45	45		25	
Link Distance (ft)			916	1198		128	
Travel Time (s)			13.9	18.2		3.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	1.00	1.00	1.00
Adj. Flow (vph)	101	119	3026	2489	0	0	0
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	220	3026	2489	0	0	0
Turn Type	Prot	Prot					
Protected Phases	5	5	2	6			
Permitted Phases							
Detector Phase	5	5	2	6			
Switch Phase							
Minimum Initial (s)	7.0	7.0	12.0	12.0			
Minimum Split (s)	14.0	14.0	23.0	23.0			
Total Split (s)	31.0	31.0	160.0	129.0	0.0	0.0	0.0
Total Split (%)	19.4%	19.4%	100.0%	80.6%	0.0%	0.0%	0.0%
Maximum Green (s)	24.0	24.0	153.0	122.0			
Yellow Time (s)	5.0	5.0	5.0	5.0			
All-Red Time (s)	2.0	2.0	2.0	2.0			
Lost Time Adjust (s)	0.0	-2.0	-2.0	-2.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	5.0	5.0	5.0	4.0	4.0	4.0
Lead/Lag	Lead	Lead		Lag			
Lead-Lag Optimize?	Yes	Yes		Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0			
Recall Mode	None	None	C-Max	C-Max			
Act Effct Green (s)		24.3	160.0	125.7			
Actuated g/C Ratio		0.15	1.00	0.79			
v/c Ratio		0.81	0.86	0.90			
Control Delay		60.9	2.9	10.6			
Queue Delay		0.0	0.0	0.1			
Total Delay		60.9	2.9	10.8			
LOS		E	A	B			
Approach Delay			6.8	10.8			
Approach LOS			A	B			
Queue Length 50th (ft)		229	23	580			



Lanes, Volumes, Timings  
 32: US 15-501 (Fordham Blvd) & Median U-Turn #2

2/28/2014

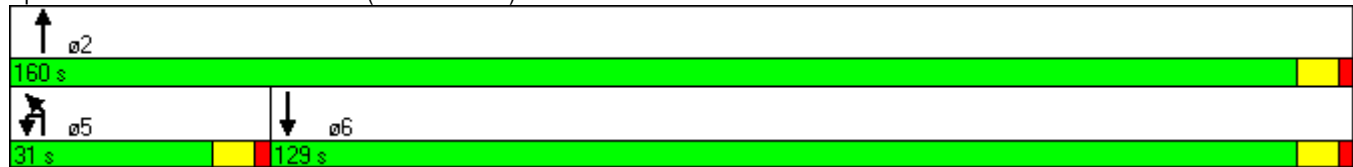


Lane Group	NBU	NBL	NBT	SBT	SBR	SEL	SER
Queue Length 95th (ft)		m225	m0	m603			
Internal Link Dist (ft)			836	1118		48	
Turn Bay Length (ft)		250					
Base Capacity (vph)		288	3539	2780			
Starvation Cap Reductn		0	0	0			
Spillback Cap Reductn		0	0	23			
Storage Cap Reductn		0	0	0			
Reduced v/c Ratio		0.76	0.86	0.90			

Intersection Summary

Area Type: Other  
 Cycle Length: 160  
 Actuated Cycle Length: 160  
 Offset: 147 (92%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.90  
 Intersection Signal Delay: 8.6  
 Intersection Capacity Utilization 81.2%  
 Analysis Period (min) 15  
 Intersection LOS: A  
 ICU Level of Service D  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 32: US 15-501 (Fordham Blvd) & Median U-Turn #2



Lanes, Volumes, Timings  
 20: Manning Drive & US 15-501 (Fordham Blvd)

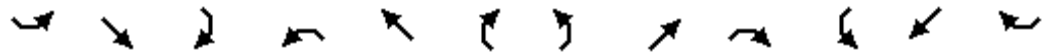
2/28/2014



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations	↔↔		↔	↔		↔		↔↔↔			↔↔	↔
Volume (vph)	606	0	111	14	0	21	0	1622	18	0	1529	547
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	9	12	12	12	12	12	12	12
Grade (%)		-4%			0%			-5%			0%	
Storage Length (ft)	0		225	0		75	0		0	0		0
Storage Lanes	0		1	1		1	2		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	*0.70	0.91	1.00	0.95	1.00
Ped Bike Factor			0.99	1.00								
Fr <sub>t</sub>			0.850			0.850		0.998				0.850
Fl <sub>t</sub> Protected	0.950			0.950								
Satd. Flow (prot)	3502	0	1615	1752	0	1568	0	3887	0	0	3471	1553
Fl <sub>t</sub> Permitted	0.950			0.950								
Satd. Flow (perm)	*3819	0	1594	1745	0	1568	0	*3811	0	0	3471	1553
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			25			45				45
Link Distance (ft)		382			515			584				715
Travel Time (s)		7.4			14.0			8.8				10.8
Confl. Peds. (#/hr)			3	3								
Peak Hour Factor	0.86	1.00	0.86	0.77	1.00	0.77	1.00	0.86	0.86	1.00	0.91	0.91
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	5%	5%	5%	4%	4%	4%
Adj. Flow (vph)	705	0	129	18	0	27	0	1886	21	0	1680	601
Shared Lane Traffic (%)												
Lane Group Flow (vph)	705	0	129	18	0	27	0	1907	0	0	1680	601
Turn Type	Prot		Free	Prot		Free						Free
Protected Phases	3			3				2				6
Permitted Phases			Free			Free						Free
Detector Phase	3			3				2				6
Switch Phase												
Minimum Initial (s)	7.0			7.0				12.0				12.0
Minimum Split (s)	32.0			32.0				19.0				19.0
Total Split (s)	39.0	0.0	0.0	39.0	0.0	0.0	0.0	81.0	0.0	0.0	81.0	0.0
Total Split (%)	32.5%	0.0%	0.0%	32.5%	0.0%	0.0%	0.0%	67.5%	0.0%	0.0%	67.5%	0.0%
Maximum Green (s)	32.0			32.0				74.0				74.0
Yellow Time (s)	5.0			5.0				5.0				5.0
All-Red Time (s)	2.0			2.0				2.0				2.0
Lost Time Adjust (s)	-2.0	0.0	0.0	-2.0	0.0	0.0	0.0	-2.0	0.0	-1.2	-2.0	0.0
Total Lost Time (s)	5.0	4.0	4.0	5.0	4.0	4.0	4.0	5.0	4.0	2.8	5.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0			1.0				6.0				6.0
Recall Mode	None			None				C-Max				C-Max
Walk Time (s)	7.0			7.0								
Flash Dont Walk (s)	18.0			18.0								
Pedestrian Calls (#/hr)	0			0								
Act Effct Green (s)	29.3		120.0	29.3		120.0		80.7			80.7	120.0
Actuated g/C Ratio	0.24		1.00	0.24		1.00		0.67			0.67	1.00

Lanes, Volumes, Timings  
 20: Manning Drive & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
v/c Ratio	0.82		0.08	0.04				0.02		0.73	0.72	0.39
Control Delay	51.5		0.1	32.9				0.0		15.4	5.2	0.5
Queue Delay	0.0		0.0	0.0				0.0		0.0	0.2	0.0
Total Delay	51.5		0.1	32.9				0.0		15.4	5.4	0.5
LOS	D		A	C				A		B	A	A
Approach Delay										15.4		4.1
Approach LOS										B		A
Queue Length 50th (ft)	266		0	11				0		417	104	0
Queue Length 95th (ft)	302		0	24				0		506	120	0
Internal Link Dist (ft)		302				435				504		635
Turn Bay Length (ft)			225					75				
Base Capacity (vph)	992		1594	496				1568		2614	2334	1553
Starvation Cap Reductn	0		0	0				0		0	152	0
Spillback Cap Reductn	0		0	0				0		0	0	0
Storage Cap Reductn	0		0	0				0		0	0	0
Reduced v/c Ratio	0.71		0.08	0.04				0.02		0.73	0.77	0.39

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 76 (63%), Referenced to phase 2:NET and 6:SWT, Start of Green  
 Natural Cycle: 75  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.82  
 Intersection Signal Delay: 14.9  
 Intersection Capacity Utilization 67.9%  
 Analysis Period (min) 15  
 \* User Entered Value

Splits and Phases: 20: Manning Drive & US 15-501 (Fordham Blvd)



Lanes, Volumes, Timings  
 21: Old Mason Farm Road & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	EBR	WBR2	SER	SER2	NET	NER	SWT	SWR	SWR2
Lane Configurations	↗	↗	↗↘		↕↕	↗	↕↕	↘	
Volume (vph)	30	208	95	3	2074	191	1965	20	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)					0%		0%		
Storage Length (ft)	0		0			300		100	
Storage Lanes	1		2			1		1	
Taper Length (ft)	25		25			25		25	
Lane Util. Factor	1.00	1.00	0.88	1.00	*1.00	1.00	*1.00	1.00	0.95
Ped Bike Factor		0.99							
Frt	0.865	0.865	0.850			0.850		0.850	
Flt Protected									
Satd. Flow (prot)	1611	1587	2759	0	3725	1583	3725	1583	0
Flt Permitted									
Satd. Flow (perm)	1611	1566	2759	0	*3787	1583	*3771	1583	0
Right Turn on Red	No	No		No		No			No
Satd. Flow (RTOR)									
Link Speed (mph)					45		45		
Link Distance (ft)					777		913		
Travel Time (s)					11.8		13.8		
Confl. Peds. (#/hr)		1							
Peak Hour Factor	0.70	0.77	0.72	0.72	0.90	0.90	0.95	0.95	0.95
Adj. Flow (vph)	43	270	132	4	2304	212	2068	21	11
Shared Lane Traffic (%)									
Lane Group Flow (vph)	43	270	136	0	2304	212	2068	32	0
Turn Type	custom	custom	custom			Free		Perm	
Protected Phases	3	4	4		2		6		
Permitted Phases	3	4	4		3	Free		6	
Detector Phase	3	4	4		2		6	6	
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0		12.0		12.0	12.0	
Minimum Split (s)	14.0	14.0	14.0		33.0		25.0	25.0	
Total Split (s)	14.0	29.0	29.0	0.0	77.0	0.0	77.0	77.0	0.0
Total Split (%)	11.7%	24.2%	24.2%	0.0%	64.2%	0.0%	64.2%	64.2%	0.0%
Maximum Green (s)	7.0	22.0	22.0		70.0		70.0	70.0	
Yellow Time (s)	5.0	5.0	5.0		5.0		5.0	5.0	
All-Red Time (s)	2.0	2.0	2.0		2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	0.0	-2.0	0.0	-2.0	-2.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes								
Vehicle Extension (s)	3.0	2.0	2.0		2.0		2.0	2.0	
Recall Mode	None	None	None		C-Max		C-Max	C-Max	
Walk Time (s)					7.0		7.0	7.0	
Flash Dont Walk (s)					16.0		11.0	11.0	
Pedestrian Calls (#/hr)					0		0	0	
Act Effct Green (s)	9.0	23.1	23.1		82.9	120.0	75.7	75.7	
Actuated g/C Ratio	0.08	0.19	0.19		0.69	1.00	0.63	0.63	
v/c Ratio	0.36	0.88	0.26		0.89	0.13	0.88	0.03	
Control Delay	61.5	76.2	42.2		11.4	0.1	14.9	6.2	

Lanes, Volumes, Timings  
 21: Old Mason Farm Road & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	EBR	WBR2	SER	SER2	NET	NER	SWT	SWR	SWR2
Queue Delay	0.0	0.0	0.0		0.6	0.0	0.2	0.0	
Total Delay	61.5	76.2	42.2		12.0	0.1	15.1	6.2	
LOS	E	E	D		B	A	B	A	
Approach Delay					11.0		15.0		
Approach LOS					B		B		
Queue Length 50th (ft)	32	203	50		406	0	512	4	
Queue Length 95th (ft)	54	#257	65		579	m0	716	m8	
Internal Link Dist (ft)					697		833		
Turn Bay Length (ft)						300		100	
Base Capacity (vph)	121	317	552		2576	1583	2349	998	
Starvation Cap Reductn	0	0	0		70	0	33	0	
Spillback Cap Reductn	0	0	0		0	0	0	0	
Storage Cap Reductn	0	0	0		0	0	0	0	
Reduced v/c Ratio	0.36	0.85	0.25		0.92	0.13	0.89	0.03	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 58 (48%), Referenced to phase 2:NET and 6:SWT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.89  
 Intersection Signal Delay: 17.4 Intersection LOS: B  
 Intersection Capacity Utilization 78.7% ICU Level of Service D  
 Analysis Period (min) 15  
 \* User Entered Value  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 21: Old Mason Farm Road & US 15-501 (Fordham Blvd)

	ø2		ø3		ø4
77 s		14 s		29 s	
	ø6				
77 s					

Lanes, Volumes, Timings  
 22: NC 54 WB On-Ramp & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	EBL	EBR	EBR2	NBL	NBT	NBR	SBL	SBT	SBR	NWL	NWR	ø2
Lane Configurations			↑↑	↑	↑↑			↑↑	↑		↑	
Volume (vph)	0	0	737	32	1222	0	0	1373	153	0	386	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	0	450		150		0	0		375	0	0	
Storage Lanes	0	1		1		0	0		1	0	1	
Taper Length (ft)	25	25		25		25	25		25	25	25	
Lane Util. Factor	1.00	1.00	0.88	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	
Fr <sub>t</sub>			0.850						0.850		0.865	
Fl <sub>t</sub> Protected				0.950								
Satd. Flow (prot)	0	0	2787	1770	3539	0	0	3539	1583	0	1611	
Fl <sub>t</sub> Permitted				0.950								
Satd. Flow (perm)	0	0	2787	1770	3539	0	0	3539	1583	0	1611	
Right Turn on Red			No			Yes			No		Yes	
Satd. Flow (RTOR)												184
Link Speed (mph)	30				45			45		25		
Link Distance (ft)	694				1058			465		587		
Travel Time (s)	15.8				16.0			7.0		16.0		
Peak Hour Factor	1.00	1.00	0.92	0.90	0.90	0.90	1.00	0.82	0.92	1.00	0.90	
Adj. Flow (vph)	0	0	801	36	1358	0	0	1674	166	0	429	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	801	36	1358	0	0	1674	166	0	429	
Turn Type			custom	Prot					Perm		Free	
Protected Phases			4	4	2 4			6				2
Permitted Phases			4						6		Free	
Detector Phase			4	4	2 4			6	6			
Switch Phase												
Minimum Initial (s)			7.0	7.0				12.0	12.0			12.0
Minimum Split (s)			13.0	13.0				18.0	18.0			18.0
Total Split (s)	0.0	0.0	48.0	48.0	120.0	0.0	0.0	72.0	72.0	0.0	0.0	72.0
Total Split (%)	0.0%	0.0%	40.0%	40.0%	100.0%	0.0%	0.0%	60.0%	60.0%	0.0%	0.0%	60%
Maximum Green (s)			42.9	42.9				66.2	66.2			66.2
Yellow Time (s)			3.1	3.1				4.5	4.5			4.5
All-Red Time (s)			2.0	2.0				1.3	1.3			1.3
Lost Time Adjust (s)	0.0	0.0	-0.1	-0.1	-0.8	0.0	0.0	-0.8	-0.8	0.0	0.0	
Total Lost Time (s)	4.0	4.0	5.0	5.0	5.0	4.0	4.0	5.0	5.0	4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)			3.0	3.0				6.0	6.0			6.0
Recall Mode			None	None				C-Max	C-Max			Max
Act Effct Green (s)			42.3	42.3	120.0			67.7	67.7		120.0	
Actuated g/C Ratio			0.35	0.35	1.00			0.56	0.56		1.00	
v/c Ratio			0.81	0.06	0.38			0.84	0.19		0.27	
Control Delay			33.0	30.2	0.3			26.8	13.6		0.4	
Queue Delay			0.0	0.0	0.0			0.0	0.0		0.0	
Total Delay			33.0	30.2	0.3			26.8	13.6		0.4	
LOS			C	C	A			C	B		A	
Approach Delay					1.0			25.6				
Approach LOS					A			C				
Queue Length 50th (ft)			252	19	0			546	61		0	

Lanes, Volumes, Timings  
 22: NC 54 WB On-Ramp & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	EBL	EBR	EBR2	NBL	NBT	NBR	SBL	SBT	SBR	NWL	NWR	ø2
Queue Length 95th (ft)			365	m31	0			546	99		0	
Internal Link Dist (ft)	614				978			385		507		
Turn Bay Length (ft)			450	150					375			
Base Capacity (vph)			999	634	3529			1995	893		1611	
Starvation Cap Reductn			0	0	0			0	0		0	
Spillback Cap Reductn			0	0	0			0	0		0	
Storage Cap Reductn			0	0	0			0	0		0	
Reduced v/c Ratio			0.80	0.06	0.38			0.84	0.19		0.27	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 25 (21%), Referenced to phase 6:SBT, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.84  
 Intersection Signal Delay: 16.8 Intersection LOS: B  
 Intersection Capacity Utilization Err% ICU Level of Service H  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 22: NC 54 WB On-Ramp & US 15-501 (Fordham Blvd)



Lanes, Volumes, Timings  
 221: NC 54 (Raleigh Road) & NC 54 WB On-Ramp

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗		↑↑	↗			↗			↗
Volume (vph)	0	710	39	0	709	737	0	0	287	0	0	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	0		0	0		0	0		0
Storage Lanes	0		1	0		1	0		1	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.98			0.98						
Frt			0.850			0.850			0.865			0.865
Flt Protected												
Satd. Flow (prot)	0	3505	1568	0	3471	1553	0	0	1580	0	0	1580
Flt Permitted												
Satd. Flow (perm)	0	3505	1531	0	3471	1521	0	0	1580	0	0	1580
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			30				30
Link Distance (ft)		468			434			601				694
Travel Time (s)		7.1			6.6			13.7				15.8
Confl. Peds. (#/hr)	1		7	7		1						
Peak Hour Factor	1.00	0.90	0.90	1.00	0.94	0.94	1.00	1.00	0.81	1.00	1.00	0.74
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	0	789	43	0	754	784	0	0	354	0	0	250
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	789	43	0	754	784	0	0	354	0	0	250
Turn Type			Free			Free			custom			Free
Protected Phases		2			6 8				8			
Permitted Phases			Free			Free			8			Free
Detector Phase		2			6 8				8			
Switch Phase												
Minimum Initial (s)		12.0							7.0			
Minimum Split (s)		19.0							14.0			
Total Split (s)	0.0	29.0	0.0	0.0	60.0	0.0	0.0	0.0	31.0	0.0	0.0	0.0
Total Split (%)	0.0%	48.3%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	51.7%	0.0%	0.0%	0.0%
Maximum Green (s)		22.0							24.0			
Yellow Time (s)		5.0							5.0			
All-Red Time (s)		2.0							2.0			
Lost Time Adjust (s)	0.0	-2.0	0.0	0.0	0.0	0.0	0.0	0.0	-2.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	4.0	4.0	7.0	4.0	4.0	4.0	5.0	4.0	4.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0							3.0			
Recall Mode		C-Max							None			
Act Effct Green (s)		28.1	60.0		60.0	60.0			21.9			60.0
Actuated g/C Ratio		0.47	1.00		1.00	1.00			0.36			1.00
v/c Ratio		0.48	0.03		0.22	0.52			0.61			0.16
Control Delay		13.2	0.0		0.1	3.5			15.5			0.2
Queue Delay		0.0	0.0		0.0	0.0			0.0			0.0
Total Delay		13.2	0.0		0.1	3.5			15.5			0.2
LOS		B	A		A	A			B			A



Lanes, Volumes, Timings  
 221: NC 54 (Raleigh Road) & NC 54 WB On-Ramp

2/28/2014

Lane Group	ø6
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	6
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	12.0
Minimum Split (s)	19.0
Total Split (s)	29.0
Total Split (%)	48%
Maximum Green (s)	22.0
Yellow Time (s)	5.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	

Lanes, Volumes, Timings  
 221: NC 54 (Raleigh Road) & NC 54 WB On-Ramp

2/28/2014

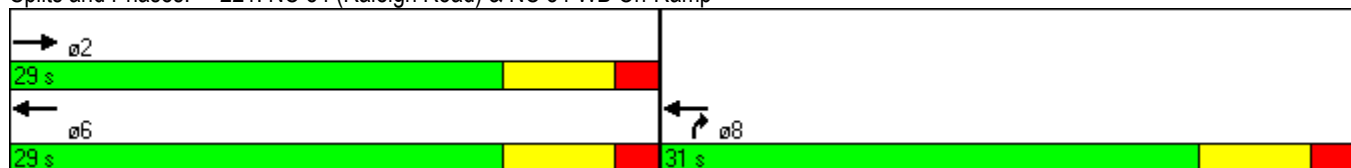


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		12.5			1.8							
Approach LOS		B			A							
Queue Length 50th (ft)		102	0		0	52			86			0
Queue Length 95th (ft)		160	0		0	89			m109			0
Internal Link Dist (ft)		388			354			521			614	
Turn Bay Length (ft)			150									
Base Capacity (vph)		1643	1531		3414	1521			685			1580
Starvation Cap Reductn		0	0		0	0			0			0
Spillback Cap Reductn		0	0		0	0			0			0
Storage Cap Reductn		0	0		0	0			0			0
Reduced v/c Ratio		0.48	0.03		0.22	0.52			0.52			0.16

Intersection Summary

Area Type: Other  
 Cycle Length: 60  
 Actuated Cycle Length: 60  
 Offset: 45 (75%), Referenced to phase 2:EBT, Start of Green  
 Natural Cycle: 40  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.61  
 Intersection Signal Delay: 6.3  
 Intersection LOS: A  
 Intersection Capacity Utilization 45.7%  
 ICU Level of Service A  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 221: NC 54 (Raleigh Road) & NC 54 WB On-Ramp



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Lane Group	ø6
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

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Lanes, Volumes, Timings  
 31: Median U-Turn #1 & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEU	NEL	NET	NER	SWU	SWL
Lane Configurations							⬆		⬆⬆		⬆	
Volume (vph)	0	0	0	0	0	0	123	0	2126	0	84	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0		0		0		250
Storage Lanes	0		0	0		0		1		0		1
Taper Length (ft)	25		25	25		25		25		25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00
Frt												
Frt Protected							0.950					0.950
Satd. Flow (prot)	0	0	0	0	0	0	1770	0	3539	0	1770	0
Frt Permitted							0.950					0.950
Satd. Flow (perm)	0	0	0	0	0	0	1770	0	3539	0	1770	0
Right Turn on Red			No			No				No		
Satd. Flow (RTOR)												
Link Speed (mph)		30			30				45			
Link Distance (ft)		77			56				715			
Travel Time (s)		1.8			1.3				10.8			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.90	0.92	0.90	0.92	0.90	0.92
Adj. Flow (vph)	0	0	0	0	0	0	137	0	2362	0	93	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	137	0	2362	0	93	0
Turn Type							Prot				Prot	
Protected Phases							5		2		1	
Permitted Phases												
Detector Phase							5		2		1	
Switch Phase												
Minimum Initial (s)							7.0		12.0		7.0	
Minimum Split (s)							14.0		23.0		14.0	
Total Split (s)	0.0	0.0	0.0	0.0	0.0	0.0	22.0	0.0	103.0	0.0	17.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	18.3%	0.0%	85.8%	0.0%	14.2%	0.0%
Maximum Green (s)							15.0		96.0		10.0	
Yellow Time (s)							5.0		5.0		5.0	
All-Red Time (s)							2.0		2.0		2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	-2.0	0.0	-2.0	0.0	-2.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	5.0	4.0	5.0	4.0	5.0	4.0
Lead/Lag							Lead		Lag		Lead	
Lead-Lag Optimize?							Yes		Yes		Yes	
Vehicle Extension (s)							3.0		3.0		3.0	
Recall Mode							None		C-Max		None	
Act Effct Green (s)							15.2		98.6		11.4	
Actuated g/C Ratio							0.13		0.82		0.10	
v/c Ratio							0.61		0.81		0.55	
Control Delay							59.0		5.2		56.6	
Queue Delay							0.0		0.1		0.0	
Total Delay							59.0		5.3		56.6	
LOS							E		A		E	
Approach Delay									8.2			
Approach LOS									A			
Queue Length 50th (ft)							105		181		76	

Lanes, Volumes, Timings  
 31: Median U-Turn #1 & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	SWT	SWR
Lane Configurations	↑↑↑	
Volume (vph)	2006	0
Ideal Flow (vphpl)	1900	1900
Storage Length (ft)		300
Storage Lanes		1
Taper Length (ft)		25
Lane Util. Factor	*0.70	1.00
Frt		
Flt Protected		
Satd. Flow (prot)	3912	0
Flt Permitted		
Satd. Flow (perm)	3912	0
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	45	
Link Distance (ft)	777	
Travel Time (s)	11.8	
Peak Hour Factor	0.90	0.92
Adj. Flow (vph)	2229	0
Shared Lane Traffic (%)		
Lane Group Flow (vph)	2229	0
Turn Type		
Protected Phases	6	
Permitted Phases		
Detector Phase	6	
Switch Phase		
Minimum Initial (s)	12.0	
Minimum Split (s)	23.0	
Total Split (s)	98.0	0.0
Total Split (%)	81.7%	0.0%
Maximum Green (s)	91.0	
Yellow Time (s)	5.0	
All-Red Time (s)	2.0	
Lost Time Adjust (s)	-2.0	0.0
Total Lost Time (s)	5.0	4.0
Lead/Lag	Lag	
Lead-Lag Optimize?	Yes	
Vehicle Extension (s)	3.0	
Recall Mode	C-Max	
Act Effct Green (s)	94.8	
Actuated g/C Ratio	0.79	
v/c Ratio	0.72	
Control Delay	1.8	
Queue Delay	0.0	
Total Delay	1.8	
LOS	A	
Approach Delay	4.0	
Approach LOS	A	
Queue Length 50th (ft)	66	

Lanes, Volumes, Timings

31: Median U-Turn #1 & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEU	NEL	NET	NER	SWU	SWL
Queue Length 95th (ft)							m148		248		m92	
Internal Link Dist (ft)		1			1				635			
Turn Bay Length (ft)											250	
Base Capacity (vph)							251		2908		177	
Starvation Cap Reductn							0		18		0	
Spillback Cap Reductn							0		32		0	
Storage Cap Reductn							0		0		0	
Reduced v/c Ratio							0.55		0.82		0.53	

Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	49 (41%), Referenced to phase 2:NET and 6:SWT, Start of Green
Natural Cycle:	65
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.81
Intersection Signal Delay:	6.2
Intersection LOS:	A
Intersection Capacity Utilization:	72.9%
ICU Level of Service:	C
Analysis Period (min):	15
* User Entered Value	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 31: Median U-Turn #1 & US 15-501 (Fordham Blvd)

ø1	ø2
17 s	103 s
ø5	ø6
22 s	98 s

Lanes, Volumes, Timings  
31: Median U-Turn #1 & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	SWT	SWR
Queue Length 95th (ft)	66	
Internal Link Dist (ft)	697	
Turn Bay Length (ft)		
Base Capacity (vph)	3091	
Starvation Cap Reductn	47	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.73	
Intersection Summary		

Lanes, Volumes, Timings  
 32: Median U-Turn #2 & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	SEL	SER	NEU	NEL	NET	SWT	SWR
Lane Configurations				↔	↑↑	↑↑	
Volume (vph)	0	0	168	28	2047	1862	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		250			0
Storage Lanes	0	0		1			0
Taper Length (ft)	25	25		25			25
Lane Util. Factor	1.00	1.00	0.95	1.00	0.95	0.95	1.00
Fr t							
Flt Protected				0.950			
Satd. Flow (prot)	0	0	0	1770	3539	3539	0
Flt Permitted				0.950			
Satd. Flow (perm)	0	0	0	1770	3539	3539	0
Right Turn on Red		No					No
Satd. Flow (RTOR)							
Link Speed (mph)	25				45	45	
Link Distance (ft)	128				913	1200	
Travel Time (s)	3.5				13.8	18.2	
Peak Hour Factor	1.00	1.00	0.90	0.90	0.90	0.90	1.00
Adj. Flow (vph)	0	0	187	31	2274	2069	0
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	0	218	2274	2069	0
Turn Type			Prot	Prot			
Protected Phases			5	5	2	6	
Permitted Phases							
Detector Phase			5	5	2	6	
Switch Phase							
Minimum Initial (s)			7.0	7.0	12.0	12.0	
Minimum Split (s)			14.0	14.0	23.0	23.0	
Total Split (s)	0.0	0.0	29.0	29.0	120.0	91.0	0.0
Total Split (%)	0.0%	0.0%	24.2%	24.2%	100.0%	75.8%	0.0%
Maximum Green (s)			22.0	22.0	113.0	84.0	
Yellow Time (s)			5.0	5.0	5.0	5.0	
All-Red Time (s)			2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	-2.0	-2.0	-2.0	0.0
Total Lost Time (s)	4.0	4.0	7.0	5.0	5.0	5.0	4.0
Lead/Lag			Lead	Lead		Lag	
Lead-Lag Optimize?			Yes	Yes		Yes	
Vehicle Extension (s)			3.0	3.0	3.0	3.0	
Recall Mode			None	None	C-Max	C-Max	
Act Effct Green (s)				20.8	120.0	89.2	
Actuated g/C Ratio				0.17	1.00	0.74	
v/c Ratio				0.71	0.64	0.79	
Control Delay				46.6	0.4	8.3	
Queue Delay				0.0	0.0	0.0	
Total Delay				46.6	0.4	8.3	
LOS				D	A	A	
Approach Delay					4.4	8.3	
Approach LOS					A	A	
Queue Length 50th (ft)				165	0	310	



Lanes, Volumes, Timings  
 32: Median U-Turn #2 & US 15-501 (Fordham Blvd)

2/28/2014

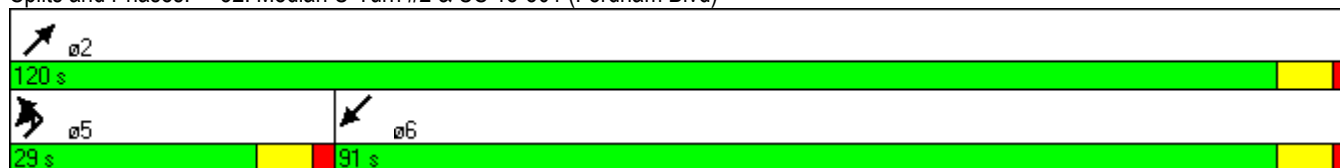


Lane Group	SEL	SER	NEU	NEL	NET	SWT	SWR
Queue Length 95th (ft)				m183	0	347	
Internal Link Dist (ft)	48				833	1120	
Turn Bay Length (ft)				250			
Base Capacity (vph)				354	3539	2630	
Starvation Cap Reductn				0	0	0	
Spillback Cap Reductn				0	0	0	
Storage Cap Reductn				0	0	0	
Reduced v/c Ratio				0.62	0.64	0.79	

Intersection Summary

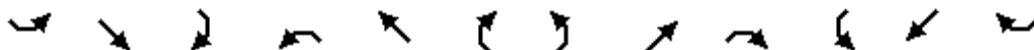
Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 45 (38%), Referenced to phase 2:NET and 6:SWT, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.79  
 Intersection Signal Delay: 6.2 Intersection LOS: A  
 Intersection Capacity Utilization 70.7% ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 32: Median U-Turn #2 & US 15-501 (Fordham Blvd)



Lanes, Volumes, Timings  
 20: Manning Drive & US 15-501 (Fordham Blvd)

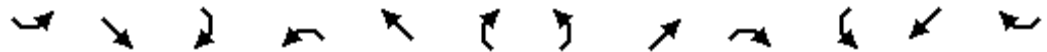
2/28/2014



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations	↔↔		↔	↔		↔		↔↔↔			↔↔	↔
Volume (vph)	270	0	36	16	0	48	0	2533	8	0	1220	947
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	9	12	12	12	12	12	12	12
Grade (%)		-4%			0%			-5%			0%	
Storage Length (ft)	0		225	0		75	0		0	0		0
Storage Lanes	0		1	1		1	2		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	*0.70	0.91	1.00	0.95	1.00
Ped Bike Factor			0.99	0.99								
Fr <sub>t</sub>			0.850			0.850						0.850
Fl <sub>t</sub> Protected	0.950			0.950								
Satd. Flow (prot)	3502	0	1615	1770	0	1583	0	3971	0	0	3539	1583
Fl <sub>t</sub> Permitted	0.950			0.950								
Satd. Flow (perm)	*3819	0	1594	1761	0	1583	0	*3811	0	0	3539	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			25			45				45
Link Distance (ft)		382			515			584				715
Travel Time (s)		7.4			14.0			8.8				10.8
Confl. Peds. (#/hr)			3	3								
Peak Hour Factor	0.85	1.00	0.85	0.84	1.00	0.84	1.00	0.96	0.96	1.00	0.96	0.96
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	2%	2%	2%
Adj. Flow (vph)	318	0	42	19	0	57	0	2639	8	0	1271	986
Shared Lane Traffic (%)												
Lane Group Flow (vph)	318	0	42	19	0	57	0	2647	0	0	1271	986
Turn Type	Prot		Free	Prot		Free						Free
Protected Phases	3			3				2				6
Permitted Phases			Free			Free						Free
Detector Phase	3			3				2				6
Switch Phase												
Minimum Initial (s)	7.0			7.0				12.0				12.0
Minimum Split (s)	32.0			32.0				19.0				19.0
Total Split (s)	32.0	0.0	0.0	32.0	0.0	0.0	0.0	108.0	0.0	0.0	108.0	0.0
Total Split (%)	22.9%	0.0%	0.0%	22.9%	0.0%	0.0%	0.0%	77.1%	0.0%	0.0%	77.1%	0.0%
Maximum Green (s)	25.0			25.0				101.0				101.0
Yellow Time (s)	5.0			5.0				5.0				5.0
All-Red Time (s)	2.0			2.0				2.0				2.0
Lost Time Adjust (s)	-2.0	0.0	0.0	-2.0	0.0	0.0	0.0	-2.0	0.0	-1.2	-2.0	0.0
Total Lost Time (s)	5.0	4.0	4.0	5.0	4.0	4.0	4.0	5.0	4.0	2.8	5.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0			1.0				6.0				6.0
Recall Mode	None			None				C-Max				C-Max
Walk Time (s)	7.0			7.0								
Flash Dont Walk (s)	18.0			18.0								
Pedestrian Calls (#/hr)	0			0								
Act Effct Green (s)	18.2		140.0	18.2		140.0		111.8			111.8	140.0
Actuated g/C Ratio	0.13		1.00	0.13		1.00		0.80			0.80	1.00

Lanes, Volumes, Timings  
 20: Manning Drive & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
v/c Ratio	0.70		0.03	0.08		0.04		0.83			0.45	0.62
Control Delay	66.6		0.0	52.6		0.0		12.3			3.5	1.8
Queue Delay	0.8		0.0	0.0		0.0		0.0			0.3	0.0
Total Delay	67.4		0.0	52.6		0.0		12.3			3.9	1.8
LOS	E		A	D		A		B			A	A
Approach Delay								12.3			3.0	
Approach LOS								B			A	
Queue Length 50th (ft)	144		0	15		0		584			151	5
Queue Length 95th (ft)	178		0	36		0		811			199	12
Internal Link Dist (ft)		302				435		504			635	
Turn Bay Length (ft)			225				75					
Base Capacity (vph)	675		1594	341		1583		3172			2827	1583
Starvation Cap Reductn	0		0	0		0		0			818	0
Spillback Cap Reductn	145		0	0		73		12			0	0
Storage Cap Reductn	0		0	0		0		0			0	0
Reduced v/c Ratio	0.60		0.03	0.06		0.04		0.84			0.63	0.62

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 36 (26%), Referenced to phase 2:NET and 6:SWT, Start of Green  
 Natural Cycle: 100  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.83  
 Intersection Signal Delay: 11.6  
 Intersection Capacity Utilization 65.2%  
 Analysis Period (min) 15  
 \* User Entered Value

Splits and Phases: 20: Manning Drive & US 15-501 (Fordham Blvd)

ø2	ø3
108 s	32 s
ø6	
108 s	

Lanes, Volumes, Timings  
 21: Old Mason Farm Road & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	EBR	WBR2	SER	SER2	NET	NER	SWT	SWR	SWR2
Lane Configurations									
Volume (vph)	24	102	208	14	2671	237	1852	5	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)					0%		0%		
Storage Length (ft)	0		0			300		100	
Storage Lanes	1		2			1		1	
Taper Length (ft)	25		25			25		25	
Lane Util. Factor	1.00	1.00	0.88	1.00	*1.00	1.00	*1.00	1.00	0.95
Ped Bike Factor		0.99							
Frt	0.865	0.865	0.850			0.850		0.850	
Flt Protected									
Satd. Flow (prot)	1611	1587	2759	0	3725	1583	3725	1583	0
Flt Permitted									
Satd. Flow (perm)	1611	1565	2759	0	*3787	1583	*3771	1583	0
Right Turn on Red	No	No		No		No			No
Satd. Flow (RTOR)									
Link Speed (mph)					45		45		
Link Distance (ft)					775		912		
Travel Time (s)					11.7		13.8		
Confl. Peds. (#/hr)		1							
Peak Hour Factor	0.39	0.86	0.59	0.59	0.92	0.92	0.90	0.90	0.90
Adj. Flow (vph)	62	119	353	24	2903	258	2058	6	1
Shared Lane Traffic (%)									
Lane Group Flow (vph)	62	119	377	0	2903	258	2058	7	0
Turn Type	custom	custom	custom			Free		Perm	
Protected Phases	3	4	4		2		6		
Permitted Phases	3	4	4		3	Free		6	
Detector Phase	3	4	4		2		6	6	
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0		12.0		12.0	12.0	
Minimum Split (s)	14.0	14.0	14.0		33.0		25.0	25.0	
Total Split (s)	14.0	24.0	24.0	0.0	102.0	0.0	102.0	102.0	0.0
Total Split (%)	10.0%	17.1%	17.1%	0.0%	72.9%	0.0%	72.9%	72.9%	0.0%
Maximum Green (s)	7.0	17.0	17.0		95.0		95.0	95.0	
Yellow Time (s)	5.0	5.0	5.0		5.0		5.0	5.0	
All-Red Time (s)	2.0	2.0	2.0		2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	0.0	-2.0	0.0	-2.0	-2.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes								
Vehicle Extension (s)	3.0	2.0	2.0		2.0		2.0	2.0	
Recall Mode	None	None	None		C-Max		C-Max	C-Max	
Walk Time (s)					7.0		7.0	7.0	
Flash Dont Walk (s)					16.0		11.0	11.0	
Pedestrian Calls (#/hr)					0		0	0	
Act Effct Green (s)	9.0	20.4	20.4		105.6	140.0	98.4	98.4	
Actuated g/C Ratio	0.06	0.15	0.15		0.75	1.00	0.70	0.70	
v/c Ratio	0.60	0.52	0.94		1.03	0.16	0.79	0.01	
Control Delay	87.0	64.9	91.0		30.3	0.1	6.5	1.3	

Lanes, Volumes, Timings  
 21: Old Mason Farm Road & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	EBR	WBR2	SER	SER2	NET	NER	SWT	SWR	SWR2
Queue Delay	0.0	0.0	0.0		21.4	0.0	0.3	0.0	
Total Delay	87.0	64.9	91.0		51.7	0.1	6.7	1.3	
LOS	F	E	F		D	A	A	A	
Approach Delay					47.5		6.7		
Approach LOS					D		A		
Queue Length 50th (ft)	56	103	~200		~1285	0	470	1	
Queue Length 95th (ft)	45	163	163		m#1098	m0	240	m1	
Internal Link Dist (ft)					695		832		
Turn Bay Length (ft)						300		100	
Base Capacity (vph)	104	231	401		2813	1583	2619	1113	
Starvation Cap Reductn	0	0	0		136	0	128	0	
Spillback Cap Reductn	0	0	0		0	0	0	0	
Storage Cap Reductn	0	0	0		0	0	0	0	
Reduced v/c Ratio	0.60	0.52	0.94		1.08	0.16	0.83	0.01	

Intersection Summary

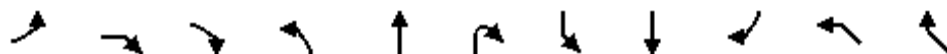
Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 14 (10%), Referenced to phase 2:NET and 6:SWT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.03  
 Intersection Signal Delay: 36.5  
 Intersection LOS: D  
 Intersection Capacity Utilization 88.8%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 \* User Entered Value  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 21: Old Mason Farm Road & US 15-501 (Fordham Blvd)

ø2	ø3	ø4
102 s	14 s	24 s
ø6		
102 s		

Lanes, Volumes, Timings  
 22: NC 54 WB On-Ramp & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	EBL	EBR	EBR2	NBL	NBT	NBR	SBL	SBT	SBR	NWL	NWR	ø2
Lane Configurations			↑↑	↑	↑↑			↑↑	↑		↑	
Volume (vph)	0	0	1074	32	1748	0	0	1661	92	0	429	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	0	450		150		0	0		375	0	0	
Storage Lanes	0	1		1		0	0		1	0	1	
Taper Length (ft)	25	25		25		25	25		25	25	25	
Lane Util. Factor	1.00	1.00	0.88	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	
Frt			0.850						0.850		0.865	
Flt Protected				0.950								
Satd. Flow (prot)	0	0	2787	1770	3539	0	0	3539	1583	0	1611	
Flt Permitted				0.950								
Satd. Flow (perm)	0	0	2787	1770	3539	0	0	3539	1583	0	1611	
Right Turn on Red			No			Yes			No		Yes	
Satd. Flow (RTOR)												82
Link Speed (mph)	30				45			45		25		
Link Distance (ft)	694				1058			476		590		
Travel Time (s)	15.8				16.0			7.2		16.1		
Peak Hour Factor	0.92	0.92	0.92	0.90	0.90	0.90	0.90	0.82	0.92	0.92	0.90	
Adj. Flow (vph)	0	0	1167	36	1942	0	0	2026	100	0	477	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	1167	36	1942	0	0	2026	100	0	477	
Turn Type			custom	Prot					Perm		Free	
Protected Phases			4	4	2 4			6				2
Permitted Phases			4						6		Free	
Detector Phase			4	4	2 4			6	6			
Switch Phase												
Minimum Initial (s)			7.0	7.0				12.0	12.0			12.0
Minimum Split (s)			13.0	13.0				18.0	18.0			18.0
Total Split (s)	0.0	0.0	59.0	59.0	140.0	0.0	0.0	81.0	81.0	0.0	0.0	81.0
Total Split (%)	0.0%	0.0%	42.1%	42.1%	100.0%	0.0%	0.0%	57.9%	57.9%	0.0%	0.0%	58%
Maximum Green (s)			53.9	53.9				75.2	75.2			75.2
Yellow Time (s)			3.1	3.1				4.5	4.5			4.5
All-Red Time (s)			2.0	2.0				1.3	1.3			1.3
Lost Time Adjust (s)	0.0	0.0	-0.1	-0.1	-0.8	0.0	0.0	-0.8	-0.8	0.0	0.0	
Total Lost Time (s)	4.0	4.0	5.0	5.0	5.0	4.0	4.0	5.0	5.0	4.0	4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)			3.0	3.0				6.0	6.0			6.0
Recall Mode			None	None				C-Max	C-Max			Max
Act Effct Green (s)			54.0	54.0	140.0			76.0	76.0		140.0	
Actuated g/C Ratio			0.39	0.39	1.00			0.54	0.54		1.00	
v/c Ratio			1.09	0.05	0.55			1.05	0.12		0.30	
Control Delay			84.9	30.3	0.5			68.3	16.1		0.4	
Queue Delay			0.0	0.0	0.0			0.0	0.0		0.0	
Total Delay			84.9	30.3	0.5			68.3	16.1		0.4	
LOS			F	C	A			E	B		A	
Approach Delay					1.0			65.9				
Approach LOS					A			E				
Queue Length 50th (ft)			~671	21	0			~1059	43		0	

Lanes, Volumes, Timings  
 22: NC 54 WB On-Ramp & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	EBL	EBR	EBR2	NBL	NBT	NBR	SBL	SBT	SBR	NWL	NWR	ø2
Queue Length 95th (ft)			#828	m31	0			#1003	74		0	
Internal Link Dist (ft)	614				978			396		510		
Turn Bay Length (ft)			450	150					375			
Base Capacity (vph)			1075	683	3539			1921	859		1611	
Starvation Cap Reductn			0	0	0			0	0		0	
Spillback Cap Reductn			0	0	0			0	0		0	
Storage Cap Reductn			0	0	0			0	0		0	
Reduced v/c Ratio			1.09	0.05	0.55			1.05	0.12		0.30	

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 119 (85%), Referenced to phase 6:SBT, Start of Green  
 Natural Cycle: 140  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.09  
 Intersection Signal Delay: 42.0 Intersection LOS: D  
 Intersection Capacity Utilization Err% ICU Level of Service H  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 22: NC 54 WB On-Ramp & US 15-501 (Fordham Blvd)



Lanes, Volumes, Timings  
 221: NC 54 (Raleigh Road) & NC 54 WB On-Ramp

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑		↑↑	↑			↑			↑
Volume (vph)	0	1456	73	0	977	1074	0	0	257	0	0	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	0		0	0		0	0		0
Storage Lanes	0		1	0		1	0		1	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.98			0.98						
Frt			0.850			0.850			0.865			0.865
Flt Protected												
Satd. Flow (prot)	0	3539	1583	0	3539	1583	0	0	1611	0	0	1611
Flt Permitted												
Satd. Flow (perm)	0	3539	1545	0	3539	1547	0	0	1611	0	0	1611
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)			34			1091						270
Link Speed (mph)		45			45			30				30
Link Distance (ft)		468			434			601				694
Travel Time (s)		7.1			6.6			13.7				15.8
Confl. Peds. (#/hr)	6		8	8		6						
Peak Hour Factor	1.00	0.86	0.86	1.00	0.92	0.92	1.00	1.00	0.84	1.00	1.00	0.88
Adj. Flow (vph)	0	1693	85	0	1062	1167	0	0	306	0	0	141
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1693	85	0	1062	1167	0	0	306	0	0	141
Turn Type			Free			Free			custom			Free
Protected Phases		2			6 8				8			
Permitted Phases			Free			Free			8			Free
Detector Phase		2			6 8				8			
Switch Phase												
Minimum Initial (s)		12.0							7.0			
Minimum Split (s)		19.0							14.0			
Total Split (s)	0.0	46.0	0.0	0.0	70.0	0.0	0.0	0.0	24.0	0.0	0.0	0.0
Total Split (%)	0.0%	65.7%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	34.3%	0.0%	0.0%	0.0%
Maximum Green (s)		39.0							17.0			
Yellow Time (s)		5.0							5.0			
All-Red Time (s)		2.0							2.0			
Lost Time Adjust (s)	0.0	-2.0	0.0	0.0	0.0	0.0	0.0	0.0	-2.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	4.0	4.0	7.0	4.0	4.0	4.0	5.0	4.0	4.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0							3.0			
Recall Mode		C-Max							None			
Act Effct Green (s)		41.7	70.0		70.0	70.0			18.3			70.0
Actuated g/C Ratio		0.60	1.00		1.00	1.00			0.26			1.00
v/c Ratio		0.80	0.06		0.30	0.75			0.73			0.09
Control Delay		15.0	0.1		0.2	10.2			25.5			0.1
Queue Delay		0.0	0.0		0.0	0.0			0.0			0.0
Total Delay		15.0	0.1		0.2	10.2			25.5			0.1
LOS		B	A		A	B			C			A
Approach Delay		14.3			5.4							



Lanes, Volumes, Timings  
 221: NC 54 (Raleigh Road) & NC 54 WB On-Ramp

2/28/2014

Lane Group	ø6
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	6
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	12.0
Minimum Split (s)	19.0
Total Split (s)	46.0
Total Split (%)	66%
Maximum Green (s)	39.0
Yellow Time (s)	5.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	

Lanes, Volumes, Timings  
 221: NC 54 (Raleigh Road) & NC 54 WB On-Ramp

2/28/2014

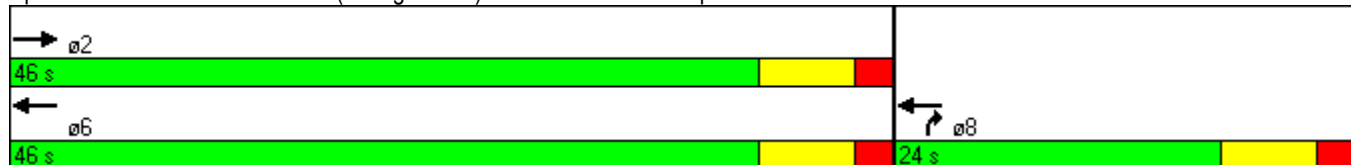


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS	B			A								
Queue Length 50th (ft)		273	0		0	509			124			0
Queue Length 95th (ft)		335	0		0	827			m119			0
Internal Link Dist (ft)		388			354			521			614	
Turn Bay Length (ft)	150											
Base Capacity (vph)		2106	1545		3502	1547			437			1611
Starvation Cap Reductn		0	0		0	0			0			0
Spillback Cap Reductn		0	0		0	0			0			0
Storage Cap Reductn		0	0		0	0			0			0
Reduced v/c Ratio		0.80	0.06		0.30	0.75			0.70			0.09

Intersection Summary

Area Type: Other  
 Cycle Length: 70  
 Actuated Cycle Length: 70  
 Offset: 4 (6%), Referenced to phase 2:EBT, Start of Green  
 Natural Cycle: 55  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.80  
 Intersection Signal Delay: 10.2  
 Intersection LOS: B  
 Intersection Capacity Utilization 64.5%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 221: NC 54 (Raleigh Road) & NC 54 WB On-Ramp



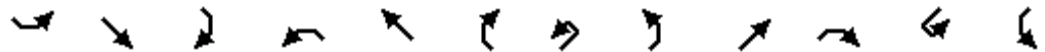
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Lane Group	ø6
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

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Lanes, Volumes, Timings  
 31: Median U-Turn #1 & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEU	NEL	NET	NER	SWU	SWL
Lane Configurations							⬇		⬆⬆		⬇	
Volume (vph)	0	0	0	0	0	0	226	0	2625	0	174	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0		0		0		250
Storage Lanes	0		0	0		0		1		0		1
Taper Length (ft)	25		25	25		25		25		25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00
Frt												
Flt Protected							0.950				0.950	
Satd. Flow (prot)	0	0	0	0	0	0	1770	0	3539	0	1770	0
Flt Permitted							0.950				0.950	
Satd. Flow (perm)	0	0	0	0	0	0	1770	0	3539	0	1770	0
Right Turn on Red			No			No				No		
Satd. Flow (RTOR)												
Link Speed (mph)		30			30				45			
Link Distance (ft)		92			68				715			
Travel Time (s)		2.1			1.5				10.8			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.90	0.92	0.90	0.92	0.90	0.92
Adj. Flow (vph)	0	0	0	0	0	0	251	0	2917	0	193	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	251	0	2917	0	193	0
Turn Type							Prot				Prot	
Protected Phases							5		2		1	
Permitted Phases												
Detector Phase							5		2		1	
Switch Phase												
Minimum Initial (s)							7.0		12.0		7.0	
Minimum Split (s)							14.0		23.0		14.0	
Total Split (s)	0.0	0.0	0.0	0.0	0.0	0.0	36.0	0.0	120.0	0.0	20.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	25.7%	0.0%	85.7%	0.0%	14.3%	0.0%
Maximum Green (s)							29.0		113.0		13.0	
Yellow Time (s)							5.0		5.0		5.0	
All-Red Time (s)							2.0		2.0		2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	-2.0	0.0	-2.0	0.0	-2.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	5.0	4.0	5.0	4.0	5.0	4.0
Lead/Lag							Lead		Lag		Lead	
Lead-Lag Optimize?							Yes		Yes		Yes	
Vehicle Extension (s)							3.0		3.0		3.0	
Recall Mode							None		C-Max		None	
Act Effct Green (s)							26.2		115.0		15.0	
Actuated g/C Ratio							0.19		0.82		0.11	
v/c Ratio							0.76		1.00		1.02	
Control Delay							59.8		24.3		113.3	
Queue Delay							0.0		46.2		0.0	
Total Delay							59.8		70.5		113.3	
LOS							E		E		F	
Approach Delay									69.7			
Approach LOS									E			
Queue Length 50th (ft)							221		~603		~191	

Lanes, Volumes, Timings  
 31: Median U-Turn #1 & US 15-501 (Fordham Blvd)

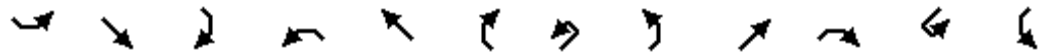
2/28/2014



Lane Group	SWT	SWR
Lane Configurations	↑↑↑	
Volume (vph)	1910	0
Ideal Flow (vphpl)	1900	1900
Storage Length (ft)		300
Storage Lanes		1
Taper Length (ft)		25
Lane Util. Factor	*0.70	1.00
Frt		
Flt Protected		
Satd. Flow (prot)	3912	0
Flt Permitted		
Satd. Flow (perm)	3912	0
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	45	
Link Distance (ft)	775	
Travel Time (s)	11.7	
Peak Hour Factor	0.90	0.92
Adj. Flow (vph)	2122	0
Shared Lane Traffic (%)		
Lane Group Flow (vph)	2122	0
Turn Type		
Protected Phases	6	
Permitted Phases		
Detector Phase	6	
Switch Phase		
Minimum Initial (s)	12.0	
Minimum Split (s)	23.0	
Total Split (s)	104.0	0.0
Total Split (%)	74.3%	0.0%
Maximum Green (s)	97.0	
Yellow Time (s)	5.0	
All-Red Time (s)	2.0	
Lost Time Adjust (s)	-2.0	0.0
Total Lost Time (s)	5.0	4.0
Lead/Lag	Lag	
Lead-Lag Optimize?	Yes	
Vehicle Extension (s)	3.0	
Recall Mode	C-Max	
Act Effct Green (s)	103.8	
Actuated g/C Ratio	0.74	
v/c Ratio	0.73	
Control Delay	6.4	
Queue Delay	0.1	
Total Delay	6.6	
LOS	A	
Approach Delay	15.5	
Approach LOS	B	
Queue Length 50th (ft)	230	

Lanes, Volumes, Timings  
 31: Median U-Turn #1 & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEU	NEL	NET	NER	SWU	SWL
Queue Length 95th (ft)							m262		#1562		m#282	
Internal Link Dist (ft)		12				1			635			
Turn Bay Length (ft)											250	
Base Capacity (vph)							392		2907		190	
Starvation Cap Reductn							0		0		0	
Spillback Cap Reductn							0		304		0	
Storage Cap Reductn							0		0		0	
Reduced v/c Ratio							0.64		1.12		1.02	

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 8 (6%), Referenced to phase 2:NET and 6:SWT, Start of Green  
 Natural Cycle: 130  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.02  
 Intersection Signal Delay: 46.8 Intersection LOS: D  
 Intersection Capacity Utilization 90.5% ICU Level of Service E  
 Analysis Period (min) 15  
 \* User Entered Value  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 31: Median U-Turn #1 & US 15-501 (Fordham Blvd)



Lanes, Volumes, Timings  
31: Median U-Turn #1 & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	SWT	SWR
Queue Length 95th (ft)	282	
Internal Link Dist (ft)	695	
Turn Bay Length (ft)		
Base Capacity (vph)	2901	
Starvation Cap Reductn	139	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.77	
Intersection Summary		

Lanes, Volumes, Timings  
 32: Median U-Turn #2 & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	SEL	SER	NEU	NEL	NET	SWT	SWR
Lane Configurations				↔	↑↑	↑↑	
Volume (vph)	0	0	88	103	2547	1975	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		250			0
Storage Lanes	0	0		1			0
Taper Length (ft)	25	25		25			25
Lane Util. Factor	1.00	1.00	0.95	1.00	0.95	0.95	1.00
Fr t							
Flt Protected				0.950			
Satd. Flow (prot)	0	0	0	1770	3539	3539	0
Flt Permitted				0.950			
Satd. Flow (perm)	0	0	0	1770	3539	3539	0
Right Turn on Red		No					No
Satd. Flow (RTOR)							
Link Speed (mph)	25				45	45	
Link Distance (ft)	128				912	1202	
Travel Time (s)	3.5				13.8	18.2	
Peak Hour Factor	1.00	1.00	0.90	0.90	0.90	0.90	1.00
Adj. Flow (vph)	0	0	98	114	2830	2194	0
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	0	212	2830	2194	0
Turn Type			Prot	Prot			
Protected Phases			5	5	2	6	
Permitted Phases							
Detector Phase			5	5	2	6	
Switch Phase							
Minimum Initial (s)			7.0	7.0	12.0	12.0	
Minimum Split (s)			14.0	14.0	23.0	23.0	
Total Split (s)	0.0	0.0	31.0	31.0	140.0	109.0	0.0
Total Split (%)	0.0%	0.0%	22.1%	22.1%	100.0%	77.9%	0.0%
Maximum Green (s)			24.0	24.0	133.0	102.0	
Yellow Time (s)			5.0	5.0	5.0	5.0	
All-Red Time (s)			2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	-2.0	-2.0	-2.0	0.0
Total Lost Time (s)	4.0	4.0	7.0	5.0	5.0	5.0	4.0
Lead/Lag			Lead	Lead		Lag	
Lead-Lag Optimize?			Yes	Yes		Yes	
Vehicle Extension (s)			3.0	3.0	3.0	3.0	
Recall Mode			None	None	C-Max	C-Max	
Act Effct Green (s)				22.7	140.0	107.3	
Actuated g/C Ratio				0.16	1.00	0.77	
v/c Ratio				0.74	0.80	0.81	
Control Delay				47.5	2.3	7.7	
Queue Delay				0.0	0.0	0.0	
Total Delay				47.5	2.3	7.7	
LOS				D	A	A	
Approach Delay					5.5	7.7	
Approach LOS					A	A	
Queue Length 50th (ft)				182	10	413	



Lanes, Volumes, Timings  
 32: Median U-Turn #2 & US 15-501 (Fordham Blvd)

2/28/2014



Lane Group	SEL	SER	NEU	NEL	NET	SWT	SWR
Queue Length 95th (ft)				m0	m0	m390	
Internal Link Dist (ft)	48				832	1122	
Turn Bay Length (ft)				250			
Base Capacity (vph)				329	3539	2713	
Starvation Cap Reductn				0	0	0	
Spillback Cap Reductn				0	0	0	
Storage Cap Reductn				0	0	0	
Reduced v/c Ratio				0.64	0.80	0.81	

Intersection Summary













Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 134 (96%), Referenced to phase 2:NET and 6:SWT, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.81  
 Intersection Signal Delay: 6.4 Intersection LOS: A  
 Intersection Capacity Utilization 74.6% ICU Level of Service D  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 32: Median U-Turn #2 & US 15-501 (Fordham Blvd)



Lanes, Volumes, Timings  
8: NC 86 NB & NC 86 SB













2/28/2014

												
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↑↑						↑↑				
Volume (vph)	0	1325	0	0	0	0	0	409	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	*0.57	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Frt												
Flt Protected												
Satd. Flow (prot)	0	2103	0	0	0	0	0	3343	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	2103	0	0	0	0	0	3343	0	0	0	0
Right Turn on Red			No			No	No		No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25				25
Link Distance (ft)		174			138			131				144
Travel Time (s)		4.7			3.8			3.6				3.9
Peak Hour Factor	0.90	0.87	0.90	0.90	0.90	0.90	0.90	0.91	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	3%	2%	2%	2%	2%	2%	8%	2%	2%	2%	2%
Adj. Flow (vph)	0	1523	0	0	0	0	0	449	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1523	0	0	0	0	0	449	0	0	0	0
Turn Type												
Protected Phases		4 3						2				
Permitted Phases												
Detector Phase		4 3						2				
Switch Phase												
Minimum Initial (s)								4.0				
Minimum Split (s)								19.0				
Total Split (s)	0.0	113.0	0.0	0.0	0.0	0.0	0.0	27.0	0.0	0.0	0.0	0.0
Total Split (%)	0.0%	80.7%	0.0%	0.0%	0.0%	0.0%	0.0%	19.3%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)								20.0				
Yellow Time (s)								5.0				
All-Red Time (s)								2.0				
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	2.0	5.0	2.0	2.0	2.0	2.0	2.0	5.0	2.0	2.0	2.0	2.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)								3.0				
Recall Mode								C-Min				
Act Effct Green (s)		108.1						21.9				
Actuated g/C Ratio		0.77						0.16				
v/c Ratio		0.94						0.86				
Control Delay		23.6						74.1				
Queue Delay		6.8						0.0				
Total Delay		30.4						74.1				
LOS		C						E				
Approach Delay		30.4						74.1				
Approach LOS		C						E				
Queue Length 50th (ft)		628						212				
Queue Length 95th (ft)		689						#298				
Internal Link Dist (ft)		94			58			51				64

Lane Group	ø3	ø4
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Lane Util. Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Peak Hour Factor		
Heavy Vehicles (%)		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	3	4
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	4.0	4.0
Minimum Split (s)	14.0	19.0
Total Split (s)	14.0	99.0
Total Split (%)	10%	71%
Maximum Green (s)	7.0	92.0
Yellow Time (s)	5.0	5.0
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lag
Lead-Lag Optimize?	Yes	
Vehicle Extension (s)	3.0	3.0
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		

Lanes, Volumes, Timings  
 8: NC 86 NB & NC 86 SB

2/28/2014

												
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Turn Bay Length (ft)												
Base Capacity (vph)		1627						525				
Starvation Cap Reductn		93						0				
Spillback Cap Reductn		0						0				
Storage Cap Reductn		0						0				
Reduced v/c Ratio		0.99						0.86				

**Intersection Summary**

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 68 (49%), Referenced to phase 2:SET, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.94

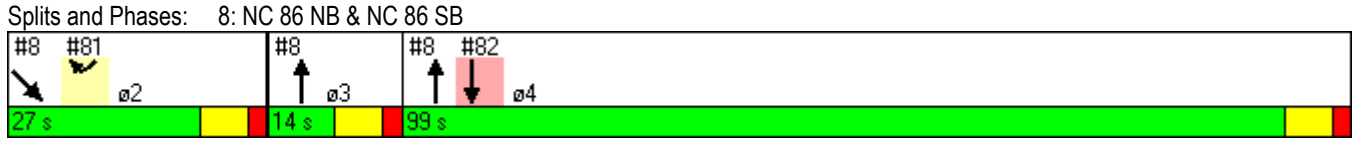
Intersection Signal Delay: 40.4      Intersection LOS: D

Intersection Capacity Utilization 56.3%      ICU Level of Service B

Analysis Period (min) 15

\* User Entered Value

# 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.



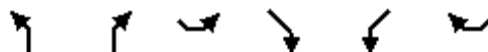
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Lane Group	ø3	ø4
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

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Lanes, Volumes, Timings  
 81: NC 86 NB & NC 54 WB Off Ramp RT

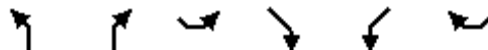
2/28/2014



Lane Group	NBL	NBR	SEL	SER	SWL	SWR	ø3	ø4
Lane Configurations	↕↕					↕		
Volume (vph)	1325	0	0	0	0	61		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Lane Util. Factor	*0.57	1.00	1.00	1.00	1.00	1.00		
Frt						0.865		
Flt Protected	0.950							
Satd. Flow (prot)	1998	0	0	0	0	1596		
Flt Permitted	0.950							
Satd. Flow (perm)	1998	0	0	0	0	1596		
Right Turn on Red	No	No		No		No		
Satd. Flow (RTOR)								
Link Speed (mph)	25		35		45			
Link Distance (ft)	138		132		310			
Travel Time (s)	3.8		2.6		4.7			
Peak Hour Factor	0.87	0.90	0.90	0.90	0.90	0.92		
Heavy Vehicles (%)	3%	2%	2%	2%	2%	3%		
Adj. Flow (vph)	1523	0	0	0	0	66		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	1523	0	0	0	0	66		
Turn Type						custom		
Protected Phases	Free!					2!	3	4
Permitted Phases								
Detector Phase						2		
Switch Phase								
Minimum Initial (s)						4.0	4.0	4.0
Minimum Split (s)						19.0	14.0	19.0
Total Split (s)	0.0	0.0	0.0	0.0	0.0	27.0	14.0	99.0
Total Split (%)	0.0%	0.0%	0.0%	0.0%	0.0%	19.3%	10%	71%
Maximum Green (s)						20.0	7.0	92.0
Yellow Time (s)						5.0	5.0	5.0
All-Red Time (s)						2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0		
Total Lost Time (s)	2.0	2.0	2.0	2.0	2.0	5.0		
Lead/Lag							Lead	Lag
Lead-Lag Optimize?							Yes	
Vehicle Extension (s)						3.0	3.0	3.0
Recall Mode						C-Min	None	None
Act Effct Green (s)	140.0					21.9		
Actuated g/C Ratio	1.00					0.16		
v/c Ratio	0.76					0.26		
Control Delay	4.5					55.1		
Queue Delay	0.0					0.0		
Total Delay	4.5					55.1		
LOS	A					E		
Approach Delay	4.5							
Approach LOS	A							
Queue Length 50th (ft)	41					54		
Queue Length 95th (ft)	18					102		
Internal Link Dist (ft)	58		52		230			

Lanes, Volumes, Timings  
 81: NC 86 NB & NC 54 WB Off Ramp RT

2/28/2014



Lane Group	NBL	NBR	SEL	SER	SWL	SWR	ø3	ø4
Turn Bay Length (ft)								
Base Capacity (vph)	1998					251		
Starvation Cap Reductn	0					0		
Spillback Cap Reductn	0					0		
Storage Cap Reductn	0					0		
Reduced v/c Ratio	0.76					0.26		

Intersection Summary

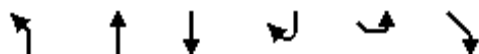
Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	140
Offset:	68 (49%), Referenced to phase 2:SET, Start of Green
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.94
Intersection Signal Delay:	6.6
Intersection LOS:	A
Intersection Capacity Utilization	56.3%
ICU Level of Service	B
Analysis Period (min)	15
* User Entered Value	
! Phase conflict between lane groups.	

Splits and Phases: 81: NC 86 NB & NC 54 WB Off Ramp RT



Lanes, Volumes, Timings  
82: NC 86 SB & NC 54 WB Off-Ramp LT

2/28/2014

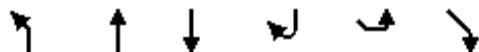


Lane Group	NBL	NBT	SBT	SBR	SEL	SER	ø2	ø3
Lane Configurations			↑↑			↑↑		
Volume (vph)	0	0	745	0	0	409		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.88		
Fr t						0.850		
Flt Protected								
Satd. Flow (prot)	0	0	3505	0	0	2632		
Flt Permitted								
Satd. Flow (perm)	0	0	3505	0	0	2632		
Right Turn on Red				No		No		
Satd. Flow (RTOR)								
Link Speed (mph)		40	35		25			
Link Distance (ft)		392	164		144			
Travel Time (s)		6.7	3.2		3.9			
Peak Hour Factor	0.90	0.90	0.92	0.90	0.90	0.91		
Heavy Vehicles (%)	2%	2%	3%	2%	2%	8%		
Adj. Flow (vph)	0	0	810	0	0	449		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	0	810	0	0	449		
Turn Type						custom		
Protected Phases			4!			Free!	2	3
Permitted Phases								
Detector Phase			4					
Switch Phase								
Minimum Initial (s)			4.0				4.0	4.0
Minimum Split (s)			19.0				19.0	14.0
Total Split (s)	0.0	0.0	99.0	0.0	0.0	0.0	27.0	14.0
Total Split (%)	0.0%	0.0%	70.7%	0.0%	0.0%	0.0%	19%	10%
Maximum Green (s)			92.0				20.0	7.0
Yellow Time (s)			5.0				5.0	5.0
All-Red Time (s)			2.0				2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0		
Total Lost Time (s)	2.0	2.0	5.0	2.0	2.0	2.0		
Lead/Lag			Lag					Lead
Lead-Lag Optimize?								Yes
Vehicle Extension (s)			3.0				3.0	3.0
Recall Mode			None				C-Min	None
Act Effct Green (s)			93.7			140.0		
Actuated g/C Ratio			0.67			1.00		
v/c Ratio			0.35			0.17		
Control Delay			10.4			3.0		
Queue Delay			0.0			0.0		
Total Delay			10.4			3.0		
LOS			B			A		
Approach Delay			10.4					
Approach LOS			B					
Queue Length 50th (ft)			154			47		
Queue Length 95th (ft)			188			m62		
Internal Link Dist (ft)		312	84		64			



Lanes, Volumes, Timings  
 82: NC 86 SB & NC 54 WB Off-Ramp LT

2/28/2014



Lane Group	NBL	NBT	SBT	SBR	SEL	SER	ø2	ø3
Turn Bay Length (ft)								
Base Capacity (vph)			2353			2632		
Starvation Cap Reductn			0			0		
Spillback Cap Reductn			0			0		
Storage Cap Reductn			0			0		
Reduced v/c Ratio			0.34			0.17		

Intersection Summary

Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	140
Offset:	68 (49%), Referenced to phase 2:SET, Start of Green
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.94
Intersection Signal Delay:	7.8
Intersection LOS:	A
Intersection Capacity Utilization	29.9%
ICU Level of Service	A
Analysis Period (min)	15
m Volume for 95th percentile queue is metered by upstream signal.	
! Phase conflict between lane groups.	

Splits and Phases: 82: NC 86 SB & NC 54 WB Off-Ramp LT



Lanes, Volumes, Timings  
9: NC 86 SB & NC 86 NB

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑			↑↑				
Volume (vph)	0	0	0	0	1119	0	0	1227	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Frt												
Flt Protected												
Satd. Flow (prot)	0	0	0	0	3374	0	0	3505	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	0	0	0	3374	0	0	3505	0	0	0	0
Right Turn on Red			No			No	No		No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			25			25				35
Link Distance (ft)		117			175			105				148
Travel Time (s)		2.0			4.8			2.9				2.9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.92	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	7%	2%	2%	3%	2%	2%	2%	2%
Adj. Flow (vph)	0	0	0	0	1243	0	0	1334	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1243	0	0	1334	0	0	0	0
Turn Type												
Protected Phases					4 3			2				
Permitted Phases												
Detector Phase					4 3			2				
Switch Phase												
Minimum Initial (s)								4.0				
Minimum Split (s)								19.0				
Total Split (s)	0.0	0.0	0.0	0.0	69.0	0.0	0.0	71.0	0.0	0.0	0.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	0.0%	49.3%	0.0%	0.0%	50.7%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)								64.0				
Yellow Time (s)								5.0				
All-Red Time (s)								2.0				
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	2.0	2.0	2.0	2.0	5.0	2.0	2.0	5.0	2.0	2.0	2.0	2.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)								3.0				
Recall Mode								C-Min				
Act Effct Green (s)					61.7			68.3				
Actuated g/C Ratio					0.44			0.49				
v/c Ratio					0.84			0.78				
Control Delay					30.9			27.3				
Queue Delay					0.0			0.0				
Total Delay					30.9			27.3				
LOS					C			C				
Approach Delay					30.9			27.3				
Approach LOS					C			C				
Queue Length 50th (ft)					270			558				
Queue Length 95th (ft)					375			m601				
Internal Link Dist (ft)		37			95			25			68	

Lane Group	ø3	ø4
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Lane Util. Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Peak Hour Factor		
Heavy Vehicles (%)		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	3	4
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	4.0	4.0
Minimum Split (s)	14.0	19.0
Total Split (s)	14.0	55.0
Total Split (%)	10%	39%
Maximum Green (s)	7.0	48.0
Yellow Time (s)	5.0	5.0
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lag
Lead-Lag Optimize?	Yes	
Vehicle Extension (s)	3.0	3.0
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		

Lanes, Volumes, Timings  
 9: NC 86 SB & NC 86 NB

2/28/2014

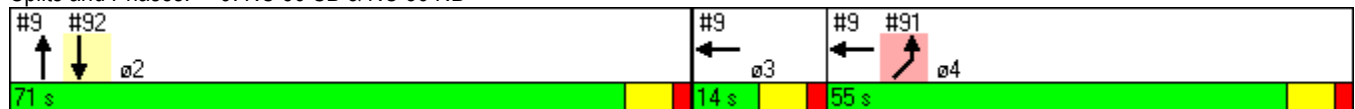


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)												
Base Capacity (vph)					1591			1709				
Starvation Cap Reductn					0			0				
Spillback Cap Reductn					0			0				
Storage Cap Reductn					0			0				
Reduced v/c Ratio					0.78			0.78				

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green, Master Intersection  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.84  
 Intersection Signal Delay: 29.0 Intersection LOS: C  
 Intersection Capacity Utilization 73.2% ICU Level of Service D  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: NC 86 SB & NC 86 NB



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Lane Group	ø3	ø4
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

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Lanes, Volumes, Timings  
 91: NC 86 NB & NC 54 EB Off Ramp LT

2/28/2014



Lane Group	NBL	NBT	SBT	SBR	NEL	NER	ø2	ø3
Lane Configurations		↑↑			↑↑			
Volume (vph)	0	1227	0	0	482	0		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.97	1.00		
Frt								
Flt Protected					0.950			
Satd. Flow (prot)	0	3505	0	0	3273	0		
Flt Permitted					0.950			
Satd. Flow (perm)	0	3505	0	0	3273	0		
Right Turn on Red				No	No	No		
Satd. Flow (RTOR)								
Link Speed (mph)		25	35		45			
Link Distance (ft)		148	335		258			
Travel Time (s)		4.0	6.5		3.9			
Peak Hour Factor	0.92	0.92	0.90	0.90	0.85	0.90		
Heavy Vehicles (%)	3%	3%	2%	2%	7%	2%		
Adj. Flow (vph)	0	1334	0	0	567	0		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	1334	0	0	567	0		
Turn Type								
Protected Phases		Free!			4!		2	3
Permitted Phases								
Detector Phase					4			
Switch Phase								
Minimum Initial (s)					4.0		4.0	4.0
Minimum Split (s)					19.0		19.0	14.0
Total Split (s)	0.0	0.0	0.0	0.0	55.0	0.0	71.0	14.0
Total Split (%)	0.0%	0.0%	0.0%	0.0%	39.3%	0.0%	51%	10%
Maximum Green (s)					48.0		64.0	7.0
Yellow Time (s)					5.0		5.0	5.0
All-Red Time (s)					2.0		2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0		
Total Lost Time (s)	2.0	2.0	2.0	2.0	5.0	2.0		
Lead/Lag					Lag			Lead
Lead-Lag Optimize?								Yes
Vehicle Extension (s)					3.0		3.0	3.0
Recall Mode					None		C-Min	None
Act Effct Green (s)		140.0			45.7			
Actuated g/C Ratio		1.00			0.33			
v/c Ratio		0.38			0.53			
Control Delay		0.2			39.7			
Queue Delay		0.0			0.4			
Total Delay		0.2			40.1			
LOS		A			D			
Approach Delay		0.2			40.1			
Approach LOS		A			D			
Queue Length 50th (ft)		1			206			
Queue Length 95th (ft)		0			244			
Internal Link Dist (ft)		68	255		178			

Lanes, Volumes, Timings  
 91: NC 86 NB & NC 54 EB Off Ramp LT

2/28/2014

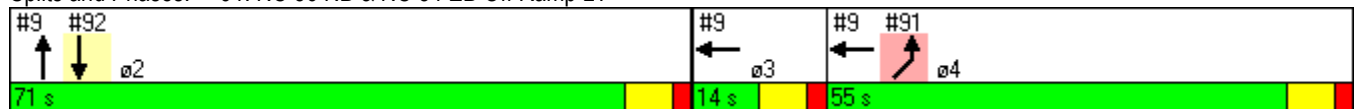


Lane Group	NBL	NBT	SBT	SBR	NEL	NER	ø2	ø3
Turn Bay Length (ft)								
Base Capacity (vph)		3505			1169			
Starvation Cap Reductn		0			0			
Spillback Cap Reductn		273			201			
Storage Cap Reductn		0			0			
Reduced v/c Ratio		0.41			0.59			

Intersection Summary

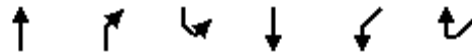
Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green, Master Intersection  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.84  
 Intersection Signal Delay: 12.1  
 Intersection LOS: B  
 Intersection Capacity Utilization 82.2%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 ! Phase conflict between lane groups.

Splits and Phases: 91: NC 86 NB & NC 54 EB Off Ramp LT



Lanes, Volumes, Timings  
 92: NC 86 SB & NC 54 EB Off Ramp RT

2/28/2014

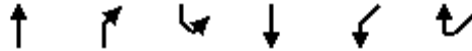


Lane Group	NBT	NBR	SBL	SBT	SWL	SWR	ø3	ø4
Lane Configurations				↑	↗	↘		
Volume (vph)	0	0	0	383	1076	0		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.97	1.00		
Frt								
Flt Protected					0.950			
Satd. Flow (prot)	0	0	0	1776	3273	0		
Flt Permitted					0.950			
Satd. Flow (perm)	0	0	0	1776	3273	0		
Right Turn on Red		No			No	No		
Satd. Flow (RTOR)								
Link Speed (mph)	40			45	25			
Link Distance (ft)	112			257	117			
Travel Time (s)	1.9			3.9	3.2			
Peak Hour Factor	0.90	0.90	0.90	0.85	0.90	0.90		
Heavy Vehicles (%)	2%	2%	2%	7%	7%	2%		
Adj. Flow (vph)	0	0	0	451	1196	0		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	0	0	451	1196	0		
Turn Type								
Protected Phases				2!	Free!		3	4
Permitted Phases								
Detector Phase				2	3			
Switch Phase								
Minimum Initial (s)				4.0			4.0	4.0
Minimum Split (s)				19.0			14.0	19.0
Total Split (s)	0.0	0.0	0.0	71.0	0.0	0.0	14.0	55.0
Total Split (%)	0.0%	0.0%	0.0%	50.7%	0.0%	0.0%	10%	39%
Maximum Green (s)				64.0			7.0	48.0
Yellow Time (s)				5.0			5.0	5.0
All-Red Time (s)				2.0			2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0		
Total Lost Time (s)	2.0	2.0	2.0	5.0	2.0	2.0		
Lead/Lag								
Lead-Lag Optimize?							Lead	Lag
Vehicle Extension (s)				3.0			Yes	
Recall Mode				C-Min			3.0	3.0
Act Effct Green (s)				68.3	140.0		None	None
Actuated g/C Ratio				0.49	1.00			
v/c Ratio				0.52	0.37			
Control Delay				28.0	0.6			
Queue Delay				0.0	0.0			
Total Delay				28.0	0.6			
LOS				C	A			
Approach Delay				28.0	0.6			
Approach LOS				C	A			
Queue Length 50th (ft)				286	8			
Queue Length 95th (ft)				361	0			
Internal Link Dist (ft)	32			177	37			



Lanes, Volumes, Timings  
 92: NC 86 SB & NC 54 EB Off Ramp RT

2/28/2014

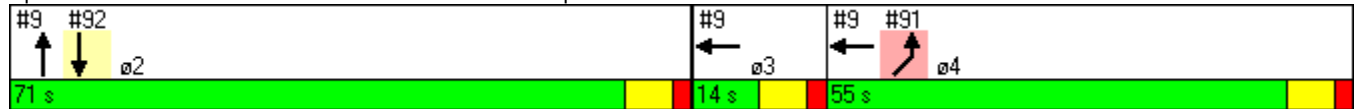


Lane Group	NBT	NBR	SBL	SBT	SWL	SWR	ø3	ø4
Turn Bay Length (ft)								
Base Capacity (vph)				866	3273			
Starvation Cap Reductn				0	0			
Spillback Cap Reductn				0	0			
Storage Cap Reductn				0	0			
Reduced v/c Ratio				0.52	0.37			

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green, Master Intersection  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.84  
 Intersection Signal Delay: 8.1  
 Intersection LOS: A  
 Intersection Capacity Utilization 73.2%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 ! Phase conflict between lane groups.

Splits and Phases: 92: NC 86 SB & NC 54 EB Off Ramp RT



Lanes, Volumes, Timings  
 10: SR 1994 (Culbreth Road) & NC 86 NB

2/28/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	229	64	90	15	129	595	78	1727	11	260	1221	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			-8%			-2%			2%	
Storage Length (ft)	0		75	425		350	125		75	550		250
Storage Lanes	1		1	0		2	1		1	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.88	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Fr <sub>t</sub>			0.850			0.850			0.850			0.850
Fl <sub>t</sub> Protected	0.950				0.995		0.950			0.950		
Satd. Flow (prot)	1743	1835	1560	0	1909	2870	1770	3540	1584	1702	3404	1523
Fl <sub>t</sub> Permitted	0.316				0.962		0.161			0.051		
Satd. Flow (perm)	580	1835	1560	0	1846	2870	300	3540	1584	91	3404	1523
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		526			543			533			550	
Travel Time (s)		10.2			10.6			8.1			8.3	
Confl. Peds. (#/hr)							2					2
Peak Hour Factor	0.89	0.89	0.89	0.91	0.91	0.91	0.94	0.94	0.94	0.98	0.98	0.98
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	5%	5%	5%
Adj. Flow (vph)	257	72	101	16	142	654	83	1837	12	265	1246	126
Shared Lane Traffic (%)												
Lane Group Flow (vph)	257	72	101	0	158	654	83	1837	12	265	1246	126
Turn Type	pm+pt		Perm	Perm		pt+ov	Perm		Perm	pm+pt		pt+ov
Protected Phases	7	4			8	8 1		2		1	6	6 7
Permitted Phases	4		4	8			2		2	6		
Detector Phase	7	4	4	8	8	8 1	2	2	2	1	6	6 7
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		12.0	12.0	12.0	7.0	12.0	
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0		19.0	19.0	19.0	13.0	26.0	
Total Split (s)	17.0	40.0	40.0	23.0	23.0	45.0	78.0	78.0	78.0	22.0	100.0	117.0
Total Split (%)	12.1%	28.6%	28.6%	16.4%	16.4%	32.1%	55.7%	55.7%	55.7%	15.7%	71.4%	83.6%
Maximum Green (s)	10.6	33.6	33.6	16.1	16.1		71.8	71.8	71.8	16.9	93.8	
Yellow Time (s)	3.0	4.2	4.2	4.5	4.5		4.7	4.7	4.7	3.0	4.7	
All-Red Time (s)	3.4	2.2	2.2	2.4	2.4		1.5	1.5	1.5	2.1	1.5	
Lost Time Adjust (s)	-1.4	-1.4	-1.4	-1.9	-1.9	-1.9	-1.2	-1.2	-1.2	-0.1	-1.2	-1.4
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.8
Lead/Lag	Lead			Lag	Lag		Lead	Lead	Lead	Lag		
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None		C-Max	C-Max	C-Max	None	C-Max	
Walk Time (s)												7.0
Flash Dont Walk (s)												12.0
Pedestrian Calls (#/hr)												0
Act Effct Green (s)	34.7	34.7	34.7		17.7	34.7	73.3	73.3	73.3	95.3	95.3	112.5
Actuated g/C Ratio	0.25	0.25	0.25		0.13	0.25	0.52	0.52	0.52	0.68	0.68	0.80
v/c Ratio	1.05	0.16	0.26		0.68	0.92	0.53	0.99	0.01	1.03	0.54	0.10

Lanes, Volumes, Timings  
 10: SR 1994 (Culbreth Road) & NC 86 NB

2/28/2014



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Control Delay	119.1	42.2	44.4		73.8	58.7	23.2	34.7	13.1	110.8	7.1	1.5
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	119.1	42.2	44.4		73.8	58.7	23.2	34.7	13.1	110.8	7.1	1.5
LOS	F	D	D		E	E	C	C	B	F	A	A
Approach Delay		88.7			61.6			34.1			23.5	
Approach LOS		F			E			C			C	
Queue Length 50th (ft)	~221	52	74		139	257	19	683	3	~213	222	10
Queue Length 95th (ft)	#334	94	127		219	#369	m36	#1032	m6	#393	208	14
Internal Link Dist (ft)		446			463			453			470	
Turn Bay Length (ft)			75			350	125		75	550		250
Base Capacity (vph)	244	459	390		237	718	157	1855	830	257	2318	1225
Starvation Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.05	0.16	0.26		0.67	0.91	0.53	0.99	0.01	1.03	0.54	0.10

Intersection Summary













Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 94 (67%), Referenced to phase 2:NETL and 6:SWTL, Start of Green  
 Natural Cycle: 120  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.05  
 Intersection Signal Delay: 40.0  
 Intersection LOS: D  
 Intersection Capacity Utilization 99.1%  
 ICU Level of Service F  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: SR 1994 (Culbreth Road) & NC 86 NB



Lanes, Volumes, Timings  
8: NC 86 NB & NC 86 SB













2/28/2014

												
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↑↑						↑↑				
Volume (vph)	0	529	0	0	0	0	0	469	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	*0.57	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Frt												
Flt Protected												
Satd. Flow (prot)	0	2006	0	0	0	0	0	3374	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	2006	0	0	0	0	0	3374	0	0	0	0
Right Turn on Red			No			No	No		No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25				25
Link Distance (ft)		174			138			131				144
Travel Time (s)		4.7			3.8			3.6				3.9
Peak Hour Factor	0.90	0.84	0.90	0.90	0.90	0.90	0.90	0.91	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	8%	2%	2%	2%	2%	2%	7%	2%	2%	2%	2%
Adj. Flow (vph)	0	630	0	0	0	0	0	515	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	630	0	0	0	0	0	515	0	0	0	0
Turn Type												
Protected Phases		4 3						2				
Permitted Phases												
Detector Phase		4 3						2				
Switch Phase												
Minimum Initial (s)								4.0				
Minimum Split (s)								19.0				
Total Split (s)	0.0	77.0	0.0	0.0	0.0	0.0	0.0	43.0	0.0	0.0	0.0	0.0
Total Split (%)	0.0%	64.2%	0.0%	0.0%	0.0%	0.0%	0.0%	35.8%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)								36.0				
Yellow Time (s)								5.0				
All-Red Time (s)								2.0				
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	2.0	5.0	2.0	2.0	2.0	2.0	2.0	5.0	2.0	2.0	2.0	2.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)								3.0				
Recall Mode								C-Min				
Act Effct Green (s)		73.5						36.5				
Actuated g/C Ratio		0.61						0.30				
v/c Ratio		0.51						0.50				
Control Delay		8.5						37.0				
Queue Delay		0.0						0.0				
Total Delay		8.5						37.0				
LOS		A						D				
Approach Delay		8.5						37.0				
Approach LOS		A						D				
Queue Length 50th (ft)		108						175				
Queue Length 95th (ft)		101						233				
Internal Link Dist (ft)		94			58			51				64

Lane Group	ø3	ø4
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Lane Util. Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Peak Hour Factor		
Heavy Vehicles (%)		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	3	4
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	4.0	4.0
Minimum Split (s)	14.0	19.0
Total Split (s)	14.0	63.0
Total Split (%)	12%	53%
Maximum Green (s)	7.0	56.0
Yellow Time (s)	5.0	5.0
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lag
Lead-Lag Optimize?	Yes	
Vehicle Extension (s)	3.0	3.0
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		

Lanes, Volumes, Timings  
 8: NC 86 NB & NC 86 SB

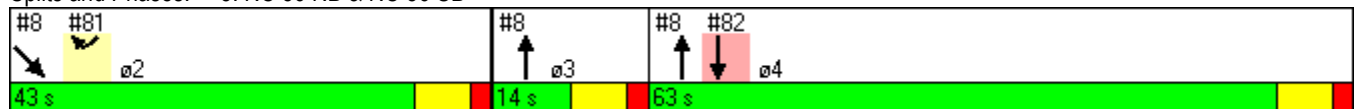
2/28/2014

												
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Turn Bay Length (ft)												
Base Capacity (vph)		1424						1098				
Starvation Cap Reductn		0						0				
Spillback Cap Reductn		0						0				
Storage Cap Reductn		0						0				
Reduced v/c Ratio		0.44						0.47				

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 68 (57%), Referenced to phase 2:SET, Start of Green  
 Natural Cycle: 55  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.66  
 Intersection Signal Delay: 21.3  
 Intersection Capacity Utilization 35.9%  
 Analysis Period (min) 15  
 \* User Entered Value

Splits and Phases: 8: NC 86 NB & NC 86 SB



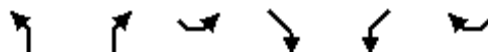
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Lane Group	ø3	ø4
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

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Lanes, Volumes, Timings  
 81: NC 86 NB & NC 54 WB Off Ramp RT

2/28/2014

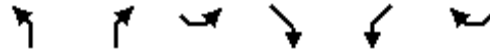


Lane Group	NBL	NBR	SEL	SER	SWL	SWR	ø3	ø4
Lane Configurations	↑↑					↑		
Volume (vph)	529	0	0	0	0	65		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Lane Util. Factor	*0.57	1.00	1.00	1.00	1.00	1.00		
Frt						0.865		
Flt Protected	0.950							
Satd. Flow (prot)	1905	0	0	0	0	1580		
Flt Permitted	0.950							
Satd. Flow (perm)	1905	0	0	0	0	1580		
Right Turn on Red	No	No		No		No		
Satd. Flow (RTOR)								
Link Speed (mph)	25		35		45			
Link Distance (ft)	138		132		310			
Travel Time (s)	3.8		2.6		4.7			
Peak Hour Factor	0.84	0.90	0.90	0.90	0.90	0.97		
Heavy Vehicles (%)	8%	2%	2%	2%	2%	4%		
Adj. Flow (vph)	630	0	0	0	0	67		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	630	0	0	0	0	67		
Turn Type						custom		
Protected Phases	Free!					2!	3	4
Permitted Phases								
Detector Phase						2		
Switch Phase								
Minimum Initial (s)						4.0	4.0	4.0
Minimum Split (s)						19.0	14.0	19.0
Total Split (s)	0.0	0.0	0.0	0.0	0.0	43.0	14.0	63.0
Total Split (%)	0.0%	0.0%	0.0%	0.0%	0.0%	35.8%	12%	53%
Maximum Green (s)						36.0	7.0	56.0
Yellow Time (s)						5.0	5.0	5.0
All-Red Time (s)						2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0		
Total Lost Time (s)	2.0	2.0	2.0	2.0	2.0	5.0		
Lead/Lag							Lead	Lag
Lead-Lag Optimize?							Yes	
Vehicle Extension (s)						3.0	3.0	3.0
Recall Mode						C-Min	None	None
Act Effct Green (s)	120.0					36.5		
Actuated g/C Ratio	1.00					0.30		
v/c Ratio	0.33					0.14		
Control Delay	1.5					32.7		
Queue Delay	0.0					0.0		
Total Delay	1.5					32.7		
LOS	A					C		
Approach Delay	1.5							
Approach LOS	A							
Queue Length 50th (ft)	7					38		
Queue Length 95th (ft)	0					77		
Internal Link Dist (ft)	58		52		230			



Lanes, Volumes, Timings  
 81: NC 86 NB & NC 54 WB Off Ramp RT

2/28/2014

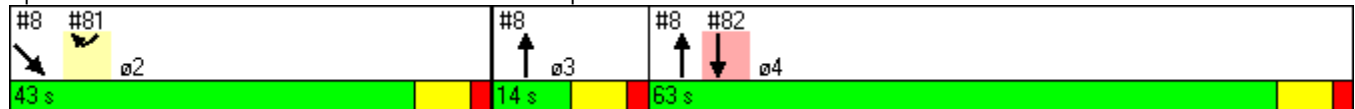


Lane Group	NBL	NBR	SEL	SER	SWL	SWR	ø3	ø4
Turn Bay Length (ft)								
Base Capacity (vph)	1905					514		
Starvation Cap Reductn	0					0		
Spillback Cap Reductn	0					0		
Storage Cap Reductn	0					0		
Reduced v/c Ratio	0.33					0.13		

Intersection Summary

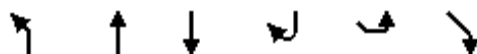
Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 68 (57%), Referenced to phase 2:SET, Start of Green  
 Natural Cycle: 55  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.66  
 Intersection Signal Delay: 4.5  
 Intersection LOS: A  
 Intersection Capacity Utilization 35.9%  
 ICU Level of Service A  
 Analysis Period (min) 15  
 \* User Entered Value  
 ! Phase conflict between lane groups.

Splits and Phases: 81: NC 86 NB & NC 54 WB Off Ramp RT



Lanes, Volumes, Timings  
82: NC 86 SB & NC 54 WB Off Ramp LT

2/28/2014



Lane Group	NBL	NBT	SBT	SBR	SEL	SER	ø2	ø3
Lane Configurations			↑↑			↑↑		
Volume (vph)	0	0	861	0	0	469		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.88		
Frt						0.850		
Flt Protected								
Satd. Flow (prot)	0	0	3471	0	0	2656		
Flt Permitted								
Satd. Flow (perm)	0	0	3471	0	0	2656		
Right Turn on Red				No		No		
Satd. Flow (RTOR)								
Link Speed (mph)		40	35		25			
Link Distance (ft)		392	164		144			
Travel Time (s)		6.7	3.2		3.9			
Peak Hour Factor	0.90	0.90	0.97	0.90	0.90	0.91		
Heavy Vehicles (%)	2%	2%	4%	2%	2%	7%		
Adj. Flow (vph)	0	0	888	0	0	515		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	0	888	0	0	515		
Turn Type						custom		
Protected Phases			4!			Free!	2	3
Permitted Phases								
Detector Phase			4					
Switch Phase								
Minimum Initial (s)			4.0				4.0	4.0
Minimum Split (s)			19.0				19.0	14.0
Total Split (s)	0.0	0.0	63.0	0.0	0.0	0.0	43.0	14.0
Total Split (%)	0.0%	0.0%	52.5%	0.0%	0.0%	0.0%	36%	12%
Maximum Green (s)			56.0				36.0	7.0
Yellow Time (s)			5.0				5.0	5.0
All-Red Time (s)			2.0				2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0		
Total Lost Time (s)	2.0	2.0	5.0	2.0	2.0	2.0		
Lead/Lag			Lag					Lead
Lead-Lag Optimize?								Yes
Vehicle Extension (s)			3.0				3.0	3.0
Recall Mode			None				C-Min	None
Act Effct Green (s)			46.3			120.0		
Actuated g/C Ratio			0.39			1.00		
v/c Ratio			0.66			0.19		
Control Delay			32.3			2.1		
Queue Delay			0.0			0.0		
Total Delay			32.3			2.1		
LOS			C			A		
Approach Delay			32.3					
Approach LOS			C					
Queue Length 50th (ft)			295			36		
Queue Length 95th (ft)			309			46		
Internal Link Dist (ft)		312	84		64			

Lanes, Volumes, Timings  
 82: NC 86 SB & NC 54 WB Off Ramp LT

2/28/2014

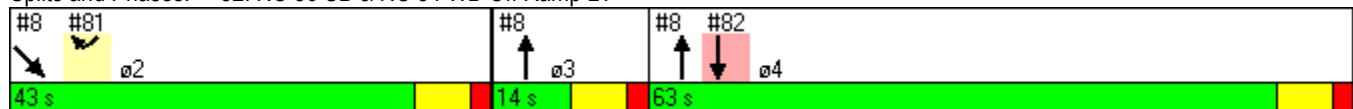


Lane Group	NBL	NBT	SBT	SBR	SEL	SER	ø2	ø3
Turn Bay Length (ft)								
Base Capacity (vph)			1678			2656		
Starvation Cap Reductn			0			0		
Spillback Cap Reductn			0			0		
Storage Cap Reductn			0			0		
Reduced v/c Ratio			0.53			0.19		

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 68 (57%), Referenced to phase 2:SET, Start of Green  
 Natural Cycle: 55  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.66  
 Intersection Signal Delay: 21.2  
 Intersection LOS: C  
 Intersection Capacity Utilization 33.2%  
 ICU Level of Service A  
 Analysis Period (min) 15  
 ! Phase conflict between lane groups.

Splits and Phases: 82: NC 86 SB & NC 54 WB Off Ramp LT



Lanes, Volumes, Timings  
9: NC 86 SB & NC 86 NB

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑			↑↑				
Volume (vph)	0	0	0	0	1214	0	0	681	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Frt												
Flt Protected												
Satd. Flow (prot)	0	0	0	0	3505	0	0	3471	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	0	0	0	3505	0	0	3471	0	0	0	0
Right Turn on Red			No			No	No		No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			25			25				35
Link Distance (ft)		117			175			105				148
Travel Time (s)		2.0			4.8			2.9				2.9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.94	0.90	0.90	0.95	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	3%	2%	2%	4%	2%	2%	2%	2%
Adj. Flow (vph)	0	0	0	0	1291	0	0	717	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1291	0	0	717	0	0	0	0
Turn Type												
Protected Phases					4 3			2				
Permitted Phases												
Detector Phase					4 3			2				
Switch Phase												
Minimum Initial (s)								4.0				
Minimum Split (s)								19.0				
Total Split (s)	0.0	0.0	0.0	0.0	75.0	0.0	0.0	45.0	0.0	0.0	0.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	0.0%	62.5%	0.0%	0.0%	37.5%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)								38.0				
Yellow Time (s)								5.0				
All-Red Time (s)								2.0				
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	2.0	2.0	2.0	2.0	5.0	2.0	2.0	5.0	2.0	2.0	2.0	2.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)								3.0				
Recall Mode								C-Min				
Act Effct Green (s)					57.3			52.7				
Actuated g/C Ratio					0.48			0.44				
v/c Ratio					0.77			0.47				
Control Delay					19.0			28.6				
Queue Delay					0.0			0.0				
Total Delay					19.0			28.6				
LOS					B			C				
Approach Delay					19.0			28.6				
Approach LOS					B			C				
Queue Length 50th (ft)					394			258				
Queue Length 95th (ft)					425			361				
Internal Link Dist (ft)		37			95			25				68

Lane Group	ø3	ø4
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Lane Util. Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Peak Hour Factor		
Heavy Vehicles (%)		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	3	4
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	4.0	4.0
Minimum Split (s)	14.0	19.0
Total Split (s)	14.0	61.0
Total Split (%)	12%	51%
Maximum Green (s)	7.0	54.0
Yellow Time (s)	5.0	5.0
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lag
Lead-Lag Optimize?	Yes	
Vehicle Extension (s)	3.0	3.0
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		

Lanes, Volumes, Timings  
 9: NC 86 SB & NC 86 NB

2/28/2014

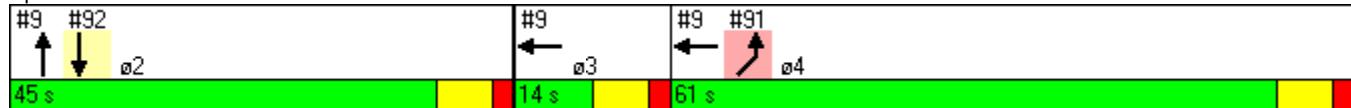


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)												
Base Capacity (vph)					2299			1526				
Starvation Cap Reductn					0			0				
Spillback Cap Reductn					0			0				
Storage Cap Reductn					0			0				
Reduced v/c Ratio					0.56			0.47				

Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	0 (0%), Referenced to phase 2:NBT, Start of Green, Master Intersection
Natural Cycle:	55
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.77
Intersection Signal Delay:	22.5
Intersection LOS:	C
Intersection Capacity Utilization	60.7%
ICU Level of Service	B
Analysis Period (min)	15

Splits and Phases: 9: NC 86 SB & NC 86 NB



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Lane Group	ø3	ø4
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

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Lanes, Volumes, Timings  
 91: NC 86 NB & NC 54 EB Off Ramp LT

2/28/2014



Lane Group	NBL	NBT	SBT	SBR	NEL	NER	ø2	ø3
Lane Configurations		↑↑			↑↑			
Volume (vph)	0	681	0	0	133	0		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.97	1.00		
Frt								
Flt Protected					0.950			
Satd. Flow (prot)	0	3471	0	0	3273	0		
Flt Permitted					0.950			
Satd. Flow (perm)	0	3471	0	0	3273	0		
Right Turn on Red				No	No	No		
Satd. Flow (RTOR)								
Link Speed (mph)		25	35		45			
Link Distance (ft)		148	335		258			
Travel Time (s)		4.0	6.5		3.9			
Peak Hour Factor	0.95	0.95	0.90	0.90	0.93	0.90		
Heavy Vehicles (%)	3%	4%	2%	2%	7%	2%		
Adj. Flow (vph)	0	717	0	0	143	0		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	717	0	0	143	0		
Turn Type								
Protected Phases		Free!			4!		2	3
Permitted Phases								
Detector Phase								
Switch Phase								
Minimum Initial (s)					4.0		4.0	4.0
Minimum Split (s)					19.0		19.0	14.0
Total Split (s)	0.0	0.0	0.0	0.0	61.0	0.0	45.0	14.0
Total Split (%)	0.0%	0.0%	0.0%	0.0%	50.8%	0.0%	38%	12%
Maximum Green (s)					54.0		38.0	7.0
Yellow Time (s)					5.0		5.0	5.0
All-Red Time (s)					2.0		2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0		
Total Lost Time (s)	2.0	2.0	2.0	2.0	5.0	2.0		
Lead/Lag								
					Lag	Lead		
Lead-Lag Optimize?								
						Yes		
Vehicle Extension (s)								
					3.0	3.0	3.0	
Recall Mode								
					None	C-Min	None	
Act Effct Green (s)								
		120.0		34.5				
Actuated g/C Ratio								
		1.00		0.29				
v/c Ratio								
		0.21		0.15				
Control Delay								
		0.1		28.7				
Queue Delay								
		0.0		0.0				
Total Delay								
		0.1		28.7				
LOS								
		A		C				
Approach Delay								
		0.1		28.7				
Approach LOS								
		A		C				
Queue Length 50th (ft)								
		0		42				
Queue Length 95th (ft)								
		0		51				
Internal Link Dist (ft)								
		68		255		178		



Lanes, Volumes, Timings  
 91: NC 86 NB & NC 54 EB Off Ramp LT

2/28/2014

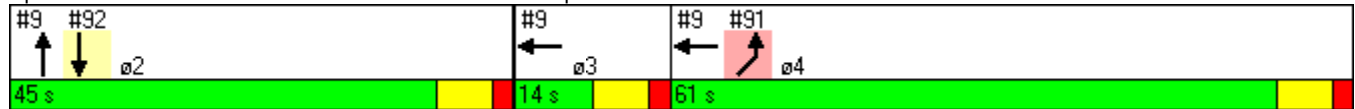


Lane Group	NBL	NBT	SBT	SBR	NEL	NER	ø2	ø3
Turn Bay Length (ft)								
Base Capacity (vph)		3471			1527			
Starvation Cap Reductn		0			0			
Spillback Cap Reductn		0			0			
Storage Cap Reductn		0			0			
Reduced v/c Ratio		0.21			0.09			

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green, Master Intersection  
 Natural Cycle: 55  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.77  
 Intersection Signal Delay: 4.9  
 Intersection LOS: A  
 Intersection Capacity Utilization 50.4%  
 ICU Level of Service A  
 Analysis Period (min) 15  
 ! Phase conflict between lane groups.

Splits and Phases: 91: NC 86 NB & NC 54 EB Off Ramp LT



Lanes, Volumes, Timings  
 92: NC 86 SB & NC 54 EB Off Ramp RT

2/28/2014



Lane Group	NBT	NBR	SBL	SBT	SWL	SWR	ø3	ø4
Lane Configurations				↑	↑↑			
Volume (vph)	0	0	0	227	1214	0		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.97	1.00		
Frt								
Flt Protected					0.950			
Satd. Flow (prot)	0	0	0	1776	3400	0		
Flt Permitted					0.950			
Satd. Flow (perm)	0	0	0	1776	3400	0		
Right Turn on Red		No			No	No		
Satd. Flow (RTOR)								
Link Speed (mph)	40			45	25			
Link Distance (ft)	112			257	117			
Travel Time (s)	1.9			3.9	3.2			
Peak Hour Factor	0.90	0.90	0.90	0.93	0.94	0.90		
Heavy Vehicles (%)	2%	2%	2%	7%	3%	2%		
Adj. Flow (vph)	0	0	0	244	1291	0		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	0	0	244	1291	0		
Turn Type								
Protected Phases				2!	Free!		3	4
Permitted Phases								
Detector Phase				2	3			
Switch Phase								
Minimum Initial (s)				4.0			4.0	4.0
Minimum Split (s)				19.0			14.0	19.0
Total Split (s)	0.0	0.0	0.0	45.0	0.0	0.0	14.0	61.0
Total Split (%)	0.0%	0.0%	0.0%	37.5%	0.0%	0.0%	12%	51%
Maximum Green (s)				38.0			7.0	54.0
Yellow Time (s)				5.0			5.0	5.0
All-Red Time (s)				2.0			2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0		
Total Lost Time (s)	2.0	2.0	2.0	5.0	2.0	2.0		
Lead/Lag							Lead	Lag
Lead-Lag Optimize?							Yes	
Vehicle Extension (s)				3.0			3.0	3.0
Recall Mode				C-Min			None	None
Act Effct Green (s)				52.7	120.0			
Actuated g/C Ratio				0.44	1.00			
v/c Ratio				0.31	0.38			
Control Delay				25.6	0.6			
Queue Delay				0.0	0.0			
Total Delay				25.6	0.6			
LOS				C	A			
Approach Delay				25.6	0.6			
Approach LOS				C	A			
Queue Length 50th (ft)				120	9			
Queue Length 95th (ft)				219	0			
Internal Link Dist (ft)	32			177	37			

Lanes, Volumes, Timings  
 92: NC 86 SB & NC 54 EB Off Ramp RT

2/28/2014



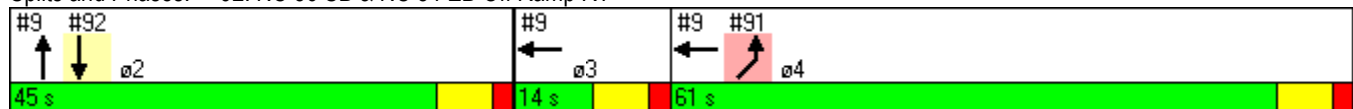
Lane Group	NBT	NBR	SBL	SBT	SWL	SWR	ø3	ø4
Turn Bay Length (ft)								
Base Capacity (vph)				781	3400			
Starvation Cap Reductn				0	0			
Spillback Cap Reductn				0	0			
Storage Cap Reductn				0	0			
Reduced v/c Ratio				0.31	0.38			

Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	0 (0%), Referenced to phase 2:NBT, Start of Green, Master Intersection
Natural Cycle:	55
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.77
Intersection Signal Delay:	4.6
Intersection LOS:	A
Intersection Capacity Utilization	60.7%
ICU Level of Service	B
Analysis Period (min)	15

! Phase conflict between lane groups.

Splits and Phases: 92: NC 86 SB & NC 54 EB Off Ramp RT



Lanes, Volumes, Timings  
 10: SR 1994 (Culbreth Road) & US 15-501

2/28/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	71	33	48	12	25	280	34	1167	13	301	1190	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			-8%			-2%			2%	
Storage Length (ft)	0		75	425		350	125		75	550		250
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00						1.00					
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1710	1800	1530	1788	1882	1600	1736	3472	1553	1686	3372	1508
Flt Permitted	0.521			0.732			0.151			0.102		
Satd. Flow (perm)	936	1800	1530	1378	1882	1600	276	3472	1553	181	3372	1508
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		526			543			533			550	
Travel Time (s)		10.2			10.6			8.1			8.3	
Confl. Peds. (#/hr)	1					1	1					1
Peak Hour Factor	0.88	0.88	0.88	0.91	0.91	0.91	0.94	0.94	0.94	0.93	0.93	0.93
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	5%	5%	5%	6%	6%	6%
Adj. Flow (vph)	81	38	55	13	27	308	36	1241	14	324	1280	110
Shared Lane Traffic (%)												
Lane Group Flow (vph)	81	38	55	13	27	308	36	1241	14	324	1280	110
Turn Type	pm+pt		Perm	Perm		pt+ov	Perm		Perm	pm+pt		pt+ov
Protected Phases	7	4			8	8 1		2		1	6	6 7
Permitted Phases	4		4	8			2		2	6		
Detector Phase	7	4	4	8	8	8 1	2	2	2	1	6	6 7
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		12.0	12.0	12.0	7.0	12.0	
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0		19.0	19.0	19.0	13.0	26.0	
Total Split (s)	14.0	33.0	33.0	19.0	19.0	49.0	57.0	57.0	57.0	30.0	87.0	101.0
Total Split (%)	11.7%	27.5%	27.5%	15.8%	15.8%	40.8%	47.5%	47.5%	47.5%	25.0%	72.5%	84.2%
Maximum Green (s)	7.6	26.6	26.6	12.1	12.1		50.8	50.8	50.8	24.9	80.8	
Yellow Time (s)	3.0	4.2	4.2	4.5	4.5		4.7	4.7	4.7	3.0	4.7	
All-Red Time (s)	3.4	2.2	2.2	2.4	2.4		1.5	1.5	1.5	2.1	1.5	
Lost Time Adjust (s)	-1.4	-1.4	-1.4	-1.9	-1.9	-1.9	-1.2	-1.2	-1.2	-0.1	-1.2	-1.4
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.8
Lead/Lag	Lead			Lag	Lag		Lead	Lead	Lead	Lag		
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None		C-Max	C-Max	C-Max	None	C-Max	
Walk Time (s)												7.0
Flash Dont Walk (s)												12.0
Pedestrian Calls (#/hr)												0
Act Effct Green (s)	25.8	25.8	25.8	11.9	11.9	36.9	54.2	54.2	54.2	84.2	84.2	98.3
Actuated g/C Ratio	0.22	0.22	0.22	0.10	0.10	0.31	0.45	0.45	0.45	0.70	0.70	0.82
v/c Ratio	0.31	0.10	0.17	0.09	0.14	0.63	0.29	0.79	0.02	0.74	0.54	0.09

Lanes, Volumes, Timings  
 10: SR 1994 (Culbreth Road) & US 15-501

2/28/2014



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Control Delay	41.8	37.8	39.2	49.9	50.5	29.2	15.9	16.0	8.9	35.8	3.7	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.8	37.8	39.2	49.9	50.5	29.2	15.9	16.0	8.9	35.8	3.7	1.0
LOS	D	D	D	D	D	C	B	B	A	D	A	A
Approach Delay	40.1			31.6			15.9			9.6		
Approach LOS	D			C			B			A		
Queue Length 50th (ft)	52	24	35	9	19	154	8	188	3	165	38	3
Queue Length 95th (ft)	93	52	69	29	48	221	29	275	m9	#256	123	14
Internal Link Dist (ft)	446			463			453			470		
Turn Bay Length (ft)	75			425			350			250		
Base Capacity (vph)	259	420	357	161	220	520	125	1569	702	440	2367	1237
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.09	0.15	0.08	0.12	0.59	0.29	0.79	0.02	0.74	0.54	0.09

Intersection Summary













Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 43 (36%), Referenced to phase 2:NETL and 6:SWTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.79  
 Intersection Signal Delay: 15.6  
 Intersection LOS: B  
 Intersection Capacity Utilization 72.0%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: SR 1994 (Culbreth Road) & US 15-501

ø2	ø1	ø4
57 s	30 s	33 s
ø6	ø7	ø8
87 s	14 s	19 s

Lanes, Volumes, Timings  
8: NC 86 NB & NC 86 SB

2/28/2014

												
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↑↑						↑↑				
Volume (vph)	0	603	0	0	0	0	0	1007	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	*0.58	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Frt												
Flt Protected												
Satd. Flow (prot)	0	2041	0	0	0	0	0	3471	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	2041	0	0	0	0	0	3471	0	0	0	0
Right Turn on Red			No			No	No		No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25				25
Link Distance (ft)		174			138			131				144
Travel Time (s)		4.7			3.8			3.6				3.9
Peak Hour Factor	0.90	0.88	0.90	0.90	0.90	0.90	0.90	0.91	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	8%	2%	2%	2%	2%	2%	4%	2%	2%	2%	2%
Adj. Flow (vph)	0	685	0	0	0	0	0	1107	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	685	0	0	0	0	0	1107	0	0	0	0
Turn Type												
Protected Phases		4 3						2				
Permitted Phases												
Detector Phase		4 3						2				
Switch Phase												
Minimum Initial (s)								4.0				
Minimum Split (s)								19.0				
Total Split (s)	0.0	75.0	0.0	0.0	0.0	0.0	0.0	55.0	0.0	0.0	0.0	0.0
Total Split (%)	0.0%	57.7%	0.0%	0.0%	0.0%	0.0%	0.0%	42.3%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)								48.0				
Yellow Time (s)								5.0				
All-Red Time (s)								2.0				
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	2.0	5.0	2.0	2.0	2.0	2.0	2.0	5.0	2.0	2.0	2.0	2.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)								3.0				
Recall Mode								C-Min				
Act Effct Green (s)		71.3						48.7				
Actuated g/C Ratio		0.55						0.37				
v/c Ratio		0.61						0.85				
Control Delay		23.9						44.7				
Queue Delay		0.0						0.0				
Total Delay		23.9						44.7				
LOS		C						D				
Approach Delay		23.9						44.7				
Approach LOS		C						D				
Queue Length 50th (ft)		493						439				
Queue Length 95th (ft)		588						532				
Internal Link Dist (ft)		94			58			51			64	













Lanes, Volumes, Timings  
 8: NC 86 NB & NC 86 SB

2/28/2014

Lane Group	ø3	ø4
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Lane Util. Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Peak Hour Factor		
Heavy Vehicles (%)		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	3	4
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	4.0	4.0
Minimum Split (s)	14.0	19.0
Total Split (s)	14.0	61.0
Total Split (%)	11%	47%
Maximum Green (s)	7.0	54.0
Yellow Time (s)	5.0	5.0
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lag
Lead-Lag Optimize?	Yes	
Vehicle Extension (s)	3.0	3.0
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		

Lanes, Volumes, Timings  
 8: NC 86 NB & NC 86 SB

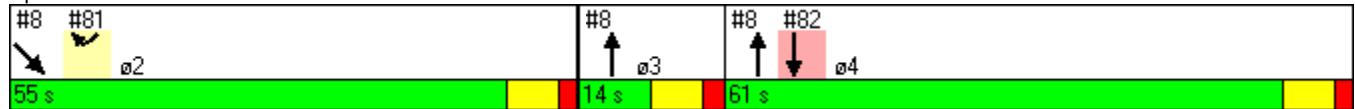
2/28/2014

												
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Turn Bay Length (ft)												
Base Capacity (vph)		1126						1335				
Starvation Cap Reductn		0						0				
Spillback Cap Reductn		0						0				
Storage Cap Reductn		0						0				
Reduced v/c Ratio		0.61						0.83				

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 118 (91%), Referenced to phase 2:SET, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.86  
 Intersection Signal Delay: 36.8  
 Intersection LOS: D  
 Intersection Capacity Utilization 52.8%  
 ICU Level of Service A  
 Analysis Period (min) 15  
 \* User Entered Value

Splits and Phases: 8: NC 86 NB & NC 86 SB





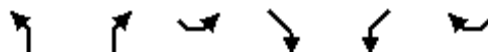
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Lane Group	ø3	ø4
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

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Lanes, Volumes, Timings  
 81: NC 86 NB & NC 54 WB Off Ramp RT

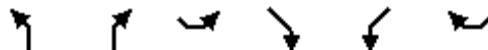
2/28/2014



Lane Group	NBL	NBR	SEL	SER	SWL	SWR	ø3	ø4
Lane Configurations								
Volume (vph)	603	0	0	0	0	44		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Lane Util. Factor	*0.58	1.00	1.00	1.00	1.00	1.00		
Frt						0.865		
Flt Protected	0.950							
Satd. Flow (prot)	1939	0	0	0	0	1611		
Flt Permitted	0.950							
Satd. Flow (perm)	1939	0	0	0	0	1611		
Right Turn on Red	No	No		No		No		
Satd. Flow (RTOR)								
Link Speed (mph)	35		35		45			
Link Distance (ft)	138		132		310			
Travel Time (s)	2.7		2.6		4.7			
Peak Hour Factor	0.88	0.90	0.90	0.90	0.90	0.95		
Heavy Vehicles (%)	8%	2%	2%	2%	2%	2%		
Adj. Flow (vph)	685	0	0	0	0	46		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	685	0	0	0	0	46		
Turn Type						custom		
Protected Phases	Free!					2!	3	4
Permitted Phases								
Detector Phase						2		
Switch Phase								
Minimum Initial (s)						4.0	4.0	4.0
Minimum Split (s)						19.0	14.0	19.0
Total Split (s)	0.0	0.0	0.0	0.0	0.0	55.0	14.0	61.0
Total Split (%)	0.0%	0.0%	0.0%	0.0%	0.0%	42.3%	11%	47%
Maximum Green (s)						48.0	7.0	54.0
Yellow Time (s)						5.0	5.0	5.0
All-Red Time (s)						2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0		
Total Lost Time (s)	2.0	2.0	2.0	2.0	2.0	5.0		
Lead/Lag							Lead	Lag
Lead-Lag Optimize?							Yes	
Vehicle Extension (s)						3.0	3.0	3.0
Recall Mode						C-Min	None	None
Act Effct Green (s)	130.0					48.7		
Actuated g/C Ratio	1.00					0.37		
v/c Ratio	0.35					0.08		
Control Delay	1.5					26.0		
Queue Delay	0.0					0.0		
Total Delay	1.5					26.0		
LOS	A					C		
Approach Delay	1.5							
Approach LOS	A							
Queue Length 50th (ft)	23					24		
Queue Length 95th (ft)	0					52		
Internal Link Dist (ft)	58		52		230			

Lanes, Volumes, Timings  
 81: NC 86 NB & NC 54 WB Off Ramp RT

2/28/2014

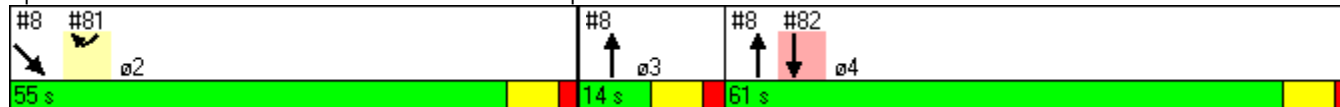


Lane Group	NBL	NBR	SEL	SER	SWL	SWR	ø3	ø4
Turn Bay Length (ft)								
Base Capacity (vph)	1939					620		
Starvation Cap Reductn	0					0		
Spillback Cap Reductn	0					0		
Storage Cap Reductn	0					0		
Reduced v/c Ratio	0.35					0.07		

Intersection Summary

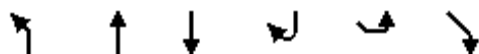
Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 118 (91%), Referenced to phase 2:SET, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.86  
 Intersection Signal Delay: 3.0  
 Intersection Capacity Utilization 52.8%  
 Analysis Period (min) 15  
 \* User Entered Value  
 ! Phase conflict between lane groups.

Splits and Phases: 81: NC 86 NB & NC 54 WB Off Ramp RT



Lanes, Volumes, Timings  
82: NC 86 SB & NC 54 WB Off-Ramp LT

2/28/2014



Lane Group	NBL	NBT	SBT	SBR	SEL	SER	ø2	ø3
Lane Configurations			↑↑			↑↑		
Volume (vph)	0	0	1241	0	0	1007		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.88		
Fr t						0.850		
Fl t Protected								
Satd. Flow (prot)	0	0	3539	0	0	2733		
Fl t Permitted								
Satd. Flow (perm)	0	0	3539	0	0	2733		
Right Turn on Red				No		No		
Satd. Flow (RTOR)								
Link Speed (mph)		40	35		25			
Link Distance (ft)		392	164		144			
Travel Time (s)		6.7	3.2		3.9			
Peak Hour Factor	0.90	0.90	0.95	0.90	0.90	0.91		
Heavy Vehicles (%)	2%	2%	2%	2%	2%	4%		
Adj. Flow (vph)	0	0	1306	0	0	1107		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	0	1306	0	0	1107		
Turn Type						custom		
Protected Phases			4!			Free!	2	3
Permitted Phases								
Detector Phase			4					
Switch Phase								
Minimum Initial (s)			4.0				4.0	4.0
Minimum Split (s)			19.0				19.0	14.0
Total Split (s)	0.0	0.0	61.0	0.0	0.0	0.0	55.0	14.0
Total Split (%)	0.0%	0.0%	46.9%	0.0%	0.0%	0.0%	42%	11%
Maximum Green (s)			54.0				48.0	7.0
Yellow Time (s)			5.0				5.0	5.0
All-Red Time (s)			2.0				2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0		
Total Lost Time (s)	2.0	2.0	5.0	2.0	2.0	2.0		
Lead/Lag			Lag					Lead
Lead-Lag Optimize?								Yes
Vehicle Extension (s)			3.0				3.0	3.0
Recall Mode			None				C-Min	None
Act Effct Green (s)			55.6			130.0		
Actuated g/C Ratio			0.43			1.00		
v/c Ratio			0.86			0.41		
Control Delay			40.9			5.6		
Queue Delay			0.0			0.0		
Total Delay			40.9			5.6		
LOS			D			A		
Approach Delay			40.9					
Approach LOS			D					
Queue Length 50th (ft)			514			482		
Queue Length 95th (ft)			615			584		
Internal Link Dist (ft)		312	84		64			

Lanes, Volumes, Timings  
 82: NC 86 SB & NC 54 WB Off-Ramp LT

2/28/2014

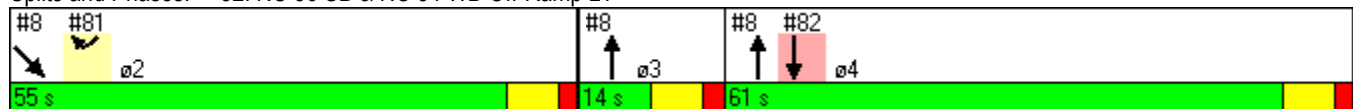


Lane Group	NBL	NBT	SBT	SBR	SEL	SER	ø2	ø3
Turn Bay Length (ft)								
Base Capacity (vph)			1524			2733		
Starvation Cap Reductn			0			0		
Spillback Cap Reductn			0			0		
Storage Cap Reductn			0			0		
Reduced v/c Ratio			0.86			0.41		

**Intersection Summary**

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 118 (91%), Referenced to phase 2:SET, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.86  
 Intersection Signal Delay: 24.7  
 Intersection LOS: C  
 Intersection Capacity Utilization 44.1%  
 ICU Level of Service A  
 Analysis Period (min) 15  
 ! Phase conflict between lane groups.

Splits and Phases: 82: NC 86 SB & NC 54 WB Off-Ramp LT



Lanes, Volumes, Timings  
 9: NC 86 SB & NC 86 NB

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑			↑↑				
Volume (vph)	0	0	0	0	2114	0	0	961	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Frt												
Flt Protected												
Satd. Flow (prot)	0	0	0	0	3539	0	0	3471	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	0	0	0	3539	0	0	3471	0	0	0	0
Right Turn on Red				No		No	No		No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			25			25				35
Link Distance (ft)		117			175			105				148
Travel Time (s)		2.0			4.8			2.9				2.9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.92	0.90	0.90	0.89	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	4%	2%	2%	2%	2%
Adj. Flow (vph)	0	0	0	0	2298	0	0	1080	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	2298	0	0	1080	0	0	0	0
Turn Type												
Protected Phases					4 3			2				
Permitted Phases												
Detector Phase					4 3			2				
Switch Phase												
Minimum Initial (s)								4.0				
Minimum Split (s)								19.0				
Total Split (s)	0.0	0.0	0.0	0.0	84.0	0.0	0.0	46.0	0.0	0.0	0.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	0.0%	64.6%	0.0%	0.0%	35.4%	0.0%	0.0%	0.0%	0.0%
Maximum Green (s)								39.0				
Yellow Time (s)								5.0				
All-Red Time (s)								2.0				
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	2.0	2.0	2.0	2.0	5.0	2.0	2.0	5.0	2.0	2.0	2.0	2.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)								3.0				
Recall Mode								C-Min				
Act Effct Green (s)					79.0			41.0				
Actuated g/C Ratio					0.61			0.32				
v/c Ratio					1.07			0.99				
Control Delay					59.1			47.2				
Queue Delay					0.0			0.0				
Total Delay					59.1			47.2				
LOS					E			D				
Approach Delay					59.1			47.2				
Approach LOS					E			D				
Queue Length 50th (ft)					~1141			427				
Queue Length 95th (ft)					#1250			m438				
Internal Link Dist (ft)		37			95			25			68	

Lane Group	ø3	ø4
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Lane Util. Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Peak Hour Factor		
Heavy Vehicles (%)		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	3	4
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	4.0	4.0
Minimum Split (s)	14.0	19.0
Total Split (s)	14.0	70.0
Total Split (%)	11%	54%
Maximum Green (s)	7.0	63.0
Yellow Time (s)	5.0	5.0
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lag
Lead-Lag Optimize?	Yes	
Vehicle Extension (s)	3.0	3.0
Recall Mode	None	None
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		

Lanes, Volumes, Timings  
 9: NC 86 SB & NC 86 NB

2/28/2014

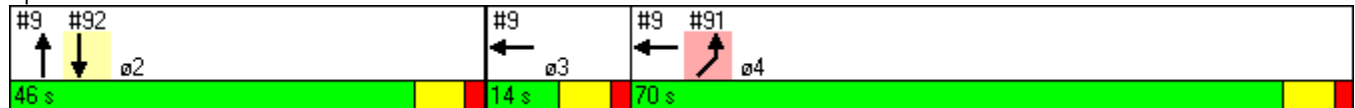


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)												
Base Capacity (vph)					2151			1095				
Starvation Cap Reductn					0			0				
Spillback Cap Reductn					0			0				
Storage Cap Reductn					0			0				
Reduced v/c Ratio					1.07			0.99				

**Intersection Summary**

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green, Master Intersection  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.07  
 Intersection Signal Delay: 55.3 Intersection LOS: E  
 Intersection Capacity Utilization 93.3% ICU Level of Service F  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: NC 86 SB & NC 86 NB





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Lane Group	ø3	ø4
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

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Lanes, Volumes, Timings  
 91: NC 86 NB & NC 54 EB Off Ramp LT

2/28/2014



Lane Group	NBL	NBT	SBT	SBR	NEL	NER	ø2	ø3
Lane Configurations		↑↑			↑↑			
Volume (vph)	0	961	0	0	163	0		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.97	1.00		
Frt								
Flt Protected					0.950			
Satd. Flow (prot)	0	3471	0	0	3242	0		
Flt Permitted					0.950			
Satd. Flow (perm)	0	3471	0	0	3242	0		
Right Turn on Red				No	No	No		
Satd. Flow (RTOR)								
Link Speed (mph)		25	35		45			
Link Distance (ft)		148	335		258			
Travel Time (s)		4.0	6.5		3.9			
Peak Hour Factor	0.92	0.89	0.90	0.90	0.86	0.90		
Heavy Vehicles (%)	3%	4%	2%	2%	8%	2%		
Adj. Flow (vph)	0	1080	0	0	190	0		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	1080	0	0	190	0		
Turn Type								
Protected Phases		Free!			4!		2	3
Permitted Phases								
Detector Phase					4			
Switch Phase								
Minimum Initial (s)					4.0		4.0	4.0
Minimum Split (s)					19.0		19.0	14.0
Total Split (s)	0.0	0.0	0.0	0.0	70.0	0.0	46.0	14.0
Total Split (%)	0.0%	0.0%	0.0%	0.0%	53.8%	0.0%	35%	11%
Maximum Green (s)					63.0		39.0	7.0
Yellow Time (s)					5.0		5.0	5.0
All-Red Time (s)					2.0		2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0		
Total Lost Time (s)	2.0	2.0	2.0	2.0	5.0	2.0		
Lead/Lag					Lag			Lead
Lead-Lag Optimize?								Yes
Vehicle Extension (s)					3.0		3.0	3.0
Recall Mode					None		C-Min	None
Act Effct Green (s)		130.0			65.0			
Actuated g/C Ratio		1.00			0.50			
v/c Ratio		0.31			0.12			
Control Delay		1.3			17.5			
Queue Delay		0.0			0.0			
Total Delay		1.3			17.5			
LOS		A			B			
Approach Delay		1.3			17.5			
Approach LOS		A			B			
Queue Length 50th (ft)		0			42			
Queue Length 95th (ft)		m0			61			
Internal Link Dist (ft)		68	255		178			

Lanes, Volumes, Timings  
 91: NC 86 NB & NC 54 EB Off Ramp LT

2/28/2014

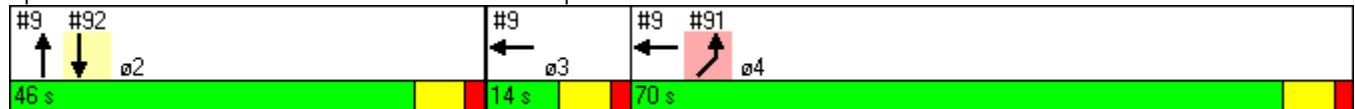


Lane Group	NBL	NBT	SBT	SBR	NEL	NER	ø2	ø3
Turn Bay Length (ft)								
Base Capacity (vph)		3471			1621			
Starvation Cap Reductn		0			0			
Spillback Cap Reductn		0			0			
Storage Cap Reductn		0			0			
Reduced v/c Ratio		0.31			0.12			

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green, Master Intersection  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.07  
 Intersection Signal Delay: 3.7  
 Intersection LOS: A  
 Intersection Capacity Utilization 69.1%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.  
 ! Phase conflict between lane groups.

Splits and Phases: 91: NC 86 NB & NC 54 EB Off Ramp LT



Lanes, Volumes, Timings  
 92: NC 86 SB & NC 54 EB Off Ramp RT

2/28/2014

	↑	↗	↘	↓	↙	↖		
Lane Group	NBT	NBR	SBL	SBT	SWL	SWR	ø3	ø4
Lane Configurations				↑	↗ ↘			
Volume (vph)	0	0	0	405	2114	0		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.97	1.00		
Frt								
Flt Protected					0.950			
Satd. Flow (prot)	0	0	0	1759	3433	0		
Flt Permitted					0.950			
Satd. Flow (perm)	0	0	0	1759	3433	0		
Right Turn on Red		No			No	No		
Satd. Flow (RTOR)								
Link Speed (mph)	40			45	25			
Link Distance (ft)	112			257	117			
Travel Time (s)	1.9			3.9	3.2			
Peak Hour Factor	0.90	0.90	0.90	0.86	0.92	0.90		
Heavy Vehicles (%)	2%	2%	2%	8%	2%	2%		
Adj. Flow (vph)	0	0	0	471	2298	0		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	0	0	471	2298	0		
Turn Type								
Protected Phases				2!	Free!		3	4
Permitted Phases								
Detector Phase				2	3			
Switch Phase								
Minimum Initial (s)				4.0			4.0	4.0
Minimum Split (s)				19.0			14.0	19.0
Total Split (s)	0.0	0.0	0.0	46.0	0.0	0.0	14.0	70.0
Total Split (%)	0.0%	0.0%	0.0%	35.4%	0.0%	0.0%	11%	54%
Maximum Green (s)				39.0			7.0	63.0
Yellow Time (s)				5.0			5.0	5.0
All-Red Time (s)				2.0			2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0		
Total Lost Time (s)	2.0	2.0	2.0	5.0	2.0	2.0		
Lead/Lag								
Lead-Lag Optimize?							Lead	Lag
Vehicle Extension (s)				3.0			3.0	3.0
Recall Mode				C-Min			None	None
Act Effct Green (s)				41.0	130.0			
Actuated g/C Ratio				0.32	1.00			
v/c Ratio				0.85	0.67			
Control Delay				57.2	5.1			
Queue Delay				0.0	0.0			
Total Delay				57.2	5.1			
LOS				E	A			
Approach Delay				57.2	5.1			
Approach LOS				E	A			
Queue Length 50th (ft)				371	107			
Queue Length 95th (ft)				#507	m28			
Internal Link Dist (ft)	32			177	37			

Lanes, Volumes, Timings  
 92: NC 86 SB & NC 54 EB Off Ramp RT

2/28/2014

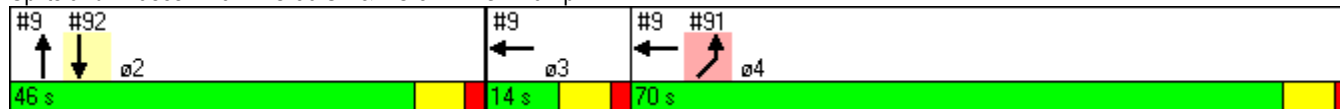


Lane Group	NBT	NBR	SBL	SBT	SWL	SWR	ø3	ø4
Turn Bay Length (ft)								
Base Capacity (vph)				555	3433			
Starvation Cap Reductn				0	0			
Spillback Cap Reductn				0	0			
Storage Cap Reductn				0	0			
Reduced v/c Ratio				0.85	0.67			

Intersection Summary

Area Type:	Other
Cycle Length:	130
Actuated Cycle Length:	130
Offset:	0 (0%), Referenced to phase 2:NBT, Start of Green, Master Intersection
Natural Cycle:	110
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	1.07
Intersection Signal Delay:	13.9
Intersection LOS:	B
Intersection Capacity Utilization	93.3%
ICU Level of Service	F
Analysis Period (min)	15
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.
m	Volume for 95th percentile queue is metered by upstream signal.
!	Phase conflict between lane groups.

Splits and Phases: 92: NC 86 SB & NC 54 EB Off Ramp RT



Lanes, Volumes, Timings  
 10: SR 1994 (Culbreth Road) & US 15-501

2/28/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	130	96	77	12	75	320	85	1532	31	521	1763	235
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			-8%			-2%			2%	
Storage Length (ft)	0		75	0		350	125		75	550		250
Storage Lanes	1		1	0		2	1		1	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.88	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.99		1.00		1.00					
Fr <sub>t</sub>			0.850			0.850			0.850			0.850
Fl <sub>t</sub> Protected	0.950				0.993		0.950			0.950		
Satd. Flow (prot)	1726	1817	1544	0	1905	2870	1753	3506	1568	1752	3504	1567
Fl <sub>t</sub> Permitted	0.600				0.728		0.113			0.064		
Satd. Flow (perm)	1090	1817	1523	0	1396	2870	208	3506	1568	118	3504	1567
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		526			543			533			550	
Travel Time (s)		10.2			10.6			8.1			8.3	
Confl. Peds. (#/hr)			1	1			1					1
Peak Hour Factor	0.87	0.87	0.87	0.89	0.89	0.89	0.93	0.93	0.93	0.92	0.92	0.92
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	2%	2%	2%
Adj. Flow (vph)	149	110	89	13	84	360	91	1647	33	566	1916	255
Shared Lane Traffic (%)												
Lane Group Flow (vph)	149	110	89	0	97	360	91	1647	33	566	1916	255
Turn Type	pm+pt		Perm	Perm		pt+ov	Perm		Perm	pm+pt		pt+ov
Protected Phases	7	4			8	8 1		2		1	6	6 7
Permitted Phases	4		4	8			2		2	6		
Detector Phase	7	4	4	8	8	8 1	2	2	2	1	6	6 7
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		12.0	12.0	12.0	7.0	12.0	
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0		19.0	19.0	19.0	13.0	26.0	
Total Split (s)	14.0	28.0	28.0	14.0	14.0	52.0	64.0	64.0	64.0	38.0	102.0	116.0
Total Split (%)	10.8%	21.5%	21.5%	10.8%	10.8%	40.0%	49.2%	49.2%	49.2%	29.2%	78.5%	89.2%
Maximum Green (s)	7.6	21.6	21.6	7.1	7.1		57.8	57.8	57.8	32.9	95.8	
Yellow Time (s)	3.0	4.2	4.2	4.5	4.5		4.7	4.7	4.7	3.0	4.7	
All-Red Time (s)	3.4	2.2	2.2	2.4	2.4		1.5	1.5	1.5	2.1	1.5	
Lost Time Adjust (s)	-1.4	-1.4	-1.4	-1.9	-1.9	-1.9	-1.2	-1.2	-1.2	-0.1	-1.2	-1.4
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.8
Lead/Lag	Lag			Lead	Lead		Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None		C-Max	C-Max	C-Max	None	C-Max	
Walk Time (s)												7.0
Flash Dont Walk (s)												12.0
Pedestrian Calls (#/hr)												0
Act Effct Green (s)	23.0	23.0	23.0		9.0	42.0	59.0	59.0	59.0	97.0	97.0	111.2
Actuated g/C Ratio	0.18	0.18	0.18		0.07	0.32	0.45	0.45	0.45	0.75	0.75	0.86
v/c Ratio	0.63	0.34	0.33		1.00	0.39	0.97	1.04	0.05	1.12	0.73	0.19

Lanes, Volumes, Timings  
 10: SR 1994 (Culbreth Road) & US 15-501

2/28/2014



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Control Delay	63.9	50.4	50.8		151.4	26.0	106.0	55.0	18.5	113.2	4.7	1.3
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.9	50.4	50.8		151.4	26.0	106.0	55.0	18.5	113.2	4.7	1.3
LOS	E	D	D		F	C	F	E	B	F	A	A
Approach Delay		56.3			52.6			57.0			26.8	
Approach LOS		E			D			E			C	
Queue Length 50th (ft)	114	82	66		~84	102	49	~788	8	~496	90	16
Queue Length 95th (ft)	179	136	116		#199	138	m#181	#906	m25	m#720	213	m29
Internal Link Dist (ft)		446			463			453			470	
Turn Bay Length (ft)			75			350	125		75	550		250
Base Capacity (vph)	237	321	269		97	928	94	1591	712	504	2616	1329
Starvation Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.34	0.33		1.00	0.39	0.97	1.04	0.05	1.12	0.73	0.19

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 97 (75%), Referenced to phase 2:NETL and 6:SWTL, Start of Green  
 Natural Cycle: 140  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.12  
 Intersection Signal Delay: 41.0  
 Intersection LOS: D  
 Intersection Capacity Utilization 97.6%  
 ICU Level of Service F  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: SR 1994 (Culbreth Road) & US 15-501

ø1	ø2	ø4
38 s	64 s	28 s
ø6	ø8	ø7
102 s	14 s	14 s

Lanes, Volumes, Timings  
8: NC 54 WB Ramps & NC 86 (S. Columbia St)

2/28/2014



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗	↘	↕	↕	↗
Volume (vph)	0	745	370	1325	409	152
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	*0.66	1.00	1.00
Frt		0.865				0.850
Flt Protected			0.950			
Satd. Flow (prot)	0	1596	1752	2435	1759	1495
Flt Permitted			0.478			
Satd. Flow (perm)	0	1596	882	2435	1759	1495
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	25			35	35	
Link Distance (ft)	172			94	190	
Travel Time (s)	4.7			1.8	3.7	
Peak Hour Factor	0.92	0.92	0.87	0.87	0.91	0.91
Heavy Vehicles (%)	2%	3%	3%	3%	8%	8%
Adj. Flow (vph)	0	810	425	1523	449	167
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	810	425	1523	449	167
Turn Type		Free	pm+pt			Perm
Protected Phases			5	2	6	
Permitted Phases		Free	2			6
Detector Phase			5	2	6	6
Switch Phase						
Minimum Initial (s)			7.0	12.0	12.0	12.0
Minimum Split (s)			14.0	19.0	19.0	19.0
Total Split (s)	0.0	0.0	33.0	140.0	107.0	107.0
Total Split (%)	0.0%	0.0%	23.6%	100.0%	76.4%	76.4%
Maximum Green (s)			26.0	133.0	100.0	100.0
Yellow Time (s)			5.0	5.0	5.0	5.0
All-Red Time (s)			2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	5.0	5.0	5.0	5.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)			3.0	3.0	3.0	3.0
Recall Mode			None	C-Max	C-Max	C-Max
Act Effct Green (s)		140.0	135.0	140.0	121.0	121.0
Actuated g/C Ratio		1.00	0.96	1.00	0.86	0.86
v/c Ratio		0.51	0.47	0.63	0.30	0.13
Control Delay		1.2	1.3	2.9	2.3	1.7
Queue Delay		0.0	0.0	0.0	0.0	0.0
Total Delay		1.2	1.3	2.9	2.3	1.7
LOS		A	A	A	A	A
Approach Delay				2.6	2.1	
Approach LOS				A	A	
Queue Length 50th (ft)		0	0	71	55	17
Queue Length 95th (ft)		0	0	15	75	27
Internal Link Dist (ft)	92			14	110	



Lanes, Volumes, Timings  
 8: NC 54 WB Ramps & NC 86 (S. Columbia St)

2/28/2014

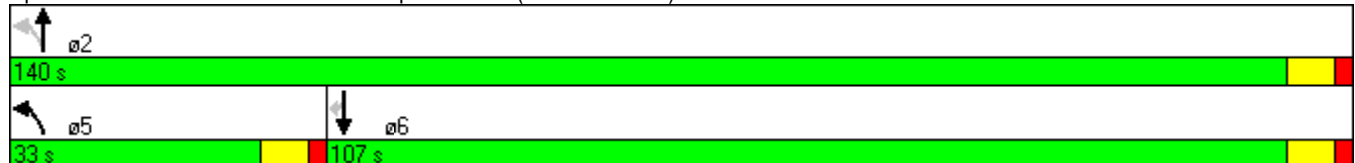


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Turn Bay Length (ft)						
Base Capacity (vph)		1596	1025	2435	1520	1292
Starvation Cap Reductn		0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0
Reduced v/c Ratio		0.51	0.41	0.63	0.30	0.13

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 79 (56%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 40  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.63  
 Intersection Signal Delay: 2.2  
 Intersection Capacity Utilization 50.4%  
 Analysis Period (min) 15  
 \* User Entered Value

Splits and Phases: 8: NC 54 WB Ramps & NC 86 (S. Columbia St)



Lanes, Volumes, Timings  
 37: US 15-501 Bypass WB Off Ramp & US 15-501

2/28/2014



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↖	↕	↗	↘	↓
Volume (vph)	0	61	1634	0	0	1154
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0	0	
Storage Lanes	0	1		0	0	
Taper Length (ft)	25	25		25	25	
Lane Util. Factor	1.00	1.00	*0.66	1.00	1.00	0.95
Ped Bike Factor						
Frt		0.865				
Flt Protected						
Satd. Flow (prot)	0	1596	2435	0	0	3343
Flt Permitted						
Satd. Flow (perm)	0	1596	2435	0	0	3343
Link Speed (mph)	35		35			35
Link Distance (ft)	893		596			94
Travel Time (s)	17.4		11.6			1.8
Confl. Peds. (#/hr)	1			3	3	
Peak Hour Factor	0.95	0.92	0.87	1.00	1.00	0.91
Heavy Vehicles (%)	2%	3%	3%	8%	4%	8%
Adj. Flow (vph)	0	66	1878	0	0	1268
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	66	1878	0	0	1268
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	65.6%
	ICU Level of Service C
Analysis Period (min)	15
* User Entered Value	

Lanes, Volumes, Timings

9: NC 54 Bypass (Fordham Blvd) EB Off Ramp & US 15-501

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	482	0	383	0	0	0	0	1227	0	55	1119	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		250	0		0	0		0	150		0
Storage Lanes	1		1	0		0	0		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor										1.00		
Frt			0.850									
Flt Protected	0.950	0.950								0.950		
Satd. Flow (prot)	1603	1603	1509	0	0	0	0	3505	0	1687	3374	0
Flt Permitted	0.950	0.950								0.081		
Satd. Flow (perm)	1603	1603	1509	0	0	0	0	3505	0	144	3374	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			35				35
Link Distance (ft)		847			142			156				596
Travel Time (s)		19.3			3.2			3.0				11.6
Confl. Peds. (#/hr)							4		3	3		4
Peak Hour Factor	0.85	0.85	0.85	1.00	1.00	1.00	1.00	0.92	1.00	0.90	0.90	1.00
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	3%	3%	3%	7%	7%	7%
Adj. Flow (vph)	567	0	451	0	0	0	0	1334	0	61	1243	0
Shared Lane Traffic (%)	50%											
Lane Group Flow (vph)	283	284	451	0	0	0	0	1334	0	61	1243	0
Turn Type	Perm		Perm							pm+pt		
Protected Phases		4						2		1	6	
Permitted Phases	4		4							6		
Detector Phase	4	4	4					2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0					10.0		7.0	10.0	
Minimum Split (s)	14.0	14.0	14.0					15.0		13.0	16.0	
Total Split (s)	59.0	59.0	59.0	0.0	0.0	0.0	0.0	68.0	0.0	13.0	81.0	0.0
Total Split (%)	42.1%	42.1%	42.1%	0.0%	0.0%	0.0%	0.0%	48.6%	0.0%	9.3%	57.9%	0.0%
Maximum Green (s)	52.8	52.8	52.8					63.3		7.5	75.1	
Yellow Time (s)	3.1	3.1	3.1					3.7		3.1	4.3	
All-Red Time (s)	3.1	3.1	3.1					1.0		2.4	1.6	
Lost Time Adjust (s)	-1.2	-1.2	-1.2	0.0	0.0	0.0	0.0	0.3	0.0	-0.5	-0.9	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.0	4.0	4.0	4.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0					3.0		3.0	3.0	
Recall Mode	None	None	None					C-Max		None	C-Max	
Act Effct Green (s)	48.7	48.7	48.7					70.9		81.3	81.3	
Actuated g/C Ratio	0.35	0.35	0.35					0.51		0.58	0.58	
v/c Ratio	0.51	0.51	0.86					0.75		0.36	0.63	
Control Delay	38.8	38.8	58.6					25.2		19.3	21.6	
Queue Delay	0.0	0.0	0.0					0.0		0.0	0.2	
Total Delay	38.8	38.8	58.6					25.2		19.3	21.8	
LOS	D	D	E					C		B	C	

Lanes, Volumes, Timings

9: NC 54 Bypass (Fordham Blvd) EB Off Ramp & US 15-501

2/28/2014

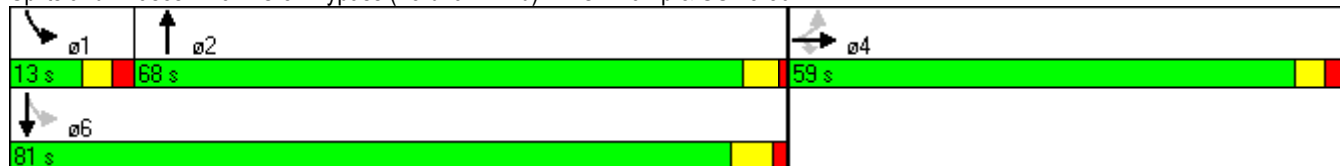


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		47.6						25.2				21.6
Approach LOS		D						C				C
Queue Length 50th (ft)	206	207	367					470		25		401
Queue Length 95th (ft)	271	272	460					m523		49		497
Internal Link Dist (ft)		767			62			76				516
Turn Bay Length (ft)	250		250							150		
Base Capacity (vph)	618	618	582					1775		172		1959
Starvation Cap Reductn	0	0	0					0		0		162
Spillback Cap Reductn	0	0	0					0		0		0
Storage Cap Reductn	0	0	0					0		0		0
Reduced v/c Ratio	0.46	0.46	0.77					0.75		0.35		0.69

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 104 (74%), Referenced to phase 2:NBT and 6:SBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.86  
 Intersection Signal Delay: 30.2  
 Intersection LOS: C  
 Intersection Capacity Utilization 65.6%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: NC 54 Bypass (Fordham Blvd) EB Off Ramp & US 15-501



Lanes, Volumes, Timings  
 10: SR 1994 (Culbreth Road) & NC 86 NB

2/28/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	229	64	90	15	129	595	78	1727	11	260	1221	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			-8%			-2%			2%	
Storage Length (ft)	0		75	425		350	125		75	550		250
Storage Lanes	1		1	0		2	1		1	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.88	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Fr <sub>t</sub>			0.850			0.850			0.850			0.850
Fl <sub>t</sub> Protected	0.950				0.995		0.950			0.950		
Satd. Flow (prot)	1743	1835	1560	0	1909	2870	1770	3540	1584	1702	3404	1523
Fl <sub>t</sub> Permitted	0.316				0.962		0.161			0.051		
Satd. Flow (perm)	580	1835	1560	0	1846	2870	300	3540	1584	91	3404	1523
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		526			543			533			635	
Travel Time (s)		10.2			10.6			8.1			9.6	
Confl. Peds. (#/hr)							2					2
Peak Hour Factor	0.89	0.89	0.89	0.91	0.91	0.91	0.94	0.94	0.94	0.98	0.98	0.98
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	5%	5%	5%
Adj. Flow (vph)	257	72	101	16	142	654	83	1837	12	265	1246	126
Shared Lane Traffic (%)												
Lane Group Flow (vph)	257	72	101	0	158	654	83	1837	12	265	1246	126
Turn Type	pm+pt		Perm	Perm		pt+ov	Perm		Perm	pm+pt		pt+ov
Protected Phases	7	4			8	8 1		2		1	6	6 7
Permitted Phases	4		4	8			2		2	6		
Detector Phase	7	4	4	8	8	8 1	2	2	2	1	6	6 7
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		12.0	12.0	12.0	7.0	12.0	
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0		19.0	19.0	19.0	13.0	26.0	
Total Split (s)	17.0	40.0	40.0	23.0	23.0	45.0	78.0	78.0	78.0	22.0	100.0	117.0
Total Split (%)	12.1%	28.6%	28.6%	16.4%	16.4%	32.1%	55.7%	55.7%	55.7%	15.7%	71.4%	83.6%
Maximum Green (s)	10.6	33.6	33.6	16.1	16.1		71.8	71.8	71.8	16.9	93.8	
Yellow Time (s)	3.0	4.2	4.2	4.5	4.5		4.7	4.7	4.7	3.0	4.7	
All-Red Time (s)	3.4	2.2	2.2	2.4	2.4		1.5	1.5	1.5	2.1	1.5	
Lost Time Adjust (s)	-1.4	-1.4	-1.4	-1.9	-1.9	-1.9	-1.2	-1.2	-1.2	-0.1	-1.2	-1.4
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.8
Lead/Lag	Lead			Lag	Lag		Lead	Lead	Lead	Lag		
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None		C-Max	C-Max	C-Max	None	C-Max	
Walk Time (s)												7.0
Flash Dont Walk (s)												12.0
Pedestrian Calls (#/hr)												0
Act Effct Green (s)	34.7	34.7	34.7		17.7	34.7	73.3	73.3	73.3	95.3	95.3	112.5
Actuated g/C Ratio	0.25	0.25	0.25		0.13	0.25	0.52	0.52	0.52	0.68	0.68	0.80
v/c Ratio	1.05	0.16	0.26		0.68	0.92	0.53	0.99	0.01	1.03	0.54	0.10

Lanes, Volumes, Timings  
 10: SR 1994 (Culbreth Road) & NC 86 NB

2/28/2014



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Control Delay	119.1	42.2	44.4		73.8	58.7	25.0	35.1	14.9	107.5	9.6	2.3
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	119.1	42.2	44.4		73.8	58.7	25.0	35.1	14.9	107.5	9.6	2.3
LOS	F	D	D		E	E	C	D	B	F	A	A
Approach Delay		88.7			61.6			34.5			24.9	
Approach LOS		F			E			C			C	
Queue Length 50th (ft)	~221	52	74		139	257	20	417	3	~210	152	14
Queue Length 95th (ft)	#334	94	127		219	#369	m42	#1032	m6	m#386	173	m22
Internal Link Dist (ft)		446			463			453			555	
Turn Bay Length (ft)			75			350	125		75	550		250
Base Capacity (vph)	244	459	390		237	718	157	1855	830	257	2318	1225
Starvation Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.05	0.16	0.26		0.67	0.91	0.53	0.99	0.01	1.03	0.54	0.10

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 94 (67%), Referenced to phase 2:NETL and 6:SWTL, Start of Green  
 Natural Cycle: 120  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.05  
 Intersection Signal Delay: 40.7  
 Intersection LOS: D  
 Intersection Capacity Utilization 99.1%  
 ICU Level of Service F  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: SR 1994 (Culbreth Road) & NC 86 NB



Lanes, Volumes, Timings  
 8: NC 54 WB Ramps & NC 86 (S. Columbia St)

2/28/2014



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗	↖	↑↑	↑	↗
Volume (vph)	0	861	289	594	469	159
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	*0.57	1.00	1.00
Fr <sub>t</sub>		0.865				0.850
Fl <sub>t</sub> Protected			0.950			
Satd. Flow (prot)	0	1580	1671	2006	1776	1509
Fl <sub>t</sub> Permitted			0.445			
Satd. Flow (perm)	0	1580	783	2006	1776	1509
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	25			35	35	
Link Distance (ft)	172			94	190	
Travel Time (s)	4.7			1.8	3.7	
Peak Hour Factor	0.92	0.97	0.84	0.84	0.91	0.91
Heavy Vehicles (%)	2%	4%	8%	8%	7%	7%
Adj. Flow (vph)	0	888	344	707	515	175
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	888	344	707	515	175
Turn Type		Free	pm+pt			Perm
Protected Phases			5	2	6	
Permitted Phases		Free	2			6
Detector Phase			5	2	6	6
Switch Phase						
Minimum Initial (s)			7.0	12.0	12.0	12.0
Minimum Split (s)			14.0	19.0	19.0	19.0
Total Split (s)	0.0	0.0	45.0	140.0	95.0	95.0
Total Split (%)	0.0%	0.0%	32.1%	100.0%	67.9%	67.9%
Maximum Green (s)			38.0	133.0	88.0	88.0
Yellow Time (s)			5.0	5.0	5.0	5.0
All-Red Time (s)			2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	5.0	5.0	5.0	5.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)			3.0	3.0	3.0	3.0
Recall Mode			None	C-Max	C-Max	C-Max
Act Effct Green (s)		140.0	135.0	140.0	121.0	121.0
Actuated g/C Ratio		1.00	0.96	1.00	0.86	0.86
v/c Ratio		0.56	0.42	0.35	0.34	0.13
Control Delay		1.5	4.5	1.3	2.4	1.7
Queue Delay		0.0	0.0	0.0	0.0	0.0
Total Delay		1.5	4.5	1.3	2.4	1.7
LOS		A	A	A	A	A
Approach Delay				2.3	2.3	
Approach LOS				A	A	
Queue Length 50th (ft)		0	29	27	66	18
Queue Length 95th (ft)		0	61	23	89	28
Internal Link Dist (ft)	92			14	110	

Lanes, Volumes, Timings  
 8: NC 54 WB Ramps & NC 86 (S. Columbia St)

2/28/2014



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Turn Bay Length (ft)						
Base Capacity (vph)		1580	1009	2006	1535	1304
Starvation Cap Reductn		0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0
Reduced v/c Ratio		0.56	0.34	0.35	0.34	0.13

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 139 (99%), Referenced to phase 2:NBTL and 6:SBT, Start of Green  
 Natural Cycle: 40  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.56  
 Intersection Signal Delay: 2.0  
 Intersection Capacity Utilization 49.0%  
 Analysis Period (min) 15  
 \* User Entered Value

Splits and Phases: 8: NC 54 WB Ramps & NC 86 (S. Columbia St)





Lanes, Volumes, Timings  
 37: US 15-501 Bypass WB Off Ramp & US 15-501

2/28/2014



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↖	↕			↘
Volume (vph)	0	65	818	0	0	1330
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0	0	
Storage Lanes	0	1		0	0	
Taper Length (ft)	25	25		25	25	
Lane Util. Factor	1.00	1.00	*0.58	1.00	1.00	0.95
Ped Bike Factor						
Frt		0.865				
Flt Protected						
Satd. Flow (prot)	0	1580	2041	0	0	3374
Flt Permitted						
Satd. Flow (perm)	0	1580	2041	0	0	3374
Link Speed (mph)	35		35			35
Link Distance (ft)	893		596			94
Travel Time (s)	17.4		11.6			1.8
Confl. Peds. (#/hr)	1			3	3	
Peak Hour Factor	0.95	0.97	0.84	1.00	1.00	0.91
Heavy Vehicles (%)	4%	4%	8%	8%	7%	7%
Adj. Flow (vph)	0	67	974	0	0	1462
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	67	974	0	0	1462
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	55.9%
	ICU Level of Service B
Analysis Period (min)	15
* User Entered Value	

Lanes, Volumes, Timings

9: NC 54 Bypass (Fordham Blvd) EB Off Ramp & US 15-501

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	133	0	227	0	0	0	0	681	0	77	1214	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		250	0		0	0		0	150		0
Storage Lanes	1		1	0		0	0		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor										1.00		
Frt			0.850									
Flt Protected	0.950	0.950								0.950		
Satd. Flow (prot)	1588	1588	1495	0	0	0	0	3471	0	1752	3505	0
Flt Permitted	0.950	0.950								0.321		
Satd. Flow (perm)	1588	1588	1495	0	0	0	0	3471	0	592	3505	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		847			142			156			596	
Travel Time (s)		19.3			3.2			3.0			11.6	
Confl. Peds. (#/hr)							4		3	3		4
Peak Hour Factor	0.93	0.93	0.93	1.00	1.00	1.00	1.00	0.95	1.00	0.94	0.94	1.00
Heavy Vehicles (%)	8%	8%	8%	2%	2%	2%	4%	4%	4%	3%	3%	3%
Adj. Flow (vph)	143	0	244	0	0	0	0	717	0	82	1291	0
Shared Lane Traffic (%)	50%											
Lane Group Flow (vph)	71	72	244	0	0	0	0	717	0	82	1291	0
Turn Type	Perm		Perm							pm+pt		
Protected Phases		4						2		1	6	
Permitted Phases	4		4							6		
Detector Phase	4	4	4					2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0					10.0		7.0	10.0	
Minimum Split (s)	14.0	14.0	14.0					15.0		13.0	16.0	
Total Split (s)	50.0	50.0	50.0	0.0	0.0	0.0	0.0	75.0	0.0	15.0	90.0	0.0
Total Split (%)	35.7%	35.7%	35.7%	0.0%	0.0%	0.0%	0.0%	53.6%	0.0%	10.7%	64.3%	0.0%
Maximum Green (s)	43.8	43.8	43.8					70.3		9.5	84.1	
Yellow Time (s)	3.1	3.1	3.1					3.7		3.1	4.3	
All-Red Time (s)	3.1	3.1	3.1					1.0		2.4	1.6	
Lost Time Adjust (s)	-1.2	-1.2	-1.2	0.0	0.0	0.0	0.0	0.3	0.0	-0.5	-0.9	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.0	4.0	4.0	4.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0					3.0		3.0	3.0	
Recall Mode	None	None	None					C-Max		None	C-Max	
Act Effct Green (s)	29.8	29.8	29.8					86.8		100.2	100.2	
Actuated g/C Ratio	0.21	0.21	0.21					0.62		0.72	0.72	
v/c Ratio	0.21	0.21	0.77					0.33		0.17	0.51	
Control Delay	44.5	44.5	66.9					14.3		7.6	10.1	
Queue Delay	0.0	0.0	0.0					0.0		0.0	0.1	
Total Delay	44.5	44.5	66.9					14.3		7.6	10.2	
LOS	D	D	E					B		A	B	

Lanes, Volumes, Timings

9: NC 54 Bypass (Fordham Blvd) EB Off Ramp & US 15-501

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		58.6						14.3				10.1
Approach LOS		E						B				B
Queue Length 50th (ft)	56	57	211					153		19		205
Queue Length 95th (ft)	94	96	285					241		41		386
Internal Link Dist (ft)		767			62			76				516
Turn Bay Length (ft)	250		250							150		
Base Capacity (vph)	510	510	481					2151		507		2508
Starvation Cap Reductn	0	0	0					0		0		354
Spillback Cap Reductn	0	0	0					0		0		0
Storage Cap Reductn	0	0	0					0		0		0
Reduced v/c Ratio	0.14	0.14	0.51					0.33		0.16		0.60

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green  
 Natural Cycle: 50  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.77  
 Intersection Signal Delay: 18.9  
 Intersection Capacity Utilization 55.9%  
 Analysis Period (min) 15

Intersection LOS: B  
 ICU Level of Service B

Splits and Phases: 9: NC 54 Bypass (Fordham Blvd) EB Off Ramp & US 15-501



Lanes, Volumes, Timings  
 10: SR 1994 (Culbreth Road) & US 15-501

2/28/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	71	33	48	12	25	280	34	1167	13	301	1190	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			-8%			-2%			2%	
Storage Length (ft)	0		75	425		350	125		75	550		250
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00						1.00					
Fr <sub>t</sub>			0.850			0.850			0.850			0.850
Fl <sub>t</sub> Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1710	1800	1530	1788	1882	1600	1736	3472	1553	1686	3372	1508
Fl <sub>t</sub> Permitted	0.521			0.732			0.151			0.102		
Satd. Flow (perm)	936	1800	1530	1378	1882	1600	276	3472	1553	181	3372	1508
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		526			543			533			635	
Travel Time (s)		10.2			10.6			8.1			9.6	
Confl. Peds. (#/hr)	1						1	1				1
Peak Hour Factor	0.88	0.88	0.88	0.91	0.91	0.91	0.94	0.94	0.94	0.93	0.93	0.93
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	5%	5%	5%	6%	6%	6%
Adj. Flow (vph)	81	38	55	13	27	308	36	1241	14	324	1280	110
Shared Lane Traffic (%)												
Lane Group Flow (vph)	81	38	55	13	27	308	36	1241	14	324	1280	110
Turn Type	pm+pt		Perm	Perm		pt+ov	Perm		Perm	pm+pt		pt+ov
Protected Phases	7	4			8	8 1		2		1	6	6 7
Permitted Phases	4		4	8			2		2	6		
Detector Phase	7	4	4	8	8	8 1	2	2	2	1	6	6 7
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		12.0	12.0	12.0	7.0	12.0	
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0		19.0	19.0	19.0	13.0	26.0	
Total Split (s)	14.0	33.0	33.0	19.0	19.0	49.0	57.0	57.0	57.0	30.0	87.0	101.0
Total Split (%)	11.7%	27.5%	27.5%	15.8%	15.8%	40.8%	47.5%	47.5%	47.5%	25.0%	72.5%	84.2%
Maximum Green (s)	7.6	26.6	26.6	12.1	12.1		50.8	50.8	50.8	24.9	80.8	
Yellow Time (s)	3.0	4.2	4.2	4.5	4.5		4.7	4.7	4.7	3.0	4.7	
All-Red Time (s)	3.4	2.2	2.2	2.4	2.4		1.5	1.5	1.5	2.1	1.5	
Lost Time Adjust (s)	-1.4	-1.4	-1.4	-1.9	-1.9	-1.9	-1.2	-1.2	-1.2	-0.1	-1.2	-1.4
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.8
Lead/Lag	Lead			Lag	Lag		Lead	Lead	Lead	Lag		
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None		C-Max	C-Max	C-Max	None	C-Max	
Walk Time (s)												7.0
Flash Dont Walk (s)												12.0
Pedestrian Calls (#/hr)												0
Act Effct Green (s)	25.8	25.8	25.8	11.9	11.9	36.9	54.2	54.2	54.2	84.2	84.2	98.3
Actuated g/C Ratio	0.22	0.22	0.22	0.10	0.10	0.31	0.45	0.45	0.45	0.70	0.70	0.82
v/c Ratio	0.31	0.10	0.17	0.09	0.14	0.63	0.29	0.79	0.02	0.74	0.54	0.09

Lanes, Volumes, Timings  
 10: SR 1994 (Culbreth Road) & US 15-501

2/28/2014

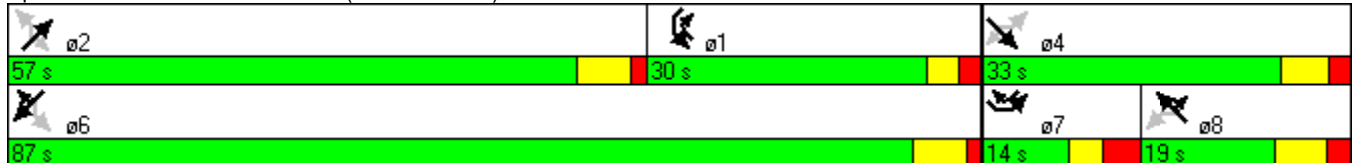


Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Control Delay	41.8	37.8	39.2	49.9	50.5	29.2	15.9	16.0	8.9	44.6	9.8	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.8	37.8	39.2	49.9	50.5	29.2	15.9	16.0	8.9	44.6	9.8	2.4
LOS	D	D	D	D	D	C	B	B	A	D	A	A
Approach Delay		40.1			31.6			15.9			15.9	
Approach LOS		D			C			B			B	
Queue Length 50th (ft)	52	24	35	9	19	154	8	188	3	156	225	13
Queue Length 95th (ft)	93	52	69	29	48	221	29	275	m9	268	294	26
Internal Link Dist (ft)		446			463			453			555	
Turn Bay Length (ft)			75	425		350	125		75	550		250
Base Capacity (vph)	259	420	357	161	220	520	125	1569	702	440	2367	1237
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.09	0.15	0.08	0.12	0.59	0.29	0.79	0.02	0.74	0.54	0.09

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 43 (36%), Referenced to phase 2:NETL and 6:SWTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.79  
 Intersection Signal Delay: 18.7  
 Intersection LOS: B  
 Intersection Capacity Utilization 72.0%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: SR 1994 (Culbreth Road) & US 15-501



Lanes, Volumes, Timings  
 8: NC 54 WB Ramps & NC 86 (S. Columbia St)

2/28/2014



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗	↖	↑↑	↑	↗
Volume (vph)	0	1241	495	647	1007	340
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	*0.57	1.00	1.00
Fr <sub>t</sub>		0.865				0.850
Fl <sub>t</sub> Protected			0.950			
Satd. Flow (prot)	0	1611	1770	2124	1863	1583
Fl <sub>t</sub> Permitted			0.084			
Satd. Flow (perm)	0	1611	156	2124	1863	1583
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	25			35	35	
Link Distance (ft)	172			94	190	
Travel Time (s)	4.7			1.8	3.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1349	538	703	1095	370
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1349	538	703	1095	370
Turn Type		Free	pm+pt			Perm
Protected Phases			5	2	6	
Permitted Phases		Free	2			6
Detector Phase			5	2	6	6
Switch Phase						
Minimum Initial (s)			7.0	12.0	12.0	12.0
Minimum Split (s)			14.0	19.0	19.0	19.0
Total Split (s)	0.0	0.0	42.0	140.0	98.0	98.0
Total Split (%)	0.0%	0.0%	30.0%	100.0%	70.0%	70.0%
Maximum Green (s)			35.0	133.0	91.0	91.0
Yellow Time (s)			5.0	5.0	5.0	5.0
All-Red Time (s)			2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	5.0	5.0	5.0	5.0
Lead/Lag			Lag		Lead	Lead
Lead-Lag Optimize?			Yes		Yes	Yes
Vehicle Extension (s)			3.0	3.0	3.0	3.0
Recall Mode			None	C-Max	C-Max	C-Max
Act Effct Green (s)		140.0	135.0	140.0	93.0	93.0
Actuated g/C Ratio		1.00	0.96	1.00	0.66	0.66
v/c Ratio		0.84	0.93	0.33	0.88	0.35
Control Delay		5.4	57.3	0.4	29.6	11.4
Queue Delay		1.4	0.0	0.0	9.3	0.0
Total Delay		6.7	57.3	0.4	38.9	11.4
LOS		A	E	A	D	B
Approach Delay				25.1	32.0	
Approach LOS				C	C	
Queue Length 50th (ft)		0	372	0	757	138
Queue Length 95th (ft)		0	#596	0	1043	194
Internal Link Dist (ft)	92			14	110	
Turn Bay Length (ft)						

Lanes, Volumes, Timings  
 8: NC 54 WB Ramps & NC 86 (S. Columbia St)

2/28/2014



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Base Capacity (vph)		1611	577	2124	1238	1052
Starvation Cap Reductn		0	0	0	0	0
Spillback Cap Reductn		113	0	0	131	0
Storage Cap Reductn		0	0	0	0	0
Reduced v/c Ratio		0.90	0.93	0.33	0.99	0.35

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 112 (80%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.93  
 Intersection Signal Delay: 21.5  
 Intersection LOS: C  
 Intersection Capacity Utilization 88.8%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 \* User Entered Value  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 8: NC 54 WB Ramps & NC 86 (S. Columbia St)



Lanes, Volumes, Timings  
 37: US 15-501 Bypass WB Off Ramp & US 15-501

2/28/2014



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↖	↕	↗	↘	↓
Volume (vph)	0	44	1098	0	0	2248
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0	0	
Storage Lanes	0	1		0	0	
Taper Length (ft)	25	25		25	25	
Lane Util. Factor	1.00	1.00	*0.58	1.00	1.00	0.95
Ped Bike Factor						
Frt		0.865				
Flt Protected						
Satd. Flow (prot)	0	1611	2041	0	0	3471
Flt Permitted						
Satd. Flow (perm)	0	1611	2041	0	0	3471
Link Speed (mph)	35		35			35
Link Distance (ft)	893		596			94
Travel Time (s)	17.4		11.6			1.8
Confl. Peds. (#/hr)	1			3	3	
Peak Hour Factor	0.95	0.95	0.88	1.00	1.00	0.94
Heavy Vehicles (%)	2%	2%	8%	8%	4%	4%
Adj. Flow (vph)	0	46	1248	0	0	2391
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	46	1248	0	0	2391
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	83.5%
ICU Level of Service	E
Analysis Period (min)	15
* User Entered Value	



# Lanes, Volumes, Timings

## 9: NC 54 Bypass (Fordham Blvd) EB Off Ramp & US 15-501

2/28/2014



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	163	0	405	0	0	0	0	961	0	107	2114	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		250	0		0	0		0	150		0
Storage Lanes	1		1	0		0	0		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor										1.00		
Frt		0.850	0.850									
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1671	1421	1421	0	0	0	0	3471	0	1770	3539	0
Flt Permitted	0.950									0.192		
Satd. Flow (perm)	1671	1421	1421	0	0	0	0	3471	0	357	3539	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		847			142			156			596	
Travel Time (s)		19.3			3.2			3.0			11.6	
Confl. Peds. (#/hr)							4		3	3		4
Peak Hour Factor	0.86	0.86	0.86	1.00	1.00	1.00	1.00	0.89	1.00	0.92	0.92	1.00
Heavy Vehicles (%)	8%	8%	8%	2%	2%	2%	4%	4%	4%	2%	2%	2%
Adj. Flow (vph)	190	0	471	0	0	0	0	1080	0	116	2298	0
Shared Lane Traffic (%)			50%									
Lane Group Flow (vph)	190	236	235	0	0	0	0	1080	0	116	2298	0
Turn Type	Perm		Perm							pm+pt		
Protected Phases		4						2		1	6	
Permitted Phases	4		4							6		
Detector Phase	4	4	4					2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0					10.0		7.0	10.0	
Minimum Split (s)	14.0	14.0	14.0					15.0		13.0	16.0	
Total Split (s)	44.0	44.0	44.0	0.0	0.0	0.0	0.0	83.0	0.0	13.0	96.0	0.0
Total Split (%)	31.4%	31.4%	31.4%	0.0%	0.0%	0.0%	0.0%	59.3%	0.0%	9.3%	68.6%	0.0%
Maximum Green (s)	37.8	37.8	37.8					78.3		7.5	90.1	
Yellow Time (s)	3.1	3.1	3.1					3.7		3.1	4.3	
All-Red Time (s)	3.1	3.1	3.1					1.0		2.4	1.6	
Lost Time Adjust (s)	-1.2	-1.2	-1.2	0.0	0.0	0.0	0.0	0.3	0.0	-0.5	-0.9	0.0
Total Lost Time (s)	5.0	5.0	5.0	4.0	4.0	4.0	4.0	5.0	4.0	5.0	5.0	4.0
Lead/Lag								Lag		Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0					3.0		3.0	3.0	
Recall Mode	None	None	None					C-Max		None	C-Max	
Act Effct Green (s)	30.6	30.6	30.6					85.9		99.4	99.4	
Actuated g/C Ratio	0.22	0.22	0.22					0.61		0.71	0.71	
v/c Ratio	0.52	0.76	0.76					0.51		0.34	0.91	
Control Delay	52.2	66.3	66.0					17.2		5.4	14.2	
Queue Delay	0.0	0.0	0.0					0.0		0.0	1.9	
Total Delay	52.2	66.3	66.0					17.2		5.4	16.0	
LOS	D	E	E					B		A	B	

Lanes, Volumes, Timings

9: NC 54 Bypass (Fordham Blvd) EB Off Ramp & US 15-501

2/28/2014

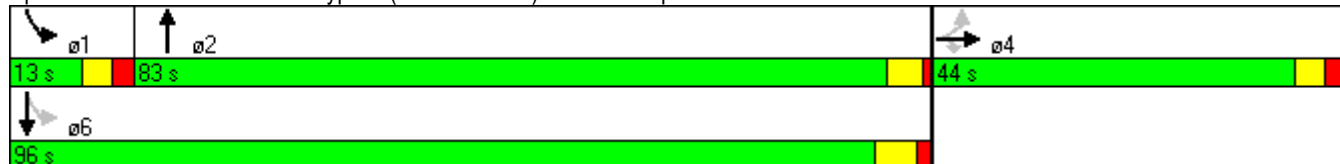


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		62.1						17.2				15.5
Approach LOS		E						B				B
Queue Length 50th (ft)	153	212	211					282		16		615
Queue Length 95th (ft)	205	278	277					377		m24		#1264
Internal Link Dist (ft)		767			62			76				516
Turn Bay Length (ft)	250		250							150		
Base Capacity (vph)	465	396	396					2131		340		2513
Starvation Cap Reductn	0	0	0					0		0		109
Spillback Cap Reductn	0	0	0					0		0		0
Storage Cap Reductn	0	0	0					0		0		0
Reduced v/c Ratio	0.41	0.60	0.59					0.51		0.34		0.96

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.91  
 Intersection Signal Delay: 23.4  
 Intersection LOS: C  
 Intersection Capacity Utilization 83.5%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: NC 54 Bypass (Fordham Blvd) EB Off Ramp & US 15-501



Lanes, Volumes, Timings  
 10: SR 1994 (Culbreth Road) & US 15-501

2/28/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	130	96	77	12	75	320	85	1532	31	521	1763	235
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			-8%			-2%			2%	
Storage Length (ft)	0		75	0		350	125		75	550		250
Storage Lanes	1		1	0		2	1		1	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.88	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor			0.99		1.00		1.00					
Fr <sub>t</sub>			0.850			0.850			0.850			0.850
Fl <sub>t</sub> Protected	0.950				0.993		0.950			0.950		
Satd. Flow (prot)	1726	1817	1544	0	1905	2870	1753	3506	1568	1752	3504	1567
Fl <sub>t</sub> Permitted	0.600				0.728		0.113			0.064		
Satd. Flow (perm)	1090	1817	1523	0	1396	2870	208	3506	1568	118	3504	1567
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		526			543			533			635	
Travel Time (s)		10.2			10.6			8.1			9.6	
Confl. Peds. (#/hr)			1	1			1					1
Peak Hour Factor	0.87	0.87	0.87	0.89	0.89	0.89	0.93	0.93	0.93	0.92	0.92	0.92
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	2%	2%	2%
Adj. Flow (vph)	149	110	89	13	84	360	91	1647	33	566	1916	255
Shared Lane Traffic (%)												
Lane Group Flow (vph)	149	110	89	0	97	360	91	1647	33	566	1916	255
Turn Type	pm+pt		Perm	Perm		pt+ov	Perm		Perm	pm+pt		pt+ov
Protected Phases	7	4			8	8 1		2		1	6	6 7
Permitted Phases	4		4	8			2		2	6		
Detector Phase	7	4	4	8	8	8 1	2	2	2	1	6	6 7
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		12.0	12.0	12.0	7.0	12.0	
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0		19.0	19.0	19.0	13.0	26.0	
Total Split (s)	14.0	28.0	28.0	14.0	14.0	52.0	64.0	64.0	64.0	38.0	102.0	116.0
Total Split (%)	10.8%	21.5%	21.5%	10.8%	10.8%	40.0%	49.2%	49.2%	49.2%	29.2%	78.5%	89.2%
Maximum Green (s)	7.6	21.6	21.6	7.1	7.1		57.8	57.8	57.8	32.9	95.8	
Yellow Time (s)	3.0	4.2	4.2	4.5	4.5		4.7	4.7	4.7	3.0	4.7	
All-Red Time (s)	3.4	2.2	2.2	2.4	2.4		1.5	1.5	1.5	2.1	1.5	
Lost Time Adjust (s)	-1.4	-1.4	-1.4	-1.9	-1.9	-1.9	-1.2	-1.2	-1.2	-0.1	-1.2	-1.4
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.8
Lead/Lag	Lag			Lead	Lead		Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None		C-Max	C-Max	C-Max	None	C-Max	
Walk Time (s)												7.0
Flash Dont Walk (s)												12.0
Pedestrian Calls (#/hr)												0
Act Effct Green (s)	23.0	23.0	23.0		9.0	42.0	59.0	59.0	59.0	97.0	97.0	111.2
Actuated g/C Ratio	0.18	0.18	0.18		0.07	0.32	0.45	0.45	0.45	0.75	0.75	0.86
v/c Ratio	0.63	0.34	0.33		1.00	0.39	0.97	1.04	0.05	1.12	0.73	0.19

Lanes, Volumes, Timings  
 10: SR 1994 (Culbreth Road) & US 15-501

2/28/2014

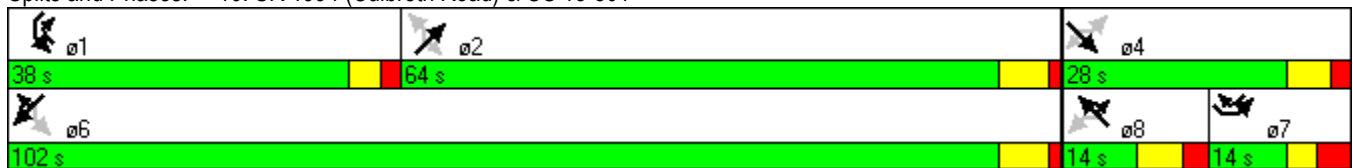


Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Control Delay	63.9	50.4	50.8		151.4	26.0	106.0	55.0	18.5	115.5	11.4	2.0
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.9	50.4	50.8		151.4	26.0	106.0	55.0	18.5	115.5	11.4	2.0
LOS	E	D	D		F	C	F	E	B	F	B	A
Approach Delay		56.3			52.6			57.0			32.0	
Approach LOS		E			D			E			C	
Queue Length 50th (ft)	114	82	66		~84	102	49	~788	8	~500	418	27
Queue Length 95th (ft)	179	136	116		#199	138	m#181	#906	m25	#729	497	41
Internal Link Dist (ft)		446			463			453			555	
Turn Bay Length (ft)			75			350	125		75	550		250
Base Capacity (vph)	237	321	269		97	928	94	1591	712	504	2616	1329
Starvation Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.34	0.33		1.00	0.39	0.97	1.04	0.05	1.12	0.73	0.19

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 97 (75%), Referenced to phase 2:NETL and 6:SWTL, Start of Green  
 Natural Cycle: 140  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.12  
 Intersection Signal Delay: 43.7  
 Intersection LOS: D  
 Intersection Capacity Utilization 97.6%  
 ICU Level of Service F  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: SR 1994 (Culbreth Road) & US 15-501



**Appendix F – Highway Capacity Software Analysis**  
**Output**

## 2022 Without Site

TWO-WAY STOP CONTROL SUMMARY								
<b>General Information</b>				<b>Site Information</b>				
Analyst	CRS			Intersection	US 15-501 & SV Park&Ride			
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC			
Date Performed	1/29/14			Analysis Year	2022			
Analysis Time Period	2022 Without Site AM Peak							
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>								
East/West Street: <i>Southern Village P&amp;R Entrance</i>				North/South Street: <i>US 15-501</i>				
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>0.25</i>				
<b>Vehicle Volumes and Adjustments</b>								
<b>Major Street</b>	Northbound			Southbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume (veh/h)					472	82		
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	0.89	0.89		
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	530	92		
Percent Heavy Vehicles	0	--	--	0	--	--		
Median Type	Undivided							
RT Channelized			0			0		
Lanes	0	0	0	0	2	1		
Configuration					T	R		
Upstream Signal		0			0			
<b>Minor Street</b>	Eastbound			Westbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume (veh/h)			17					
Peak-Hour Factor, PHF	1.00	1.00	0.75	1.00	1.00	1.00		
Hourly Flow Rate, HFR (veh/h)	0	0	22	0	0	0		
Percent Heavy Vehicles	0	0	7	0	0	0		
Percent Grade (%)	1			0				
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0			0		
Lanes	0	0	1	0	0	0		
Configuration			R					
<b>Delay, Queue Length, and Level of Service</b>								
Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration								R
v (veh/h)								22
C (m) (veh/h)								756
v/c								0.03
95% queue length								0.09
Control Delay (s/veh)								9.9
LOS								A
Approach Delay (s/veh)	--	--				9.9		
Approach LOS	--	--				A		

TWO-WAY STOP CONTROL SUMMARY							
<b>General Information</b>				<b>Site Information</b>			
Analyst	CRS			Intersection	US 15-501 & SV Park&Ride		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	1/29/14			Analysis Year	2022		
Analysis Time Period	2022 Without Site Noon Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>							
East/West Street: <i>Southern Village P&amp;R Entrance</i>				North/South Street: <i>US 15-501</i>			
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>0.25</i>			
<b>Vehicle Volumes and Adjustments</b>							
<b>Major Street</b>	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)					712	9	
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	0.95	0.95	
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	749	9	
Percent Heavy Vehicles	0	--	--	0	--	--	
Median Type	Undivided						
RT Channelized			0				0
Lanes	0	0	0	0	2	1	
Configuration					T	R	
Upstream Signal		0			0		
<b>Minor Street</b>	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)			19				
Peak-Hour Factor, PHF	1.00	1.00	0.71	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	0	0	26	0	0	0	
Percent Heavy Vehicles	0	0	2	0	0	0	
Percent Grade (%)		1			0		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0				0
Lanes	0	0	1	0	0	0	
Configuration			R				
<b>Delay, Queue Length, and Level of Service</b>							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration							R
v (veh/h)							26
C (m) (veh/h)							665
v/c							0.04
95% queue length							0.12
Control Delay (s/veh)							10.6
LOS							B
Approach Delay (s/veh)	--	--				10.6	
Approach LOS	--	--				B	



TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	CRS			Intersection	US 15-501 & SV Park&Ride		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	1/29/14			Analysis Year	2022		
Analysis Time Period	2022 Without Site PM Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>							
East/West Street: <i>Southern Village P&amp;R Entrance</i>				North/South Street: <i>US 15-501</i>			
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments							
Major Street	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)					1190	72	
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	0.91	0.91	
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	1307	79	
Percent Heavy Vehicles	0	--	--	0	--	--	
Median Type	Undivided						
RT Channelized			0			0	
Lanes	0	0	0	0	2	1	
Configuration					T	R	
Upstream Signal		0			0		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)			124				
Peak-Hour Factor, PHF	1.00	1.00	0.72	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	0	0	172	0	0	0	
Percent Heavy Vehicles	0	0	2	0	0	0	
Percent Grade (%)		1			0		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0			0	
Lanes	0	0	1	0	0	0	
Configuration			R				
Delay, Queue Length, and Level of Service							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration							R
v (veh/h)							172
C (m) (veh/h)							458
v/c							0.38
95% queue length							1.72
Control Delay (s/veh)							17.5
LOS							C
Approach Delay (s/veh)	--	--					17.5
Approach LOS	--	--					C

TWO-WAY STOP CONTROL SUMMARY							
<b>General Information</b>				<b>Site Information</b>			
Analyst	CRS			Intersection	Bennett & Mt. Carmel Church		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	1/29/14			Analysis Year	2022		
Analysis Time Period	2022 Without Site AM Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>							
East/West Street: <i>Bennett Road</i>				North/South Street: <i>Mt. Carmel Church Road</i>			
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>0.25</i>			
<b>Vehicle Volumes and Adjustments</b>							
<b>Major Street</b>	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)	105	596	2	29	280	8	
Peak-Hour Factor, PHF	0.88	0.88	0.88	0.78	0.78	0.78	
Hourly Flow Rate, HFR (veh/h)	119	677	2	37	358	10	
Percent Heavy Vehicles	2	--	--	6	--	--	
Median Type	Undivided						
RT Channelized			0				0
Lanes	0	1	0	0	1	0	
Configuration	LTR			LTR			
Upstream Signal		0			0		
<b>Minor Street</b>	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)	2	2	89	0	12	83	
Peak-Hour Factor, PHF	0.75	0.75	0.75	0.79	0.79	0.79	
Hourly Flow Rate, HFR (veh/h)	2	2	118	0	15	105	
Percent Heavy Vehicles	2	2	2	4	4	4	
Percent Grade (%)	2			5			
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0			0	
Lanes	0	1	0	0	1	0	
Configuration		LTR			LTR		
<b>Delay, Queue Length, and Level of Service</b>							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration	LTR	LTR		LTR			LTR
v (veh/h)	119	37		120			122
C (m) (veh/h)	1191	895		270			521
v/c	0.10	0.04		0.44			0.23
95% queue length	0.33	0.13		2.15			0.90
Control Delay (s/veh)	8.4	9.2		28.6			14.0
LOS	A	A		D			B
Approach Delay (s/veh)	--	--		28.6			14.0
Approach LOS	--	--		D			B

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	CRS			Intersection	Bennett & Mt. Carmel Church		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	1/29/14			Analysis Year	2022		
Analysis Time Period	2022 Without Site Noon Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>							
East/West Street: <i>Bennett Road</i>				North/South Street: <i>Mt. Carmel Church Road</i>			
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments							
Major Street	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)	36	299	0	30	258	1	
Peak-Hour Factor, PHF	0.91	0.91	0.91	0.92	0.92	0.92	
Hourly Flow Rate, HFR (veh/h)	39	328	0	32	280	1	
Percent Heavy Vehicles	3	--	--	3	--	--	
Median Type	Undivided						
RT Channelized			0				0
Lanes	0	1	0	0	1	0	
Configuration	LTR			LTR			
Upstream Signal		0			0		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)	4	2	33	0	5	45	
Peak-Hour Factor, PHF	0.77	0.77	0.77	0.70	0.70	0.70	
Hourly Flow Rate, HFR (veh/h)	5	2	42	0	7	64	
Percent Heavy Vehicles	6	6	6	4	4	4	
Percent Grade (%)	2			5			
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0			0	
Lanes	0	1	0	0	1	0	
Configuration		LTR			LTR		
Delay, Queue Length, and Level of Service							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration	LTR	LTR		LTR			LTR
v (veh/h)	39	32		71			49
C (m) (veh/h)	1276	1226		582			576
v/c	0.03	0.03		0.12			0.09
95% queue length	0.09	0.08		0.41			0.28
Control Delay (s/veh)	7.9	8.0		12.0			11.8
LOS	A	A		B			B
Approach Delay (s/veh)	--	--		12.0			11.8
Approach LOS	--	--		B			B

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	CRS			Intersection	Bennett & Mt. Carmel Church		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	1/29/14			Analysis Year	2022		
Analysis Time Period	2022 Without Site PM Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>							
East/West Street: <i>Bennett Road</i>				North/South Street: <i>Mt. Carmel Church Road</i>			
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments							
Major Street	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)	54	362	3	64	535	9	
Peak-Hour Factor, PHF	0.92	0.92	0.92	0.89	0.89	0.89	
Hourly Flow Rate, HFR (veh/h)	58	393	3	71	601	10	
Percent Heavy Vehicles	3	--	--	2	--	--	
Median Type	Undivided						
RT Channelized			0				0
Lanes	0	1	0	0	1		0
Configuration	LTR			LTR			
Upstream Signal		0			0		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)	10	17	104	0	14	42	
Peak-Hour Factor, PHF	0.80	0.80	0.80	0.78	0.78	0.78	
Hourly Flow Rate, HFR (veh/h)	12	21	129	0	17	53	
Percent Heavy Vehicles	2	2	2	8	8	8	
Percent Grade (%)	2			5			
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0				0
Lanes	0	1	0	0	1		0
Configuration		LTR			LTR		
Delay, Queue Length, and Level of Service							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration	LTR	LTR		LTR			LTR
v (veh/h)	58	71		70			162
C (m) (veh/h)	963	1163		267			278
v/c	0.06	0.06		0.26			0.58
95% queue length	0.19	0.19		1.02			3.39
Control Delay (s/veh)	9.0	8.3		23.2			34.6
LOS	A	A		C			D
Approach Delay (s/veh)	--	--		23.2			34.6
Approach LOS	--	--		C			D

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	CRS			Intersection	Merritt Mill & NC 54 WB Ramp		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	1/29/14			Analysis Year	2022		
Analysis Time Period	2022 Without Site AM Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>							
East/West Street: <i>Merritt Mill Road</i>				North/South Street: <i>NC 54 Bypass WB Off Ramp</i>			
Intersection Orientation: <i>East-West</i>				Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments							
Major Street	Eastbound			Westbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		543			169		
Peak-Hour Factor, PHF	1.00	0.88	1.00	1.00	0.94	1.00	
Hourly Flow Rate, HFR (veh/h)	0	617	0	0	179	0	
Percent Heavy Vehicles	0	--	--	0	--	--	
Median Type	Undivided						
RT Channelized			0				0
Lanes	0	1	0	0	1		0
Configuration		T			T		
Upstream Signal		0			0		
Minor Street	Northbound			Southbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)	148	148	151				
Peak-Hour Factor, PHF	0.93	0.93	0.93	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	159	159	162	0	0	0	
Percent Heavy Vehicles	2	2	2	0	0	0	
Percent Grade (%)		-2			0		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0				0
Lanes	1	1	0	0	0		0
Configuration	L		TR				
Delay, Queue Length, and Level of Service							
Approach	Eastbound	Westbound	Northbound			Southbound	
Movement	1	4	7	8	9	10	11
Lane Configuration			L		TR		
v (veh/h)			159		321		
C (m) (veh/h)			389		414		
v/c			0.41		0.78		
95% queue length			1.94		6.60		
Control Delay (s/veh)			20.5		37.9		
LOS			C		E		
Approach Delay (s/veh)	--	--	32.1				
Approach LOS	--	--	D				

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	CRS			Intersection	Merritt Mill & NC 54 WB Ramp		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	1/29/14			Analysis Year	2022		
Analysis Time Period	2022 Without Site Noon Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>							
East/West Street: <i>Merritt Mill Road</i>				North/South Street: <i>NC 54 Bypass WB Off Ramp</i>			
Intersection Orientation: <i>East-West</i>				Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments							
Major Street	Eastbound			Westbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		221			231		
Peak-Hour Factor, PHF	1.00	0.87	1.00	1.00	0.75	1.00	
Hourly Flow Rate, HFR (veh/h)	0	254	0	0	308	0	
Percent Heavy Vehicles	0	--	--	0	--	--	
Median Type	Undivided						
RT Channelized			0				0
Lanes	0	1	0	0	1		0
Configuration		T			T		
Upstream Signal		0			0		
Minor Street	Northbound			Southbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)	109	109	93				
Peak-Hour Factor, PHF	0.89	0.89	0.89	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	122	122	104	0	0	0	
Percent Heavy Vehicles	8	8	8	0	0	0	
Percent Grade (%)		-2			0		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0				0
Lanes	1	1	0	0	0		0
Configuration	L		TR				
Delay, Queue Length, and Level of Service							
Approach	Eastbound	Westbound	Northbound			Southbound	
Movement	1	4	7	8	9	10	11
Lane Configuration			L		TR		
v (veh/h)			122		226		
C (m) (veh/h)			509		563		
v/c			0.24		0.40		
95% queue length			0.93		1.92		
Control Delay (s/veh)			14.3		15.6		
LOS			B		C		
Approach Delay (s/veh)	--	--	15.2				
Approach LOS	--	--	C				

TWO-WAY STOP CONTROL SUMMARY								
General Information				Site Information				
Analyst	CRS			Intersection	Merritt Mill & NC 54 WB Ramp			
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC			
Date Performed	1/29/14			Analysis Year	2022			
Analysis Time Period	2022 Without Site PM Peak							
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>								
East/West Street: <i>Merritt Mill Road</i>				North/South Street: <i>NC 54 Bypass WB Off Ramp</i>				
Intersection Orientation: <i>East-West</i>				Study Period (hrs): <i>0.25</i>				
Vehicle Volumes and Adjustments								
Major Street	Eastbound			Westbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume (veh/h)		259			705			
Peak-Hour Factor, PHF	1.00	0.88	1.00	1.00	0.87	1.00		
Hourly Flow Rate, HFR (veh/h)	0	294	0	0	810	0		
Percent Heavy Vehicles	0	--	--	0	--	--		
Median Type	Undivided							
RT Channelized			0				0	
Lanes	0	1	0	0	1		0	
Configuration		T			T			
Upstream Signal		0			0			
Minor Street	Northbound			Southbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume (veh/h)	204	204	118					
Peak-Hour Factor, PHF	0.94	0.94	0.94	1.00	1.00	1.00		
Hourly Flow Rate, HFR (veh/h)	217	217	125	0	0	0		
Percent Heavy Vehicles	2	2	2	0	0	0		
Percent Grade (%)		-2			0			
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0				0	
Lanes	1	1	0	0	0		0	
Configuration	L		TR					
Delay, Queue Length, and Level of Service								
Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration			L		TR			
v (veh/h)			217		342			
C (m) (veh/h)			264		319			
v/c			0.82		1.07			
95% queue length			6.55		12.85			
Control Delay (s/veh)			60.1		108.1			
LOS			F		F			
Approach Delay (s/veh)	--	--	89.4					
Approach LOS	--	--	F					

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	CRS			Intersection	Raleigh NB On Ramp & 15-501NB		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	1/29/14			Analysis Year	2022		
Analysis Time Period	2022 Without Site AM Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>							
East/West Street: <i>Raleigh Road NB On-Ramp</i>				North/South Street: <i>US 15-501 Mainline NB</i>			
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments							
Major Street	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		1401	28				
Peak-Hour Factor, PHF	1.00	0.90	0.90	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	0	1556	31	0	0	0	
Percent Heavy Vehicles	0	--	--	0	--	--	
Median Type	Raised curb						
RT Channelized			0				0
Lanes	0	2	1	0	0		0
Configuration		T	R				
Upstream Signal		0			0		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)						281	
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	0.84	
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	334	
Percent Heavy Vehicles	0	0	0	0	0	4	
Percent Grade (%)		0			-2		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0				0
Lanes	0	0	0	0	0		1
Configuration							R
Delay, Queue Length, and Level of Service							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration					R		
v (veh/h)					334		
C (m) (veh/h)					411		
v/c					0.81		
95% queue length					7.37		
Control Delay (s/veh)					42.2		
LOS					E		
Approach Delay (s/veh)	--	--	42.2				
Approach LOS	--	--	E				



TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	CRS			Intersection	Raleigh NB On Ramp & 15-501NB		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	1/29/14			Analysis Year	2022		
Analysis Time Period	2022 Without Site Noon Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>							
East/West Street: <i>Raleigh Road NB On-Ramp</i>				North/South Street: <i>US 15-501 Mainline NB</i>			
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments							
Major Street	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		1163	25				
Peak-Hour Factor, PHF	1.00	0.90	0.90	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	0	1292	27	0	0	0	
Percent Heavy Vehicles	0	--	--	0	--	--	
Median Type	Raised curb						
RT Channelized			0				0
Lanes	0	2	1	0	0		0
Configuration		T	R				
Upstream Signal		0			0		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)							386
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00		0.94
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0		410
Percent Heavy Vehicles	0	0	0	0	0		4
Percent Grade (%)		0			-2		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0				0
Lanes	0	0	0	0	0		1
Configuration							R
Delay, Queue Length, and Level of Service							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration					R		
v (veh/h)					410		
C (m) (veh/h)					485		
v/c					0.85		
95% queue length					8.57		
Control Delay (s/veh)					41.1		
LOS					E		
Approach Delay (s/veh)	--	--	41.1				
Approach LOS	--	--	E				

TWO-WAY STOP CONTROL SUMMARY							
<b>General Information</b>				<b>Site Information</b>			
Analyst	CRS			Intersection	Raleigh NB On Ramp & 15-501NB		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	1/29/14			Analysis Year	2022		
Analysis Time Period	2022 Without Site PM Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>							
East/West Street: <i>Raleigh Road NB On-Ramp</i>				North/South Street: <i>US 15-501 Mainline NB</i>			
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>0.25</i>			
<b>Vehicle Volumes and Adjustments</b>							
<b>Major Street</b>	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		1653	21				
Peak-Hour Factor, PHF	1.00	0.90	0.90	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	0	1836	23	0	0	0	
Percent Heavy Vehicles	0	--	--	0	--	--	
Median Type	Raised curb						
RT Channelized			0				0
Lanes	0	2	1	0	0		0
Configuration		T	R				
Upstream Signal		0			0		
<b>Minor Street</b>	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)							429
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00		0.93
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0		461
Percent Heavy Vehicles	0	0	0	0	0		2
Percent Grade (%)		0			-2		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0				0
Lanes	0	0	0	0	0		1
Configuration							R
<b>Delay, Queue Length, and Level of Service</b>							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration					R		
v (veh/h)					461		
C (m) (veh/h)					346		
v/c					1.33		
95% queue length					22.17		
Control Delay (s/veh)					199.0		
LOS					F		
Approach Delay (s/veh)	--	--	199.0				
Approach LOS	--	--	F				

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	CRS			Intersection	Raleigh Rd On Ramps & 15-501		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	1/29/14			Analysis Year	2022		
Analysis Time Period	2022 Without Site AM Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>							
East/West Street: <i>Raleigh Road On-Ramps</i>				North/South Street: <i>US 15-501 Mainline</i>			
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments							
Major Street	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		1369			2030	296	
Peak-Hour Factor, PHF	1.00	0.92	1.00	1.00	0.90	0.90	
Hourly Flow Rate, HFR (veh/h)	0	1488	0	0	2255	328	
Percent Heavy Vehicles	0	--	--	0	--	--	
Median Type	Raised curb						
RT Channelized			0			0	
Lanes	0	2	0	0	2	1	
Configuration		T			T	R	
Upstream Signal		0			0		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)			12			60	
Peak-Hour Factor, PHF	1.00	1.00	0.83	1.00	1.00	0.80	
Hourly Flow Rate, HFR (veh/h)	0	0	14	0	0	74	
Percent Heavy Vehicles	0	0	6	0	0	5	
Percent Grade (%)		2			3		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0			0	
Lanes	0	0	1	0	0	1	
Configuration			R			R	
Delay, Queue Length, and Level of Service							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration					R		R
v (veh/h)					74		14
C (m) (veh/h)					381		225
v/c					0.19		0.06
95% queue length					0.71		0.20
Control Delay (s/veh)					16.7		22.1
LOS					C		C
Approach Delay (s/veh)	--	--	16.7			22.1	
Approach LOS	--	--	C			C	

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	CRS			Intersection	Raleigh Rd On Ramps & 15-501		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	1/29/14			Analysis Year	2022		
Analysis Time Period	2022 Without Site Noon Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>							
East/West Street: <i>Raleigh Road On-Ramps</i>				North/South Street: <i>US 15-501 Mainline</i>			
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments							
Major Street	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		1088			1696	287	
Peak-Hour Factor, PHF	1.00	0.90	1.00	1.00	0.90	0.90	
Hourly Flow Rate, HFR (veh/h)	0	1208	0	0	1884	318	
Percent Heavy Vehicles	0	--	--	0	--	--	
Median Type	Raised curb						
RT Channelized			0				0
Lanes	0	2	0	0	2	1	
Configuration		T			T	R	
Upstream Signal		0			0		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)			31			101	
Peak-Hour Factor, PHF	1.00	1.00	0.90	1.00	1.00	0.92	
Hourly Flow Rate, HFR (veh/h)	0	0	34	0	0	109	
Percent Heavy Vehicles	0	0	3	0	0	4	
Percent Grade (%)		2			3		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0			0	
Lanes	0	0	1	0	0	1	
Configuration			R			R	
Delay, Queue Length, and Level of Service							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration					R		R
v (veh/h)					109		34
C (m) (veh/h)					467		299
v/c					0.23		0.11
95% queue length					0.90		0.38
Control Delay (s/veh)					15.0		18.6
LOS					C		C
Approach Delay (s/veh)	--	--	15.0			18.6	
Approach LOS	--	--	C			C	

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	CRS			Intersection	Raleigh Rd On Ramps & 15-501		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	1/29/14			Analysis Year	2022		
Analysis Time Period	2022 Without Site Noon Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>							
East/West Street: <i>Raleigh Road On-Ramps</i>				North/South Street: <i>US 15-501 Mainline</i>			
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments							
Major Street	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		1442			2350	257	
Peak-Hour Factor, PHF	1.00	0.90	1.00	1.00	0.90	0.90	
Hourly Flow Rate, HFR (veh/h)	0	1602	0	0	2611	285	
Percent Heavy Vehicles	0	--	--	0	--	--	
Median Type	Raised curb						
RT Channelized			0				0
Lanes	0	2	0	0	2	1	
Configuration		T			T	R	
Upstream Signal		0			0		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)			65			232	
Peak-Hour Factor, PHF	1.00	1.00	0.86	1.00	1.00	0.89	
Hourly Flow Rate, HFR (veh/h)	0	0	75	0	0	260	
Percent Heavy Vehicles	0	0	2	0	0	2	
Percent Grade (%)		2			3		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0			0	
Lanes	0	0	1	0	0	1	
Configuration			R			R	
Delay, Queue Length, and Level of Service							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration					R		R
v (veh/h)					260		75
C (m) (veh/h)					358		180
v/c					0.73		0.42
95% queue length					5.49		1.87
Control Delay (s/veh)					37.6		38.6
LOS					E		E
Approach Delay (s/veh)	--	--	37.6			38.6	
Approach LOS	--	--	E			E	

TWO-WAY STOP CONTROL SUMMARY								
<b>General Information</b>				<b>Site Information</b>				
Analyst	CRS			Intersection	Raleigh & 15-501 SB Ramps			
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC			
Date Performed	1/29/14			Analysis Year	2022			
Analysis Time Period	2022 Without Site AM Peak							
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>								
East/West Street: <i>Raleigh Road</i>				North/South Street: <i>US 15-501 SB Ramps</i>				
Intersection Orientation: <i>East-West</i>				Study Period (hrs): <i>0.25</i>				
<b>Vehicle Volumes and Adjustments</b>								
<b>Major Street</b>	Eastbound			Westbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume (veh/h)		691	12		1294	963		
Peak-Hour Factor, PHF	1.00	0.83	0.83	1.00	0.85	0.85		
Hourly Flow Rate, HFR (veh/h)	0	832	14	0	1522	1132		
Percent Heavy Vehicles	0	--	--	0	--	--		
Median Type	Raised curb							
RT Channelized			0			0		
Lanes	0	2	1	0	2	1		
Configuration		T	R		T	R		
Upstream Signal		0			0			
<b>Minor Street</b>	Northbound			Southbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume (veh/h)			296			181		
Peak-Hour Factor, PHF	1.00	1.00	0.74	1.00	1.00	0.96		
Hourly Flow Rate, HFR (veh/h)	0	0	399	0	0	188		
Percent Heavy Vehicles	0	0	2	0	0	2		
Percent Grade (%)	0			0				
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0			0		
Lanes	0	0	1	0	0	1		
Configuration			R			R		
<b>Delay, Queue Length, and Level of Service</b>								
Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration					R			R
v (veh/h)					399			188
C (m) (veh/h)					635			403
v/c					0.63			0.47
95% queue length					4.41			2.41
Control Delay (s/veh)					19.8			21.5
LOS					C			C
Approach Delay (s/veh)	--	--	19.8			21.5		
Approach LOS	--	--	C			C		

TWO-WAY STOP CONTROL SUMMARY								
<b>General Information</b>				<b>Site Information</b>				
Analyst	CRS			Intersection	Raleigh & 15-501 SB Ramps			
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC			
Date Performed	1/29/14			Analysis Year	2022			
Analysis Time Period	2022 Without Site Noon Peak							
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>								
East/West Street: <i>Raleigh Road</i>				North/South Street: <i>US 15-501 SB Ramps</i>				
Intersection Orientation: <i>East-West</i>				Study Period (hrs): <i>0.25</i>				
<b>Vehicle Volumes and Adjustments</b>								
<b>Major Street</b>	Eastbound			Westbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume (veh/h)		710	31		702	675		
Peak-Hour Factor, PHF	1.00	0.90	0.90	1.00	0.94	0.94		
Hourly Flow Rate, HFR (veh/h)	0	788	34	0	746	718		
Percent Heavy Vehicles	0	--	--	0	--	--		
Median Type	Raised curb							
RT Channelized			0				0	
Lanes	0	2	1	0	2	1		
Configuration		T	R		T	R		
Upstream Signal		0			0			
<b>Minor Street</b>	Northbound			Southbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume (veh/h)			287			153		
Peak-Hour Factor, PHF	1.00	1.00	0.81	1.00	1.00	0.74		
Hourly Flow Rate, HFR (veh/h)	0	0	354	0	0	206		
Percent Heavy Vehicles	0	0	4	0	0	4		
Percent Grade (%)		0			0			
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0			0		
Lanes	0	0	1	0	0	1		
Configuration			R			R		
<b>Delay, Queue Length, and Level of Service</b>								
Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration					R			R
v (veh/h)					354			206
C (m) (veh/h)					647			665
v/c					0.55			0.31
95% queue length					3.32			1.32
Control Delay (s/veh)					17.1			12.8
LOS					C			B
Approach Delay (s/veh)	--	--	17.1			12.8		
Approach LOS	--	--	C			B		

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	CRS			Intersection	Raleigh & 15-501 SB Ramps		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	1/29/14			Analysis Year	2022		
Analysis Time Period	2022 Without Site PM Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>							
East/West Street: <i>Raleigh Road</i>				North/South Street: <i>US 15-501 SB Ramps</i>			
Intersection Orientation: <i>East-West</i>				Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments							
Major Street	Eastbound			Westbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		1456	65		966	1012	
Peak-Hour Factor, PHF	1.00	0.86	0.86	1.00	0.92	0.92	
Hourly Flow Rate, HFR (veh/h)	0	1693	75	0	1049	1099	
Percent Heavy Vehicles	0	--	--	0	--	--	
Median Type	Raised curb						
RT Channelized			0			0	
Lanes	0	2	1	0	2	1	
Configuration		T	R		T	R	
Upstream Signal		0			0		
Minor Street	Northbound			Southbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)			257			92	
Peak-Hour Factor, PHF	1.00	1.00	0.84	1.00	1.00	0.88	
Hourly Flow Rate, HFR (veh/h)	0	0	305	0	0	104	
Percent Heavy Vehicles	0	0	2	0	0	2	
Percent Grade (%)	0			0			
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0			0	
Lanes	0	0	1	0	0	1	
Configuration			R			R	
Delay, Queue Length, and Level of Service							
Approach	Eastbound	Westbound	Northbound			Southbound	
Movement	1	4	7	8	9	10	11
Lane Configuration					R		R
v (veh/h)					305		104
C (m) (veh/h)					360		551
v/c					0.85		0.19
95% queue length					7.80		0.69
Control Delay (s/veh)					51.3		13.0
LOS					F		B
Approach Delay (s/veh)	--	--	51.3			13.0	
Approach LOS	--	--	F			B	



TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	CRS			Intersection	Raleigh & 15-501 NB Ramps		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	1/29/14			Analysis Year	2022		
Analysis Time Period	2022 Without Site AM Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>							
East/West Street: <i>Raleigh Road</i>				North/South Street: <i>US 15-501 NB Ramps</i>			
Intersection Orientation: <i>East-West</i>				Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments							
Major Street	Eastbound			Westbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)					1469	281	
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	0.84	0.84	
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	1748	334	
Percent Heavy Vehicles	0	--	--	0	--	--	
Median Type	Raised curb						
RT Channelized			0			0	
Lanes	0	0	0	0	2	0	
Configuration					T	TR	
Upstream Signal		0			0		
Minor Street	Northbound			Southbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)						28	
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	0.57	
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	49	
Percent Heavy Vehicles	0	0	2	0	0	8	
Percent Grade (%)	0			-2			
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0			0	
Lanes	0	0	0	0	0	1	
Configuration						R	
Delay, Queue Length, and Level of Service							
Approach	Eastbound	Westbound	Northbound			Southbound	
Movement	1	4	7	8	9	10	11
Lane Configuration							R
v (veh/h)							49
C (m) (veh/h)							288
v/c							0.17
95% queue length							0.60
Control Delay (s/veh)							20.0
LOS							C
Approach Delay (s/veh)	--	--				20.0	
Approach LOS	--	--				C	

TWO-WAY STOP CONTROL SUMMARY								
<b>General Information</b>				<b>Site Information</b>				
Analyst	CRS			Intersection	Raleigh & 15-501 NB Ramps			
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC			
Date Performed	1/29/14			Analysis Year	2022			
Analysis Time Period	2022 Without Site Noon Peak							
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>								
East/West Street: <i>Raleigh Road</i>				North/South Street: <i>US 15-501 NB Ramps</i>				
Intersection Orientation: <i>East-West</i>				Study Period (hrs): <i>0.25</i>				
<b>Vehicle Volumes and Adjustments</b>								
<b>Major Street</b>	Eastbound			Westbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume (veh/h)					905	386		
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	0.94	0.94		
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	962	410		
Percent Heavy Vehicles	0	--	--	0	--	--		
Median Type	Raised curb							
RT Channelized			0				0	
Lanes	0	0	0	0	2	0		
Configuration					T	TR		
Upstream Signal		0			0			
<b>Minor Street</b>	Northbound			Southbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume (veh/h)						25		
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	0.86		
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	29		
Percent Heavy Vehicles	0	0	2	0	0	2		
Percent Grade (%)		0			-2			
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0				0	
Lanes	0	0	0	0	0	1		
Configuration						R		
<b>Delay, Queue Length, and Level of Service</b>								
Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration								R
v (veh/h)								29
C (m) (veh/h)								465
v/c								0.06
95% queue length								0.20
Control Delay (s/veh)								13.3
LOS								B
Approach Delay (s/veh)	--	--				13.3		
Approach LOS	--	--				B		

TWO-WAY STOP CONTROL SUMMARY								
General Information				Site Information				
Analyst	CRS			Intersection	Raleigh & 15-501 NB Ramps			
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC			
Date Performed	1/29/14			Analysis Year	2022			
Analysis Time Period	2022 Without Site PM Peak							
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>								
East/West Street: <i>Raleigh Road</i>				North/South Street: <i>US 15-501 NB Ramps</i>				
Intersection Orientation: <i>East-West</i>				Study Period (hrs): <i>0.25</i>				
Vehicle Volumes and Adjustments								
Major Street	Eastbound			Westbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume (veh/h)					1304	429		
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	0.93	0.93		
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	1402	461		
Percent Heavy Vehicles	0	--	--	0	--	--		
Median Type	Raised curb							
RT Channelized			0			0		
Lanes	0	0	0	0	2	0		
Configuration					T	TR		
Upstream Signal		0			0			
Minor Street	Northbound			Southbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume (veh/h)						21		
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	0.50		
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	42		
Percent Heavy Vehicles	0	0	2	0	0	6		
Percent Grade (%)	0			-2				
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0			0		
Lanes	0	0	0	0	0	1		
Configuration						R		
Delay, Queue Length, and Level of Service								
Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration								R
v (veh/h)								42
C (m) (veh/h)								334
v/c								0.13
95% queue length								0.43
Control Delay (s/veh)								17.3
LOS								C
Approach Delay (s/veh)	--	--				17.3		
Approach LOS	--	--				C		

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	CRS			Intersection	Dogwood Acres & Smith Level		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	1/29/14			Analysis Year	2022		
Analysis Time Period	2022 Without Site AM Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>							
East/West Street: <i>Dogwood Acres Drive</i>				North/South Street: <i>Smith Level Road</i>			
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments							
Major Street	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		414	8	13	303		
Peak-Hour Factor, PHF	1.00	0.87	0.87	0.97	0.97	1.00	
Hourly Flow Rate, HFR (veh/h)	0	475	9	13	312	0	
Percent Heavy Vehicles	0	--	--	2	--	--	
Median Type	Undivided						
RT Channelized			0				0
Lanes	0	1	0	0	1		0
Configuration			TR	LT			
Upstream Signal		0			0		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)				4		16	
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.71	1.00	0.71	
Hourly Flow Rate, HFR (veh/h)	0	0	0	5	0	22	
Percent Heavy Vehicles	0	0	2	2	0	2	
Percent Grade (%)		0			4		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0				0
Lanes	0	0	0	0	0	0	
Configuration					LR		
Delay, Queue Length, and Level of Service							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration		LT		LR			
v (veh/h)		13		27			
C (m) (veh/h)		1079		472			
v/c		0.01		0.06			
95% queue length		0.04		0.18			
Control Delay (s/veh)		8.4		13.1			
LOS		A		B			
Approach Delay (s/veh)	--	--	13.1				
Approach LOS	--	--	B				

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	CRS			Intersection	Dogwood Acres & Smith Level		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	1/29/14			Analysis Year	2022		
Analysis Time Period	2022 Without Site Noon Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>							
East/West Street: <i>Dogwood Acres Drive</i>				North/South Street: <i>Smith Level Road</i>			
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments							
Major Street	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		236	3	8	207		
Peak-Hour Factor, PHF	1.00	0.90	0.90	0.95	0.95	1.00	
Hourly Flow Rate, HFR (veh/h)	0	262	3	8	217	0	
Percent Heavy Vehicles	0	--	--	8	--	--	
Median Type	Undivided						
RT Channelized			0				0
Lanes	0	1	0	0	1		0
Configuration			TR	LT			
Upstream Signal		0			0		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)				2		8	
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.75	1.00	0.75	
Hourly Flow Rate, HFR (veh/h)	0	0	0	2	0	10	
Percent Heavy Vehicles	0	0	2	11	0	11	
Percent Grade (%)		0			4		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0				0
Lanes	0	0	0	0	0	0	
Configuration					LR		
Delay, Queue Length, and Level of Service							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration		LT		LR			
v (veh/h)		8		12			
C (m) (veh/h)		1265		666			
v/c		0.01		0.02			
95% queue length		0.02		0.06			
Control Delay (s/veh)		7.9		10.5			
LOS		A		B			
Approach Delay (s/veh)	--	--	10.5				
Approach LOS	--	--	B				

TWO-WAY STOP CONTROL SUMMARY							
<b>General Information</b>				<b>Site Information</b>			
Analyst	CRS			Intersection	Dogwood Acres & Smith Level		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	1/29/14			Analysis Year	2022		
Analysis Time Period	2022 Without Site PM Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>							
East/West Street: <i>Dogwood Acres Drive</i>				North/South Street: <i>Smith Level Road</i>			
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>0.25</i>			
<b>Vehicle Volumes and Adjustments</b>							
<b>Major Street</b>	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		330	10	29	535		
Peak-Hour Factor, PHF	1.00	0.89	0.89	0.93	0.93	1.00	
Hourly Flow Rate, HFR (veh/h)	0	370	11	31	575	0	
Percent Heavy Vehicles	0	--	--	2	--	--	
Median Type	Undivided						
RT Channelized			0				0
Lanes	0	1	0	0	1		0
Configuration			TR	LT			
Upstream Signal		0			0		
<b>Minor Street</b>	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)				9		21	
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.72	1.00	0.72	
Hourly Flow Rate, HFR (veh/h)	0	0	0	12	0	29	
Percent Heavy Vehicles	0	0	2	4	0	4	
Percent Grade (%)		0			4		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0				0
Lanes	0	0	0	0	0		0
Configuration					LR		
<b>Delay, Queue Length, and Level of Service</b>							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration		LT		LR			
v (veh/h)		31		41			
C (m) (veh/h)		1177		393			
v/c		0.03		0.10			
95% queue length		0.08		0.35			
Control Delay (s/veh)		8.1		15.2			
LOS		A		C			
Approach Delay (s/veh)	--	--	15.2				
Approach LOS	--	--	C				

TWO-WAY STOP CONTROL SUMMARY								
<b>General Information</b>				<b>Site Information</b>				
Analyst	CRS			Intersection	Mt. Carmel Church & Old Lystra			
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC			
Date Performed	1/29/14			Analysis Year	2022			
Analysis Time Period	2022 Without Site AM Peak							
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>								
East/West Street: <i>Mt. Carmel Church Road</i>				North/South Street: <i>Old Lystra Road</i>				
Intersection Orientation: <i>East-West</i>				Study Period (hrs): <i>0.25</i>				
<b>Vehicle Volumes and Adjustments</b>								
<b>Major Street</b>	Eastbound			Westbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume (veh/h)		326	41	19	638			
Peak-Hour Factor, PHF	1.00	0.74	0.74	0.87	0.87	1.00		
Hourly Flow Rate, HFR (veh/h)	0	440	55	21	733	0		
Percent Heavy Vehicles	0	--	--	2	--	--		
Median Type	Undivided							
RT Channelized			0				0	
Lanes	0	1	0	0	1		0	
Configuration			TR	LT				
Upstream Signal		0			0			
<b>Minor Street</b>	Northbound			Southbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume (veh/h)	66		39					
Peak-Hour Factor, PHF	0.85	1.00	0.85	1.00	1.00	1.00		
Hourly Flow Rate, HFR (veh/h)	77	0	45	0	0	0		
Percent Heavy Vehicles	2	2	2	0	0	0		
Percent Grade (%)		-2			0			
Flared Approach		Y			N			
Storage		1			0			
RT Channelized			0				0	
Lanes	0	0	0	0	0		0	
Configuration		LR						
<b>Delay, Queue Length, and Level of Service</b>								
Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT		LR				
v (veh/h)		21		122				
C (m) (veh/h)		1069		314				
v/c		0.02		0.39				
95% queue length		0.06		1.77				
Control Delay (s/veh)		8.4		23.6				
LOS		A		C				
Approach Delay (s/veh)	--	--	23.6					
Approach LOS	--	--	C					

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	CRS			Intersection	Mt. Carmel Church & Old Lystra		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	1/29/14			Analysis Year	2022		
Analysis Time Period	2022 Without Site Noon Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>							
East/West Street: <i>Mt. Carmel Church Road</i>				North/South Street: <i>Old Lystra Road</i>			
Intersection Orientation: <i>East-West</i>				Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments							
Major Street	Eastbound			Westbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		254	29	22	295		
Peak-Hour Factor, PHF	1.00	0.89	0.89	0.89	0.89	1.00	
Hourly Flow Rate, HFR (veh/h)	0	285	32	24	331	0	
Percent Heavy Vehicles	0	--	--	3	--	--	
Median Type	Undivided						
RT Channelized			0				0
Lanes	0	1	0	0	1	0	
Configuration			TR	LT			
Upstream Signal		0			0		
Minor Street	Northbound			Southbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)	38		16				
Peak-Hour Factor, PHF	0.82	1.00	0.82	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	46	0	19	0	0	0	
Percent Heavy Vehicles	4	2	4	0	0	0	
Percent Grade (%)		-2			0		
Flared Approach		Y			N		
Storage		1			0		
RT Channelized			0				0
Lanes	0	0	0	0	0	0	
Configuration		LR					
Delay, Queue Length, and Level of Service							
Approach	Eastbound	Westbound	Northbound			Southbound	
Movement	1	4	7	8	9	10	11
Lane Configuration		LT		LR			
v (veh/h)		24		65			
C (m) (veh/h)		1237		618			
v/c		0.02		0.11			
95% queue length		0.06		0.35			
Control Delay (s/veh)		8.0		13.0			
LOS		A		B			
Approach Delay (s/veh)	--	--	13.0				
Approach LOS	--	--	B				



TWO-WAY STOP CONTROL SUMMARY								
<b>General Information</b>				<b>Site Information</b>				
Analyst	CRS			Intersection	Mt. Carmel Church & Old Lystra			
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC			
Date Performed	1/29/14			Analysis Year	2022			
Analysis Time Period	2022 Without Site PM Peak							
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>								
East/West Street: <i>Mt. Carmel Church Road</i>				North/South Street: <i>Old Lystra Road</i>				
Intersection Orientation: <i>East-West</i>				Study Period (hrs): <i>0.25</i>				
<b>Vehicle Volumes and Adjustments</b>								
<b>Major Street</b>	Eastbound			Westbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume (veh/h)		595	30	44	398			
Peak-Hour Factor, PHF	1.00	0.91	0.91	0.88	0.88	1.00		
Hourly Flow Rate, HFR (veh/h)	0	653	32	50	452	0		
Percent Heavy Vehicles	0	--	--	4	--	--		
Median Type	Undivided							
RT Channelized			0				0	
Lanes	0	1	0	0	1	0		
Configuration			TR	LT				
Upstream Signal		0			0			
<b>Minor Street</b>	Northbound			Southbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume (veh/h)	33		38					
Peak-Hour Factor, PHF	0.80	1.00	0.80	1.00	1.00	1.00		
Hourly Flow Rate, HFR (veh/h)	41	0	47	0	0	0		
Percent Heavy Vehicles	3	2	3	0	0	0		
Percent Grade (%)		-2			0			
Flared Approach		Y			N			
Storage		1			0			
RT Channelized			0				0	
Lanes	0	0	0	0	0	0		
Configuration		LR						
<b>Delay, Queue Length, and Level of Service</b>								
Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT		LR				
v (veh/h)		50		88				
C (m) (veh/h)		899		457				
v/c		0.06		0.19				
95% queue length		0.18		0.70				
Control Delay (s/veh)		9.2		19.2				
LOS		A		C				
Approach Delay (s/veh)	--	--	19.2					
Approach LOS	--	--	C					

## 2022 With Site

TWO-WAY STOP CONTROL SUMMARY							
<b>General Information</b>				<b>Site Information</b>			
Analyst	CRS			Intersection	Bennett & Mt. Carmel Church		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	1/29/14			Analysis Year	2022		
Analysis Time Period	2022 With Site AM Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>							
East/West Street: <i>Bennett Road</i>				North/South Street: <i>Mt. Carmel Church Road</i>			
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>0.25</i>			
<b>Vehicle Volumes and Adjustments</b>							
<b>Major Street</b>	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)	128	596	2	29	280	8	
Peak-Hour Factor, PHF	0.88	0.88	0.88	0.78	0.78	0.78	
Hourly Flow Rate, HFR (veh/h)	145	677	2	37	358	10	
Percent Heavy Vehicles	2	--	--	6	--	--	
Median Type	Undivided						
RT Channelized			0				0
Lanes	0	1	0	0	1	0	
Configuration	LTR			LTR			
Upstream Signal		0			0		
<b>Minor Street</b>	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)	2	6	102	0	18	83	
Peak-Hour Factor, PHF	0.75	0.75	0.75	0.79	0.79	0.79	
Hourly Flow Rate, HFR (veh/h)	2	8	136	0	22	105	
Percent Heavy Vehicles	2	2	2	4	4	4	
Percent Grade (%)	2			5			
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0			0	
Lanes	0	1	0	0	1	0	
Configuration		LTR			LTR		
<b>Delay, Queue Length, and Level of Service</b>							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration	LTR	LTR		LTR			LTR
v (veh/h)	145	37		127			146
C (m) (veh/h)	1191	895		222			429
v/c	0.12	0.04		0.57			0.34
95% queue length	0.41	0.13		3.17			1.49
Control Delay (s/veh)	8.4	9.2		40.9			17.7
LOS	A	A		E			C
Approach Delay (s/veh)	--	--		40.9			17.7
Approach LOS	--	--		E			C

TWO-WAY STOP CONTROL SUMMARY							
<b>General Information</b>				<b>Site Information</b>			
Analyst	CRS			Intersection	Bennett & Mt. Carmel Church		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	1/29/14			Analysis Year	2022		
Analysis Time Period	2022 With Site Noon Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>							
East/West Street: <i>Bennett Road</i>				North/South Street: <i>Mt. Carmel Church Road</i>			
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>0.25</i>			
<b>Vehicle Volumes and Adjustments</b>							
<b>Major Street</b>	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)	52	299	0	30	258	1	
Peak-Hour Factor, PHF	0.91	0.91	0.91	0.92	0.92	0.92	
Hourly Flow Rate, HFR (veh/h)	57	328	0	32	280	1	
Percent Heavy Vehicles	3	--	--	3	--	--	
Median Type	Undivided						
RT Channelized			0				0
Lanes	0	1	0	0	1	0	
Configuration	LTR			LTR			
Upstream Signal		0			0		
<b>Minor Street</b>	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)	4	6	47	0	9	45	
Peak-Hour Factor, PHF	0.77	0.77	0.77	0.70	0.70	0.70	
Hourly Flow Rate, HFR (veh/h)	5	7	61	0	12	64	
Percent Heavy Vehicles	6	6	6	4	4	4	
Percent Grade (%)	2			5			
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0			0	
Lanes	0	1	0	0	1	0	
Configuration		LTR			LTR		
<b>Delay, Queue Length, and Level of Service</b>							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration	LTR	LTR		LTR			LTR
v (veh/h)	57	32		76			73
C (m) (veh/h)	1276	1226		523			552
v/c	0.04	0.03		0.15			0.13
95% queue length	0.14	0.08		0.51			0.45
Control Delay (s/veh)	8.0	8.0		13.1			12.5
LOS	A	A		B			B
Approach Delay (s/veh)	--	--		13.1			12.5
Approach LOS	--	--		B			B

TWO-WAY STOP CONTROL SUMMARY							
<b>General Information</b>				<b>Site Information</b>			
Analyst	CRS			Intersection	Bennett & Mt. Carmel Church		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	1/29/14			Analysis Year	2022		
Analysis Time Period	2022 With Site PM Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>							
East/West Street: <i>Bennett Road</i>				North/South Street: <i>Mt. Carmel Church Road</i>			
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>0.25</i>			
<b>Vehicle Volumes and Adjustments</b>							
<b>Major Street</b>	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)	70	362	3	64	535	9	
Peak-Hour Factor, PHF	0.92	0.92	0.92	0.89	0.89	0.89	
Hourly Flow Rate, HFR (veh/h)	76	393	3	71	601	10	
Percent Heavy Vehicles	3	--	--	2	--	--	
Median Type	Undivided						
RT Channelized			0				0
Lanes	0	1	0	0	1		0
Configuration	LTR			LTR			
Upstream Signal		0			0		
<b>Minor Street</b>	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)	10	22	127	0	18	42	
Peak-Hour Factor, PHF	0.80	0.80	0.80	0.78	0.78	0.78	
Hourly Flow Rate, HFR (veh/h)	12	27	158	0	23	53	
Percent Heavy Vehicles	2	2	2	8	8	8	
Percent Grade (%)		2			5		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0				0
Lanes	0	1	0	0	1		0
Configuration		LTR			LTR		
<b>Delay, Queue Length, and Level of Service</b>							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration	LTR	LTR		LTR			LTR
v (veh/h)	76	71		76			197
C (m) (veh/h)	963	1163		218			268
v/c	0.08	0.06		0.35			0.74
95% queue length	0.26	0.19		1.48			5.24
Control Delay (s/veh)	9.1	8.3		30.1			48.2
LOS	A	A		D			E
Approach Delay (s/veh)	--	--		30.1			48.2
Approach LOS	--	--		D			E

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	CRS			Intersection	Merritt Mill & NC 54 WB Ramp		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	1/29/14			Analysis Year	2022		
Analysis Time Period	2022 With Site AM Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>							
East/West Street: <i>Merritt Mill Road</i>				North/South Street: <i>NC 54 Bypass WB Off Ramp</i>			
Intersection Orientation: <i>East-West</i>				Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments							
Major Street	Eastbound			Westbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		543			175		
Peak-Hour Factor, PHF	1.00	0.88	1.00	1.00	0.94	1.00	
Hourly Flow Rate, HFR (veh/h)	0	617	0	0	186	0	
Percent Heavy Vehicles	0	--	--	0	--	--	
Median Type	Undivided						
RT Channelized			0				0
Lanes	0	1	0	0	1		0
Configuration		T			T		
Upstream Signal		0			0		
Minor Street	Northbound			Southbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)	151	151	154				
Peak-Hour Factor, PHF	0.93	0.93	0.93	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	162	162	165	0	0	0	
Percent Heavy Vehicles	2	2	2	0	0	0	
Percent Grade (%)		-2			0		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0				0
Lanes	1	1	0	0	0		0
Configuration	L		TR				
Delay, Queue Length, and Level of Service							
Approach	Eastbound	Westbound	Northbound			Southbound	
Movement	1	4	7	8	9	10	11
Lane Configuration			L		TR		
v (veh/h)			162		327		
C (m) (veh/h)			386		412		
v/c			0.42		0.79		
95% queue length			2.02		6.97		
Control Delay (s/veh)			20.9		40.0		
LOS			C		E		
Approach Delay (s/veh)	--	--	33.6				
Approach LOS	--	--	D				

TWO-WAY STOP CONTROL SUMMARY								
General Information				Site Information				
Analyst	CRS			Intersection	Merritt Mill & NC 54 WB Ramp			
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC			
Date Performed	1/29/14			Analysis Year	2022			
Analysis Time Period	2022 With Site Noon Peak							
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>								
East/West Street: <i>Merritt Mill Road</i>				North/South Street: <i>NC 54 Bypass WB Off Ramp</i>				
Intersection Orientation: <i>East-West</i>				Study Period (hrs): <i>0.25</i>				
Vehicle Volumes and Adjustments								
Major Street	Eastbound			Westbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume (veh/h)		221			235			
Peak-Hour Factor, PHF	1.00	0.87	1.00	1.00	0.75	1.00		
Hourly Flow Rate, HFR (veh/h)	0	254	0	0	313	0		
Percent Heavy Vehicles	0	--	--	0	--	--		
Median Type	Undivided							
RT Channelized			0				0	
Lanes	0	1	0	0	1		0	
Configuration		T			T			
Upstream Signal		0			0			
Minor Street	Northbound			Southbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume (veh/h)	113	112	97					
Peak-Hour Factor, PHF	0.89	0.89	0.89	1.00	1.00	1.00		
Hourly Flow Rate, HFR (veh/h)	126	125	108	0	0	0		
Percent Heavy Vehicles	8	8	8	0	0	0		
Percent Grade (%)		-2			0			
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0				0	
Lanes	1	1	0	0	0		0	
Configuration	L		TR					
Delay, Queue Length, and Level of Service								
Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration			L		TR			
v (veh/h)			126		233			
C (m) (veh/h)			506		562			
v/c			0.25		0.41			
95% queue length			0.97		2.02			
Control Delay (s/veh)			14.5		15.9			
LOS			B		C			
Approach Delay (s/veh)	--	--	15.4					
Approach LOS	--	--	C					

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	CRS			Intersection	Merritt Mill & NC 54 WB Ramp		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	1/29/14			Analysis Year	2022		
Analysis Time Period	2022 With Site PM Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>							
East/West Street: <i>Merritt Mill Road</i>				North/South Street: <i>NC 54 Bypass WB Off Ramp</i>			
Intersection Orientation: <i>East-West</i>				Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments							
Major Street	Eastbound			Westbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		259			709		
Peak-Hour Factor, PHF	1.00	0.88	1.00	1.00	0.87	1.00	
Hourly Flow Rate, HFR (veh/h)	0	294	0	0	814	0	
Percent Heavy Vehicles	0	--	--	0	--	--	
Median Type	Undivided						
RT Channelized			0				0
Lanes	0	1	0	0	1		0
Configuration		T			T		
Upstream Signal		0			0		
Minor Street	Northbound			Southbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)	210	210	124				
Peak-Hour Factor, PHF	0.94	0.94	0.94	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	223	223	131	0	0	0	
Percent Heavy Vehicles	2	2	2	0	0	0	
Percent Grade (%)		-2			0		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0				0
Lanes	1	1	0	0	0		0
Configuration	L		TR				
Delay, Queue Length, and Level of Service							
Approach	Eastbound	Westbound	Northbound			Southbound	
Movement	1	4	7	8	9	10	11
Lane Configuration			L		TR		
v (veh/h)			223		354		
C (m) (veh/h)			263		318		
v/c			0.85		1.11		
95% queue length			6.98		13.99		
Control Delay (s/veh)			64.4		121.3		
LOS			F		F		
Approach Delay (s/veh)	--	--	99.3				
Approach LOS	--	--	F				



TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	CRS			Intersection	Raleigh NB On Ramp & 15-501NB		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	1/29/14			Analysis Year	2022		
Analysis Time Period	2022 With Site AM Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>							
East/West Street: <i>Raleigh Road NB On-Ramp</i>				North/South Street: <i>US 15-501 Mainline NB</i>			
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments							
Major Street	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		1458	0				
Peak-Hour Factor, PHF	1.00	0.90	0.90	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	0	1620	0	0	0	0	
Percent Heavy Vehicles	0	--	--	0	--	--	
Median Type	Raised curb						
RT Channelized			0				0
Lanes	0	2	1	0	0		0
Configuration		T	R				
Upstream Signal		0			0		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)							281
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00		0.84
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0		334
Percent Heavy Vehicles	0	0	0	0	0		4
Percent Grade (%)		0			-2		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0				0
Lanes	0	0	0	0	0		1
Configuration							R
Delay, Queue Length, and Level of Service							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration					R		
v (veh/h)					334		
C (m) (veh/h)					394		
v/c					0.85		
95% queue length					8.05		
Control Delay (s/veh)					48.1		
LOS					E		
Approach Delay (s/veh)	--	--	48.1				
Approach LOS	--	--	E				

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	CRS			Intersection	Raleigh NB On Ramp & 15-501NB		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	1/29/14			Analysis Year	2022		
Analysis Time Period	2022 With Site Noon Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>							
East/West Street: <i>Raleigh Road NB On-Ramp</i>				North/South Street: <i>US 15-501 Mainline NB</i>			
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments							
Major Street	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		1222	32				
Peak-Hour Factor, PHF	1.00	0.90	0.90	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	0	1357	35	0	0	0	
Percent Heavy Vehicles	0	--	--	0	--	--	
Median Type	Raised curb						
RT Channelized			0				0
Lanes	0	2	1	0	0		0
Configuration		T	R				
Upstream Signal		0			0		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)							386
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	0.94	
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	410	
Percent Heavy Vehicles	0	0	0	0	0	4	
Percent Grade (%)		0			-2		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0				0
Lanes	0	0	0	0	0		1
Configuration							R
Delay, Queue Length, and Level of Service							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration					R		
v (veh/h)					410		
C (m) (veh/h)					466		
v/c					0.88		
95% queue length					9.38		
Control Delay (s/veh)					47.2		
LOS					E		
Approach Delay (s/veh)	--	--	47.2				
Approach LOS	--	--	E				

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	CRS			Intersection	Raleigh NB On Ramp & 15-501NB		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	1/29/14			Analysis Year	2022		
Analysis Time Period	2022 With Site PM Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>							
East/West Street: <i>Raleigh Road NB On-Ramp</i>				North/South Street: <i>US 15-501 Mainline NB</i>			
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments							
Major Street	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		1748	32				
Peak-Hour Factor, PHF	1.00	0.90	0.90	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	0	1942	35	0	0	0	
Percent Heavy Vehicles	0	--	--	0	--	--	
Median Type	Raised curb						
RT Channelized			0				0
Lanes	0	2	1	0	0		0
Configuration		T	R				
Upstream Signal		0			0		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)							429
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	0.93	
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	461	
Percent Heavy Vehicles	0	0	0	0	0	2	
Percent Grade (%)		0			-2		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0				0
Lanes	0	0	0	0	0		1
Configuration							R
Delay, Queue Length, and Level of Service							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration					R		
v (veh/h)					461		
C (m) (veh/h)					324		
v/c					1.42		
95% queue length					24.25		
Control Delay (s/veh)					238.4		
LOS					F		
Approach Delay (s/veh)	--	--	238.4				
Approach LOS	--	--	F				

TWO-WAY STOP CONTROL SUMMARY								
<b>General Information</b>				<b>Site Information</b>				
Analyst	CRS			Intersection	Raleigh Rd On Ramps & 15-501			
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC			
Date Performed	1/29/14			Analysis Year	2022			
Analysis Time Period	2022 With Site AM Peak							
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>								
East/West Street: <i>Raleigh Road On-Ramps</i>				North/South Street: <i>US 15-501 Mainline</i>				
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>0.25</i>				
<b>Vehicle Volumes and Adjustments</b>								
<b>Major Street</b>	Northbound			Southbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume (veh/h)		1432			2216	295		
Peak-Hour Factor, PHF	1.00	0.92	1.00	1.00	0.90	0.90		
Hourly Flow Rate, HFR (veh/h)	0	1556	0	0	2462	327		
Percent Heavy Vehicles	0	--	--	0	--	--		
Median Type	Raised curb							
RT Channelized			0			0		
Lanes	0	2	0	0	2	1		
Configuration		T			T	R		
Upstream Signal		0			0			
<b>Minor Street</b>	Eastbound			Westbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume (veh/h)			23			60		
Peak-Hour Factor, PHF	1.00	1.00	0.83	1.00	1.00	0.80		
Hourly Flow Rate, HFR (veh/h)	0	0	27	0	0	74		
Percent Heavy Vehicles	0	0	6	0	0	5		
Percent Grade (%)		2			3			
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0			0		
Lanes	0	0	1	0	0	1		
Configuration			R			R		
<b>Delay, Queue Length, and Level of Service</b>								
Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration					R			R
v (veh/h)					74			27
C (m) (veh/h)					363			194
v/c					0.20			0.14
95% queue length					0.75			0.47
Control Delay (s/veh)					17.4			26.5
LOS					C			D
Approach Delay (s/veh)	--	--	17.4			26.5		
Approach LOS	--	--	C			D		

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	CRS			Intersection	Raleigh Rd On Ramps & 15-501		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	1/29/14			Analysis Year	2022		
Analysis Time Period	2022 With Site Noon Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>							
East/West Street: <i>Raleigh Road On-Ramps</i>				North/South Street: <i>US 15-501 Mainline</i>			
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments							
Major Street	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		1154			1823	287	
Peak-Hour Factor, PHF	1.00	0.90	1.00	1.00	0.90	0.90	
Hourly Flow Rate, HFR (veh/h)	0	1282	0	0	2025	318	
Percent Heavy Vehicles	0	--	--	0	--	--	
Median Type	Raised curb						
RT Channelized			0			0	
Lanes	0	2	0	0	2	1	
Configuration		T			T	R	
Upstream Signal		0			0		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)			39			101	
Peak-Hour Factor, PHF	1.00	1.00	0.90	1.00	1.00	0.92	
Hourly Flow Rate, HFR (veh/h)	0	0	43	0	0	109	
Percent Heavy Vehicles	0	0	3	0	0	4	
Percent Grade (%)		2			3		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0			0	
Lanes	0	0	1	0	0	1	
Configuration			R			R	
Delay, Queue Length, and Level of Service							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration					R		R
v (veh/h)					109		43
C (m) (veh/h)					443		271
v/c					0.25		0.16
95% queue length					0.96		0.55
Control Delay (s/veh)					15.8		20.8
LOS					C		C
Approach Delay (s/veh)	--	--	15.8			20.8	
Approach LOS	--	--	C			C	

TWO-WAY STOP CONTROL SUMMARY							
<b>General Information</b>				<b>Site Information</b>			
Analyst	CRS			Intersection	Raleigh Rd On Ramps & 15-501		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	1/29/14			Analysis Year	2022		
Analysis Time Period	2022 With Site Noon Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>							
East/West Street: <i>Raleigh Road On-Ramps</i>				North/South Street: <i>US 15-501 Mainline</i>			
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>0.25</i>			
<b>Vehicle Volumes and Adjustments</b>							
<b>Major Street</b>	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		1549			2479	257	
Peak-Hour Factor, PHF	1.00	0.90	1.00	1.00	0.90	0.90	
Hourly Flow Rate, HFR (veh/h)	0	1721	0	0	2754	285	
Percent Heavy Vehicles	0	--	--	0	--	--	
Median Type	Raised curb						
RT Channelized			0				0
Lanes	0	2	0	0	2	1	
Configuration		T			T	R	
Upstream Signal		0			0		
<b>Minor Street</b>	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)			73			232	
Peak-Hour Factor, PHF	1.00	1.00	0.86	1.00	1.00	0.89	
Hourly Flow Rate, HFR (veh/h)	0	0	84	0	0	260	
Percent Heavy Vehicles	0	0	2	0	0	2	
Percent Grade (%)		2			3		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0			0	
Lanes	0	0	1	0	0	1	
Configuration			R			R	
<b>Delay, Queue Length, and Level of Service</b>							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration					R		R
v (veh/h)					260		84
C (m) (veh/h)					329		163
v/c					0.79		0.52
95% queue length					6.46		2.54
Control Delay (s/veh)					47.0		48.5
LOS					E		E
Approach Delay (s/veh)	--	--	47.0			48.5	
Approach LOS	--	--	E			E	

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	CRS			Intersection	Raleigh & 15-501 SB Ramps		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	1/29/14			Analysis Year	2022		
Analysis Time Period	2022 With Site AM Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>							
East/West Street: <i>Raleigh Road</i>				North/South Street: <i>US 15-501 SB Ramps</i>			
Intersection Orientation: <i>East-West</i>				Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments							
Major Street	Eastbound			Westbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		691	23		1301	1054	
Peak-Hour Factor, PHF	1.00	0.83	0.83	1.00	0.85	0.85	
Hourly Flow Rate, HFR (veh/h)	0	832	27	0	1530	1239	
Percent Heavy Vehicles	0	--	--	0	--	--	
Median Type	Raised curb						
RT Channelized			0			0	
Lanes	0	2	1	0	2	1	
Configuration		T	R		T	R	
Upstream Signal		0			0		
Minor Street	Northbound			Southbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)			295			181	
Peak-Hour Factor, PHF	1.00	1.00	0.74	1.00	1.00	0.96	
Hourly Flow Rate, HFR (veh/h)	0	0	398	0	0	188	
Percent Heavy Vehicles	0	0	2	0	0	2	
Percent Grade (%)	0			0			
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0			0	
Lanes	0	0	1	0	0	1	
Configuration			R			R	
Delay, Queue Length, and Level of Service							
Approach	Eastbound	Westbound	Northbound			Southbound	
Movement	1	4	7	8	9	10	11
Lane Configuration					R		R
v (veh/h)					398		188
C (m) (veh/h)					635		401
v/c					0.63		0.47
95% queue length					4.39		2.43
Control Delay (s/veh)					19.7		21.7
LOS					C		C
Approach Delay (s/veh)	--	--	19.7			21.7	
Approach LOS	--	--	C			C	

TWO-WAY STOP CONTROL SUMMARY								
General Information				Site Information				
Analyst	CRS			Intersection	Raleigh & 15-501 SB Ramps			
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC			
Date Performed	1/29/14			Analysis Year	2022			
Analysis Time Period	2022 With Site Noon Peak							
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>								
East/West Street: <i>Raleigh Road</i>				North/South Street: <i>US 15-501 SB Ramps</i>				
Intersection Orientation: <i>East-West</i>				Study Period (hrs): <i>0.25</i>				
Vehicle Volumes and Adjustments								
Major Street	Eastbound			Westbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume (veh/h)		710	39		709	737		
Peak-Hour Factor, PHF	1.00	0.90	0.90	1.00	0.94	0.94		
Hourly Flow Rate, HFR (veh/h)	0	788	43	0	754	784		
Percent Heavy Vehicles	0	--	--	0	--	--		
Median Type	Raised curb							
RT Channelized			0			0		
Lanes	0	2	1	0	2	1		
Configuration		T	R		T	R		
Upstream Signal		0			0			
Minor Street	Northbound			Southbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume (veh/h)			287			153		
Peak-Hour Factor, PHF	1.00	1.00	0.81	1.00	1.00	0.74		
Hourly Flow Rate, HFR (veh/h)	0	0	354	0	0	206		
Percent Heavy Vehicles	0	0	4	0	0	4		
Percent Grade (%)	0			0				
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0			0		
Lanes	0	0	1	0	0	1		
Configuration			R			R		
Delay, Queue Length, and Level of Service								
Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration					R			R
v (veh/h)					354			206
C (m) (veh/h)					647			662
v/c					0.55			0.31
95% queue length					3.32			1.32
Control Delay (s/veh)					17.1			12.9
LOS					C			B
Approach Delay (s/veh)	--	--	17.1			12.9		
Approach LOS	--	--	C			B		



TWO-WAY STOP CONTROL SUMMARY								
General Information				Site Information				
Analyst	CRS			Intersection	Raleigh & 15-501 SB Ramps			
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC			
Date Performed	1/29/14			Analysis Year	2022			
Analysis Time Period	2022 With Site PM Peak							
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>								
East/West Street: <i>Raleigh Road</i>				North/South Street: <i>US 15-501 SB Ramps</i>				
Intersection Orientation: <i>East-West</i>				Study Period (hrs): <i>0.25</i>				
Vehicle Volumes and Adjustments								
Major Street	Eastbound			Westbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume (veh/h)		1456	73		977	1074		
Peak-Hour Factor, PHF	1.00	0.86	0.86	1.00	0.92	0.92		
Hourly Flow Rate, HFR (veh/h)	0	1693	84	0	1061	1167		
Percent Heavy Vehicles	0	--	--	0	--	--		
Median Type	Raised curb							
RT Channelized			0			0		
Lanes	0	2	1	0	2	1		
Configuration		T	R		T	R		
Upstream Signal		0			0			
Minor Street	Northbound			Southbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume (veh/h)			257			92		
Peak-Hour Factor, PHF	1.00	1.00	0.84	1.00	1.00	0.88		
Hourly Flow Rate, HFR (veh/h)	0	0	305	0	0	104		
Percent Heavy Vehicles	0	0	2	0	0	2		
Percent Grade (%)	0			0				
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0			0		
Lanes	0	0	1	0	0	1		
Configuration			R			R		
Delay, Queue Length, and Level of Service								
Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration					R			R
v (veh/h)					305			104
C (m) (veh/h)					360			547
v/c					0.85			0.19
95% queue length					7.80			0.70
Control Delay (s/veh)					51.3			13.1
LOS					F			B
Approach Delay (s/veh)	--	--	51.3			13.1		
Approach LOS	--	--	F			B		

TWO-WAY STOP CONTROL SUMMARY								
General Information				Site Information				
Analyst	CRS			Intersection	Raleigh & 15-501 NB Ramps			
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC			
Date Performed	1/29/14			Analysis Year	2022			
Analysis Time Period	2022 With Site AM Peak							
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>								
East/West Street: <i>Raleigh Road</i>				North/South Street: <i>US 15-501 NB Ramps</i>				
Intersection Orientation: <i>East-West</i>				Study Period (hrs): <i>0.25</i>				
Vehicle Volumes and Adjustments								
Major Street	Eastbound			Westbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume (veh/h)					1530	281		
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	0.84	0.84		
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	1821	334		
Percent Heavy Vehicles	0	--	--	0	--	--		
Median Type	Raised curb							
RT Channelized			0			0		
Lanes	0	0	0	0	2	0		
Configuration					T	TR		
Upstream Signal		0			0			
Minor Street	Northbound			Southbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume (veh/h)						34		
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	0.57		
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	59		
Percent Heavy Vehicles	0	0	2	0	0	8		
Percent Grade (%)	0			-2				
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0			0		
Lanes	0	0	0	0	0	1		
Configuration						R		
Delay, Queue Length, and Level of Service								
Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration								R
v (veh/h)								59
C (m) (veh/h)								275
v/c								0.21
95% queue length								0.80
Control Delay (s/veh)								21.6
LOS								C
Approach Delay (s/veh)	--	--				21.6		
Approach LOS	--	--				C		

TWO-WAY STOP CONTROL SUMMARY								
<b>General Information</b>				<b>Site Information</b>				
Analyst	CRS			Intersection	Raleigh & 15-501 NB Ramps			
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC			
Date Performed	1/29/14			Analysis Year	2022			
Analysis Time Period	2022 With Site Noon Peak							
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>								
East/West Street: <i>Raleigh Road</i>				North/South Street: <i>US 15-501 NB Ramps</i>				
Intersection Orientation: <i>East-West</i>				Study Period (hrs): <i>0.25</i>				
<b>Vehicle Volumes and Adjustments</b>								
<b>Major Street</b>	Eastbound			Westbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume (veh/h)					947	386		
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	0.94	0.94		
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	1007	410		
Percent Heavy Vehicles	0	--	--	0	--	--		
Median Type	Raised curb							
RT Channelized			0				0	
Lanes	0	0	0	0	2	0		
Configuration					T	TR		
Upstream Signal		0			0			
<b>Minor Street</b>	Northbound			Southbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume (veh/h)						32		
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	0.86		
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	37		
Percent Heavy Vehicles	0	0	2	0	0	2		
Percent Grade (%)	0			-2				
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0				0	
Lanes	0	0	0	0	0	1		
Configuration							R	
<b>Delay, Queue Length, and Level of Service</b>								
Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration								R
v (veh/h)								37
C (m) (veh/h)								452
v/c								0.08
95% queue length								0.27
Control Delay (s/veh)								13.7
LOS								B
Approach Delay (s/veh)	--	--				13.7		
Approach LOS	--	--				B		

TWO-WAY STOP CONTROL SUMMARY								
General Information				Site Information				
Analyst	CRS			Intersection	Raleigh & 15-501 NB Ramps			
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC			
Date Performed	1/29/14			Analysis Year	2022			
Analysis Time Period	2022 With Site PM Peak							
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>								
East/West Street: <i>Raleigh Road</i>				North/South Street: <i>US 15-501 NB Ramps</i>				
Intersection Orientation: <i>East-West</i>				Study Period (hrs): <i>0.25</i>				
Vehicle Volumes and Adjustments								
Major Street	Eastbound			Westbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume (veh/h)					1346	429		
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	0.93	0.93		
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	1447	461		
Percent Heavy Vehicles	0	--	--	0	--	--		
Median Type	Raised curb							
RT Channelized			0			0		
Lanes	0	0	0	0	2	0		
Configuration					T	TR		
Upstream Signal		0			0			
Minor Street	Northbound			Southbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume (veh/h)						32		
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	0.50		
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	64		
Percent Heavy Vehicles	0	0	2	0	0	6		
Percent Grade (%)	0			-2				
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0			0		
Lanes	0	0	0	0	0	1		
Configuration						R		
Delay, Queue Length, and Level of Service								
Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration								R
v (veh/h)								64
C (m) (veh/h)								325
v/c								0.20
95% queue length								0.72
Control Delay (s/veh)								18.8
LOS								C
Approach Delay (s/veh)	--	--				18.8		
Approach LOS	--	--				C		

TWO-WAY STOP CONTROL SUMMARY							
<b>General Information</b>				<b>Site Information</b>			
Analyst	CRS			Intersection	Dogwood Acres & Smith Level		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	1/29/14			Analysis Year	2022		
Analysis Time Period	2022 With Site AM Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>							
East/West Street: <i>Dogwood Acres Drive</i>				North/South Street: <i>Smith Level Road</i>			
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>0.25</i>			
<b>Vehicle Volumes and Adjustments</b>							
<b>Major Street</b>	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		414	8	19	303		
Peak-Hour Factor, PHF	1.00	0.87	0.87	0.97	0.97	1.00	
Hourly Flow Rate, HFR (veh/h)	0	475	9	19	312	0	
Percent Heavy Vehicles	0	--	--	2	--	--	
Median Type	Undivided						
RT Channelized			0				0
Lanes	0	1	0	0	1		0
Configuration			TR	LT			
Upstream Signal		0			0		
<b>Minor Street</b>	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)				4		19	
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.71	1.00	0.71	
Hourly Flow Rate, HFR (veh/h)	0	0	0	5	0	26	
Percent Heavy Vehicles	0	0	2	2	0	2	
Percent Grade (%)		0			4		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0				0
Lanes	0	0	0	0	0	0	
Configuration					LR		
<b>Delay, Queue Length, and Level of Service</b>							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration		LT		LR			
v (veh/h)		19		31			
C (m) (veh/h)		1079		478			
v/c		0.02		0.06			
95% queue length		0.05		0.21			
Control Delay (s/veh)		8.4		13.1			
LOS		A		B			
Approach Delay (s/veh)	--	--	13.1				
Approach LOS	--	--	B				

TWO-WAY STOP CONTROL SUMMARY							
<b>General Information</b>				<b>Site Information</b>			
Analyst	CRS			Intersection	Dogwood Acres & Smith Level		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	1/29/14			Analysis Year	2022		
Analysis Time Period	2022 With Site Noon Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>							
East/West Street: <i>Dogwood Acres Drive</i>				North/South Street: <i>Smith Level Road</i>			
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>0.25</i>			
<b>Vehicle Volumes and Adjustments</b>							
<b>Major Street</b>	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		236	3	12	207		
Peak-Hour Factor, PHF	1.00	0.90	0.90	0.95	0.95	1.00	
Hourly Flow Rate, HFR (veh/h)	0	262	3	12	217	0	
Percent Heavy Vehicles	0	--	--	8	--	--	
Median Type	Undivided						
RT Channelized			0				0
Lanes	0	1	0	0	1		0
Configuration			TR	LT			
Upstream Signal		0			0		
<b>Minor Street</b>	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)				2		11	
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.75	1.00	0.75	
Hourly Flow Rate, HFR (veh/h)	0	0	0	2	0	14	
Percent Heavy Vehicles	0	0	2	11	0	11	
Percent Grade (%)		0			4		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0				0
Lanes	0	0	0	0	0		0
Configuration					LR		
<b>Delay, Queue Length, and Level of Service</b>							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration		LT		LR			
v (veh/h)		12		16			
C (m) (veh/h)		1265		680			
v/c		0.01		0.02			
95% queue length		0.03		0.07			
Control Delay (s/veh)		7.9		10.4			
LOS		A		B			
Approach Delay (s/veh)	--	--	10.4				
Approach LOS	--	--	B				

TWO-WAY STOP CONTROL SUMMARY							
<b>General Information</b>				<b>Site Information</b>			
Analyst	CRS			Intersection	Dogwood Acres & Smith Level		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	1/29/14			Analysis Year	2022		
Analysis Time Period	2022 With Site PM Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>							
East/West Street: <i>Dogwood Acres Drive</i>				North/South Street: <i>Smith Level Road</i>			
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>0.25</i>			
<b>Vehicle Volumes and Adjustments</b>							
<b>Major Street</b>	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		330	10	33	535		
Peak-Hour Factor, PHF	1.00	0.89	0.89	0.93	0.93	1.00	
Hourly Flow Rate, HFR (veh/h)	0	370	11	35	575	0	
Percent Heavy Vehicles	0	--	--	2	--	--	
Median Type	Undivided						
RT Channelized			0				0
Lanes	0	1	0	0	1		0
Configuration			TR	LT			
Upstream Signal		0			0		
<b>Minor Street</b>	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)				9		27	
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.72	1.00	0.72	
Hourly Flow Rate, HFR (veh/h)	0	0	0	12	0	37	
Percent Heavy Vehicles	0	0	2	4	0	4	
Percent Grade (%)		0			4		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0				0
Lanes	0	0	0	0	0		0
Configuration					LR		
<b>Delay, Queue Length, and Level of Service</b>							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration		LT		LR			
v (veh/h)		35		49			
C (m) (veh/h)		1177		417			
v/c		0.03		0.12			
95% queue length		0.09		0.40			
Control Delay (s/veh)		8.2		14.8			
LOS		A		B			
Approach Delay (s/veh)	--	--	14.8				
Approach LOS	--	--	B				

TWO-WAY STOP CONTROL SUMMARY								
<b>General Information</b>				<b>Site Information</b>				
Analyst	CRS			Intersection	Mt. Carmel Church & Old Lystra			
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC			
Date Performed	1/29/14			Analysis Year	2022			
Analysis Time Period	2022 With Site AM Peak							
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>								
East/West Street: <i>Mt. Carmel Church Road</i>				North/South Street: <i>Old Lystra Road</i>				
Intersection Orientation: <i>East-West</i>				Study Period (hrs): <i>0.25</i>				
<b>Vehicle Volumes and Adjustments</b>								
<b>Major Street</b>	Eastbound			Westbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume (veh/h)		336	44	19	655			
Peak-Hour Factor, PHF	1.00	0.74	0.74	0.87	0.87	1.00		
Hourly Flow Rate, HFR (veh/h)	0	454	59	21	752	0		
Percent Heavy Vehicles	0	--	--	2	--	--		
Median Type	Undivided							
RT Channelized			0				0	
Lanes	0	1	0	0	1	0		
Configuration			TR	LT				
Upstream Signal		0			0			
<b>Minor Street</b>	Northbound			Southbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume (veh/h)	72		39					
Peak-Hour Factor, PHF	0.85	1.00	0.85	1.00	1.00	1.00		
Hourly Flow Rate, HFR (veh/h)	84	0	45	0	0	0		
Percent Heavy Vehicles	2	2	2	0	0	0		
Percent Grade (%)		-2			0			
Flared Approach		Y			N			
Storage		1			0			
RT Channelized			0				0	
Lanes	0	0	0	0	0	0		
Configuration		LR						
<b>Delay, Queue Length, and Level of Service</b>								
Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT		LR				
v (veh/h)		21		129				
C (m) (veh/h)		1052		293				
v/c		0.02		0.44				
95% queue length		0.06		2.14				
Control Delay (s/veh)		8.5		26.6				
LOS		A		D				
Approach Delay (s/veh)	--	--	26.6					
Approach LOS	--	--	D					



TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	CRS			Intersection	Mt. Carmel Church & Old Lystra		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	1/29/14			Analysis Year	2022		
Analysis Time Period	2022 With Site Noon Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>							
East/West Street: <i>Mt. Carmel Church Road</i>				North/South Street: <i>Old Lystra Road</i>			
Intersection Orientation: <i>East-West</i>				Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments							
Major Street	Eastbound			Westbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		264	32	22	306		
Peak-Hour Factor, PHF	1.00	0.89	0.89	0.89	0.89	1.00	
Hourly Flow Rate, HFR (veh/h)	0	296	35	24	343	0	
Percent Heavy Vehicles	0	--	--	3	--	--	
Median Type	Undivided						
RT Channelized			0			0	
Lanes	0	1	0	0	1	0	
Configuration			TR	LT			
Upstream Signal		0			0		
Minor Street	Northbound			Southbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)	42		16				
Peak-Hour Factor, PHF	0.82	1.00	0.82	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	51	0	19	0	0	0	
Percent Heavy Vehicles	4	2	4	0	0	0	
Percent Grade (%)		-2			0		
Flared Approach		Y			N		
Storage		1			0		
RT Channelized			0			0	
Lanes	0	0	0	0	0	0	
Configuration		LR					
Delay, Queue Length, and Level of Service							
Approach	Eastbound	Westbound	Northbound			Southbound	
Movement	1	4	7	8	9	10	11
Lane Configuration		LT		LR			
v (veh/h)		24		70			
C (m) (veh/h)		1223		582			
v/c		0.02		0.12			
95% queue length		0.06		0.41			
Control Delay (s/veh)		8.0		13.4			
LOS		A		B			
Approach Delay (s/veh)	--	--	13.4				
Approach LOS	--	--	B				

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	CRS			Intersection	Mt. Carmel Church & Old Lystra		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	1/29/14			Analysis Year	2022		
Analysis Time Period	2022 With Site PM Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>							
East/West Street: <i>Mt. Carmel Church Road</i>				North/South Street: <i>Old Lystra Road</i>			
Intersection Orientation: <i>East-West</i>				Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments							
Major Street	Eastbound			Westbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		612	55	44	409		
Peak-Hour Factor, PHF	1.00	0.91	0.91	0.88	0.88	1.00	
Hourly Flow Rate, HFR (veh/h)	0	672	60	50	464	0	
Percent Heavy Vehicles	0	--	--	4	--	--	
Median Type	Undivided						
RT Channelized			0			0	
Lanes	0	1	0	0	1	0	
Configuration			TR	LT			
Upstream Signal		0			0		
Minor Street	Northbound			Southbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)	37		38				
Peak-Hour Factor, PHF	0.80	1.00	0.80	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	46	0	47	0	0	0	
Percent Heavy Vehicles	3	2	3	0	0	0	
Percent Grade (%)		-2			0		
Flared Approach		Y			N		
Storage		1			0		
RT Channelized			0			0	
Lanes	0	0	0	0	0	0	
Configuration		LR					
Delay, Queue Length, and Level of Service							
Approach	Eastbound	Westbound	Northbound			Southbound	
Movement	1	4	7	8	9	10	11
Lane Configuration		LT		LR			
v (veh/h)		50		93			
C (m) (veh/h)		863		408			
v/c		0.06		0.23			
95% queue length		0.18		0.87			
Control Delay (s/veh)		9.4		20.8			
LOS		A		C			
Approach Delay (s/veh)	--	--	20.8				
Approach LOS	--	--	C				

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	CRS			Intersection	US 15-501 & Site Dr #1		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	1/31/14			Analysis Year	2022		
Analysis Time Period	2022 With Site AM Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>							
East/West Street: <i>Site Driveway #1 (RIRO)</i>				North/South Street: <i>US 15-501 NB</i>			
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments							
Major Street	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		1420	11				
Peak-Hour Factor, PHF	1.00	0.90	0.90	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	0	1577	12	0	0	0	
Percent Heavy Vehicles	0	--	--	0	--	--	
Median Type	Raised curb						
RT Channelized			0				0
Lanes	0	2	0	0	0	0	0
Configuration		T	TR				
Upstream Signal		0			0		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)							34
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	0.90	
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	37	
Percent Heavy Vehicles	0	0	2	0	0	2	
Percent Grade (%)		0			0		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0				0
Lanes	0	0	0	0	0	1	
Configuration							R
Delay, Queue Length, and Level of Service							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration					R		
v (veh/h)					37		
C (m) (veh/h)					388		
v/c					0.10		
95% queue length					0.31		
Control Delay (s/veh)					15.3		
LOS					C		
Approach Delay (s/veh)	--	--	15.3				
Approach LOS	--	--	C				

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	CRS			Intersection	US 15-501 & Site Dr #1		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	1/31/14			Analysis Year	2022		
Analysis Time Period	2022 With Site Noon Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>							
East/West Street: <i>Site Driveway #1 (RIRO)</i>				North/South Street: <i>US 15-501 NB</i>			
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments							
Major Street	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		807	8				
Peak-Hour Factor, PHF	1.00	0.90	0.90	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	0	896	8	0	0	0	
Percent Heavy Vehicles	0	--	--	0	--	--	
Median Type	Raised curb						
RT Channelized			0				0
Lanes	0	2	0	0	0	0	0
Configuration		T	TR				
Upstream Signal		0			0		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)						10	
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	0.90	
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	11	
Percent Heavy Vehicles	0	0	2	0	0	2	
Percent Grade (%)		0			0		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0			0	
Lanes	0	0	0	0	0	1	
Configuration						R	
Delay, Queue Length, and Level of Service							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration					R		
v (veh/h)					11		
C (m) (veh/h)					608		
v/c					0.02		
95% queue length					0.06		
Control Delay (s/veh)					11.0		
LOS					B		
Approach Delay (s/veh)	--	--	11.0				
Approach LOS	--	--	B				

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	CRS			Intersection	US 15-501 & Site Dr #1		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	1/31/14			Analysis Year	2022		
Analysis Time Period	2022 With Site PM Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>							
East/West Street: <i>Site Driveway #1 (RIRO)</i>				North/South Street: <i>US 15-501 NB</i>			
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments							
Major Street	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		832	16				
Peak-Hour Factor, PHF	1.00	0.90	0.90	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	0	924	17	0	0	0	
Percent Heavy Vehicles	0	--	--	0	--	--	
Median Type	Raised curb						
RT Channelized			0				0
Lanes	0	2	0	0	0	0	0
Configuration		T	TR				
Upstream Signal		0			0		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)							11
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	0.90	
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	12	
Percent Heavy Vehicles	0	0	2	0	0	2	
Percent Grade (%)		0			0		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0				0
Lanes	0	0	0	0	0	1	
Configuration							R
Delay, Queue Length, and Level of Service							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration					R		
v (veh/h)					12		
C (m) (veh/h)					594		
v/c					0.02		
95% queue length					0.06		
Control Delay (s/veh)					11.2		
LOS					B		
Approach Delay (s/veh)	--	--	11.2				
Approach LOS	--	--	B				

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	CRS			Intersection	US 15-501 & Site Dr #2		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	1/31/14			Analysis Year	2022		
Analysis Time Period	2022 With Site AM Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>							
East/West Street: <i>Site Driveway #2 (RIRO)</i>				North/South Street: <i>US 15-501 NB</i>			
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments							
Major Street	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		1432	22				
Peak-Hour Factor, PHF	1.00	0.90	0.90	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	0	1591	24	0	0	0	
Percent Heavy Vehicles	0	--	--	0	--	--	
Median Type	Raised curb						
RT Channelized			0				0
Lanes	0	2	0	0	0	0	0
Configuration		T	TR				
Upstream Signal		0			0		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)							27
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	0.90	
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	30	
Percent Heavy Vehicles	0	0	2	0	0	2	
Percent Grade (%)		0			0		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0				0
Lanes	0	0	0	0	0	1	
Configuration							R
Delay, Queue Length, and Level of Service							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration					R		
v (veh/h)					30		
C (m) (veh/h)					381		
v/c					0.08		
95% queue length					0.25		
Control Delay (s/veh)					15.3		
LOS					C		
Approach Delay (s/veh)	--	--	15.3				
Approach LOS	--	--	C				

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	CRS			Intersection	US 15-501 & Site Dr #2		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	1/31/14			Analysis Year	2022		
Analysis Time Period	2022 With Site Noon Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>							
East/West Street: <i>Site Driveway #2 (RIRO)</i>				North/South Street: <i>US 15-501 NB</i>			
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments							
Major Street	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		765	52				
Peak-Hour Factor, PHF	1.00	0.90	0.90	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	0	850	57	0	0	0	
Percent Heavy Vehicles	0	--	--	0	--	--	
Median Type	Raised curb						
RT Channelized			0				0
Lanes	0	2	0	0	0	0	0
Configuration		T	TR				
Upstream Signal		0			0		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)						50	
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	0.90	
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	55	
Percent Heavy Vehicles	0	0	2	0	0	2	
Percent Grade (%)		0			0		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0			0	
Lanes	0	0	0	0	0	1	
Configuration						R	
Delay, Queue Length, and Level of Service							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration					R		
v (veh/h)					55		
C (m) (veh/h)					606		
v/c					0.09		
95% queue length					0.30		
Control Delay (s/veh)					11.5		
LOS					B		
Approach Delay (s/veh)	--	--	11.5				
Approach LOS	--	--	B				

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	CRS			Intersection	US 15-501 & Site Dr #2		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	1/31/14			Analysis Year	2022		
Analysis Time Period	2022 With Site PM Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>							
East/West Street: <i>Site Driveway #2 (RIRO)</i>				North/South Street: <i>US 15-501 NB</i>			
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments							
Major Street	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		777	67				
Peak-Hour Factor, PHF	1.00	0.90	0.90	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	0	863	74	0	0	0	
Percent Heavy Vehicles	0	--	--	0	--	--	
Median Type	Raised curb						
RT Channelized			0				0
Lanes	0	2	0	0	0	0	0
Configuration		T	TR				
Upstream Signal		0			0		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)							77
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	0.90	
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	85	
Percent Heavy Vehicles	0	0	2	0	0	2	
Percent Grade (%)		0			0		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0				0
Lanes	0	0	0	0	0	1	
Configuration							R
Delay, Queue Length, and Level of Service							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration					R		
v (veh/h)					85		
C (m) (veh/h)					595		
v/c					0.14		
95% queue length					0.50		
Control Delay (s/veh)					12.1		
LOS					B		
Approach Delay (s/veh)	--	--	12.1				
Approach LOS	--	--	B				



TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	CRS			Intersection	US 15-501 & Site Dr #5		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	1/31/14			Analysis Year	2022		
Analysis Time Period	2022 With Site AM Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>							
East/West Street: <i>Site Driveway #5 (RIRO)</i>				North/South Street: <i>US 15-501 NB</i>			
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments							
Major Street	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		1785	11				
Peak-Hour Factor, PHF	1.00	0.90	0.90	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	0	1983	12	0	0	0	
Percent Heavy Vehicles	0	--	--	0	--	--	
Median Type	Raised curb						
RT Channelized			0				0
Lanes	0	2	0	0	0	0	0
Configuration		T	TR				
Upstream Signal		0			0		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)						1	
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	0.90	
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	1	
Percent Heavy Vehicles	0	0	2	0	0	2	
Percent Grade (%)		0			0		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0			0	
Lanes	0	0	0	0	0	1	
Configuration						R	
Delay, Queue Length, and Level of Service							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration					R		
v (veh/h)					1		
C (m) (veh/h)					296		
v/c					0.00		
95% queue length					0.01		
Control Delay (s/veh)					17.2		
LOS					C		
Approach Delay (s/veh)	--	--	17.2				
Approach LOS	--	--	C				

TWO-WAY STOP CONTROL SUMMARY							
<b>General Information</b>				<b>Site Information</b>			
Analyst	CRS			Intersection	US 15-501 & Site Dr #5		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	1/31/14			Analysis Year	2022		
Analysis Time Period	2022 With Site Noon Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>							
East/West Street: <i>Site Driveway #5 (RIRO)</i>				North/South Street: <i>US 15-501 NB</i>			
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>0.25</i>			
<b>Vehicle Volumes and Adjustments</b>							
<b>Major Street</b>	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		1247	5				
Peak-Hour Factor, PHF	1.00	0.90	0.90	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	0	1385	5	0	0	0	
Percent Heavy Vehicles	0	--	--	0	--	--	
Median Type	Raised curb						
RT Channelized			0			0	
Lanes	0	2	0	0	0	0	
Configuration		T	TR				
Upstream Signal		0			0		
<b>Minor Street</b>	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)						4	
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	0.90	
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	4	
Percent Heavy Vehicles	0	0	2	0	0	2	
Percent Grade (%)		0			0		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0			0	
Lanes	0	0	0	0	0	1	
Configuration						R	
<b>Delay, Queue Length, and Level of Service</b>							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration					R		
v (veh/h)					4		
C (m) (veh/h)					442		
v/c					0.01		
95% queue length					0.03		
Control Delay (s/veh)					13.2		
LOS					B		
Approach Delay (s/veh)	--	--	13.2				
Approach LOS	--	--	B				

TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	CRS			Intersection	US 15-501 & Site Dr #5		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	1/31/14			Analysis Year	2022		
Analysis Time Period	2022 With Site PM Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS</i>							
East/West Street: <i>Site Driveway #5 (RIRO)</i>				North/South Street: <i>US 15-501 NB</i>			
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>0.25</i>			
Vehicle Volumes and Adjustments							
Major Street	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)		1648	2				
Peak-Hour Factor, PHF	1.00	0.90	0.90	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	0	1831	2	0	0	0	
Percent Heavy Vehicles	0	--	--	0	--	--	
Median Type	Raised curb						
RT Channelized			0				0
Lanes	0	2	0	0	0	0	0
Configuration		T	TR				
Upstream Signal		0			0		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)						9	
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	0.90	
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	10	
Percent Heavy Vehicles	0	0	2	0	0	2	
Percent Grade (%)		0			0		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0			0	
Lanes	0	0	0	0	0	1	
Configuration						R	
Delay, Queue Length, and Level of Service							
Approach	Northbound	Southbound	Westbound			Eastbound	
Movement	1	4	7	8	9	10	11
Lane Configuration					R		
v (veh/h)					10		
C (m) (veh/h)					330		
v/c					0.03		
95% queue length					0.09		
Control Delay (s/veh)					16.2		
LOS					C		
Approach Delay (s/veh)	--	--	16.2				
Approach LOS	--	--	C				

## **2022 With Site Mitigated**

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	CRS	Freeway/Dir of Travel	US 15-501 (Fordham Blvd) NB						
Agency or Company	HNTB North Carolina, PC	Junction	NC 54 WB On-Ramp						
Date Performed	2/21/2014	Jurisdiction	Chapel Hill, NC						
Analysis Time Period	2022 Build - AM Peak	Analysis Year	2022						
Project Description Obey Creek TIS									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N	2	Downstream Adj Ramp						
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On						
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L <sub>A</sub>	350	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off						
L <sub>up</sub> = 900 ft	Deceleration Lane Length L <sub>D</sub>		L <sub>down</sub> = ft						
V <sub>u</sub> = 60 veh/h	Freeway Volume, V <sub>F</sub>	1454	V <sub>D</sub> = veh/h						
	Ramp Volume, V <sub>R</sub>	281							
	Freeway Free-Flow Speed, S <sub>FF</sub>	55.0							
	Ramp Free-Flow Speed, S <sub>FR</sub>	35.0							
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>	
Freeway	1454	0.90	Rolling	2	0	0.971	1.00	1664	
Ramp	281	0.90	Rolling	2	0	0.971	1.00	322	
UpStream	60	0.90	Rolling	2	0	0.971	1.00	69	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v <sub>12</sub>					Estimation of v <sub>12</sub>				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L <sub>EQ</sub> = P <sub>FM</sub> = 1.000 using Equation (Exhibit 13-6) V <sub>12</sub> = 1664 pc/h V <sub>3</sub> or V <sub>av34</sub> = 0 pc/h (Equation 13-14 or 13-17) Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L <sub>EQ</sub> = P <sub>FD</sub> = using Equation (Exhibit 13-7) V <sub>12</sub> = pc/h V <sub>3</sub> or V <sub>av34</sub> = pc/h (Equation 13-14 or 13-17) Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V <sub>FO</sub>	1986	Exhibit 13-8		No	V <sub>F</sub>		Exhibit 13-8		
					V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>		Exhibit 13-8		
					V <sub>R</sub>		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V <sub>R12</sub>	1986	Exhibit 13-8	4600:All	No	V <sub>12</sub>		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D <sub>R</sub> = 18.6 (pc/mi/ln) LOS = B (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D <sub>R</sub> = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
M <sub>S</sub> = 0.325 (Exhibit 13-11)					D <sub>S</sub> = (Exhibit 13-12)				
S <sub>R</sub> = 50.8 mph (Exhibit 13-11)					S <sub>R</sub> = mph (Exhibit 13-12)				
S <sub>0</sub> = N/A mph (Exhibit 13-11)					S <sub>0</sub> = mph (Exhibit 13-12)				
S = 50.8 mph (Exhibit 13-13)					S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	CRS	Freeway/Dir of Travel	US 15-501 (Fordham Blvd) NB						
Agency or Company	HNTB North Carolina, PC	Junction	NC 54 WB On-Ramp						
Date Performed	2/21/2014	Jurisdiction	Chapel Hill, NC						
Analysis Time Period	2022 Build - Noon Peak	Analysis Year	2022						
Project Description Obey Creek TIS									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N	2	Downstream Adj Ramp						
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On						
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L <sub>A</sub>	350	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off						
L <sub>up</sub> = 900 ft	Deceleration Lane Length L <sub>D</sub>		L <sub>down</sub> = ft						
V <sub>u</sub> = 101 veh/h	Freeway Volume, V <sub>F</sub>	1215	V <sub>D</sub> = veh/h						
	Ramp Volume, V <sub>R</sub>	385							
	Freeway Free-Flow Speed, S <sub>FF</sub>	55.0							
	Ramp Free-Flow Speed, S <sub>FR</sub>	35.0							
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>	
Freeway	1215	0.90	Rolling	2	0	0.971	1.00	1391	
Ramp	385	0.90	Rolling	2	0	0.971	1.00	441	
UpStream	101	0.90	Rolling	2	0	0.971	1.00	116	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v <sub>12</sub>					Estimation of v <sub>12</sub>				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)				
L <sub>EQ</sub> =					L <sub>EQ</sub> =				
P <sub>FM</sub> = 1.000 using Equation (Exhibit 13-6)					P <sub>FD</sub> = using Equation (Exhibit 13-7)				
V <sub>12</sub> = 1391 pc/h					V <sub>12</sub> = pc/h				
V <sub>3</sub> or V <sub>av34</sub> = 0 pc/h (Equation 13-14 or 13-17)					V <sub>3</sub> or V <sub>av34</sub> = pc/h (Equation 13-14 or 13-17)				
Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No				
Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input type="checkbox"/> No				
If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)					If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V <sub>FO</sub>	1832	Exhibit 13-8		No	V <sub>F</sub>		Exhibit 13-8		
					V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>		Exhibit 13-8		
					V <sub>R</sub>		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V <sub>R12</sub>	1832	Exhibit 13-8	4600:All	No	V <sub>12</sub>		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$				
D <sub>R</sub> = 17.4 (pc/mi/ln)					D <sub>R</sub> = (pc/mi/ln)				
LOS = B (Exhibit 13-2)					LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
M <sub>S</sub> = 0.321 (Exhibit 13-11)					D <sub>S</sub> = (Exhibit 13-12)				
S <sub>R</sub> = 50.8 mph (Exhibit 13-11)					S <sub>R</sub> = mph (Exhibit 13-12)				
S <sub>0</sub> = N/A mph (Exhibit 13-11)					S <sub>0</sub> = mph (Exhibit 13-12)				
S = 50.8 mph (Exhibit 13-13)					S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	CRS	Freeway/Dir of Travel	US 15-501 (Fordham Blvd) NB						
Agency or Company	HNTB North Carolina, PC	Junction	NC 54 WB On-Ramp						
Date Performed	2/21/2014	Jurisdiction	Chapel Hill, NC						
Analysis Time Period	2022 Build - PM Peak	Analysis Year	2022						
Project Description Obey Creek TIS									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N	2	Downstream Adj Ramp						
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On						
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L <sub>A</sub>	350	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off						
L <sub>up</sub> = 900 ft	Deceleration Lane Length L <sub>D</sub>		L <sub>down</sub> = ft						
V <sub>u</sub> = 232 veh/h	Freeway Volume, V <sub>F</sub>	1744	V <sub>D</sub> = veh/h						
	Ramp Volume, V <sub>R</sub>	429							
	Freeway Free-Flow Speed, S <sub>FF</sub>	55.0							
	Ramp Free-Flow Speed, S <sub>FR</sub>	35.0							
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>	
Freeway	1744	0.90	Rolling	2	0	0.971	1.00	1996	
Ramp	429	0.90	Rolling	2	0	0.971	1.00	491	
UpStream	232	0.90	Rolling	2	0	0.971	1.00	266	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v <sub>12</sub>					Estimation of v <sub>12</sub>				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)				
L <sub>EQ</sub> =					L <sub>EQ</sub> =				
P <sub>FM</sub> = 1.000 using Equation (Exhibit 13-6)					P <sub>FD</sub> = using Equation (Exhibit 13-7)				
V <sub>12</sub> = 1996 pc/h					V <sub>12</sub> = pc/h				
V <sub>3</sub> or V <sub>av34</sub> = 0 pc/h (Equation 13-14 or 13-17)					V <sub>3</sub> or V <sub>av34</sub> = pc/h (Equation 13-14 or 13-17)				
Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No				
Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input type="checkbox"/> No				
If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)					If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V <sub>FO</sub>	2487	Exhibit 13-8		No	V <sub>F</sub>		Exhibit 13-8		
					V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>		Exhibit 13-8		
					V <sub>R</sub>		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V <sub>R12</sub>	2487	Exhibit 13-8		No	V <sub>12</sub>		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$				
D <sub>R</sub> = 22.5 (pc/mi/ln)					D <sub>R</sub> = (pc/mi/ln)				
LOS = C (Exhibit 13-2)					LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
M <sub>S</sub> = 0.343 (Exhibit 13-11)					D <sub>S</sub> = (Exhibit 13-12)				
S <sub>R</sub> = 50.5 mph (Exhibit 13-11)					S <sub>R</sub> = mph (Exhibit 13-12)				
S <sub>0</sub> = N/A mph (Exhibit 13-11)					S <sub>0</sub> = mph (Exhibit 13-12)				
S = 50.5 mph (Exhibit 13-13)					S = mph (Exhibit 13-13)				

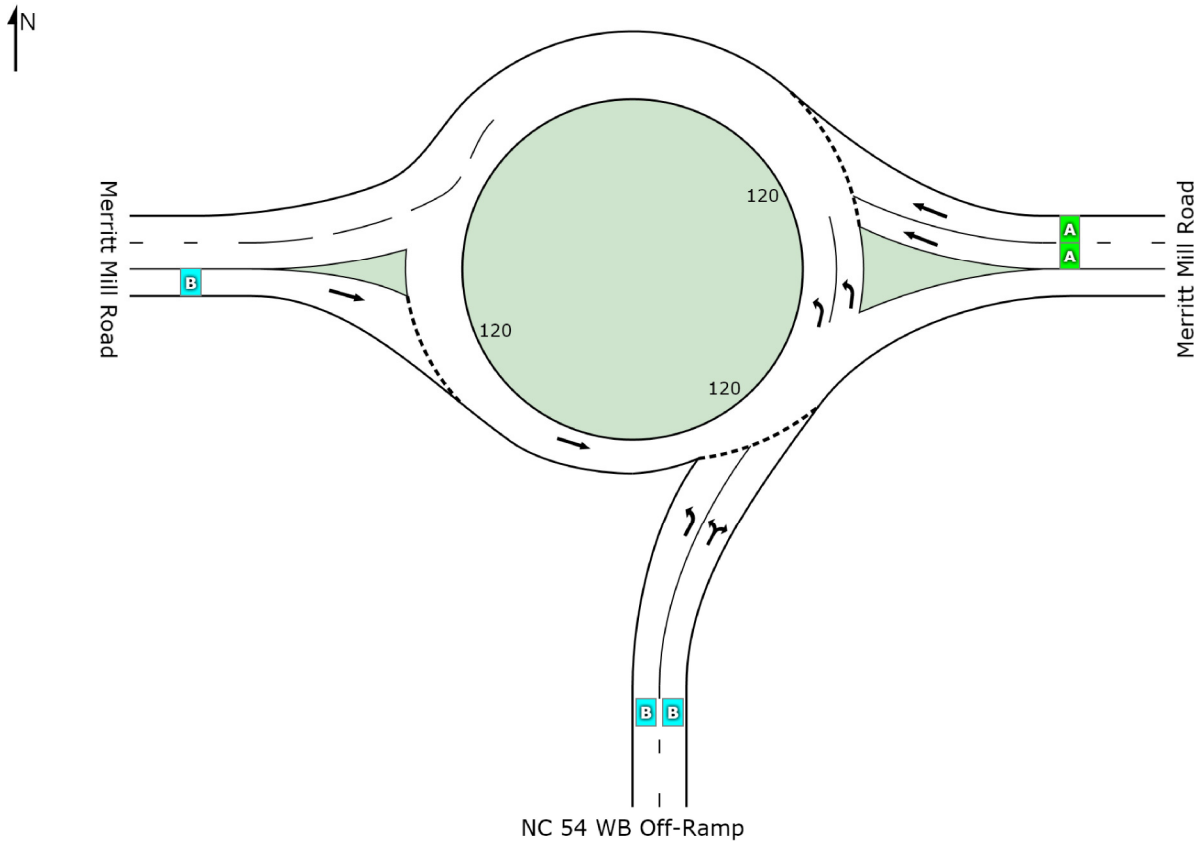
## **Appendix G – SIDRA Output**



# LEVEL OF SERVICE SUMMARY

Site: 2022 AM Alt 1

Merritt Mill Road and NC 54 Westbound Off-Ramp  
Roundabout



	South	East	West	Intersection
LOS	B	A	B	B

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).

HCM Delay Model used. Geometric Delay not included.

# MOVEMENT SUMMARY

Site: 2022 AM Alt 1

Merritt Mill Road and NC 54 Westbound Off-Ramp Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NC 54 WB Off-Ramp											
3	L	325	5.0	0.427	13.0	LOS B	1.8	47.8	0.65	0.93	22.4
18	R	166	5.0	0.427	13.0	LOS B	1.8	47.8	0.65	0.83	23.7
Approach		490	5.0	0.427	13.0	LOS B	1.8	47.8	0.65	0.90	22.8
East: Merritt Mill Road											
6	T	186	5.0	0.111	5.4	LOS A	0.3	7.7	0.32	0.46	28.7
Approach		186	5.0	0.111	5.4	LOS A	0.3	7.7	0.32	0.46	28.7
West: Merritt Mill Road											
2	T	617	2.0	0.557	10.0	LOS B	0.0	0.0	0.00	0.30	32.5
Approach		617	2.0	0.557	10.0	LOS B	0.0	0.0	0.00	0.30	32.5
All Vehicles		1294	3.6	0.557	10.5	LOS B	1.8	47.8	0.29	0.55	27.4

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

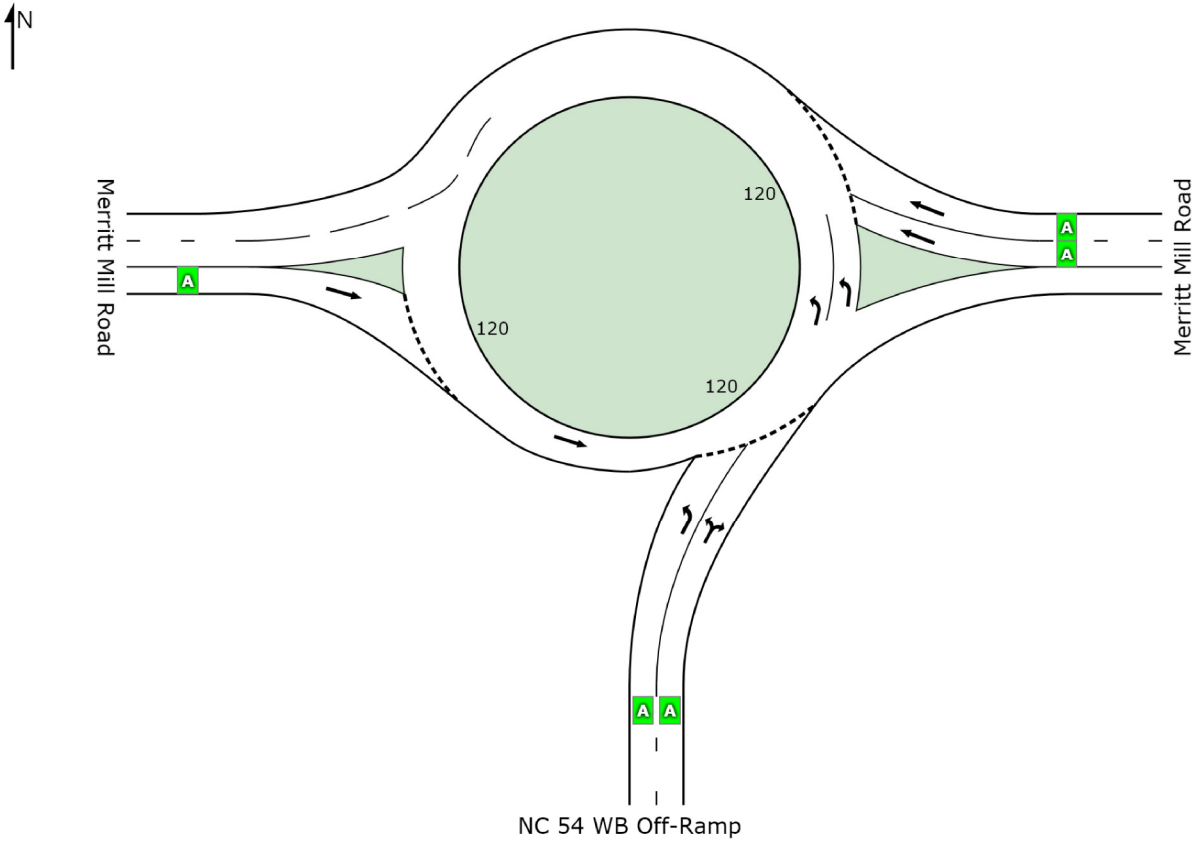
Roundabout Capacity Model: US HCM 2010.

HCM Delay Model used. Geometric Delay not included.

# LEVEL OF SERVICE SUMMARY

Site: 2022 Noon Alt 1

Merritt Mill Road and NC 54 Westbound Off-Ramp  
Roundabout



	South	East	West	Intersection
LOS	A	A	A	A

Level of Service (LOS) Method: Delay & v/c (HCM 2010).  
 Roundabout LOS Method: Same as Sign Control.  
 Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.  
 LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).  
 Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).  
 HCM Delay Model used. Geometric Delay not included.

# MOVEMENT SUMMARY

Site: 2022 Noon Alt 1

Merritt Mill Road and NC 54 Westbound Off-Ramp Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NC 54 WB Off-Ramp											
3	L	253	5.0	0.220	6.7	LOS A	0.8	21.4	0.41	0.74	24.8
18	R	109	5.0	0.220	6.7	LOS A	0.8	21.4	0.41	0.56	26.8
Approach		362	5.0	0.220	6.7	LOS A	0.8	21.4	0.41	0.68	25.4
East: Merritt Mill Road											
6	T	313	7.0	0.180	5.9	LOS A	0.5	13.2	0.30	0.44	28.3
Approach		313	7.0	0.180	5.9	LOS A	0.5	13.2	0.30	0.44	28.3
West: Merritt Mill Road											
2	T	254	6.0	0.238	5.6	LOS A	0.0	0.0	0.00	0.29	32.5
Approach		254	6.0	0.238	5.6	LOS A	0.0	0.0	0.00	0.29	32.5
All Vehicles		929	5.9	0.238	6.2	LOS A	0.8	21.4	0.26	0.49	27.9

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

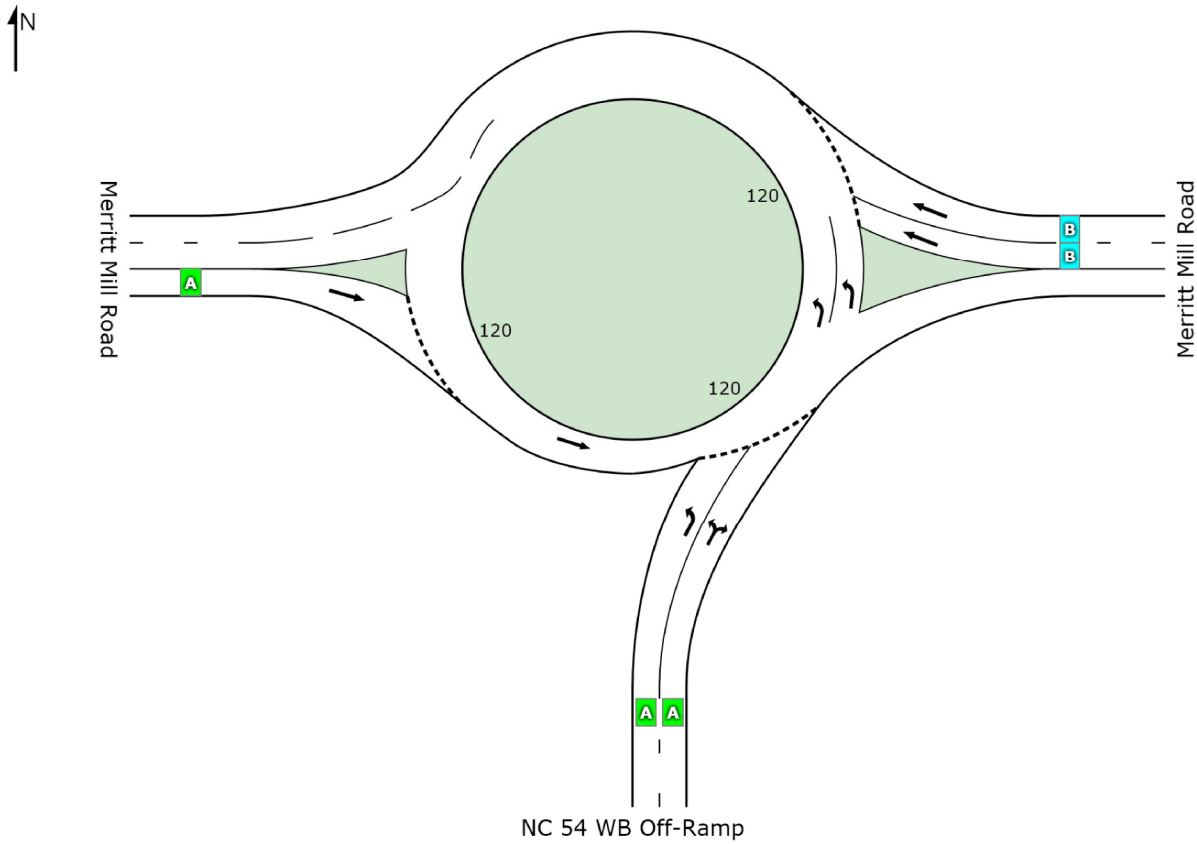
Roundabout Capacity Model: US HCM 2010.

HCM Delay Model used. Geometric Delay not included.

# LEVEL OF SERVICE SUMMARY

Site: 2022 PM Alt 1

Merritt Mill Road and NC 54 Westbound Off-Ramp  
Roundabout



	South	East	West	Intersection
LOS	A	B	A	A

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).

HCM Delay Model used. Geometric Delay not included.

# MOVEMENT SUMMARY

Site: 2022 PM Alt 1

Merritt Mill Road and NC 54 Westbound Off-Ramp Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NC 54 WB Off-Ramp											
3	L	447	2.0	0.353	8.5	LOS A	1.5	38.9	0.49	0.78	24.1
18	R	132	2.0	0.353	8.5	LOS A	1.5	38.9	0.49	0.62	25.8
Approach		579	2.0	0.353	8.5	LOS A	1.5	38.9	0.49	0.74	24.4
East: Merritt Mill Road											
6	T	815	2.0	0.512	11.7	LOS B	2.3	57.6	0.53	0.70	25.2
Approach		815	2.0	0.512	11.7	LOS B	2.3	57.6	0.53	0.70	25.2
West: Merritt Mill Road											
2	T	294	2.0	0.266	5.7	LOS A	0.0	0.0	0.00	0.30	32.5
Approach		294	2.0	0.266	5.7	LOS A	0.0	0.0	0.00	0.30	32.5
All Vehicles		1688	2.0	0.512	9.6	LOS A	2.3	57.6	0.42	0.64	25.9

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

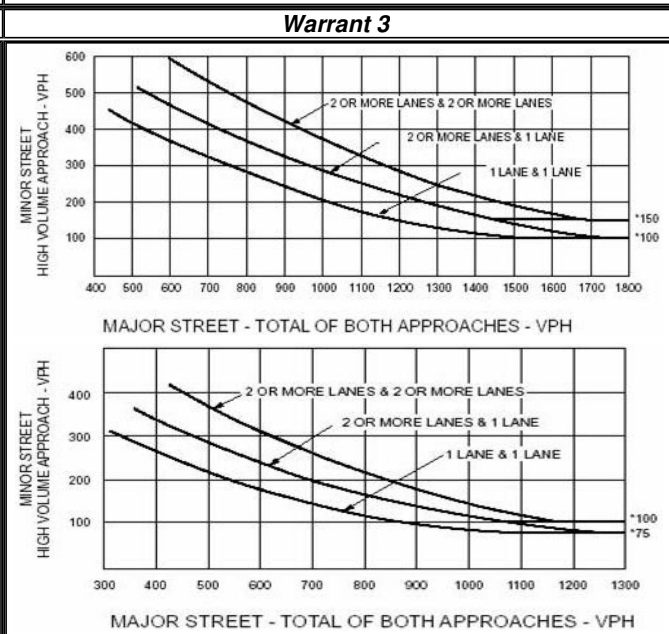
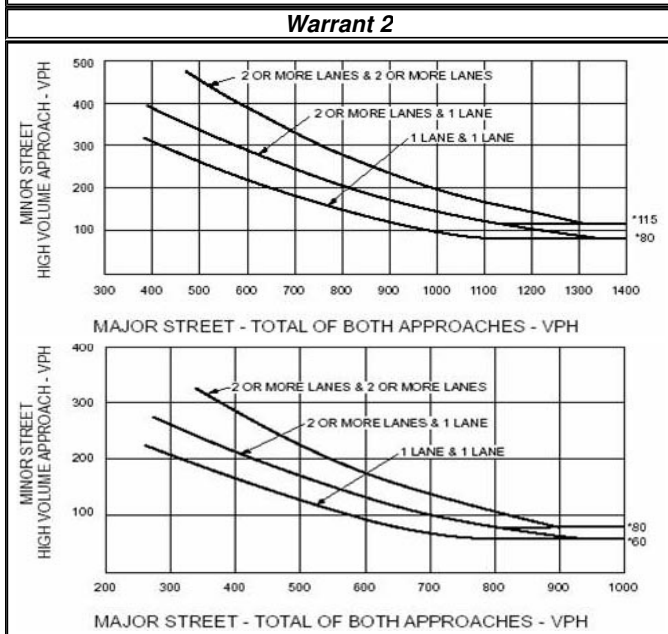
Roundabout Capacity Model: US HCM 2010.

HCM Delay Model used. Geometric Delay not included.

**Appendix H – MUTCD Peak Hour  
Signal Warrant Analysis**

Warrants Volume		
<b>Information</b>		
Analyst	HDJ	Intersection
Agency/Co	HNTB North Carolina, PC	US 15-501 & NC 54
Date Performed	2/27/2014	Jurisdiction
Project ID	Obey Creek TIS	Units
East/West Street	NC 54 EB	Time Period Analyzed
File Name	NC 54 EB & US 15-501 SB Off Ramp.xhy	North/South Street
		Major Street
		US 15-501 SB Off Ramp
		East-West
Project Description <i>Obey Creek TIS</i>		

Warrant 1															
<b>Condition A - Minimum Vehicular Volume</b>						<b>Condition B - Interruption of Continuous Traffic</b>									
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)			Vehicles per hour on higher-volume minor-street approach (one direction only)			Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)			Vehicles per hour on higher-volume minor-street approach (one direction only)		
Major Street	Minor Street	100% <sup>a</sup>	80% <sup>b</sup>	70% <sup>c</sup>	100% <sup>a</sup>	80% <sup>b</sup>	70% <sup>c</sup>	Major Street	Minor Street	100% <sup>a</sup>	80% <sup>b</sup>	70% <sup>c</sup>	100% <sup>a</sup>	80% <sup>b</sup>	70% <sup>c</sup>
1.....	1.....	500	400	350	150	120	105	1.....	1.....	750	600	525	75	60	53
2 or more...	1.....	600	480	420	150	120	105	2 or more...	1.....	900	720	630	75	60	53
2 or more...	2 or more...	600	480	420	200	160	140	2 or more...	2 or more...	900	720	630	100	80	70
1.....	2 or more...	500	400	350	200	160	140	1.....	2 or more...	750	600	525	100	80	70



**Volume Summary**

Major Street Lanes 2+				Minor Street Lanes 1		Speed		Population		
						35		10000+		
Hours	Major Volume	Minor Volume	Total Volume	1A (100%)	1A (80%)	1B (100%)	1B (80%)	2 (100%)	3A (100%)	3B (100%)
07-08	714	295	1009	Yes	Yes	No	No	Yes	No	No
08-09	0	0	0	No	No	No	No	No	No	No
09-10	0	0	0	No	No	No	No	No	No	No
10-11	0	0	0	No	No	No	No	No	No	No
11-12	0	0	0	No	No	No	No	No	No	No
12-13	749	287	1036	Yes	Yes	No	Yes	Yes	No	No
13-14	0	0	0	No	No	No	No	No	No	No
14-15	0	0	0	No	No	No	No	No	No	No
15-16	0	0	0	No	No	No	No	No	No	No
16-17	0	0	0	No	No	No	No	No	No	No
17-18	1529	257	1786	Yes	Yes	Yes	Yes	Yes	No	Yes
18-19	0	0	0	No	No	No	No	No	No	No
Totals	2992	839	3831	3	3	1	2	3	0	1



Warrants Summary												
<b>Information</b>												
Analyst	HDJ					Intersection	US 15-501 & NC 54					
Agency/Co	HNTB North Carolina, PC					Jurisdiction	Orange County, NC					
Date Performed	2/27/2014					Units	U.S. Customary					
Project ID	Obey Creek TIS					Time Period Analyzed	2022 Build AM/NN/PM					
East/West Street	NC 54 EB						Peak					
File Name	NC 54 EB & US 15-501 SB Off Ramp.xhy					North/South Street	US 15-501 SB Off Ramp					
						Major Street	East-West					
Project Description <i>Obey Creek TIS</i>												
<b>General</b>						<b>Roadway Network</b>						
Major Street Speed (mph)	35	<input type="checkbox"/>	Population < 10,000				Two Major Routes			<input type="checkbox"/>		
Nearest Signal (ft)	0	<input type="checkbox"/>	Coordinated Signal System				Weekend Count			<input type="checkbox"/>		
Crashes (per year)	0	<input type="checkbox"/>	Adequate Trials of Alternatives				5-yr Growth Factor			0		
<b>Geometry and Traffic</b>	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N	0	2	1	0	0	0	0	0	1	0	0	0
Lane usage		T	R						R			
Vehicle Volume Averages (vph)	0	238	11	0	0	0	0	0	69	0	0	0
Peds (ped/h) / Gaps (gaps/h)	--	0 / 0	--	--	0 / 0	--	--	0 / 0	--	--	0 / 0	--
Delay (s/veh) / (veh-hr)	--	0 / 0	--	--	0 / 0	--	--	0 / 0	--	--	0 / 0	--
<b>Warrant 1: Eight-Hour Vehicular Volume</b>												<input type="checkbox"/>
1 A. Minimum Vehicular Volumes (Both major approaches --and-- higher minor approach) --or--												<input type="checkbox"/>
1 B. Interruption of Continuous Traffic (Both major approaches --and-- higher minor approach) --or--												<input type="checkbox"/>
1 80% Vehicular --and-- Interruption Volumes (Both major approaches --and-- higher minor approach)												<input type="checkbox"/>
<b>Warrant 2: Four-Hour Vehicular Volume</b>												<input type="checkbox"/>
2 A. Four-Hour Vehicular Volumes (Both major approaches --and-- higher minor approach)												<input type="checkbox"/>
<b>Warrant 3: Peak Hour</b>												<input checked="" type="checkbox"/>
3 A. Peak-Hour Conditions (Minor delay --and-- minor volume --and-- total volume ) --or--												<input type="checkbox"/>
3 B. Peak- Hour Vehicular Volumes (Both major approaches --and-- higher minor approach)												<input checked="" type="checkbox"/>
<b>Warrant 4: Pedestrian Volume</b>												<input type="checkbox"/>
4 A. Four Hour Volumes --or--												<input type="checkbox"/>
4 B. One-Hour Volumes												<input type="checkbox"/>
<b>Warrant 5: School Crossing</b>												<input type="checkbox"/>
5. Student Volumes --and--												<input type="checkbox"/>
5. Gaps Same Period												<input type="checkbox"/>
<b>Warrant 6: Coordinated Signal System</b>												<input type="checkbox"/>
6. Degree of Platooning (Predominant direction or both directions)												<input type="checkbox"/>
<b>Warrant 7: Crash Experience</b>												<input type="checkbox"/>
7 A. Adequate trials of alternatives, observance and enforcement failed --and--												<input type="checkbox"/>
7 B. Reported crashes susceptible to correction by signal (12-month period) --and--												<input type="checkbox"/>

7 C. 80% Volumes for Warrants 1A, 1B --or-- 4 are satisfied	<input type="checkbox"/>
<b>Warrant 8: Roadway Network</b>	<input type="checkbox"/>
8 A. Weekday Volume (Peak hour total --and-- projected warrants 1, 2 or 3) --or--	<input type="checkbox"/>
8 B. Weekend Volume (Five hours total)	<input type="checkbox"/>
<b>Warrant 9: Grade Crossing</b>	<input type="checkbox"/>
9 A. Grade Crossing within 140 ft --and--	<input type="checkbox"/>
9 B. Peak-Hour Vehicular Volumes	<input type="checkbox"/>