

OBEY CREEK MIXED-USE DEVELOPMENT

TRAFFIC IMPACT STUDY

**TECHNICAL MEMORANDUM #3 – DRAFT
2022 SITE CONCEPT ANALYSIS (CONCEPT #2)**



Prepared for:

The Town of Chapel Hill
Engineering Department

Prepared by:

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August 2014

HNTB

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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 for a second alternative land use scenario with 79 single family home sites and 25,300 square feet of general commercial/retail development. 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. An initial analysis of 2022 No-Build and Build conditions for a more intensive land use development was analyzed in *Obey Creek Mixed Use Development Traffic Impact Study - Technical Memorandum #2 - 2022 Site Concept Analysis*, submitted by HNTB in April 2014.

B. Site Location and Study Area

This technical memorandum defines and analyzes the future transportation system in the Obey Creek project study area for Build conditions related to Site Concept #2 only. 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 Concept #2 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**

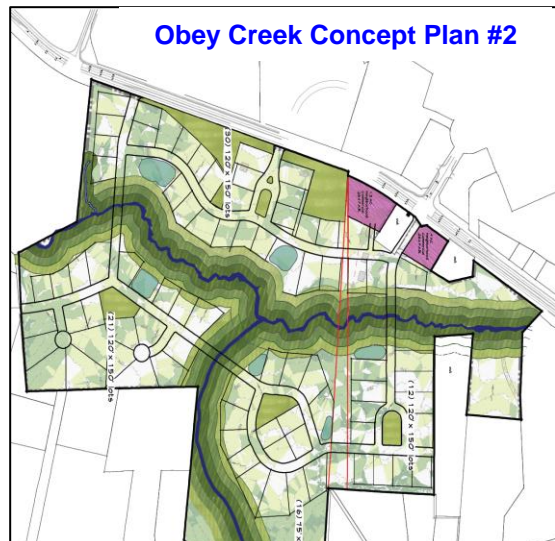


**Obey Creek Site Parcel Looking South
Near Southern Village P&R Driveway**

D. Proposed Site Concept

The Obey Creek preliminary Site Concept #2, developed in July 2014 and analyzed in this technical memorandum is shown in **Figure 2** and schematically shown below.

The proposed site concept plan delineates three 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 access point would be located directly across from the existing limited access Southern Village Park-and-Ride intersection with US 15-501 and would also be limited to right-turns in and out only (RIRO). The remaining driveway would be a RIRO limited access intersection on the southern portion of the site's US 15-501 frontage. The site concept plan also shows potential single family lot locations, locations of potential retail use, as well as an internal street system.



Two outparcels near the Market Street intersection are also shown, but not included in this analysis.



II. 2022 BUILD-OUT YEAR+1 TRAFFIC CONDITIONS

A. Proposed Project Traffic

i. Trip Generation

The projected trips generated by the proposed Obey Creek development Site Concept #2 were based on the *ITE Trip Generation Manual* (Institute of Transportation Engineers, 9th Edition, 2012). Two separate land use types were analyzed for the development. The Applicant's basic development program is as follows:

- 79 Single Family Home Sites
- 25,300 square feet of Commercial/Retail Space (not defined as to specific uses)

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. Additional information from the Applicant regarding location and intensity of proposed uses within the Obey Creek site was used to initially determine all respective trip generation and then was used in the trip distribution process.

Table 1 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 1** follows a progression of:

- 1) deriving raw unadjusted trips from ITE data (see **Appendix B** for ITE trip generation output),
- 2) reducing the raw external vehicular trips by transit and multi-modal factors for appropriate land uses, and
- 3) segregating new external vehicular site trips and pass-by type trips.

Additional details and methodologies regarding all trip adjustment factors are described below.

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 the Obey Creek development Site Concept #2 would only exhibit a small 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 an internal capture analysis) exist. These computations were conservatively excluded from the trip generation data used in this study.



Table 1. Weekday Vehicle Trip Generation Summary - Obey Creek Development Site Concept #2

1. ITE RAW TRIP GENERATION CALCULATIONS

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
Single Family Homes	210	79	DU	423	423	846	16	49	65	18	20	38	54	31	85
Shopping Center	820	25.3	1000 SF	540	540	1,080	15	9	24	30	29	59	45	49	94
EXTERNAL TRIP GENERATION BEFORE MODAL REDUCTION				963	963	1,926	31	58	89	48	49	97	99	80	179

2. 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
Single Family Homes	--	--	1.03	--	--	5%	--	--	2.5%	--	--	5%
Shopping Center	--	--	2.21	--	--	10%	--	--	5.0%	--	--	10%

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
Single Family Homes	210	79	DU	41	41	81	1	2	3	0	1	1	3	2	4
Shopping Center	820	25.3	1000 SF	28	28	56	2	1	2	2	1	3	5	5	9
TOTAL				69	69	137	2	3	6	2	2	4	7	6	14

3. 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
Single Family Homes	--	--	0.206	--	--	1.0%	--	--	0.5%	--	--	1.0%
Shopping Center	--	--	0.442	--	--	2.0%	--	--	1.0%	--	--	2.0%

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
Single Family Homes	210	79	DU	8	8	16	0	0	1	0	0	0	1	0	1
Shopping Center	820	25.3	1000 SF	6	6	11	0	0	0	0	0	1	1	1	2
TOTAL				14	14	27	0	1	1	0	0	1	1	1	3

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
	881	881	1,761	28	54	82	45	47	92	90	72	163

4. 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	25.3	1000 SF	17%	17%	17%	0%	0%	0%	34%	34%	34%	34%	34%	34%
Adjusted Pass-By Trips				87	87	174	0	0	0	10	10	19	14	14	29
TOTAL				87	87	174	0	0	0	10	10	19	14	14	29

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
	794	794	1,587	28	54	82	35	37	73	76	58	134



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. **Table 2** highlights the estimated transit reduction percentages assumed for Site Concept #2.

Table 2. Obey Creek Development Selected Transit Trip Reductions

Proposed Land Use	Daily Factors*	AM Peak Hour %	Noon Peak Hour %	PM Peak Hour %
Single Family Homes	2.06	5%	2.5%	5%
Retail - Shopping Center	4.42	10%	5.0%	10%

* - 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 or Per Dwelling Unit

Estimates in **Table 2** are based on adjustments to information on transit trip reduction sources cited in *Obey Creek Mixed Use Development Traffic Impact Study – Technical Memorandum #2 - 2022 Site Concept Analysis*. Since the analysis of the original site concept was based on a much higher density development with broader mix of uses, reductions in transit usage were applied considering the lower density, more traditional development pattern for Site Concept #2.

As shown in **Table 2**, a 10 percent transit trip reduction factor is estimated for Obey Creek retail/commercial trips. A slightly lower 5 percent factor was estimated for single family residential trips, as this land uses may likely not generate trips to the degree of the retail land uses. 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. **Table 1** shows the effects of transit trip reductions on trip generation data 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 3**.

Table 3. 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	Enter	Exit	Total
69	69	137	2	3	6	2	2	4	7	6	14

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 4**. 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.

Table 4. Total Pedestrian/Bicycle External Trip Generation Estimates

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
14	14	27	0	1	1	0	0	1	1	1	3

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 the commercial/retail component 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 were 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 was 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 5** shows pass-by trip generation percentages used in this study. Pass-by trips affect study area traffic volume calculations at the proposed site driveways only and add no new trips to the study area network.

Table 5. 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. In the original Obey Creek Site Concept #1 analysis, the density and mix of proposed land uses were assumed to generate an appreciable amount of potential diverted linked trips from the nearby NC 54 Bypass. For Site Concept #2, the proposed land uses and overall density was conservatively not assumed to generate any diverted linked trips.



d.) Trip Generation Budget

For the purposes of this Site Concept #2 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. No separate trip generation budget for any project phasing was considered for this study.

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. External trip distribution methodologies and results were taken directly from the original Site Concept analysis documentation and applied for this study. They are presented in **Figures 3A and 3B** and in **Appendix C**.

- **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 residential and commercial/retail land uses, 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:

- 50%/40% To/From US 15-501 Northbound at Site Driveway #3 (Noon/PM Peak, respectively)
- 50%/60% To/From US 15-501 Southbound at Site Driveway #3
- No pass-by trips estimated at Site Driveway #1 or #2, as they do not directly serve the proposed retail component of Site Concept #2

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 3C** presents the projected pass-by trip distribution traffic percentages for the proposed site in the 2022 build-out year+1 scenario.

iv.) Trip Assignment

Appendix C 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. No specific forecasts or estimates of transit, pedestrian or bicycle trip distribution and assignment were made for this study.

B. Future Traffic Forecasts with the Proposed Development

Figures 4A, 4B, 5A and 5B display the 2022 projected study area traffic volumes with site traffic added. These traffic volumes represent the aggregate traffic growth over existing 2013 base year 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 and pass-by trips. As mentioned previously, 2013 existing year study area conditions were analyzed in the *Obey Creek Mixed Use Development Traffic Impact Study - Technical Memorandum #1 Existing Conditions Analysis*, submitted by HNTB in May 2013. 2022 No-Build conditions were analyzed in *Obey Creek Mixed Use Development Traffic Impact Study – Technical Memorandum #2 - 2022 Site Concept Analysis*, submitted by HNTB in April 2014.



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 6**.

Table 6. Level of Service (LOS) Characteristics

Level of Service Description	Per Vehicle Delay at Signal	Per Vehicle Delay at Stop Sign
LOS A ➤ Free flow ➤ Freedom to select desired speed and to maneuver is extremely high ➤ General level of comfort and convenience for motorists is excellent	< 10.0 sec	< 10.0 sec
LOS B ➤ Stable flow ➤ Other vehicles in the traffic stream become noticeable ➤ Reduction in freedom to maneuver from LOS A	10.0 – 20.0 sec	10.0 – 15.0 sec
LOS C ➤ Stable flow ➤ Maneuverability and operating speed are significantly affected by other vehicles ➤ General level of comfort and convenience declines noticeably	20.0 – 35.0 sec	15.0 – 25.0 sec
LOS D ➤ 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	35.0 – 55.0 sec	25.0 – 35.0 sec
LOS E ➤ 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	55.0 – 80.0 sec	35.0 – 50.0 sec
LOS F ➤ Forced or breakdown flow ➤ Volumes exceed roadway capacity ➤ Formation of unstable queues ➤ Stoppages for long periods of time because of traffic congestion	> 80.0 sec	> 50.0 sec



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 D 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 E** 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 6A and 6B**, 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 7 presents the results for the 2022 No-Build scenario traffic conditions as compiled from the recent *Obey Creek Mixed Use Development Traffic Impact Study – Technical Memorandum #2 - 2022 Site Concept Analysis*. All information as to the methodologies for the development of 2022 traffic conditions and operational assumptions are taken directly from that report. The table lists LOS and delay values for the 2022 study area intersections. It also only lists data for the worst-case individual movements encountering delay at the stop-controlled intersections (which do not have an overall intersection delay value produced by HCS). The information from the No-Build Scenario is presented to make a direct comparison with Build scenario results to determine traffic operations impacts due to site-related traffic increases. Figures 11A and 11B from the *Obey Creek Mixed Use Development Traffic Impact Study – Technical Memorandum #2 - 2022 Site Concept Analysis* present a summary intersection LOS for each peak period.



Table 7. Capacity Analysis Results for Study Area Intersections – 2022 Analysis Year Scenarios

ID	Intersection Name	2022 No-Build Scenario						2022 Build Concept #2 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	E	42.3	53.5	70.8	D	D	E	42.3	53.5	71.4	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	C	C	D	34.9	33.6	35.0	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	25.5	23.4	27.1	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	15.1	18.0	21.3	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	30.6	32.0	39.1	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	27.6	38.1	43.1	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	28.0	24.5	31.5	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	E	26.3	26.5	57.9	C	C	E	26.9	26.5	60.3	SEE TABLE 8					
9	US 15-501 & NC 54 Bypass (Fordham Blvd) EB Ramps	C	B	B	22.3	12.4	14.0	C	B	B	22.1	12.6	14.5	SEE TABLE 8					
10	US 15-501 & Culbreth Road / Mt. Carmel Church Road	E	B	C	59.1	17.8	24.2	E	B	C	60.8	17.4	23.9	SEE TABLE 8					
11	US 15-501 & Arlen Park Drive / Bennett Road	B	A	B	13.8	7.6	12.0	B	A	B	14.4	6.8	12.4	N/A	N/A	N/A	N/A	N/A	N/A
12	US 15-501 & Market Street / Site Driveway #3	C	B	C	27.4	16.2	24.4	C	C	D	33.8	24.5	36.1	D	C	C	35.9	28.3	34.5
13	US 15-501 & Southern Village Park & Ride Driveway [@]	A	B	C	9.9	10.6	17.5	B	B	C	10.0	10.5	16.8	N/A	N/A	N/A	N/A	N/A	N/A
14	US 15-501 & Dogwood Acres Drive	A	A	A	5.2	2.6	5.5	A	A	B	7.0	4.0	10.7	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	27.3	22.6	31.9	N/A	N/A	N/A	N/A	N/A	N/A
16	Mt. Carmel Church Road & Bennett Road [@]	D	B	D	28.6	12.0	34.6	D	B	E	28.6	12.2	35.5	C**	B**	C**	18.6**	14.4**	17.6**
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	15.2	19.8	29.0	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	B	30.6	13.0	19.3	N/A	N/A	N/A	N/A	N/A	N/A
19	NC 54 Bypass (Fordham Blvd) WB Off-Ramp & Merritt Mill Road [@]	E	C	F	37.9	15.6	108.1	E	C	F	37.9	15.6	111.2	C**	B**	B**	16.0**	12.1**	12.5**
20	US 15-501/NC 54 Bypass (Fordham Blvd) & Manning Drive	D	C	D	44.7	31.3	44.5	D	C	D	46.5	31.7	47.1	B	B	C	12.4	14.7	23.5
21	US 15-501/NC 54 Bypass (Fordham Blvd) & Old Mason Farm Road	F	D	F	93.7	35.5	82.9	F	D	F	95.4	39.5	82.2	D	B	B	45.9	15.5	17.7
22	US 15-501 Bypass (Fordham Blvd) & NC 54 (Raleigh Road) Interchange Ramps (North) ^{\$}	C	C	D	28.0	20.9	37.3	C	C	D	28.2	21.1	38.7	C ^{&}	B ^{&}	D ^{&}	23.6 ^{&}	15.5 ^{&}	37.1 ^{&}
	N	E [#]	E [#]	F [#]	42.2 [#]	41.1 [#]	199.0 [#]	E [#]	E [#]	F [#]	43.1 [#]	41.7 [#]	202.3 [#]						
22	US 15-501 Bypass (Fordham Blvd) & NC 54 (Raleigh Road) Interchange Ramps (South) [@]	C	C	E	22.1	18.6	38.6	C	C	E	22.3	18.8	40.1	N/A	N/A	N/A	N/A	N/A	N/A
22	US 15-501 Bypass (Fordham Blvd) & NC 54 (Raleigh Road) Interchange Ramps (West) [@]	C	C	F	21.5	17.1	51.3	C	C	F	21.5	17.1	51.3	A	A	A	8.5	6.4	9.9
22	US 15-501 Bypass (Fordham Blvd) & NC 54 (Raleigh Road) Interchange Ramps (East) [@]	C	B	C	20.0	13.3	17.3	C	B	C	20.2	13.3	17.4	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	20.0	12.3	21.3	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	27.1	18.1	22.5	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	24.9	10.7	14.6	N/A	N/A	N/A	N/A	N/A	N/A
26	Smith Level Road & Dogwood Acres Drive [@]	B	B	C	13.1	10.5	15.2	B	B	C	13.1	10.5	15.2	N/A	N/A	N/A	N/A	N/A	N/A
27	Mt. Carmel Church Road & Old Lystra Road [@]	C	B	C	23.6	13.0	19.2	C	B	C	23.8	13.0	19.7	N/A	N/A	N/A	N/A	N/A	N/A
28	US 15-501 & Site Driveway #1 (RIRO) [@]	N/A	N/A	N/A	N/A	N/A	N/A	B	B	B	13.8	10.6	10.8	N/A	N/A	N/A	N/A	N/A	N/A
29	US 15-501 & Site Driveway #2 (RIRO) [@]	N/A	N/A	N/A	N/A	N/A	N/A	B	B	B	13.7	10.6	10.7	B	B	B	13.9	10.6	10.7
30	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	A	A	18.4	5.5	7.2
31	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	A	A	A	8.3	7.2	5.8

N/A – Not Applicable, i.e. movement is non-existent or no improvements made
 # - Estimated LOS/Delay For Yield-Controlled Movement Based on HCM Stop-Controlled Methodology
 @ - 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
 & - Signalized Intersection Reconfigured and Yield-Controlled Movement Removed
 BLUE = New/Proposed Intersections/intersections with Changes Due to Site Access
 \$ - Intersection Signalized Southbound/Yield Controlled Northbound
 ** - SIDRA Roundabout Analysis Results for Worst-Case Critical Movement



The following assessment of results from the 2022 No-Build Scenario analysis was taken directly from the *Obey Creek Mixed Use Development Traffic Impact Study – Technical Memorandum #2 - 2022 Site Concept Analysis*. The information is presented in this study as a reference to Build Scenario results and discussion presented in the following section of this report.

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 7 presents the results for the 2022 Build Scenario, which includes impacts of site-related traffic (new trips and pass-by 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 7A and 7B** present a summary intersection LOS for each peak period.

Of the 32 intersection locations analyzed, the same seven intersections from the 2022 No-Build Scenario analysis 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 remain at LOS E with the addition of site traffic, with a marginal increase in overall intersection delay.

- **US 15-501 and Mt. Carmel Church Road – ID #10**

This intersection is expected to remain at a LOS E in the 2022 AM peak hour with the addition of site traffic, with a marginal increase in overall intersection delay.

- **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 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 marginal increases in overall intersection delay.

- **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 7 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 7A and 7B** present a summary intersection LOS for each peak period for any intersections requiring mitigation in the 2022 No-Build or Build Scenarios. **Figures 8A, 8B and 8C** highlight schematic improvements to geometrics and/or traffic control recommended. The following discussion highlights recommendations for mitigating specific intersection LOS/delay issues and is very similar to information presented in the *Obey Creek Mixed Use Development Traffic Impact Study – Technical Memorandum #2 - 2022 Site Concept Analysis*.

- **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 of improvement provided by the two options suggested above. A comparison of operational improvements from these two options is shown in **Table 8**, 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 converting 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 8** to projected No-Build and Build Conditions in **Table 7** indicate that this potential improvement to the westbound approach mitigates deficient operations in either Alternative Scenario.



**Table 8. 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	C	B	C	25.6	18.2	30.9
81	NC 86 Northbound & NC 54 Westbound Off-Ramp Right-Turn	A	A	A	5.6	5.0	2.8
82	NC 86 Southbound & NC 54 Westbound Off-Ramp Left-Turn	A	C	C	6.1	24.3	23.6
9	US 15-501 Northbound & US 15-501 Southbound Crossover	C	C	C	28.0	20.3	30.2
91	NC 54 Eastbound Off-Ramp Left-Turn & US 15-501 Northbound	B	A	A	16.5	9.8	3.6
92	NC 54 Eastbound Off-Ramp Right-Turn & US 15-501 Southbound	A	A	A	7.1	2.7	8.1
10	US 15-501 & Culbreth Road / Mt. Carmel Church Road	D	B	C	36.7	14.7	28.3

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	A	2.0	1.2	8.7
	NC 86 (S. Columbia Street) & NC 54 Bypass WB Off-Ramp [@]	B	B	B	11.9	10.7	10.6
9	US 15-501 & NC 54 Bypass EB Off-Ramp	C	B	B	27.4	12.3	17.1
10	US 15-501 & Culbreth Road / Mt. Carmel Church Road	C	B	C	34.2	17.1	29.7

[@] - Unsignalized Intersection, LOS/Delay Values Correspond to Worst-Case Critical Movement

• **Mt. Carmel Church Road and Bennett Road – ID #16**

Though this intersection is not projected to exhibit deficient unsignalized LOS operations (LOS F) in any 2022 peak hour, existing safety and operational concerns have led the Town to consider constructing a roundabout at this location. A single lane roundabout was tested in the SIDRA software for 2022 Build scenario traffic volumes and results are shown in **Table 7**. The roundabout should provide adequate operations for all peak hours analyzed. SIDRA results are presented in **Appendix F**.



- **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 F**.
- **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 G** 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 summer 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 summer 2014.

The Town of Chapel Hill is also investigating improvements to the intersection of Mt. Carmel Church Road and Bennett Road due to safety and operational issues. Current preliminary plans are to install a single-lane roundabout at this location once funding sources are available. This improvement was analyzed in the 2022 mitigation scenario.

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 Obey Creek Site Concept Plan #2 analyzed in this technical memorandum, shown in **Figure 2**, the Applicant proposes three 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 4th (westbound) leg to the intersection. No specific laneage details are provided on the current preliminary plan. It was assumed that this new access roadway would be a two-lane facility and all assume 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 4th (westbound) leg to the intersection with no median break. The existing Park-and-Ride Driveway and the proposed site driveway access would be stop-controlled RIRO intersections.
- US 15-501 & Proposed Southern Driveway Access Intersection – Construct a two-way driveway access point just north of the Dogwood Acres signalized intersection with RIRO unsignalized traffic control.

No improvements to US 15-501 geometrics are shown on the site plan for Obey Creek Concept #2. A fully developed internal roadway network is depicted, showing neighborhood connections to the three access points. 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 9**. 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 9** is also schematically displayed in **Figures 8A, 8B, and 8C**.

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, and acknowledging that site traffic impacts with the proposed Site Concept #2 development plan in the interchange area do not cause degradation of Level-of-Service and only have marginal effects on vehicular delays, **Table 9** notes that the significant proposed improvement strategies are not the responsibility of the Applicant. Regardless of future improvement option, the development of the Obey Creek site should include the commitment to retune/reoptimize all of the traffic signals along the US 15-501 corridor from the NC 54 Bypass to Dogwood Acres Drive to minimize the impact of site-related traffic increases.

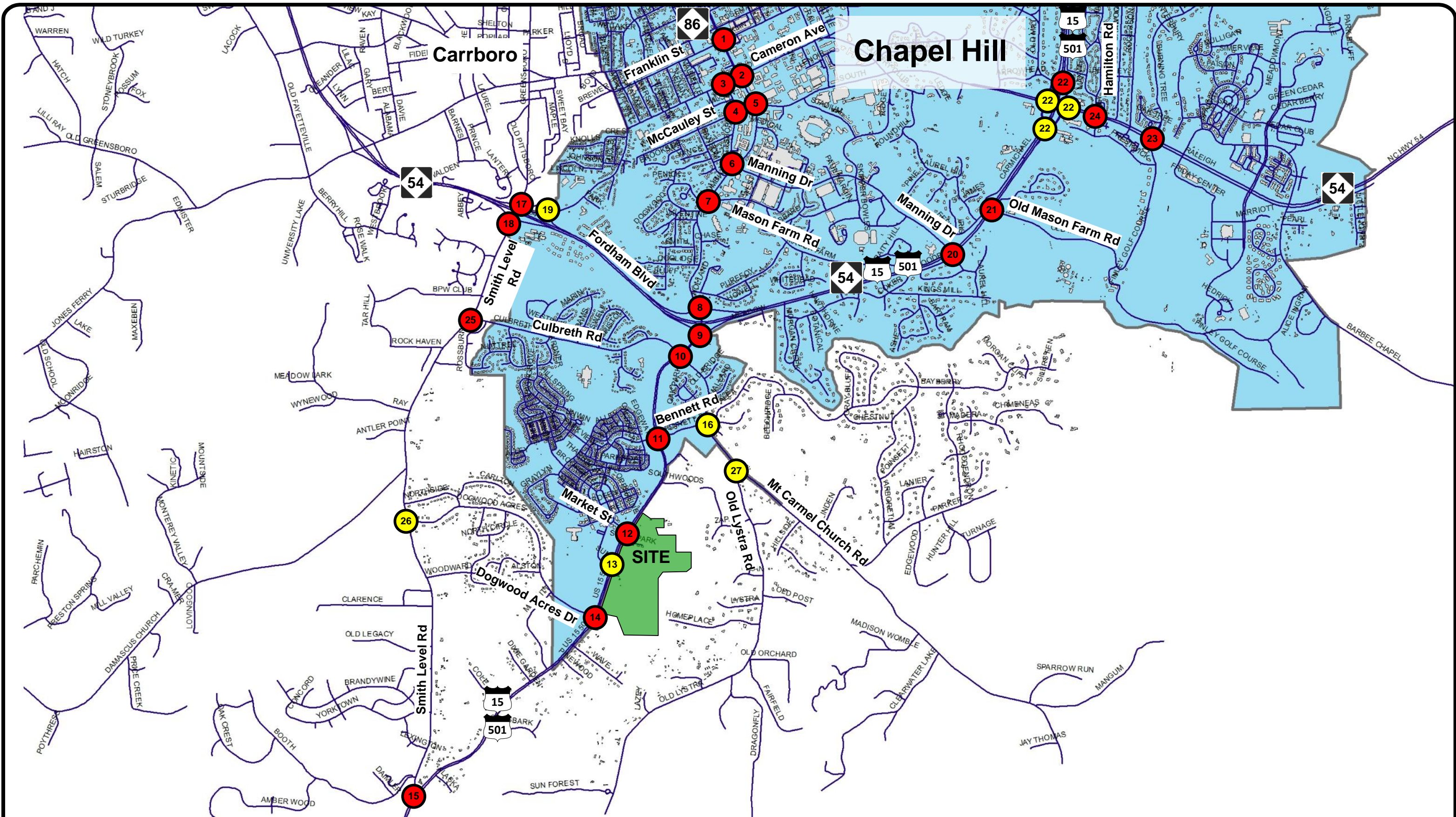


Table 9. Recommended Improvements Matrix

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"> With limited feasible geometric improvement options available periodically reoptimize traffic signal for maximum efficiency and changes to traffic volumes
8	NC 86 (S. Columbia Street) & NC 54 Bypass (Fordham Blvd) Westbound Ramps	E	E	<p>Alternative 1</p> <ul style="list-style-type: none"> Reconfigure existing interchange as a Diverging Diamond Interchange Reoptimize signals along US 15-501 corridor <p>Alternative 2</p> <ul style="list-style-type: none"> Create NC 54 Bypass Westbound Loop Off-Ramp with free-flowing southbound traffic movement at bridge Reconfigure existing intersection for longer northbound left-turn lane Create existing westbound off-ramp stop-controlled right-turn movement Provide single southbound through lane and right turn lane Reoptimize signals along US 15-501 corridor
9	US 15-501 & NC 54 Bypass (Fordham Blvd) Eastbound Ramps	C	C	<p>Alternative 1</p> <ul style="list-style-type: none"> Reconfigure existing interchange as a Diverging Diamond Interchange Reoptimize signals along US 15-501 corridor <p>Alternative 2</p> <ul style="list-style-type: none"> No geometric changes, only signal timing reoptimization along US 15-501 corridor
10	US 15-501 & Culbreth Road / Mt. Carmel Church Road	E	E	<ul style="list-style-type: none"> Restripe existing westbound Mt. Carmel Church Road approach for a shared left-turn/through lane and dual right-turn lanes Reoptimize signals along US 15-501 corridor
12	US 15-501 & Market Street / Site Driveway #3	C	D	<ul style="list-style-type: none"> Construct northbound right-turn deceleration lane with minimum of 150 feet of storage and full taper Upgrade signal and retime signals along US 15-501 corridor Provide crosswalks across US 15-501 & pedestrian signal heads
14	US 15-501 & Dogwood Acres Drive	A	B	<ul style="list-style-type: none"> Provide crosswalk and pedestrian signal heads across north leg of US 15-501 at this intersection Extend sidewalk from intersection to Obey Creek parcel frontage
16	Mt. Carmel Church Road & Bennett Road	D	E	<ul style="list-style-type: none"> Construct single lane roundabout
19	NC 54 Bypass (Fordham Blvd) Westbound Off-Ramp & Merritt Mill Road	F	F	<ul style="list-style-type: none"> 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)
20	US 15-501/NC 54 Bypass (Fordham Boulevard) & Manning Drive	D	D	<ul style="list-style-type: none"> Convert existing intersection to a "reverse" superstreet concept – allow left and right-turns at Manning Drive approaches Construct downstream median u-turn superstreet intersection and signalize
21	US 15-501/NC 54 Bypass (Fordham Boulevard) & Old Mason Farm Road	F	F	<ul style="list-style-type: none"> Convert existing intersection to a superstreet concept – allow no left-turns for any approach Construct downstream median u-turn superstreet intersection and signalize
22 N	US 15-501 Bypass (Fordham Boulevard) & NC 54 (Raleigh Road) Interchange Ramps (North)	F	F	<ul style="list-style-type: none"> Eliminate northbound US 15-501 loop off-ramp 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 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
22 W	US 15-501 Bypass (Fordham Blvd) & NC 54 (Raleigh Road) Interchange Ramps (West)	F	F	<ul style="list-style-type: none"> 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
28	US 15-501 & Site Driveway #1 (RIRO)	N/A	B	<ul style="list-style-type: none"> Consider eliminating intersection due to proximity to Dogwood Acres Drive signalized intersection and southbound u-turn bulb-out. Create nearby internal local street dead-end connection to future development on land parcel to the south of Obey Creek (with eventual access at signalized Dogwood Acres intersection).
29	US 15-501 & Site Driveway #2 (RIRO)	N/A	B	<ul style="list-style-type: none"> Construct northbound right-turn deceleration lane with minimum of 150 feet of storage and full taper


RED = Developer Required Improvement

Appendix A – Figures



Obey Creek Mixed-Use Development (Concept #2)
Traffic Impact Study

PROJECT STUDY AREA



**NOT
TO
SCALE**

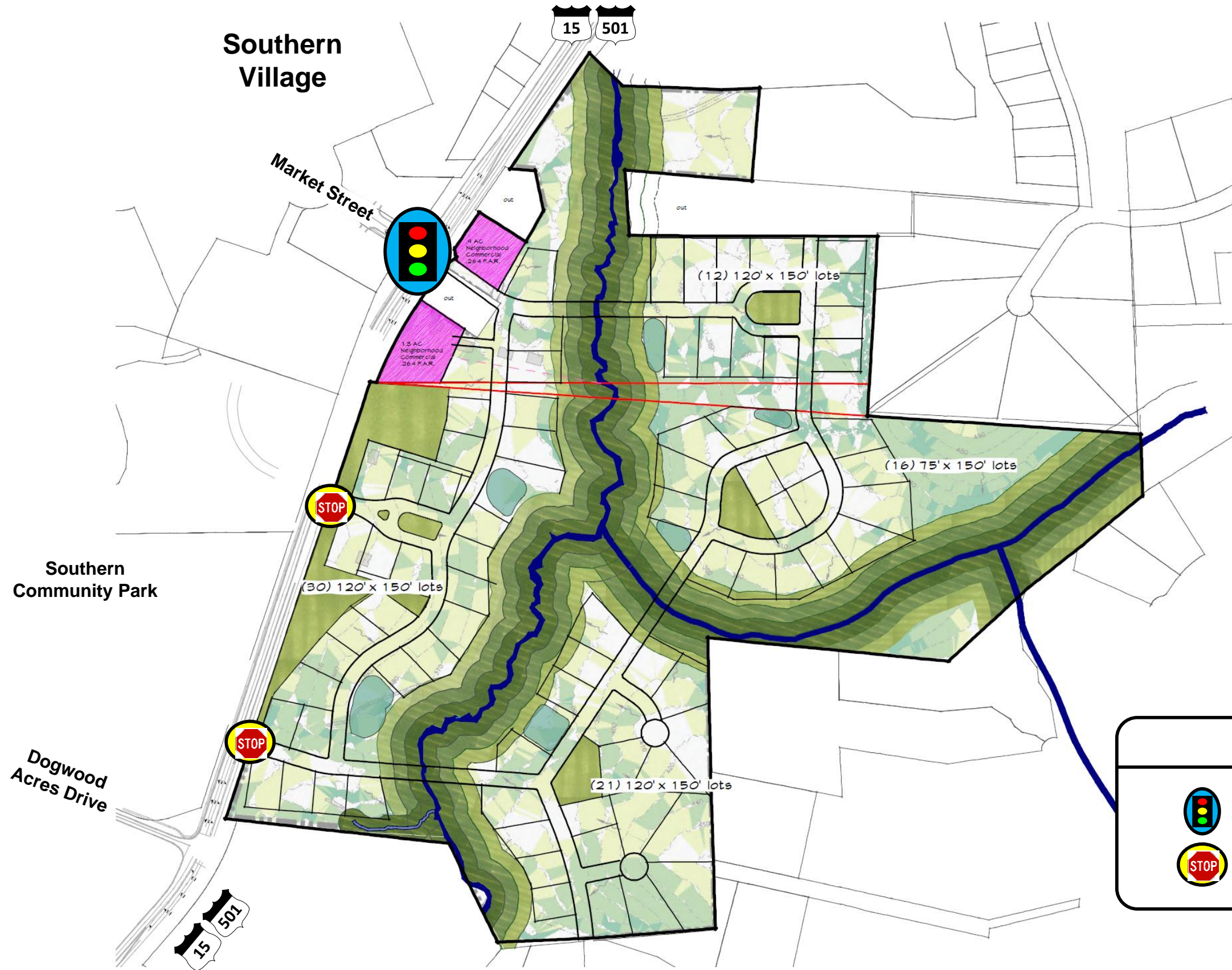
- LEGEND**
- = Signalized Study Area Intersection
 - = Unsignalized Study Area Intersection

DATE: August 2014

FIGURE 1



Southern Village



SITE DATA

Total Site Area	120.0 AC (GLA)
Less TCH Outparcel	- 2.4 AC
Less RCD	- 38.5 AC
(RCD not considered in Cluster Lot density calc)	
Net Land Area	- 79.1 AC
Maximum No. of Lots	79 Lots

Land Use

Commercial	2.4 AC
Single-Family Lots	115.2 AC

Proposed Lots

120' x 150'	79 Lots
-------------	---------

Impervious Surface 18% +/-

Recreation Area Req. 5.8 Ac + Improved

Environmental Impacts

Total Area within RCD	38.5 AC
Other Undisturbed Area	9.6 AC
Total Undisturbed	48.1 AC
Total Disturbed Area	69.5 AC (59%)

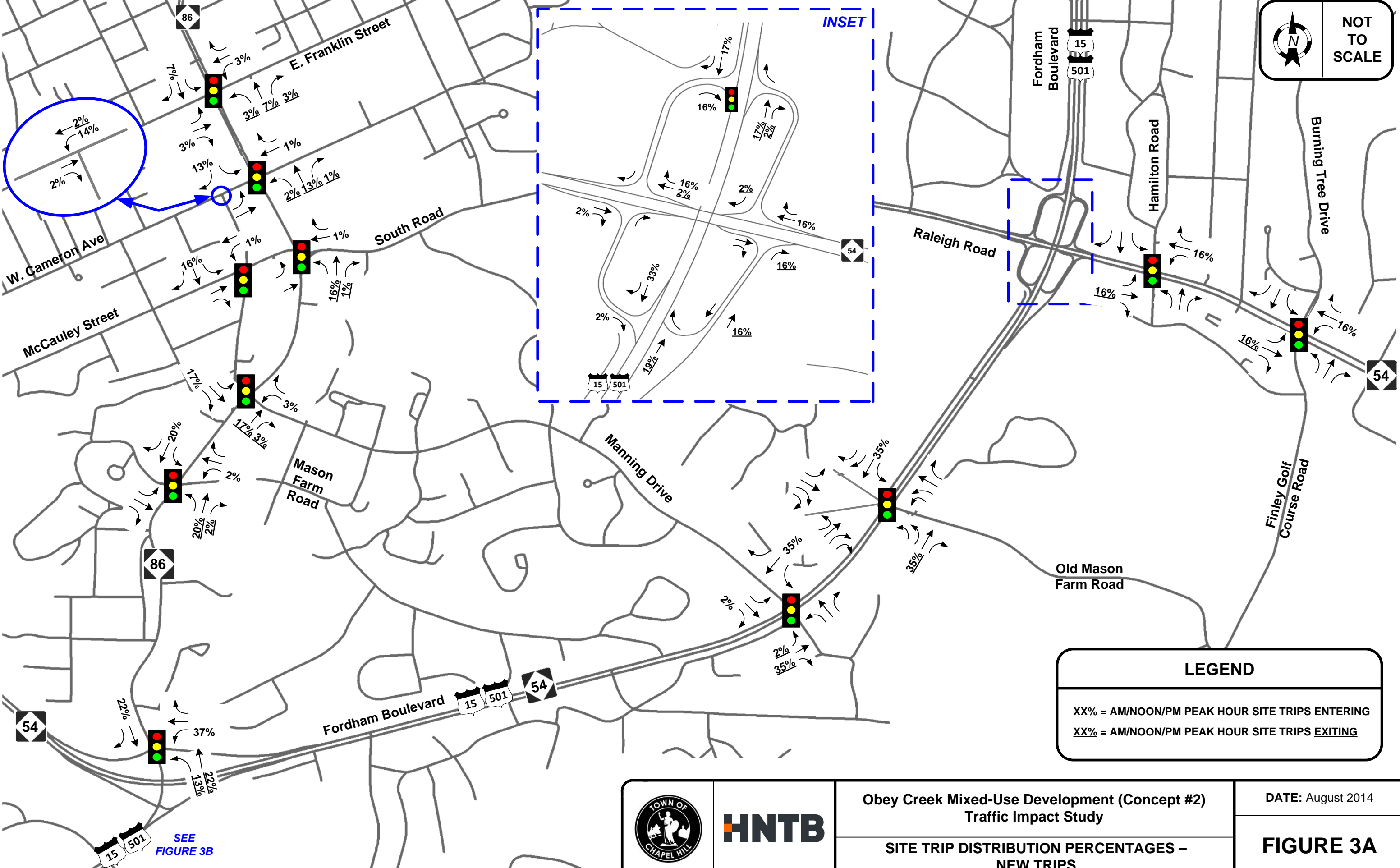
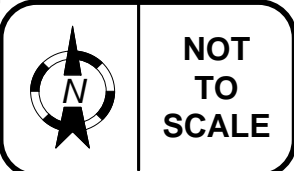
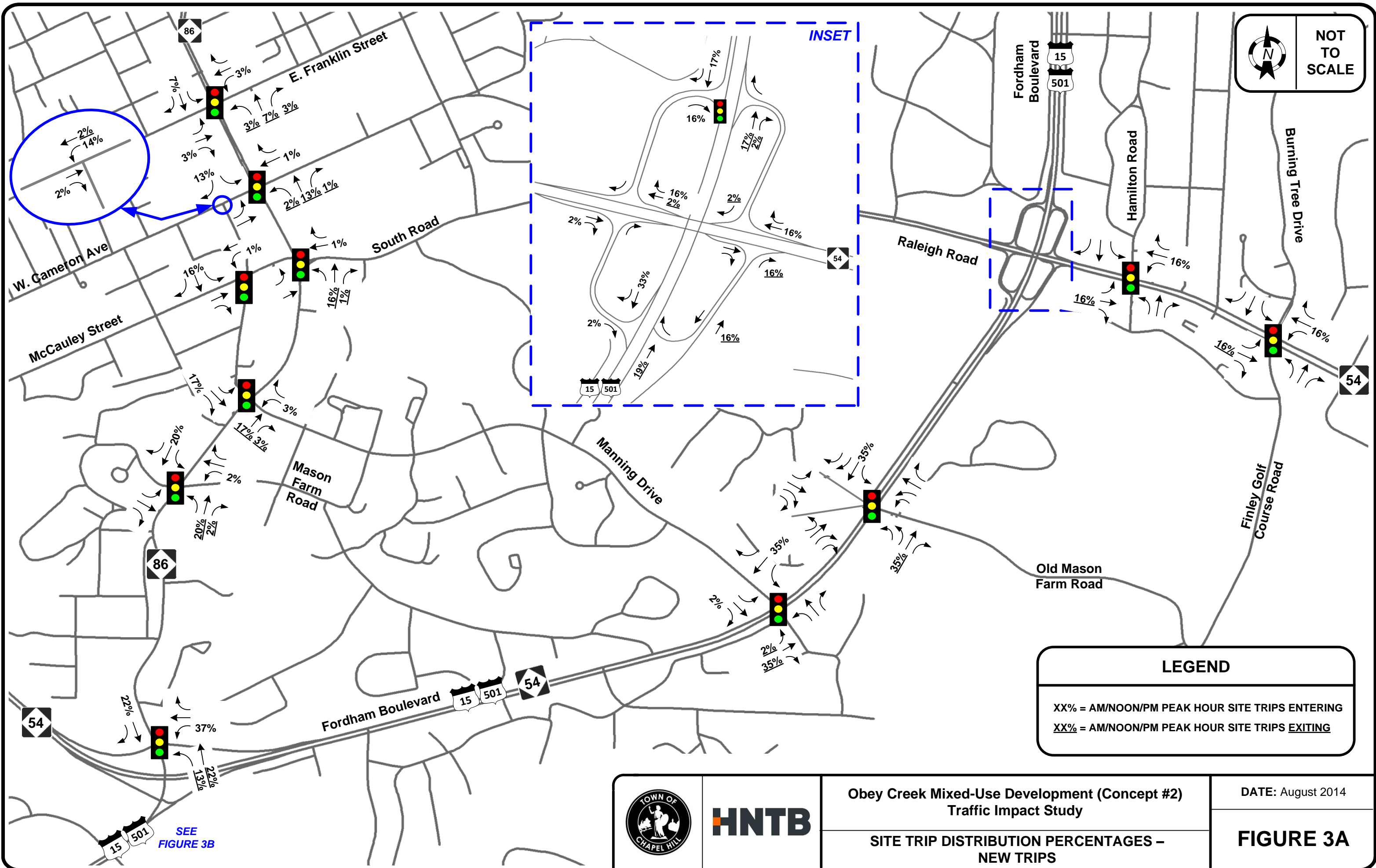
LEGEND

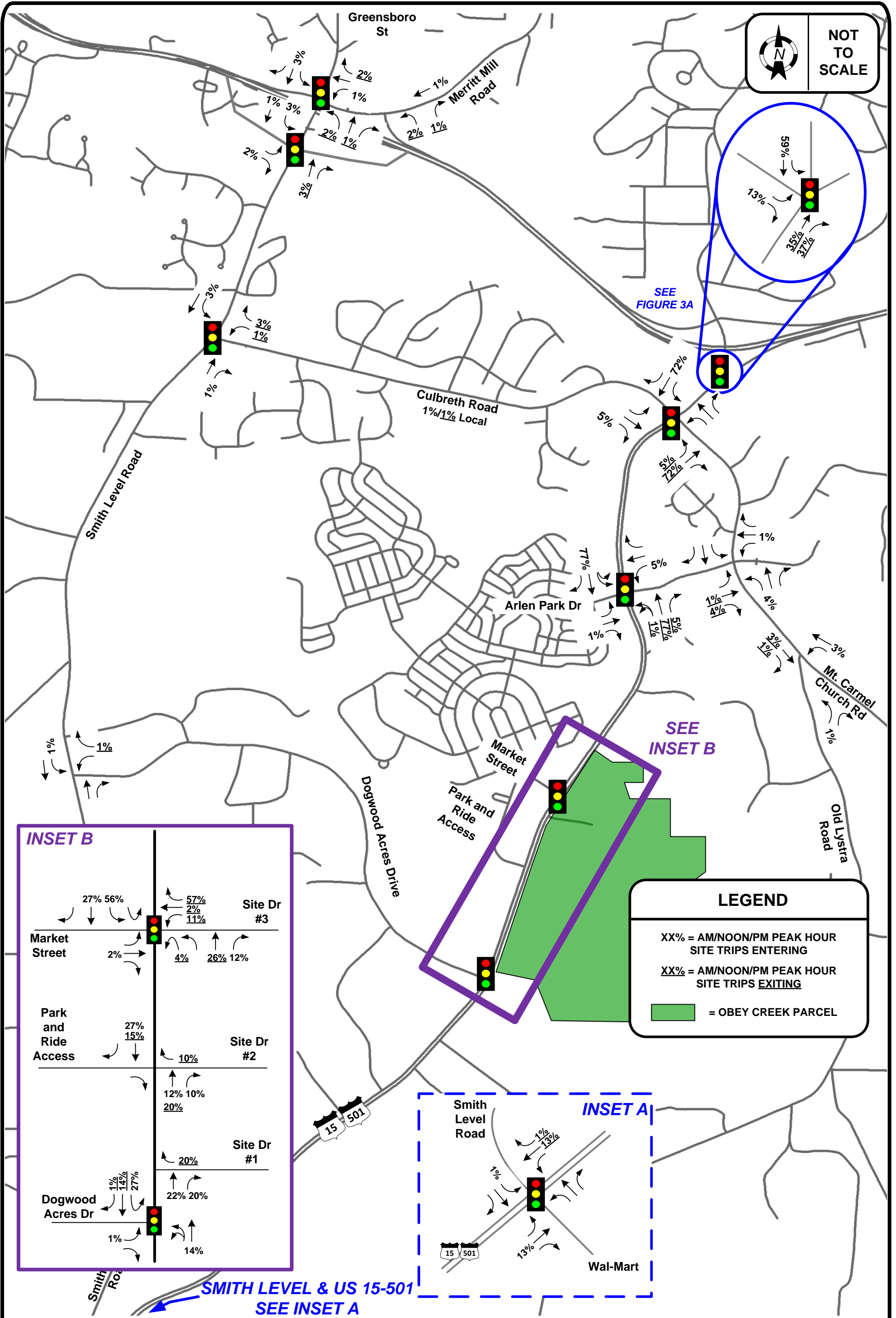


= Existing Signalized Intersection



= Proposed RIRO Stop-Controlled Intersection





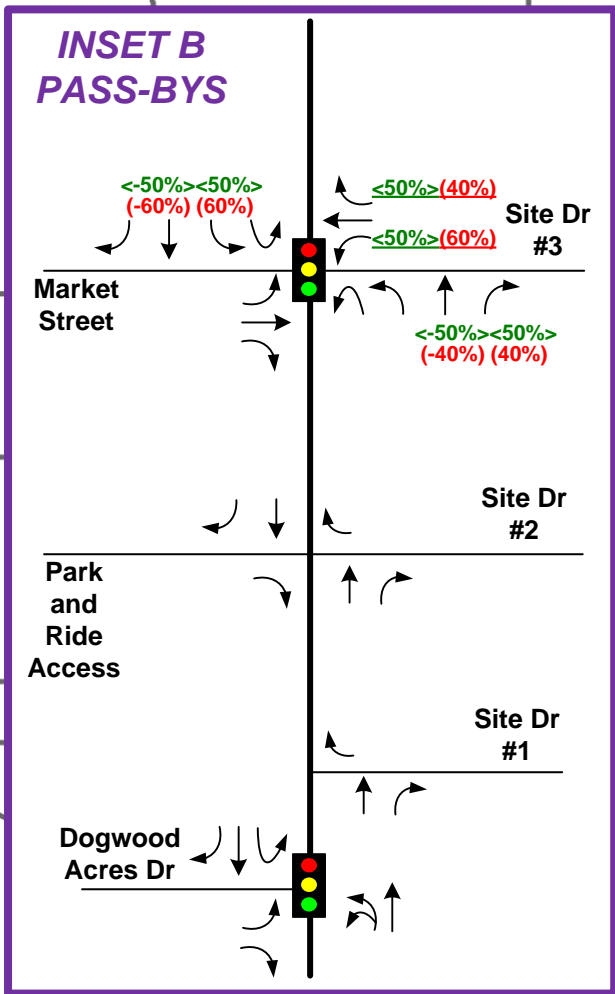
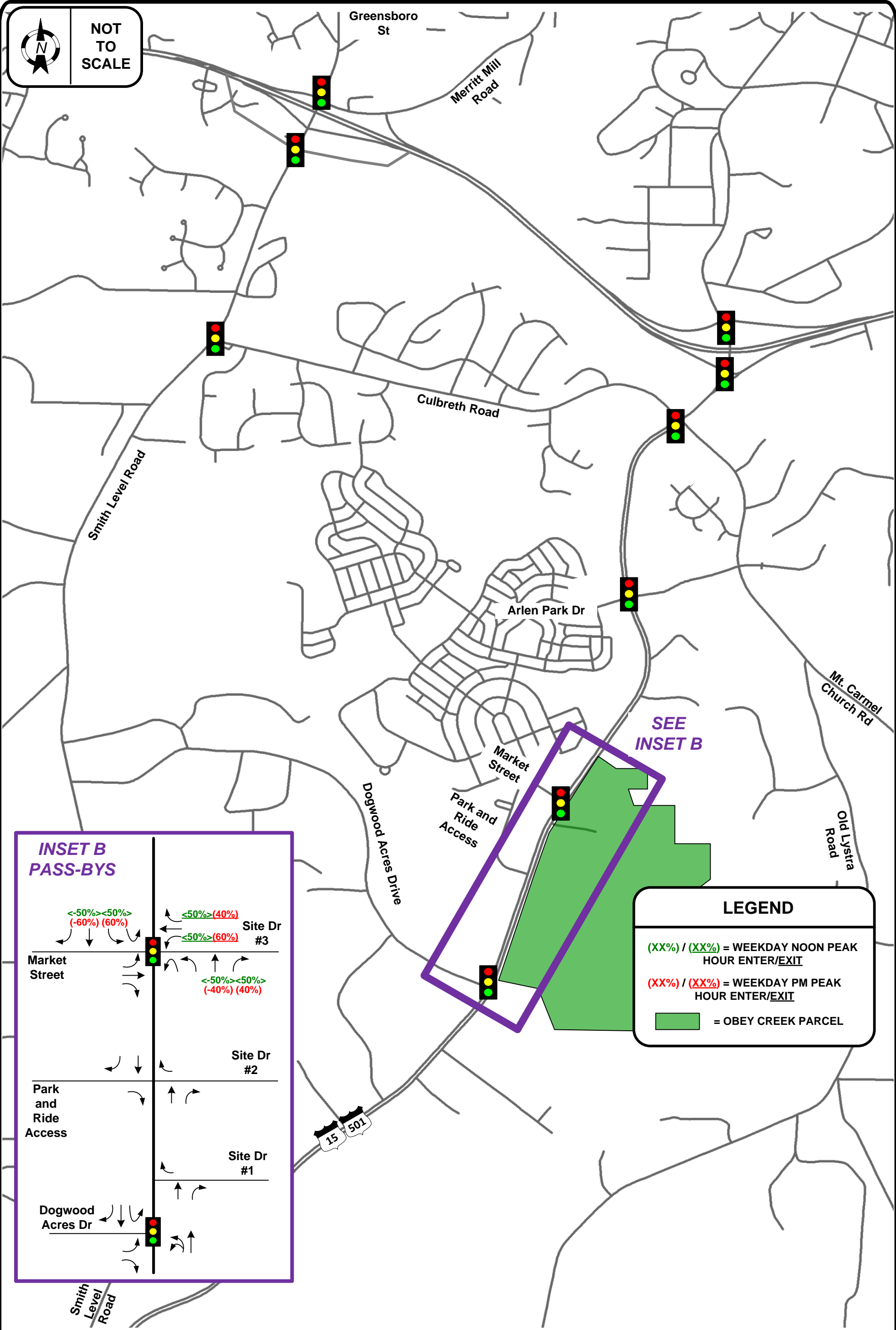
HNTB

**Obey Creek Mixed-Use Development (Concept #2)
Traffic Impact Study**

DATE: August 2014

SITE TRIP DISTRIBUTION PERCENTAGES – NEW TRIPS

FIGURE 3B



LEGEND

$(XX\%) / (XX\%) =$ WEEKDAY NOON PEAK HOUR ENTER/EXIT
 $(XX\%) / (XX\%) =$ WEEKDAY PM PEAK HOUR ENTER/EXIT
 = OBEY CREEK PARCEL

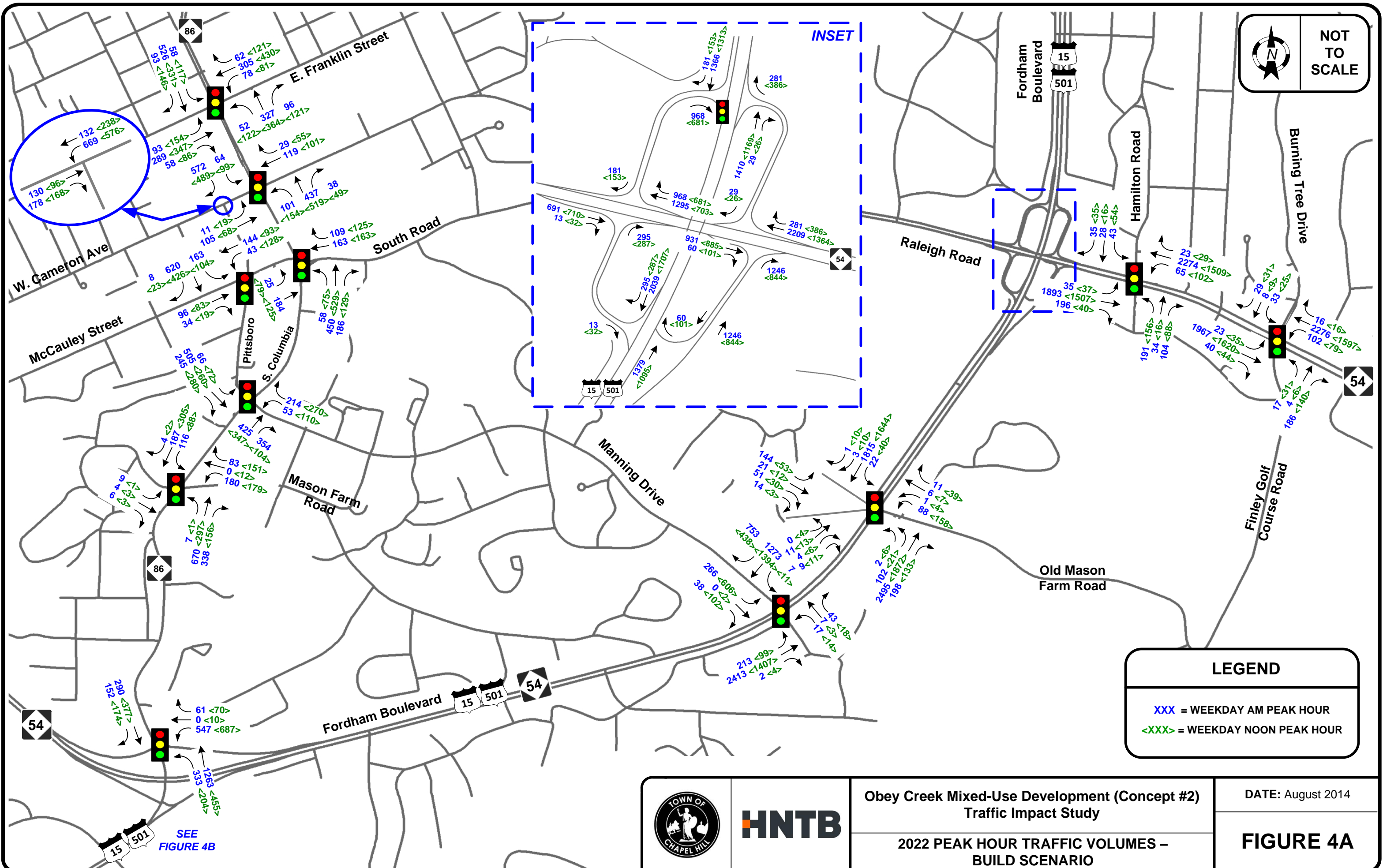
**Obey Creek Mixed-Use Development (Concept #2)
Traffic Impact Study**

DATE: August 2014



SITE PASS-BY TRIP DISTRIBUTION PERCENTAGES

FIGURE 3C



LEGEND

XXX = WEEKDAY AM PEAK HOUR
 <XXX> = WEEKDAY NOON PEAK HOUR



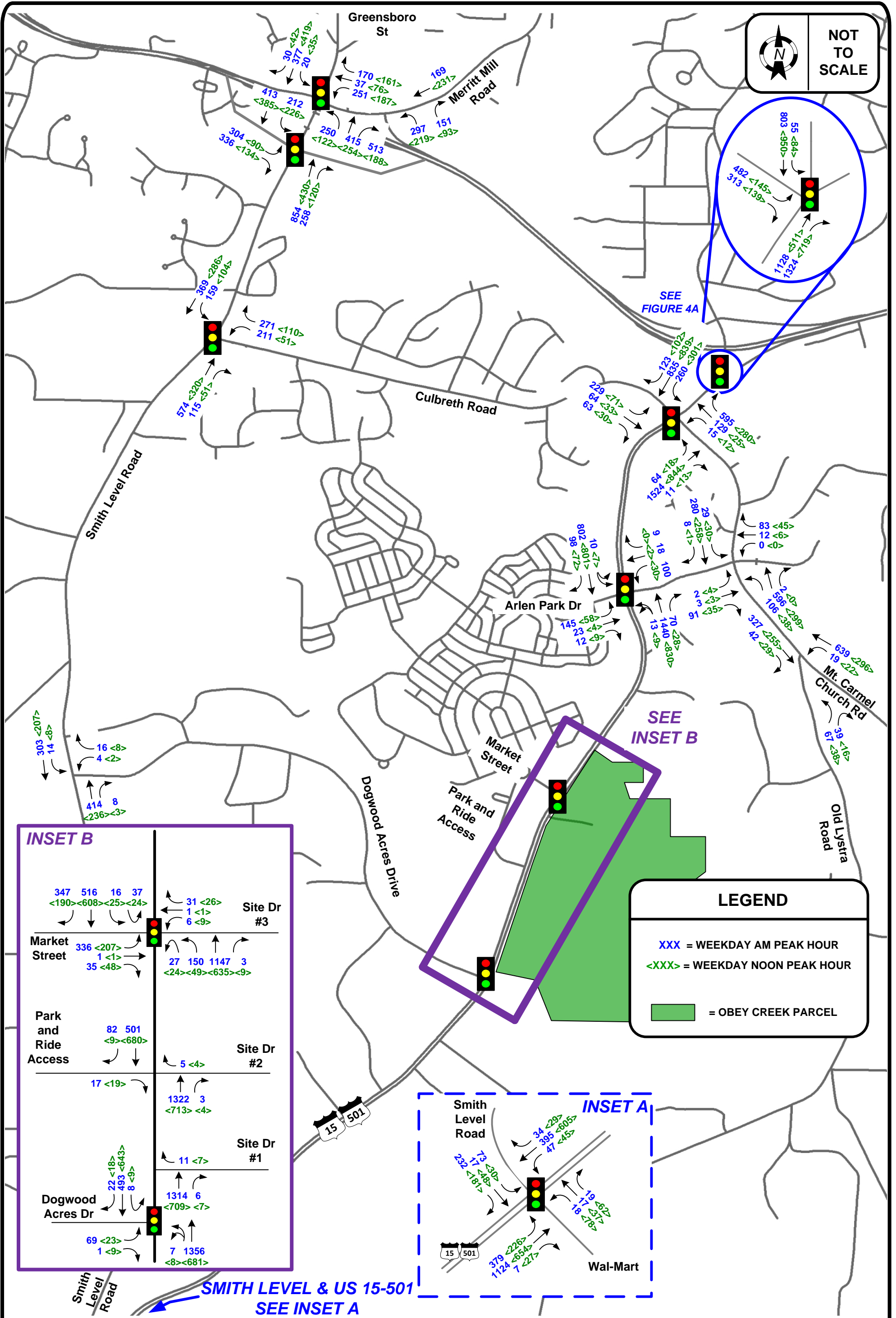
Obey Creek Mixed-Use Development (Concept #2)
 Traffic Impact Study

2022 PEAK HOUR TRAFFIC VOLUMES –
 BUILD SCENARIO

DATE: August 2014

FIGURE 4A

SEE FIGURE 4B

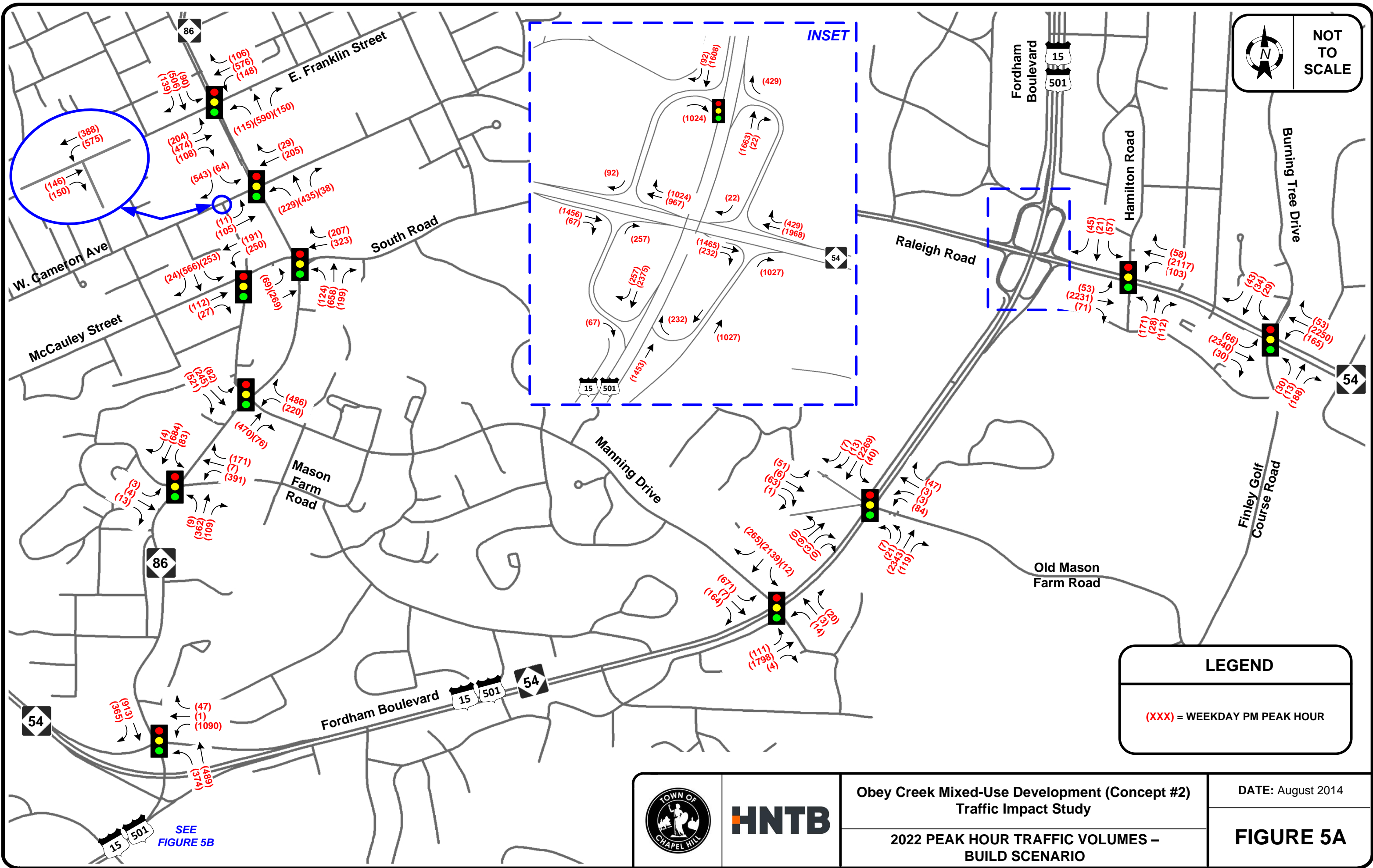


**Obey Creek Mixed-Use Development (Concept #2)
Traffic Impact Study**

2022 PEAK HOUR TRAFFIC VOLUMES – BUILD SCENARIO

DATE: August 2014

FIGURE 4B



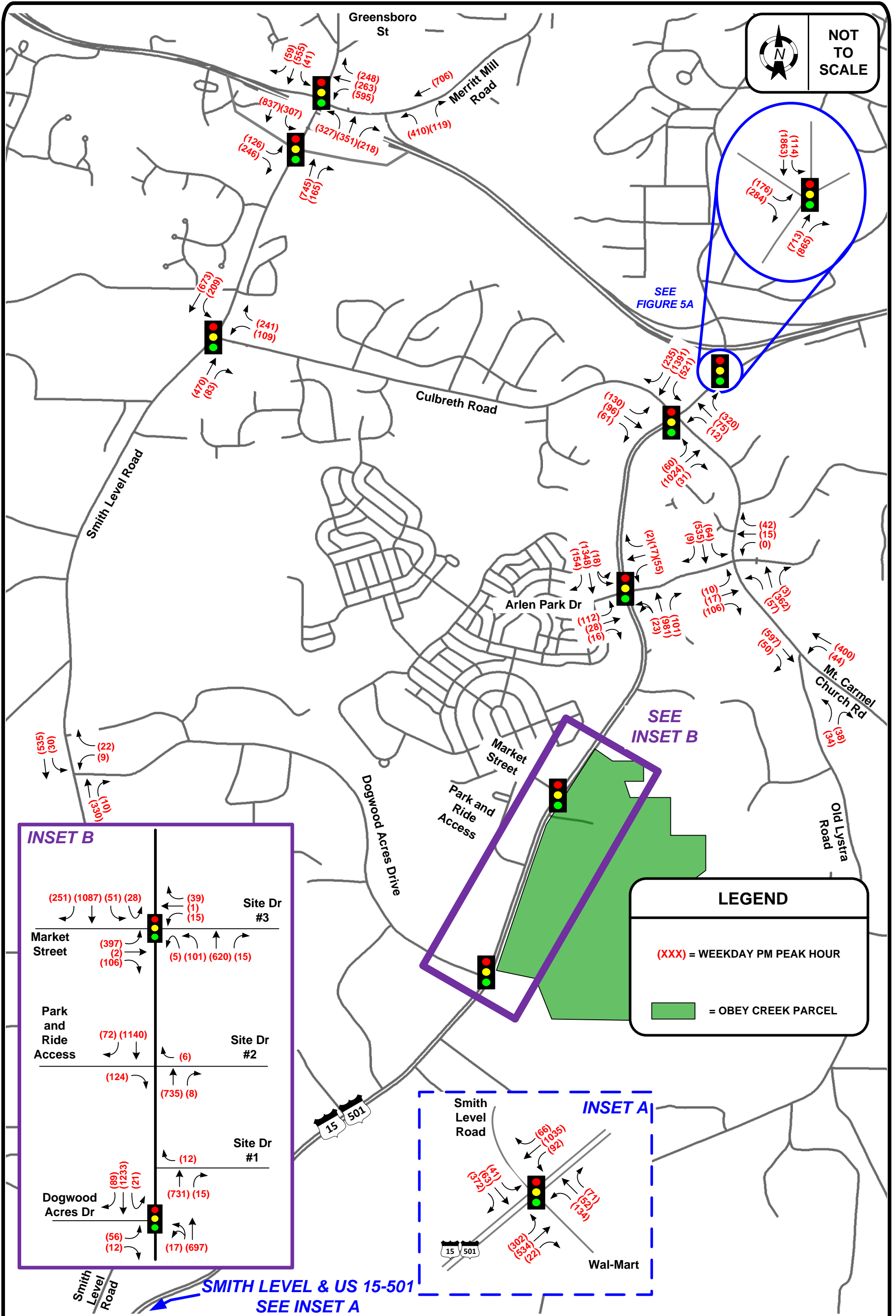
HNTB

Obey Creek Mixed-Use Development (Concept #2)
 Traffic Impact Study

2022 PEAK HOUR TRAFFIC VOLUMES –
 BUILD SCENARIO

DATE: August 2014

FIGURE 5A



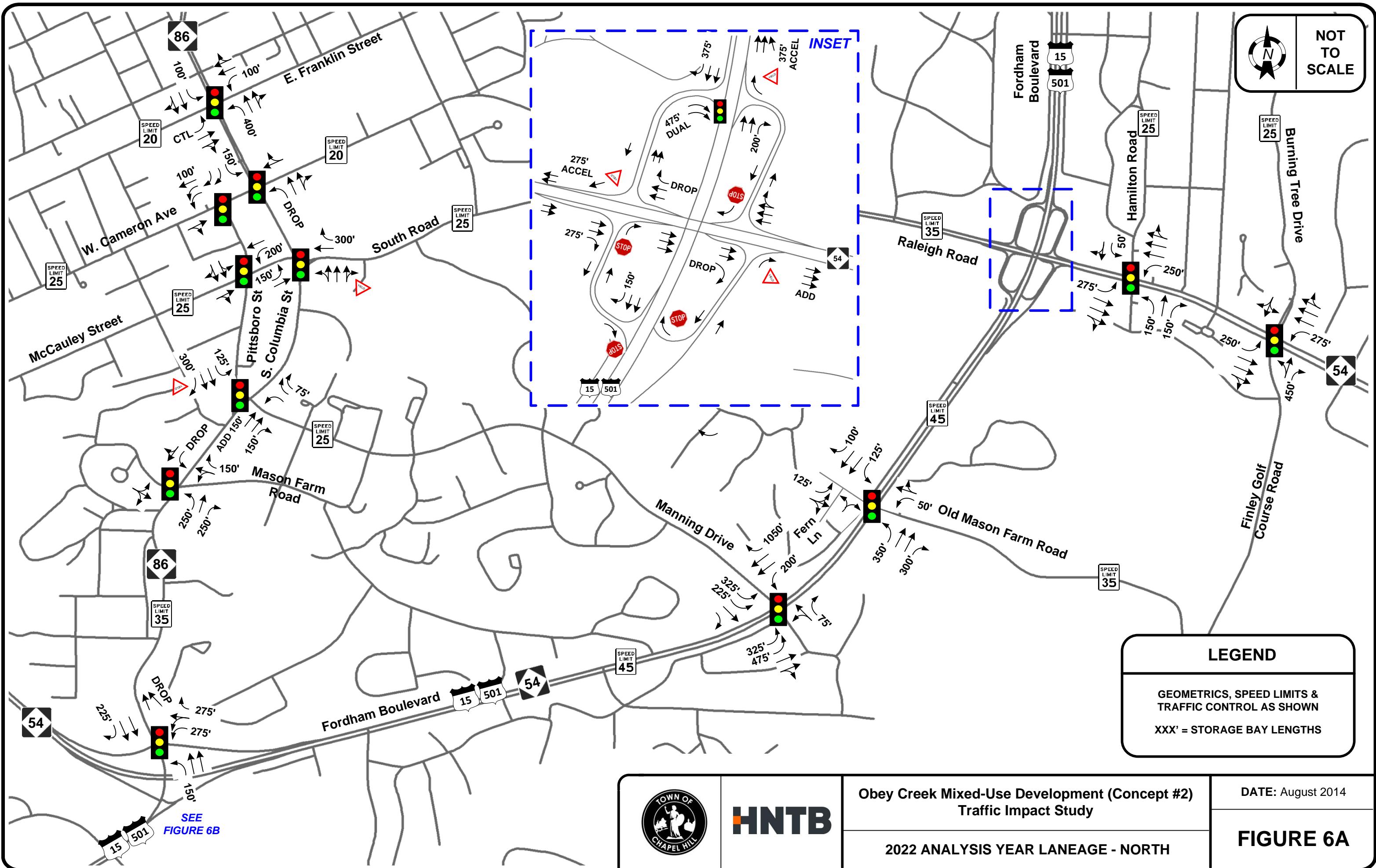
HNTB

**Obey Creek Mixed-Use Development (Concept #2)
 Traffic Impact Study**

2022 PEAK HOUR TRAFFIC VOLUMES – BUILD SCENARIO

DATE: August 2014

FIGURE 5B



LEGEND

GEOMETRICS, SPEED LIMITS & TRAFFIC CONTROL AS SHOWN

XXX' = STORAGE BAY LENGTHS



HNTB

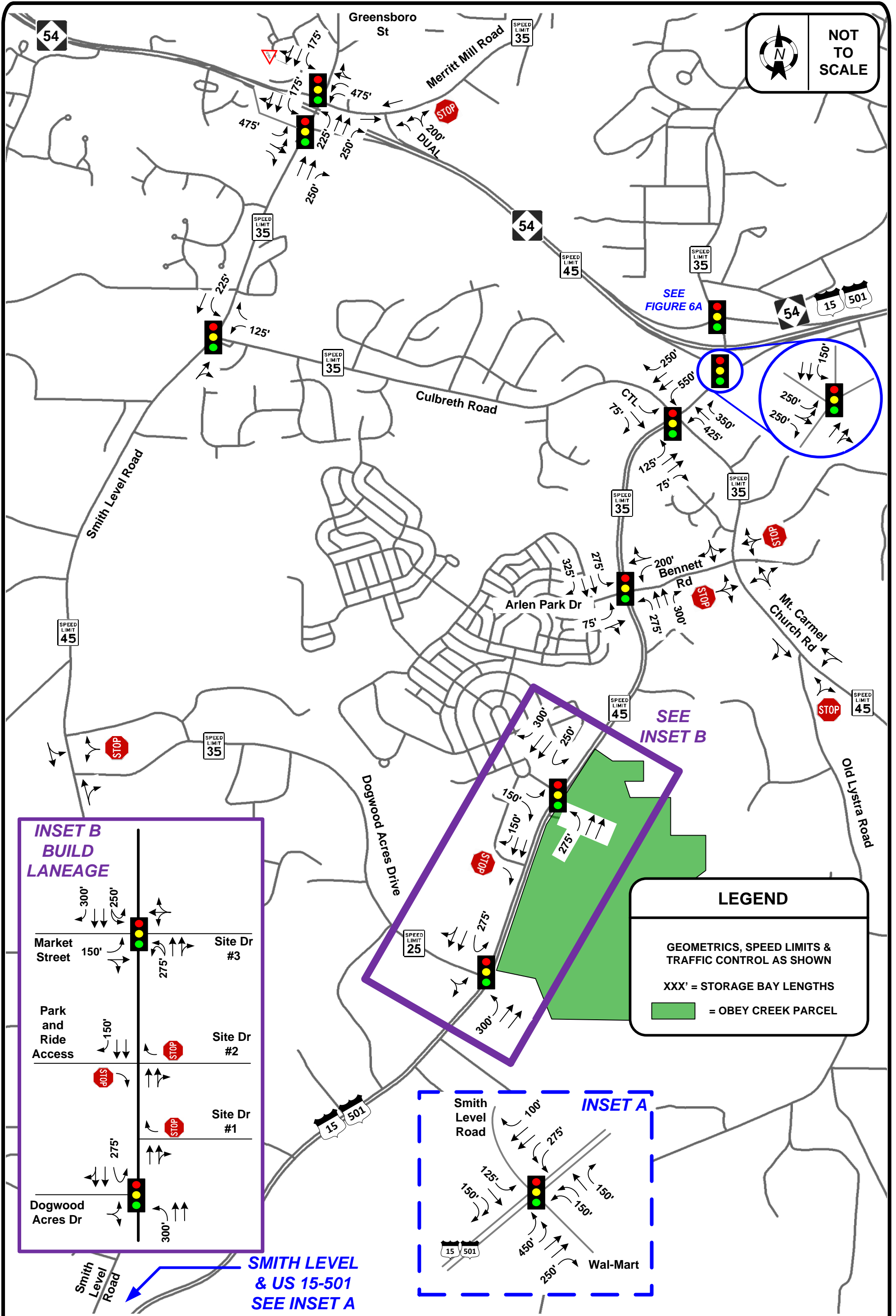
Obey Creek Mixed-Use Development (Concept #2)
Traffic Impact Study

DATE: August 2014

2022 ANALYSIS YEAR LANEAGE - NORTH

FIGURE 6A

SEE FIGURE 6B



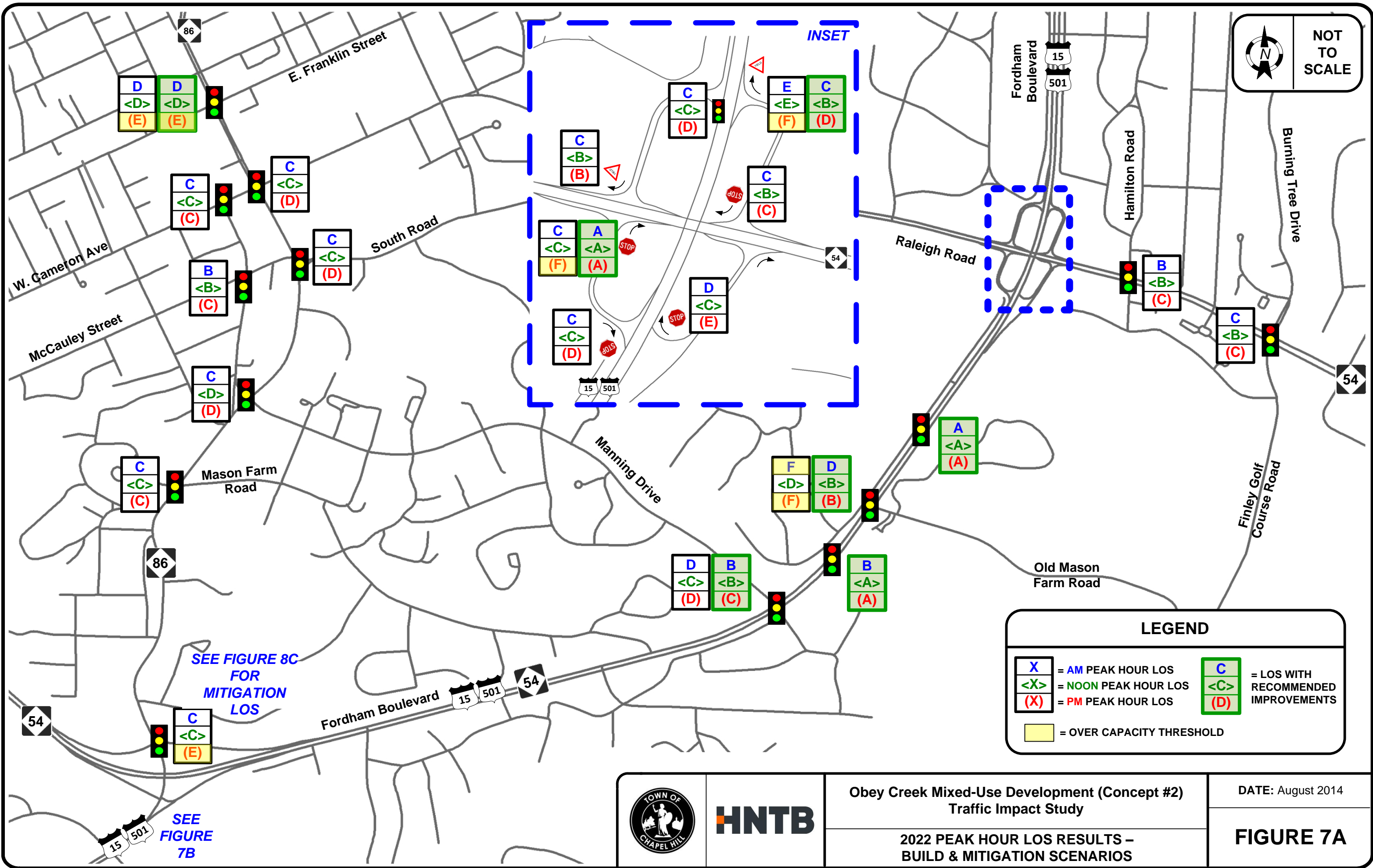
HNTB

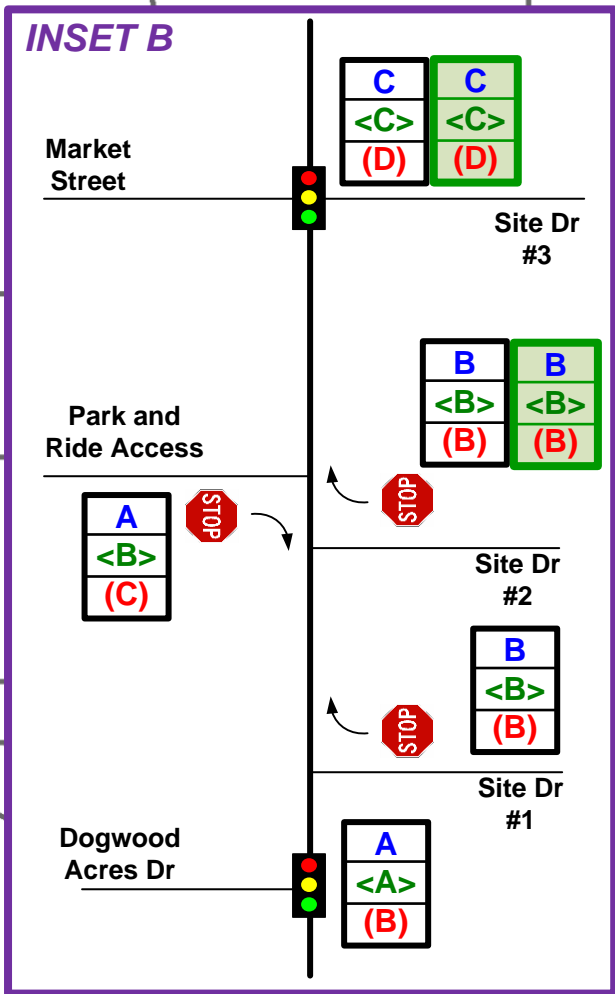
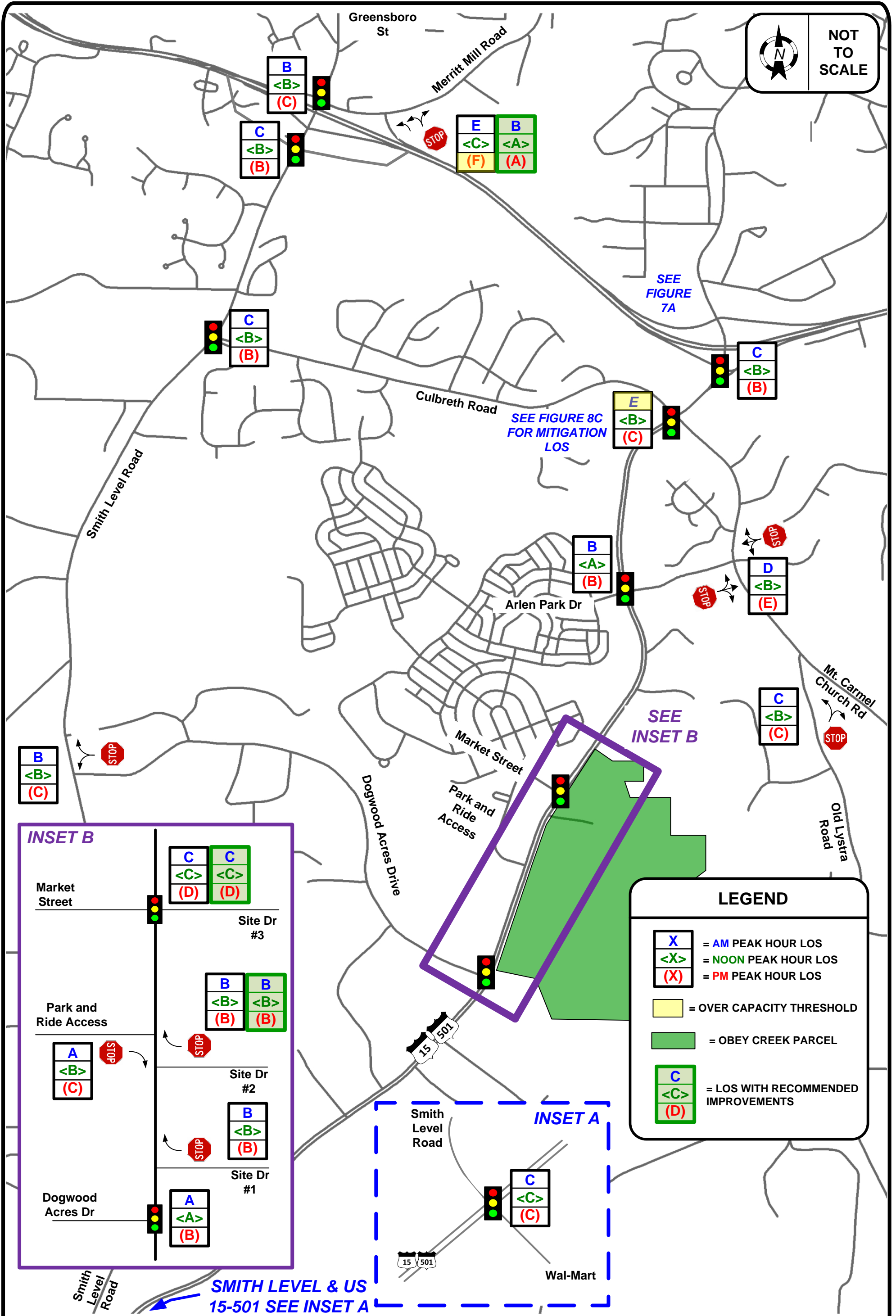
**Obey Creek Mixed-Use Development (Concept #2)
Traffic Impact Study**

2022 ANALYSIS YEAR LANEAGE - SOUTH

DATE: August 2014

FIGURE 6B





LEGEND

	= AM PEAK HOUR LOS
	= NOON PEAK HOUR LOS
	= PM PEAK HOUR LOS
	= OVER CAPACITY THRESHOLD
	= OBEY CREEK PARCEL
	= LOS WITH RECOMMENDED IMPROVEMENTS

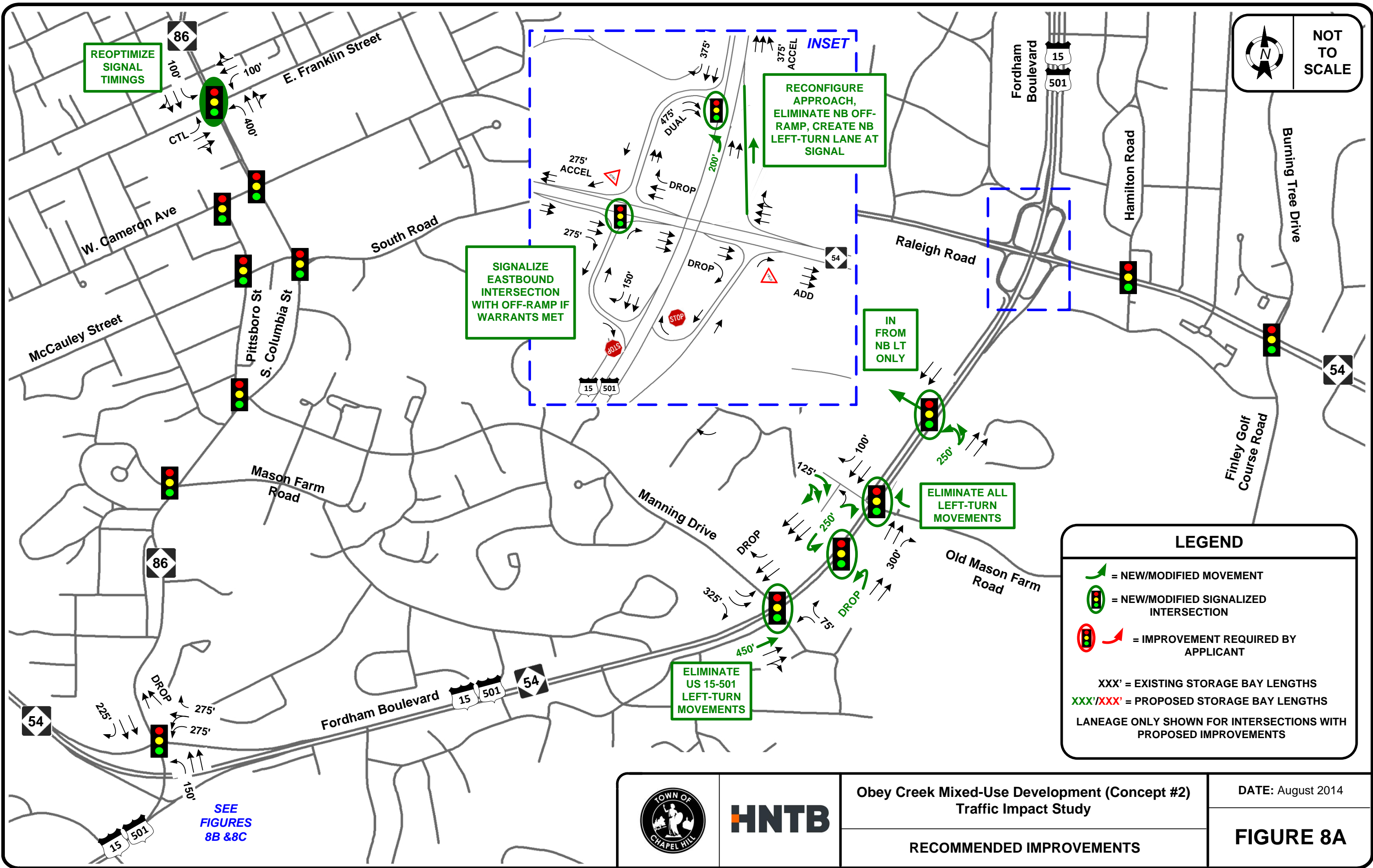
Obey Creek Mixed-Use Development (Concept #2)
Traffic Impact Study

DATE: August 2014

2022 PEAK HOUR LOS RESULTS – BUILD & MITIGATION SCENARIOS

FIGURE 7B





NOT TO SCALE

REOPTIMIZE SIGNAL TIMINGS

RECONFIGURE APPROACH, ELIMINATE NB OFF-RAMP, CREATE NB LEFT-TURN LANE AT SIGNAL

SIGNALIZE EASTBOUND INTERSECTION WITH OFF-RAMP IF WARRANTS MET

IN FROM NB LT ONLY

ELIMINATE ALL LEFT-TURN MOVEMENTS

ELIMINATE US 15-501 LEFT-TURN MOVEMENTS

SEE FIGURES 8B & 8C

LEGEND

- = NEW/MODIFIED MOVEMENT
- = NEW/MODIFIED SIGNALIZED INTERSECTION
- = IMPROVEMENT REQUIRED BY APPLICANT

XXX' = EXISTING STORAGE BAY LENGTHS
 XXX'/XXX' = PROPOSED STORAGE BAY LENGTHS
 LANEAGE ONLY SHOWN FOR INTERSECTIONS WITH PROPOSED IMPROVEMENTS



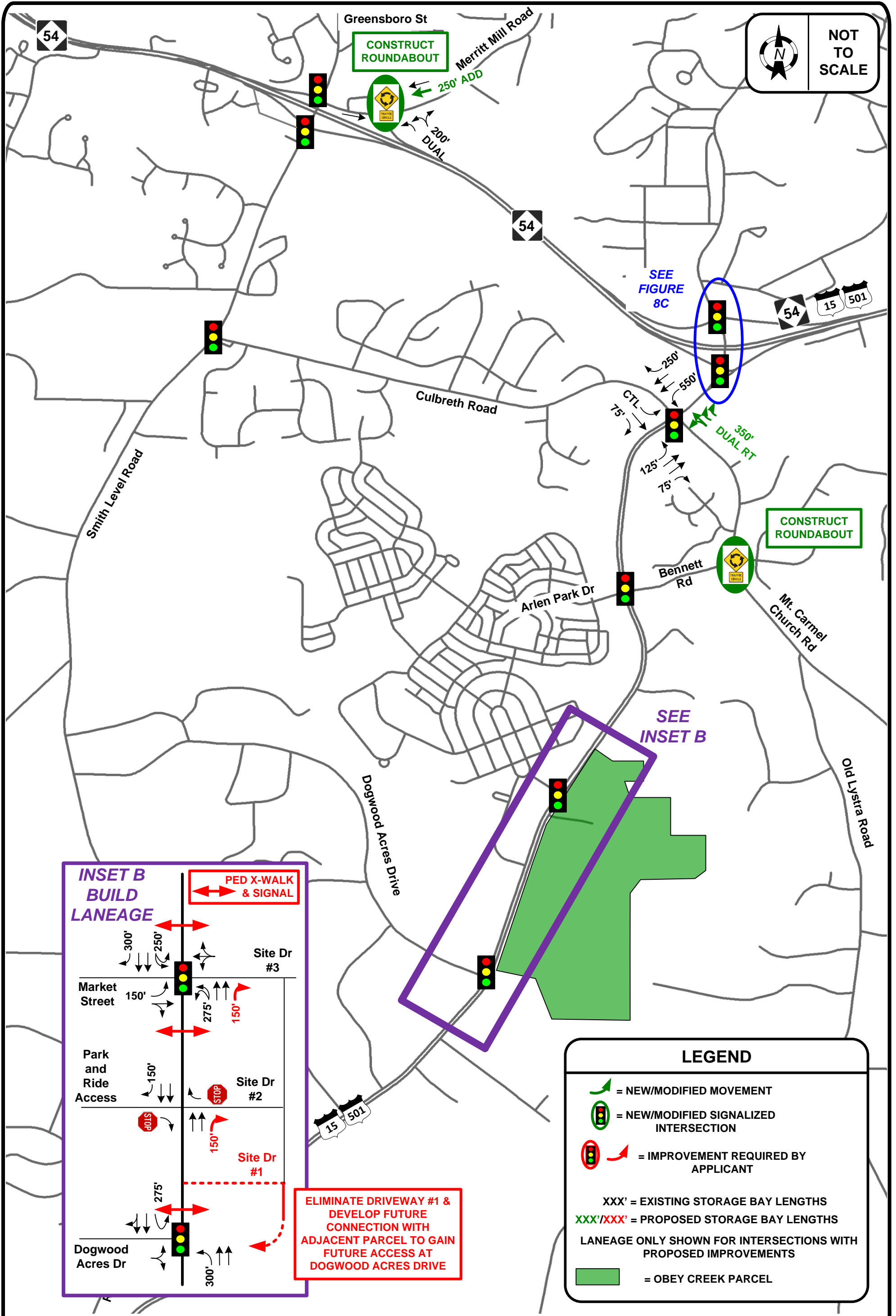
HNTB

Obey Creek Mixed-Use Development (Concept #2)
 Traffic Impact Study

DATE: August 2014

RECOMMENDED IMPROVEMENTS

FIGURE 8A



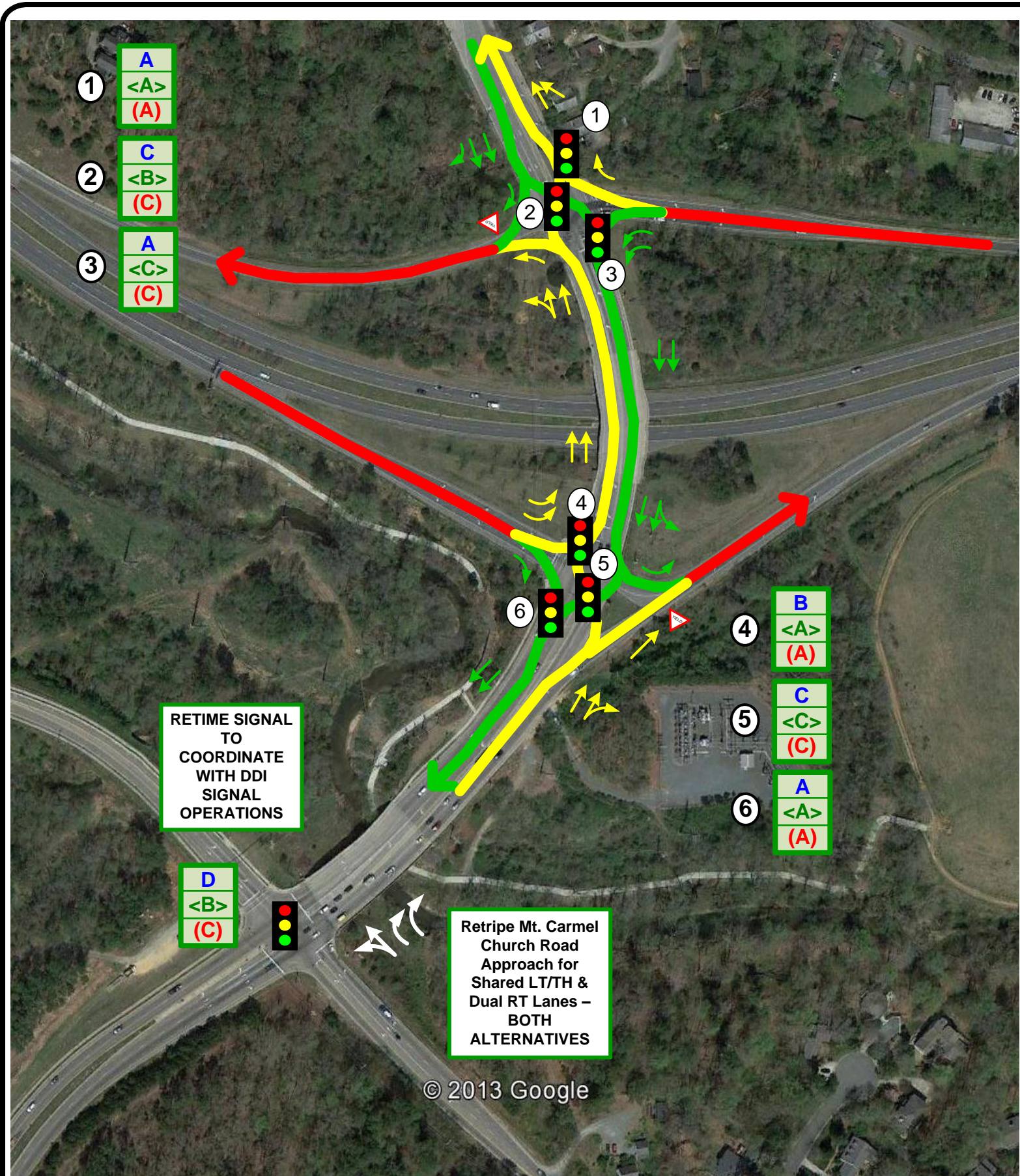
HNTB

Obey Creek Mixed-Use Development (Concept #2)
Traffic Impact Study

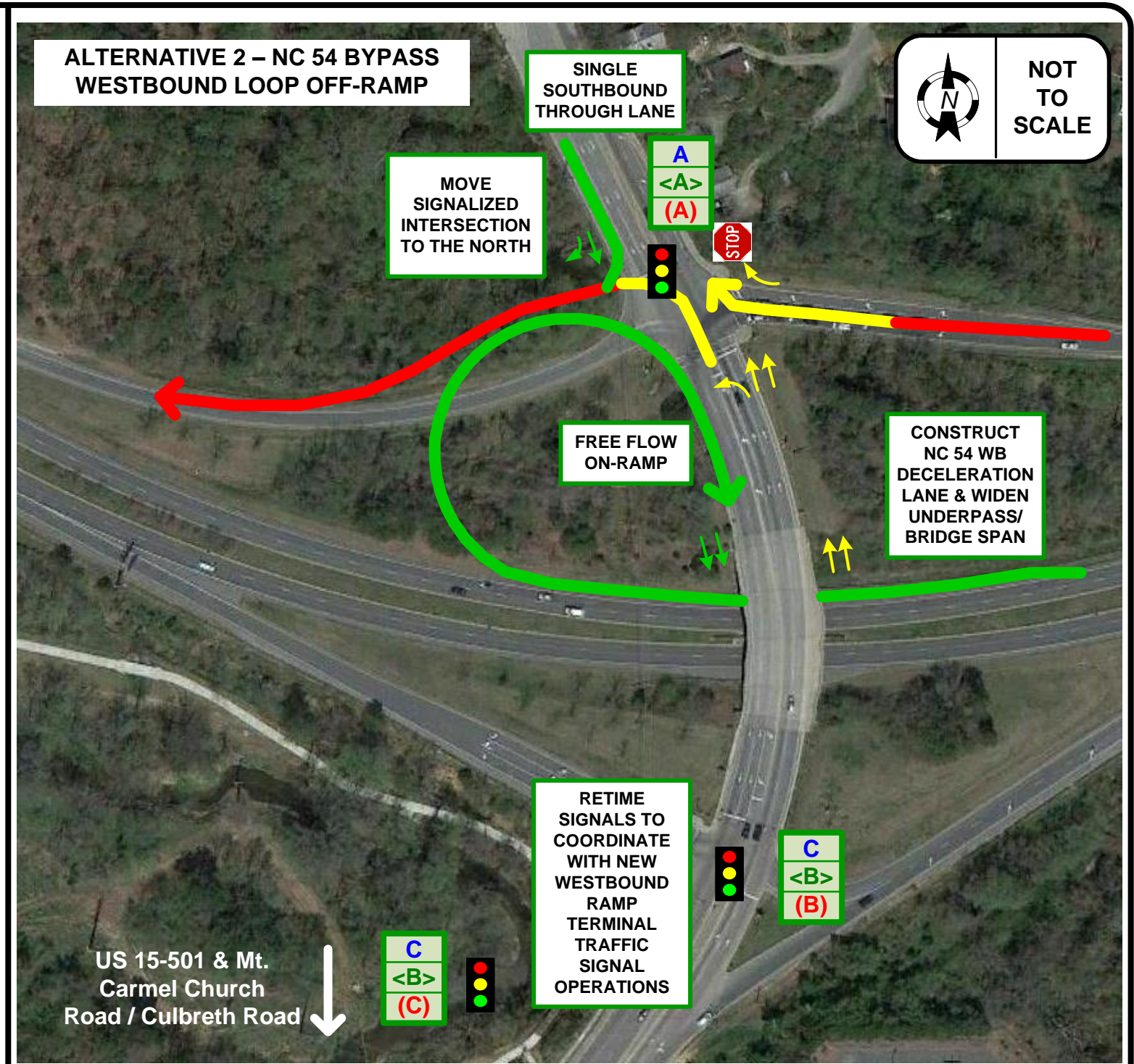
DATE: August 2014

RECOMMENDED IMPROVEMENTS

FIGURE 8B



ALTERNATIVE 1 – DIVERGING DIAMOND INTERCHANGE



LEGEND

			= PROPOSED TRAFFIC CONTROL	YELLOW = NORTHBOUND MOVEMENTS		= LOS WITH RECOMMENDED IMPROVEMENTS
			= PROPOSED TRAFFIC MOVEMENTS/LANEAGE	GREEN = SOUTHBOUND MOVEMENTS		
				RED = RAMP MOVEMENTS		

Appendix B – ITE Trip Generation Output

Detailed Land Use Data
 For 79 Dwelling Units of Single Family Home Sites
 (210) Single-Family Detached Housing

Project: Obey Creek - Revised Concept
 Phase: Phase 1
 Description: Obey Creek TIS - Revised Concept for 79 SF homes

Open Date: 7/15/2014
 Analysis Date: 7/15/2014

Day / Period	Total Trips	Pass-By Trips	Avg Rate	Min Rate	Max Rate	Std Dev	Avg Size	% Enter	% Exit	Use Eq.	Equation	R2
Weekday Average Daily Trips	845	0	9.52	4.31	21.85	3.7	198	50	50	True	$\ln(T) = 0.92 \ln(X) + 2.72$	0.95
Weekday AM Peak Hour of Generator	67	0	0.77	0.33	2.27	0.91	180	26	74	True	$T = 0.70(X) + 12.12$	0.89
Weekday AM Peak Hour of Adjacent Street Traffic	65	0	0.75	0.33	2.27	0.9	194	25	75	True	$T = 0.70(X) + 9.74$	0.89
Weekday PM Peak Hour of Generator	87	0	1.02	0.42	2.98	1.05	174	64	36	True	$\ln(T) = 0.88 \ln(X) + 0.62$	0.91
Weekday PM Peak Hour of Adjacent Street Traffic	85	0	1	0.42	2.98	1.05	207	63	37	True	$\ln(T) = 0.90 \ln(X) + 0.51$	0.91
Saturday Average Daily Trips	815	0	9.91	5.32	15.25	3.72	215	50	50	True	$\ln(T) = 0.93 \ln(X) + 2.64$	0.92
Saturday Peak Hour of Generator	79	0	0.93	0.5	1.75	0.99	215	54	46	True	$T = 0.89(X) + 8.77$	0.91
Sunday Average Daily Trips	681	0	8.62	4.74	12.31	3.36	218	50	50	True	$T = 8.63(X) - 0.63$	0.93
Sunday Peak Hour of Generator	73	0	0.86	0.55	1.48	0.95	212	53	47	True	$\ln(T) = 0.91 \ln(X) + 0.31$	0.88

Source: Institute of Transportation Engineers, Trip Generation Manual 9th Edition, 2012

TRIP GENERATION 2013, TRAFFICWARE, LLC

Detailed Land Use Data
 For 25.3 Gross Leasable Area 1000 SF of Retail - Shopping Center
 (820) Shopping Center

Project: Obey Creek - Revised Concept
 Phase: Phase 1
 Description: Obey Creek TIS - Revised Concept for 79 SF homes

Open Date: 7/15/2014
 Analysis Date: 7/15/2014

Day / Period	Total Trips	Pass-By Trips	Avg Rate	Min Rate	Max Rate	Std Dev	Avg Size	% Enter	% Exit	Use Eq.	Equation	R2
Christmas Weekday Peak Hour of Adjacent Street T	95	0	3.76	2.16	10.01	2.3	459	50	50	False	$T = 2.76(X) + 457.28$	0.68
Christmas Saturday Peak Hour of Generator	149	0	5.88	4.33	7.57	2.58	526	51	49	False	$T = 4.90(X) + 515.88$	0.77
Weekday Average Daily Trips	1080	0	42.7	12.5	270.89	21.25	331	50	50	False	$\ln(T) = 0.65 \ln(X) + 5.83$	0.79
Weekday AM Peak Hour of Adjacent Street Traffic	24	0	0.96	0.1	9.05	1.31	310	62	38	False	$\ln(T) = 0.61 \ln(X) + 2.24$	0.56
Weekday PM Peak Hour of Adjacent Street Traffic	94	32	3.71	0.68	29.27	2.74	376	48	52	False	$\ln(T) = 0.67 \ln(X) + 3.31$	0.81
Saturday Average Daily Trips	1264	0	49.97	16.7	227.5	22.62	450	50	50	False	$\ln(T) = 0.63 \ln(X) + 6.23$	0.82
Saturday Peak Hour of Generator	122	0	4.82	1.46	18.32	3.1	458	52	48	False	$\ln(T) = 0.65 \ln(X) + 3.78$	0.83
Sunday Average Daily Trips	639	0	25.24	4.15	148.15	17.23	439	50	50	False	$T = 15.63(X) + 4214.46$	0.52
Sunday Peak Hour of Generator	79	0	3.12	0.39	12.4	2.78	369	49	51	False		

**Appendix C – Site Trip Distribution and
Assignment Details**

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
Single Family Homes	210	79	DU	423	423	846	16	49	65	18	20	38	54	31	85
Shopping Center	820	25.3	1000 SF	540	540	1,080	15	9	24	30	29	59	45	49	94
TOTAL				963	963	1,926	31	58	89	48	49	97	99	80	179
2. INTERNAL CAPTURE (FROM ITE CALCULATIONS)				0	0	0	0	0	0	0	0	0	0	0	0
EXTERNAL TRIP GENERATION BEFORE MODAL REDUCTION				963	963	1,926	31	58	89	48	49	97	99	80	179

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
Single Family Homes				--	--	1.03	--	--	5%	--	--	2.5%	--	--	5%
Shopping Center				--	--	2.21	--	--	10%	--	--	5.0%	--	--	10%

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
Single Family Homes	210	79	DU	41	41	81	1	2	3	0	1	1	3	2	4
Shopping Center	820	25.3	1000 SF	28	28	56	2	1	2	2	1	3	5	5	9
TOTAL				69	69	137	2	3	6	2	2	4	7	6	14

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
Single Family Homes				--	--	0.206	--	--	1.0%	--	--	0.5%	--	--	1.0%
Shopping Center				--	--	0.442	--	--	2.0%	--	--	1.0%	--	--	2.0%

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
Single Family Homes	210	79	DU	8	8	16	0	0	1	0	0	0	1	0	1
Shopping Center	820	25.3	1000 SF	6	6	11	0	0	0	0	0	1	1	1	2
TOTAL				14	14	27	0	1	1	0	0	1	1	1	3

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
				881	881	1,761	28	54	82	45	47	92	90	72	163

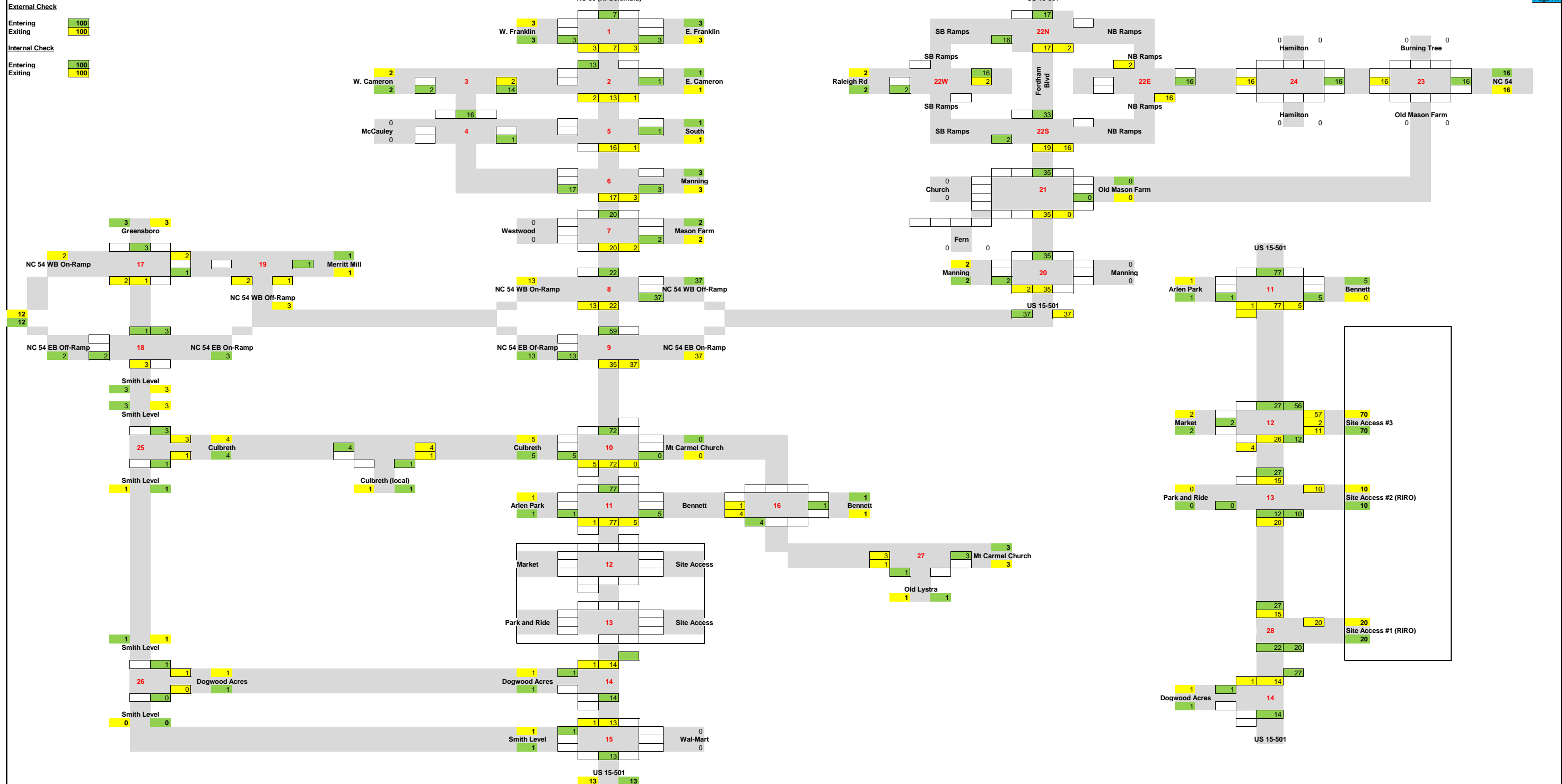
5. PASS-BY TRIPS				24 Hour Volumes			AM Peak Hour Trips			Noon Peak Hour Trips			PM Peak Hour Trips		
Pass-By Trip Rates - Shopping Center	ITE Code	Size	Unit	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
				Pass-By Trip Rates	820	25.3	1000 SF	17%	17%	17%	0%	0%	0%	34%	34%
Pass-By Trips				87	87	174	0	0	0	10	9	19	14	15	29
Adjusted Pass-By Trips				87	87	174	0	0	0	10	10	19	14	14	29
TOTAL				87	87	174	0	0	0	10	10	19	14	14	29

6. DIVERTED LINKED TRIPS				24 Hour Volumes			AM Peak Hour Trips			Noon Peak Hour Trips			PM Peak Hour Trips		
DL Trip Rates - Shopping Center	ITE Code	Size	Unit	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
				DL Trip Rates	820	25.3	1000 SF	0%	0%	0%	0%	0%	0%	0%	0%
Diverted Linked Trips				0	0	0	0	0	0	0	0	0	0	0	0
Adjusted DL Trips				0	0	0	0	0	0	0	0	0	0	0	0
TOTAL				0	0	0	0	0	0	0	0	0	0	0	0

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
				794	794	1,587	28	54	82	35	37	73	76	58	134

1. 2022 Site Trip Distribution Percentages

Peak AM

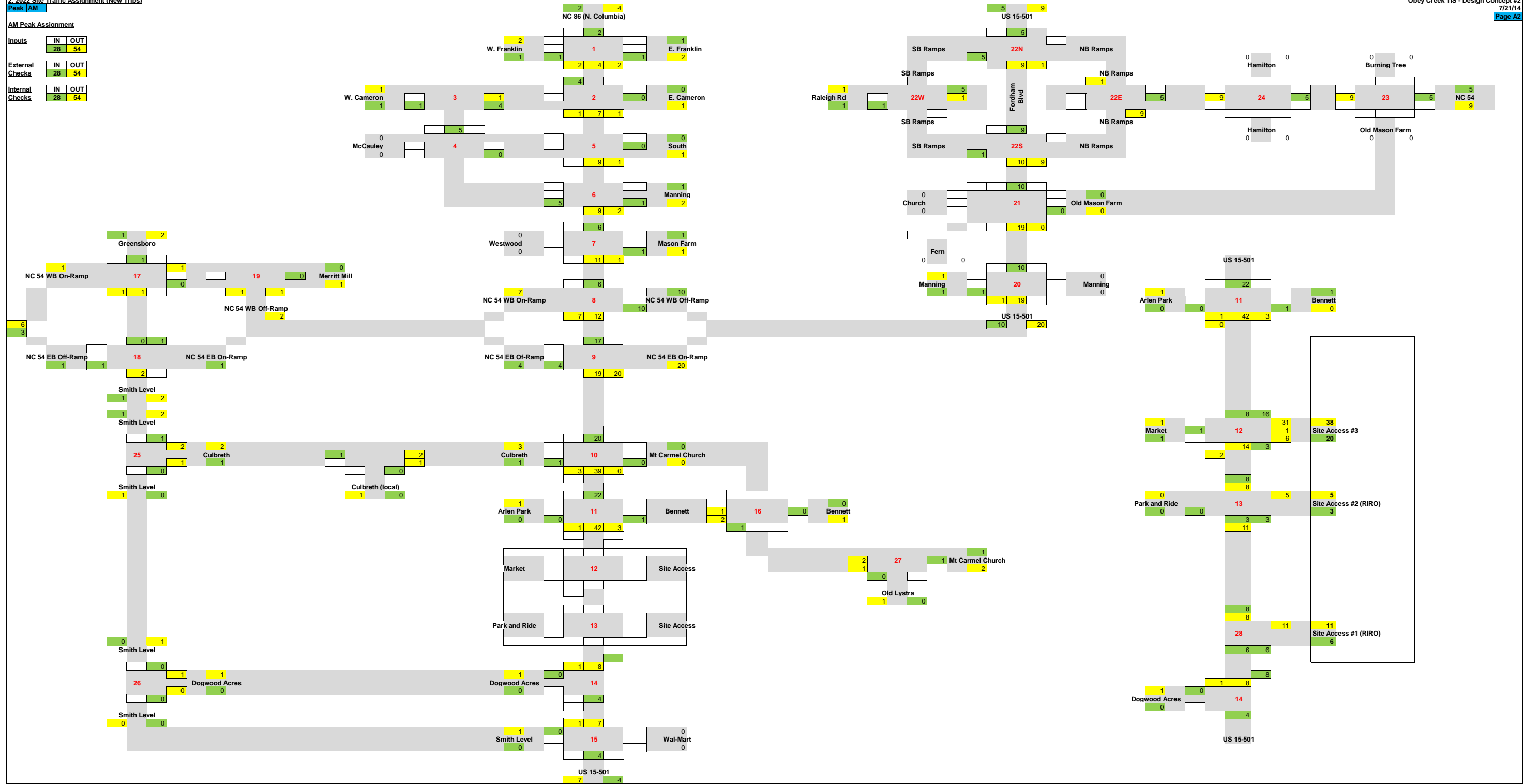


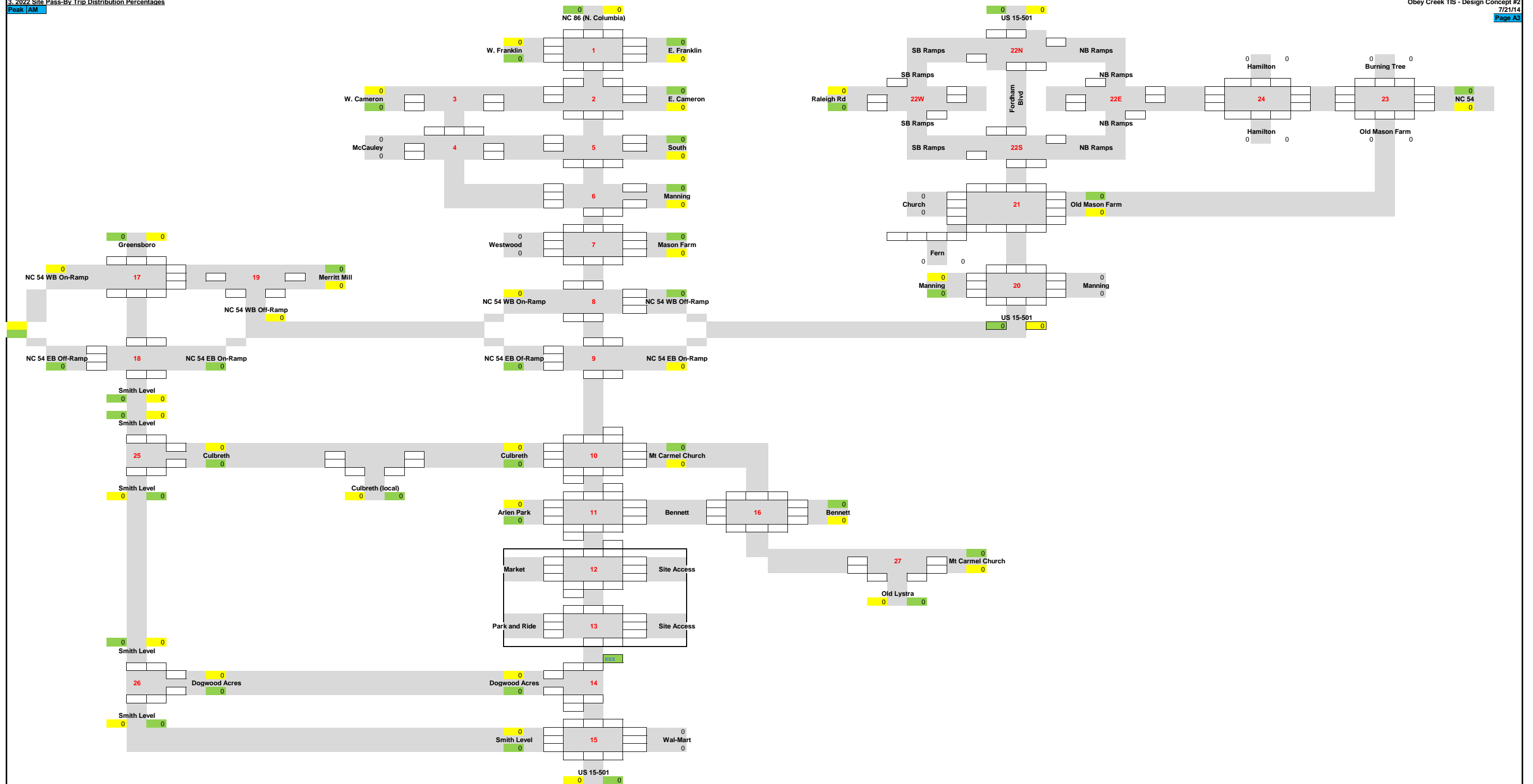
AM Peak Assignment

Inputs	IN	OUT
External Checks	28	54

External Checks	IN	OUT
Internal Checks	28	54

Internal Checks	IN	OUT
External Checks	28	54



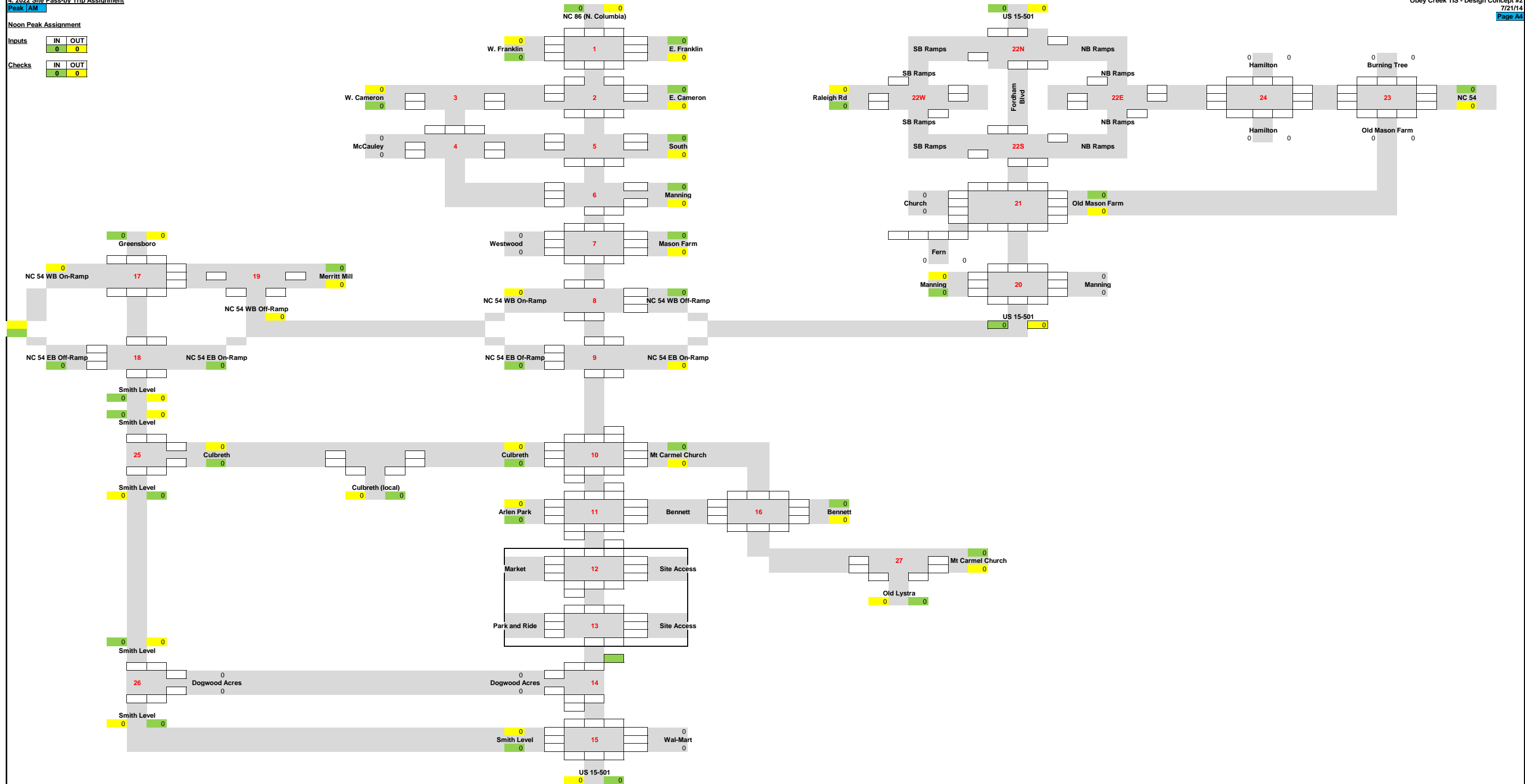


Peak AM

Noon Peak Assignment

Inputs	IN	OUT
	0	0

Checks	IN	OUT
	0	0



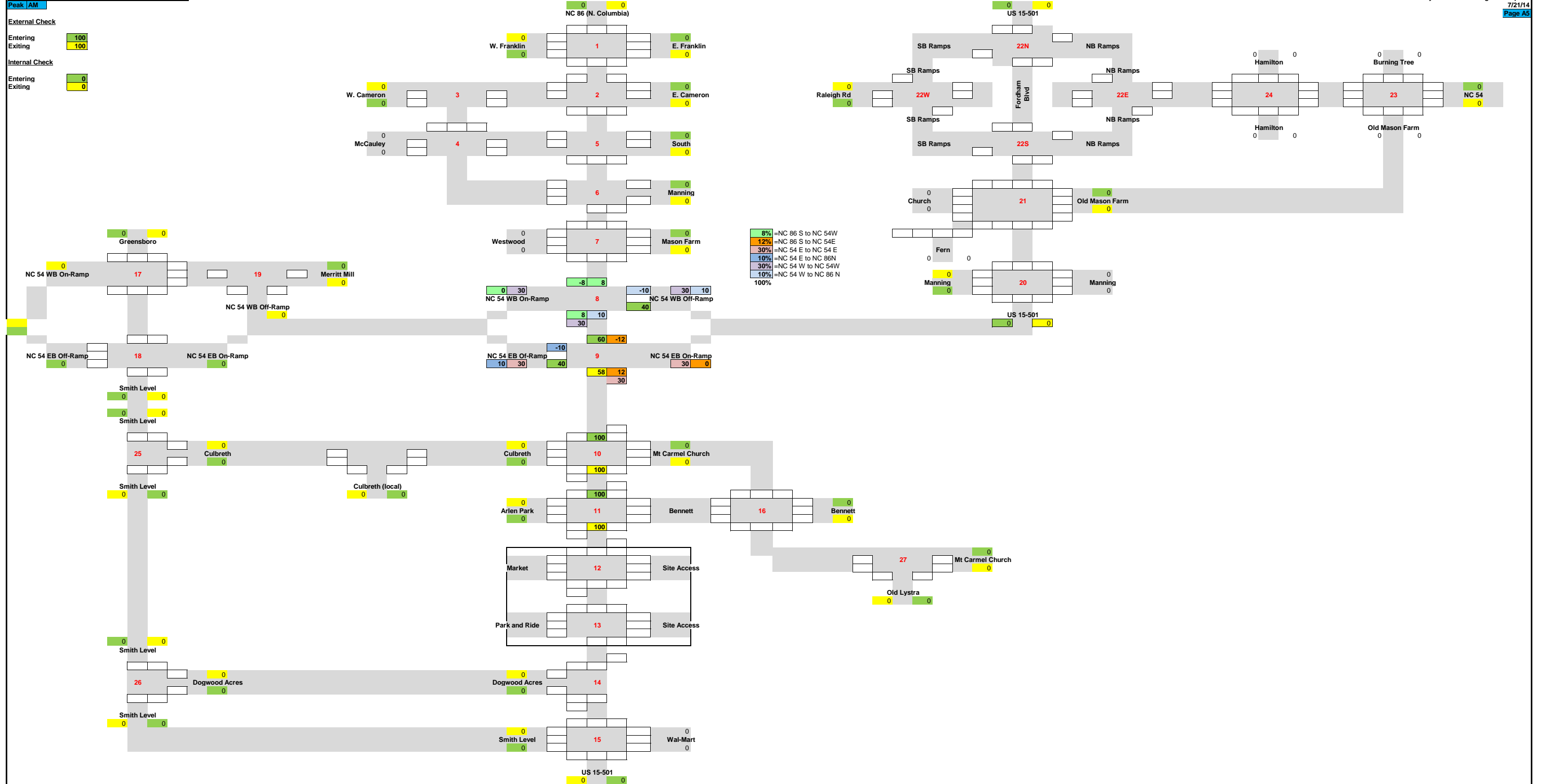
Peak AM

External Check

Entering 100
Exiting 100

Internal Check

Entering 0
Exiting 0



Peak AM

7/21/14
Page A6

AM Peak Assignment

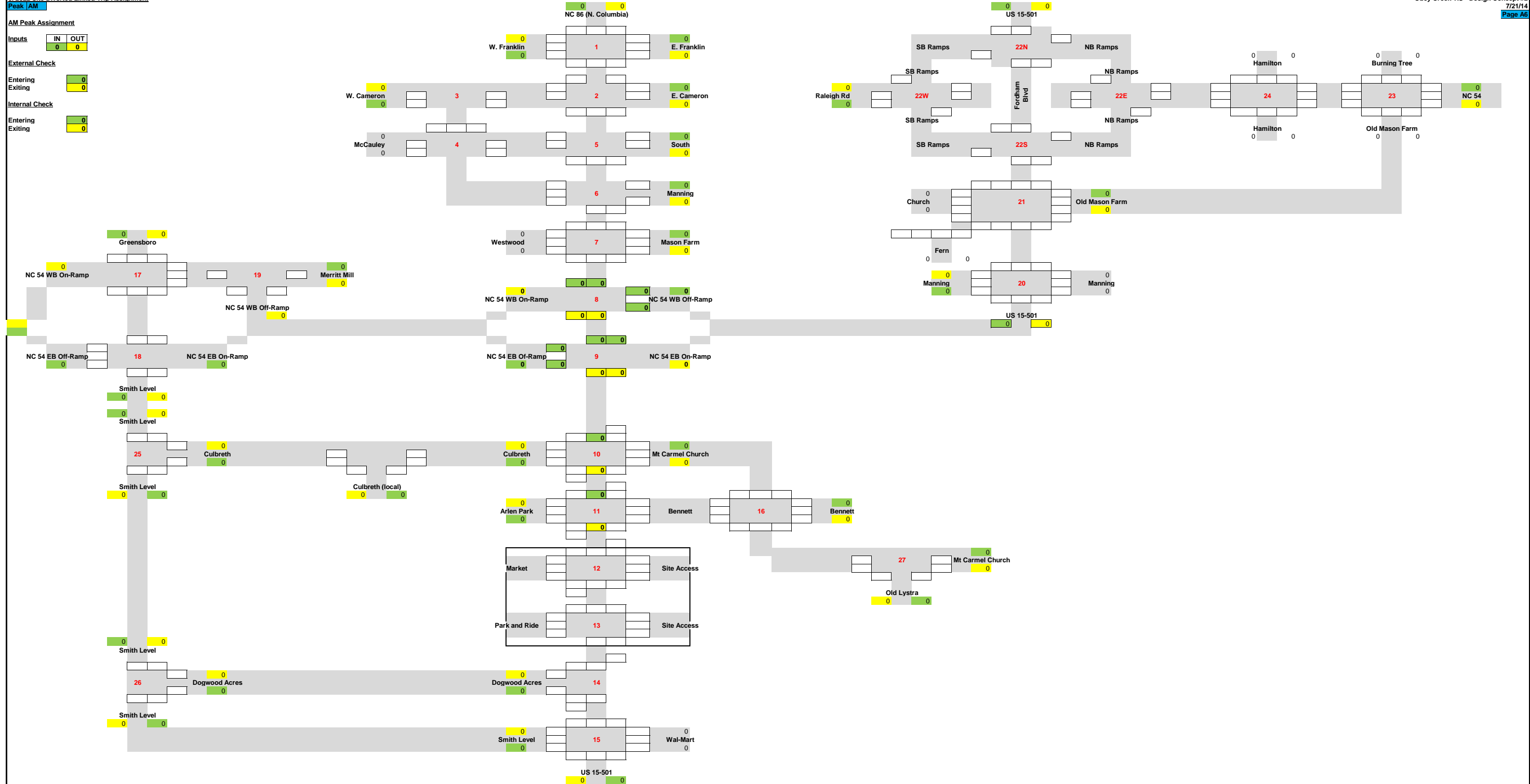
Inputs	IN	OUT
	0	0

External Check

Entering	0
Exiting	0

Internal Check

Entering	0
Exiting	0



AM Peak Primary Trip Assignment

Inputs	IN	OUT
	28	54

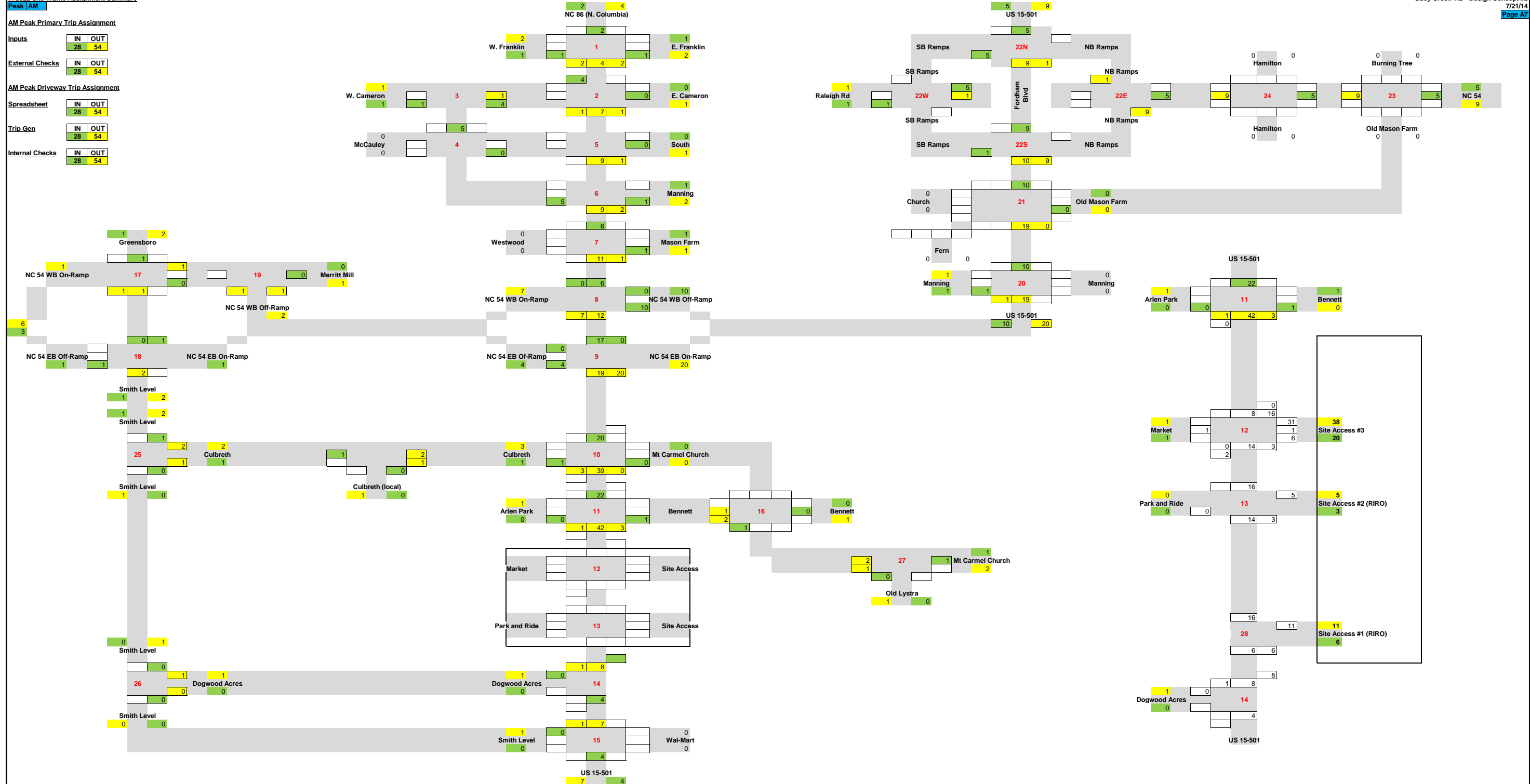
External Checks	IN	OUT
	28	54

AM Peak Driveway Trip Assignment

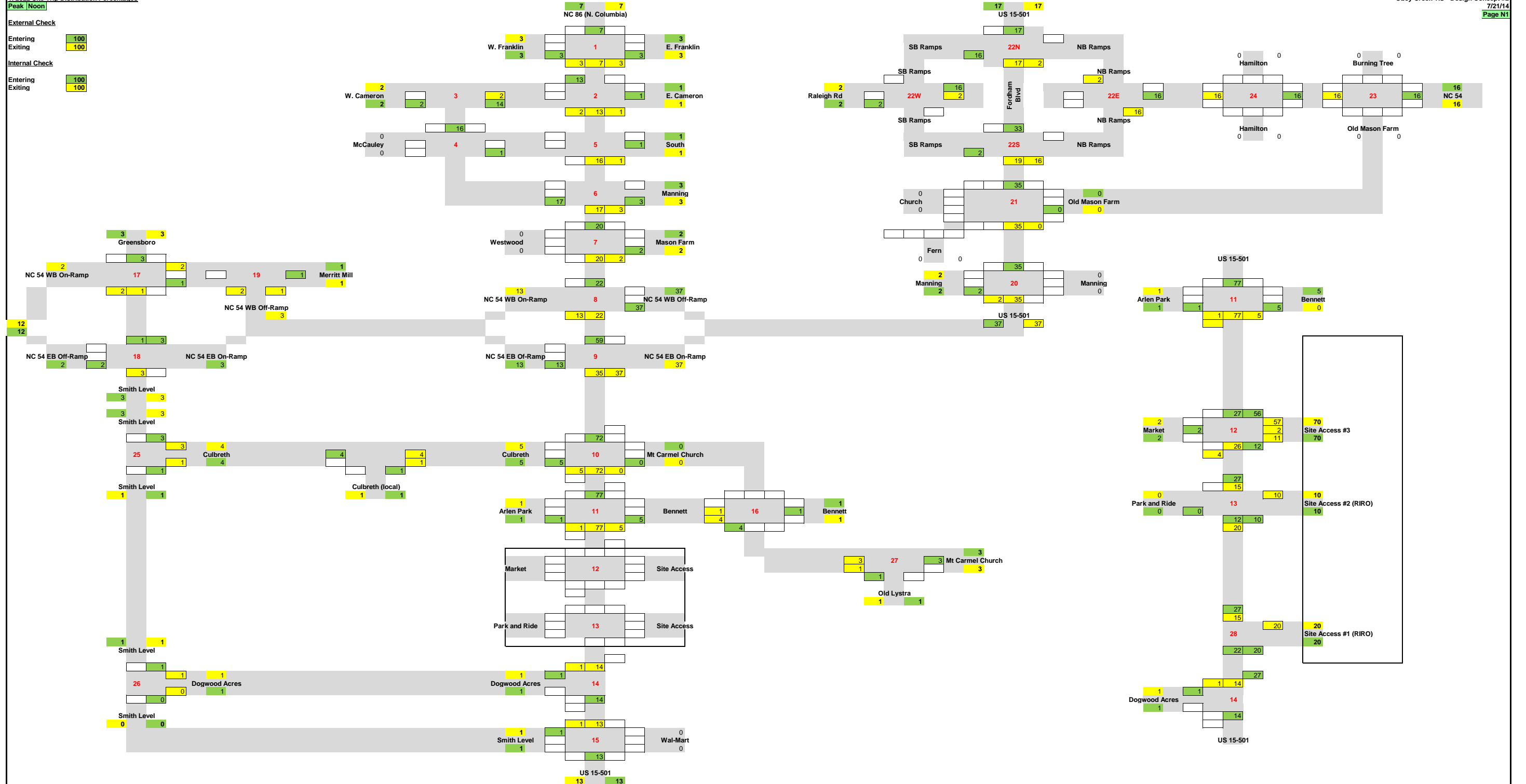
Spreadsheet	IN	OUT
	28	54

Trip Gen	IN	OUT
	28	54

Internal Checks	IN	OUT
	28	54



1. 2022 Site Trip Distribution Percentages

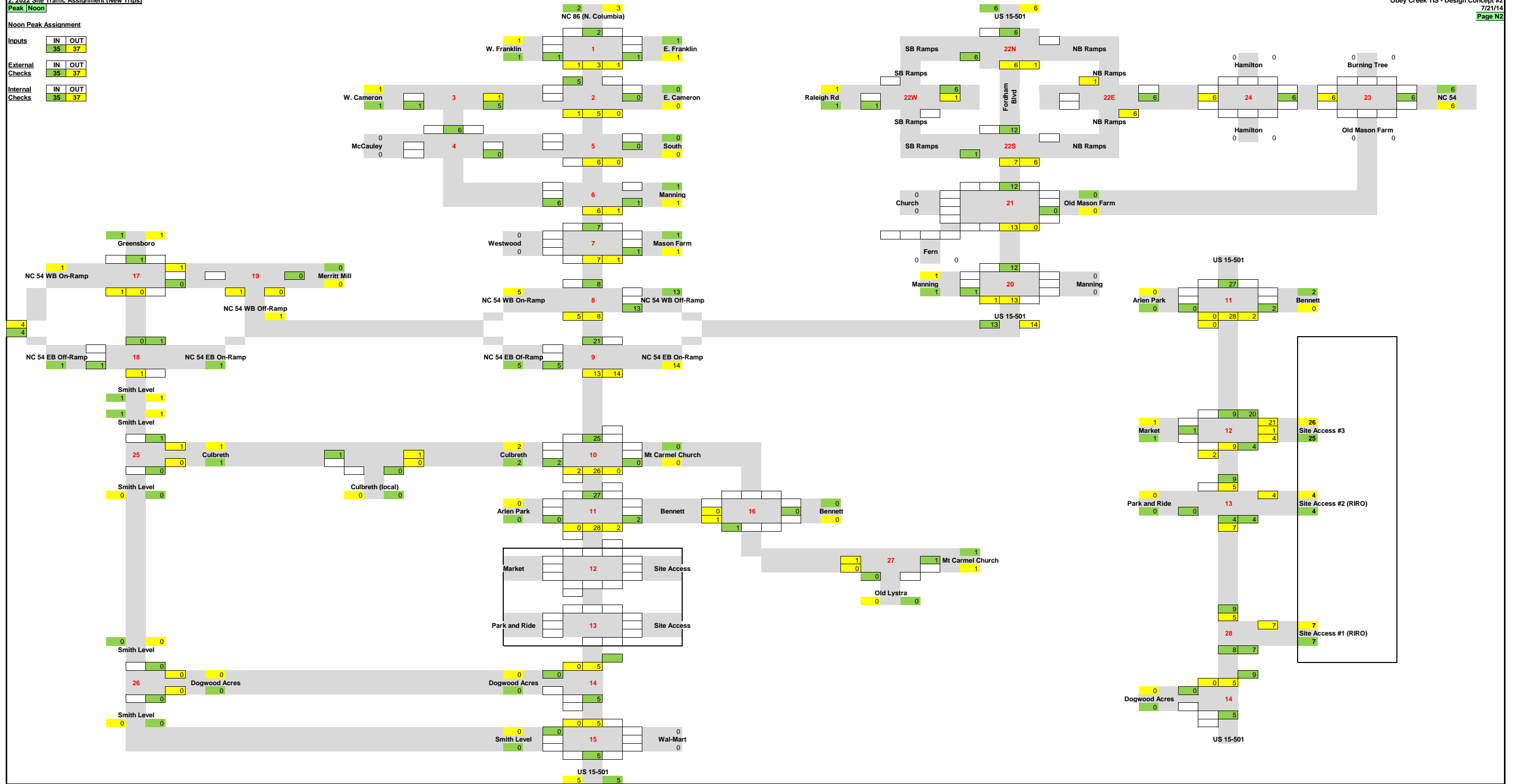


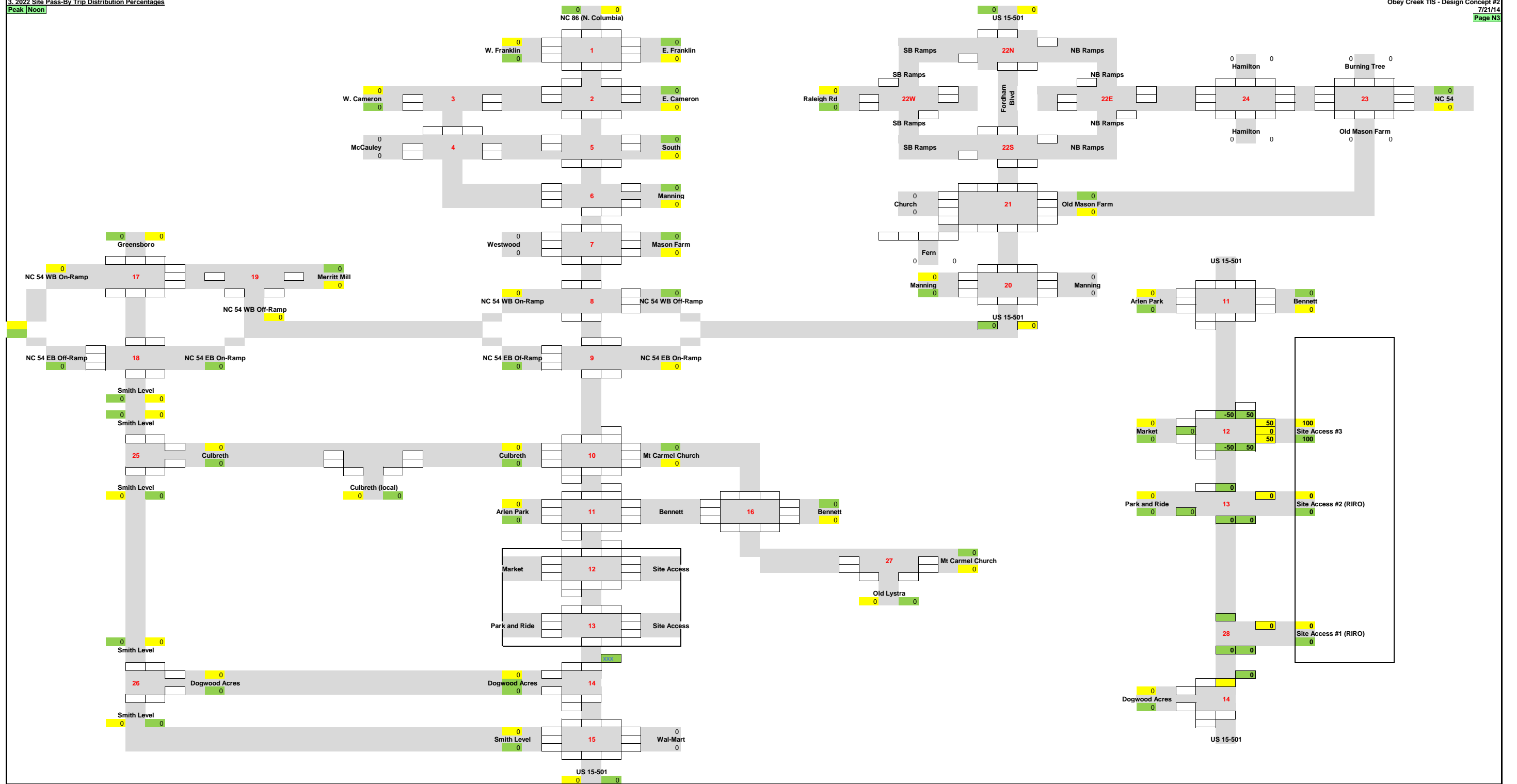
Noon Peak Assignment

Inputs	IN	OUT
External Checks	35	37

External Checks	IN	OUT
Internal Checks	35	37

Internal Checks	IN	OUT
External Checks	35	37





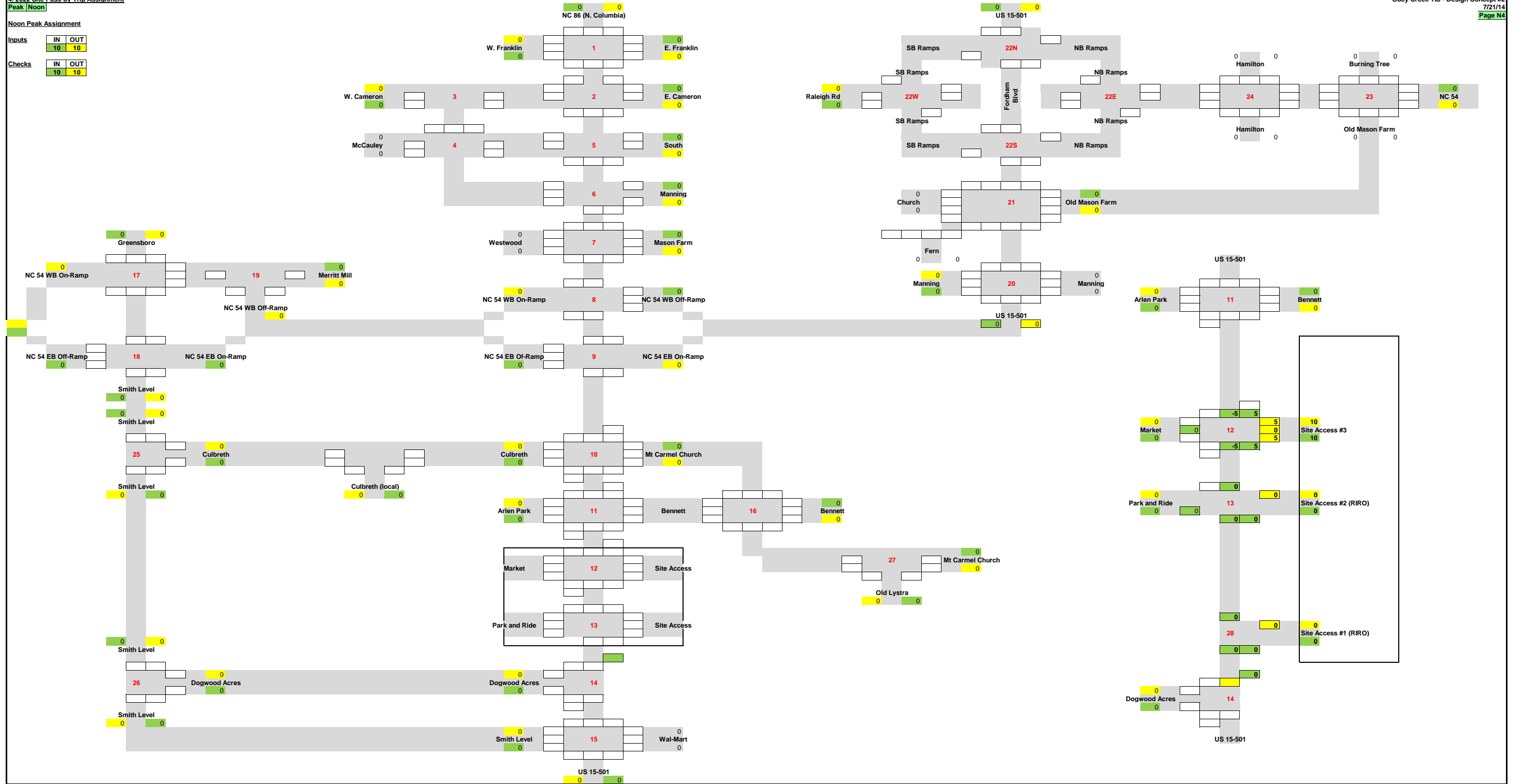
4. 2022 Site Pass-by Trip Assignment

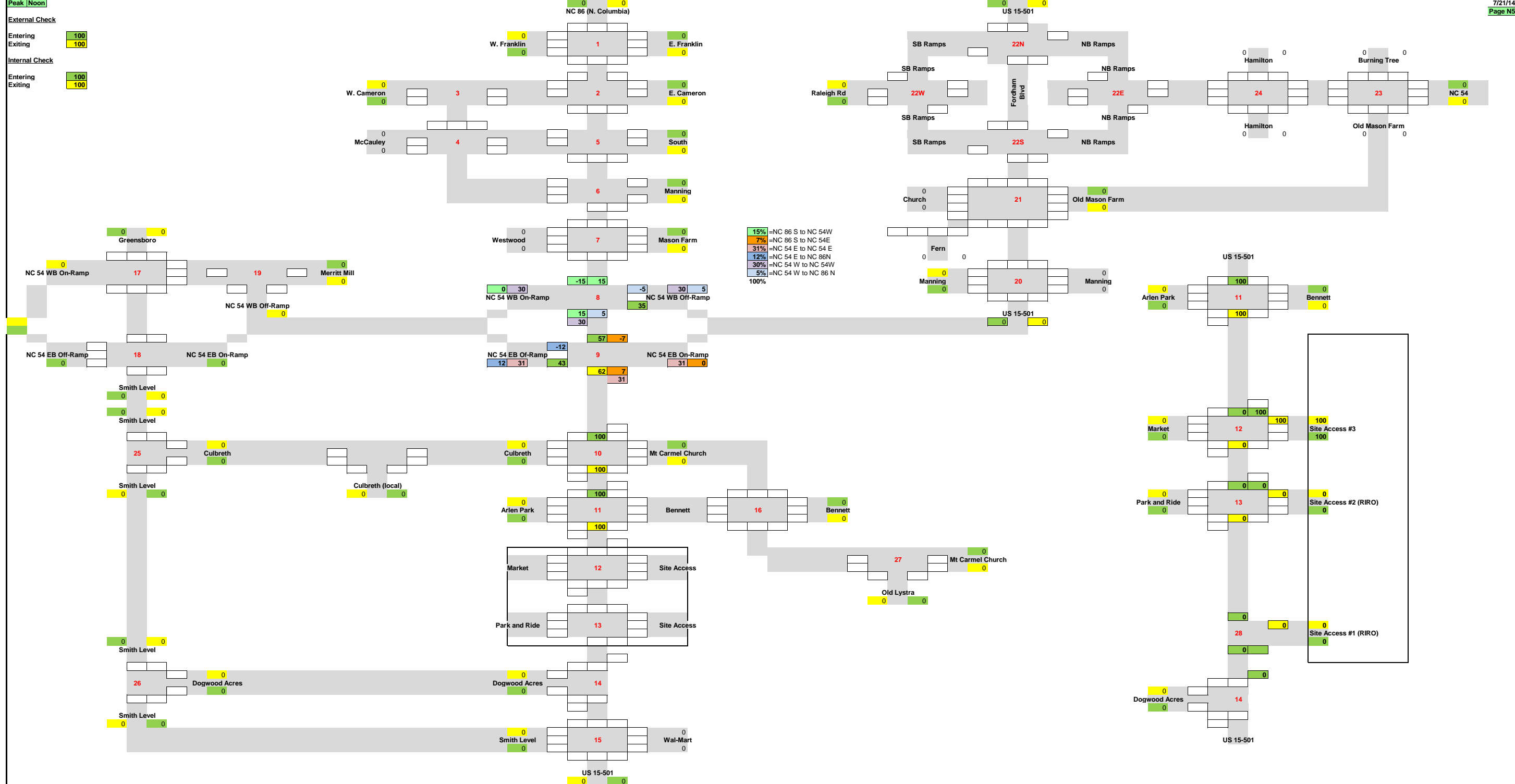
Peak Noon

Noon Peak Assignment

Inputs	IN	OUT
	10	10

Checks	IN	OUT
	10	10





Peak Noon

7/21/14

Noon Peak Assignment

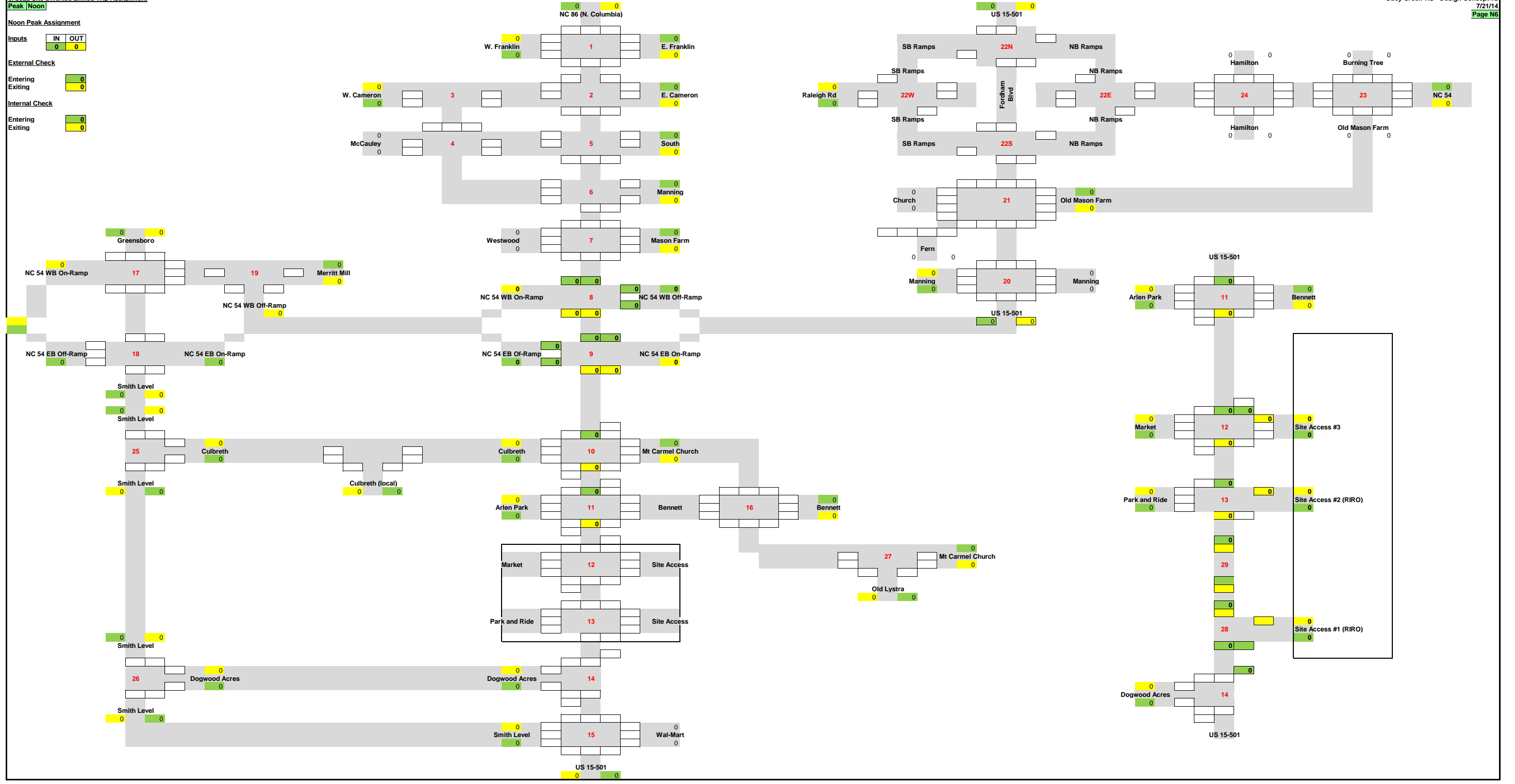
Inputs	IN	OUT
	0	0

External Check

Entering	0
Exiting	0

Internal Check

Entering	0
Exiting	0



7. 2022 Site Traffic Assignment Summary

Peak Noon

Noon Peak Primary Trip Assignment

Inputs	IN	OUT
	35	37

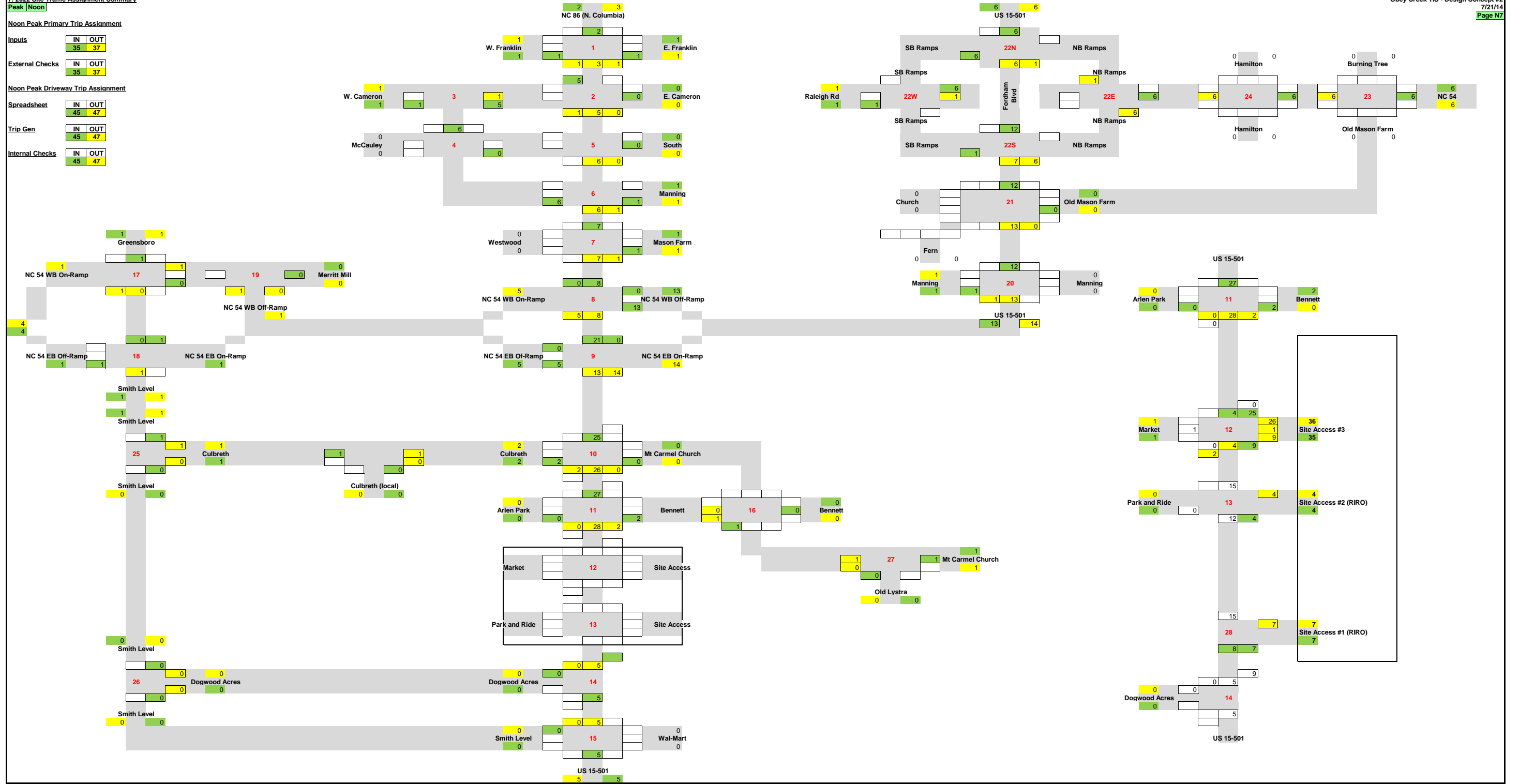
External Checks	IN	OUT
	35	37

Noon Peak Driveway Trip Assignment

Spreadsheet	IN	OUT
	45	47

Trip Gen	IN	OUT
	45	47

Internal Checks	IN	OUT
	45	47



Peak PM

7/21/14

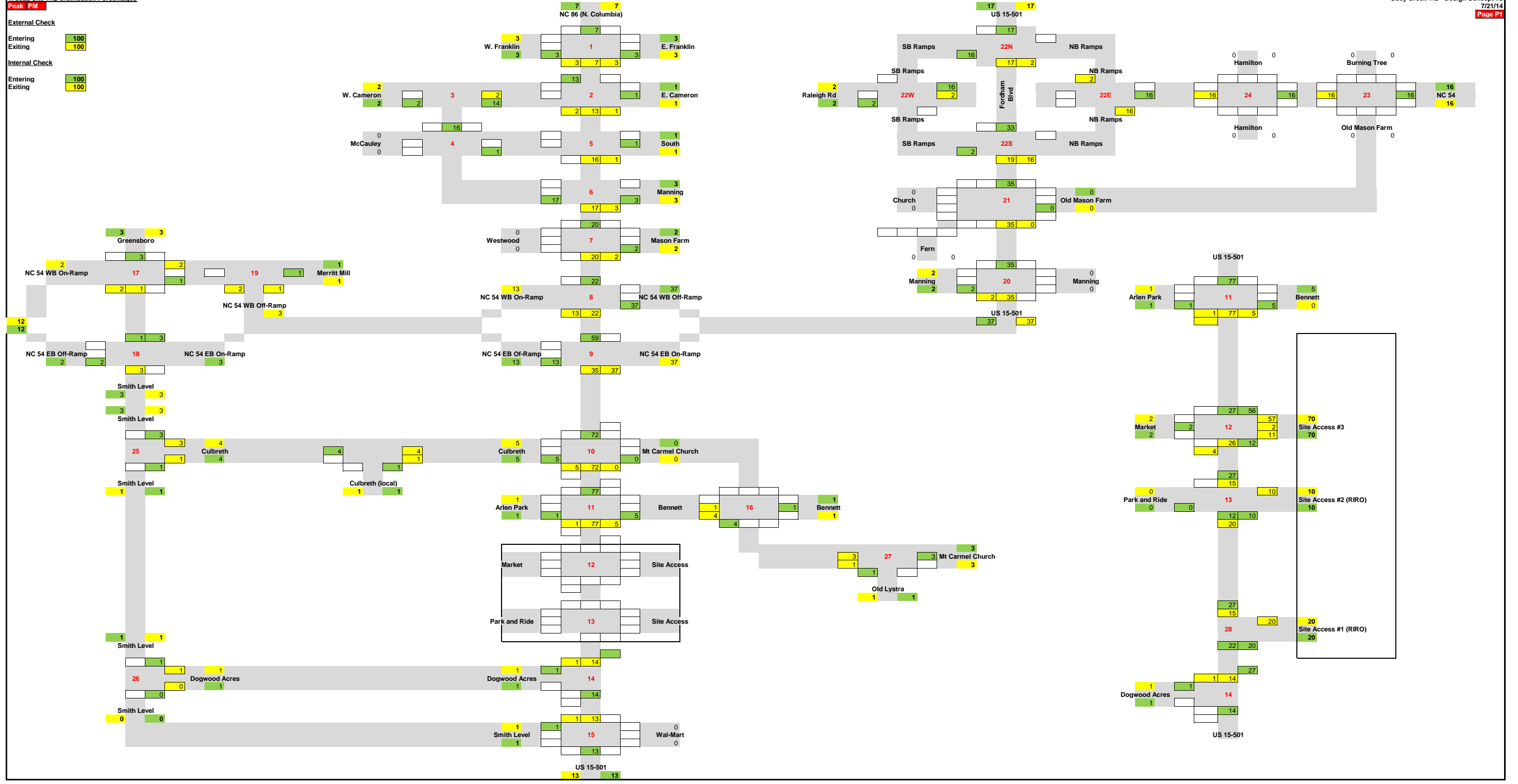
Page P1

External Check

Entering 100
Exiting 100

Internal Check

Entering 100
Exiting 100



Peak PM

7/21/14

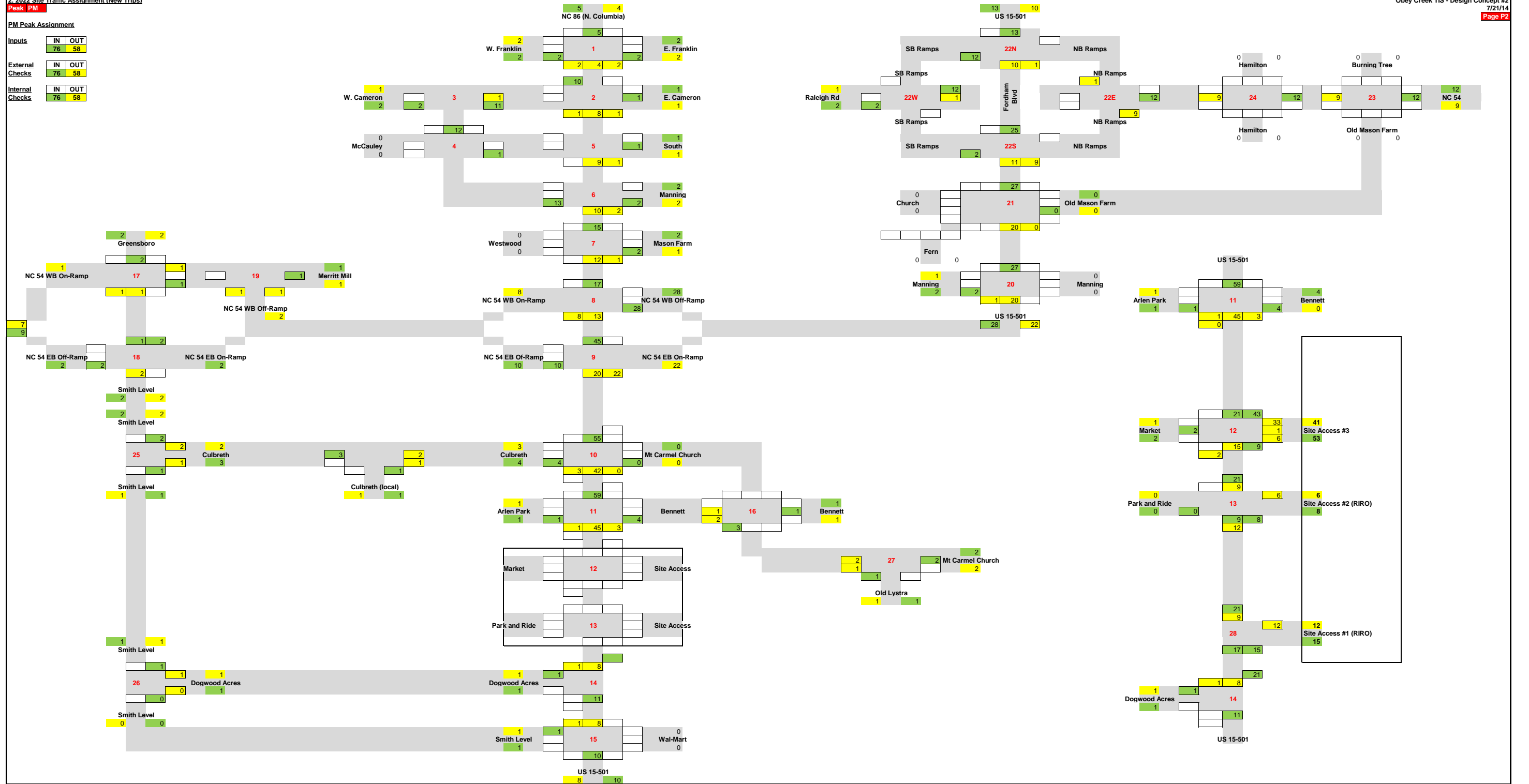
Page P2

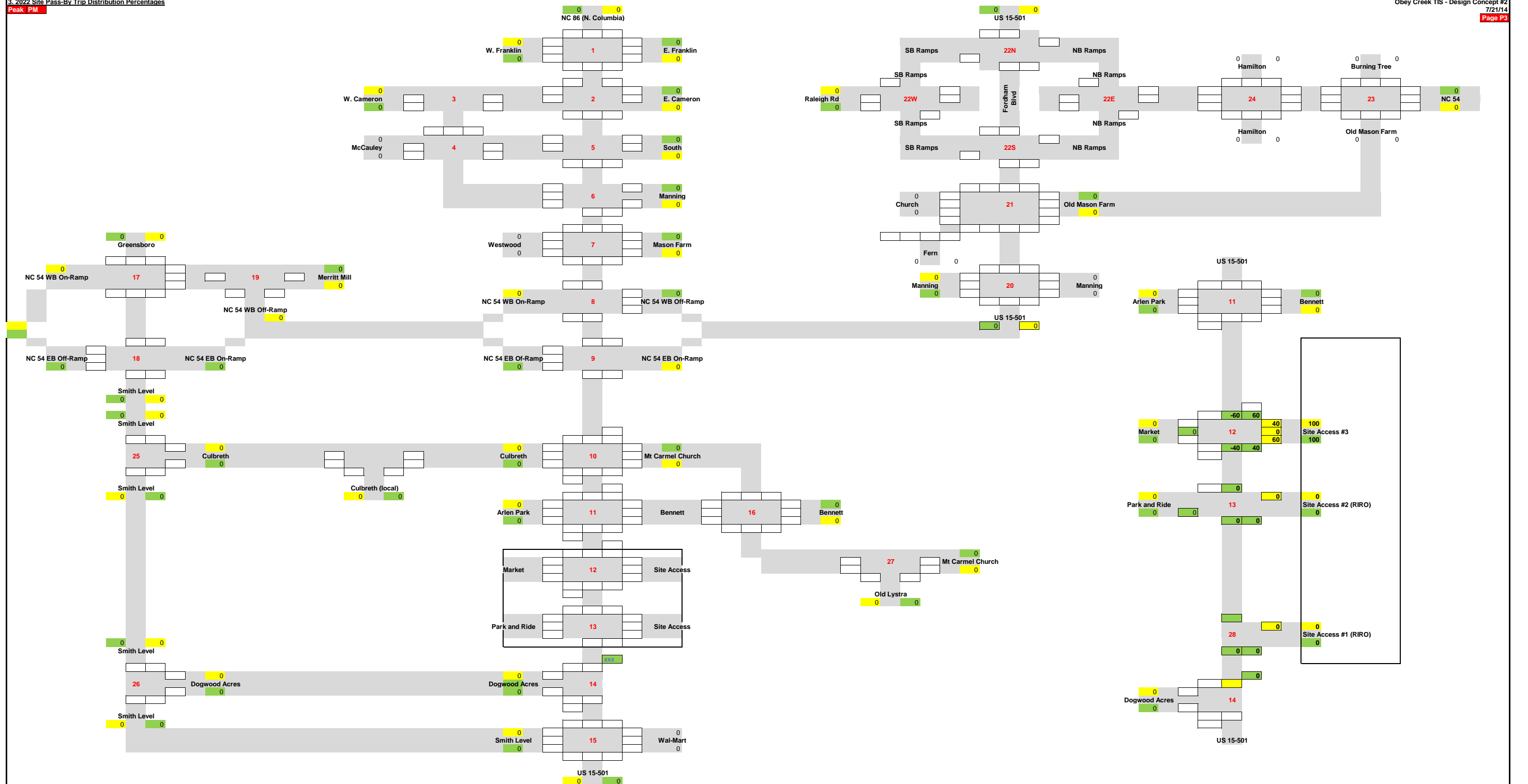
PM Peak Assignment

Inputs	IN	OUT
External Checks	76	58

Internal Checks	IN	OUT
	76	58

Internal Checks	IN	OUT
	76	58





Peak PM

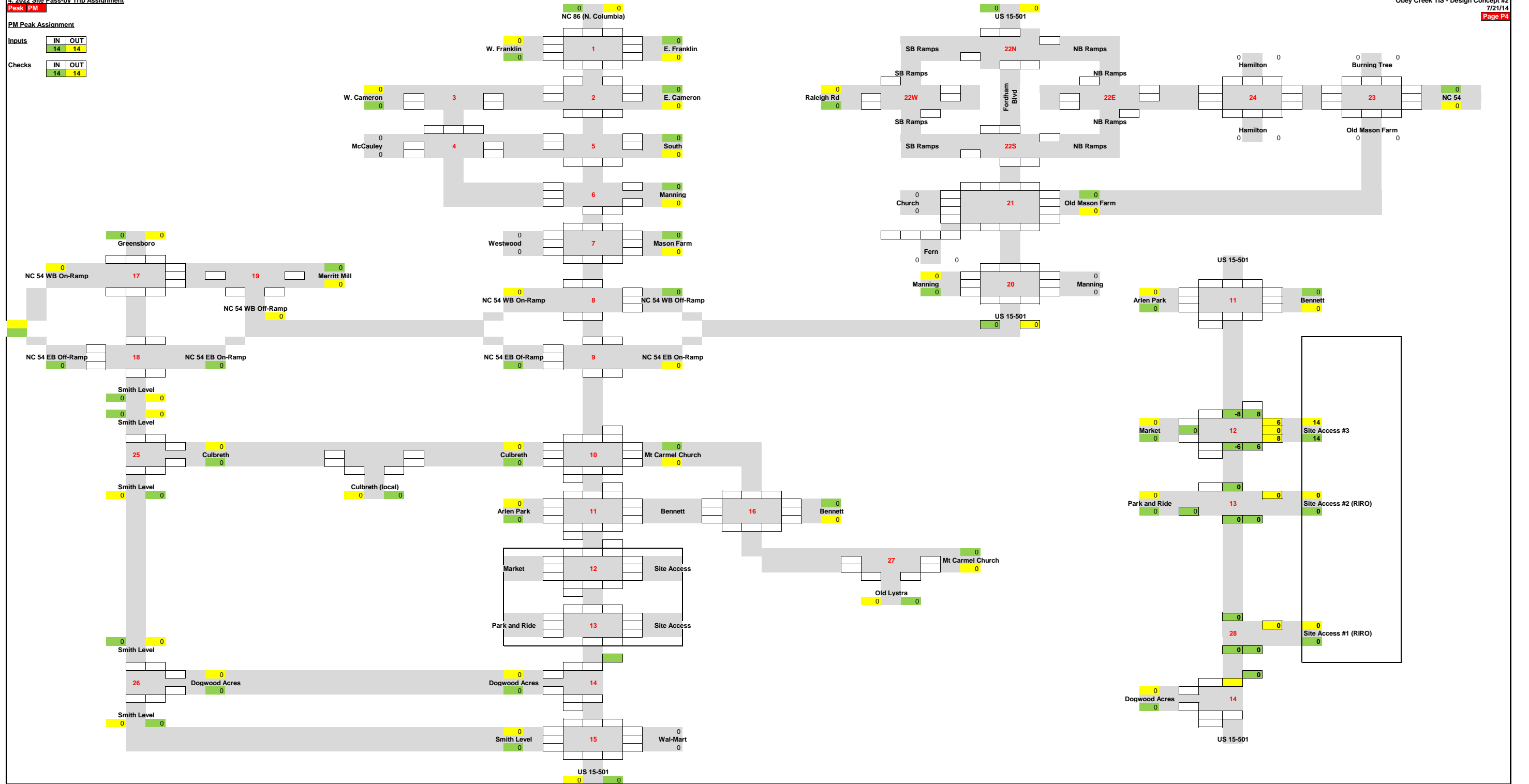
7/21/14

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PM Peak Assignment

Inputs	IN	OUT
	14	14

Checks	IN	OUT
	14	14



Peak PM

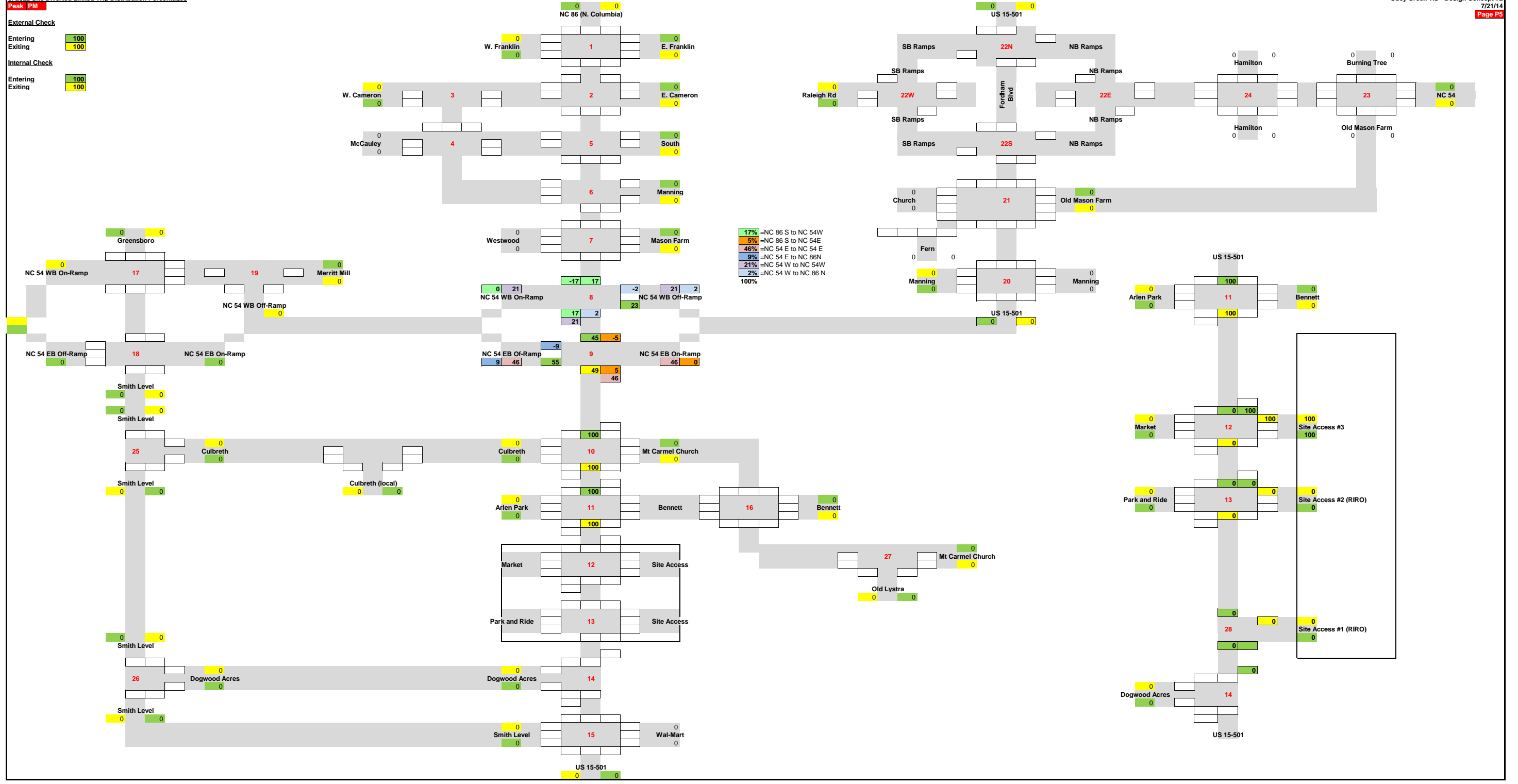
7/21/14
Page P5

External Check

Entering 100
Exiting 100

Internal Check

Entering 100
Exiting 100



PM Peak Assignment

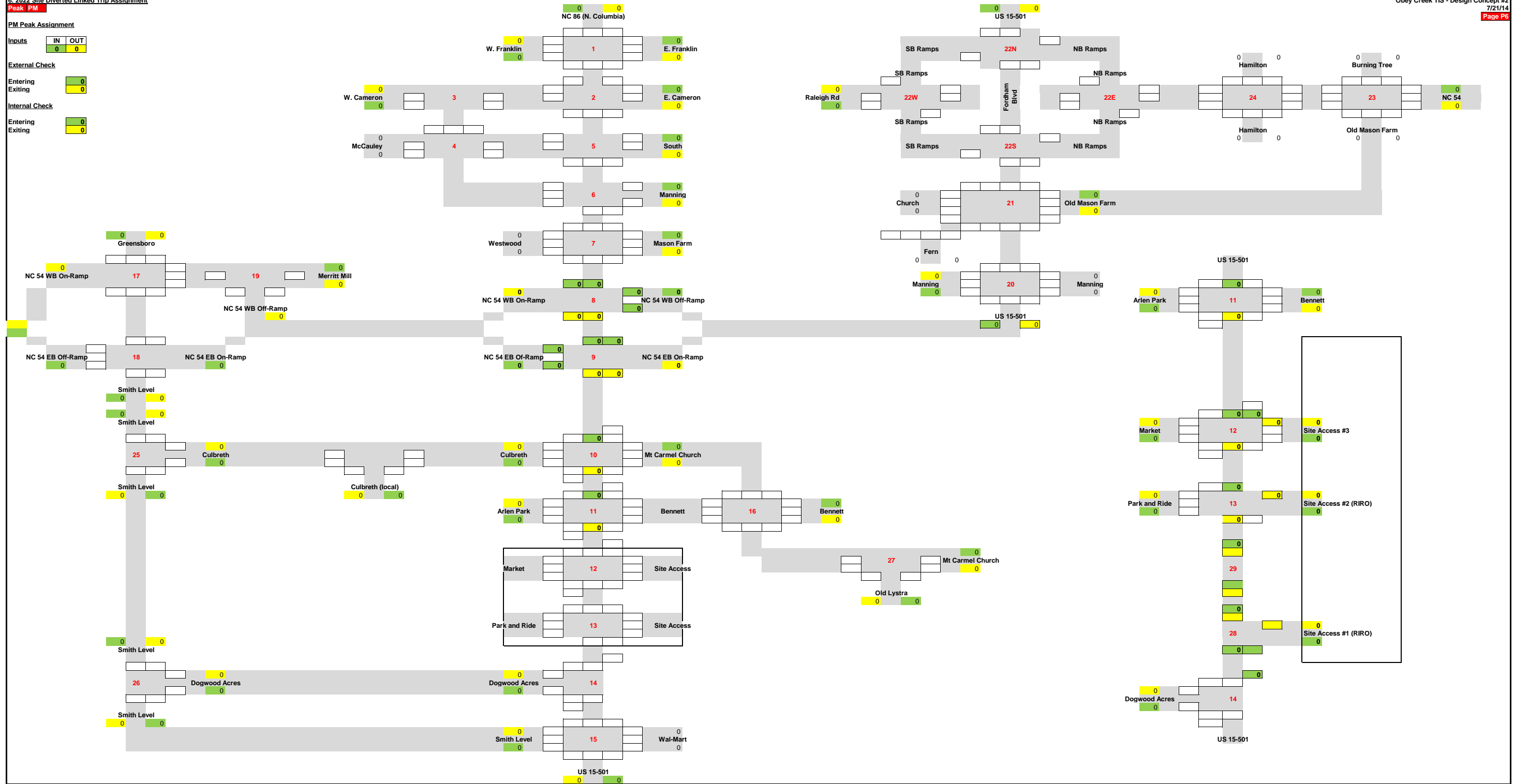
Inputs	IN	OUT
	0	0

External Check

Entering	0
Exiting	0

Internal Check

Entering	0
Exiting	0



Peak PM

7/21/14

Page P7

PM Peak Primary Trip Assignment

Inputs	IN	OUT
	76	58

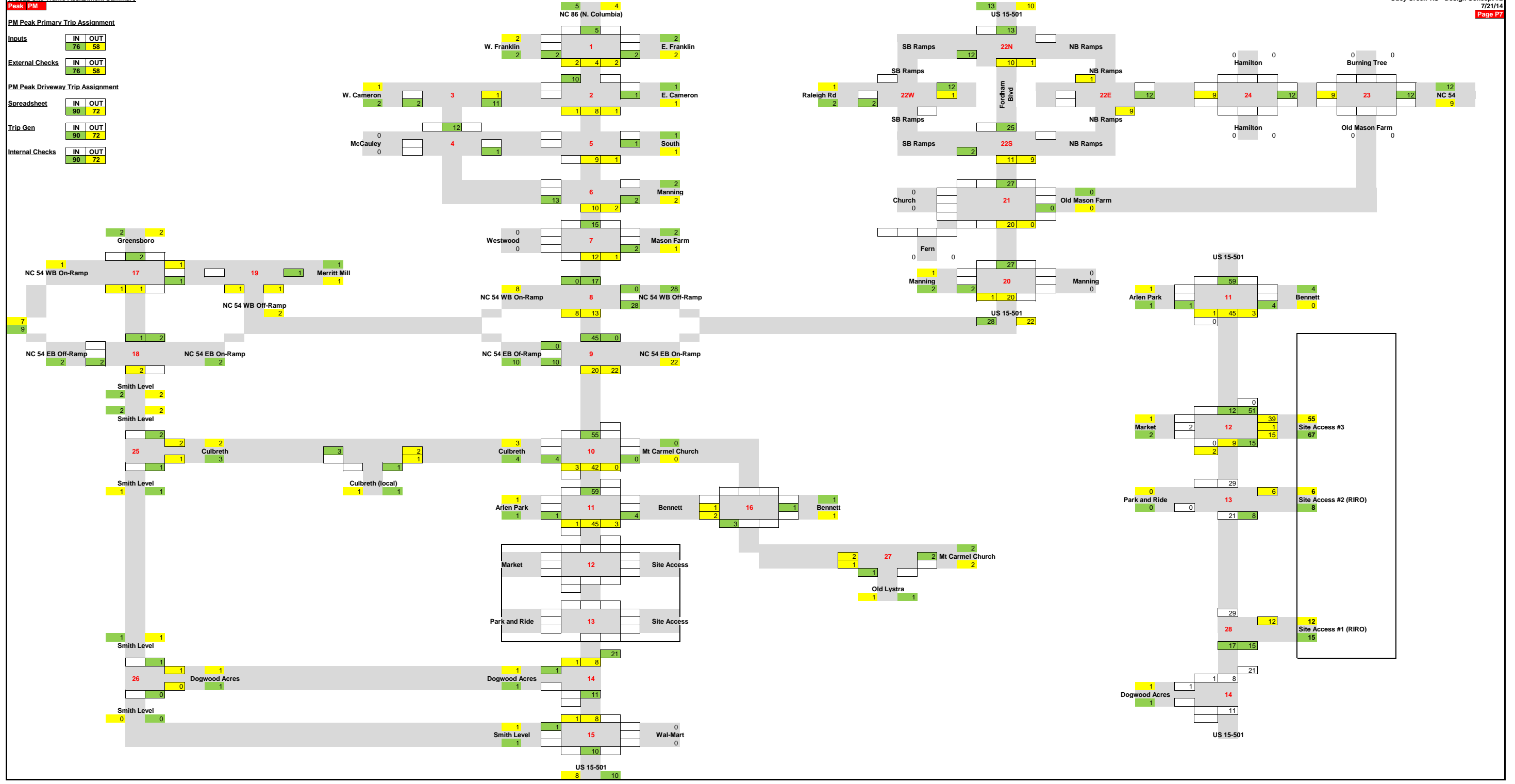
External Checks	IN	OUT
	76	58

PM Peak Driveway Trip Assignment

Spreadsheet	IN	OUT
	90	72

Trip Gen	IN	OUT
	90	72

Internal Checks	IN	OUT
	90	72



Appendix D – SYNCHRO Signalized Analysis Output

2022 With Site

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

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	93	289	58	78	305	62	52	327	96	58	526	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	
Fr't		0.975			0.975			0.966			0.978	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1379	2929	0	1404	2596	0	1354	2551	0	1354	2600	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1161	2929	0	1312	2596	0	1295	2551	0	1178	2600	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	62	99	386	78	60	376	110	64	578	102
Shared Lane Traffic (%)												
Lane Group Flow (vph)	100	373	0	99	464	0	60	486	0	64	680	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	29.3		12.9	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	0.57		0.71	0.81		0.58	0.41		0.59	0.56	

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

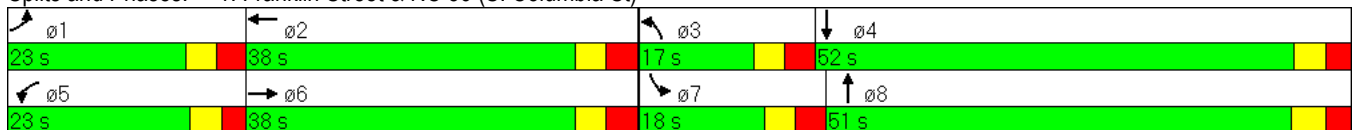
8/8/2014

	↖	→	↘	↙	←	↖	↘	↑	↖	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	80.9	47.8		82.7	59.3		115.4	8.3		78.8	30.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	80.9	47.8		82.7	59.3		115.4	8.3		78.8	30.6	
LOS	F	D		F	E		F	A		E	C	
Approach Delay		54.8			63.4			20.1			34.7	
Approach LOS		D			E			C			C	
Queue Length 50th (ft)	83	146		82	195		54	20		53	226	
Queue Length 95th (ft)	141	193		120	213		m97	94		102	334	
Internal Link Dist (ft)		726			860			892			742	
Turn Bay Length (ft)	225			100			400			100		
Base Capacity (vph)	191	744		194	659		125	1176		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		0.51	0.70		0.48	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 66.8% 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)

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	11	105	0	0	119	29	101	437	38	64	0	572
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 _t					0.974			0.988				0.850
Flt Protected	0.950						0.950			0.950		
Satd. Flow (prot)	1525	1660	0	0	1535	0	1404	2724	0	1454	0	2369
Flt Permitted	0.350						0.950			0.950		
Satd. Flow (perm)	541	1660	0	0	1535	0	1341	2724	0	1340	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	128	553	48	67	0	596
Shared Lane Traffic (%)												
Lane Group Flow (vph)	14	136	0	0	200	0	128	601	0	67	0	596
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		57.2	57.2		38.1		38.1
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		0.21	0.50		0.16		0.86

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

8/8/2014

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)

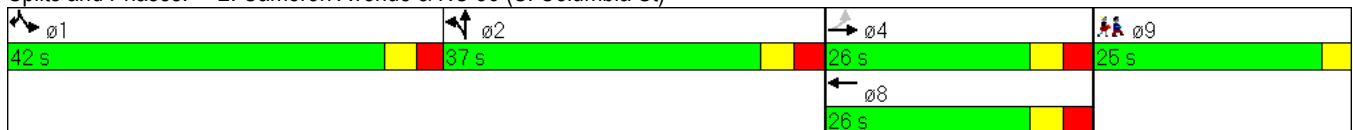
8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	16.9	24.2			85.0		18.9	19.5		17.9		41.8
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0		0.2
Total Delay	16.9	24.2			85.0		18.9	19.5		17.9		42.0
LOS	B	C			F		B	B		B		D
Approach Delay		23.5			85.0			19.4				
Approach LOS		C			F			B				
Queue Length 50th (ft)	10	119			165		39	97		43		261
Queue Length 95th (ft)	m11	127			202		84	162		m53		323
Internal Link Dist (ft)		332			976			759			892	
Turn Bay Length (ft)	110									150		
Base Capacity (vph)	87	268			248		618	1198		446		726
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		0.21	0.50		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: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.86
 Intersection Signal Delay: 34.9 Intersection LOS: C
 Intersection Capacity Utilization 56.2% 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

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	130	178	669	132	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								
Frt		0.922										
Flt Protected				0.950								
Satd. Flow (prot)	0	1370	0	2821	1583	0	0	0	0	0	0	0
Flt Permitted				0.950								
Satd. Flow (perm)	0	1370	0	2413	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		25		25
Link Distance (ft)		258		412		549		191		191		191
Travel Time (s)		30.0		10.7		15.0		5.2		5.2		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	205	727	143	0	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	354	0	727	143	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)		38.3		61.7	105.0							
Actuated g/C Ratio		0.29		0.47	0.81							
v/c Ratio		0.88		0.54	0.11							

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

8/8/2014

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	
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	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

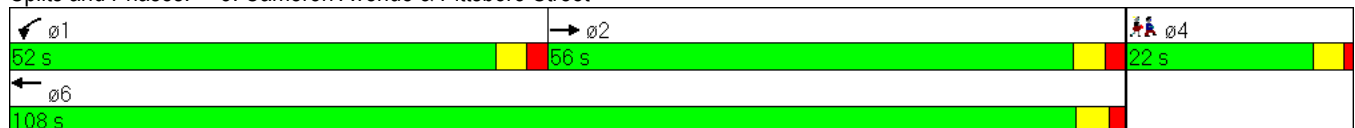
8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		65.3		10.3	1.6							
Queue Delay		0.0		0.5	0.0							
Total Delay		65.3		10.8	1.6							
LOS		E		B	A							
Approach Delay		65.3			9.3							
Approach LOS		E			A							
Queue Length 50th (ft)		283		86	10							
Queue Length 95th (ft)		347		201	m27							
Internal Link Dist (ft)		178			332			469			111	
Turn Bay Length (ft)												
Base Capacity (vph)		537		1339	1279							
Starvation Cap Reductn		0		257	0							
Spillback Cap Reductn		0		0	0							
Storage Cap Reductn		0		0	0							
Reduced v/c Ratio		0.66		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: 25.5
 Intersection LOS: C
 Intersection Capacity Utilization 51.2%
 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

8/8/2014

												
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	620	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	674	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	146	0	49	166	0	0	0	0	0	860	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

8/8/2014

	↗	→	↘	↙	←	↖	↗	↑	↘	↙	↓	↖
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		68.0		29.1	34.2						1.7	
Queue Delay		0.0		0.0	0.0						0.0	
Total Delay		68.0		29.1	34.2						1.7	
LOS		E		C	C						A	
Approach Delay		68.0			33.1						1.7	
Approach LOS		E			C						A	
Queue Length 50th (ft)		118		13	68						0	
Queue Length 95th (ft)		179		37	111						16	
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: 15.1
 Intersection Capacity Utilization 53.2%
 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)

8/8/2014

													
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	450	186	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 _t					0.991	0.850			0.850				
Flt Protected	0.950							0.994					
Satd. Flow (prot)	1577	1771	0	0	1535	1321	0	4153	1301	0	0	0	
Flt Permitted	0.950							0.994					
Satd. Flow (perm)	1528	1771	0	0	1535	1252	0	4124	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	511	211	0	0	0	
Shared Lane Traffic (%)						10%							
Lane Group Flow (vph)	27	198	0	0	197	112	0	577	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	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		0.25	0.17				

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

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	46.0	69.8			70.1	57.6		8.9	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		8.9	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		2336	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		0.25	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: 30.6
 Intersection Capacity Utilization 53.2%
 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)

8/8/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	66	505	0	53	0	214	0	425	354	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't						0.850			0.850			
Flt Protected	0.950			0.950								
Satd. Flow (prot)	1512	3023	0	1489	0	2345	0	3093	1384	0	0	0
Flt 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	61	0	246	0	483	402	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	75	574	0	61	0	246	0	483	402	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		23.5		23.5		60.1	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		0.23		0.58		0.34	0.47			

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

8/8/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Control Delay	24.8	38.2		44.1		52.8		17.7	7.0			
Queue Delay	0.0	0.0		0.0		0.0		0.0	0.0			
Total Delay	24.8	38.2		44.1		52.8		17.7	7.0			
LOS	C	D		D		D		B	A			
Approach Delay		36.7						12.8				
Approach LOS		D						B				
Queue Length 50th (ft)	38	210		45		110		92	27			
Queue Length 95th (ft)	47	201		73		132		204	54			
Internal Link Dist (ft)		161			557			142			400	
Turn Bay Length (ft)	125					75			150			
Base Capacity (vph)	475	949		424		667		1430	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		0.34	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: 27.6
 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)

ø2	ø4	ø3
42 s	46 s	42 s

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

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	9	4	6	180	0	83	7	670	338	116	187	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		0.627			0.183		
Satd. Flow (perm)	0	1724	0	0	1603	1482	1096	1781	1560	319	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	243	0	112	8	744	376	127	205	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	27	0	0	243	112	8	744	376	127	209	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			21.6	33.6	75.0	75.0	96.6	90.0	90.0	
Actuated g/C Ratio		0.07			0.17	0.26	0.58	0.58	0.74	0.69	0.69	

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

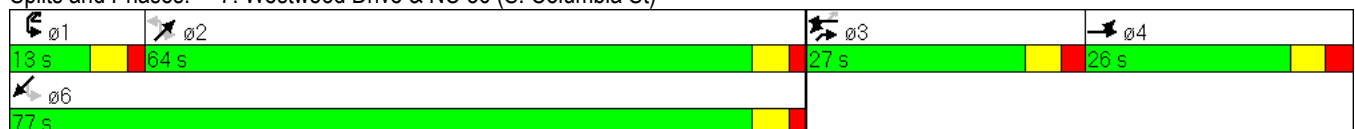
8/8/2014

	↖	→	↘	↙	←	↖	↗	↘	↙	↖	↗	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
v/c Ratio		0.23			0.88	0.29	0.01	0.72	0.32	0.39	0.17	
Control Delay		62.2			84.3	30.9	16.1	27.7	6.2	12.0	7.4	
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		62.2			84.3	30.9	16.1	27.7	6.2	12.0	7.4	
LOS		E			F	C	B	C	A	B	A	
Approach Delay		62.2			67.5			20.4			9.1	
Approach LOS		E			E			C			A	
Queue Length 50th (ft)		22			199	62	3	484	90	32	54	
Queue Length 95th (ft)		42			239	79	13	#752	163	67	91	
Internal Link Dist (ft)		194			512			550			866	
Turn Bay Length (ft)						150	250		250			
Base Capacity (vph)		278			285	384	632	1028	1178	325	1202	
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			0.85	0.29	0.01	0.72	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: 0.88
 Intersection Signal Delay: 28.0 Intersection LOS: C
 Intersection Capacity Utilization 70.8% 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.

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

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Volume (vph)	0	0	0	547	0	61	333	1263	0	0	290	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		0.537						
Satd. Flow (perm)	0	0	0	1665	1665	1534	990	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	595	0	66	383	1452	0	0	319	167	
Shared Lane Traffic (%)				50%									
Lane Group Flow (vph)	0	0	0	297	298	66	383	1452	0	0	319	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)				32.4	32.4	32.4	97.6	97.6			65.6	65.6	
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	0.46	0.86			0.20	0.24	
Control Delay				63.3	63.5	41.9	8.0	16.1			23.6	25.3	
Queue Delay				0.0	0.0	0.0	0.5	1.0			0.0	0.0	
Total Delay				63.3	63.5	41.9	8.5	17.1			23.6	25.3	
LOS				E	E	D	A	B			C	C	

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

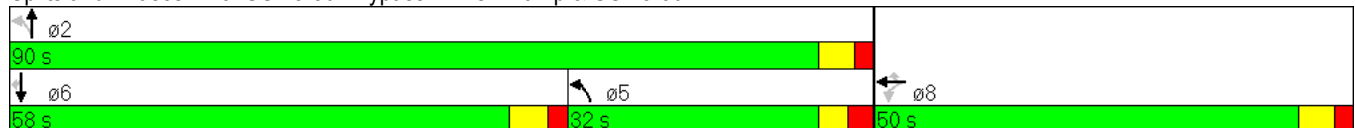
8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay					61.3			15.3			24.2	
Approach LOS					E			B			C	
Queue Length 50th (ft)				269	270	49	39	556			87	89
Queue Length 95th (ft)				348	349	83	141	#927			138	163
Internal Link Dist (ft)		344			813			516			226	
Turn Bay Length (ft)				275		275	150					
Base Capacity (vph)				535	535	493	837	1698			1567	686
Starvation Cap Reductn				0	0	0	166	84			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	0.56	0.13	0.57	0.90			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: 0.86
 Intersection Signal Delay: 26.9 Intersection LOS: C
 Intersection Capacity Utilization 62.9% 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.

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

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	482	0	313	0	0	0	0	1128	0	55	803	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								0.131		
Satd. Flow (perm)	1603	1603	1509	0	0	0	0	3505	0	233	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	368	0	0	0	0	1226	0	61	892	0
Shared Lane Traffic (%)	50%											
Lane Group Flow (vph)	283	284	368	0	0	0	0	1226	0	61	892	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)	41.2	41.2	41.2					78.5		88.8	88.8	
Actuated g/C Ratio	0.29	0.29	0.29					0.56		0.63	0.63	
v/c Ratio	0.60	0.60	0.83					0.62		0.27	0.42	
Control Delay	47.1	47.2	61.7					12.6		6.3	3.4	
Queue Delay	0.0	0.0	0.0					0.2		0.0	0.3	
Total Delay	47.1	47.2	61.7					12.8		6.3	3.7	
LOS	D	D	E					B		A	A	

Lanes, Volumes, Timings

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

8/8/2014

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		52.9						12.8			3.9	
Approach LOS		D						B			A	
Queue Length 50th (ft)	227	228	306					232		4	31	
Queue Length 95th (ft)	295	296	386					m245		m8	36	
Internal Link Dist (ft)		767			62			76			516	
Turn Bay Length (ft)	250		250							150		
Base Capacity (vph)	538	538	507					1965		231	2139	
Starvation Cap Reductn	0	0	0					0		0	633	
Spillback Cap Reductn	0	0	0					182		0	0	
Storage Cap Reductn	0	0	0					0		0	0	
Reduced v/c Ratio	0.53	0.53	0.73					0.69		0.26	0.59	

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: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 22.1

Intersection LOS: C

Intersection Capacity Utilization 62.9%

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

↘ ø1	↑ ø2	↗ ø4
13 s	75 s	52 s
↓ ø6		
88 s		

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

8/8/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations	↖	↗	↘	↙	↕	↖	↗	↘	↙	↕	↖	↗
Volume (vph)	229	64	63	15	129	595	64	1524	11	260	835	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					
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1743	1835	1560	1823	1918	1631	1770	3540	1584	1702	3404	1523
Flt Permitted	0.522			0.710			0.249			0.062		
Satd. Flow (perm)	958	1835	1560	1362	1918	1631	463	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	71	16	142	654	68	1621	12	265	852	126
Shared Lane Traffic (%)												
Lane Group Flow (vph)	257	72	71	16	142	654	68	1621	12	265	852	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	0.34	1.07	0.02	1.13	0.44	0.12

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

8/8/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Control Delay	44.4	30.8	31.2	39.8	43.7	104.6	22.2	68.1	18.2	142.6	12.7	8.7
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	44.4	30.8	31.2	39.8	43.7	104.6	22.2	68.1	18.2	142.6	12.7	8.7
LOS	D	C	C	D	D	F	C	E	B	F	B	A
Approach Delay		39.6			92.7			65.9			39.9	
Approach LOS		D			F			E			D	
Queue Length 50th (ft)	176	44	43	11	104	~574	15	~843	3	~243	157	35
Queue Length 95th (ft)	254	80	79	31	166	#913	m44	#982	m8	#433	180	m53
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	198	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	0.34	1.07	0.02	1.13	0.44	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: 60.8
 Intersection LOS: E
 Intersection Capacity Utilization 104.2%
 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

ø2	ø1	ø4
65 s	20 s	55 s
ø6	ø7	ø8
85 s	14 s	41 s

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

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	145	23	12	100	18	9	7	6	1440	70	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							
Fr't		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	143	26	13	8	7	1694	82	1	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	148	35	0	143	39	0	0	15	1694	82	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		0.63	0.13			0.13	0.64	0.07		0.10

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

8/8/2014

	↓	↙
Lane Group	SBT	SBR
Lane Configurations	↑↑	↗
Volume (vph)	802	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		
Fr _t		0.850
Fl _t Protected		
Satd. Flow (prot)	3438	1538
Fl _t 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)	827	101
Shared Lane Traffic (%)		
Lane Group Flow (vph)	827	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	0.33	0.09

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

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Control Delay	69.9	48.2		66.0	48.4			79.6	8.0	4.0		43.6
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0		0.0
Total Delay	69.9	48.2		66.0	48.4			79.6	8.0	4.0		43.6
LOS	E	D		E	D			E	A	A		D
Approach Delay		65.8			62.2				8.4			
Approach LOS		E			E				A			
Queue Length 50th (ft)	129	28		123	31			14	206	14		9
Queue Length 95th (ft)	192	57		138	47			m0	363	m24		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		0.26	0.05			0.13	0.64	0.07		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: 140

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.68

Intersection Signal Delay: 14.4

Intersection LOS: B

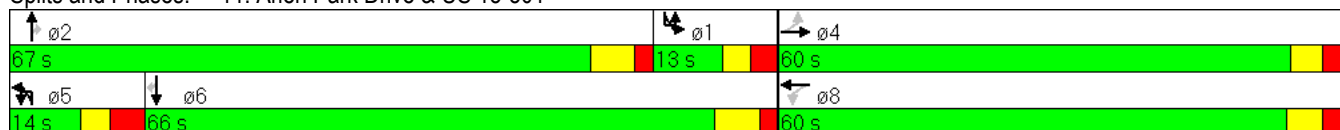
Intersection Capacity Utilization 63.2%

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

8/8/2014

	↓	↙
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)	70	16
Queue Length 95th (ft)	138	45
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	0.33	0.09
Intersection Summary		


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

8/8/2014

Lane Group	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	SEL	SET	SER	NWL
Lane Configurations												
Volume (vph)	27	150	1147	3	37	16	516	347	336	1	35	6
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	0
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								0.850		0.853		
Flt Protected		0.950				0.950			0.950			
Satd. Flow (prot)	0	1796	3592	0	0	1701	3402	1522	1762	1582	0	0
Flt Permitted		0.950				0.950			0.950			
Satd. Flow (perm)	0	1796	3592	0	0	1701	3402	1522	1762	1582	0	0
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	0.96	0.96	0.96	0.82	0.82	0.82	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	4%	4%	4%	4%	4%	4%	4%	2%
Adj. Flow (vph)	29	163	1247	3	39	17	538	361	410	1	43	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	192	1250	0	0	56	538	361	410	44	0	0
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)	29.0	29.0	64.0	0.0	14.0	14.0	49.0	48.0	48.0	62.0	0.0	14.0
Total Split (%)	20.7%	20.7%	45.7%	0.0%	10.0%	10.0%	35.0%	34.3%	34.3%	44.3%	0.0%	10.0%
Maximum Green (s)	23.2	23.2	57.6		7.0	7.0	43.0	41.9	41.9	55.9		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	Lag	Lag	Lead		Lag	Lag	Lead	Lag	Lag			Lead
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)		22.0	69.8			9.0	54.0	96.8	37.8	49.0		
Actuated g/C Ratio		0.16	0.50			0.06	0.39	0.69	0.27	0.35		
v/c Ratio		0.68	0.70			0.51	0.41	0.34	0.86	0.08		
Control Delay		62.1	28.1			76.4	22.6	7.3	66.5	27.0		
Queue Delay		0.0	0.0			0.0	0.0	0.0	0.0	0.0		
Total Delay		62.1	28.1			76.4	22.6	7.3	66.5	27.0		
LOS		E	C			E	C	A	E	C		
Approach Delay			32.6				20.0			62.6		

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

8/8/2014

Lane Group	NWT	NWR
Lane Configurations		
Volume (vph)	1	31
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	0.891	
Flt Protected	0.992	
Satd. Flow (prot)	1646	0
Flt Permitted	0.931	
Satd. Flow (perm)	1545	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	0.90	0.90
Heavy Vehicles (%)	2%	2%
Adj. Flow (vph)	1	34
Shared Lane Traffic (%)		
Lane Group Flow (vph)	42	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	Lead	
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	0.42	
Control Delay	76.6	
Queue Delay	0.0	
Total Delay	76.6	
LOS	E	
Approach Delay	76.6	

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

8/8/2014

Lane Group	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	SEL	SET	SER	NWL
Approach LOS			C				B			E		
Queue Length 50th (ft)		165	512			46	134	99	350	25		
Queue Length 95th (ft)		251	625			103	250	157	411	46		
Internal Link Dist (ft)			869				2658			376		
Turn Bay Length (ft)		275				250		300	150			
Base Capacity (vph)		308	1790			109	1311	1049	541	644		
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		0.62	0.70			0.51	0.41	0.34	0.76	0.07		

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 84 (60%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.86

Intersection Signal Delay: 33.8

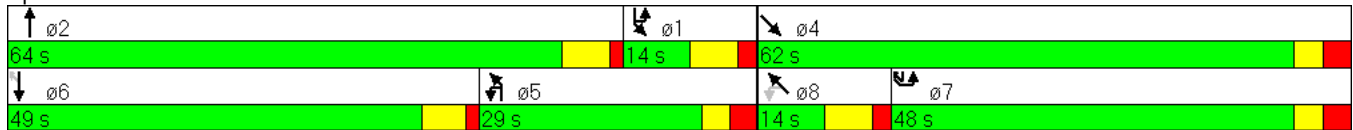
Intersection LOS: C

Intersection Capacity Utilization 75.4%

ICU Level of Service D

Analysis Period (min) 15

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





Lane Group	NWT	NWR
Approach LOS	E	
Queue Length 50th (ft)	38	
Queue Length 95th (ft)	79	
Internal Link Dist (ft)	311	
Turn Bay Length (ft)		
Base Capacity (vph)	99	
Starvation Cap Reductn	0	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.42	
Intersection Summary		

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

8/8/2014

Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Volume (vph)	69	1	7	1356	8	493	22
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		0.439		0.950		
Satd. Flow (perm)	1781	0	826	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	0.91	0.91	0.91
Heavy Vehicles (%)	2%	2%	3%	3%	2%	7%	7%
Adj. Flow (vph)	78	1	8	1458	9	542	24
Shared Lane Traffic (%)							
Lane Group Flow (vph)	79	0	8	1458	9	566	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)	11.6		114.8	114.8	8.9	118.4	
Actuated g/C Ratio	0.08		0.82	0.82	0.06	0.85	
v/c Ratio	0.54		0.01	0.50	0.08	0.20	
Control Delay	74.4		4.6	5.7	35.1	0.8	
Queue Delay	0.0		0.0	0.0	0.0	0.0	
Total Delay	74.4		4.6	5.7	35.1	0.8	
LOS	E		A	A	D	A	
Approach Delay	74.4			5.6		1.4	

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

8/8/2014

Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Approach LOS	E		A		A		
Queue Length 50th (ft)	70		1	138	9	13	
Queue Length 95th (ft)	120		8	401	m21	16	
Internal Link Dist (ft)	1070		819		45		
Turn Bay Length (ft)			300				
Base Capacity (vph)	216		678	2933	150	2781	
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	0.37		0.01	0.50	0.06	0.20	

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: 0.54
 Intersection Signal Delay: 7.0 Intersection LOS: A
 Intersection Capacity Utilization 51.7% 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

↑ ø2	↓ ø1	↘ ø4
100 s	18 s	22 s
↓ ø6		
118 s		

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

8/8/2014

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	1124	7	47	395	34
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	1196	7	51	425	37
Shared Lane Traffic (%)												
Lane Group Flow (vph)	76	18	242	26	25	28	403	1196	7	51	425	37
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)	12.3	12.2	21.7	13.4	11.1	17.4	12.7	59.7	72.2	10.7	47.9	66.5
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	0.24	0.03
Control Delay	51.8	48.8	38.2	49.5	52.5	40.6	64.4	14.5	5.6	51.0	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	51.8	48.8	38.2	49.5	52.5	40.6	64.4	14.5	5.6	51.0	12.2	5.0
LOS	D	D	D	D	D	D	E	B	A	D	B	A
Approach Delay		41.8			47.3			27.0			15.5	

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

8/8/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Approach LOS		D			D			C			B	
Queue Length 50th (ft)	48	11	90	6	16	15	~167	272	1	16	76	7
Queue Length 95th (ft)	115	39	146	20	39	37	#362	387	7	44	115	17
Internal Link Dist (ft)		720			587			1027			1172	
Turn Bay Length (ft)	125		175	150		150	500		250	275		100
Base Capacity (vph)	364	510	657	768	513	333	473	2966	1307	459	2881	1225
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	0.15	0.03

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 91.4

Natural Cycle: 70

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.85

Intersection Signal Delay: 27.3

Intersection LOS: C

Intersection Capacity Utilization 60.1%

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

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	251	37	170	250	415	513	20	377	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't					0.877				0.850			0.850
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	0	0	3385	1592	0	1702	3404	1523	1712	3424	1532
Flt Permitted				0.950			0.488			0.472		
Satd. Flow (perm)	0	0	0	3385	1592	0	874	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	185	291	483	597	22	419	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	273	225	0	291	483	597	22	419	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	0.23	0.04
Control Delay				42.8	57.1		2.3	1.0	3.3	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				42.8	57.1		3.3	1.0	3.9	15.4	15.5	15.0

Lanes, Volumes, Timings

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

8/8/2014

	↖	→	↘	↙	←	↖	↙	↑	↗	↘	↓	↙
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			15.5	
Approach LOS					D			A			B	
Queue Length 50th (ft)				95	164		7	6	15	8	85	11
Queue Length 95th (ft)				127	235		12	10	23	24	132	32
Internal Link Dist (ft)		387			687			304			527	
Turn Bay Length (ft)				475			225		250	250		
Base Capacity (vph)				874	411		739	2447	1067	461	1862	833
Starvation Cap Reductn				0	0		236	0	183	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	0.68	0.05	0.23	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

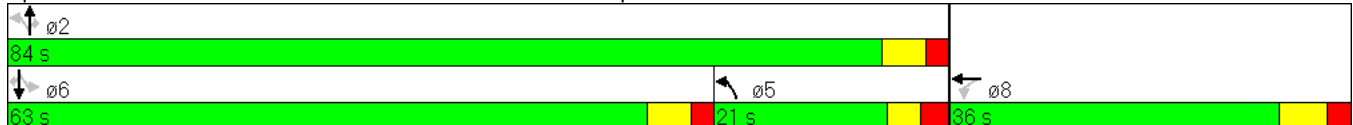
Intersection LOS: B

Intersection Capacity Utilization 49.4%

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

8/8/2014

Lane Group	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	SEL2	SEL	SER
Lane Configurations				↑↑	↑	↑	↑↑		↑	↑	↑
Volume (vph)	0	0	0	854	258	212	413	0	304	2	336
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						
Frnt					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						0.145			0.950	0.950	
Satd. Flow (perm)	0	0	0	3421	1470	260	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	982	297	259	504	0	358	2	395
Shared Lane Traffic (%)									50%		
Lane Group Flow (vph)	0	0	0	982	297	259	504	0	179	181	395
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)				52.5	52.5	74.0	74.0		36.0	36.0	36.0
Actuated g/C Ratio				0.44	0.44	0.62	0.62		0.30	0.30	0.30
v/c Ratio				0.66	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

8/8/2014

	↙	↖	↗	↑	↘	↙	↓	↘	↗	↘	↘
Lane Group	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	SEL2	SEL	SER
Control Delay				30.9	29.0	33.8	5.5		34.2	34.3	56.9
Queue Delay				0.0	0.0	0.3	0.2		0.0	0.0	0.0
Total Delay				30.9	29.0	34.1	5.8		34.2	34.3	56.9
LOS				C	C	C	A		C	C	E
Approach Delay				30.5			15.4			46.1	
Approach LOS				C			B			D	
Queue Length 50th (ft)				332	170	61	33		111	112	280
Queue Length 95th (ft)				408	257	167	38		161	162	362
Internal Link Dist (ft)	626			334			304			410	
Turn Bay Length (ft)					125	175			250	250	250
Base Capacity (vph)				1498	643	389	2102		561	561	528
Starvation Cap Reductn				0	0	9	909		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	0.46	0.68	0.42		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: 30.6
 Intersection LOS: C
 Intersection Capacity Utilization 56.3%
 ICU Level of Service B
 Analysis Period (min) 15

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

↙ ø1	↑ ø2	↘ ø4
24 s	50 s	46 s
↘ ø6		
74 s		

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

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	213	2413	2	7	1273	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)	227	2567	2	7	1340	793	302	0	43	25	10	63
Shared Lane Traffic (%)												
Lane Group Flow (vph)	227	2569	0	7	1340	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)	16.9	134.0		9.0	126.1	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

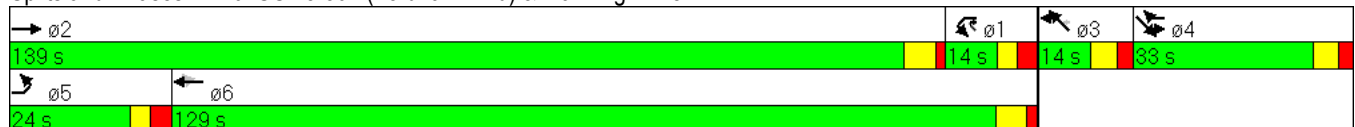
8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
v/c Ratio	0.76	1.06		0.09	0.62	0.65	0.57		0.03		0.50	0.40
Control Delay	106.5	67.8		66.3	8.6	2.5	84.0		0.0		117.8	90.8
Queue Delay	0.0	1.1		0.0	0.0	0.0	0.0		0.0		0.0	0.0
Total Delay	106.5	68.8		66.3	8.6	2.5	84.0		0.0		117.8	90.8
LOS	F	E		E	A	A	F		A		F	F
Approach Delay		71.9			6.5						100.4	
Approach LOS		E			A						F	
Queue Length 50th (ft)	153	~1940		9	158	58	196		0		46	78
Queue Length 95th (ft)	204	#2028		m10	m196	m84	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	6		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	1.06		0.09	0.62	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: 1.06
 Intersection Signal Delay: 46.5 Intersection LOS: D
 Intersection Capacity Utilization 100.0% 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.
 # 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)

8/8/2014

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	2495	198	22	1815
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	2599	206	25	2086
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	40	0	169	35	0	0	106	2599	206	25	2086
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	1.14	0.18	0.29	0.94
Control Delay		140.7		147.0	86.9			170.1	88.6	3.6	100.8	46.4

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

8/8/2014

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)

8/8/2014

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			170.1	93.7	3.6	100.8	46.4
LOS		F		F	F			F	F	A	F	D
Approach Delay		140.7			136.7				90.1			47.0
Approach LOS		F			F				F			D
Queue Length 50th (ft)		53		226	43			~167	~2049	32	32	1268
Queue Length 95th (ft)		68		177	50			m#171	m#1892	m31	69	1276
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	1.15	0.18	0.28	0.94

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: 95.4

Intersection LOS: F

Intersection Capacity Utilization 107.8%

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)

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

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

8/8/2014



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		
Intersection Summary					

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

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	968	0	0	281	0	1410	29	0	1366	181
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		450	0		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
Fr _t			0.850			0.865			0.850			0.850
Fl _t Protected												
Satd. Flow (prot)	0	0	2787	0	0	1611	0	3539	1583	0	3539	1583
Fl _t 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)						138			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	1052	0	0	312	0	1567	32	0	1666	197
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	1052	0	0	312	0	1567	32	0	1666	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			56.1			0.3		0.4	0.0		45.9	0.2
Queue Delay			0.0			0.0		0.0	0.0		0.0	0.0
Total Delay			56.1			0.3		0.4	0.0		45.9	0.2
LOS			E			A		A	A		D	A
Approach Delay								0.4			41.1	
Approach LOS								A			D	
Queue Length 50th (ft)			613			0		0	0		874	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)

8/8/2014

	↖	→	↘	↙	←	↖	↘	↑	↖	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)			730			0		0	0		830	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: 28.2
 Intersection LOS: C
 Intersection Capacity Utilization 80.0%
 ICU Level of Service D
 Analysis Period (min) 15

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

↑ ø2	↖ ø4
93 s	77 s
↓ ø6	
93 s	

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	

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

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	1967	40	102	2276	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			0.054				0.783			0.853	
Satd. Flow (perm)	86	5066	0	99	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	2093	43	113	2529	18	21	5	230	43	10	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	24	2136	0	113	2547	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	
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	
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)	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		0.57	0.74			0.09	0.77		0.32	
Control Delay	14.6	12.1		53.8	18.9			47.3	74.0		53.3	

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

8/8/2014

	↖	→	↘	↙	←	↖	↘	↑	↖	↘	↓	↙
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	14.6	12.1		53.8	18.9			47.3	74.0		53.3	
LOS	B	B		D	B			D	E		D	
Approach Delay		12.1			20.4			71.3			53.3	
Approach LOS		B			C			E			D	
Queue Length 50th (ft)	5	193		49	609			21	216		77	
Queue Length 95th (ft)	m10	286		124	802			41	258		104	
Internal Link Dist (ft)		946			801			557			377	
Turn Bay Length (ft)	250			275					450			
Base Capacity (vph)	145	3178		199	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		0.57	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: C

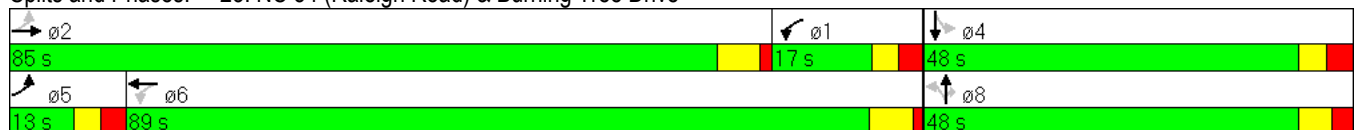
Intersection Capacity Utilization 79.3%

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

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	1893	196	65	2274	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	2151	223	73	2555	26	294	52	160	50	33	41
Shared Lane Traffic (%)												
Lane Group Flow (vph)	40	2374	0	73	2581	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	0.0
Total Split (%)	8.7%	60.0%	0.0%	8.7%	60.0%	0.0%	31.3%	31.3%	31.3%	31.3%	31.3%	0.0%
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	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)	88.3	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	0.82		0.51	0.85		0.89	0.11	0.41	0.15	0.18	
Control Delay	19.4	28.0		40.3	17.3		82.2	41.6	48.8	42.7	43.1	

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

8/8/2014

						
Lane Group	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Volume (vph)	211	271	574	115	159	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)	289	371	624	125	187	434
Shared Lane Traffic (%)						
Lane Group Flow (vph)	289	371	749	0	187	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	31.4	48.5		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

8/8/2014

	↖	↗	↘	↙	↕	↔
Lane Group	WBL	WBR	NET	NER	SWL	SWT
Control Delay	53.8	32.8	23.1		13.1	7.4
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	53.8	32.8	23.1		13.1	7.4
LOS	D	C	C		B	A
Approach Delay	42.0		23.1			9.1
Approach LOS	D		C			A
Queue Length 50th (ft)	155	174	327		35	97
Queue Length 95th (ft)	189	203	489		56	136
Internal Link Dist (ft)	1070		783			748
Turn Bay Length (ft)	125				225	
Base Capacity (vph)	380	536	987		324	1193
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		0.58	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 Capacity Utilization 70.3%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service C

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



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

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	154	347	86	81	430	121	122	364	121	117	331	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	
Fr't		0.970			0.967			0.963			0.954	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1392	2825	0	1472	2609	0	1366	2489	0	1366	2325	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1158	2825	0	1257	2609	0	1206	2489	0	1198	2325	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	98	85	453	127	128	383	127	133	376	166
Shared Lane Traffic (%)												
Lane Group Flow (vph)	175	492	0	85	580	0	128	510	0	133	542	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%
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?												
Recall Mode	None	Min		None	Min		None	C-Max		None	C-Max	
Act Effct Green (s)	18.9	39.6		11.3	32.0		14.5	43.9		15.2	44.6	
Actuated g/C Ratio	0.15	0.30		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	0.61		0.83	0.68	
Control Delay	90.0	41.0		81.3	66.0		105.9	21.6		93.4	43.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	90.0	41.0		81.3	66.0		105.9	21.6		93.4	43.2	
LOS	F	D		F	E		F	C		F	D	
Approach Delay		53.8			68.0			38.5			53.1	

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

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	154	347	86	81	430	121	122	364	121	117	331	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	
Fr't		0.970			0.967			0.963			0.954	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1392	2825	0	1472	2609	0	1366	2489	0	1366	2325	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1158	2825	0	1257	2609	0	1206	2489	0	1198	2325	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	98	85	453	127	128	383	127	133	376	166
Shared Lane Traffic (%)												
Lane Group Flow (vph)	175	492	0	85	580	0	128	510	0	133	542	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%
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?												
Recall Mode	None	Min		None	Min		None	C-Max		None	C-Max	
Act Effct Green (s)	18.9	39.6		11.3	32.0		14.5	43.9		15.2	44.6	
Actuated g/C Ratio	0.15	0.30		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	0.61		0.83	0.68	
Control Delay	90.0	41.0		81.3	66.0		105.9	21.6		93.4	43.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	90.0	41.0		81.3	66.0		105.9	21.6		93.4	43.2	
LOS	F	D		F	E		F	C		F	D	
Approach Delay		53.8			68.0			38.5			53.1	

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

8/8/2014

	↖	→	↘	↙	←	↖	↘	↑	↖	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS	D			E			D			D		
Queue Length 50th (ft)	143	176		71	248		81	198		110	216	
Queue Length 95th (ft)	#250	237		125	#348		m#189	m148		#203	280	
Internal Link Dist (ft)		726			860			892			742	
Turn Bay Length (ft)	225			100			400			100		
Base Capacity (vph)	225	882		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		0.50	0.88		0.76	0.61		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

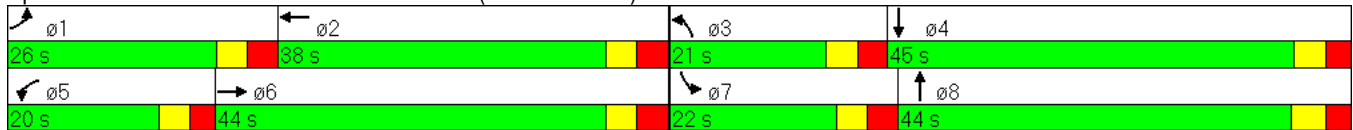
Analysis Period (min) 15

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)

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	19	68	0	0	101	55	154	519	49	99	0	489
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		0.79		0.79
Fr _t					0.952			0.987				0.850
Flt Protected	0.950						0.950			0.950		
Satd. Flow (prot)	1510	1644	0	0	1391	0	1417	2672	0	1468	0	2391
Flt Permitted	0.387						0.950			0.950		
Satd. Flow (perm)	516	1644	0	0	1391	0	1251	2672	0	1155	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	169	570	54	115	0	569
Shared Lane Traffic (%)												
Lane Group Flow (vph)	23	83	0	0	195	0	169	624	0	115	0	569
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%
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?												
Recall Mode	Min	Min			None		C-Max	C-Max		None		None
Act Effct Green (s)	21.1	21.1			21.1		58.1	58.1		35.8		35.8
Actuated g/C Ratio	0.16	0.16			0.16		0.45	0.45		0.28		0.28
v/c Ratio	0.27	0.31			0.86		0.27	0.52		0.28		0.86
Control Delay	23.4	20.0			86.2		13.3	14.4		25.1		45.4
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0		1.3
Total Delay	23.4	20.0			86.2		13.3	14.4		25.1		46.7
LOS	C	C			F		B	B		C		D
Approach Delay		20.8			86.2			14.2				

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

8/8/2014

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%
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
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
 2: Cameron Avenue & NC 86 (S. Columbia St)

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS	C			F			B					
Queue Length 50th (ft)	20	71			161		49	102		64		247
Queue Length 95th (ft)	m23	m85			#237		81	145		m90		292
Internal Link Dist (ft)		332			976			759			892	
Turn Bay Length (ft)	110									150		
Base Capacity (vph)	87	278			235		633	1194		418		681
Starvation Cap Reductn	0	0			0		0	0		0		0
Spillback Cap Reductn	0	0			0		0	0		0		28
Storage Cap Reductn	0	0			0		0	0		0		0
Reduced v/c Ratio	0.26	0.30			0.83		0.27	0.52		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: 33.6

Intersection LOS: C

Intersection Capacity Utilization 60.3%

ICU Level of Service B

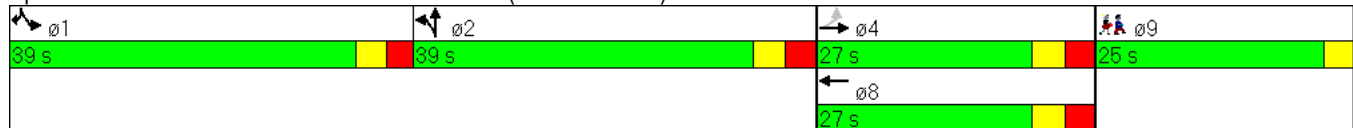
Analysis Period (min) 15

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
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

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	96	168	576	238	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	1193	0	2874	1613	0	0	0	0	0	0	0
Flt Permitted				0.950								
Satd. Flow (perm)	0	1193	0	1832	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		25		25
Link Distance (ft)		258		412		549		191		191		191
Travel Time (s)		30.0		10.7		15.0		5.2		5.2		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	191	789	326	0	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	300	0	789	326	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%
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?												
Recall Mode		None		C-Max	None							
Act Effct Green (s)		38.4		61.5	105.0							
Actuated g/C Ratio		0.30		0.47	0.81							
v/c Ratio		0.85		0.58	0.25							
Control Delay		63.9		15.9	1.8							
Queue Delay		0.0		0.7	0.8							
Total Delay		63.9		16.6	2.7							
LOS		E		B	A							
Approach Delay		63.9		12.5								

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	
Fr _t	
Fl _t Protected	
Satd. Flow (prot)	
Fl _t 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%
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	Ped
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	

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

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		E			B							
Queue Length 50th (ft)		237		134	24							
Queue Length 95th (ft)		305		169	44							
Internal Link Dist (ft)		178			332			469			111	
Turn Bay Length (ft)												
Base Capacity (vph)		458		1359	1303							
Starvation Cap Reductn		0		262	688							
Spillback Cap Reductn		0		0	0							
Storage Cap Reductn		0		0	0							
Reduced v/c Ratio		0.66		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: 23.4
 Intersection Capacity Utilization 48.0%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service A

Splits and Phases: 3: Cameron Avenue & Pittsboro Street

ø1	ø2	ø4
53 s	65 s	22 s
ø6		
108 s		

Lane Group	ø4
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

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	83	19	128	93	0	0	0	0	104	426	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				0.629							0.991	
Satd. Flow (perm)	0	1359	0	742	1583	0	0	0	0	0	2828	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	144	104	0	0	0	0	111	453	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	122	0	144	104	0	0	0	0	0	588	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%
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?												
Recall Mode		None		None	None					C-Max	C-Max	
Act Effct Green (s)		30.5		30.5	30.5						89.5	
Actuated g/C Ratio		0.23		0.23	0.23						0.69	
v/c Ratio		0.38		0.83	0.28						0.30	
Control Delay		42.7		54.0	20.5						3.7	
Queue Delay		0.0		0.0	0.0						0.0	
Total Delay		42.7		54.0	20.5						3.7	
LOS		D		D	C						A	
Approach Delay		42.7			39.9						3.7	

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

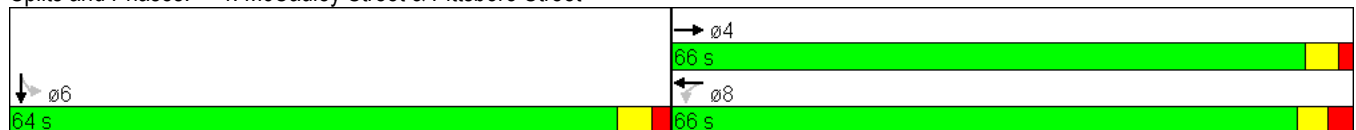
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		D			D							A
Queue Length 50th (ft)		87		47	33							27
Queue Length 95th (ft)		116		71	52							121
Internal Link Dist (ft)		413			428			1086				190
Turn Bay Length (ft)				200								
Base Capacity (vph)		638		348	743							1947
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:	18.0
Intersection LOS:	B
Intersection Capacity Utilization:	50.0%
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)

8/8/2014

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	529	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 _t					0.990	0.850			0.850			
Flt Protected	0.950							0.994				
Satd. Flow (prot)	1593	1788	0	0	1530	1334	0	4153	1301	0	0	0
Flt Permitted	0.950							0.994				
Satd. Flow (perm)	1347	1788	0	0	1530	1051	0	3923	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	725	177	0	0	0
Shared Lane Traffic (%)						10%						
Lane Group Flow (vph)	107	169	0	0	201	130	0	828	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%
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?												
Recall Mode	Min	Min			Min	Min	C-Max	C-Max				
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			
Control Delay	57.6	67.1			69.9	72.3		12.8	0.3			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	57.6	67.1			69.9	72.3		12.8	0.3			
LOS	E	E			E	E		B	A			
Approach Delay		63.4			70.8			10.6				

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

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS	E			E			B					
Queue Length 50th (ft)	90	144			172	110		143	0			
Queue Length 95th (ft)	121	175			235	167		152	0			
Internal Link Dist (ft)		428			566			452			759	
Turn Bay Length (ft)	150					300						
Base Capacity (vph)	343	385			447	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			0.45	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)

8/8/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations	↘	↗		↘		↗		↗	↘			
Volume (vph)	72	260	0	110	0	270	0	347	104	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 t						0.850			0.850			
Flt Protected	0.950			0.950								
Satd. Flow (prot)	1512	3023	0	1475	0	2323	0	3034	1358	0	0	0
Flt 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	134	0	329	0	390	117	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	75	271	0	134	0	329	0	390	117	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%
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?												
Recall Mode	Min	Min		None		None		C-Max	None			
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		0.50		0.78		0.23	0.12			
Control Delay	38.8	45.5		53.2		63.0		16.8	4.5			
Queue Delay	0.0	0.0		0.0		0.0		0.0	0.0			
Total Delay	38.8	45.5		53.2		63.0		16.8	4.5			
LOS	D	D		D		E		B	A			
Approach Delay		44.1						14.0				

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

8/8/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR	
Approach LOS		D							B				
Queue Length 50th (ft)	58	116		103		151		110	34				
Queue Length 95th (ft)	87	142		142		176		92	28				
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		0.30		0.46		0.23	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: 38.1
 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)

ø2	ø4	ø3
43 s	42 s	45 s

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

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	1	3	3	179	12	151	1	297	156	88	305	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		0.550			0.455		
Satd. Flow (perm)	0	1723	0	0	1624	1482	937	1731	1530	792	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	242	16	204	1	345	181	101	351	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	12	0	0	258	204	1	345	181	101	353	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%
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?												
Recall Mode	None	None		None	None	None	C-Min	C-Min	None	None	C-Min	
Act Effct Green (s)		8.2			25.5	36.9	75.8	75.8	101.2	89.2	89.2	
Actuated g/C Ratio		0.06			0.20	0.28	0.58	0.58	0.78	0.69	0.69	
v/c Ratio		0.11			0.79	0.48	0.00	0.34	0.15	0.17	0.30	
Control Delay		59.9			66.4	35.4	19.0	18.4	3.8	7.4	7.9	
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		59.9			66.4	35.4	19.0	18.4	3.8	7.4	7.9	
LOS		E			E	D	B	B	A	A	A	

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

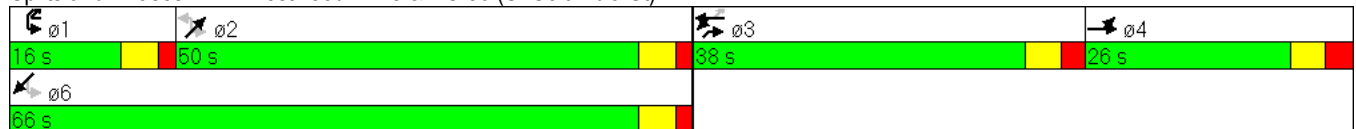
8/8/2014

	↖	→	↗	↖	←	↖	↗	↖	↗	↖	↗	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Approach Delay		59.9			52.7			13.4			7.8	
Approach LOS		E			D			B			A	
Queue Length 50th (ft)		10			209	142	0	125	16	16	63	
Queue Length 95th (ft)		21			223	121	4	274	61	47	146	
Internal Link Dist (ft)		194			512			550			866	
Turn Bay Length (ft)						150	250		250			
Base Capacity (vph)		278			426	451	546	1009	1293	617	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			0.61	0.45	0.00	0.34	0.14	0.16	0.30	

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)



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

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	687	10	70	204	455	0	0	377	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	*0.57	1.00	1.00	0.95	1.00
Ped Bike Factor							1.00					0.98
Frt						0.850						0.850
Flt Protected				0.950	0.954		0.950					
Satd. Flow (prot)	0	0	0	1649	1656	1553	1671	2006	0	0	3374	1509
Flt Permitted				0.950	0.954		0.435					
Satd. Flow (perm)	0	0	0	1649	1656	1553	765	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	708	10	72	243	542	0	0	414	191
Shared Lane Traffic (%)				49%								
Lane Group Flow (vph)	0	0	0	361	357	72	243	542	0	0	414	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%
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?												
Recall Mode				None	None	None	None	C-Max			C-Max	C-Max
Act Effct Green (s)				34.7	34.7	34.7	75.3	75.3			55.9	55.9
Actuated g/C Ratio				0.29	0.29	0.29	0.63	0.63			0.47	0.47
v/c Ratio				0.76	0.75	0.16	0.41	0.43			0.26	0.28
Control Delay				48.5	47.8	29.9	8.8	8.9			22.8	24.8
Queue Delay				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Delay				48.5	47.8	29.9	8.8	8.9			22.8	24.8
LOS				D	D	C	A	A			C	C
Approach Delay					46.5			8.9			23.4	
Approach LOS					D			A			C	

Lanes, Volumes, Timings

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

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	145	0	139	0	0	0	0	511	0	84	950	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
Frnt			0.850									
Flt Protected	0.950	0.950								0.950		
Satd. Flow (prot)	1603	1603	1509	0	0	0	0	3471	0	1752	3505	0
Flt Permitted	0.950	0.950								0.410		
Satd. Flow (perm)	1603	1603	1509	0	0	0	0	3471	0	756	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	149	0	0	0	0	538	0	89	1011	0
Shared Lane Traffic (%)	50%											
Lane Group Flow (vph)	78	78	149	0	0	0	0	538	0	89	1011	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%
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?												
Recall Mode	None	None	None					C-Max		None	C-Max	
Act Effct Green (s)	18.5	18.5	18.5					78.5		91.5	91.5	
Actuated g/C Ratio	0.15	0.15	0.15					0.65		0.76	0.76	
v/c Ratio	0.32	0.32	0.64					0.24		0.14	0.38	
Control Delay	46.8	46.8	59.4					4.9		4.6	4.9	
Queue Delay	0.0	0.0	0.0					0.0		0.0	0.4	
Total Delay	46.8	46.8	59.4					4.9		4.6	5.3	
LOS	D	D	E					A		A	A	
Approach Delay		52.9						4.9			5.2	
Approach LOS		D						A			A	
Queue Length 50th (ft)	56	56	110					36		5	34	
Queue Length 95th (ft)	100	100	169					68		46	243	

Lanes, Volumes, Timings

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

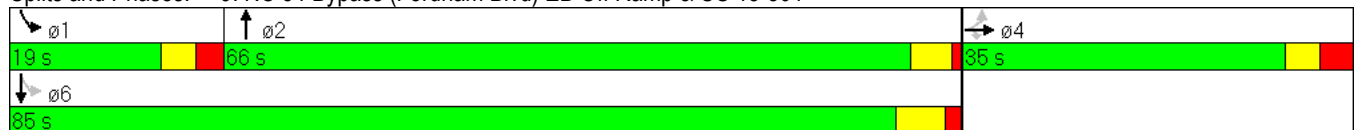
8/8/2014

	↖	→	↘	↙	←	↖	↘	↑	↖	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		767			62			76			516	
Turn Bay Length (ft)	250		250							150		
Base Capacity (vph)	401	401	377					2270		692	2672	
Starvation Cap Reductn	0	0	0					0		0	1022	
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	0.40					0.24		0.13	0.61	

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:	0.64
Intersection Signal Delay:	12.6
Intersection LOS:	B
Intersection Capacity Utilization:	56.4%
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

8/8/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations	↖	↗	↖	↖	↗	↖	↖	↗	↖	↖	↗	↖
Volume (vph)	71	33	30	12	25	280	18	844	13	301	839	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					
Frnt			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	0.525			0.732			0.268			0.210		
Satd. Flow (perm)	944	1800	1530	1378	1882	1600	489	3472	1553	373	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	34	13	27	308	19	898	14	324	902	110
Shared Lane Traffic (%)												
Lane Group Flow (vph)	81	38	34	13	27	308	19	898	14	324	902	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%
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		
Recall Mode	None	None	None	None	None		C-Max	C-Max	C-Max	None	C-Max	
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	0.09	0.60	0.02	0.58	0.38	0.09
Control Delay	41.3	37.3	37.5	49.2	49.8	26.5	14.8	19.5	13.5	27.0	5.6	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	14.8	19.5	13.5	27.0	5.6	2.1
LOS	D	D	D	D	D	C	B	B	B	C	A	A
Approach Delay		39.5			29.2			19.4				10.5

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

8/8/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Approach LOS		D			C			B			B	
Queue Length 50th (ft)	52	24	21	9	19	149	4	170	3	101	74	12
Queue Length 95th (ft)	92	51	48	29	48	207	19	270	14	238	72	20
Internal Link Dist (ft)		446			463			453			555	
Turn Bay Length (ft)			75	425		350	125		75	550		250
Base Capacity (vph)	262	480	408	207	282	600	212	1503	672	556	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	0.09	0.60	0.02	0.58	0.38	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: 0.60
 Intersection Signal Delay: 17.4
 Intersection Capacity Utilization 63.1%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service B

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

ø2	ø1	ø4
51 s	32 s	37 s
ø6	ø7	ø8
83 s	14 s	23 s

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

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	58	4	9	30	2	0	6	3	830	28	7	801
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				
Frnt		0.900								0.850		
Flt Protected	0.950			0.950				0.950			0.950	
Satd. Flow (prot)	1694	1605	0	1746	1838	0	0	1728	3455	1546	1703	3406
Flt Permitted	0.757			0.748				0.950			0.950	
Satd. Flow (perm)	1348	1605	0	1375	1838	0	0	1724	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	10	35	2	0	6	3	874	29	8	871
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	15	0	35	2	0	0	9	874	29	8	871
Turn Type	Perm			Perm			Prot	Prot		Perm	Prot	
Protected Phases		4			8		5	5	2		1	6
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%
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
Recall Mode	None	None		None	None		None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	13.2	13.2		13.3	13.3			8.7	97.9	97.9	8.0	97.8
Actuated g/C Ratio	0.11	0.11		0.11	0.11			0.07	0.82	0.82	0.07	0.82
v/c Ratio	0.45	0.09		0.23	0.01			0.07	0.31	0.02	0.07	0.31
Control Delay	58.8	46.8		50.8	44.5			33.1	2.3	2.6	56.3	4.5
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	0.0
Total Delay	58.8	46.8		50.8	44.5			33.1	2.3	2.6	56.3	4.5
LOS	E	D		D	D			C	A	A	E	A
Approach Delay		56.6			50.5				2.6			4.8

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

8/8/2014

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%
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
Recall Mode	C-Max
Act Effct Green (s)	97.8
Actuated g/C Ratio	0.82
v/c Ratio	0.06
Control Delay	2.5
Queue Delay	0.0
Total Delay	2.5
LOS	A
Approach Delay	

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

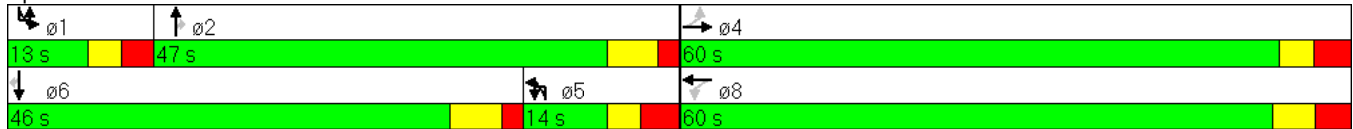
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Approach LOS	E			D			A			A		
Queue Length 50th (ft)	49	11		25	1			7	37	2	6	105
Queue Length 95th (ft)	88	29		54	9			m13	62	m7	m13	217
Internal Link Dist (ft)	307			398			2658			1712		
Turn Bay Length (ft)	75			200			275			300		
Base Capacity (vph)	618	736		630	842			130	2819	1261	115	2775
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	0.02		0.06	0.00			0.07	0.31	0.02	0.07	0.31

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: 6.8 Intersection LOS: A
 Intersection Capacity Utilization 41.2% 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
Approach LOS	
Queue Length 50th (ft)	12
Queue Length 95th (ft)	25
Internal Link Dist (ft)	
Turn Bay Length (ft)	325
Base Capacity (vph)	1212
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.06
Intersection Summary	


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

8/8/2014

Lane Group	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	SEL	SET	SER	NWL
Lane Configurations												
Volume (vph)	24	49	635	9	24	25	608	190	207	1	48	9
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	0
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			
Frnt			0.998					0.850		0.852		
Flt Protected		0.950				0.950			0.950			
Satd. Flow (prot)	0	1796	3585	0	0	1726	3435	1537	1796	1611	0	0
Flt Permitted		0.950				0.950			0.950			
Satd. Flow (perm)	0	1796	3585	0	0	1726	3435	1537	1789	1611	0	0
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	0.69	0.69	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	3%	2%	3%	3%	2%	2%	2%	2%
Adj. Flow (vph)	27	54	706	10	26	27	661	207	300	1	70	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	81	716	0	0	53	661	207	300	71	0	0
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)	18.0	18.0	47.0	0.0	16.0	16.0	45.0	42.0	42.0	57.0	0.0	15.0
Total Split (%)	15.0%	15.0%	39.2%	0.0%	13.3%	13.3%	37.5%	35.0%	35.0%	47.5%	0.0%	12.5%
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	Lag	Lag	Lead		Lag	Lag	Lead	Lag	Lag			Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes			Yes
Recall Mode	None	None	C-Max		None	None	C-Max	None	None	None		None
Act Effct Green (s)		11.7	59.1				10.3	57.5	90.0	25.6	37.4	
Actuated g/C Ratio		0.10	0.49				0.09	0.48	0.75	0.21	0.31	
v/c Ratio		0.46	0.41				0.36	0.40	0.18	0.78	0.14	
Control Delay		55.2	19.8				37.6	12.9	4.9	58.6	26.8	
Queue Delay		0.0	0.0				0.0	0.0	0.0	0.0	0.0	
Total Delay		55.2	19.8				37.6	12.9	4.9	58.6	26.8	
LOS		E	B				D	B	A	E	C	
Approach Delay			23.4					12.5			52.5	

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

8/8/2014

Lane Group	NWT	NWR
Lane Configurations		
Volume (vph)	1	26
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	0.902	
Flt Protected	0.988	
Satd. Flow (prot)	1660	0
Flt Permitted	0.892	
Satd. Flow (perm)	1499	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)	1	29
Shared Lane Traffic (%)		
Lane Group Flow (vph)	40	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)	15.0	0.0
Total Split (%)	12.5%	0.0%
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	Lead	
Lead-Lag Optimize?	Yes	
Recall Mode	None	
Act Effct Green (s)	9.6	
Actuated g/C Ratio	0.08	
v/c Ratio	0.33	
Control Delay	59.9	
Queue Delay	0.0	
Total Delay	59.9	
LOS	E	
Approach Delay	59.9	

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

8/8/2014

	↖	↗	↑	↘	↙	↓	↗	↘	↙	↘	↙	↘
Lane Group	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	SEL	SET	SER	NWL
Approach LOS			C				B			D		
Queue Length 50th (ft)		60	177			42	77	13	221	38		
Queue Length 95th (ft)		113	142			85	128	72	212	49		
Internal Link Dist (ft)			862				2658			376		
Turn Bay Length (ft)		275				250		300	150			
Base Capacity (vph)		195	1765			158	1645	1145	539	685		
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	0.41			0.34	0.40	0.18	0.56	0.10		

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: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 24.5

Intersection LOS: C

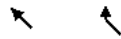
Intersection Capacity Utilization 55.1%

ICU Level of Service B

Analysis Period (min) 15

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

↑ ø2	↘ ø1	↘ ø4	
47 s	16 s	57 s	
↓ ø6	↖ ø5	↖ ø8	↖ ø7
45 s	18 s	15 s	42 s



Lane Group	NWT	NWR
Approach LOS	E	
Queue Length 50th (ft)	30	
Queue Length 95th (ft)	67	
Internal Link Dist (ft)	448	
Turn Bay Length (ft)		
Base Capacity (vph)	125	
Starvation Cap Reductn	0	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.32	
Intersection Summary		

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

8/8/2014

Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Volume (vph)	23	9	8	681	9	643	18
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	0.962					0.996	
Flt Protected	0.965		0.950		0.950		
Satd. Flow (prot)	1738	0	1753	3507	1734	3388	0
Flt Permitted	0.965		0.390		0.950		
Satd. Flow (perm)	1735	0	720	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	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	5%	5%	2%	4%	4%
Adj. Flow (vph)	26	10	9	748	9	670	19
Shared Lane Traffic (%)							
Lane Group Flow (vph)	36	0	9	748	9	689	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%
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		
Recall Mode	None		C-Max	C-Max	None	C-Max	
Act Effct Green (s)	8.6		103.5	103.5	11.2	108.5	
Actuated g/C Ratio	0.07		0.86	0.86	0.09	0.90	
v/c Ratio	0.29		0.01	0.25	0.06	0.22	
Control Delay	58.6		5.5	3.9	29.4	0.9	
Queue Delay	0.0		0.0	0.0	0.0	0.0	
Total Delay	58.6		5.5	3.9	29.4	0.9	
LOS	E		A	A	C	A	
Approach Delay	58.6			3.9		1.3	

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

8/8/2014

Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Approach LOS	E		A		A		
Queue Length 50th (ft)	27		1	41	5	16	
Queue Length 95th (ft)	59		9	173	m11	38	
Internal Link Dist (ft)	1070		819		42		
Turn Bay Length (ft)			300				
Base Capacity (vph)	232		621	3026	289	3064	
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	0.16		0.01	0.25	0.03	0.22	

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: 0.29
 Intersection Signal Delay: 4.0
 Intersection LOS: A
 Intersection Capacity Utilization 33.0%
 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

8/8/2014

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	654	27	45	605	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		
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1718	1809	2706	3383	1835	1560	3320	3423	1531	3287	3389	1516
Flt 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	1.00	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	181	94	45	75	276	798	33	48	651	31
Shared Lane Traffic (%)												
Lane Group Flow (vph)	35	54	181	94	45	75	276	798	33	48	651	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%
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?												
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	39.9	44.5	9.2	31.1	48.5
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	0.28	0.21	0.18	0.21	0.55	0.43	0.04	0.12	0.45	0.03
Control Delay	36.3	37.5	24.2	36.1	36.1	26.5	39.7	16.4	6.9	36.4	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	36.3	37.5	24.2	36.1	36.1	26.5	39.7	16.4	6.9	36.4	17.7	7.3
LOS	D	D	C	D	D	C	D	B	A	D	B	A
Approach Delay		28.4			32.7			21.9			18.5	

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

8/8/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Approach LOS		C				C				B		
Queue Length 50th (ft)	16	24	36	21	20	27	65	148	6	10	120	6
Queue Length 95th (ft)	46	63	78	46	53	65	#122	194	16	31	180	18
Internal Link Dist (ft)		720				587				1027		
Turn Bay Length (ft)	125		175	150		150	500		250	275		100
Base Capacity (vph)	418	543	643	762	551	401	498	3355	1010	493	3322	1125
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	0.28	0.12	0.08	0.19	0.55	0.24	0.03	0.10	0.20	0.03

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 73.4

Natural Cycle: 65

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.55

Intersection Signal Delay: 22.6

Intersection LOS: C

Intersection Capacity Utilization 45.3%

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

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	187	76	161	122	254	188	35	419	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't					0.898				0.850			0.850
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	0	0	3291	1604	0	1718	3436	1537	1745	3490	1561
Flt 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	194	131	273	202	45	537	54
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	225	286	0	131	273	202	45	537	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%
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?												
Recall Mode				None	None		None	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)				27.4	27.4		72.6	72.6	72.6	53.6	53.6	53.6
Actuated g/C Ratio				0.25	0.25		0.66	0.66	0.66	0.49	0.49	0.49
v/c Ratio				0.27	0.71		0.21	0.12	0.20	0.09	0.32	0.07
Control Delay				32.7	47.1		4.5	2.2	3.2	18.5	19.0	18.0
Queue Delay				0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay				32.7	47.1		4.5	2.2	3.2	18.5	19.0	18.0
LOS				C	D		A	A	A	B	B	B
Approach Delay					40.8			3.0			18.9	

Lanes, Volumes, Timings

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

8/8/2014

	↖	→	↘	↙	←	↖	↘	↑	↖	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS					D			A			B	
Queue Length 50th (ft)				65	184		5	4	7	17	117	20
Queue Length 95th (ft)				80	224		34	9	15	38	154	43
Internal Link Dist (ft)		387			687			304			527	
Turn Bay Length (ft)				475			225		250	250		
Base Capacity (vph)				1316	642		614	2267	993	522	1700	760
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	0.45		0.21	0.12	0.20	0.09	0.32	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: 0.71

Intersection Signal Delay: 19.8

Intersection LOS: B

Intersection Capacity Utilization 48.1%

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

8/8/2014

Lane Group	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	SEL2	SEL	SER
Lane Configurations				↑↑	↗	↘	↑↑		↘	↘	↗
Volume (vph)	0	0	0	430	120	226	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
Fr t					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						0.441			0.950	0.950	
Satd. Flow (perm)	0	0	0	3357	1461	789	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	453	126	276	470	0	95	0	141
Shared Lane Traffic (%)									50%		
Lane Group Flow (vph)	0	0	0	453	126	276	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%
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					
Recall Mode				C-Max	C-Max	None	C-Max		None	None	None
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
Control Delay				11.8	12.1	5.1	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	12.1	5.1	1.3		40.2	40.3	53.8
LOS				B	B	A	A		D	D	D
Approach Delay				11.9			2.7			48.4	

Lanes, Volumes, Timings

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

8/8/2014

	↙	↖	↗	↑	↘	↙	↓	↘	↗	↘	↙
Lane Group	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	SEL2	SEL	SER
Approach LOS				B			A			D	
Queue Length 50th (ft)				72	36	20	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)				2004	872	829	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:	43.6%
ICU Level of Service:	A
Analysis Period (min):	15

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

↙ ø1	↑ ø2	↘ ø4
33 s	43 s	34 s
↓ ø6		
76 s		

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

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	99	1407	4	11	1394	438	606	2	102	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	
Fr't						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			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)	115	1636	5	12	1532	481	705	2	119	18	4	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	115	1641	0	12	1532	481	705	2	119	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%
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?												
Recall Mode	None	C-Max		None	C-Max	None	None	None		None	None	None
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
v/c Ratio	0.61	0.83		0.13	0.84	0.38	0.73	0.00	0.07		0.26	0.14
Control Delay	88.2	34.8		55.3	21.8	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	34.8		55.3	21.8	2.1	59.0	46.5	0.1		80.9	63.4
LOS	F	C		E	C	A	E	D	A		F	E

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

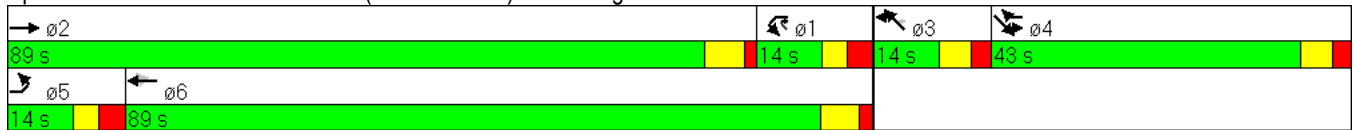
8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Approach Delay		38.3			17.3			50.5			71.9	
Approach LOS		D			B			D			E	
Queue Length 50th (ft)	61	785		12	275	37	363	2	0		23	21
Queue Length 95th (ft)	93	824		m15	m315	m63	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	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	0.83		0.12	0.84	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: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.84
 Intersection Signal Delay: 31.7 Intersection LOS: C
 Intersection Capacity Utilization 75.4% 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)

8/8/2014

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	1872	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	2080	148	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	50	0	205	65	0	0	23	2080	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%
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?												
Recall Mode	None	None	None		None	None			None	C-Max	None	None
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	0.93	0.13	0.42
Control Delay			110.8		241.8	81.6			83.5	25.3	3.0	85.7
Queue Delay			0.0		0.0	0.0			0.0	0.0	0.0	0.0
Total Delay			110.8		241.8	81.6			83.5	25.3	3.0	85.7
LOS			F		F	F			F	C	A	F
Approach Delay			110.8			203.2				24.4		
Approach LOS			F			F				C		

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

8/8/2014

	↓	↙	↘	↖	↗	↘	↙
Lane Group	SBT	SBR	SBR2	SEL2	SEL	SER	SER2
Lane Configurations	↑↑	↔		↔	↔		
Volume (vph)	1644	10	10	53	12	30	3
Ideal Flow (vphpl)	1900	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	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	0	1664	1552	0	0
Flt Permitted				0.950	0.983		
Satd. Flow (perm)	*3771	1583	0	1664	1552	0	0
Right Turn on Red				No		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	0.95	0.72	0.72	0.72	0.72
Adj. Flow (vph)	1731	11	11	74	17	42	4
Shared Lane Traffic (%)				10%			
Lane Group Flow (vph)	1731	22	0	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	0.0	19.0	19.0	0.0	0.0
Total Split (%)	58.8%	58.8%	0.0%	11.9%	11.9%	0.0%	0.0%
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	0.0	-2.4	-2.4	-2.4	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	1.6	4.0
Lead/Lag	Lag	Lag	Lag		Lag		
Lead-Lag Optimize?							
Recall Mode	C-Max	C-Max	None		None		
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	0.75	0.02	0.51		0.57		
Control Delay	26.8	15.5	84.2		89.4		
Queue Delay	0.0	0.0	0.0		0.0		
Total Delay	26.8	15.5	84.2		89.4		
LOS	C	B	F		F		
Approach Delay	28.1				86.9		
Approach LOS	C				F		

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

8/8/2014

Lane Group	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL	NBT	NBR	SBL
Queue Length 50th (ft)			53		~279	66			22	733	24	43
Queue Length 95th (ft)			#82		#364	103			m28	#1243	m26	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	0.93	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: 39.5 Intersection LOS: D
 Intersection Capacity Utilization 84.1% 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
15 s	94 s			

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

8/8/2014

	↓	↙	↘	↖	↗	↘	↙
Lane Group	SBT	SBR	SBR2	SEL2	SEL	SER	SER2
Queue Length 50th (ft)	718	10		71	74		
Queue Length 95th (ft)	829	25		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	0.75	0.02		0.46	0.51		
Intersection Summary							

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

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	681	0	0	386	0	1169	26	0	1313	153
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		450	0		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
Fr _t			0.850			0.865			0.850			0.850
Fl _t Protected												
Satd. Flow (prot)	0	0	2787	0	0	1611	0	3539	1583	0	3539	1583
Fl _t 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)						199			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	740	0	0	429	0	1299	29	0	1601	166
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	740	0	0	429	0	1299	29	0	1601	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%
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?												
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			0.72			0.27		0.37	0.02		0.79	0.10
Control Delay			50.6			0.4		0.3	0.0		32.4	0.1
Queue Delay			0.0			0.0		0.0	0.0		0.0	0.0
Total Delay			50.6			0.4		0.3	0.0		32.4	0.1
LOS			D			A		A	A		C	A
Approach Delay								0.3			29.3	
Approach LOS								A			C	
Queue Length 50th (ft)			401			0		0	0		716	0
Queue Length 95th (ft)			488			0		0	0		684	0
Internal Link Dist (ft)		614			605			978			1221	

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)	102.0
Total Split (%)	60%
Yellow Time (s)	4.5
All-Red Time (s)	1.3
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
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)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	

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

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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			0.72			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: 21.1 Intersection LOS: C
 Intersection Capacity Utilization 68.5% ICU Level of Service C
 Analysis Period (min) 15

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

ø2	ø4
102 s	68 s
ø6	
102 s	

Lane Group	ø2
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
23: NC 54 (Raleigh Road) & Burning Tree Drive

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	1620	44	79	1597	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			0.084				0.753			0.871	
Satd. Flow (perm)	172	4964	0	155	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	1906	52	82	1664	17	37	7	169	34	12	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	41	1958	0	82	1681	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%
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?												
Recall Mode	None	C-Max		None	C-Max		Min	Min	Min	Min	Min	
Act Effct Green (s)	79.9	79.9		79.7	79.7		19.7	19.7	19.7	19.7	19.7	
Actuated g/C Ratio	0.67	0.67		0.66	0.66		0.16	0.16	0.16	0.16	0.16	
v/c Ratio	0.19	0.59		0.39	0.50		0.19	0.66	0.66	0.37	0.37	
Control Delay	7.0	5.5		30.1	12.1		43.0	58.8	58.8	47.3	47.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	7.0	5.5		30.1	12.1		43.0	58.8	58.8	47.3	47.3	
LOS	A	A		C	B		D	E	E	D	D	
Approach Delay		5.5			13.0		55.5				47.3	
Approach LOS		A			B		E				D	

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

8/8/2014

	↖	→	↘	↙	←	↖	↘	↑	↖	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)	5	117		22	235			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		209	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 LOS: B
 Intersection Capacity Utilization 62.6% ICU Level of Service B
 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

↖ ø2	↙ ø1	↓ ø4
59 s	13 s	48 s
↖ ø5	↙ ø6	↑ ø8
13 s	59 s	48 s

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

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	37	1507	40	102	1509	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			0.101			0.716			0.746		
Satd. Flow (perm)	157	4964	0	186	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	1712	45	111	1640	32	179	18	101	66	20	43
Shared Lane Traffic (%)												
Lane Group Flow (vph)	42	1757	0	111	1672	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
Total Split (%)	10.8%	52.5%	0.0%	13.3%	55.0%	0.0%	34.2%	34.2%	34.2%	34.2%		34.2%
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							
Recall Mode	None	C-Max		None	C-Max		Min	Min	Min	Min		Min
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		22.1	10.6		59.2	36.1	43.0	41.1		39.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0		0.0
Total Delay	14.9	17.6		22.1	10.6		59.2	36.1	43.0	41.1		39.6
LOS	B	B		C	B		E	D	D	D		D
Approach Delay		17.6			11.4			52.3				40.4
Approach LOS		B			B			D				D

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

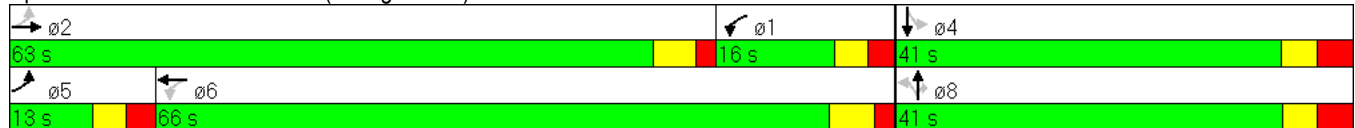
8/8/2014

	↖	→	↘	↙	←	↖	↘	↑	↖	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)	13	297		27	169		131	12	68	44	41	
Queue Length 95th (ft)	34	401		51	189		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		262	3191		394	554	462	406	486	
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	0.21	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 66.0%
 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

8/8/2014

Lane Group	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Volume (vph)	51	110	320	51	104	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	129	352	56	128	353
Shared Lane Traffic (%)						
Lane Group Flow (vph)	60	129	408	0	128	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%
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?						
Recall Mode	None	None	C-Max		None	C-Max
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	0.39	0.35		0.17	0.24
Control Delay	41.9	31.9	8.4		3.0	3.0
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	41.9	31.9	8.4		3.0	3.0
LOS	D	C	A		A	A
Approach Delay	35.0		8.4			3.0

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

8/8/2014

	↖	↗	↘	↙	↕	↕
Lane Group	WBL	WBR	NET	NER	SWL	SWT
Approach LOS	D		A		A	
Queue Length 50th (ft)	32	61	94		12	40
Queue Length 95th (ft)	64	99	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	0.35	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:	0.39
Intersection Signal Delay:	10.7
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)

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	204	474	108	148	576	106	115	590	150	90	506	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	
Frnt		0.972			0.977			0.970				0.968
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1419	2862	0	1486	2727	0	1379	2573	0	1406	2529	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1238	2862	0	1283	2727	0	1209	2573	0	1235	2529	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	127	174	678	125	120	615	156	97	544	149
Shared Lane Traffic (%)												
Lane Group Flow (vph)	240	685	0	174	803	0	120	771	0	97	693	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%
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?												
Recall Mode	None	Min		None	Min		None	C-Max		None	C-Max	
Act Effct Green (s)	24.0	47.2		18.8	42.0		13.0	44.0		10.0	41.0	
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	0.71		0.87	0.98		0.94	0.95		0.97	0.94	
Control Delay	111.9	45.8		96.6	75.7		126.8	55.7		145.8	68.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	111.9	45.8		96.6	75.7		126.8	55.7		145.8	68.9	
LOS	F	D		F	E		F	E		F	E	
Approach Delay		63.0			79.4			65.3			78.3	

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

8/8/2014

	↖	→	↘	↙	←	↖	↘	↑	↖	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS	E			E			E			E		
Queue Length 50th (ft)	221	292		155	382		93	365		90	324	
Queue Length 95th (ft)	#364	341		#245	#471		m#226	m#503		#209	#449	
Internal Link Dist (ft)	726			860			892			742		
Turn Bay Length (ft)	225			100			400			100		
Base Capacity (vph)	243	966		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	0.71		0.78	0.98		0.94	0.95		0.97	0.94	

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: 71.4

Intersection LOS: E

Intersection Capacity Utilization 83.1%

ICU Level of Service E

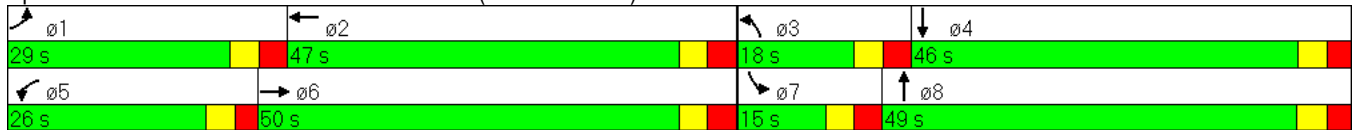
Analysis Period (min) 15

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)

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	11	105	0	0	205	29	229	435	38	64	0	543
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 _t					0.983			0.988				0.850
Fl _t Protected	0.950						0.950			0.950		
Satd. Flow (prot)	1510	1644	0	0	1604	0	1378	2674	0	1468	0	2391
Fl _t Permitted	0.233						0.950			0.950		
Satd. Flow (perm)	362	1644	0	0	1604	0	1315	2674	0	1337	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	250	35	273	518	45	70	0	597
Shared Lane Traffic (%)												
Lane Group Flow (vph)	14	136	0	0	285	0	273	563	0	70	0	597
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%
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?												
Recall Mode	Min	Min			None		C-Max	C-Max		None		None
Act Effct Green (s)	27.0	27.0			27.0		56.7	56.7		41.2		41.2
Actuated g/C Ratio	0.19	0.19			0.19		0.40	0.40		0.29		0.29
v/c Ratio	0.20	0.43			0.92		0.49	0.52		0.16		0.85
Control Delay	27.2	20.4			89.3		23.4	22.6		16.4		31.6
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0		0.1
Total Delay	27.2	20.4			89.3		23.4	22.6		16.4		31.7
LOS	C	C			F		C	C		B		C
Approach Delay		21.0			89.3			22.8				

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

8/8/2014

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%
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
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
 2: Cameron Avenue & NC 86 (S. Columbia St)

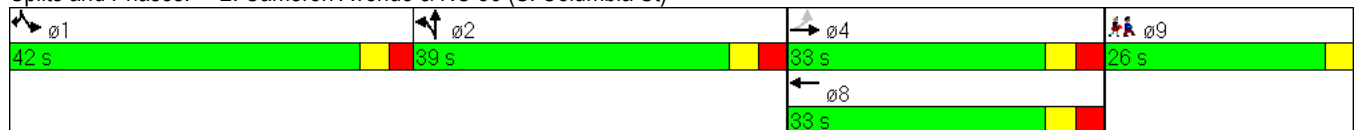
8/8/2014

	↖	→	↘	↙	←	↖	↘	↑	↖	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS	C			F			C					
Queue Length 50th (ft)	2	27			255		177	196		31		264
Queue Length 95th (ft)	m9	85			#356		98	95		m34		m292
Internal Link Dist (ft)		332			976			759			892	
Turn Bay Length (ft)	110									150		
Base Capacity (vph)	72	329			321		558	1083		439		715
Starvation Cap Reductn	0	0			0		0	0		0		0
Spillback Cap Reductn	0	0			0		0	0		0		3
Storage Cap Reductn	0	0			0		0	0		0		0
Reduced v/c Ratio	0.19	0.41			0.89		0.49	0.52		0.16		0.84

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: 35.0 Intersection LOS: C
 Intersection Capacity Utilization 65.2% 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
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

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	146	150	575	388	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								
Frt		0.932										
Flt Protected				0.950								
Satd. Flow (prot)	0	1296	0	2874	1613	0	0	0	0	0	0	0
Flt Permitted				0.950								
Satd. Flow (perm)	0	1296	0	1907	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		25		25
Link Distance (ft)		258		412		549		191		191		191
Travel Time (s)		30.0		10.7		15.0		5.2		5.2		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	181	605	408	0	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	357	0	605	408	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%
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?												
Recall Mode		None		C-Max	None							
Act Effct Green (s)		44.6		65.4	115.0							
Actuated g/C Ratio		0.32		0.47	0.82							
v/c Ratio		0.86		0.45	0.31							
Control Delay		64.5		18.3	4.7							
Queue Delay		0.0		0.9	1.5							
Total Delay		64.5		19.2	6.2							
LOS		E		B	A							
Approach Delay		64.5		14.0								

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

8/8/2014

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	
Fr _t	
Fl _t Protected	
Satd. Flow (prot)	
Fl _t 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%
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	Ped
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	

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

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		E			B							
Queue Length 50th (ft)		305		154	87							
Queue Length 95th (ft)		337		m308	m161							
Internal Link Dist (ft)		178			332			469			111	
Turn Bay Length (ft)												
Base Capacity (vph)		583		1342	1325							
Starvation Cap Reductn		0		440	708							
Spillback Cap Reductn		0		0	0							
Storage Cap Reductn		0		0	0							
Reduced v/c Ratio		0.61		0.67	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: 27.1
 Intersection LOS: C
 Intersection Capacity Utilization 48.6%
 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

ø1	ø2	ø4
50 s	68 s	22 s
ø6		
118 s		

Lane Group	ø4
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

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	112	27	250	191	0	0	0	0	253	566	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	2854	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	272	208	0	0	0	0	281	629	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	174	0	272	208	0	0	0	0	0	937	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%
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?												
Recall Mode		None		None	None					C-Max	C-Max	
Act Effct Green (s)		24.5		24.5	24.5						35.5	
Actuated g/C Ratio		0.35		0.35	0.35						0.51	
v/c Ratio		0.35		0.83	0.36						0.65	
Control Delay		17.7		41.5	20.3						16.3	
Queue Delay		0.0		0.0	0.0						0.0	
Total Delay		17.7		41.5	20.3						16.3	
LOS		B		D	C						B	
Approach Delay		17.7			32.3						16.3	

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

8/8/2014

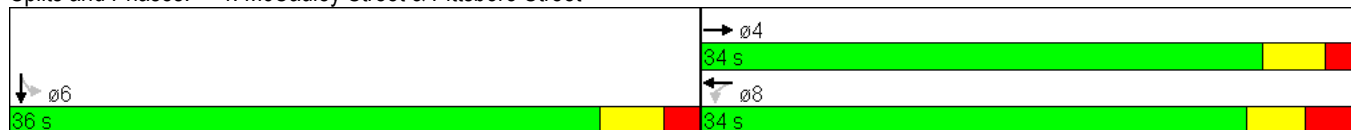
	↖	→	↘	↙	←	↖	↘	↑	↖	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		B			C						B	
Queue Length 50th (ft)		52		78	59						281	
Queue Length 95th (ft)		79		239	102						362	
Internal Link Dist (ft)		413			472			1089			181	
Turn Bay Length (ft)				200								
Base Capacity (vph)		589		390	688						1449	
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		0.70	0.30						0.65	

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: 21.3
 Intersection Capacity Utilization 65.2%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service C

Splits and Phases: 4: McCauley Street & Pittsboro Street



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

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	69	269	0	0	323	207	124	658	199	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't					0.991	0.850			0.850			
Flt Protected	0.950							0.992				
Satd. Flow (prot)	1593	1788	0	0	1598	1385	0	4107	1289	0	0	0
Flt Permitted	0.950							0.992				
Satd. Flow (perm)	1429	1788	0	0	1598	1141	0	3992	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	333	213	132	700	212	0	0	0
Shared Lane Traffic (%)						10%						
Lane Group Flow (vph)	73	286	0	0	354	192	0	832	212	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%
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						
Recall Mode	None	None			Min	Min	C-Max	C-Max				
Act Effct Green (s)	27.4	27.4			36.3	36.3		61.3	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		0.48	0.18			
Control Delay	41.7	63.2			67.9	55.5		24.4	0.3			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	41.7	63.2			67.9	55.5		24.4	0.3			
LOS	D	E			E	E		C	A			
Approach Delay		58.8			63.6			19.5				

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

8/8/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	82	245	0	220	0	486	0	470	76	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			
Frnt						0.850			0.850			
Flt Protected	0.950			0.950								
Satd. Flow (prot)	1512	3023	0	1489	0	2345	0	3034	1358	0	0	0
Flt 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	259	0	572	0	540	87	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	87	261	0	259	0	572	0	540	87	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%
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?												
Recall Mode	Min	Min		None		None		C-Max	None			
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		0.60		0.84		0.38	0.09			
Control Delay	53.0	55.9		47.9		58.1		23.5	4.6			
Queue Delay	0.0	0.0		0.0		0.0		0.0	0.0			
Total Delay	53.0	55.9		47.9		58.1		23.5	4.6			
LOS	D	E		D		E		C	A			
Approach Delay		55.1						20.9				

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

8/8/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR	
Approach LOS		E							C				
Queue Length 50th (ft)	64	106		203		278		97	7				
Queue Length 95th (ft)	m101	151		252		302		176	40				
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		0.47		0.66		0.38	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: 43.1
 Intersection LOS: D
 Intersection Capacity Utilization 60.1%
 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)

ø2	ø4	ø3
45 s	38 s	57 s

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

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	3	4	13	391	7	171	9	362	109	83	684	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		0.252			0.369		
Satd. Flow (perm)	0	1385	0	0	1497	1528	428	1700	1414	649	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	425	8	186	10	402	121	89	735	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	34	0	0	433	186	10	402	121	89	739	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%
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?												
Recall Mode	None	None		None	None	None	C-Min	C-Min	None	None	C-Min	
Act Effct Green (s)		9.8			37.9	46.7	68.9	68.9	106.7	82.6	82.6	
Actuated g/C Ratio		0.07			0.27	0.33	0.49	0.49	0.76	0.59	0.59	
v/c Ratio		0.35			0.91	0.36	0.05	0.48	0.11	0.20	0.71	
Control Delay		71.6			73.2	27.0	5.0	8.5	1.1	12.6	26.4	
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		71.6			73.2	27.0	5.0	8.5	1.1	12.6	26.4	
LOS		E			E	C	A	A	A	B	C	

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

8/8/2014

	↖	→	↗	↖	←	↖	↗	↖	↗	↖	↗	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Approach Delay		71.6			59.3			6.7			24.9	
Approach LOS		E			E			A			C	
Queue Length 50th (ft)		30			363	93	1	33	2	40	615	
Queue Length 95th (ft)		43			#569	138	m3	274	13	65	779	
Internal Link Dist (ft)		194			512			550			866	
Turn Bay Length (ft)						150	250		250			
Base Capacity (vph)		208			500	515	211	836	1134	449	1037	
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			0.87	0.36	0.05	0.48	0.11	0.20	0.71	

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: 31.5 Intersection LOS: C
 Intersection Capacity Utilization 85.8% 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)

↖ ø1	↗ ø2	↖ ø3	↗ ø4
13 s	57 s	44 s	26 s
↖ ø6			
70 s			

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

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	1090	1	47	374	489	0	0	913	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		0.083					
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	1147	1	49	425	556	0	0	971	388
Shared Lane Traffic (%)				50%								
Lane Group Flow (vph)	0	0	0	573	575	49	425	556	0	0	971	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%
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?												
Recall Mode				None	None	None	None	C-Max			C-Max	C-Max
Act Effct Green (s)				49.6	49.6	49.6	80.4	80.4			43.0	43.0
Actuated g/C Ratio				0.35	0.35	0.35	0.57	0.57			0.31	0.31
v/c Ratio				0.96	0.96	0.09	0.97	0.47			0.91	0.84
Control Delay				73.1	73.4	30.6	77.4	38.9			53.1	54.3
Queue Delay				0.0	0.0	0.0	0.0	0.0			0.6	0.0
Total Delay				73.1	73.4	30.6	77.4	38.9			53.7	54.3
LOS				E	E	C	E	D			D	D
Approach Delay					71.5			55.6			53.9	
Approach LOS					E			E			D	

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

8/8/2014

	↖	→	↘	↙	←	↖	↘	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)				533	536	29	329	431			461	334
Queue Length 95th (ft)				#787	#790	60	#524	535			#567	m#469
Internal Link Dist (ft)		344			813			516			226	
Turn Bay Length (ft)				275		275	150					
Base Capacity (vph)				600	601	565	437	1172			1066	464
Starvation Cap Reductn				0	0	0	0	0			0	0
Spillback Cap Reductn				0	0	0	0	0			13	0
Storage Cap Reductn				0	0	0	0	0			0	0
Reduced v/c Ratio				0.95	0.96	0.09	0.97	0.47			0.92	0.84

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: 60.3

Intersection LOS: E

Intersection Capacity Utilization 90.1%

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

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	176	0	284	0	0	0	0	713	0	114	1863	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								0.276		
Satd. Flow (perm)	1588	1588	1495	0	0	0	0	3471	0	514	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	330	0	0	0	0	801	0	124	2025	0
Shared Lane Traffic (%)	50%											
Lane Group Flow (vph)	102	103	330	0	0	0	0	801	0	124	2025	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%
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?												
Recall Mode	None	None	None					C-Max		None	C-Max	
Act Effct Green (s)	35.5	35.5	35.5					81.5		94.5	94.5	
Actuated g/C Ratio	0.25	0.25	0.25					0.58		0.68	0.68	
v/c Ratio	0.25	0.26	0.87					0.40		0.30	0.85	
Control Delay	42.3	42.4	72.9					8.8		1.1	3.9	
Queue Delay	0.0	0.0	0.0					0.0		0.0	1.2	
Total Delay	42.3	42.4	72.9					8.8		1.1	5.1	
LOS	D	D	E					A		A	A	
Approach Delay		61.2						8.8			4.9	
Approach LOS		E						A			A	

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

8/8/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations	↖	↗	↖	↖	↗	↖	↖	↗	↖	↖	↗	↖
Volume (vph)	130	96	61	12	75	320	60	1024	31	521	1391	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								
Frnt			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			0.104			0.125		
Satd. Flow (perm)	796	1817	1523	1312	1918	1631	192	3506	1568	231	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	70	13	84	360	65	1101	33	566	1512	255
Shared Lane Traffic (%)												
Lane Group Flow (vph)	149	110	70	13	84	360	65	1101	33	566	1512	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%
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		
Recall Mode	None	None	None	None	None		C-Max	C-Max	C-Max	None	C-Max	
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	0.25	0.12	0.53	0.60	0.80	0.74	0.05	0.93	0.58	0.19
Control Delay	72.1	52.7	51.5	61.9	73.8	28.4	82.5	27.2	15.8	42.0	3.9	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	0.0
Total Delay	72.1	52.7	51.5	61.9	73.8	28.4	82.5	27.2	15.8	42.0	3.9	1.3
LOS	E	D	D	E	E	C	F	C	B	D	A	A
Approach Delay		61.2			37.7			29.9				12.8

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

8/8/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Approach LOS		E			D			C			B	
Queue Length 50th (ft)	122	88	55	11	74	202	33	289	12	301	123	20
Queue Length 95th (ft)	#198	142	100	33	130	281	#148	500	34	m#589	135	m19
Internal Link Dist (ft)		446			463			453			555	
Turn Bay Length (ft)			75	425		350	125		75	550		250
Base Capacity (vph)	206	337	283	112	164	606	81	1486	664	607	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	0.25	0.12	0.51	0.59	0.80	0.74	0.05	0.93	0.58	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: 0.93

Intersection Signal Delay: 23.9

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

ø2	ø1	ø4
64 s	45 s	31 s
ø6		ø7
109 s		14 s
		ø8
		17 s

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

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Volume (vph)	112	28	16	55	17	2	7	16	981	101	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		0.945			0.983					0.850		
Flt Protected	0.950			0.950				0.950				0.950
Satd. Flow (prot)	1761	1751	0	1779	1841	0	0	1761	3522	1576	0	1770
Flt Permitted	0.740			0.723				0.950				0.950
Satd. Flow (perm)	1372	1751	0	1354	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	19	73	23	3	7	16	1011	104	2	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	133	52	0	73	26	0	0	23	1011	104	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%
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
Recall Mode	None	None		None	None		None	None	C-Max	C-Max	None	None
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		0.36	0.10			0.19	0.40	0.09		0.18
Control Delay	70.4	51.8		57.0	49.2			62.7	6.3	6.5		72.2
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0		0.0
Total Delay	70.4	51.8		57.0	49.2			62.7	6.3	6.5		72.2
LOS	E	D		E	D			E	A	A		E
Approach Delay		65.1			54.9				7.5			
Approach LOS		E			D				A			
Queue Length 50th (ft)	116	42		61	21			22	61	11		16

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

8/8/2014

	↓	↙
Lane Group	SBT	SBR
Lane Configurations	↑↑	↗
Volume (vph)	1348	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
Friction		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)	1465	167
Shared Lane Traffic (%)		
Lane Group Flow (vph)	1465	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%
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
Recall Mode	C-Max	C-Max
Act Effct Green (s)	100.2	100.2
Actuated g/C Ratio	0.72	0.72
v/c Ratio	0.58	0.15
Control Delay	6.9	4.2
Queue Delay	0.0	0.0
Total Delay	6.9	4.2
LOS	A	A
Approach Delay	7.4	
Approach LOS	A	
Queue Length 50th (ft)	210	30

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

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Queue Length 95th (ft)	163	73		86	39			m41	156	m39		m29
Internal Link Dist (ft)		307			398				2658			
Turn Bay Length (ft)	75			200				275		300		275
Base Capacity (vph)	539	688		532	723			121	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		0.14	0.04			0.19	0.40	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: 130
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.66
 Intersection Signal Delay: 12.4 Intersection LOS: B
 Intersection Capacity Utilization 58.5% 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

ø1 13 s	ø2 67 s	ø4 60 s
ø5 14 s	ø6 66 s	ø8 60 s

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

8/8/2014

	↓	↙
Lane Group	SBT	SBR
Queue Length 95th (ft)	470	74
Internal Link Dist (ft)	1712	
Turn Bay Length (ft)		325
Base Capacity (vph)	2534	1133
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.58	0.15
Intersection Summary		

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

8/8/2014

Lane Group	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	SEL	SET	SER	NWL
Lane Configurations												
Volume (vph)	5	101	620	15	28	51	1087	251	397	2	106	15
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	0
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										
Frnt			0.996					0.850		0.853		
Flt Protected		0.950				0.950			0.950			
Satd. Flow (prot)	0	1779	3544	0	0	1734	3468	1552	1779	1597	0	0
Flt Permitted		0.950				0.950			0.950			
Satd. Flow (perm)	0	1778	3544	0	0	1734	3468	1552	1779	1597	0	0
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)	5	107	660	17	29	57	1144	264	432	2	115	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	112	677	0	0	86	1144	264	432	117	0	0
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)	18.0	18.0	60.0	0.0	18.0	18.0	60.0	48.0	48.0	62.0	0.0	14.0
Total Split (%)	12.9%	12.9%	42.9%	0.0%	12.9%	12.9%	42.9%	34.3%	34.3%	44.3%	0.0%	10.0%
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	Lead		Lag	Lag	Lag	Lag	Lag			Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes			Yes
Recall Mode	None	None	C-Max		None	None	C-Max	None	None	None		None
Act Effct Green (s)		12.8	62.1			13.0	62.3	102.0	38.7	49.9		
Actuated g/C Ratio		0.09	0.44			0.09	0.44	0.73	0.28	0.36		
v/c Ratio		0.69	0.43			0.53	0.74	0.23	0.88	0.21		
Control Delay		74.9	28.5			59.1	27.0	3.2	67.7	30.2		
Queue Delay		0.0	0.0			0.0	0.0	0.0	0.0	0.0		
Total Delay		74.9	28.5			59.1	27.0	3.2	67.7	30.2		
LOS		E	C			E	C	A	E	C		
Approach Delay			35.1				24.7			59.7		

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

8/8/2014

Lane Group	NWT	NWR
Lane Configurations	↕	
Volume (vph)	1	39
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	0.905	
Flt Protected	0.986	
Satd. Flow (prot)	1662	0
Flt Permitted	0.733	
Satd. Flow (perm)	1236	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)	1	43
Shared Lane Traffic (%)		
Lane Group Flow (vph)	61	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%
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	Lead	
Lead-Lag Optimize?	Yes	
Recall Mode	None	
Act Effct Green (s)	9.0	
Actuated g/C Ratio	0.06	
v/c Ratio	0.77	
Control Delay	115.6	
Queue Delay	0.0	
Total Delay	115.6	
LOS	F	
Approach Delay	115.6	

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

8/8/2014

	↖	↗	↑	↘	↙	↓	↗	↘	↙	↘	↙	↘
Lane Group	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	SEL	SET	SER	NWL
Approach LOS			D				C			E		
Queue Length 50th (ft)		100	260			74	463	36	371	70		
Queue Length 95th (ft)		#184	332			131	410	53	497	113		
Internal Link Dist (ft)			862				2658			376		
Turn Bay Length (ft)		275				250		300	150			
Base Capacity (vph)		171	1573			161	1543	1178	546	650		
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		0.65	0.43			0.53	0.74	0.22	0.79	0.18		

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 82 (59%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.88

Intersection Signal Delay: 36.1

Intersection LOS: D

Intersection Capacity Utilization 77.1%

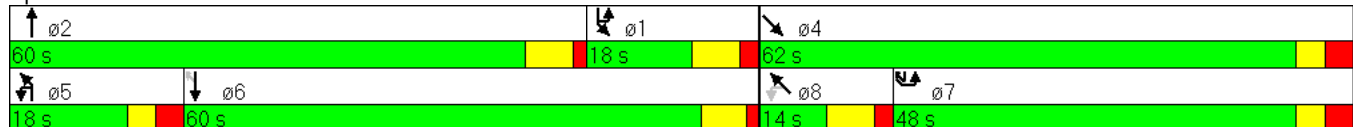
ICU Level of Service D

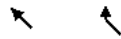
Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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





Lane Group	NWT	NWR
Approach LOS	F	
Queue Length 50th (ft)	56	
Queue Length 95th (ft)	#139	
Internal Link Dist (ft)	284	
Turn Bay Length (ft)		
Base Capacity (vph)	79	
Starvation Cap Reductn	0	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.77	
Intersection Summary		

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

8/8/2014

Lane Group	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR
Lane Configurations								
Volume (vph)	56	12	4	13	697	21	1233	89
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	0.976				0.990			
Flt Protected	0.961			0.950		0.950		
Satd. Flow (prot)	1756	0	0	1770	3541	1734	3434	0
Flt Permitted	0.961			0.164		0.950		
Satd. Flow (perm)	1756	0	0	306	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)	74	16	5	16	850	23	1340	97
Shared Lane Traffic (%)								
Lane Group Flow (vph)	90	0	0	21	850	23	1437	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%
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		
Recall Mode	None		C-Max	C-Max	C-Max	None	C-Max	
Act Effct Green (s)	12.4			103.2	103.2	15.0	117.6	
Actuated g/C Ratio	0.09			0.74	0.74	0.11	0.84	
v/c Ratio	0.58			0.09	0.33	0.12	0.50	
Control Delay	75.3			10.2	8.6	71.2	6.9	
Queue Delay	0.0			0.0	0.0	0.0	0.0	
Total Delay	75.3			10.2	8.6	71.2	6.9	
LOS	E			B	A	E	A	
Approach Delay	75.3				8.6		7.9	
Approach LOS	E				A		A	
Queue Length 50th (ft)	80			6	164	22	19	

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

8/8/2014

Lane Group	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR
Queue Length 95th (ft)	112			18	198	m36	662	
Internal Link Dist (ft)	1070				819		50	
Turn Bay Length (ft)				300				
Base Capacity (vph)	263			225	2610	235	2885	
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	0.34			0.09	0.33	0.10	0.50	

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: 0.58
 Intersection Signal Delay: 10.7 Intersection LOS: B
 Intersection Capacity Utilization 51.1% 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

↑ ∅2	↘ ∅1	↗ ∅4
90 s	24 s	26 s
↓ ∅6		
114 s		

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

8/8/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	41	63	372	134	52	71	302	534	22	92	1035	66
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)	42	65	384	151	58	80	343	607	25	94	1056	67
Shared Lane Traffic (%)												
Lane Group Flow (vph)	42	65	384	151	58	80	343	607	25	94	1056	67
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%
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?												
Recall Mode	None	None	None	None	None	None	None	Min	None	None	Min	None
Act Effct Green (s)	9.3	10.2	21.9	11.0	11.8	26.4	10.5	48.4	64.6	9.3	47.1	61.7
Actuated g/C Ratio	0.10	0.11	0.23	0.11	0.12	0.28	0.11	0.51	0.67	0.10	0.49	0.64
v/c Ratio	0.25	0.33	0.61	0.39	0.25	0.18	0.92	0.34	0.02	0.28	0.61	0.07
Control Delay	51.0	50.9	39.4	47.0	46.6	33.3	77.0	15.3	6.0	49.2	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	51.0	50.9	39.4	47.0	46.6	33.3	77.0	15.3	6.0	49.2	19.6	7.4
LOS	D	D	D	D	D	C	E	B	A	D	B	A
Approach Delay		41.9			43.2			36.8			21.2	
Approach LOS		D			D			D			C	
Queue Length 50th (ft)	25	38	117	45	33	39	110	113	5	28	240	15

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

8/8/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Queue Length 95th (ft)	70	95	217	92	84	95	#268	173	14	65	349	33
Internal Link Dist (ft)		720			587			1027			1172	
Turn Bay Length (ft)	125		175	150		150	500		250	275		100
Base Capacity (vph)	289	405	631	563	407	454	372	3015	1131	375	3044	1121
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	0.15	0.16	0.61	0.27	0.14	0.18	0.92	0.20	0.02	0.25	0.35	0.06

Intersection Summary

Area Type: Other
 Cycle Length: 150
 Actuated Cycle Length: 95.8
 Natural Cycle: 65
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.92
 Intersection Signal Delay: 31.9 Intersection LOS: C
 Intersection Capacity Utilization 60.2% 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

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	595	263	248	327	351	218	41	555	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 _t					0.927				0.850			0.850
Fl _t Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	0	0	3485	1753	0	1752	3504	1567	1796	3592	1607
Fl _t Permitted				0.950			0.273			0.491		
Satd. Flow (perm)	0	0	0	3485	1753	0	503	3504	1530	924	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	647	286	270	355	382	237	44	590	63
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	647	556	0	355	382	237	44	590	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%
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?												
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		0.65	0.21	0.29	0.18	0.62	0.15
Control Delay				28.6	43.9		22.5	4.0	5.0	39.5	43.4	37.6
Queue Delay				0.0	0.0		0.0	0.0	0.4	0.0	0.0	0.0
Total Delay				28.6	43.9		22.5	4.0	5.4	39.5	43.4	37.6
LOS				C	D		C	A	A	D	D	D
Approach Delay					35.7			11.1			42.6	
Approach LOS					D			B			D	

Lanes, Volumes, Timings

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

8/8/2014

	↖	→	↘	↙	←	↖	↘	↑	↖	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)				185	369		165	57	95	27	218	39
Queue Length 95th (ft)				229	499		236	7	10	63	290	80
Internal Link Dist (ft)		387			687			304			527	
Turn Bay Length (ft)				475			225		250	250		
Base Capacity (vph)				1481	745		548	1862	813	245	951	416
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	0.75		0.65	0.21	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:NBT and 6:SBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 29.0

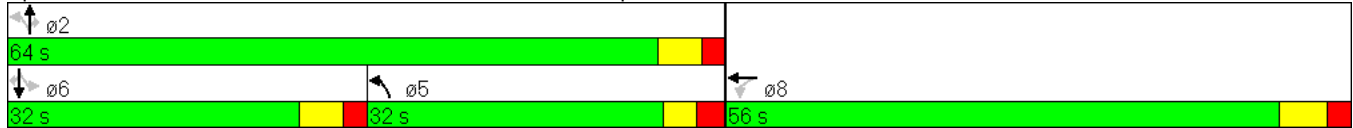
Intersection LOS: C

Intersection Capacity Utilization 75.0%

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

8/8/2014

Lane Group	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	SEL2	SEL	SER
Lane Configurations				↑↑	↑	↑	↑↑		↑	↑	↑
Volume (vph)	0	0	0	745	165	307	837	0	126	0	246
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
Fr't					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						0.234			0.950	0.950	
Satd. Flow (perm)	0	0	0	3522	1513	440	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	828	183	334	910	0	135	0	265
Shared Lane Traffic (%)									50%		
Lane Group Flow (vph)	0	0	0	828	183	334	910	0	67	68	265
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%
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					
Recall Mode				C-Max	C-Max	None	C-Max		None	None	None
Act Effct Green (s)				60.2	60.2	83.5	83.5		26.5	26.5	26.5
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	0.37		0.18	0.18	0.76
Control Delay				23.0	21.4	18.1	1.8		37.0	37.0	57.8
Queue Delay				0.0	0.0	0.3	0.2		0.0	0.0	0.0
Total Delay				23.0	21.4	18.4	2.0		37.0	37.0	57.8
LOS				C	C	B	A		D	D	E
Approach Delay				22.7			6.4			50.8	

Lanes, Volumes, Timings

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

8/8/2014

	↙	↖	↗	↑	↘	↙	↓	↘	↗	↘	↙
Lane Group	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	SEL2	SEL	SER
Approach LOS				C			A			D	
Queue Length 50th (ft)				211	77	61	0		44	45	193
Queue Length 95th (ft)				351	166	235	138		80	81	270
Internal Link Dist (ft)	626			334			304			410	
Turn Bay Length (ft)					125	175			250	250	250
Base Capacity (vph)				1768	759	620	2488		479	479	445
Starvation Cap Reductn				0	0	43	715		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	0.58	0.51		0.14	0.14	0.60

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: 19.3

Intersection LOS: B

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

↙ ø1	↑ ø2	↘ ø4
33 s	48 s	39 s
↓ ø6		
81 s		

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

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	111	1798	4	12	2139	265	671	7	164	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	
Fr't						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			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)	116	1873	4	12	2228	276	789	8	193	17	4	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	116	1877	0	12	2228	276	789	8	193	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%
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?												
Recall Mode	None	C-Max		None	C-Max	None	None	None		None	None	None
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
v/c Ratio	0.72	0.86		0.15	1.07	0.21	0.93	0.02	0.12		0.30	0.17
Control Delay	112.6	37.4		56.4	46.8	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	112.6	37.4		56.4	46.8	0.6	87.0	59.1	0.2		98.6	79.3
LOS	F	D		E	D	A	F	E	A		F	E

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

8/8/2014

	↘	→	↙	↖	←	↗	↘	↙	↖	↗	↘	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Approach Delay		41.7			41.7			69.8			88.3	
Approach LOS		D			D			E			F	
Queue Length 50th (ft)	75	1034		14	~1592	11	~550	8	0		26	27
Queue Length 95th (ft)	#121	1146		m14	m#120	m8	#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	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	0.86		0.14	1.07	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: 16 (8%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.07
 Intersection Signal Delay: 47.1 Intersection LOS: D
 Intersection Capacity Utilization 93.3% 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

→ ø2	↖ ø1	↖ ø3	↘ ø4
117 s	14 s	14 s	45 s
↘ ø5	← ø6		
14 s	117 s		

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

8/8/2014

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	2343	119	40	2269	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								
Frnt				0.857					0.850			0.850
Flt Protected		0.964	0.950				0.950			0.950		
Satd. Flow (prot)	0	1796	1743	1552	0	0	1770	3725	1583	1770	3725	1583
Flt 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	2547	129	44	2521	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	31	98	61	0	0	23	2547	129	44	2521	22
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%
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?												
Recall Mode	None	None	None	None			None	C-Max	None	None	C-Max	C-Max
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	1.13	0.12	0.46	1.08	0.02
Control Delay		119.2	104.9	93.3			104.4	89.0	3.2	102.0	76.1	17.4
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			104.4	89.0	3.2	102.0	76.1	17.4
LOS		F	F	F			F	F	A	F	E	B
Approach Delay		119.3		100.5				85.0			76.0	
Approach LOS		F		F				F			E	

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

8/8/2014

Lane Group	SBR2	SEL2	SEL	SER	SER2
Lane Configurations					
Volume (vph)	7	51	6	63	1
Ideal Flow (vphpl)	1900	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	0.95	1.00	1.00
Ped Bike Factor					
Frt			0.872		
Flt Protected		0.950	0.993		
Satd. Flow (prot)	0	1664	1517	0	0
Flt Permitted		0.950	0.993		
Satd. Flow (perm)	0	1664	1517	0	0
Right Turn on Red	No				No
Satd. Flow (RTOR)					
Link Speed (mph)			25		
Link Distance (ft)			359		
Travel Time (s)			9.8		
Confl. Peds. (#/hr)					
Peak Hour Factor	0.90	0.59	0.59	0.59	0.59
Adj. Flow (vph)	8	86	10	107	2
Shared Lane Traffic (%)		10%			
Lane Group Flow (vph)	0	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)	0.0	25.0	25.0	0.0	0.0
Total Split (%)	0.0%	13.2%	13.2%	0.0%	0.0%
Yellow Time (s)		3.0	3.0		
All-Red Time (s)		4.4	4.4		
Lost Time Adjust (s)	0.0	-2.4	-2.4	-2.4	0.0
Total Lost Time (s)	4.0	5.0	5.0	1.6	4.0
Lead/Lag		Lag	Lag		
Lead-Lag Optimize?					
Recall Mode		None	None		
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		
Queue Delay		0.0	0.0		
Total Delay		87.4	113.4		
LOS		F	F		
Approach Delay			103.7		
Approach LOS			F		

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

8/8/2014

Lane Group	EBL	EBT	WBL	WBT	WBR	WBR2	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		39	121	74			27	~1942	20	54	~1889	12
Queue Length 95th (ft)		35	180	123			m31	#2039	m21	103	#1982	27
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	1.13	0.11	0.43	1.08	0.02

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: 82.2

Intersection LOS: F

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)

Phase	Duration	Phase	Duration	Phase	Duration	Phase	Duration
↑ ø2	111 s	↘ ø1	16 s	↗ ø3	25 s	↘ ø4	25 s
↗ ø5	14 s	↓ ø6	113 s	→ ø7	13 s		

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

8/8/2014

					
Lane Group	SBR2	SEL2	SEL	SER	SER2
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		
Intersection Summary					

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

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	1024	0	0	429	0	1663	22	0	1608	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		450	0		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)						94			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	1113	0	0	477	0	1848	24	0	1961	100
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	1113	0	0	477	0	1848	24	0	1961	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%
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?												
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			1.00			0.30		0.52	0.02		1.02	0.06
Control Delay			76.6			0.5		0.6	0.0		65.0	0.1
Queue Delay			0.0			0.0		0.0	0.0		0.0	0.0
Total Delay			76.6			0.5		0.6	0.0		65.0	0.1
LOS			E			A		A	A		E	A
Approach Delay								0.5			61.9	
Approach LOS								A			E	
Queue Length 50th (ft)			702			0		0	0		~1217	0
Queue Length 95th (ft)			#880			0		0	0		1058	0
Internal Link Dist (ft)		614			605			978			1221	

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)	97.0
Total Split (%)	57%
Yellow Time (s)	4.5
All-Red Time (s)	1.3
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
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)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	

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

8/8/2014

	↖	→	↘	↙	←	↖	↘	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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			1.00			0.30		0.52	0.02		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: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.02
 Intersection Signal Delay: 38.7 Intersection LOS: D
 Intersection Capacity Utilization 88.6% 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)

↑ ø2	↖ ø4
97 s	73 s
↓ ø6	
97 s	

Lane Group	ø2
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
 23: NC 54 (Raleigh Road) & Burning Tree Drive

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	66	2340	30	165	2250	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	2463	32	185	2528	60	35	15	219	35	41	52
Shared Lane Traffic (%)												
Lane Group Flow (vph)	69	2495	0	185	2588	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%
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?												
Recall Mode	None	C-Max		None	C-Max		Min	Min	Min	Min	Min	
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	37.8	7.8		120.8	20.6		47.6	68.5			53.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	37.8	7.8		120.8	20.6		47.6	68.5			53.8	
LOS	D	A		F	C		D	E			D	
Approach Delay		8.7			27.3			64.6			53.8	
Approach LOS		A			C			E			D	
Queue Length 50th (ft)	18	142		~128	586			39	190		104	

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

8/8/2014

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)	m49	193		#295	792			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: 21.3

Intersection LOS: C

Intersection Capacity Utilization 85.6%

ICU Level of Service E

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

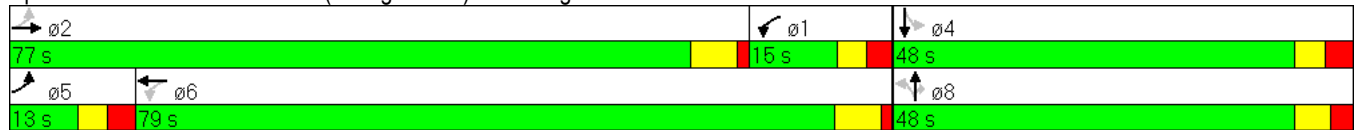
Queue shown is maximum after two cycles.

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

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	53	2231	71	103	2117	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	2373	76	110	2252	62	182	30	119	58	21	45
Shared Lane Traffic (%)												
Lane Group Flow (vph)	56	2449	0	110	2314	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%
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	Yes							
Recall Mode	None	C-Max		None	C-Max		Min	Min	Min	Min	Min	
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	0.69		0.74	0.09	0.42	0.23	0.21	
Control Delay	20.6	21.3		45.4	15.8		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	
Total Delay	20.6	21.3		45.4	15.8		70.7	44.2	53.2	48.1	47.5	
LOS	C	C		D	B		E	D	D	D	D	
Approach Delay		21.3			17.2			62.0			47.8	
Approach LOS		C			B			E			D	
Queue Length 50th (ft)	18	544		38	251		158	23	97	45	52	

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

8/8/2014

	↖	→	↘	↙	←	↖	↘	↑	↖	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)	51	733		m79	444		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	
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	0.76		0.61	0.69		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 86.1%

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

8/8/2014

Lane Group	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Volume (vph)	109	241	470	83	209	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)	115	254	547	97	213	687
Shared Lane Traffic (%)						
Lane Group Flow (vph)	115	254	644	0	213	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%
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?						
Recall Mode	None	None	C-Max		None	C-Max
Act Effct Green (s)	11.8	24.2	55.8		70.8	71.8
Actuated g/C Ratio	0.13	0.27	0.62		0.79	0.80
v/c Ratio	0.50	0.61	0.56		0.36	0.47
Control Delay	43.4	33.9	14.0		7.1	5.6
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	43.4	33.9	14.0		7.1	5.6
LOS	D	C	B		A	A
Approach Delay	36.8		14.0			5.9

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

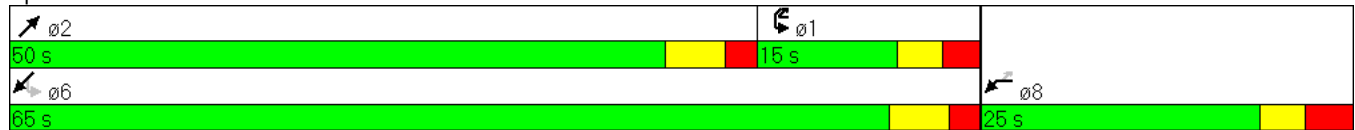
8/8/2014

	↖	↗	↘	↙	↕	↔
Lane Group	WBL	WBR	NET	NER	SWL	SWT
Approach LOS	D		B		A	
Queue Length 50th (ft)	62	121	210		26	120
Queue Length 95th (ft)	109	184	330		56	227
Internal Link Dist (ft)	1070		783		748	
Turn Bay Length (ft)	125				225	
Base Capacity (vph)	388	419	1144		586	1465
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	0.30	0.61	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:	0.61
Intersection Signal Delay:	14.6
Intersection LOS:	B
Intersection Capacity Utilization:	59.9%
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
12: US 15-501 & Market St

8/8/2014

Lane Group	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	SEL	SET	SER	NWL
Lane Configurations												
Volume (vph)	27	150	1147	4	37	19	512	347	336	1	35	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)			-3%				4%			-3%		
Storage Length (ft)		275		150		250		300	150		0	250
Storage Lanes		1		1		1		1	1		0	0
Taper Length (ft)		25		25		25		25	25		25	25
Lane Util. Factor	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00
Frt				0.850				0.850		0.853		
Flt Protected		0.950				0.950			0.950			
Satd. Flow (prot)	0	1796	3592	1607	0	1701	3402	1522	1762	1582	0	0
Flt Permitted		0.950				0.950			0.950			
Satd. Flow (perm)	0	1796	3592	1607	0	1701	3402	1522	1762	1582	0	0
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	0.96	0.96	0.96	0.82	0.82	0.82	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	4%	4%	4%	4%	4%	4%	4%	2%
Adj. Flow (vph)	29	163	1247	4	39	20	533	361	410	1	43	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	192	1247	4	0	59	533	361	410	44	0	0
Turn Type	Prot	Prot		Perm	Prot	Prot		pm+ov	Prot			Perm
Protected Phases	5	5	2		1	1	6	7	7	4		
Permitted Phases				2				6				8
Detector Phase	5	5	2	2	1	1	6	7	7	4		8
Switch Phase												
Minimum Initial (s)	7.0	7.0	14.0	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	21.0	14.0	14.0	20.0	14.0	14.0	14.0		14.0
Total Split (s)	29.0	29.0	64.0	64.0	14.0	14.0	49.0	48.0	48.0	62.0	0.0	14.0
Total Split (%)	20.7%	20.7%	45.7%	45.7%	10.0%	10.0%	35.0%	34.3%	34.3%	44.3%	0.0%	10.0%
Yellow Time (s)	3.0	3.0	5.0	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	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	6.4	6.0	5.0	5.0	5.0	5.0	5.0	3.2	5.0
Lead/Lag	Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag			Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes			Yes
Recall Mode	None	None	C-Max	C-Max	None	None	C-Max	None	None	None		None
Act Effct Green (s)		22.0	69.8	68.4		9.0	54.0	96.8	37.8	49.0		
Actuated g/C Ratio		0.16	0.50	0.49		0.06	0.39	0.69	0.27	0.35		
v/c Ratio		0.68	0.70	0.01		0.54	0.41	0.34	0.86	0.08		
Control Delay		61.5	27.5	21.8		87.1	32.2	10.3	66.5	27.0		
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total Delay		61.5	27.5	21.8		87.1	32.2	10.3	66.5	27.0		
LOS		E	C	C		F	C	B	E	C		
Approach Delay			32.0				27.3			62.6		
Approach LOS			C				C			E		
Queue Length 50th (ft)		166	485	2		48	222	172	350	25		

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

8/8/2014

Lane Group	NWT	NWR
Lane Configurations	↕	
Volume (vph)	1	31
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	0.891	
Flt Protected	0.992	
Satd. Flow (prot)	1646	0
Flt Permitted	0.931	
Satd. Flow (perm)	1545	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	0.90	0.90
Heavy Vehicles (%)	2%	2%
Adj. Flow (vph)	1	34
Shared Lane Traffic (%)		
Lane Group Flow (vph)	42	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%
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	Lead	
Lead-Lag Optimize?	Yes	
Recall Mode	None	
Act Effct Green (s)	9.0	
Actuated g/C Ratio	0.06	
v/c Ratio	0.42	
Control Delay	76.6	
Queue Delay	0.0	
Total Delay	76.6	
LOS	E	
Approach Delay	76.6	
Approach LOS	E	
Queue Length 50th (ft)	38	

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

8/8/2014

	↖	↗	↑	↘	↙	↓	↗	↘	↙	↘	↙	
Lane Group	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	SEL	SET	SER	NWL
Queue Length 95th (ft)		251	324	m3		#110	246	166	411	46		
Internal Link Dist (ft)			869				2658			376		
Turn Bay Length (ft)		275		150		250		300	150			
Base Capacity (vph)		308	1790	785		109	1311	1049	541	644		
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		0.62	0.70	0.01		0.54	0.41	0.34	0.76	0.07		

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 105 (75%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.86

Intersection Signal Delay: 35.9

Intersection LOS: D

Intersection Capacity Utilization 75.3%

ICU Level of Service D

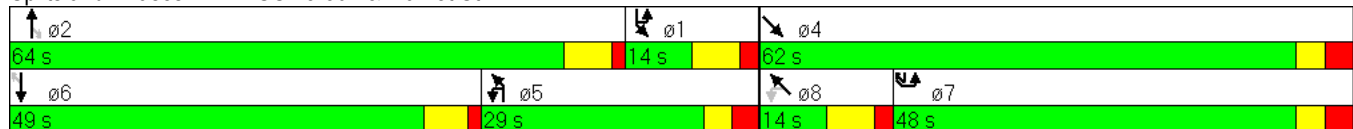
Analysis Period (min) 15

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: 12: US 15-501 & Market St





Lane Group	NWT	NWR
Queue Length 95th (ft)	79	
Internal Link Dist (ft)	311	
Turn Bay Length (ft)		
Base Capacity (vph)	99	
Starvation Cap Reductn	0	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.42	
Intersection Summary		

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

8/8/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations	↖↗		↖	↖		↖		↕↔			↕↕	↖
Volume (vph)	266	0	38	17	0	50	0	2626	9	0	1280	973
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								
Frt			0.850			0.850		0.999				0.850
Flt Protected	0.950			0.950								
Satd. Flow (prot)	3434	0	1584	1752	0	1568	0	4006	0	0	3438	1538
Flt 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	43	25	0	74	0	2794	10	0	1347	1024
Shared Lane Traffic (%)												
Lane Group Flow (vph)	302	0	43	25	0	74	0	2804	0	0	1347	1024
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%
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?												
Recall Mode	None			None				C-Max			C-Max	
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
v/c Ratio	0.72		0.03	0.12		0.05		0.86			0.48	0.67
Control Delay	77.5		0.0	62.1		0.1		13.4			3.5	2.0
Queue Delay	0.0		0.0	0.0		0.0		0.0			0.2	0.0
Total Delay	77.5		0.0	62.1		0.1		13.4			3.8	2.0
LOS	E		A	E		A		B			A	A

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

8/8/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Approach Delay								13.4			3.0	
Approach LOS								B			A	
Queue Length 50th (ft)	159		0	24		0		728			98	10
Queue Length 95th (ft)	201		0	41		0		981			191	14
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			628	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	0.52		0.03	0.08		0.05		0.86			0.62	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: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.86
 Intersection Signal Delay: 12.4 Intersection LOS: B
 Intersection Capacity Utilization 66.9% ICU Level of Service C
 Analysis Period (min) 15
 * User Entered Value

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

02 128 s	03 32 s
06 128 s	

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

8/8/2014

Lane Group	EBR	WBR2	SER	SER2	NET	NER	SWT	SWR	SWR2
Lane Configurations									
Volume (vph)	24	105	216	14	2755	246	1925	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	2870	256	2213	8	1
Shared Lane Traffic (%)									
Lane Group Flow (vph)	39	202	490	0	2870	256	2213	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%
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								
Recall Mode	None	None	None		C-Max		C-Max	C-Max	
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		1.00	0.16	0.82	0.01	
Control Delay	87.9	104.2	182.8		21.8	0.1	7.3	1.8	
Queue Delay	0.0	0.0	0.0		29.7	0.0	0.4	0.0	
Total Delay	87.9	104.2	182.8		51.5	0.1	7.7	1.8	
LOS	F	F	F		D	A	A	A	
Approach Delay					47.3		7.7		
Approach LOS					D		A		

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

8/8/2014



Lane Group	EBR	WBR2	SER	SER2	NET	NER	SWT	SWR	SWR2
Queue Length 50th (ft)	40	~223	~390		824	0	350	1	
Queue Length 95th (ft)	56	169	185		m#1213	m0	261	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		215	0	141	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	0.43	0.89	1.25		1.08	0.16	0.86	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: 140

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.25

Intersection Signal Delay: 45.9

Intersection LOS: D

Intersection Capacity Utilization 91.3%

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

Phase	Duration	Phase	Duration	Phase	Duration
↗ ø2	121 s	↘ ø3	14 s	↖ ø4	25 s
↙ ø6	121 s				

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

8/8/2014

Lane Group	EBL	EBR	EBR2	NBL	NBT	NBR	SBL	SBT	SBR	NWL	NWR	ø2	
Lane Configurations			↗↗	↖	↕			↕	↗			↗	
Volume (vph)	0	0	968	29	1410	0	0	1366	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		
Fr _t			0.850						0.850		0.865		
Fl _t Protected				0.950									
Satd. Flow (prot)	0	0	2787	1770	3539	0	0	3539	1583	0	1611		
Fl _t 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)											138		
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	1052	29	1567	0	0	1666	197	0	312		
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	0	1052	29	1567	0	0	1666	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	36.0	36.0	80.0	0.0	0.0	44.0	44.0	0.0	0.0	44.0	
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%	
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?													
Recall Mode			None	None				C-Max	C-Max			C-Max	
Act Effct Green (s)			31.0	31.0	80.0			39.0	39.0		80.0		
Actuated g/C Ratio			0.39	0.39	1.00			0.49	0.49		1.00		
v/c Ratio			0.97	0.04	0.44			0.97	0.26		0.19		
Control Delay			47.6	14.6	0.2			36.1	13.1		0.3		
Queue Delay			0.0	0.0	0.0			0.0	0.0		0.0		
Total Delay			47.6	14.6	0.2			36.1	13.1		0.3		
LOS			D	B	A			D	B		A		
Approach Delay					0.5			33.7					
Approach LOS					A			C					
Queue Length 50th (ft)			286	11	0			402	55		0		
Queue Length 95th (ft)			#437	m12	0			#441	96		0		
Internal Link Dist (ft)	614				978			407		512			

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

8/8/2014

Lane Group	EBL	EBR	EBR2	NBL	NBT	NBR	SBL	SBT	SBR	NWL	NWR	ø2
Turn Bay Length (ft)			450	150					375			
Base Capacity (vph)			1080	686	3539			1725	772		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			0.97	0.04	0.44			0.97	0.26		0.19	

Intersection Summary













Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 28 (35%), 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: 23.6 Intersection LOS: C
 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)

	ø2					ø4
44 s					36 s	
	ø6					
44 s						

Lanes, Volumes, Timings
68: Median U-Turn #1 & US 15-501 (Fordham Blvd)

8/8/2014

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEU	NEL	NET	NER	SWU	SWL
Lane Configurations							⬆⬆		⬆⬆		⬆⬆	
Volume (vph)	0	0	0	0	0	0	236	0	2706	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		250		0		250
Storage Lanes	0		0	0		0		1		0		2
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	0.97	1.00	0.95	1.00	0.97	1.00
Fr t												
Flt Protected							0.950				0.950	
Satd. Flow (prot)	0	0	0	0	0	0	3433	0	3539	0	3433	0
Flt Permitted							0.950				0.950	
Satd. Flow (perm)	0	0	0	0	0	0	3433	0	3539	0	3433	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	262	0	3007	0	201	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	262	0	3007	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	24.0	0.0	146.0	0.0	14.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	15.0%	0.0%	91.3%	0.0%	8.8%	0.0%
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	
Recall Mode							None		C-Max		None	
Act Effct Green (s)							17.9		141.0		9.0	
Actuated g/C Ratio							0.11		0.88		0.06	
v/c Ratio							0.68		0.96		1.04	
Control Delay							75.3		12.0		129.9	
Queue Delay							0.0		5.5		0.0	
Total Delay							75.3		17.5		129.9	
LOS							E		B		F	
Approach Delay									22.1			
Approach LOS									C			
Queue Length 50th (ft)							142		350		~119	
Queue Length 95th (ft)							m172		406		m#153	
Internal Link Dist (ft)		33			4				624			

Lanes, Volumes, Timings
 68: Median U-Turn #1 & US 15-501 (Fordham Blvd)

8/8/2014

Lane Group	SWT	SWR
Lane Configurations	↑↑↑	
Volume (vph)	1984	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)	2204	0
Shared Lane Traffic (%)		
Lane Group Flow (vph)	2204	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)	136.0	0.0
Total Split (%)	85.0%	0.0%
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	
Recall Mode	C-Max	
Act Effct Green (s)	132.1	
Actuated g/C Ratio	0.83	
v/c Ratio	0.68	
Control Delay	2.6	
Queue Delay	0.2	
Total Delay	2.8	
LOS	A	
Approach Delay	13.4	
Approach LOS	B	
Queue Length 50th (ft)	214	
Queue Length 95th (ft)	m216	
Internal Link Dist (ft)	709	

Lanes, Volumes, Timings
 68: Median U-Turn #1 & US 15-501 (Fordham Blvd)

8/8/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEU	NEL	NET	NER	SWU	SWL
Turn Bay Length (ft)							250				250	
Base Capacity (vph)							408		3119		193	
Starvation Cap Reductn							0		0		0	
Spillback Cap Reductn							0		115		0	
Storage Cap Reductn							0		0		0	
Reduced v/c Ratio							0.64		1.00		1.04	

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: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.04
 Intersection Signal Delay: 18.4 Intersection LOS: B
 Intersection Capacity Utilization 89.0% 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: 68: Median U-Turn #1 & US 15-501 (Fordham Blvd)

◀ ø1	↗ ø2
14 s	146 s
↘ ø5	↖ ø6
24 s	136 s

Lanes, Volumes, Timings
68: Median U-Turn #1 & US 15-501 (Fordham Blvd)











8/8/2014



Lane Group	SWT	SWR
Turn Bay Length (ft)		
Base Capacity (vph)	3229	
Starvation Cap Reductn	297	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.75	
Intersection Summary		

Lanes, Volumes, Timings
 69: US 15-501 (Fordham Blvd) & Median U-Turn #2

8/8/2014

							
Lane Group	NBU	NBL	NBT	SBT	SBR	SEL	SER
Lane Configurations							
Volume (vph)	91	107	2625	2052	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
Frt							
Flt Protected		0.950					
Satd. Flow (prot)	0	1770	3539	3539	0	0	0
Flt 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	2917	2280	0	0	0
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	220	2917	2280	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%
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			
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	0.82	0.82			
Control Delay		67.0	2.1	10.7			
Queue Delay		0.0	0.0	0.0			
Total Delay		67.0	2.1	10.7			
LOS		E	A	B			
Approach Delay			6.6	10.7			
Approach LOS			A	B			
Queue Length 50th (ft)		231	0	666			
Queue Length 95th (ft)		m233	m0	m691			
Internal Link Dist (ft)			836	1118		48	

Lanes, Volumes, Timings
 69: US 15-501 (Fordham Blvd) & Median U-Turn #2

8/8/2014

	↖	↗	↑	↓	↘	↙	
Lane Group	NBU	NBL	NBT	SBT	SBR	SEL	SER
Turn Bay Length (ft)		250					
Base Capacity (vph)		288	3539	2780			
Starvation Cap Reductn		0	0	0			
Spillback Cap Reductn		0	0	21			
Storage Cap Reductn		0	0	0			
Reduced v/c Ratio		0.76	0.82	0.83			

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: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.82
 Intersection Signal Delay: 8.3
 Intersection LOS: A
 Intersection Capacity Utilization 76.7%
 ICU Level of Service D
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 69: US 15-501 (Fordham Blvd) & Median U-Turn #2



Lanes, Volumes, Timings
 221: NC 54 (Raleigh Road) & NC 54 WB On-Ramp

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗		↑↑	↗			↗			↗
Volume (vph)	0	691	13	0	1295	968	0	0	295	0	0	210
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	16	0	1524	1139	0	0	399	0	0	219
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	833	16	0	1524	1139	0	0	399	0	0	219
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%
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?												
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	0.01		0.44	0.75			0.59			0.14
Control Delay		17.5	0.0		0.2	10.5			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	10.5			20.5			0.2
LOS		B	A		A	B			C			A
Approach Delay		17.2			4.6							
Approach LOS		B			A							

Lanes, Volumes, Timings
 221: NC 54 (Raleigh Road) & NC 54 WB On-Ramp

8/8/2014

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%
Yellow Time (s)	5.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Lanes, Volumes, Timings
 221: NC 54 (Raleigh Road) & NC 54 WB On-Ramp

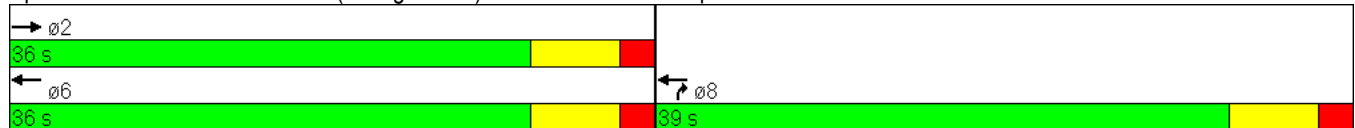
8/8/2014

	↖	→	↘	↙	←	↖	↘	↑	↖	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		153	0		0	873			129			0
Queue Length 95th (ft)		186	0		0	249			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	0.01		0.44	0.75			0.55			0.14

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 19 (25%), Referenced to phase 2:EBT, Start of Green
 Natural Cycle: 40
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.75
 Intersection Signal Delay: 8.5
 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



Lane Group	ø6
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
12: US 15-501 & Market St

8/8/2014

Lane Group	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	SEL	SET	SER	NWL
Lane Configurations												
Volume (vph)	24	49	635	10	24	29	604	190	207	1	48	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)			-3%				4%			-3%		
Storage Length (ft)		275		150		250		300	150		0	0
Storage Lanes		1		1		1		1	1		0	0
Taper Length (ft)		25		25		25		25	25		25	25
Lane Util. Factor	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor									1.00			
Frnt				0.850				0.850		0.852		
Flt Protected		0.950				0.950			0.950			
Satd. Flow (prot)	0	1796	3592	1607	0	1727	3435	1537	1796	1611	0	0
Flt Permitted		0.950				0.950			0.950			
Satd. Flow (perm)	0	1796	3592	1607	0	1727	3435	1537	1789	1611	0	0
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	0.69	0.69	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	3%	2%	3%	3%	2%	2%	2%	2%
Adj. Flow (vph)	27	54	706	11	26	32	657	207	300	1	70	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	81	706	11	0	58	657	207	300	71	0	0
Turn Type	Prot	Prot		Perm	Prot	Prot		pm+ov	Prot			Perm
Protected Phases	5	5	2		1	1	6	7	7	4		
Permitted Phases				2				6				8
Detector Phase	5	5	2	2	1	1	6	7	7	4		8
Switch Phase												
Minimum Initial (s)	7.0	7.0	14.0	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	21.0	14.0	14.0	20.0	14.0	14.0	14.0		14.0
Total Split (s)	18.0	18.0	47.0	47.0	16.0	16.0	45.0	42.0	42.0	57.0	0.0	15.0
Total Split (%)	15.0%	15.0%	39.2%	39.2%	13.3%	13.3%	37.5%	35.0%	35.0%	47.5%	0.0%	12.5%
Yellow Time (s)	3.0	3.0	5.0	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	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	6.4	6.0	5.0	5.0	5.0	6.0	6.0	3.2	5.0
Lead/Lag	Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag			Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes			Yes
Recall Mode	None	None	C-Max	C-Max	None	None	C-Max	None	None	None		None
Act Effct Green (s)		11.7	59.0	57.6		10.4	57.4	90.0	25.6	37.4		
Actuated g/C Ratio		0.10	0.49	0.48		0.09	0.48	0.75	0.21	0.31		
v/c Ratio		0.46	0.40	0.01		0.39	0.40	0.18	0.78	0.14		
Control Delay		55.6	20.3	20.9		41.9	22.8	9.4	58.6	26.8		
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total Delay		55.6	20.3	20.9		41.9	22.8	9.4	58.6	26.8		
LOS		E	C	C		D	C	A	E	C		
Approach Delay			23.9				21.0			52.5		

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

8/8/2014

Lane Group	NWT	NWR
Lane Configurations		
Volume (vph)	1	26
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	0.902	
Flt Protected	0.988	
Satd. Flow (prot)	1660	0
Flt Permitted	0.892	
Satd. Flow (perm)	1499	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)	1	29
Shared Lane Traffic (%)		
Lane Group Flow (vph)	40	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)	15.0	0.0
Total Split (%)	12.5%	0.0%
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	Lead	
Lead-Lag Optimize?	Yes	
Recall Mode	None	
Act Effct Green (s)	9.6	
Actuated g/C Ratio	0.08	
v/c Ratio	0.33	
Control Delay	59.9	
Queue Delay	0.0	
Total Delay	59.9	
LOS	E	
Approach Delay	59.9	

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

8/8/2014

	↖	↗	↑	↘	↙	↓	↗	↘	↙	↘	↙	↘
Lane Group	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	SEL	SET	SER	NWL
Approach LOS			C				C				D	
Queue Length 50th (ft)		60	175	4		43	106	52	221	38		
Queue Length 95th (ft)		112	158	12		79	208	126	212	49		
Internal Link Dist (ft)			862				2658			376		
Turn Bay Length (ft)		275		150		250		300	150			
Base Capacity (vph)		195	1766	771		158	1643	1145	539	685		
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		0.42	0.40	0.01		0.37	0.40	0.18	0.56	0.10		

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 104 (87%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 28.3

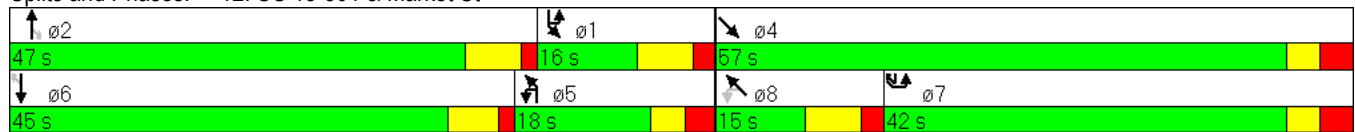
Intersection LOS: C

Intersection Capacity Utilization 54.9%

ICU Level of Service A

Analysis Period (min) 15

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





Lane Group	NWT	NWR
Approach LOS	E	
Queue Length 50th (ft)	30	
Queue Length 95th (ft)	67	
Internal Link Dist (ft)	448	
Turn Bay Length (ft)		
Base Capacity (vph)	125	
Starvation Cap Reductn	0	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.32	
Intersection Summary		

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

8/8/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations	↔↔		↔	↔		↔		↔↔↔			↔↔	↔
Volume (vph)	606	0	104	14	0	21	0	1507	18	0	1405	540
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								
Frt			0.850			0.850		0.998				0.850
Flt Protected	0.950			0.950								
Satd. Flow (prot)	3502	0	1615	1752	0	1568	0	3887	0	0	3471	1553
Flt 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	121	18	0	27	0	1752	21	0	1544	593
Shared Lane Traffic (%)												
Lane Group Flow (vph)	705	0	121	18	0	27	0	1773	0	0	1544	593
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%
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?												
Recall Mode	None			None				C-Max			C-Max	
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
v/c Ratio	0.82		0.08	0.04		0.02		0.68			0.66	0.38
Control Delay	51.5		0.1	32.9		0.0		14.1			5.0	0.6
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		14.1			5.2	0.6
LOS	D		A	C		A		B			A	A

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

8/8/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Approach Delay								14.1			3.9	
Approach LOS								B			A	
Queue Length 50th (ft)	266		0	11		0		363			99	0
Queue Length 95th (ft)	302		0	24		0		444			114	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			165	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		0.68			0.71	0.38

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 79 (66%), Referenced to phase 2:NET and 6:SWT, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.82
 Intersection Signal Delay: 14.7 Intersection LOS: B
 Intersection Capacity Utilization 64.5% ICU Level of Service C
 Analysis Period (min) 15
 * User Entered Value

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

ø2 81 s	ø3 39 s
ø6 81 s	

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

8/8/2014

Lane Group	EBR	WBR2	SER	SER2	NET	NER	SWT	SWR	SWR2
Lane Configurations									
Volume (vph)	30	208	95	3	1965	191	1842	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	2183	212	1939	21	11
Shared Lane Traffic (%)									
Lane Group Flow (vph)	43	270	136	0	2183	212	1939	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%
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								
Recall Mode	None	None	None		C-Max		C-Max	C-Max	
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		0.85	0.13	0.83	0.03	
Control Delay	61.5	76.2	42.2		9.5	0.1	12.4	5.2	
Queue Delay	0.0	0.0	0.0		0.3	0.0	0.1	0.0	
Total Delay	61.5	76.2	42.2		9.8	0.1	12.5	5.2	
LOS	E	E	D		A	A	B	A	
Approach Delay					8.9		12.4		
Approach LOS					A		B		

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

8/8/2014

Lane Group	EBR	WBR2	SER	SER2	NET	NER	SWT	SWR	SWR2
Queue Length 50th (ft)	32	203	50		249	0	579	4	
Queue Length 95th (ft)	54	#257	65		522	m0	447	m7	
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		72	0	34	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		0.87	0.13	0.84	0.03	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 61 (51%), Referenced to phase 2:NET and 6:SWT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.88

Intersection Signal Delay: 15.5

Intersection LOS: B

Intersection Capacity Utilization 75.7%

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)

8/8/2014

Lane Group	EBL	EBR	EBR2	NBL	NBT	NBR	SBL	SBT	SBR	NWL	NWR	ø2	
Lane Configurations			↑↑	↑	↑↑			↑↑	↑		↑		
Volume (vph)	0	0	737	26	1169	0	0	1313	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 _t			0.850						0.850		0.865		
Fl _t Protected				0.950									
Satd. Flow (prot)	0	0	2787	1770	3539	0	0	3539	1583	0	1611		
Fl _t 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)											199		
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	29	1299	0	0	1601	166	0	429		
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	0	801	29	1299	0	0	1601	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	25.0	25.0	60.0	0.0	0.0	35.0	35.0	0.0	0.0	35.0	
Total Split (%)	0.0%	0.0%	41.7%	41.7%	100.0%	0.0%	0.0%	58.3%	58.3%	0.0%	0.0%	58%	
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?													
Recall Mode			None	None				C-Max	C-Max			Max	
Act Effct Green (s)			20.0	20.0	60.0			30.0	30.0		60.0		
Actuated g/C Ratio			0.33	0.33	1.00			0.50	0.50		1.00		
v/c Ratio			0.86	0.05	0.37			0.90	0.21		0.27		
Control Delay			34.3	14.0	0.2			23.1	9.3		0.4		
Queue Delay			0.0	0.0	0.0			0.0	0.0		0.0		
Total Delay			34.3	14.0	0.2			23.1	9.3		0.4		
LOS			C	B	A			C	A		A		
Approach Delay					0.6			21.8					
Approach LOS					A			C					
Queue Length 50th (ft)			218	8	0			256	31		0		
Queue Length 95th (ft)			#308	m14	0			298	61		0		
Internal Link Dist (ft)	614				978			385		507			

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

8/8/2014

Lane Group	EBL	EBR	EBR2	NBL	NBT	NBR	SBL	SBT	SBR	NWL	NWR	ø2
Turn Bay Length (ft)			450	150					375			
Base Capacity (vph)			929	590	3539			1770	792		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			0.86	0.05	0.37			0.90	0.21		0.27	

Intersection Summary













Area Type: Other
 Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 52 (87%), Referenced to phase 6:SBT, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.90
 Intersection Signal Delay: 15.5 Intersection LOS: B
 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)

	ø2		ø4
35 s		25 s	
	ø6		
35 s			

Lanes, Volumes, Timings
 68: Median U-Turn #1 & US 15-501 (Fordham Blvd)

8/8/2014

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEU	NEL	NET	NER	SWU	SWL
Lane Configurations							⬆⬆		⬆⬆		⬆⬆	
Volume (vph)	0	0	0	0	0	0	117	0	2017	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		250		0		250
Storage Lanes	0		0	0		0		1		0		2
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	0.97	1.00	0.95	1.00	0.97	1.00
Frt												
Flt Protected							0.950				0.950	
Satd. Flow (prot)	0	0	0	0	0	0	3433	0	3539	0	3433	0
Flt Permitted							0.950				0.950	
Satd. Flow (perm)	0	0	0	0	0	0	3433	0	3539	0	3433	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	130	0	2241	0	93	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	130	0	2241	0	93	0
Turn Type												
Protected Phases							Prot				Prot	
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	14.0	0.0	106.0	0.0	14.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	11.7%	0.0%	88.3%	0.0%	11.7%	0.0%
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 Optimize?							Lead		Lag		Lead	
Recall Mode							Yes		Yes		Yes	
Act Effct Green (s)							None		C-Max		None	
Actuated g/C Ratio							9.0		101.0		9.0	
v/c Ratio							0.08		0.84		0.08	
Control Delay							0.51		0.75		0.36	
Queue Delay							62.1		4.1		55.6	
Total Delay							0.0		0.0		0.0	
LOS							62.1		4.1		55.6	
Approach Delay							E		A		E	
Approach LOS									7.3			
Queue Length 50th (ft)									A			
Queue Length 95th (ft)							52		201		38	
Internal Link Dist (ft)							m77		144		m49	
		1			1				635			

Lanes, Volumes, Timings
 68: Median U-Turn #1 & US 15-501 (Fordham Blvd)

8/8/2014

Lane Group	SWT	SWR
Lane Configurations	↑↑↑	
Volume (vph)	1883	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)	2092	0
Shared Lane Traffic (%)		
Lane Group Flow (vph)	2092	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)	106.0	0.0
Total Split (%)	88.3%	0.0%
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	
Recall Mode	C-Max	
Act Effct Green (s)	101.0	
Actuated g/C Ratio	0.84	
v/c Ratio	0.64	
Control Delay	1.1	
Queue Delay	0.1	
Total Delay	1.2	
LOS	A	
Approach Delay	3.5	
Approach LOS	A	
Queue Length 50th (ft)	47	
Queue Length 95th (ft)	45	
Internal Link Dist (ft)	697	

Lanes, Volumes, Timings
 68: Median U-Turn #1 & US 15-501 (Fordham Blvd)

8/8/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEU	NEL	NET	NER	SWU	SWL
Turn Bay Length (ft)							250				250	
Base Capacity (vph)							257		2979		257	
Starvation Cap Reductn							0		22		0	
Spillback Cap Reductn							0		19		0	
Storage Cap Reductn							0		0		0	
Reduced v/c Ratio							0.51		0.76		0.36	

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 52 (43%), Referenced to phase 2:NET and 6:SWT, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.75
 Intersection Signal Delay: 5.5 Intersection LOS: A
 Intersection Capacity Utilization 59.9% ICU Level of Service B
 Analysis Period (min) 15
 * User Entered Value
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 68: Median U-Turn #1 & US 15-501 (Fordham Blvd)

Phase	Duration	Phase	Duration
◀ ø1	14 s	↗ ø2	106 s
↘ ø5	14 s	↖ ø6	106 s

Lanes, Volumes, Timings
68: Median U-Turn #1 & US 15-501 (Fordham Blvd)











8/8/2014



Lane Group	SWT	SWR
Turn Bay Length (ft)		
Base Capacity (vph)	3293	
Starvation Cap Reductn	280	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.69	
Intersection Summary		

Lanes, Volumes, Timings
69: Median U-Turn #2 & US 15-501 (Fordham Blvd)

8/8/2014

							
Lane Group	SEL	SER	NEU	NEL	NET	SWT	SWR
Lane Configurations							
Volume (vph)	0	0	168	28	1938	1739	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
Frnt							
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	2153	1932	0
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	0	218	2153	1932	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%
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	
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	0.61	0.73	
Control Delay				48.2	0.4	10.2	
Queue Delay				0.0	0.0	0.0	
Total Delay				48.2	0.4	10.2	
LOS				D	A	B	
Approach Delay					4.8	10.2	
Approach LOS					A	B	
Queue Length 50th (ft)				169	0	362	
Queue Length 95th (ft)				m192	0	523	
Internal Link Dist (ft)	48				833	1120	

Lanes, Volumes, Timings
 69: Median U-Turn #2 & US 15-501 (Fordham Blvd)

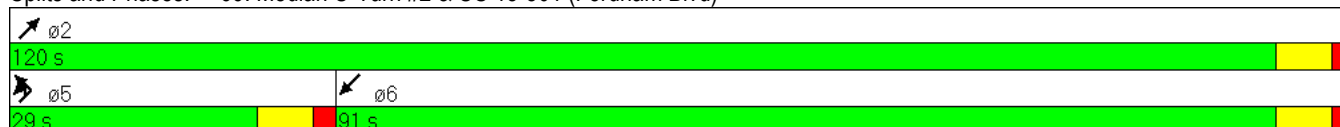
8/8/2014

	↖	↗	→	↘	↙	↘	↖
Lane Group	SEL	SER	NEU	NEL	NET	SWT	SWR
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	0.61	0.73	

Intersection Summary














Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 48 (40%), Referenced to phase 2:NET and 6:SWT, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.73
 Intersection Signal Delay: 7.2 Intersection LOS: A
 Intersection Capacity Utilization 67.3% ICU Level of Service C
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 69: Median U-Turn #2 & US 15-501 (Fordham Blvd)



Lanes, Volumes, Timings
 221: NC 54 (Raleigh Road) & NC 54 WB On-Ramp

8/8/2014

													
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑↑	↗		↑↑	↗			↗			↗	
Volume (vph)	0	710	32	0	703	681	0	0	287	0	0	179	
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	36	0	748	724	0	0	354	0	0	242	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	789	36	0	748	724	0	0	354	0	0	242	
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%	
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?													
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	0.02		0.22	0.48			0.61			0.15	
Control Delay		13.2	0.0		0.1	2.7			16.6			0.3	
Queue Delay		0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay		13.2	0.0		0.1	2.7			16.6			0.3	
LOS		B	A		A	A			B			A	
Approach Delay		12.6			1.4								
Approach LOS		B			A								

Lanes, Volumes, Timings
 221: NC 54 (Raleigh Road) & NC 54 WB On-Ramp

8/8/2014

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%
Yellow Time (s)	5.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Lanes, Volumes, Timings
 221: NC 54 (Raleigh Road) & NC 54 WB On-Ramp

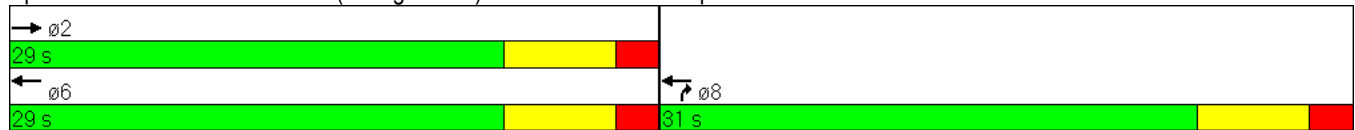
8/8/2014

	↖	→	↘	↙	←	↖	↘	↑	↖	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		102	0		0	34			88			1
Queue Length 95th (ft)		160	0		0	70			m90			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	0.02		0.22	0.48			0.52			0.15

Intersection Summary

Area Type: Other
 Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 48 (80%), Referenced to phase 2:EBT, Start of Green
 Natural Cycle: 40
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.61
 Intersection Signal Delay: 6.4
 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



Lane Group	ø6
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
12: US 15-501 & Market St

8/8/2014

Lane Group	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	SEL	SET	SER	NWL
Lane Configurations												
Volume (vph)	5	101	620	17	28	61	1078	251	397	2	106	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)			-3%				4%			-3%		
Storage Length (ft)		275		150		250		300	150		0	0
Storage Lanes		1		1		1		1	1		0	0
Taper Length (ft)		25		25		25		25	25		25	25
Lane Util. Factor	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00										
Frnt				0.850				0.850		0.853		
Flt Protected		0.950				0.950			0.950			
Satd. Flow (prot)	0	1779	3557	1607	0	1734	3468	1552	1779	1597	0	0
Flt Permitted		0.950				0.950			0.950			
Satd. Flow (perm)	0	1777	3557	1607	0	1734	3468	1552	1779	1597	0	0
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)	5	107	660	19	29	68	1135	264	432	2	115	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	112	660	19	0	97	1135	264	432	117	0	0
Turn Type	Prot	Prot		Perm	Prot	Prot		pm+ov	Prot			Perm
Protected Phases	5	5	2		1	1	6	7	7	4		
Permitted Phases				2				6				8
Detector Phase	5	5	2	2	1	1	6	7	7	4		8
Switch Phase												
Minimum Initial (s)	7.0	7.0	14.0	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	21.0	14.0	14.0	20.0	14.0	14.0	14.0		14.0
Total Split (s)	17.0	17.0	61.0	61.0	18.0	18.0	62.0	47.0	47.0	61.0	0.0	14.0
Total Split (%)	12.1%	12.1%	43.6%	43.6%	12.9%	12.9%	44.3%	33.6%	33.6%	43.6%	0.0%	10.0%
Yellow Time (s)	3.0	3.0	5.0	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	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	6.4	6.0	5.0	5.0	5.0	5.0	5.0	3.2	5.0
Lead/Lag	Lead	Lead	Lead	Lead	Lag	Lag	Lag	Lag	Lag			Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes			Yes
Recall Mode	None	None	C-Max	C-Max	None	None	C-Max	None	None	None		None
Act Effct Green (s)		12.2	62.4	61.0		13.0	63.3	102.6	38.4	49.6		
Actuated g/C Ratio		0.09	0.45	0.44		0.09	0.45	0.73	0.27	0.35		
v/c Ratio		0.73	0.42	0.03		0.60	0.72	0.23	0.89	0.21		
Control Delay		83.1	31.3	26.8		58.7	20.3	1.7	68.9	30.6		
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total Delay		83.1	31.3	26.8		58.7	20.3	1.7	68.9	30.6		
LOS		F	C	C		E	C	A	E	C		
Approach Delay			38.5				19.5			60.8		

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

8/8/2014

Lane Group	NWT	NWR
Lane Configurations		
Volume (vph)	1	39
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	0.905	
Flt Protected	0.986	
Satd. Flow (prot)	1662	0
Flt Permitted	0.730	
Satd. Flow (perm)	1231	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)	1	43
Shared Lane Traffic (%)		
Lane Group Flow (vph)	61	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%
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	Lead	
Lead-Lag Optimize?	Yes	
Recall Mode	None	
Act Effct Green (s)	9.0	
Actuated g/C Ratio	0.06	
v/c Ratio	0.77	
Control Delay	115.6	
Queue Delay	0.0	
Total Delay	115.6	
LOS	F	
Approach Delay	115.6	

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

8/8/2014

	↖	↗	↑	↘	↙	↓	↗	↘	↙	↘	↙	
Lane Group	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	SEL	SET	SER	NWL
Approach LOS			D				B			E		
Queue Length 50th (ft)		101	233	11		90	350	2	370	70		
Queue Length 95th (ft)		#197	332	33		#144	290	46	#526	114		
Internal Link Dist (ft)			862				2658			376		
Turn Bay Length (ft)		275		150		250		300	150			
Base Capacity (vph)		159	1586	701		161	1567	1178	534	639		
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		0.70	0.42	0.03		0.60	0.72	0.22	0.81	0.18		

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 32 (23%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.89

Intersection Signal Delay: 34.5

Intersection LOS: C

Intersection Capacity Utilization 76.8%

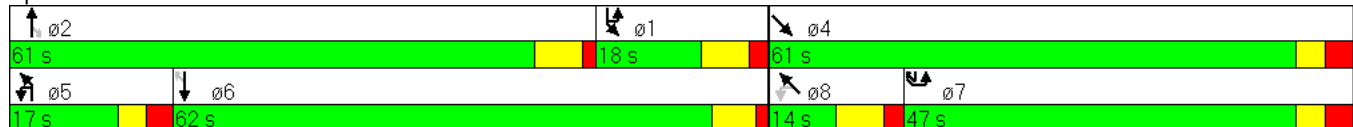
ICU Level of Service D

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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





Lane Group	NWT	NWR
Approach LOS	F	
Queue Length 50th (ft)	56	
Queue Length 95th (ft)	#139	
Internal Link Dist (ft)	284	
Turn Bay Length (ft)		
Base Capacity (vph)	79	
Starvation Cap Reductn	0	
Spillback Cap Reductn	0	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.77	
Intersection Summary		

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

8/8/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations	↖↗		↖	↖		↖		↕↔			↕↕	↖
Volume (vph)	671	0	171	14	0	23	0	1908	23	0	2151	379
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								
Frt			0.850			0.850		0.998				0.850
Flt Protected	0.950			0.950								
Satd. Flow (prot)	3502	0	1615	1770	0	1583	0	3963	0	0	3539	1583
Flt 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)	789	0	201	17	0	27	0	1988	24	0	2241	395
Shared Lane Traffic (%)												
Lane Group Flow (vph)	789	0	201	17	0	27	0	2012	0	0	2241	395
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)	38.0	0.0	0.0	38.0	0.0	0.0	0.0	102.0	0.0	0.0	102.0	0.0
Total Split (%)	27.1%	0.0%	0.0%	27.1%	0.0%	0.0%	0.0%	72.9%	0.0%	0.0%	72.9%	0.0%
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?												
Recall Mode	None			None				C-Max				C-Max
Act Effct Green (s)	32.9		140.0	32.9		140.0		97.1			97.1	140.0
Actuated g/C Ratio	0.24		1.00	0.24		1.00		0.69			0.69	1.00
v/c Ratio	0.96		0.13	0.04		0.02		0.73			0.91	0.25
Control Delay	75.6		0.2	41.9		0.0		15.4			14.9	0.2
Queue Delay	0.0		0.0	0.0		0.0		0.0			3.8	0.0
Total Delay	75.6		0.2	41.9		0.0		15.4			18.7	0.2
LOS	E		A	D		A		B			B	A

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

8/8/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Approach Delay								15.4			15.9	
Approach LOS								B			B	
Queue Length 50th (ft)	368		0	12		0		500			581	0
Queue Length 95th (ft)	#445		0	31		0		573			731	m0
Internal Link Dist (ft)		302			435			504			635	
Turn Bay Length (ft)			225			75						
Base Capacity (vph)	825		1594	417		1583		2749			2455	1583
Starvation Cap Reductn	0		0	0		0		0			156	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	0.96		0.13	0.04		0.02		0.73			0.97	0.25

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 37 (26%), Referenced to phase 2:NET and 6:SWT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.96
 Intersection Signal Delay: 23.5 Intersection LOS: C
 Intersection Capacity Utilization 86.9% 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: 20: Manning Drive & US 15-501 (Fordham Blvd)

↖ ø2	↗ ø3
102 s	38 s
↙ ø6	
102 s	

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

8/8/2014

Lane Group	EBR	WBR2	SER	SER2	NET	NER	SWT	SWR	SWR2
Lane Configurations									
Volume (vph)	12	137	120	1	2430	167	2393	23	7
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	1563	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)	31	159	203	2	2641	182	2659	26	8
Shared Lane Traffic (%)									
Lane Group Flow (vph)	31	159	205	0	2641	182	2659	34	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	19.0	19.0	0.0	107.0	0.0	107.0	107.0	0.0
Total Split (%)	10.0%	13.6%	13.6%	0.0%	76.4%	0.0%	76.4%	76.4%	0.0%
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								
Recall Mode	None	None	None		C-Max		C-Max	C-Max	
Act Effct Green (s)	9.0	17.0	17.0		110.0	140.0	104.6	104.6	
Actuated g/C Ratio	0.06	0.12	0.12		0.79	1.00	0.75	0.75	
v/c Ratio	0.30	0.83	0.61		0.90	0.11	0.96	0.03	
Control Delay	70.3	91.9	67.8		6.5	0.1	15.3	3.8	
Queue Delay	0.0	0.0	0.0		1.6	0.0	4.4	0.0	
Total Delay	70.3	91.9	67.8		8.0	0.1	19.7	3.8	
LOS	E	F	E		A	A	B	A	
Approach Delay					7.5		19.5		
Approach LOS					A		B		

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

8/8/2014

	↗	↖	↘	↙	↗	↖	↘	↙	↗
Lane Group	EBR	WBR2	SER	SER2	NET	NER	SWT	SWR	SWR2
Queue Length 50th (ft)	27	~148	105		98	0	865	5	
Queue Length 95th (ft)	27	#279	97		331	m0	#1341	m5	
Internal Link Dist (ft)					695		832		
Turn Bay Length (ft)						300		100	
Base Capacity (vph)	104	192	334		2930	1583	2784	1183	
Starvation Cap Reductn	0	0	0		148	0	104	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	0.30	0.83	0.61		0.95	0.11	0.99	0.03	

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 12 (9%), Referenced to phase 2:NET and 6:SWT, Start of Green
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.96
 Intersection Signal Delay: 17.7
 Intersection LOS: B
 Intersection Capacity Utilization 90.3%
 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
107 s	14 s	19 s
↙ ø6		
107 s		

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

8/8/2014

												ø2
Lane Group	EBL	EBR	EBR2	NBL	NBT	NBR	SBL	SBT	SBR	NWL	NWR	
Lane Configurations			↗↗	↖	↕			↕	↖		↖	
Volume (vph)	0	0	1024	22	1663	0	0	1606	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	
Fr _t			0.850						0.850		0.865	
Fl _t Protected				0.950								
Satd. Flow (prot)	0	0	2787	1770	3539	0	0	3539	1583	0	1611	
Fl _t 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)												94
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	1113	24	1848	0	0	1959	100	0	477	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	1113	24	1848	0	0	1959	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%
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?												
Recall Mode			None	None				C-Max	C-Max			C-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			1.04	0.04	0.52			1.02	0.12		0.30	
Control Delay			80.0	27.0	0.4			57.5	16.1		0.4	
Queue Delay			0.0	0.0	0.0			0.0	0.0		0.0	
Total Delay			80.0	27.0	0.4			57.5	16.1		0.4	
LOS			F	C	A			E	B		A	
Approach Delay					0.8			55.5				
Approach LOS					A			E				
Queue Length 50th (ft)			~610	12	0			~993	43		0	
Queue Length 95th (ft)			#767	m18	0			879	74		0	
Internal Link Dist (ft)	614				978			396		510		

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

8/8/2014

Lane Group	EBL	EBR	EBR2	NBL	NBT	NBR	SBL	SBT	SBR	NWL	NWR	ø2
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			1.04	0.04	0.52			1.02	0.12		0.30	

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: 130
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.04
 Intersection Signal Delay: 37.1 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)

	ø2		ø4
81 s		59 s	
	ø6		
81 s			

Lanes, Volumes, Timings
67: Median U-Turn #1 & US 15-501 (Fordham Blvd)

8/8/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEU	NEL	NET	NER	SWU	SWL
Lane Configurations							⬆		⬆		⬆	
Volume (vph)	0	0	0	0	0	0	129	0	2475	0	69	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0		250		0		250
Storage Lanes	0		0	0		0		1		0		2
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	0.97	1.00	0.95	1.00	0.97	1.00
Frt												
Flt Protected							0.950				0.950	
Satd. Flow (prot)	0	0	0	0	0	0	3433	0	3539	0	3433	0
Flt Permitted							0.950				0.950	
Satd. Flow (perm)	0	0	0	0	0	0	3433	0	3539	0	3433	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	143	0	2750	0	77	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	0	0	143	0	2750	0	77	0
Turn Type												
Protected Phases							Prot				Prot	
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	16.0	0.0	126.0	0.0	14.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	11.4%	0.0%	90.0%	0.0%	10.0%	0.0%
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 Optimize?							Lead		Lag		Lead	
Recall Mode							Yes		Yes		Yes	
Act Effct Green (s)							None		C-Max		None	
Actuated g/C Ratio							10.8		121.0		9.0	
v/c Ratio							0.08		0.86		0.06	
Control Delay							0.54		0.90		0.35	
Queue Delay							70.3		7.8		63.4	
Queue Length 50th (ft)							0.0		0.0		0.0	
Queue Length 95th (ft)							70.3		7.8		63.4	
LOS												
Approach Delay							E		A		E	
Approach LOS									B			
Queue Length 50th (ft)							67		161		38	
Queue Length 95th (ft)							m87		376		m41	
Internal Link Dist (ft)		12			1				635			

Lanes, Volumes, Timings
 67: Median U-Turn #1 & US 15-501 (Fordham Blvd)

8/8/2014

Lane Group	SWT	SWR
Lane Configurations	↑↑↑	
Volume (vph)	2456	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)	2729	0
Shared Lane Traffic (%)		
Lane Group Flow (vph)	2729	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)	124.0	0.0
Total Split (%)	88.6%	0.0%
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	
Recall Mode	C-Max	
Act Effct Green (s)	119.2	
Actuated g/C Ratio	0.85	
v/c Ratio	0.82	
Control Delay	1.5	
Queue Delay	0.2	
Total Delay	1.7	
LOS	A	
Approach Delay	3.4	
Approach LOS	A	
Queue Length 50th (ft)	13	
Queue Length 95th (ft)	14	
Internal Link Dist (ft)	695	

Lanes, Volumes, Timings
 67: Median U-Turn #1 & US 15-501 (Fordham Blvd)

8/8/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEU	NEL	NET	NER	SWU	SWL
Turn Bay Length (ft)							250				250	
Base Capacity (vph)							270		3059		221	
Starvation Cap Reductn							0		0		0	
Spillback Cap Reductn							0		0		0	
Storage Cap Reductn							0		0		0	
Reduced v/c Ratio							0.53		0.90		0.35	

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 7 (5%), Referenced to phase 2:NET and 6:SWT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.90
 Intersection Signal Delay: 7.2 Intersection LOS: A
 Intersection Capacity Utilization 72.6% 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: 67: Median U-Turn #1 & US 15-501 (Fordham Blvd)

ø1	ø2
14 s	126 s
ø5	ø6
16 s	124 s

Lanes, Volumes, Timings
67: Median U-Turn #1 & US 15-501 (Fordham Blvd)











8/8/2014



Lane Group	SWT	SWR
Turn Bay Length (ft)		
Base Capacity (vph)	3331	
Starvation Cap Reductn	134	
Spillback Cap Reductn	50	
Storage Cap Reductn	0	
Reduced v/c Ratio	0.85	
Intersection Summary		

Lanes, Volumes, Timings
68: Median U-Turn #2 & US 15-501 (Fordham Blvd)

8/8/2014

							
Lane Group	SEL	SER	NEU	NEL	NET	SWT	SWR
Lane Configurations							
Volume (vph)	0	0	94	24	2480	2442	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
Frt							
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	104	27	2756	2713	0
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	0	0	131	2756	2713	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	17.0	17.0	140.0	123.0	0.0
Total Split (%)	0.0%	0.0%	12.1%	12.1%	100.0%	87.9%	0.0%
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	
Recall Mode			None	None	C-Max	C-Max	
Act Effct Green (s)				12.0	140.0	118.0	
Actuated g/C Ratio				0.09	1.00	0.84	
v/c Ratio				0.86	0.78	0.91	
Control Delay				82.0	1.3	5.5	
Queue Delay				0.0	0.0	1.1	
Total Delay				82.0	1.3	6.7	
LOS				F	A	A	
Approach Delay					5.0	6.7	
Approach LOS					A	A	
Queue Length 50th (ft)				122	9	374	
Queue Length 95th (ft)				m138	0	m345	
Internal Link Dist (ft)	48				832	1122	

Lanes, Volumes, Timings
 68: Median U-Turn #2 & US 15-501 (Fordham Blvd)

8/8/2014

	↖	↗	→	↘	↙	↘	↖
Lane Group	SEL	SER	NEU	NEL	NET	SWT	SWR
Turn Bay Length (ft)				250			
Base Capacity (vph)				152	3539	2983	
Starvation Cap Reductn				0	0	0	
Spillback Cap Reductn				0	0	112	
Storage Cap Reductn				0	0	0	
Reduced v/c Ratio				0.86	0.78	0.94	

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 135 (96%), Referenced to phase 2:NET and 6:SWT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.91
 Intersection Signal Delay: 5.8
 Intersection LOS: A
 Intersection Capacity Utilization 82.4%
 ICU Level of Service E
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 68: Median U-Turn #2 & US 15-501 (Fordham Blvd)



Lanes, Volumes, Timings
 221: NC 54 (Raleigh Road) & NC 54 WB On-Ramp

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗		↑↑	↗			↗			↗
Volume (vph)	0	1456	67	0	967	1024	0	0	257	0	0	114
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)			32			1091						274
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	78	0	1051	1113	0	0	306	0	0	130
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1693	78	0	1051	1113	0	0	306	0	0	130
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%
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?												
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	0.05		0.30	0.72			0.73			0.08
Control Delay		15.0	0.1		0.2	8.4			26.6			0.1
Queue Delay		0.0	0.0		0.0	0.0			0.0			0.0
Total Delay		15.0	0.1		0.2	8.4			26.6			0.1
LOS		B	A		A	A			C			A
Approach Delay		14.4			4.4							
Approach LOS		B			A							
Queue Length 50th (ft)		273	0		0	115			128			0

Lanes, Volumes, Timings
 221: NC 54 (Raleigh Road) & NC 54 WB On-Ramp

8/8/2014

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%
Yellow Time (s)	5.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	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)	

Lanes, Volumes, Timings
 221: NC 54 (Raleigh Road) & NC 54 WB On-Ramp

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)		335	0		0	759			m128			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	0.05		0.30	0.72			0.70			0.08

Intersection Summary

Area Type: Other
 Cycle Length: 70
 Actuated Cycle Length: 70
 Offset: 25 (36%), Referenced to phase 2:EBT, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.80
 Intersection Signal Delay: 9.9
 Intersection LOS: A
 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



Lane Group	ø6
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	

**2022 With Site Mitigated
Alternative 1 - Diverging Diamond Interchange**

Lanes, Volumes, Timings
8: NC 86 NB & NC 86 SB

8/8/2014

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↑↑						↑↑				
Volume (vph)	0	1263	0	0	0	0	0	290	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	1452	0	0	0	0	0	319	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1452	0	0	0	0	0	319	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	116.0	0.0	0.0	0.0	0.0	0.0	24.0	0.0	0.0	0.0	0.0
Total Split (%)	0.0%	82.9%	0.0%	0.0%	0.0%	0.0%	0.0%	17.1%	0.0%	0.0%	0.0%	0.0%
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?												
Recall Mode								C-Min				
Act Effct Green (s)		112.1						17.9				
Actuated g/C Ratio		0.80						0.13				
v/c Ratio		0.86						0.75				
Control Delay		12.7						70.2				
Queue Delay		3.1						0.0				
Total Delay		15.8						70.2				
LOS		B						E				
Approach Delay		15.8						70.2				
Approach LOS		B						E				
Queue Length 50th (ft)		178						148				
Queue Length 95th (ft)		642						202				
Internal Link Dist (ft)		94			58			51			64	
Turn Bay Length (ft)												
Base Capacity (vph)		1687						454				

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	102.0
Total Split (%)	10%	73%
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	
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)		
Turn Bay Length (ft)		
Base Capacity (vph)		

Lanes, Volumes, Timings
 8: NC 86 NB & NC 86 SB

8/8/2014

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Starvation Cap Reductn		150						0				
Spillback Cap Reductn		0						0				
Storage Cap Reductn		0						0				
Reduced v/c Ratio		0.94						0.70				

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 69 (49%), Referenced to phase 2:SET, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.86
 Intersection Signal Delay: 25.6
 Intersection LOS: C
 Intersection Capacity Utilization 51.3%
 ICU Level of Service A
 Analysis Period (min) 15
 * User Entered Value

Splits and Phases: 8: NC 86 NB & NC 86 SB

#8 #81	#8	#8 #82
ø2	ø3	ø4
24 s	14 s	102 s

Lane Group	ø3	ø4
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

Lanes, Volumes, Timings
9: NC 86 SB & NC 86 NB

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑			↑↑				
Volume (vph)	0	0	0	0	803	0	0	1128	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	892	0	0	1226	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	892	0	0	1226	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	61.0	0.0	0.0	79.0	0.0	0.0	0.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	0.0%	43.6%	0.0%	0.0%	56.4%	0.0%	0.0%	0.0%	0.0%
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?												
Recall Mode								C-Min				
Act Effct Green (s)					58.5			71.5				
Actuated g/C Ratio					0.42			0.51				
v/c Ratio					0.63			0.68				
Control Delay					27.0			28.8				
Queue Delay					0.0			0.0				
Total Delay					27.0			28.8				
LOS					C			C				
Approach Delay					27.0			28.8				
Approach LOS					C			C				
Queue Length 50th (ft)					199			367				
Queue Length 95th (ft)					257			m427				
Internal Link Dist (ft)		37			95			25			68	
Turn Bay Length (ft)												
Base Capacity (vph)					1571			1853				

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	47.0
Total Split (%)	10%	34%
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	
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)		
Turn Bay Length (ft)		
Base Capacity (vph)		

Lanes, Volumes, Timings
 9: NC 86 SB & NC 86 NB

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn					0			0				
Spillback Cap Reductn					0			0				
Storage Cap Reductn					0			0				
Reduced v/c Ratio					0.57			0.66				

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: 0.69
 Intersection Signal Delay: 28.0 Intersection LOS: C
 Intersection Capacity Utilization 61.7% 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 86 SB & NC 86 NB

#9 #92 $\emptyset 2$	#9 $\emptyset 3$	#9 #91 $\emptyset 4$
79 s	14 s	47 s

Lane Group	ø3	ø4
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

Lanes, Volumes, Timings
 10: SR 1994 (Culbreth Road) & NC 86 NB

8/8/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations	↘	↑	↗		↖	↗	↘	↗	↗	↘	↗	↗
Volume (vph)	229	64	63	15	129	595	64	1524	11	260	835	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							1.00					
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950				0.995		0.950			0.950		
Satd. Flow (prot)	1743	1835	1560	0	1909	2870	1770	3540	1584	1702	3404	1523
Flt Permitted	0.294				0.961		0.284			0.053		
Satd. Flow (perm)	539	1835	1560	0	1844	2870	528	3540	1584	95	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			532			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	71	16	142	654	68	1621	12	265	852	126
Shared Lane Traffic (%)												
Lane Group Flow (vph)	257	72	71	0	158	654	68	1621	12	265	852	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)	19.0	41.0	41.0	22.0	22.0	46.0	75.0	75.0	75.0	24.0	99.0	118.0
Total Split (%)	13.6%	29.3%	29.3%	15.7%	15.7%	32.9%	53.6%	53.6%	53.6%	17.1%	70.7%	84.3%
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		
Recall Mode	None	None	None	None	None		C-Max	C-Max	C-Max	None	C-Max	
Act Effct Green (s)	35.5	35.5	35.5		16.5	35.5	70.5	70.5	70.5	94.5	94.5	113.7
Actuated g/C Ratio	0.25	0.25	0.25		0.12	0.25	0.50	0.50	0.50	0.68	0.68	0.81
v/c Ratio	1.00	0.15	0.18		0.72	0.90	0.26	0.91	0.02	0.94	0.37	0.10
Control Delay	103.5	41.5	42.1		78.8	52.7	11.1	23.9	8.5	83.6	12.5	4.8
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	103.5	41.5	42.1		78.8	52.7	11.1	23.9	8.5	83.6	12.5	4.8
LOS	F	D	D		E	D	B	C	A	F	B	A
Approach Delay		81.4			57.8			23.3			26.9	

Lanes, Volumes, Timings
 10: SR 1994 (Culbreth Road) & NC 86 NB

8/8/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Approach LOS		F			E			C			C	
Queue Length 50th (ft)	205	51	51		140	247	15	360	2	156	177	35
Queue Length 95th (ft)	#331	93	93		#236	#342	m22	533	m4	#363	304	47
Internal Link Dist (ft)		446			463			452			470	
Turn Bay Length (ft)			75			350	125		75	550		250
Base Capacity (vph)	257	472	401		224	738	266	1782	797	282	2298	1236
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	1.00	0.15	0.18		0.71	0.89	0.26	0.91	0.02	0.94	0.37	0.10

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 19 (14%), Referenced to phase 2:NETL and 6:SWTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.00

Intersection Signal Delay: 36.7

Intersection LOS: D

Intersection Capacity Utilization 93.5%

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: 10: SR 1994 (Culbreth Road) & NC 86 NB

ø2	ø1	ø4
75 s	24 s	41 s
ø6	ø7	ø8
99 s	19 s	22 s

Lanes, Volumes, Timings
 81: NC 86 NB & NC 54 WB Off Ramp RT

8/8/2014

							ø3	ø4
Lane Group	NBL	NBR	SEL	SER	SWL	SWR		
Lane Configurations								
Volume (vph)	1263	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)	1452	0	0	0	0	66		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	1452	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	24.0	14.0	102.0
Total Split (%)	0.0%	0.0%	0.0%	0.0%	0.0%	17.1%	10%	73%
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	
Recall Mode						C-Min	None	None
Act Effct Green (s)	140.0					17.9		
Actuated g/C Ratio	1.00					0.13		
v/c Ratio	0.73					0.32		
Control Delay	3.1					59.7		
Queue Delay	0.0					0.0		
Total Delay	3.1					59.7		
LOS	A					E		
Approach Delay	3.1							
Approach LOS	A							
Queue Length 50th (ft)	33					55		
Queue Length 95th (ft)	0					105		
Internal Link Dist (ft)	58		52		230			
Turn Bay Length (ft)								
Base Capacity (vph)	1998					217		

Lanes, Volumes, Timings
 81: NC 86 NB & NC 54 WB Off Ramp RT

8/8/2014



Lane Group	NBL	NBR	SEL	SER	SWL	SWR	ø3	ø4
Starvation Cap Reductn	0					0		
Spillback Cap Reductn	0					0		
Storage Cap Reductn	0					0		
Reduced v/c Ratio	0.73					0.30		

Intersection Summary







Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 69 (49%), Referenced to phase 2:SET, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.86
 Intersection Signal Delay: 5.6
 Intersection LOS: A
 Intersection Capacity Utilization 51.3%
 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

8/8/2014

							ø2	ø3
Lane Group	NBL	NBT	SBT	SBR	SEL	SER		
Lane Configurations			↑↑			↑↑		
Volume (vph)	0	0	547	0	0	290		
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	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	595	0	0	319		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	0	595	0	0	319		
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	102.0	0.0	0.0	0.0	24.0	14.0
Total Split (%)	0.0%	0.0%	72.9%	0.0%	0.0%	0.0%	17%	10%
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
Recall Mode			None				C-Min	None
Act Effct Green (s)			96.8			140.0		
Actuated g/C Ratio			0.69			1.00		
v/c Ratio			0.25			0.12		
Control Delay			8.3			1.9		
Queue Delay			0.0			0.0		
Total Delay			8.3			1.9		
LOS			A			A		
Approach Delay			8.3					
Approach LOS			A					
Queue Length 50th (ft)			96			26		
Queue Length 95th (ft)			122			37		
Internal Link Dist (ft)		312	84		64			
Turn Bay Length (ft)								
Base Capacity (vph)			2428			2632		

Lanes, Volumes, Timings
 82: NC 86 SB & NC 54 WB Off-Ramp LT

8/8/2014

	↖	↑	↓	↙	↘			
Lane Group	NBL	NBT	SBT	SBR	SEL	SER	ø2	ø3
Starvation Cap Reductn			0			0		
Spillback Cap Reductn			0			0		
Storage Cap Reductn			0			0		
Reduced v/c Ratio			0.25			0.12		

Intersection Summary







Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 69 (49%), Referenced to phase 2:SET, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.86
 Intersection Signal Delay: 6.1 Intersection LOS: A
 Intersection Capacity Utilization 24.3% 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

#8 #81	#8	#8 #82
↙ ↘ ø2	↑ ø3	↑ ↓ ø4
24 s	14 s	102 s

Lanes, Volumes, Timings
 91: NC 86 NB & NC 54 EB Off Ramp LT

8/8/2014

								
Lane Group	NBL	NBT	SBT	SBR	NEL	NER	ø2	ø3
Lane Configurations		↑↑			↑↑			
Volume (vph)	0	1128	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	1226	0	0	567	0		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	1226	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	47.0	0.0	79.0	14.0
Total Split (%)	0.0%	0.0%	0.0%	0.0%	33.6%	0.0%	56%	10%
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
Recall Mode					None		C-Min	None
Act Effct Green (s)		140.0			35.3			
Actuated g/C Ratio		1.00			0.25			
v/c Ratio		0.35			0.69			
Control Delay		0.2			51.3			
Queue Delay		0.0			0.3			
Total Delay		0.2			51.6			
LOS		A			D			
Approach Delay		0.2			51.6			
Approach LOS		A			D			
Queue Length 50th (ft)		0			243			
Queue Length 95th (ft)		0			267			
Internal Link Dist (ft)		68	255		178			
Turn Bay Length (ft)								
Base Capacity (vph)		3505			982			

Lanes, Volumes, Timings
 91: NC 86 NB & NC 54 EB Off Ramp LT

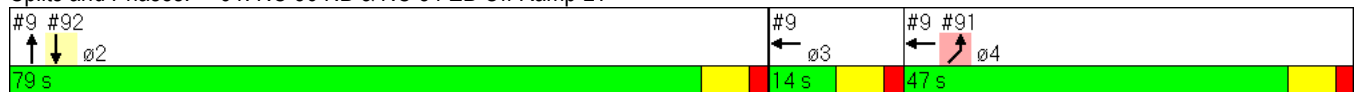
8/8/2014

Lane Group	NBL	NBT	SBT	SBR	NEL	NER	ø2	ø3
Starvation Cap Reductn		0			0			
Spillback Cap Reductn		139			91			
Storage Cap Reductn		0			0			
Reduced v/c Ratio		0.36			0.64			

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: 0.69
 Intersection Signal Delay: 16.5
 Intersection LOS: B
 Intersection Capacity Utilization 75.1%
 ICU Level of Service D
 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

8/8/2014

	↑	↖	↗	↓	↙	↘	ø3	ø4
Lane Group	NBT	NBR	SBL	SBT	SWL	SWR		
Lane Configurations				↑	↖↗			
Volume (vph)	0	0	0	313	803	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	368	892	0		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	0	0	368	892	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	79.0	0.0	0.0	14.0	47.0
Total Split (%)	0.0%	0.0%	0.0%	56.4%	0.0%	0.0%	10%	34%
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	
Recall Mode				C-Min			None	None
Act Effct Green (s)				71.5	140.0			
Actuated g/C Ratio				0.51	1.00			
v/c Ratio				0.41	0.27			
Control Delay				22.4	0.8			
Queue Delay				0.0	0.0			
Total Delay				22.4	0.8			
LOS				C	A			
Approach Delay				22.4	0.8			
Approach LOS				C	A			
Queue Length 50th (ft)				196	12			
Queue Length 95th (ft)				251	3			
Internal Link Dist (ft)	32			177	37			
Turn Bay Length (ft)								
Base Capacity (vph)				939	3273			

Lanes, Volumes, Timings
 92: NC 86 SB & NC 54 EB Off Ramp RT

8/8/2014

	↑	↗	↘	↓	↙	↖		
Lane Group	NBT	NBR	SBL	SBT	SWL	SWR	ø3	ø4
Starvation Cap Reductn				0	0			
Spillback Cap Reductn				0	0			
Storage Cap Reductn				0	0			
Reduced v/c Ratio				0.39	0.27			

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: 0.69
 Intersection Signal Delay: 7.1 Intersection LOS: A
 Intersection Capacity Utilization 61.7% 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

#9 #92 ↑ ↓ ø2	#9 ← ø3	#9 #91 ← ↗ ø4
79 s	14 s	47 s

Lanes, Volumes, Timings
8: NC 86 NB & NC 86 SB

8/8/2014

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↑↑						↑↑				
Volume (vph)	0	455	0	0	0	0	0	377	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	542	0	0	0	0	0	414	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	542	0	0	0	0	0	414	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	78.0	0.0	0.0	0.0	0.0	0.0	42.0	0.0	0.0	0.0	0.0
Total Split (%)	0.0%	65.0%	0.0%	0.0%	0.0%	0.0%	0.0%	35.0%	0.0%	0.0%	0.0%	0.0%
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?												
Recall Mode								C-Min				
Act Effct Green (s)		68.3						41.7				
Actuated g/C Ratio		0.57						0.35				
v/c Ratio		0.47						0.35				
Control Delay		8.1						31.4				
Queue Delay		0.0						0.0				
Total Delay		8.1						31.4				
LOS		A						C				
Approach Delay		8.1						31.4				
Approach LOS		A						C				
Queue Length 50th (ft)		113						129				
Queue Length 95th (ft)		113						182				
Internal Link Dist (ft)		94			58			51			64	
Turn Bay Length (ft)												
Base Capacity (vph)		1491						1177				

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	64.0
Total Split (%)	12%	53%
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	
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)		
Turn Bay Length (ft)		
Base Capacity (vph)		

Lanes, Volumes, Timings
 8: NC 86 NB & NC 86 SB

8/8/2014

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Starvation Cap Reductn		0						0				
Spillback Cap Reductn		0						0				
Storage Cap Reductn		0						0				
Reduced v/c Ratio		0.36						0.35				

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 64 (53%), Referenced to phase 2:SET, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.65
 Intersection Signal Delay: 18.2 Intersection LOS: B
 Intersection Capacity Utilization 31.3% ICU Level of Service A
 Analysis Period (min) 15
 * User Entered Value













Splits and Phases: 8: NC 86 NB & NC 86 SB

#8 #81	#8	#8 #82
#2	#3	#4 #4
42 s	14 s	64 s

Lane Group	ø3	ø4
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

Lanes, Volumes, Timings
9: NC 86 SB & NC 86 NB

8/8/2014

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑			↑↑				
Volume (vph)	0	0	0	0	950	0	0	511	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	1011	0	0	538	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1011	0	0	538	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	73.0	0.0	0.0	47.0	0.0	0.0	0.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	0.0%	60.8%	0.0%	0.0%	39.2%	0.0%	0.0%	0.0%	0.0%
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?												
Recall Mode								C-Min				
Act Effct Green (s)					49.5			60.5				
Actuated g/C Ratio					0.41			0.50				
v/c Ratio					0.70			0.31				
Control Delay					19.9			21.0				
Queue Delay					0.0			0.0				
Total Delay					19.9			21.0				
LOS					B			C				
Approach Delay					19.9			21.0				
Approach LOS					B			C				
Queue Length 50th (ft)					321			172				
Queue Length 95th (ft)					375			230				
Internal Link Dist (ft)		37			95			25			68	
Turn Bay Length (ft)												
Base Capacity (vph)					2529			1749				

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	59.0
Total Split (%)	12%	49%
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	
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)		
Turn Bay Length (ft)		
Base Capacity (vph)		

Lanes, Volumes, Timings
 9: NC 86 SB & NC 86 NB

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn					0			0				
Spillback Cap Reductn					0			0				
Storage Cap Reductn					0			0				
Reduced v/c Ratio					0.40			0.31				

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:	0.70
Intersection Signal Delay:	20.3
Intersection LOS:	C
Intersection Capacity Utilization	48.7%
ICU Level of Service	A
Analysis Period (min)	15

Splits and Phases: 9: NC 86 SB & NC 86 NB

#9 #92 ø2	#9 ø3	#9 #91 ø4
47 s	14 s	59 s

Lane Group	ø3	ø4
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

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

8/8/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations	↖	↗	↖	↖	↗	↖	↖	↗	↖	↖	↗	↖
Volume (vph)	71	33	30	12	25	280	18	844	13	301	839	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					
Frnt			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	0.525			0.732			0.268			0.210		
Satd. Flow (perm)	944	1800	1530	1378	1882	1600	489	3472	1553	373	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	34	13	27	308	19	898	14	324	902	110
Shared Lane Traffic (%)												
Lane Group Flow (vph)	81	38	34	13	27	308	19	898	14	324	902	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%
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		
Recall Mode	None	None	None	None	None		C-Max	C-Max	C-Max	None	C-Max	
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	0.09	0.60	0.02	0.58	0.38	0.09
Control Delay	41.3	37.3	37.5	49.2	49.8	26.5	11.7	18.1	10.4	18.5	1.9	0.7
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	41.3	37.3	37.5	49.2	49.8	26.5	11.7	18.1	10.4	18.5	1.9	0.7
LOS	D	D	D	D	D	C	B	B	B	B	A	A
Approach Delay		39.5			29.2			17.8				5.8

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

8/8/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR	
Approach LOS		D				C				B			A
Queue Length 50th (ft)	52	24	21	9	19	149	5	182	4	98	25	3	
Queue Length 95th (ft)	92	51	48	29	48	207	15	210	12	157	34	6	
Internal Link Dist (ft)		446				463				453			470
Turn Bay Length (ft)			75	425		350	125		75	550		250	
Base Capacity (vph)	262	480	408	207	282	600	212	1503	672	556	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	0.09	0.60	0.02	0.58	0.38	0.09	

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 39 (33%), Referenced to phase 2:NETL and 6:SWTL, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.60
 Intersection Signal Delay: 14.7
 Intersection LOS: B
 Intersection Capacity Utilization 63.1%
 ICU Level of Service B
 Analysis Period (min) 15

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

ø2	ø1	ø4
51 s	32 s	37 s
ø6	ø7	ø8
83 s	14 s	23 s

Lanes, Volumes, Timings
 81: NC 86 NB & NC 54 WB Off Ramp RT

8/8/2014

							ø3	ø4
Lane Group	NBL	NBR	SEL	SER	SWL	SWR		
Lane Configurations								
Volume (vph)	455	0	0	0	0	70		
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)	542	0	0	0	0	72		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	542	0	0	0	0	72		
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	42.0	14.0	64.0
Total Split (%)	0.0%	0.0%	0.0%	0.0%	0.0%	35.0%	12%	53%
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	
Recall Mode						C-Min	None	None
Act Effct Green (s)	120.0					41.7		
Actuated g/C Ratio	1.00					0.35		
v/c Ratio	0.28					0.13		
Control Delay	1.6					29.9		
Queue Delay	0.0					0.0		
Total Delay	1.6					29.9		
LOS	A					C		
Approach Delay	1.6							
Approach LOS	A							
Queue Length 50th (ft)	41					39		
Queue Length 95th (ft)	4					79		
Internal Link Dist (ft)	58		52		230			
Turn Bay Length (ft)								
Base Capacity (vph)	1905					551		

Lanes, Volumes, Timings
 81: NC 86 NB & NC 54 WB Off Ramp RT

8/8/2014



Lane Group	NBL	NBR	SEL	SER	SWL	SWR	ø3	ø4
Starvation Cap Reductn	0					0		
Spillback Cap Reductn	0					0		
Storage Cap Reductn	0					0		
Reduced v/c Ratio	0.28					0.13		

Intersection Summary







Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 64 (53%), Referenced to phase 2:SET, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.65
 Intersection Signal Delay: 5.0
 Intersection LOS: A
 Intersection Capacity Utilization 31.3%
 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

#8 #81	#8	#8 #82
 ø2	 ø3	 ø4
42 s	14 s	64 s

Lanes, Volumes, Timings
82: NC 86 SB & NC 54 WB Off Ramp LT

8/8/2014

							ø2	ø3
Lane Group	NBL	NBT	SBT	SBR	SEL	SER		
Lane Configurations			↑↑			↑↑		
Volume (vph)	0	0	697	0	0	377		
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	719	0	0	414		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	0	719	0	0	414		
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	64.0	0.0	0.0	0.0	42.0	14.0
Total Split (%)	0.0%	0.0%	53.3%	0.0%	0.0%	0.0%	35%	12%
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
Recall Mode			None				C-Min	None
Act Effct Green (s)			38.1			120.0		
Actuated g/C Ratio			0.32			1.00		
v/c Ratio			0.65			0.16		
Control Delay			37.5			1.5		
Queue Delay			0.0			0.0		
Total Delay			37.5			1.5		
LOS			D			A		
Approach Delay			37.5					
Approach LOS			D					
Queue Length 50th (ft)			252			21		
Queue Length 95th (ft)			276			32		
Internal Link Dist (ft)		312	84		64			
Turn Bay Length (ft)								
Base Capacity (vph)			1707			2656		

Lanes, Volumes, Timings
 82: NC 86 SB & NC 54 WB Off Ramp LT

8/8/2014

	↖	↑	↓	↙	↘			
Lane Group	NBL	NBT	SBT	SBR	SEL	SER	ø2	ø3
Starvation Cap Reductn			0			0		
Spillback Cap Reductn			0			0		
Storage Cap Reductn			0			0		
Reduced v/c Ratio			0.42			0.16		

Intersection Summary







Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 64 (53%), Referenced to phase 2:SET, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.65
 Intersection Signal Delay: 24.3 Intersection LOS: C
 Intersection Capacity Utilization 28.6% 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

#8 #81 ↙ ↘ ø2	#8 ↑ ø3	#8 #82 ↑ ↓ ø4
42 s	14 s	64 s

Lanes, Volumes, Timings
 91: NC 86 NB & NC 54 EB Off Ramp LT

8/8/2014

								
Lane Group	NBL	NBT	SBT	SBR	NEL	NER	ø2	ø3
Lane Configurations		↑↑			↑↑			
Volume (vph)	0	511	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	538	0	0	143	0		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	538	0	0	143	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	59.0	0.0	47.0	14.0
Total Split (%)	0.0%	0.0%	0.0%	0.0%	49.2%	0.0%	39%	12%
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
Recall Mode					None		C-Min	None
Act Effct Green (s)		120.0			16.9			
Actuated g/C Ratio		1.00			0.14			
v/c Ratio		0.15			0.31			
Control Delay		0.1			46.3			
Queue Delay		0.0			0.0			
Total Delay		0.1			46.3			
LOS		A			D			
Approach Delay		0.1			46.3			
Approach LOS		A			D			
Queue Length 50th (ft)		1			53			
Queue Length 95th (ft)		0			73			
Internal Link Dist (ft)		68	255		178			
Turn Bay Length (ft)								
Base Capacity (vph)		3471			1473			

Lanes, Volumes, Timings

91: NC 86 NB & NC 54 EB Off Ramp LT

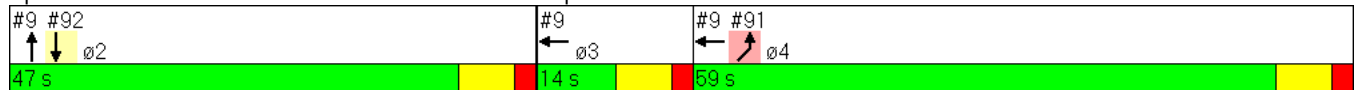
8/8/2014

							ø2	ø3
Lane Group	NBL	NBT	SBT	SBR	NEL	NER		
Starvation Cap Reductn		0			0			
Spillback Cap Reductn		0			0			
Storage Cap Reductn		0			0			
Reduced v/c Ratio		0.15			0.10			

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: 0.70
 Intersection Signal Delay: 9.8
 Intersection LOS: A
 Intersection Capacity Utilization 40.2%
 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

8/8/2014

	↑	↖	↙	↓	↘	↗	ø3	ø4
Lane Group	NBT	NBR	SBL	SBT	SWL	SWR		
Lane Configurations				↑	↖↗			
Volume (vph)	0	0	0	139	950	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	149	1011	0		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	0	0	149	1011	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	47.0	0.0	0.0	14.0	59.0
Total Split (%)	0.0%	0.0%	0.0%	39.2%	0.0%	0.0%	12%	49%
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	
Recall Mode				C-Min			None	None
Act Effct Green (s)				60.5	120.0			
Actuated g/C Ratio				0.50	1.00			
v/c Ratio				0.17	0.30			
Control Delay				17.2	0.5			
Queue Delay				0.0	0.0			
Total Delay				17.2	0.5			
LOS				B	A			
Approach Delay				17.2	0.5			
Approach LOS				B	A			
Queue Length 50th (ft)				59	7			
Queue Length 95th (ft)				109	0			
Internal Link Dist (ft)	32			177	37			
Turn Bay Length (ft)								
Base Capacity (vph)				895	3400			

Lanes, Volumes, Timings
 92: NC 86 SB & NC 54 EB Off Ramp RT

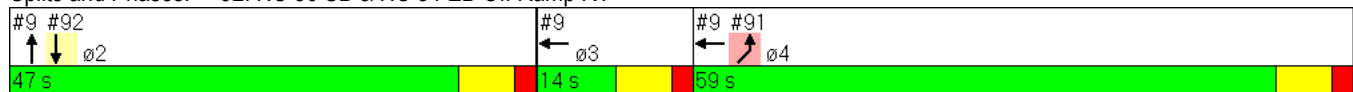
8/8/2014

	↑	↖	↙	↓	↘	↗		
Lane Group	NBT	NBR	SBL	SBT	SWL	SWR	ø3	ø4
Starvation Cap Reductn				0	0			
Spillback Cap Reductn				0	0			
Storage Cap Reductn				0	0			
Reduced v/c Ratio				0.17	0.30			

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: 0.70
 Intersection Signal Delay: 2.7 Intersection LOS: A
 Intersection Capacity Utilization 48.7% ICU Level of Service A
 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
8: NC 86 NB & NC 86 SB

8/8/2014

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↑↑						↑↑				
Volume (vph)	0	489	0	0	0	0	0	913	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	556	0	0	0	0	0	1003	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	556	0	0	0	0	0	1003	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	80.0	0.0	0.0	0.0	0.0	0.0	60.0	0.0	0.0	0.0	0.0
Total Split (%)	0.0%	57.1%	0.0%	0.0%	0.0%	0.0%	0.0%	42.9%	0.0%	0.0%	0.0%	0.0%
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?												
Recall Mode								C-Min				
Act Effct Green (s)		77.6						52.4				
Actuated g/C Ratio		0.55						0.37				
v/c Ratio		0.49						0.77				
Control Delay		8.9						43.1				
Queue Delay		0.0						0.0				
Total Delay		8.9						43.1				
LOS		A						D				
Approach Delay		8.9						43.1				
Approach LOS		A						D				
Queue Length 50th (ft)		68						423				
Queue Length 95th (ft)		81						490				
Internal Link Dist (ft)		94			58			51			64	
Turn Bay Length (ft)												
Base Capacity (vph)		1175						1364				

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	66.0
Total Split (%)	10%	47%
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	
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)		
Turn Bay Length (ft)		
Base Capacity (vph)		

Lanes, Volumes, Timings
 8: NC 86 NB & NC 86 SB

8/8/2014

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Starvation Cap Reductn		0						0				
Spillback Cap Reductn		0						0				
Storage Cap Reductn		0						0				
Reduced v/c Ratio		0.47						0.74				

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 93 (66%), Referenced to phase 2:SET, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 30.9
 Intersection LOS: C
 Intersection Capacity Utilization 47.1%
 ICU Level of Service A
 Analysis Period (min) 15
 * User Entered Value













Splits and Phases: 8: NC 86 NB & NC 86 SB

#8 #81 #2	#8 #3	#8 #82 #4
60 s	14 s	66 s

Lane Group	ø3	ø4
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

Lanes, Volumes, Timings
9: NC 86 SB & NC 86 NB

8/8/2014

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑			↑↑				
Volume (vph)	0	0	0	0	1863	0	0	713	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	2025	0	0	801	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	2025	0	0	801	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	94.0	0.0	0.0	46.0	0.0	0.0	0.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	0.0%	67.1%	0.0%	0.0%	32.9%	0.0%	0.0%	0.0%	0.0%
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?												
Recall Mode								C-Min				
Act Effct Green (s)					87.5			42.5				
Actuated g/C Ratio					0.62			0.30				
v/c Ratio					0.92			0.76				
Control Delay					28.9			33.5				
Queue Delay					0.0			0.0				
Total Delay					28.9			33.5				
LOS					C			C				
Approach Delay					28.9			33.5				
Approach LOS					C			C				
Queue Length 50th (ft)					808			327				
Queue Length 95th (ft)					921			408				
Internal Link Dist (ft)		37			95			25			68	
Turn Bay Length (ft)												
Base Capacity (vph)					2289			1055				

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	80.0
Total Split (%)	10%	57%
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	
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)		
Turn Bay Length (ft)		
Base Capacity (vph)		

Lanes, Volumes, Timings
 9: NC 86 SB & NC 86 NB

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn					0			0				
Spillback Cap Reductn					0			0				
Storage Cap Reductn					0			0				
Reduced v/c Ratio					0.88			0.76				

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:	80
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.92
Intersection Signal Delay:	30.2
Intersection LOS:	C
Intersection Capacity Utilization:	79.5%
ICU Level of Service:	D
Analysis Period (min):	15

Splits and Phases: 9: NC 86 SB & NC 86 NB

#9 #92 ø2	#9 ø3	#9 #91 ø4
46 s	14 s	80 s

Lane Group	ø3	ø4
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

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

8/8/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations	↘	↑	↗		↖	↗	↘	↗	↗	↘	↗	↗
Volume (vph)	130	96	61	12	75	320	60	1024	31	521	1391	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					
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950				0.993		0.950			0.950		
Satd. Flow (prot)	1726	1817	1544	0	1905	2870	1753	3506	1568	1752	3504	1567
Flt Permitted	0.601				0.808		0.171			0.088		
Satd. Flow (perm)	1092	1817	1523	0	1550	2870	315	3506	1568	162	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	70	13	84	360	65	1101	33	566	1512	255
Shared Lane Traffic (%)												
Lane Group Flow (vph)	149	110	70	0	97	360	65	1101	33	566	1512	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	67.0	59.0	59.0	59.0	50.0	109.0	123.0
Total Split (%)	10.0%	22.1%	22.1%	12.1%	12.1%	47.9%	42.1%	42.1%	42.1%	35.7%	77.9%	87.9%
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		
Recall Mode	None	None	None	None	None		C-Max	C-Max	C-Max	None	C-Max	
Act Effct Green (s)	26.0	26.0	26.0		12.0	54.7	56.3	56.3	56.3	104.0	104.0	118.2
Actuated g/C Ratio	0.19	0.19	0.19		0.09	0.39	0.40	0.40	0.40	0.74	0.74	0.84
v/c Ratio	0.61	0.33	0.25		0.73	0.32	0.51	0.78	0.05	0.94	0.58	0.19
Control Delay	65.6	52.6	51.4		92.0	20.1	39.0	34.3	17.2	65.4	5.7	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
Total Delay	65.6	52.6	51.4		92.0	20.1	39.0	34.3	17.2	65.4	5.7	2.1
LOS	E	D	D		F	C	D	C	B	E	A	A
Approach Delay		58.2			35.4			34.1			19.8	

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

8/8/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Approach LOS	E			D			C			B		
Queue Length 50th (ft)	122	88	55		88	94	45	498	16	363	144	25
Queue Length 95th (ft)	187	142	100		#175	125	107	583	32	#634	216	56
Internal Link Dist (ft)		446			463			453			470	
Turn Bay Length (ft)			75			350	125		75	550		250
Base Capacity (vph)	244	337	283		133	1169	127	1409	630	631	2603	1323
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	0.61	0.33	0.25		0.73	0.31	0.51	0.78	0.05	0.90	0.58	0.19

Intersection Summary









Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 88 (63%), Referenced to phase 2:NETL and 6:SWTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.94
 Intersection Signal Delay: 28.3
 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.

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

ø1	ø2	ø4
50 s	59 s	31 s
ø6		ø8
109 s		17 s
		ø7
		14 s

Lanes, Volumes, Timings
 81: NC 86 NB & NC 54 WB Off Ramp RT

8/8/2014

							ø3	ø4
Lane Group	NBL	NBR	SEL	SER	SWL	SWR		
Lane Configurations								
Volume (vph)	489	0	0	0	0	47		
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)	556	0	0	0	0	49		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	556	0	0	0	0	49		
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	60.0	14.0	66.0
Total Split (%)	0.0%	0.0%	0.0%	0.0%	0.0%	42.9%	10%	47%
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	
Recall Mode						C-Min	None	None
Act Effct Green (s)	140.0					52.4		
Actuated g/C Ratio	1.00					0.37		
v/c Ratio	0.29					0.08		
Control Delay	0.6					28.0		
Queue Delay	0.0					0.0		
Total Delay	0.6					28.0		
LOS	A					C		
Approach Delay	0.6							
Approach LOS	A							
Queue Length 50th (ft)	0					29		
Queue Length 95th (ft)	0					56		
Internal Link Dist (ft)	58		52		230			
Turn Bay Length (ft)								
Base Capacity (vph)	1939					633		

Lanes, Volumes, Timings
 81: NC 86 NB & NC 54 WB Off Ramp RT

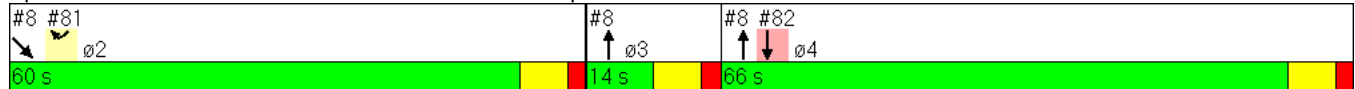
8/8/2014

							ø3	ø4
Lane Group	NBL	NBR	SEL	SER	SWL	SWR		
Starvation Cap Reductn	0					0		
Spillback Cap Reductn	0					0		
Storage Cap Reductn	0					0		
Reduced v/c Ratio	0.29					0.08		

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 93 (66%), Referenced to phase 2:SET, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 2.8 Intersection LOS: A
 Intersection Capacity Utilization 47.1% 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

8/8/2014

Lane Group	NBL	NBT	SBT	SBR	SEL	SER	ø2	ø3
Lane Configurations			↑↑			↑↑		
Volume (vph)	0	0	1091	0	0	913		
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	3539	0	0	2733		
Flt 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	1148	0	0	1003		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	0	1148	0	0	1003		
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	66.0	0.0	0.0	0.0	60.0	14.0
Total Split (%)	0.0%	0.0%	47.1%	0.0%	0.0%	0.0%	43%	10%
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
Recall Mode			None				C-Min	None
Act Effct Green (s)			58.0			140.0		
Actuated g/C Ratio			0.41			1.00		
v/c Ratio			0.78			0.37		
Control Delay			39.7			5.2		
Queue Delay			0.0			0.0		
Total Delay			39.7			5.2		
LOS			D			A		
Approach Delay			39.7					
Approach LOS			D					
Queue Length 50th (ft)			455			127		
Queue Length 95th (ft)			540			172		
Internal Link Dist (ft)		312	84		64			
Turn Bay Length (ft)								
Base Capacity (vph)			1542			2733		

Lanes, Volumes, Timings
 82: NC 86 SB & NC 54 WB Off-Ramp LT

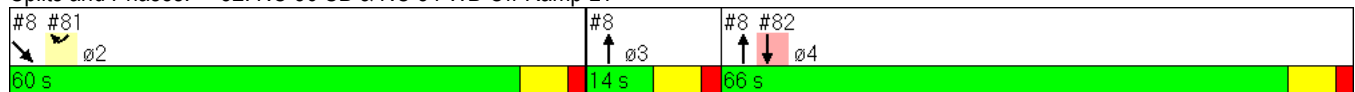
8/8/2014

	↖	↑	↓	↙	↘		
Lane Group	NBL	NBT	SBT	SBR	SEL	SER	ø2 ø3
Starvation Cap Reductn			0			0	
Spillback Cap Reductn			0			0	
Storage Cap Reductn			0			0	
Reduced v/c Ratio			0.74			0.37	

Intersection Summary







Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 93 (66%), Referenced to phase 2:SET, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 23.6 Intersection LOS: C
 Intersection Capacity Utilization 39.8% 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
 91: NC 86 NB & NC 54 EB Off Ramp LT







8/8/2014

								
Lane Group	NBL	NBT	SBT	SBR	NEL	NER	ø2	ø3
Lane Configurations		↑↑			↑↑			
Volume (vph)	0	713	0	0	176	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	801	0	0	205	0		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	801	0	0	205	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	80.0	0.0	46.0	14.0
Total Split (%)	0.0%	0.0%	0.0%	0.0%	57.1%	0.0%	33%	10%
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
Recall Mode					None		C-Min	None
Act Effct Green (s)		140.0			71.9			
Actuated g/C Ratio		1.00			0.51			
v/c Ratio		0.23			0.12			
Control Delay		0.1			17.3			
Queue Delay		0.0			0.0			
Total Delay		0.1			17.3			
LOS		A			B			
Approach Delay		0.1			17.3			
Approach LOS		A			B			
Queue Length 50th (ft)		0			46			
Queue Length 95th (ft)		0			64			
Internal Link Dist (ft)		68	255		178			
Turn Bay Length (ft)								
Base Capacity (vph)		3471			1737			

Lanes, Volumes, Timings

91: NC 86 NB & NC 54 EB Off Ramp LT






8/8/2014

								
Lane Group	NBL	NBT	SBT	SBR	NEL	NER	ø2	ø3
Starvation Cap Reductn		0			0			
Spillback Cap Reductn		0			0			
Storage Cap Reductn		0			0			
Reduced v/c Ratio		0.23			0.12			

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: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.92
 Intersection Signal Delay: 3.6
 Intersection LOS: A
 Intersection Capacity Utilization 54.8%
 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

#9 #92   ø2	#9  ø3	#9 #91   ø4
46 s	14 s	80 s

Lanes, Volumes, Timings
 92: NC 86 SB & NC 54 EB Off Ramp RT

8/8/2014

	↑	↖	↙	↓	↘	↗	ø3	ø4
Lane Group	NBT	NBR	SBL	SBT	SWL	SWR		
Lane Configurations				↑	↖↗			
Volume (vph)	0	0	0	284	1863	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	330	2025	0		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	0	0	0	330	2025	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	80.0
Total Split (%)	0.0%	0.0%	0.0%	32.9%	0.0%	0.0%	10%	57%
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	
Recall Mode				C-Min			None	None
Act Effct Green (s)				42.5	140.0			
Actuated g/C Ratio				0.30	1.00			
v/c Ratio				0.62	0.59			
Control Delay				48.3	1.6			
Queue Delay				0.0	0.0			
Total Delay				48.3	1.6			
LOS				D	A			
Approach Delay				48.3	1.6			
Approach LOS				D	A			
Queue Length 50th (ft)				262	22			
Queue Length 95th (ft)				351	0			
Internal Link Dist (ft)	32			177	37			
Turn Bay Length (ft)								
Base Capacity (vph)				534	3433			

Lanes, Volumes, Timings
 92: NC 86 SB & NC 54 EB Off Ramp RT

8/8/2014

	↑	↗	↘	↓	↙	↖		
Lane Group	NBT	NBR	SBL	SBT	SWL	SWR	ø3	ø4
Starvation Cap Reductn				0	0			
Spillback Cap Reductn				0	0			
Storage Cap Reductn				0	0			
Reduced v/c Ratio				0.62	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: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.92
 Intersection Signal Delay: 8.1
 Intersection LOS: A
 Intersection Capacity Utilization 79.5%
 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

#9 #92 ↑ ↓ ø2	#9 ← ø3	#9 #91 ← ↗ ø4
46 s	14 s	80 s

**2022 With Site Mitigated
Alternative 2 - NC 54 WB Loop Off-Ramp**

Lanes, Volumes, Timings
8: NC 54 WB Ramps & NC 86 (S. Columbia St)

8/8/2014

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	547	333	1324	290	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			0.545			
Satd. Flow (perm)	0	1596	1005	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	595	383	1522	319	167
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	595	383	1522	319	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	26.0	140.0	114.0	114.0
Total Split (%)	0.0%	0.0%	18.6%	100.0%	81.4%	81.4%
Maximum Green (s)			19.0	133.0	107.0	107.0
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		0.37	0.38	0.63	0.21	0.13
Control Delay		0.7	0.9	2.9	1.9	1.7
Queue Delay		0.0	0.0	0.0	0.0	0.0
Total Delay		0.7	0.9	2.9	1.9	1.7
LOS		A	A	A	A	A
Approach Delay				2.5	1.8	
Approach LOS				A	A	
Queue Length 50th (ft)		0	0	60	35	17
Queue Length 95th (ft)		0	0	37	50	27
Internal Link Dist (ft)	92			14	110	

Lanes, Volumes, Timings
 8: NC 54 WB Ramps & NC 86 (S. Columbia St)

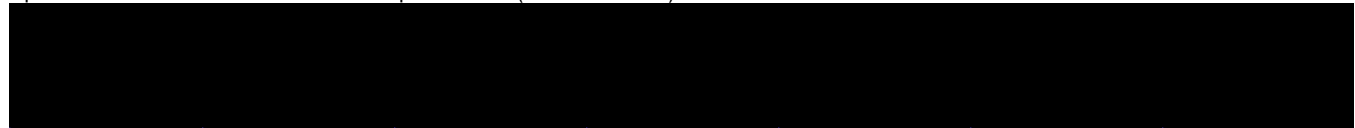
8/8/2014

	↗	↘	↖	↑	↓	↙
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Turn Bay Length (ft)						
Base Capacity (vph)		1596	1081	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		0.37	0.35	0.63	0.21	0.13

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 123 (88%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
 Natural Cycle: 40
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.63
 Intersection Signal Delay: 2.0
 Intersection Capacity Utilization 42.0%
 Analysis Period (min) 15
 * User Entered Value

Splits and Phases: 8: NC 54 WB Ramps & NC 86 (S. Columbia St)



Lanes, Volumes, Timings

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

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	482	0	313	0	0	0	0	1128	0	55	803	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								0.127		
Satd. Flow (perm)	1603	1603	1509	0	0	0	0	3505	0	225	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	368	0	0	0	0	1226	0	61	892	0
Shared Lane Traffic (%)	50%											
Lane Group Flow (vph)	283	284	368	0	0	0	0	1226	0	61	892	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)	56.0	56.0	56.0	0.0	0.0	0.0	0.0	71.0	0.0	13.0	84.0	0.0
Total Split (%)	40.0%	40.0%	40.0%	0.0%	0.0%	0.0%	0.0%	50.7%	0.0%	9.3%	60.0%	0.0%
Maximum Green (s)	49.8	49.8	49.8					66.3		7.5	78.1	
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)	42.5	42.5	42.5					77.0		87.5	87.5	
Actuated g/C Ratio	0.30	0.30	0.30					0.55		0.62	0.62	
v/c Ratio	0.58	0.58	0.80					0.64		0.27	0.42	
Control Delay	45.2	45.3	57.9					20.0		14.6	14.6	
Queue Delay	0.0	0.0	0.0					0.0		0.0	0.0	
Total Delay	45.2	45.3	57.9					20.0		14.6	14.6	
LOS	D	D	E					B		B	B	

Lanes, Volumes, Timings

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

8/8/2014

	↖	→	↘	↙	←	↖	↙	↑	↖	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		50.2						20.0			14.6	
Approach LOS		D						B			B	
Queue Length 50th (ft)	226	227	305					270		20	212	
Queue Length 95th (ft)	282	283	368					m491		47	296	
Internal Link Dist (ft)		767			62			76			516	
Turn Bay Length (ft)	250		250							150		
Base Capacity (vph)	584	584	550					1927		226	2108	
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	0.49	0.67					0.64		0.27	0.42	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 12 (9%), Referenced to phase 2:NBT and 6:SBTL, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 27.4

Intersection LOS: C

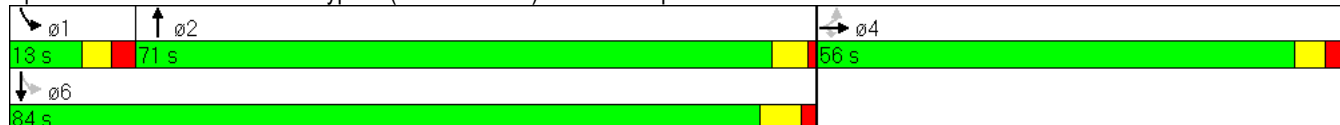
Intersection Capacity Utilization 62.9%

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) & NC 86 NB

8/8/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations	↖	↑	↗		↖	↗	↖	↗	↗	↖	↗	↗
Volume (vph)	229	64	63	15	129	595	64	1524	11	260	835	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							1.00					
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950				0.995		0.950			0.950		
Satd. Flow (prot)	1743	1835	1560	0	1909	2870	1770	3540	1584	1702	3404	1523
Flt Permitted	0.453				0.961		0.332			0.053		
Satd. Flow (perm)	831	1835	1560	0	1844	2870	617	3540	1584	95	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	71	16	142	654	68	1621	12	265	852	126
Shared Lane Traffic (%)												
Lane Group Flow (vph)	257	72	71	0	158	654	68	1621	12	265	852	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	39.0	39.0	22.0	22.0	46.0	77.0	77.0	77.0	24.0	101.0	118.0
Total Split (%)	12.1%	27.9%	27.9%	15.7%	15.7%	32.9%	55.0%	55.0%	55.0%	17.1%	72.1%	84.3%
Maximum Green (s)	10.6	32.6	32.6	15.1	15.1		70.8	70.8	70.8	18.9	94.8	
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)	34.0	34.0	34.0		17.0	35.8	72.2	72.2	72.2	96.0	96.0	113.2
Actuated g/C Ratio	0.24	0.24	0.24		0.12	0.26	0.52	0.52	0.52	0.69	0.69	0.81
v/c Ratio	0.92	0.16	0.19		0.71	0.89	0.21	0.89	0.01	0.95	0.37	0.10

Lanes, Volumes, Timings
 10: SR 1994 (Culbreth Road) & NC 86 NB

8/8/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Control Delay	91.0	43.0	43.7		76.7	54.1	10.4	21.1	9.0	88.6	7.3	1.9
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	91.0	43.0	43.7		76.7	54.1	10.4	21.1	9.0	88.6	7.3	1.9
LOS	F	D	D		E	D	B	C	A	F	A	A
Approach Delay		74.0			58.5			20.6			24.1	
Approach LOS		E			E			C			C	
Queue Length 50th (ft)	209	52	52		140	253	11	325	2	207	140	11
Queue Length 95th (ft)	#380	95	94		#236	#351	m27	412	m5	#367	128	m17
Internal Link Dist (ft)		446			463			453			555	
Turn Bay Length (ft)			75			350	125		75	550		250
Base Capacity (vph)	280	446	379		224	738	318	1827	818	283	2334	1231
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	0.92	0.16	0.19		0.71	0.89	0.21	0.89	0.01	0.94	0.37	0.10

Intersection Summary












Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 2 (1%), Referenced to phase 2:NETL and 6:SWTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.95
 Intersection Signal Delay: 34.2
 Intersection LOS: C
 Intersection Capacity Utilization 93.5%
 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: 10: SR 1994 (Culbreth Road) & NC 86 NB



Lanes, Volumes, Timings
8: NC 54 WB Ramps & NC 86 (S. Columbia St)

8/8/2014

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	697	204	520	377	174
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	*0.57	1.00	1.00
Frt		0.865				0.850
Flt Protected			0.950			
Satd. Flow (prot)	0	1580	1671	2006	1776	1509
Flt Permitted			0.492			
Satd. Flow (perm)	0	1580	866	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	719	243	619	414	191
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	719	243	619	414	191
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	36.0	120.0	84.0	84.0
Total Split (%)	0.0%	0.0%	30.0%	100.0%	70.0%	70.0%
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
Recall Mode			None	C-Max	C-Max	C-Max
Act Effct Green (s)		120.0	115.0	120.0	101.0	101.0
Actuated g/C Ratio		1.00	0.96	1.00	0.84	0.84
v/c Ratio		0.46	0.27	0.31	0.28	0.15
Control Delay		0.9	0.9	0.6	2.5	2.0
Queue Delay		0.0	0.0	0.0	0.0	0.0
Total Delay		0.9	0.9	0.6	2.5	2.0
LOS		A	A	A	A	A
Approach Delay				0.7	2.3	
Approach LOS				A	A	
Queue Length 50th (ft)		0	0	0	49	20
Queue Length 95th (ft)		0	1	1	70	32
Internal Link Dist (ft)	92			14	110	
Turn Bay Length (ft)						
Base Capacity (vph)		1580	1038	2006	1495	1270

Lanes, Volumes, Timings
 8: NC 54 WB Ramps & NC 86 (S. Columbia St)

8/8/2014

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
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		0.46	0.23	0.31	0.28	0.15

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 35 (29%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
 Natural Cycle: 40
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.46
 Intersection Signal Delay: 1.2
 Intersection LOS: A
 Intersection Capacity Utilization 39.5%
 ICU Level of Service A
 Analysis Period (min) 15
 * User Entered Value

Splits and Phases: 8: NC 54 WB Ramps & NC 86 (S. Columbia St)



Lanes, Volumes, Timings

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

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	145	0	139	0	0	0	0	511	0	84	950	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								0.409		
Satd. Flow (perm)	1588	1588	1495	0	0	0	0	3471	0	754	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)	156	0	149	0	0	0	0	538	0	89	1011	0
Shared Lane Traffic (%)	50%											
Lane Group Flow (vph)	78	78	149	0	0	0	0	538	0	89	1011	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)	41.0	41.0	41.0	0.0	0.0	0.0	0.0	60.0	0.0	19.0	79.0	0.0
Total Split (%)	34.2%	34.2%	34.2%	0.0%	0.0%	0.0%	0.0%	50.0%	0.0%	15.8%	65.8%	0.0%
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?												
Recall Mode	None	None	None					C-Max		None	C-Max	
Act Effct Green (s)	18.7	18.7	18.7					78.3		91.3	91.3	
Actuated g/C Ratio	0.16	0.16	0.16					0.65		0.76	0.76	
v/c Ratio	0.32	0.32	0.64					0.24		0.14	0.38	
Control Delay	46.6	46.6	59.3					4.3		4.2	5.1	
Queue Delay	0.0	0.0	0.0					0.0		0.0	0.0	
Total Delay	46.6	46.6	59.3					4.3		4.2	5.1	
LOS	D	D	E					A		A	A	
Approach Delay		52.8						4.3			5.0	
Approach LOS		D						A			A	

Lanes, Volumes, Timings

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

8/8/2014

	↖	→	↘	↙	←	↖	↘	↑	↖	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)	56	56	110					36		11	101	
Queue Length 95th (ft)	100	100	168					63		33	192	
Internal Link Dist (ft)		767			62			76			516	
Turn Bay Length (ft)	250		250							150		
Base Capacity (vph)	476	476	449					2265		690	2668	
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	0.16	0.33					0.24		0.13	0.38	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 64 (53%), Referenced to phase 2:NBT and 6:SBTL, Start of Green

Natural Cycle: 45

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.64

Intersection Signal Delay: 12.3

Intersection LOS: B

Intersection Capacity Utilization 43.2%

ICU Level of Service A

Analysis Period (min) 15

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

↘ ø1	↑ ø2	↔ ø4
19 s	60 s	41 s
↓ ø6		
79 s		

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

8/8/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations	↖	↗	↖	↖	↗	↖	↖	↗	↖	↖	↗	↖
Volume (vph)	71	33	30	12	25	280	18	844	13	301	839	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't			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	0.525			0.732			0.268			0.210		
Satd. Flow (perm)	944	1800	1530	1378	1882	1600	489	3472	1553	373	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	34	13	27	308	19	898	14	324	902	110
Shared Lane Traffic (%)												
Lane Group Flow (vph)	81	38	34	13	27	308	19	898	14	324	902	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%
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		
Recall Mode	None	None	None	None	None		C-Max	C-Max	C-Max	None	C-Max	
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	0.09	0.60	0.02	0.58	0.38	0.09
Control Delay	41.3	37.3	37.5	49.2	49.8	26.5	12.1	18.5	10.7	25.8	6.1	1.8
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	41.3	37.3	37.5	49.2	49.8	26.5	12.1	18.5	10.7	25.8	6.1	1.8
LOS	D	D	D	D	D	C	B	B	B	C	A	A
Approach Delay		39.5			29.2			18.3				10.5

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

8/8/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Approach LOS	D			C			B			B		
Queue Length 50th (ft)	52	24	21	9	19	149	5	182	4	95	94	11
Queue Length 95th (ft)	92	51	48	29	48	207	16	211	12	177	112	19
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	212	1503	672	556	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	0.09	0.60	0.02	0.58	0.38	0.09

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 40 (33%), Referenced to phase 2:NETL and 6:SWTL, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.60
 Intersection Signal Delay: 17.1
 Intersection Capacity Utilization 63.1%
 Analysis Period (min) 15

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

ø2	ø1	ø4
51 s	32 s	37 s
ø6	ø7	ø8
83 s	14 s	23 s

Lanes, Volumes, Timings
8: NC 54 WB Ramps & NC 86 (S. Columbia St)

8/8/2014

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	1091	374	536	913	365
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	*0.57	1.00	1.00
Frt		0.865				0.850
Flt Protected			0.950			
Satd. Flow (prot)	0	1611	1770	2124	1863	1583
Flt Permitted			0.176			
Satd. Flow (perm)	0	1611	328	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	1186	407	583	992	397
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1186	407	583	992	397
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	35.0	140.0	105.0	105.0
Total Split (%)	0.0%	0.0%	25.0%	100.0%	75.0%	75.0%
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
Recall Mode			None	C-Max	C-Max	C-Max
Act Effct Green (s)		140.0	135.0	140.0	100.0	100.0
Actuated g/C Ratio		1.00	0.96	1.00	0.71	0.71
v/c Ratio		0.74	0.65	0.27	0.75	0.35
Control Delay		3.0	17.5	0.3	16.7	8.6
Queue Delay		0.1	0.0	0.0	0.1	0.0
Total Delay		3.1	17.5	0.3	16.8	8.6
LOS		A	B	A	B	A
Approach Delay				7.4	14.4	
Approach LOS				A	B	
Queue Length 50th (ft)		0	65	0	501	125
Queue Length 95th (ft)		0	194	0	679	176
Internal Link Dist (ft)	92			14	110	
Turn Bay Length (ft)						
Base Capacity (vph)		1611	625	2124	1331	1131
Starvation Cap Reductn		0	0	0	0	0

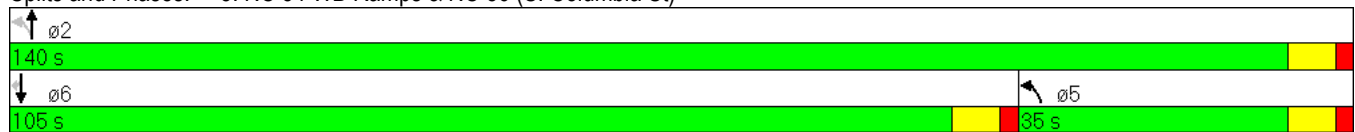
Lanes, Volumes, Timings
 8: NC 54 WB Ramps & NC 86 (S. Columbia St)

8/8/2014

	↖	↘	↙	↑	↓	↗
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Spillback Cap Reductn		18	0	0	21	0
Storage Cap Reductn		0	0	0	0	0
Reduced v/c Ratio		0.74	0.65	0.27	0.76	0.35

Intersection Summary	
Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	140
Offset:	116 (83%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle:	60
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.75
Intersection Signal Delay:	8.7
Intersection LOS:	A
Intersection Capacity Utilization	77.1%
ICU Level of Service	D
Analysis Period (min)	15
* User Entered Value	

Splits and Phases: 8: NC 54 WB Ramps & NC 86 (S. Columbia St)



Lanes, Volumes, Timings

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

8/8/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	176	0	284	0	0	0	0	713	0	114	1863	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									0.299		
Satd. Flow (perm)	1671	1421	1421	0	0	0	0	3471	0	557	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	330	0	0	0	0	801	0	124	2025	0
Shared Lane Traffic (%)			50%									
Lane Group Flow (vph)	205	165	165	0	0	0	0	801	0	124	2025	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)	33.0	33.0	33.0	0.0	0.0	0.0	0.0	94.0	0.0	13.0	107.0	0.0
Total Split (%)	23.6%	23.6%	23.6%	0.0%	0.0%	0.0%	0.0%	67.1%	0.0%	9.3%	76.4%	0.0%
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?												
Recall Mode	None	None	None					C-Max		None	C-Max	
Act Effct Green (s)	23.3	23.3	23.3					93.7		106.7	106.7	
Actuated g/C Ratio	0.17	0.17	0.17					0.67		0.76	0.76	
v/c Ratio	0.74	0.70	0.70					0.34		0.25	0.75	
Control Delay	70.8	70.1	70.1					10.4		3.4	6.3	
Queue Delay	0.0	0.0	0.0					0.0		0.0	0.2	
Total Delay	70.8	70.1	70.1					10.4		3.4	6.5	
LOS	E	E	E					B		A	A	
Approach Delay		70.3						10.4			6.3	
Approach LOS		E						B			A	

Lanes, Volumes, Timings

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

8/8/2014

	↖	→	↘	↙	←	↖	↘	↑	↖	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)	178	149	149					120		14	208	
Queue Length 95th (ft)	247	216	216					194		m22	396	
Internal Link Dist (ft)		767			62			76			516	
Turn Bay Length (ft)	250		250							150		
Base Capacity (vph)	334	284	284					2324		494	2696	
Starvation Cap Reductn	0	0	0					0		0	144	
Spillback Cap Reductn	0	0	0					0		0	0	
Storage Cap Reductn	0	0	0					0		0	0	
Reduced v/c Ratio	0.61	0.58	0.58					0.34		0.25	0.79	

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: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 17.1

Intersection LOS: B

Intersection Capacity Utilization 71.6%

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

↘ ø1	↑ ø2	↖ ø4
13 s	94 s	33 s
↓ ø6		
107 s		

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

8/8/2014

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations	↘	↑	↗		↖	↗	↘	↗	↗	↘	↗	↗
Volume (vph)	130	96	61	12	75	320	60	1024	31	521	1391	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					
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950				0.993		0.950			0.950		
Satd. Flow (prot)	1726	1817	1544	0	1905	2870	1753	3506	1568	1752	3504	1567
Flt Permitted	0.601				0.808		0.171			0.088		
Satd. Flow (perm)	1092	1817	1523	0	1550	2870	315	3506	1568	162	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	70	13	84	360	65	1101	33	566	1512	255
Shared Lane Traffic (%)												
Lane Group Flow (vph)	149	110	70	0	97	360	65	1101	33	566	1512	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	67.0	59.0	59.0	59.0	50.0	109.0	123.0
Total Split (%)	10.0%	22.1%	22.1%	12.1%	12.1%	47.9%	42.1%	42.1%	42.1%	35.7%	77.9%	87.9%
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		
Recall Mode	None	None	None	None	None		C-Max	C-Max	C-Max	None	C-Max	
Act Effct Green (s)	26.0	26.0	26.0		12.0	54.7	56.3	56.3	56.3	104.0	104.0	118.2
Actuated g/C Ratio	0.19	0.19	0.19		0.09	0.39	0.40	0.40	0.40	0.74	0.74	0.84
v/c Ratio	0.61	0.33	0.25		0.73	0.32	0.51	0.78	0.05	0.94	0.58	0.19
Control Delay	65.6	52.6	51.4		92.0	20.1	49.2	43.9	28.0	54.7	6.1	1.7
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.6	52.6	51.4		92.0	20.1	49.2	43.9	28.0	54.7	6.1	1.7
LOS	E	D	D		F	C	D	D	C	D	A	A
Approach Delay		58.2			35.4			43.7			17.4	

Appendix E – Highway Capacity Software Analysis
Output

2022 With Site

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	7/22/14			Analysis Year	2022		
Analysis Time Period	2022 With Site AM Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS (Concept #2)</i>							
East/West Street: <i>Southern Village P&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)					501	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	562	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		
Minor Street	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				
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)							22
C (m) (veh/h)							740
v/c							0.03
95% queue length							0.09
Control Delay (s/veh)							10.0
LOS							B
Approach Delay (s/veh)	--	--				10.0	
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	7/22/14			Analysis Year	2022			
Analysis Time Period	2022 With Site Noon Peak							
Project Description <i>Town of Chapel Hill - Obey Creek TIS (Concept #2)</i>								
East/West Street: <i>Southern Village P&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)					680	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	715	9		
Percent Heavy Vehicles	0	--	--	0	--	--		
Median Type	<i>Undivided</i>							
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)			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					
Delay, Queue Length, and Level of Service								
Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration								R
v (veh/h)								26
C (m) (veh/h)								679
v/c								0.04
95% queue length								0.12
Control Delay (s/veh)								10.5
LOS								B
Approach Delay (s/veh)	--	--				10.5		
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	7/22/14			Analysis Year	2022		
Analysis Time Period	2022 With Site PM Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS (Concept #2)</i>							
East/West Street: <i>Southern Village P&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)					1140	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	1252	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)							476
v/c							0.36
95% queue length							1.63
Control Delay (s/veh)							16.8
LOS							C
Approach Delay (s/veh)	--	--					16.8
Approach LOS	--	--					C

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	7/22/14			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>			
Vehicle Volumes and Adjustments							
Major Street	Northbound			Southbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)	106	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)	120	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		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)	2	3	91	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	4	121	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		
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)	120	37		120			127
C (m) (veh/h)	1191	895		270			490
v/c	0.10	0.04		0.44			0.26
95% queue length	0.34	0.13		2.15			1.03
Control Delay (s/veh)	8.4	9.2		28.6			14.9
LOS	A	A		D			B
Approach Delay (s/veh)	--	--		28.6			14.9
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	7/22/14			Analysis Year	2022			
Analysis Time Period	2022 With Site Noon Peak							
Project Description <i>Town of Chapel Hill - Obey Creek TIS (Concept #2)</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)	38	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)	41	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	3	35	0	6	45		
Peak-Hour Factor, PHF	0.77	0.77	0.77	0.70	0.70	0.70		
Hourly Flow Rate, HFR (veh/h)	5	3	45	0	8	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	12
Lane Configuration	LTR	LTR		LTR			LTR	
v (veh/h)	41	32		72			53	
C (m) (veh/h)	1276	1226		571			570	
v/c	0.03	0.03		0.13			0.09	
95% queue length	0.10	0.08		0.43			0.31	
Control Delay (s/veh)	7.9	8.0		12.2			12.0	
LOS	A	A		B			B	
Approach Delay (s/veh)	--	--	12.2			12.0		
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	7/22/14			Analysis Year	2022			
Analysis Time Period	2022 With Site PM Peak							
Project Description <i>Town of Chapel Hill - Obey Creek TIS (Concept #2)</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)	57	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)	61	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	106	0	15	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	132	0	19	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	12
Lane Configuration	LTR	LTR		LTR			LTR	
v (veh/h)	61	71		72			165	
C (m) (veh/h)	963	1163		251			277	
v/c	0.06	0.06		0.29			0.60	
95% queue length	0.20	0.19		1.15			3.53	
Control Delay (s/veh)	9.0	8.3		25.0			35.5	
LOS	A	A		D			E	
Approach Delay (s/veh)	--	--	25.0			35.5		
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	7/22/14			Analysis Year	2022		
Analysis Time Period	2022 With Site AM Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS (Concept #2)</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)	149	148	151				
Peak-Hour Factor, PHF	0.93	0.93	0.93	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	160	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)			160		321		
C (m) (veh/h)			389		414		
v/c			0.41		0.78		
95% queue length			1.96		6.60		
Control Delay (s/veh)			20.6		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	7/22/14			Analysis Year	2022		
Analysis Time Period	2022 With Site Noon Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS (Concept #2)</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)	110	109	93				
Peak-Hour Factor, PHF	0.89	0.89	0.89	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	123	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)			123		226		
C (m) (veh/h)			509		563		
v/c			0.24		0.40		
95% queue length			0.94		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	7/22/14			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			706		
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	811	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)	205	205	119				
Peak-Hour Factor, PHF	0.94	0.94	0.94	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	218	218	126	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)			218		344		
C (m) (veh/h)			264		318		
v/c			0.83		1.08		
95% queue length			6.61		13.10		
Control Delay (s/veh)			60.7		111.2		
LOS			F		F		
Approach Delay (s/veh)	--	--	91.6				
Approach LOS	--	--	F				

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	7/22/14			Analysis Year	2022			
Analysis Time Period	2022 With Site AM Peak							
Project Description <i>Town of Chapel Hill - Obey Creek TIS (Concept #2)</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)					1473	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	1753	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)						29		
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	50		
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)								50
C (m) (veh/h)								287
v/c								0.17
95% queue length								0.62
Control Delay (s/veh)								20.2
LOS								C
Approach Delay (s/veh)	--	--						20.2
Approach LOS	--	--						C

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	7/22/14			Analysis Year	2022			
Analysis Time Period	2022 With Site Noon Peak							
Project Description <i>Town of Chapel Hill - Obey Creek TIS (Concept #2)</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)					909	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	967	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			
Minor Street	Northbound			Southbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume (veh/h)						26		
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	30		
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		
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)								30
C (m) (veh/h)								464
v/c								0.06
95% queue length								0.21
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	7/22/14			Analysis Year	2022			
Analysis Time Period	2022 With Site PM Peak							
Project Description <i>Town of Chapel Hill - Obey Creek TIS (Concept #2)</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)					1312	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	1410	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)						22		
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	44		
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)								44
C (m) (veh/h)								333
v/c								0.13
95% queue length								0.45
Control Delay (s/veh)								17.4
LOS								C
Approach Delay (s/veh)	--	--						17.4
Approach LOS	--	--						C

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	7/22/14			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)		1410	29				
Peak-Hour Factor, PHF	1.00	0.90	0.90	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	0	1566	32	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)					408		
v/c					0.82		
95% queue length					7.48		
Control Delay (s/veh)					43.1		
LOS					E		
Approach Delay (s/veh)	--	--	43.1				
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	7/22/14			Analysis Year	2022		
Analysis Time Period	2022 With Site Noon Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS (Concept #2)</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)		1169	26				
Peak-Hour Factor, PHF	1.00	0.90	0.90	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	0	1298	28	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)					483		
v/c					0.85		
95% queue length					8.65		
Control Delay (s/veh)					41.7		
LOS					E		
Approach Delay (s/veh)	--	--	41.7				
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	7/22/14			Analysis Year	2022		
Analysis Time Period	2022 With Site PM Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS (Concept #2)</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)		1663	22				
Peak-Hour Factor, PHF	1.00	0.90	0.90	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	0	1847	24	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)					344		
v/c					1.34		
95% queue length					22.36		
Control Delay (s/veh)					202.3		
LOS					F		
Approach Delay (s/veh)	--	--	202.3				
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	7/22/14			Analysis Year	2022		
Analysis Time Period	2022 With Site AM Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS (Concept #2)</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)		1379			2039	295	
Peak-Hour Factor, PHF	1.00	0.92	1.00	1.00	0.90	0.90	
Hourly Flow Rate, HFR (veh/h)	0	1498	0	0	2265	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		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)			13			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	15	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		15
C (m) (veh/h)					378		223
v/c					0.20		0.07
95% queue length					0.72		0.21
Control Delay (s/veh)					16.8		22.3
LOS					C		C
Approach Delay (s/veh)	--	--	16.8			22.3	
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	7/22/14			Analysis Year	2022		
Analysis Time Period	2022 With Site Noon Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS (Concept #2)</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)		1095			1707	287	
Peak-Hour Factor, PHF	1.00	0.90	1.00	1.00	0.90	0.90	
Hourly Flow Rate, HFR (veh/h)	0	1216	0	0	1896	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)			32			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	35	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		35
C (m) (veh/h)					464		296
v/c					0.23		0.12
95% queue length					0.90		0.40
Control Delay (s/veh)					15.1		18.8
LOS					C		C
Approach Delay (s/veh)	--	--	15.1			18.8	
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	7/22/14			Analysis Year	2022		
Analysis Time Period	2022 With Site PM Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS (Concept #2)</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)		1453			2375	257	
Peak-Hour Factor, PHF	1.00	0.90	1.00	1.00	0.90	0.90	
Hourly Flow Rate, HFR (veh/h)	0	1614	0	0	2638	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)			67			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	77	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		77
C (m) (veh/h)					355		177
v/c					0.73		0.44
95% queue length					5.58		1.99
Control Delay (s/veh)					38.4		40.1
LOS					E		E
Approach Delay (s/veh)	--	--	38.4			40.1	
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	7/22/14			Analysis Year	2022			
Analysis Time Period	2022 With Site AM Peak							
Project Description <i>Town of Chapel Hill - Obey Creek TIS (Concept #2)</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	13		1295	968		
Peak-Hour Factor, PHF	1.00	0.83	0.83	1.00	0.85	0.85		
Hourly Flow Rate, HFR (veh/h)	0	832	15	0	1523	1138		
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	12
Lane Configuration					R			R
v (veh/h)					398			188
C (m) (veh/h)					635			403
v/c					0.63			0.47
95% queue length					4.39			2.41
Control Delay (s/veh)					19.7			21.5
LOS					C			C
Approach Delay (s/veh)	--	--	19.7			21.5		
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	7/22/14			Analysis Year	2022			
Analysis Time Period	2022 With Site Noon Peak							
Project Description <i>Town of Chapel Hill - Obey Creek TIS (Concept #2)</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	32		703	681		
Peak-Hour Factor, PHF	1.00	0.90	0.90	1.00	0.94	0.94		
Hourly Flow Rate, HFR (veh/h)	0	788	35	0	747	724		
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			664
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	7/22/14			Analysis Year	2022			
Analysis Time Period	2022 With Site PM Peak							
Project Description <i>Town of Chapel Hill - Obey Creek TIS (Concept #2)</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	67		967	1024		
Peak-Hour Factor, PHF	1.00	0.86	0.86	1.00	0.92	0.92		
Hourly Flow Rate, HFR (veh/h)	0	1693	77	0	1051	1113		
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			550
v/c					0.85			0.19
95% queue length					7.80			0.69
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	Dogwood Acres & Smith Level		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	7/22/14			Analysis Year	2022		
Analysis Time Period	2022 With Site AM Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS (Concept #2)</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	14	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	14	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)		14		27			
C (m) (veh/h)		1079		471			
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	7/22/14			Analysis Year	2022		
Analysis Time Period	2022 With Site Noon Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS (Concept #2)</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							
General Information				Site Information			
Analyst	CRS			Intersection	Dogwood Acres & Smith Level		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	7/22/14			Analysis Year	2022		
Analysis Time Period	2022 With Site PM Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS (Concept #2)</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)		330	10	30	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	32	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		
Minor Street	Eastbound			Westbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)				9		22	
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	30	
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		
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)		32		42			
C (m) (veh/h)		1177		396			
v/c		0.03		0.11			
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							
General Information				Site Information			
Analyst	CRS			Intersection	Mt. Carmel Church & Old Lystra		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	7/22/14			Analysis Year	2022		
Analysis Time Period	2022 With Site AM Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS (Concept #2)</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)		327	42	19	639		
Peak-Hour Factor, PHF	1.00	0.74	0.74	0.87	0.87	1.00	
Hourly Flow Rate, HFR (veh/h)	0	441	56	21	734	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	Northbound			Southbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)	67		39				
Peak-Hour Factor, PHF	0.85	1.00	0.85	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	78	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					
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)		21		123			
C (m) (veh/h)		1067		313			
v/c		0.02		0.39			
95% queue length		0.06		1.80			
Control Delay (s/veh)		8.4		23.8			
LOS		A		C			
Approach Delay (s/veh)	--	--	23.8				
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	7/22/14			Analysis Year	2022			
Analysis Time Period	2022 With Site Noon Peak							
Project Description <i>Town of Chapel Hill - Obey Creek TIS (Concept #2)</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)		255	29	22	296			
Peak-Hour Factor, PHF	1.00	0.89	0.89	0.89	0.89	1.00		
Hourly Flow Rate, HFR (veh/h)	0	286	32	24	332	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	12
Lane Configuration		LT		LR				
v (veh/h)		24		65				
C (m) (veh/h)		1236		616				
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							
General Information				Site Information			
Analyst	CRS			Intersection	Mt. Carmel Church & Old Lystra		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	7/22/14			Analysis Year	2022		
Analysis Time Period	2022 With Site PM Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS (Concept #2)</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)		597	50	44	400		
Peak-Hour Factor, PHF	1.00	0.91	0.91	0.88	0.88	1.00	
Hourly Flow Rate, HFR (veh/h)	0	656	54	50	454	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)	34		38				
Peak-Hour Factor, PHF	0.80	1.00	0.80	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	42	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		89			
C (m) (veh/h)		880		443			
v/c		0.06		0.20			
95% queue length		0.18		0.74			
Control Delay (s/veh)		9.3		19.7			
LOS		A		C			
Approach Delay (s/veh)	--	--	19.7				
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	7/22/14			Analysis Year	2022		
Analysis Time Period	2022 With Site AM Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS (Concept #2)</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)		1314	6				
Peak-Hour Factor, PHF	1.00	0.90	0.90	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	0	1460	6	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)					421		
v/c					0.03		
95% queue length					0.09		
Control Delay (s/veh)					13.8		
LOS					B		
Approach Delay (s/veh)	--	--	13.8				
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	7/22/14			Analysis Year	2022		
Analysis Time Period	2022 With Site Noon Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS (Concept #2)</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)		709	7				
Peak-Hour Factor, PHF	1.00	0.90	0.90	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	0	787	7	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)						7	
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	7	
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)					7		
C (m) (veh/h)					652		
v/c					0.01		
95% queue length					0.03		
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 & Site Dr #1		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	7/22/14			Analysis Year	2022		
Analysis Time Period	2022 With Site PM Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS (Concept #2)</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)		731	15				
Peak-Hour Factor, PHF	1.00	0.90	0.90	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	0	812	16	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)						12	
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	13	
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)					13		
C (m) (veh/h)					638		
v/c					0.02		
95% queue length					0.06		
Control Delay (s/veh)					10.8		
LOS					B		
Approach Delay (s/veh)	--	--	10.8				
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	7/22/14		Analysis Year	2022				
Analysis Time Period	2022 With Site AM Peak							
Project Description <i>Town of Chapel Hill - Obey Creek TIS (Concept #2)</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)		1322	3					
Peak-Hour Factor, PHF	1.00	0.90	0.90	1.00	1.00	1.00		
Hourly Flow Rate, HFR (veh/h)	0	1468	3	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			
Minor Street	Eastbound			Westbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume (veh/h)						5		
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	5		
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	12
Lane Configuration					R			
v (veh/h)					5			
C (m) (veh/h)					419			
v/c					0.01			
95% queue length					0.04			
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	US 15-501 & Site Dr #2		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	7/22/14			Analysis Year	2022		
Analysis Time Period	2022 With Site Noon Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS (Concept #2)</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)		713	4				
Peak-Hour Factor, PHF	1.00	0.90	0.90	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	0	792	4	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)						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	
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)					4		
C (m) (veh/h)					652		
v/c					0.01		
95% queue length					0.02		
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 & Site Dr #2		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	7/22/14			Analysis Year	2022		
Analysis Time Period	2022 With Site PM Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS (Concept #2)</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)		735	8				
Peak-Hour Factor, PHF	1.00	0.90	0.90	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	0	816	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)						6	
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	6	
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)					6		
C (m) (veh/h)					640		
v/c					0.01		
95% queue length					0.03		
Control Delay (s/veh)					10.7		
LOS					B		
Approach Delay (s/veh)	--	--	10.7				
Approach LOS	--	--	B				

2022 With Site Mitigated

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	7/22/14			Analysis Year	2022		
Analysis Time Period	2022 Mitigated AM Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS (Concept #2)</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)		1312	4				
Peak-Hour Factor, PHF	1.00	0.90	0.90	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	0	1457	4	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)						16	
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	17	
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)					17		
C (m) (veh/h)					423		
v/c					0.04		
95% queue length					0.13		
Control Delay (s/veh)					13.9		
LOS					B		
Approach Delay (s/veh)	--	--	13.9				
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	7/22/14			Analysis Year	2022		
Analysis Time Period	2022 Mitigated Noon Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS (Concept #2)</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)		707	5				
Peak-Hour Factor, PHF	1.00	0.90	0.90	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	0	785	5	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)						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)					657		
v/c					0.02		
95% queue length					0.06		
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 & Site Dr #2		
Agency/Co.	HNTB North Carolina, PC			Jurisdiction	Chapel Hill, NC		
Date Performed	7/22/14			Analysis Year	2022		
Analysis Time Period	2022 Mitigated PM Peak						
Project Description <i>Town of Chapel Hill - Obey Creek TIS (Concept #2)</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)		726	11				
Peak-Hour Factor, PHF	1.00	0.90	0.90	1.00	1.00	1.00	
Hourly Flow Rate, HFR (veh/h)	0	806	12	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)						17	
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	18	
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)					18		
C (m) (veh/h)					647		
v/c					0.03		
95% queue length					0.09		
Control Delay (s/veh)					10.7		
LOS					B		
Approach Delay (s/veh)	--	--	10.7				
Approach LOS	--	--	B				

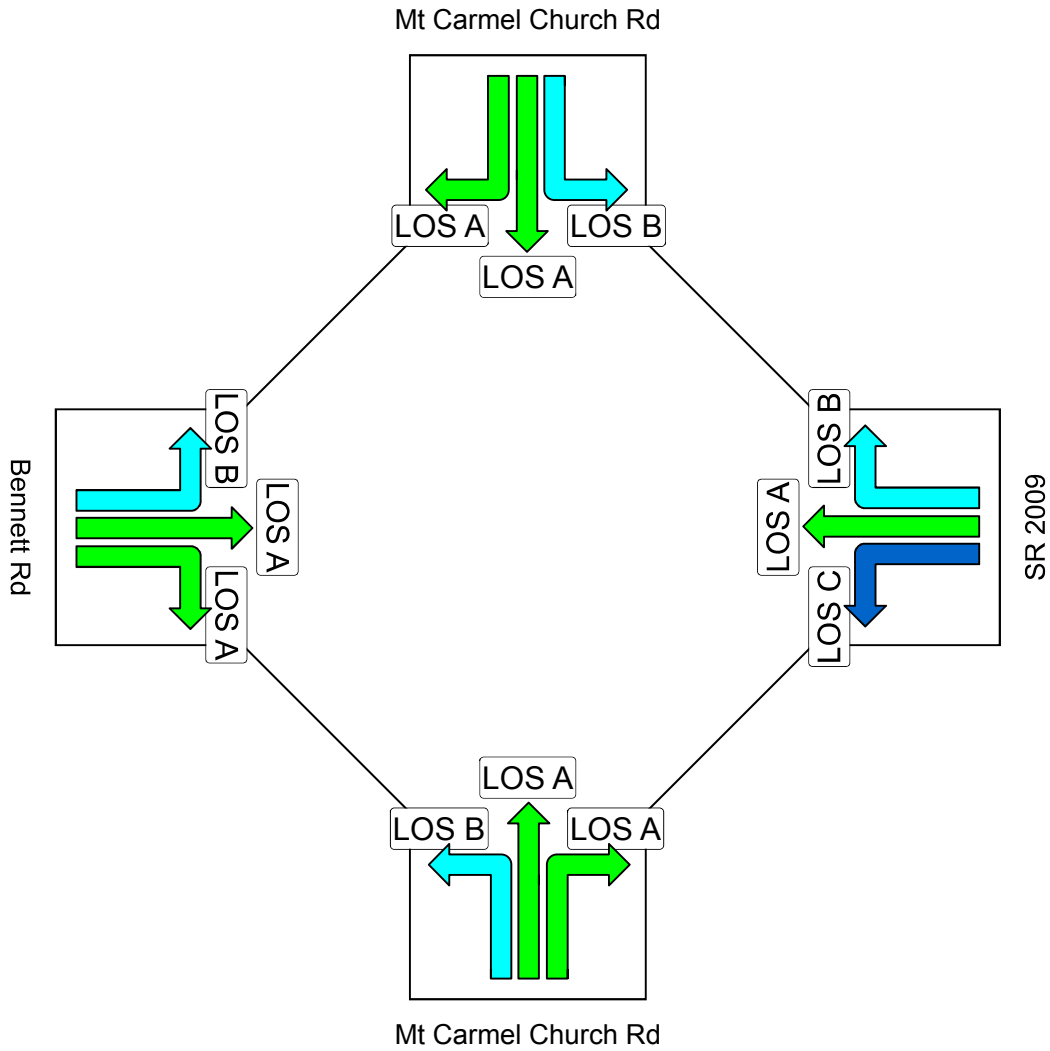
Appendix F – SIDRA Roundabout Analysis Output

LEVEL OF SERVICE

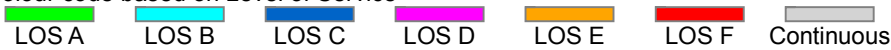
Site: 2022 AM

Level of Service Method: Delay (HCM) & Degree of Saturation

Bennett Rd and Mt Carmel Church Rd
Roundabout



Colour code based on Level of Service



Roundabout Level of Service Method used in this display: Same as Sign Control

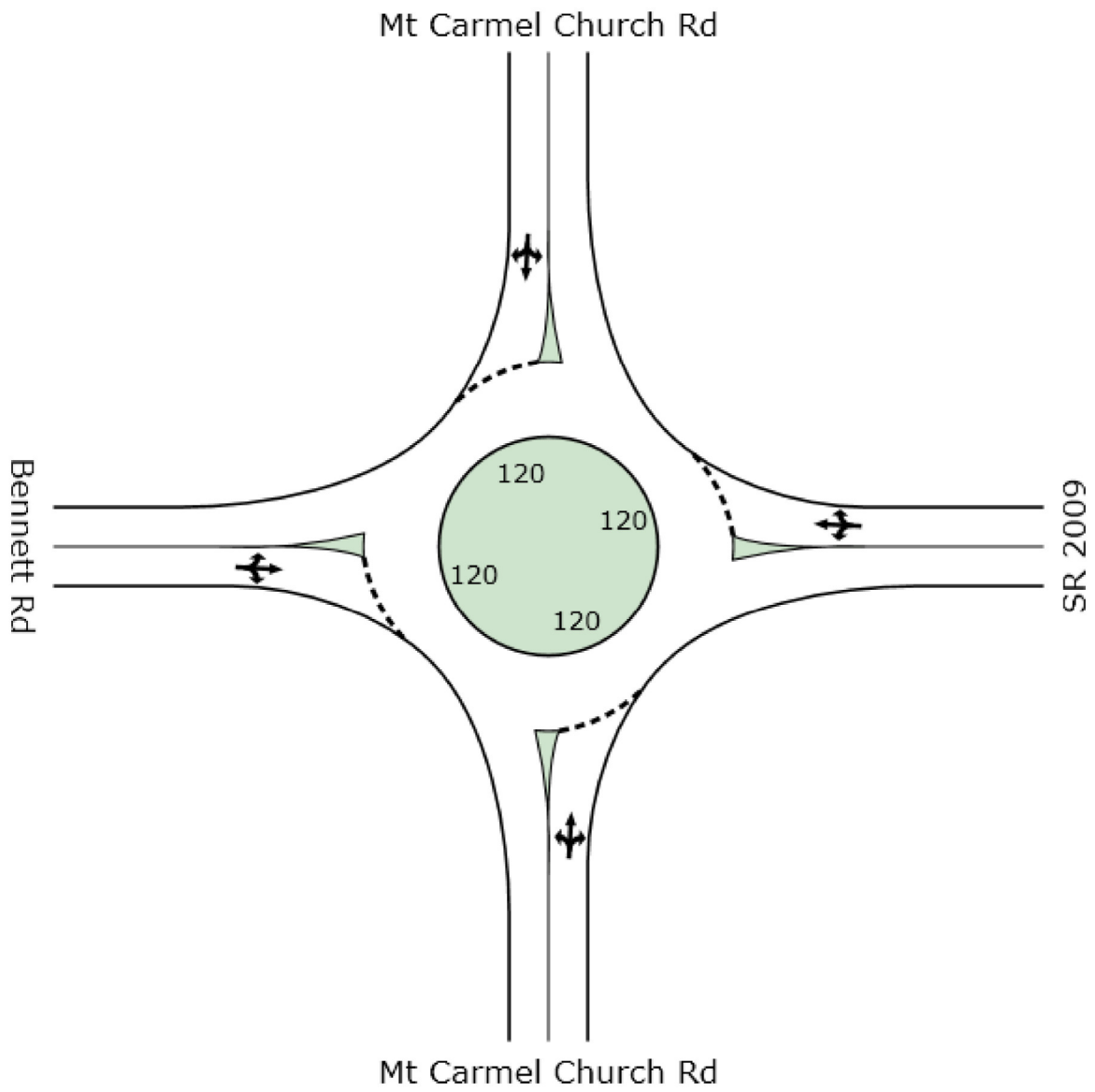
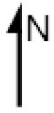
MOVEMENT SUMMARY

Site: 2022 AM

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: Mt Carmel Church Rd											
3	L	120	2.0	0.758	11.1	LOS B	10.0	255.1	0.43	0.78	28.0
8	T	677	2.0	0.756	5.2	LOS A	10.0	255.1	0.43	0.41	32.7
18	R	2	2.0	0.758	5.0	LOS A	10.0	255.1	0.43	0.45	29.8
Approach		800	2.0	0.756	6.1	LOS B	10.0	255.1	0.43	0.46	31.9
East: SR 2009											
1	L	1	4.0	0.267	18.6	LOS C	1.1	29.3	0.63	0.97	27.2
6	T	16	4.0	0.267	9.2	LOS A	1.1	29.3	0.63	0.73	27.6
16	R	111	4.0	0.267	12.3	LOS B	1.1	29.3	0.63	0.81	29.5
Approach		128	4.0	0.266	12.0	LOS C	1.1	29.3	0.63	0.80	29.3
North: Mt Carmel Church Rd											
7L	L	37	6.0	0.437	13.5	LOS B	2.7	69.9	0.38	0.89	30.0
4T	T	359	6.0	0.439	5.6	LOS A	2.7	69.9	0.38	0.48	33.1
4R	R	10	6.0	0.446	7.1	LOS A	2.7	69.9	0.38	0.58	32.6
Approach		406	6.0	0.439	6.4	LOS B	2.7	69.9	0.38	0.52	32.8
West: Bennett Rd											
5	L	3	2.0	0.169	14.8	LOS B	0.8	19.1	0.48	0.90	29.0
2	T	4	2.0	0.165	5.4	LOS A	0.8	19.1	0.48	0.54	29.6
12	R	115	2.0	0.167	8.5	LOS A	0.8	19.1	0.48	0.69	31.8
Approach		122	2.0	0.167	8.5	LOS B	0.8	19.1	0.48	0.69	31.7
All Vehicles		1456	3.3	0.756	6.9	LOS A	10.0	255.1	0.44	0.53	31.9

Level of Service (Aver. Int. Delay): LOS A. Based on average delay for all vehicle movements. LOS Method: Delay (HCM).
 Level of Service (Worst Movement): LOS C. LOS Method for individual vehicle movements: Delay (HCM) & Degree of Saturation.
 Approach LOS values are based on the worst delay and degree of saturation (v/c ratio) for any vehicle movement.
 Roundabout LOS Method: Same as Sign Control.
 Roundabout Capacity Model: US NCHRP 572.

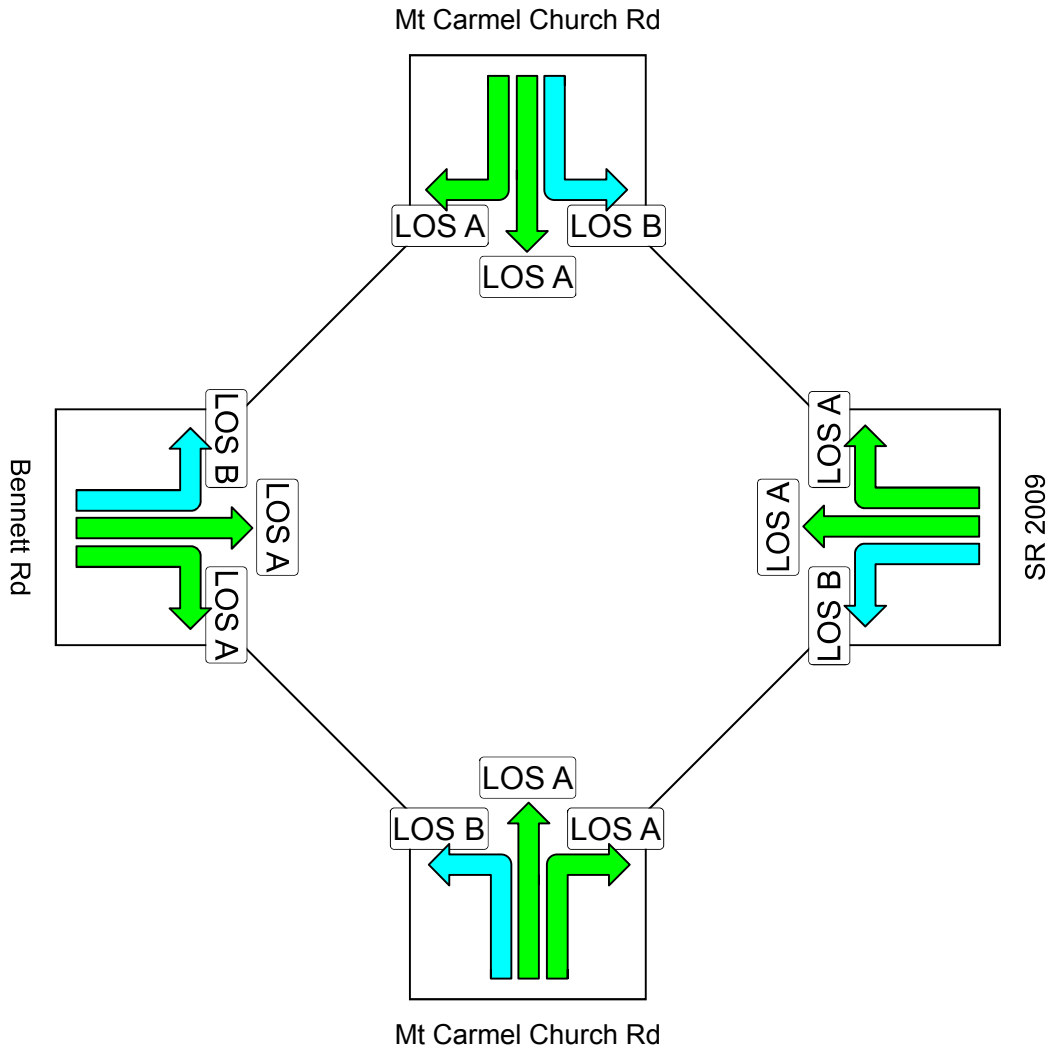


LEVEL OF SERVICE

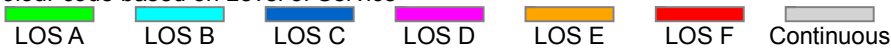
Site: 2022 Noon

Level of Service Method: Delay (HCM) & Degree of Saturation

Bennett Rd and Mt Carmel Church Rd
Roundabout



Colour code based on Level of Service



Roundabout Level of Service Method used in this display: Same as Sign Control

MOVEMENT SUMMARY

Site: 2022 Noon

Bennett Rd and Mt Carmel Church Rd
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 Vehicles veh	Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph	
South: Mt Carmel Church Rd												
3	L	42	3.0	0.354	10.7	LOS B	2.1	54.6	0.18	0.93	28.0	
8	T	329	3.0	0.353	4.8	LOS A	2.1	54.6	0.18	0.38	34.3	
18	R	1	3.0	0.366	4.6	LOS A	2.1	54.6	0.18	0.45	30.7	
Approach		371	3.0	0.353	5.4	LOS B	2.1	54.6	0.18	0.44	33.4	
East: SR 2009												
1	L	1	4.0	0.102	14.4	LOS B	0.4	11.0	0.44	0.88	29.2	
6	T	9	4.0	0.101	5.0	LOS A	0.4	11.0	0.44	0.50	29.9	
16	R	64	4.0	0.101	8.2	LOS A	0.4	11.0	0.44	0.64	32.1	
Approach		74	4.0	0.101	7.9	LOS B	0.4	11.0	0.44	0.63	31.7	
North: Mt Carmel Church Rd												
7L	L	33	3.0	0.302	12.7	LOS B	1.7	43.5	0.19	0.92	30.2	
4T	T	280	3.0	0.302	4.8	LOS A	1.7	43.5	0.19	0.39	34.2	
4R	R	1	3.0	0.272	6.2	LOS A	1.7	43.5	0.19	0.51	33.4	
Approach		314	3.0	0.302	5.6	LOS B	1.7	43.5	0.19	0.44	33.7	
West: Bennett Rd												
5	L	5	6.0	0.071	14.2	LOS B	0.3	7.6	0.39	0.83	29.4	
2	T	4	6.0	0.071	4.6	LOS A	0.3	7.6	0.39	0.45	30.1	
12	R	45	6.0	0.071	7.7	LOS A	0.3	7.6	0.39	0.59	32.2	
Approach		55	6.0	0.071	8.1	LOS B	0.3	7.6	0.39	0.60	31.7	
All Vehicles		814	3.3	0.353	5.9	LOS A	2.1	54.6	0.22	0.47	33.2	

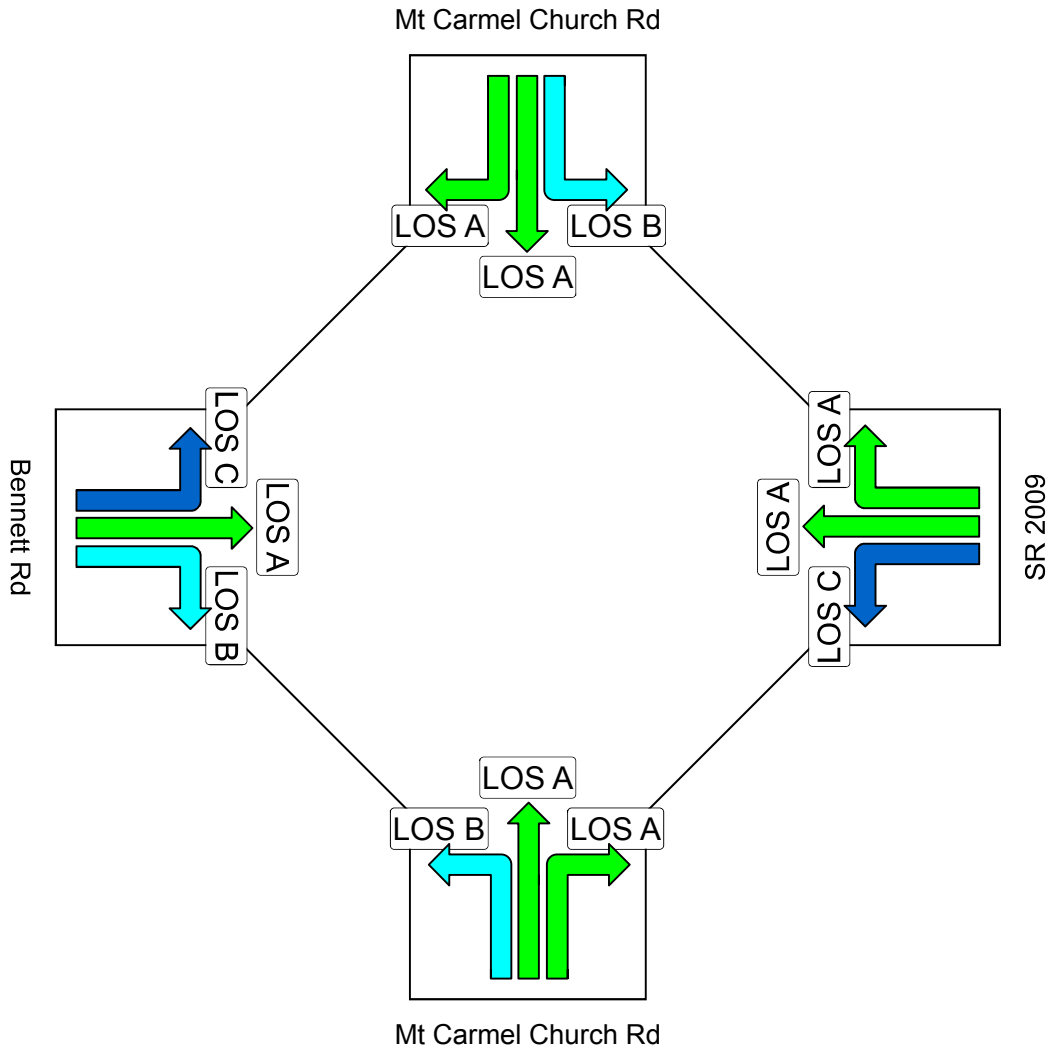
Level of Service (Aver. Int. Delay): LOS A. Based on average delay for all vehicle movements. LOS Method: Delay (HCM).
 Level of Service (Worst Movement): LOS B. LOS Method for individual vehicle movements: Delay (HCM) & Degree of Saturation.
 Approach LOS values are based on the worst delay and degree of saturation (v/c ratio) for any vehicle movement.
 Roundabout LOS Method: Same as Sign Control.
 Roundabout Capacity Model: US NCHRP 572.

LEVEL OF SERVICE

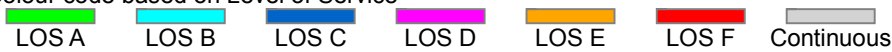
Site: 2022 PM

Level of Service Method: Delay (HCM) & Degree of Saturation

Bennett Rd and Mt Carmel Church Rd
Roundabout



Colour code based on Level of Service



Roundabout Level of Service Method used in this display: Same as Sign Control

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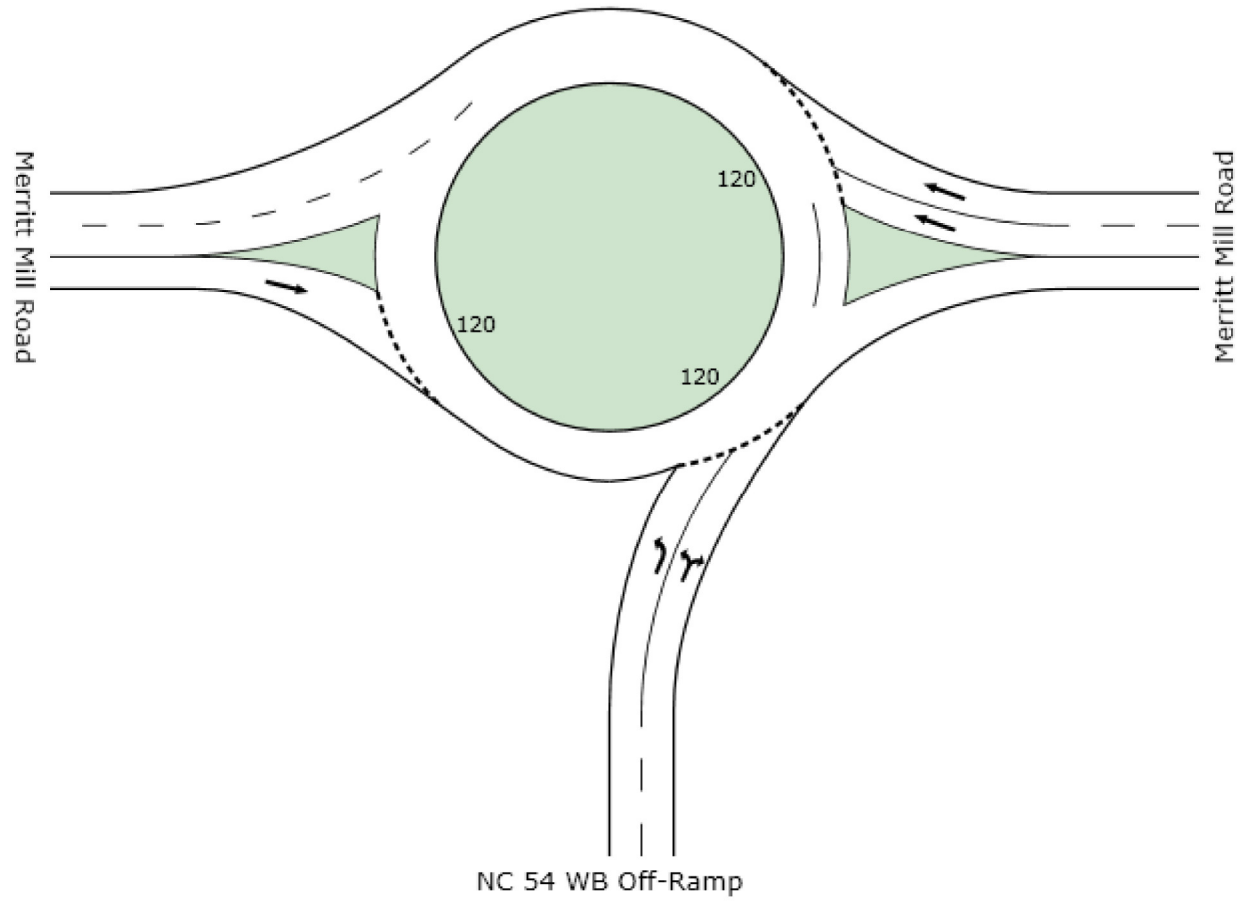
MOVEMENT SUMMARY

Site: 2022 PM

Bennett Rd and Mt Carmel Church Rd
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: Mt Carmel Church Rd											
3	L	62	3.0	0.466	11.3	LOS B	3.1	80.3	0.35	0.89	28.0
8	T	393	3.0	0.466	5.3	LOS A	3.1	80.3	0.35	0.45	33.2
18	R	3	3.0	0.466	5.2	LOS A	3.1	80.3	0.35	0.51	30.1
Approach		459	3.0	0.466	6.1	LOS B	3.1	80.3	0.35	0.51	32.4
East: SR 2009											
1	L	1	8.0	0.117	15.4	LOS C	0.5	12.4	0.49	0.92	28.9
6	T	19	8.0	0.115	5.8	LOS A	0.5	12.4	0.49	0.57	29.7
16	R	54	8.0	0.115	9.0	LOS A	0.5	12.4	0.49	0.70	31.9
Approach		74	8.0	0.115	8.2	LOS C	0.5	12.4	0.49	0.67	31.3
North: Mt Carmel Church Rd											
7L	L	72	2.0	0.672	13.4	LOS B	6.7	170.6	0.46	0.82	30.2
4T	T	601	2.0	0.672	5.5	LOS A	6.7	170.6	0.46	0.47	32.6
4R	R	10	2.0	0.674	7.0	LOS A	6.7	170.6	0.46	0.55	32.2
Approach		683	2.0	0.672	6.4	LOS B	6.7	170.6	0.46	0.51	32.3
West: Bennett Rd											
5	L	13	2.0	0.298	17.6	LOS C	1.4	35.1	0.62	0.97	27.7
2	T	21	2.0	0.299	8.1	LOS A	1.4	35.1	0.62	0.72	28.3
12	R	133	2.0	0.298	11.2	LOS B	1.4	35.1	0.62	0.81	30.2
Approach		166	2.0	0.299	11.3	LOS C	1.4	35.1	0.62	0.81	29.7
All Vehicles		1382	2.7	0.672	7.0	LOS A	6.7	170.6	0.44	0.55	31.9

Level of Service (Aver. Int. Delay): LOS A. Based on average delay for all vehicle movements. LOS Method: Delay (HCM).
 Level of Service (Worst Movement): LOS C. LOS Method for individual vehicle movements: Delay (HCM) & Degree of Saturation.
 Approach LOS values are based on the worst delay and degree of saturation (v/c ratio) for any vehicle movement.
 Roundabout LOS Method: Same as Sign Control.
 Roundabout Capacity Model: US NCHRP 572.

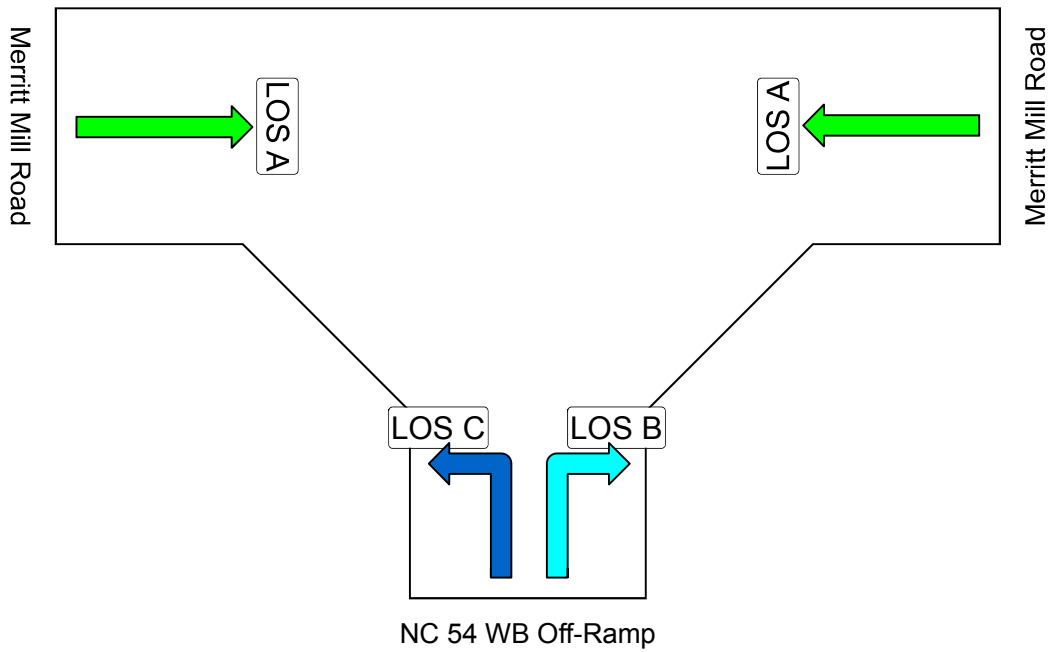


LEVEL OF SERVICE

Site: 2022 AM Alt 1

Level of Service Method: Delay (HCM) & Degree of Saturation

Merritt Mill Road and NC 54 Westbound Off-Ramp
Roundabout



Colour code based on Level of Service

LOS A LOS B LOS C LOS D LOS E LOS F Continuous

Roundabout Level of Service Method used in this display: Same as Sign Control

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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	319	5.0	0.415	16.0	LOS C	2.2	57.6	0.64	0.93	25.3
18	R	162	5.0	0.415	10.1	LOS B	2.2	57.6	0.64	0.83	27.4
Approach		482	5.0	0.415	14.1	LOS C	2.2	57.6	0.64	0.90	25.9
East: Merritt Mill Road											
6	T	180	5.0	0.107	4.2	LOS A	0.4	9.2	0.31	0.42	30.8
Approach		180	5.0	0.107	4.2	LOS A	0.4	9.2	0.31	0.42	30.8
West: Merritt Mill Road											
2	T	606	2.0	0.547	2.9	LOS A	0.0	0.0	0.00	0.30	32.5
Approach		606	2.0	0.547	2.9	LOS A	0.0	0.0	0.00	0.30	32.5
All Vehicles		1267	3.6	0.547	7.3	LOS A	2.2	57.6	0.29	0.54	29.3

Level of Service (Aver. Int. Delay): LOS A. Based on average delay for all vehicle movements. LOS Method: Delay (HCM).
 Level of Service (Worst Movement): LOS C. LOS Method for individual vehicle movements: Delay (HCM) & Degree of Saturation.
 Approach LOS values are based on the worst delay and degree of saturation (v/c ratio) for any vehicle movement.
 Roundabout LOS Method: Same as Sign Control.
 Roundabout Capacity Model: US NCHRP 572.

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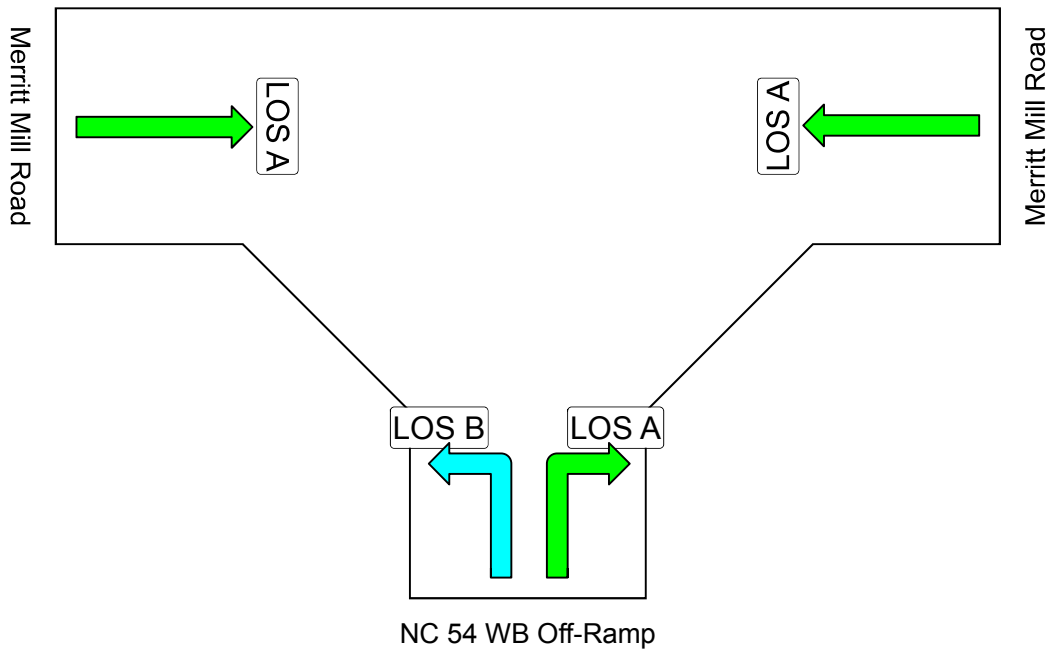


LEVEL OF SERVICE

Site: 2022 Noon Alt 1

Level of Service Method: Delay (HCM) & Degree of Saturation

Merritt Mill Road and NC 54 Westbound Off-Ramp
Roundabout



Colour code based on Level of Service

LOS A LOS B LOS C LOS D LOS E LOS F Continuous

Roundabout Level of Service Method used in this display: Same as Sign Control

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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	246	5.0	0.214	12.1	LOS B	1.0	25.9	0.41	0.74	27.0
18	R	104	5.0	0.214	6.2	LOS A	1.0	25.9	0.41	0.56	29.4
Approach		351	5.0	0.214	10.3	LOS B	1.0	25.9	0.41	0.68	27.6
East: Merritt Mill Road											
6	T	308	7.0	0.176	4.0	LOS A	0.6	16.1	0.29	0.39	30.9
Approach		308	7.0	0.176	4.0	LOS A	0.6	16.1	0.29	0.39	30.9
West: Merritt Mill Road											
2	T	256	6.0	0.240	3.0	LOS A	0.0	0.0	0.00	0.29	32.5
Approach		256	6.0	0.240	3.0	LOS A	0.0	0.0	0.00	0.29	32.5
All Vehicles		915	6.0	0.240	6.1	LOS A	1.0	25.9	0.25	0.48	29.9

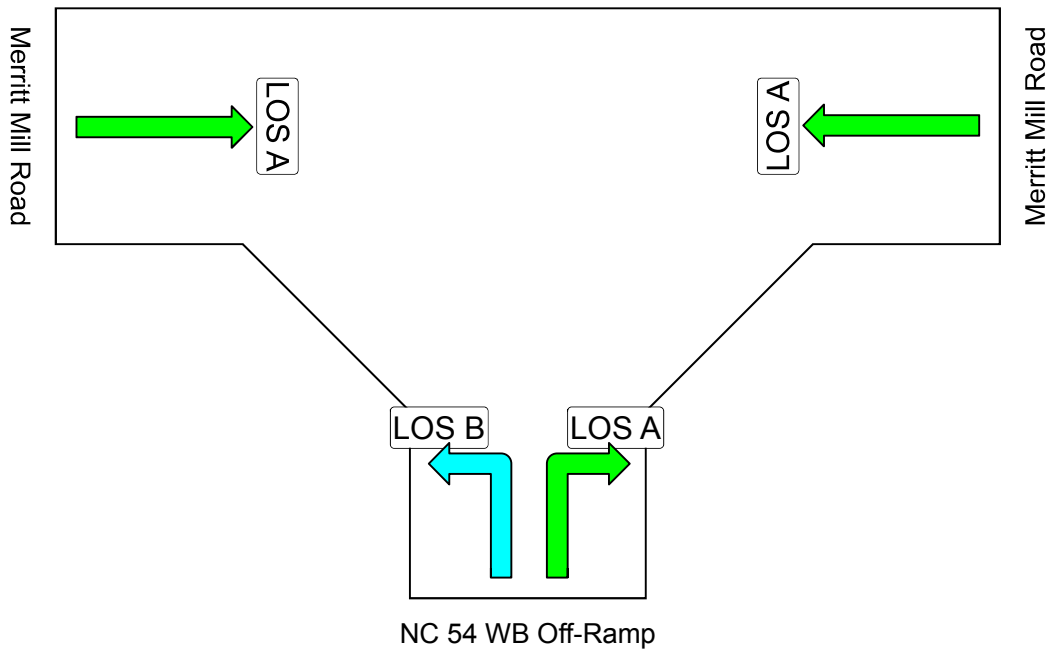
Level of Service (Aver. Int. Delay): LOS A. Based on average delay for all vehicle movements. LOS Method: Delay (HCM).
 Level of Service (Worst Movement): LOS B. LOS Method for individual vehicle movements: Delay (HCM) & Degree of Saturation.
 Approach LOS values are based on the worst delay and degree of saturation (v/c ratio) for any vehicle movement.
 Roundabout LOS Method: Same as Sign Control.
 Roundabout Capacity Model: US NCHRP 572.

LEVEL OF SERVICE

Site: 2022 PM Alt 1

Level of Service Method: Delay (HCM) & Degree of Saturation

Merritt Mill Road and NC 54 Westbound Off-Ramp
Roundabout



Colour code based on Level of Service

LOS A LOS B LOS C LOS D LOS E LOS F Continuous

Roundabout Level of Service Method used in this display: Same as Sign Control

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SIDRA INTERSECTION 5.0.5.1510
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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	436	2.0	0.343	12.5	LOS B	1.8	46.6	0.48	0.78	26.8
18	R	127	2.0	0.343	6.6	LOS A	1.8	46.6	0.48	0.61	29.0
Approach		563	2.0	0.343	11.1	LOS B	1.8	46.6	0.48	0.74	27.3
East: Merritt Mill Road											
6	T	811	2.0	0.506	6.0	LOS A	2.8	71.2	0.52	0.64	29.8
Approach		811	2.0	0.506	6.0	LOS A	2.8	71.2	0.52	0.64	29.8
West: Merritt Mill Road											
2	T	294	2.0	0.266	2.9	LOS A	0.0	0.0	0.00	0.30	32.5
Approach		294	2.0	0.266	2.9	LOS A	0.0	0.0	0.00	0.30	32.5
All Vehicles		1669	2.0	0.506	7.2	LOS A	2.8	71.2	0.42	0.61	29.2

Level of Service (Aver. Int. Delay): LOS A. Based on average delay for all vehicle movements. LOS Method: Delay (HCM).
 Level of Service (Worst Movement): LOS B. LOS Method for individual vehicle movements: Delay (HCM) & Degree of Saturation.
 Approach LOS values are based on the worst delay and degree of saturation (v/c ratio) for any vehicle movement.
 Roundabout LOS Method: Same as Sign Control.
 Roundabout Capacity Model: US NCHRP 572.

**Appendix G – MUTCD Peak Hour
Signal Warrant Analysis**

Warrants Summary												
Information												
Analyst	CRS					Intersection	US 15-501 & NC 54					
Agency/Co	HNTB North Carolina, PC					Jurisdiction	Orange County, NC					
Date Performed	8/6/2014					Units	U.S. Customary					
Project ID	Obey Creek TIS - Concept #2					Time Period Analyzed	2022 Build AM/NN/PM Peak					
East/West Street	NC 54 EB					North/South Street	US 15-501 SB Off Ramp					
File Name	NC 54 EB & US 15-501 SB Off Ramp.xhy					Major Street	East-West					
Project Description <i>Obey Creek TIS - Concept #2</i>												
General						Roadway Network						
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		
Geometry and Traffic	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	9	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	--
Warrant 1: Eight-Hour Vehicular Volume												<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"/>
Warrant 2: Four-Hour Vehicular Volume												<input type="checkbox"/>
2 A. Four-Hour Vehicular Volumes (Both major approaches --and-- higher minor approach)												<input type="checkbox"/>
Warrant 3: Peak Hour												<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"/>
Warrant 4: Pedestrian Volume												<input type="checkbox"/>
4 A. Four Hour Volumes --or--												<input type="checkbox"/>
4 B. One-Hour Volumes												<input type="checkbox"/>
Warrant 5: School Crossing												<input type="checkbox"/>
5. Student Volumes --and--												<input type="checkbox"/>
5. Gaps Same Period												<input type="checkbox"/>
Warrant 6: Coordinated Signal System												<input type="checkbox"/>
6. Degree of Platooning (Predominant direction or both directions)												<input type="checkbox"/>
Warrant 7: Crash Experience												<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"/>
Warrant 8: Roadway Network	<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"/>
Warrant 9: Grade Crossing	<input type="checkbox"/>
9 A. Grade Crossing within 140 ft --and--	<input type="checkbox"/>
9 B. Peak-Hour Vehicular Volumes	<input type="checkbox"/>

Warrants Volume

Information

Analyst: CRS Agency/Co: HNTB North Carolina, PC Date Performed: 8/6/2014 Project ID: Obey Creek TIS - Concept #2 East/West Street: NC 54 EB File Name: NC 54 EB & US 15-501 SB Off Ramp.xhy	Intersection: US 15-501 & NC 54 Jurisdiction: Orange County, NC Units: U.S. Customary Time Period Analyzed: 2022 Build AM/NN/PM Peak North/South Street: US 15-501 SB Off Ramp Major Street: East-West
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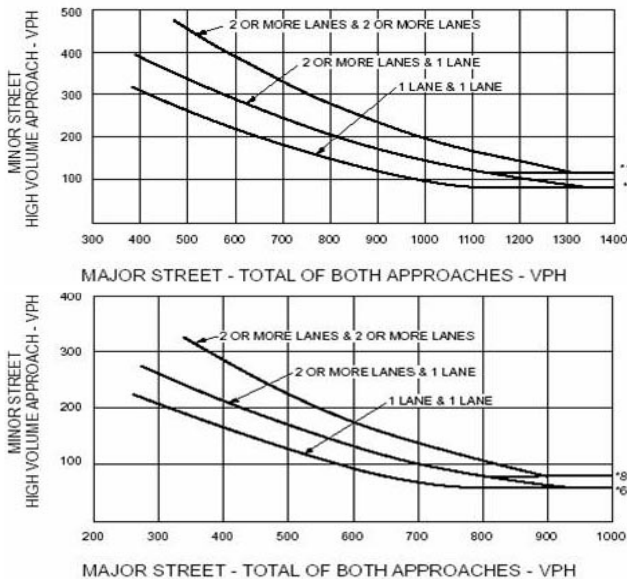
Project Description *Obey Creek TIS - Concept #2*

Warrant 1

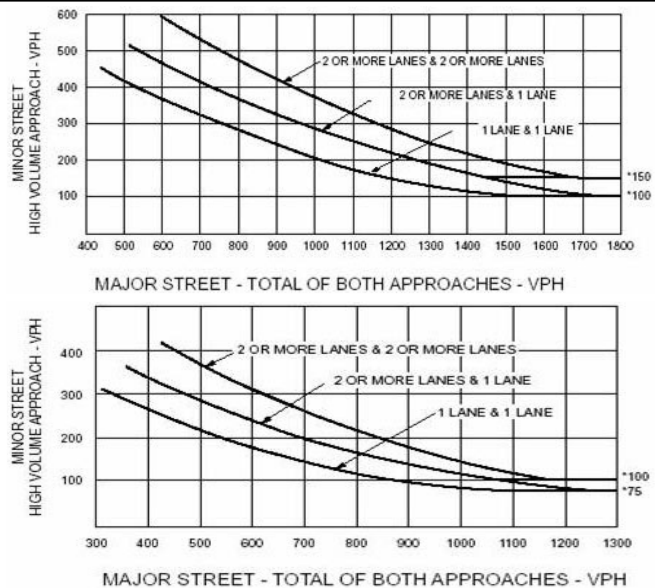
Condition A - Minimum Vehicular Volume						
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)			Vehicles per hour on higher-volume minor-street approach (one direction only)	
Major Street	Minor Street	100% ^a	80% ^b	70% ^c	100% ^a	80% ^b 70% ^c
1.....	1.....	500	400	350	150	120 105
2 or more...	1.....	600	480	420	150	120 105
2 or more...	2 or more...	600	480	420	200	160 140
1.....	2 or more...	500	400	350	200	160 140

Condition B - Interruption of Continuous Traffic						
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% ^a	80% ^b	70% ^c	100% ^a	80% ^b 70% ^c
1.....	1.....	750	600	525	75	60 53
2 or more...	1.....	900	720	630	75	60 53
2 or more...	2 or more...	900	720	630	100	80 70
1.....	2 or more...	750	600	525	100	80 70

Warrant 2



Warrant 3



Volume Summary

Major Street Lanes 2+			Minor Street Lanes 1			Speed		Population		
Hours	Major Volume	Minor Volume	Total Volume	1A (100%)	1A (80%)	1B (100%)	1B (80%)	2 (100%)	3A (100%)	3B (100%)
07-08	704	295	999	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	742	287	1029	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	1523	257	1780	Yes	Yes	Yes	Yes	Yes	No	Yes
18-19	0	0	0	No	No	No	No	No	No	No
Totals	2969	839	3808	3	3	1	2	3	0	1