

Westpoint at Eno

Durham, NC

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Executive Summary

Sun Forest Systems has plans to construct a residential development on the west side of N. Roxboro Street (US 501) in Durham, NC (Figure 1). The site will be bordered by N. Roxboro Street (US 501) to the east, existing residential developments to the south, and the Eno River to the north. The development will consist of approximately 170 single-family homes and approximately 210 townhomes. The development is expected to be constructed by 2022.

Project Background

Based on the conceptual site plan (Figure 2), access to Westpoint at Eno is proposed via two (2) vehicular access points. The following are the proposed access points:

- › Future Access #1: Full movement access along N. Roxboro Street (US 501).
- › Future Access #2: Connection to existing Stadium Drive via extension of the existing roadway.

The following intersections meet the City of Durham's requirement for inclusion in the study area and were analyzed, where applicable, for existing and future conditions:

- › Horton Road and Guess Road (NC 157) (signalized)
- › Horton Road and Stadium Drive (signalized) – connection to Future Access #2
- › Duke Street (US 501) and Horton Road (signalized)
- › N. Roxboro Street (US 501) and Seven Oaks Road (signalized)
- › N. Roxboro Street (US 501) and Future Access #1 (unsignalized)

The City of Durham requires that future year analysis be for the build year +1. Analysis was performed under four (4) scenarios: Existing (2018), Background/No-Build (2023), Build (2023),

and Build (2023) with Improvements. The Existing (2018) scenario includes typical weekday AM and PM peak hour analysis based on turning movement count data collected in December 2018. The No-Build (2023) scenario includes existing traffic with a three percent (3%) annual growth rate applied between the base year (2018) and the build-out year (2023). The Build (2023) scenario includes No-Build (2023) volumes with the addition of site trips generated by the full build-out of the proposed development. Future conditions with the recommended improvements in place were analyzed in the Build (2023) with Improvements scenario.

Existing (2018) Conditions

Existing analyses were conducted based on current roadway geometrics and intersection turning movement counts.

As reported in the Summary Level of Service (LOS) table on page v, one signalized intersection within the study area does not operate at acceptable levels of service (i.e., LOS D or better) during the PM peak hour. The signalized intersection of Guess Road (NC 157) and Horton Road operates at LOS E during the PM peak hour. All other signalized intersections operate acceptably during both peak hours.

No-Build (2023) Conditions

Based on the City of Durham requirements, an annual growth rate of three percent (3%) was applied to the existing traffic to account for the normal growth between the base year (2018) and the build year (2022+1). No background projects in the area were identified; therefore, no additional site trips from surrounding developments were included in the No-Build (2023) scenario.

As shown on the Summary LOS table on page v, two out of four signalized study intersections operate at an unacceptable level of service during the PM peak hour. The intersection of Guess Road (NC 157) and Horton Road continues to operate at LOS E during the PM peak hour, and the intersection of N. Duke Street (US 501) and Horton Road deteriorates to LOS E during the PM peak hour.

Trip Generation and Assignment

Trip generation was conducted based on the most appropriate corresponding trip generation codes included in the *ITE Trip Generation Manual, 10th Edition* and the suggested method of calculation in the NCDOT's *"Rate vs. Equation" Spreadsheet*. The proposed Westpoint at Eno Development is to consist of approximately 170 single-family homes and 210 townhomes; ITE LUC 210 (Single-Family Detached Housing) and LUC 220 (Multifamily Housing (Low Rise)) were used based on the NCDOT guidance.

As a result, the proposed development is projected to generate 3,407 daily weekday site trips, with 219 trips (52 entering, 167 exiting) occurring in the AM peak hour and 268 trips (169

entering, 99 exiting) occurring in the PM peak hour. The generated site trips were distributed in accordance with the existing turning movement counts and land uses.

Build (2023) Conditions

The Build (2023) conditions account for both the No-Build (2023) traffic and the site traffic generated by the proposed development after the completion.

As shown on the Summary LOS table on page v, with the addition of site trips, the study area signalized intersections continue to operate similarly to the No-Build (2023) scenario. The intersections of Guess Road (NC 157) at Horton Road and N. Duke Street (US 501) at Horton Road continue to operate at LOS E during the PM peak hour with slight increases in delay. The proposed eastbound stop-controlled approach for Future Access #1 is projected to operate at LOS F during both peak hours.

Roadway Improvement Recommendations

As indicated in the traffic operations analyses, the proposed development is projected to have minimal impact on the traffic operations of the surrounding roadway network and intersections. Generally, intersections within the study area are more affected by background growth in the area instead of trips generated by the proposed development. The aforementioned changes in LOS for the described intersections minimally change the overall functionality of the intersections. Therefore, no offsite improvements are recommended; however, the following driveway configurations should be considered.

N. Roxboro Street (US 501) and Future Access #1

The stop-controlled approach along Future Access #1 is projected to operate at LOS F during both peak hours. The peak hour volumes projected to use Future Access #1 are not expected to meet peak hour signal warrants. The driveway will be able to operate as stop-controlled with vehicles leaving the development needing to wait to make a turning movement until a gap in traffic along N. Roxboro Street (US 501) is available. The following is recommended for the Future Access #1 connection:

- › Construct Future Access #1 to connect to N. Roxboro Street (US 501) as a full access intersection.
- › Utilize the existing two-way left-turn lane to accommodate northbound left-turning vehicles entering the site.
- › Provide one ingress lane and two egress lanes that will consist of a continuous eastbound left-turn lane and an eastbound right-turn lane with at least 150 feet of storage.

Future Access #2/Stadium Drive

The site plan submitted proposes to extend existing Stadium Drive to provide a direct connection to the development. This connection will have no effect on the existing alignment of Stadium Drive, and no additional improvements to Stadium Drive are recommended in addition to the extension of the roadway.

As shown on the Summary LOS table on page v, two signalized intersections operate at LOS E during the PM peak hour in the No-Build (2023) and Build (2023) scenarios. The intersections see significant increases in delay due to projected background growth between the Existing (2018) and No-Build (2023) scenarios. With the addition of generated site trips, the two signalized intersections only see minimal increases in delay compared to what was observed in the No-Build (2023) scenario.

The trips generated by the development are not projected to make up at least 10% of any approach during the peak hour that either of the signalized intersection operate at failing levels of service (PM peak hour). Since the site trips generated do not cause any of the study area intersections to deteriorate to a failing level of service, this study does not require any additional improvements within the study area.

Multiple intersection improvements would help improve overall operations across the roadway network; however, these improvements are not required to be constructed in addition to the build-out of the development. The following intersection geometry improvements would help improve operations throughout the study area:

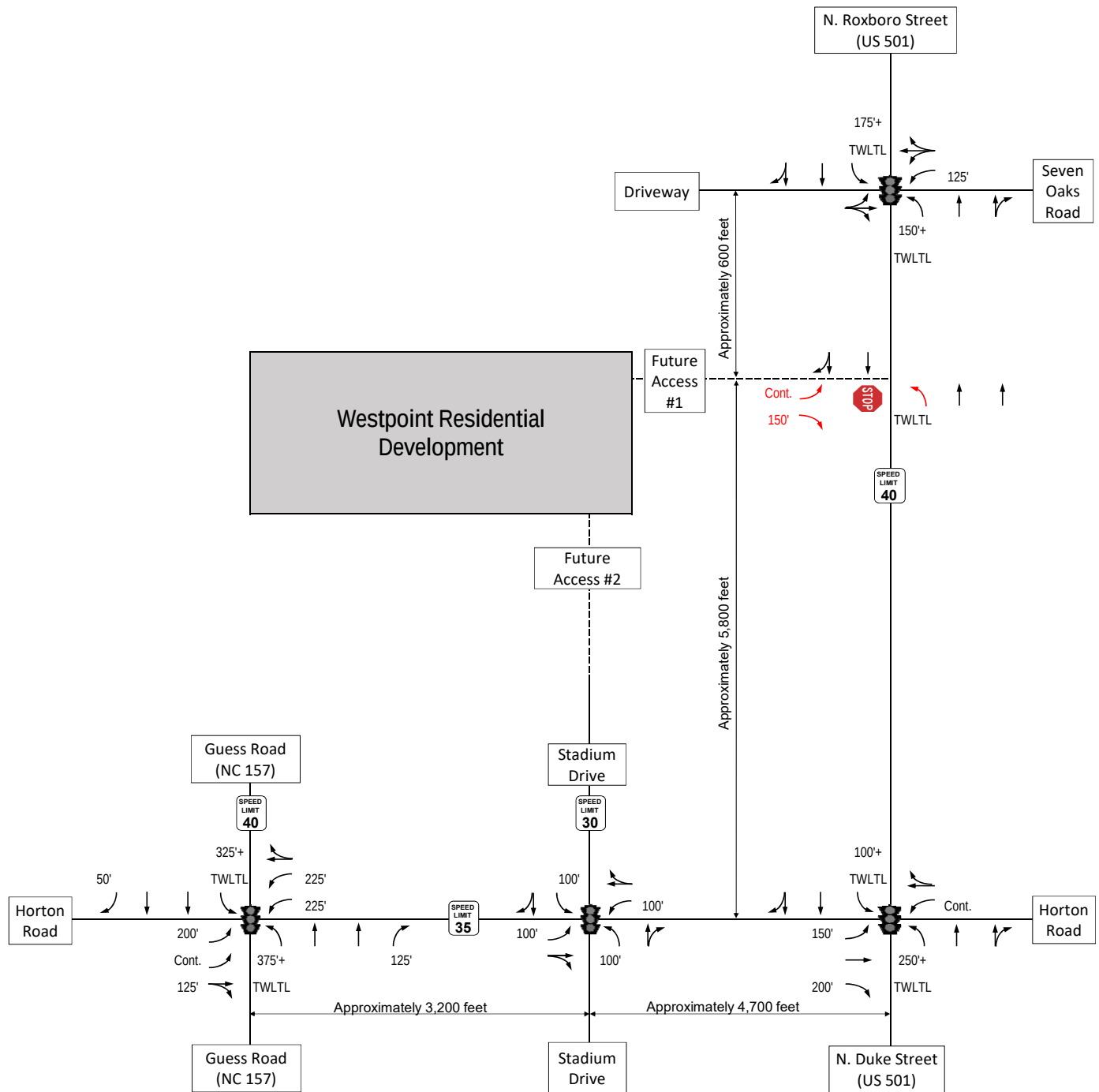
- › Construct a northbound right-turn lane along N. Duke Street (US 501) at Horton Road.
- › Construct a southbound right-turn lane along N. Duke Street (US 501) at Horton Road.
- › Construct a westbound right-turn lane along Horton Road at Guess Road (NC 157).

If funding is available for future projects in the area, these improvements should be considered.

Table ES-1 Summary Level of Service Table

Intersection and Approach	Traffic Control	Existing (2018)		No-Build (2023)		Build (2023)		Build (2023) with Improvements	
		AM	PM	AM	PM	AM	PM	AM	PM
Guess Road (NC 157) and Horton Road	Signalized	C (32.2 sec/veh)	E (55.0 sec/veh)	D (35.9 sec/veh)	E (74.4 sec/veh)	D (38.5 sec/veh)	E (76.1 sec/veh)	D (38.5 sec/veh)	E (76.1 sec/veh)
Eastbound		E-61.0	E-71.5	E-62.0	F-87.1	E-60.6	F-97.0	E-60.6	F-97.0
Westbound		E-59.8	E-64.4	E-65.6	F-101.1	E-75.1	F-104.6	E-75.1	F-104.6
Northbound		B-17.9	D-53.6	C-20.3	E-71.8	C-20.9	E-66.2	C-20.9	E-66.2
Southbound		C-23.3	D-38.3	C-27.5	D-52.9	C-28.3	E-56.5	C-28.3	E-56.5
Horton Road and Stadium Drive/Future Access #2	Signalized	B (12.5 sec/veh)	B (12.6 sec/veh)	B (12.9 sec/veh)	B (13.5 sec/veh)	B (17.9 sec/veh)	B (15.5 sec/veh)	B (17.9 sec/veh)	B (15.5 sec/veh)
Eastbound		A-3.8	A-5.2	A-4.4	A-6.4	A-5.8	A-6.9	A-5.8	A-6.9
Westbound		A-3.4	A-4.8	A-3.9	A-5.8	A-5.2	A-6.5	A-5.2	A-6.5
Northbound		D-51.6	D-50.2	D-52.2	D-50.4	E-56.8	D-53.6	E-56.8	D-53.6
Southbound		D-45.5	D-41.4	D-44.9	D-40.3	D-49.6	D-43.9	D-49.6	D-43.9
N. Duke Street (US 501) and Horton Road	Signalized	C (30.3 sec/veh)	D (37.2 sec/veh)	D (38.2 sec/veh)	E (62.2 sec/veh)	D (40.8 sec/veh)	E (68.9 sec/veh)	D (40.8 sec/veh)	E (68.9 sec/veh)
Eastbound		D-42.9	D-39.1	D-42.5	D-42.1	D-42.9	D-41.1	D-42.9	D-41.1
Westbound		D-49.5	D-51.9	E-59.6	E-58.2	E-58.9	E-59.0	E-58.9	E-59.0
Northbound		B-15.1	D-36.8	B-18.6	F-83.9	B-19.6	F-94.7	B-19.6	F-94.7
Southbound		C-27.3	C-28.8	D-39.9	D-37.1	D-45.3	D-43.4	D-45.3	D-43.4
N. Roxboro Street (US 501) and Seven Oaks Road	Signalized	B (14.6 sec/veh)	C (20.4 sec/veh)	B (19.0 sec/veh)	C (26.7 sec/veh)	B (19.0 sec/veh)	C (26.7 sec/veh)	B (19.0 sec/veh)	C (26.7 sec/veh)
Eastbound		E-59.6	E-72.8	E-60.3	E-73.2	E-60.3	E-73.2	E-60.3	E-73.2
Westbound		F-128.1	F-133.5	F-165.2	F-173.6	F-165.2	F-173.6	F-165.2	F-173.6
Northbound		A-7.4	B-14.2	A-8.2	B-19.0	A-8.3	B-19.2	A-8.3	B-19.2
Southbound		A-7.6	A-5.1	B-10.9	A-6.2	B-11.0	A-6.3	B-11.0	A-6.3
N. Roxboro Street (US 501) and Future Access #1	Unsignalized	-	-	-	-	-	-	-	-
Eastbound		-	-	-	-	F-1260.5	F-313.9	F-538.4	F-195.8

X (X sec/veh) = Overall intersection LOS (average delay), X-XX = Approach LOS and average delay



LEGEND	
	Existing Roadway
	Future Roadway
	Turning Movement
	Existing Stop-Controlled Approach
	Existing Signalized Intersection
	Proposed Turning Movement
	Proposed Stop-Controlled Approach



Figure ES-1
Future (2023) Lane Geometrics and Traffic Control

Westpoint Residential
Development TIA
Durham, NC

Table of Contents

1 **Introduction..... 1**

2 **Existing (2018) Conditions 4**

3 **No-Build (2023) Background Conditions 11**

4 **Build (2023) Conditions..... 14**

5 **Findings and Conclusions..... 20**

Appendices

- Appendix A: Turning Movement Counts**
- Appendix B: Traffic Signal Plans**
- Appendix C: Intersection Capacity Analysis**
- Appendix D: Memorandum of Understanding**

List of Tables

Table No.	Description	Page
Table 1	Weekday Peak Hour Turning Movement Count Schedule	7
Table 2	Level of Service Description for Intersections	8
Table 3	Existing (2018) LOS Results.....	9
Table 4	No-Build (2023) LOS Results	12
Table 5	Trip Generation Rates (Vehicle Trips).....	15
Table 6	Build (2023) LOS Results	18
Table 7	Summary of LOS Results.....	22

List of Figures

Figure No.	Description	Page
Figure 1	Vicinity Map	2
Figure 2	Site Plan	3
Figure 3	Existing (2018) Lane Geometrics and Traffic Control	6
Figure 4	Existing (2018) AM and PM Peak Hour Turning Movement Volumes.....	10
Figure 5	No-Build (2023) AM and PM Peak Hour Turning Movement Volumes	13
Figure 6	Peak Hour Trip Assignment Percentages.....	16
Figure 7	Total AM and PM Peak Hour Site Trips.....	17
Figure 8	Build (2023) AM and PM Peak Hour Turning Movement Volumes	19
Figure 9	Future (2023) Lane Geometrics and Traffic Control.....	23



1

Introduction

Sun Forest Systems has plans to construct a residential development on the west side of N. Roxboro Street (US 501) in Durham, NC (Figure 1). The site will be bordered by N. Roxboro Street (US 501) to the east, existing residential developments to the south, and the Eno River to the north. The development will consist of approximately 170 single-family homes and approximately 210 townhomes. The development is expected to be constructed by 2022.

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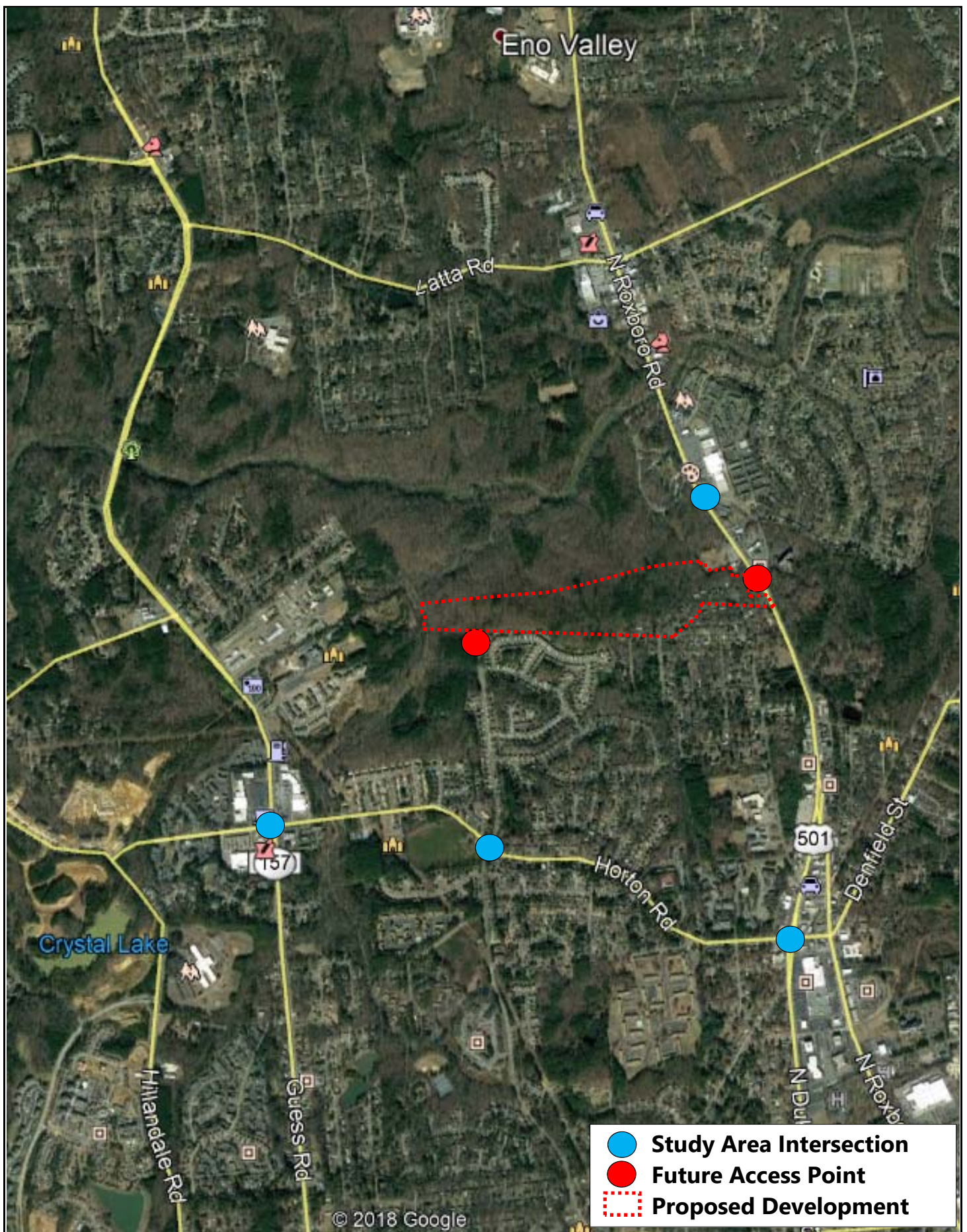
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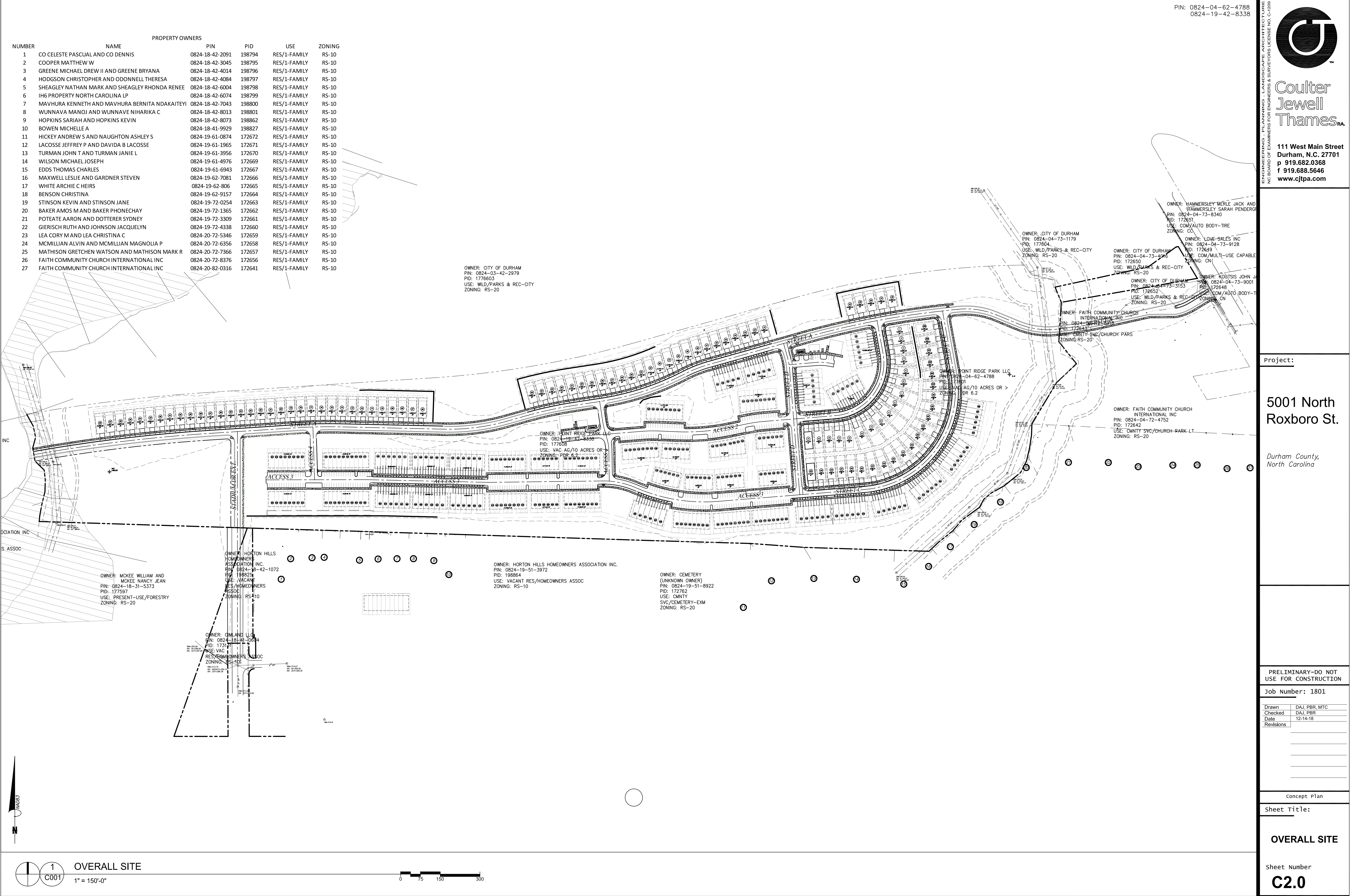
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- › Duke Street (US 501) and Horton Road (signalized)
- › N. Roxboro Street (US 501) and Seven Oaks Road (signalized)

N. Roxboro Street (US 501) and Future Access #1 (unsignalized)

VHB Engineering NC, P.C. was retained by Coulter Jewell Thames, PA to analyze the potential traffic impacts of the proposed development and to identify any necessary roadway improvements. This Traffic Impact Analysis (TIA) summarizes trip generation, distribution, traffic assignment, and traffic analyses for the proposed development.





NUMBER	NAME	PIN	PID	USE	ZONING
1	CO CELESTE PASCUAL AND CO DENNIS	0824-18-42-2091	198794	RES/1-FAMILY	RS-10
2	COOPER MATTHEW W	0824-18-42-3045	198795	RES/1-FAMILY	RS-10
3	GREENE MICHAEL DREW II AND GREENE BRYANA	0824-18-42-4014	198796	RES/1-FAMILY	RS-10
4	HODGSON CHRISTOPHER AND O'DONNELL THERESA	0824-18-42-4084	198797	RES/1-FAMILY	RS-10
5	SHEAGLEY NATHAN MARK AND SHEAGLEY RHONDA RENEE	0824-18-42-6004	198798	RES/1-FAMILY	RS-10
6	IHE PROPERTY NORTH CAROLINA LP	0824-18-42-6074	198799	RES/1-FAMILY	RS-10
7	MAVHURA KENNETH AND MAVHURA BERNITA NDAKAITEYI	0824-18-42-7043	198800	RES/1-FAMILY	RS-10
8	WUNNAVA MANOJ AND WUNNAVE NIHARIKA C	0824-18-42-8013	198801	RES/1-FAMILY	RS-10
9	HOPKINS SARIAH AND HOPKINS KEVIN	0824-18-42-8073	198862	RES/1-FAMILY	RS-10
10	BOWEN MICHELLE A	0824-18-41-9929	198827	RES/1-FAMILY	RS-10
11	HICKEY ANDREW S AND NAUGHTON ASHLEY S	0824-19-61-0874	172672	RES/1-FAMILY	RS-10
12	LACOSSE JEFFREY P AND DAVIDA B LACOSSE	0824-19-61-1965	172671	RES/1-FAMILY	RS-10
13	TURMAN JOHN T AND TURMAN JANIE L	0824-19-61-3956	172670	RES/1-FAMILY	RS-10
14	WILSON MICHAEL JOSEPH	0824-19-61-4976	172669	RES/1-FAMILY	RS-10
15	EDDS THOMAS CHARLES	0824-19-61-6943	172667	RES/1-FAMILY	RS-10
16	MAXWELL LESLIE AND GARDNER STEVEN	0824-19-62-7081	172666	RES/1-FAMILY	RS-10
17	WHITE ARCHIE C HEIRS	0824-19-62-806	172665	RES/1-FAMILY	RS-10
18	BENSON CHRISTINA	0824-19-62-9157	172664	RES/1-FAMILY	RS-10
19	STINSON KEVIN AND STINSON JANE	0824-19-72-0254	172663	RES/1-FAMILY	RS-10
20	BAKER AMOS M AND BAKER PHONECHAY	0824-19-72-1365	172662	RES/1-FAMILY	RS-10
21	POTEAATE AARON AND DOTTERER SYDNEY	0824-19-72-3309	172661	RES/1-FAMILY	RS-10
22	GIERISCH RUTH AND JOHNSON JACQUELYN	0824-19-72-4338	172660	RES/1-FAMILY	RS-10
23	LEA CORY M AND LEA CHRISTINA C	0824-20-72-5346	172659	RES/1-FAMILY	RS-10
24	MCMILLIAN ALVIN AND MCMILLIAN MAGNOLIA P	0824-20-72-6356	172658	RES/1-FAMILY	RS-10
25	MATHISON GRETCHEN WATSON AND MATHISON MARK R	0824-20-72-7366	172657	RES/1-FAMILY	RS-10
26	FAITH COMMUNITY CHURCH INTERNATIONAL INC	0824-20-72-8376	172656	RES/1-FAMILY	RS-10
27	FAITH COMMUNITY CHURCH INTERNATIONAL INC	0824-20-82-0316	172641	RES/1-FAMILY	RS-10

OWNER: CITY OF DURHAM
PIN: 0824-03-42-2979
PID: 1776603
USE: WILD/PARKS & REC-CITY
ZONING: RS-20

OWNER: POINT RIDGE PARK LLC
PIN: 0824-19-42-8340
PID: 177608
USE: VAC AG/10 ACRES OR >
ZONING: PDR 6.2

OWNER: HORTON HILLS HOMEOWNERS ASSOCIATION INC.
PIN: 0824-19-51-3972
PID: 198864
USE: VACANT RES/HOMEOWNERS ASSOC
ZONING: RS-10

OWNER: CEMETERY (UNKNOWN OWNER)
PIN: 0824-19-51-8922
PID: 177262
USE: CMNTY SVC/CEMETERY-EXM
ZONING: RS-20

OWNER: HAMMERSLEY MERLE JACK AND HAMMERSLEY SARAH PENDERG
PIN: 0824-04-73-8340
PID: 172651
USE: COM/AUTO BODY-TIRE
ZONING: CO

OWNER: LOVE SALES INC
PIN: 0824-04-73-9128
PID: 172649
USE: COM/MULTI-USE CAPABLE
ZONING: CN

OWNER: CITY OF DURHAM
PIN: 0824-04-73-5096
PID: 172650
USE: WILD/PARKS & REC-CITY
ZONING: RS-20

OWNER: CITY OF DURHAM
PIN: 0824-04-73-3153
PID: 172648
USE: WILD/PARKS & REC-CITY
ZONING: RS-20

OWNER: KOUTSIS JOHN J
PIN: 0824-04-73-9001
PID: 172647
USE: COM/AUTO BODY-T
ZONING: CN

OWNER: FAITH COMMUNITY CHURCH INTERNATIONAL INC
PIN: 0824-04-72-4752
PID: 172642
USE: CMNTY SVC/CHURCH-PARK-LT
ZONING: RS-20

OWNER: MCKEE WILLIAM AND MCKEE NANCY JEAN
PIN: 0824-18-31-5373
PID: 177597
USE: PRESENT-USE/FORESTRY
ZONING: RS-20

OWNER: HORTON HILLS HOMEOWNERS ASSOCIATION INC.
PIN: 0824-19-42-1072
PID: 198825
USE: VACANT RES/HOMEOWNERS ASSOC
ZONING: RS-10

OWNER: OM LAND LLC
PIN: 0824-18-41-10614
PID: 17310
USE: VAC
ZONING: RS-10



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PRELIMINARY-DO NOT
USE FOR CONSTRUCTION

Job Number: 1801

Drawn	DAJ, PBR, MTC
Checked	DAJ, PBR
Date	12-14-18
Revisions	

Concept Plan

Sheet Title:

OVERALL SITE

Sheet Number

C2.0



2

Existing (2018) Conditions

This section describes the existing roadways in the vicinity of the proposed development. Average Annual Daily Traffic (AADT) data for the surrounding network of roadway were obtained from the North Carolina Department of Transportation (NCDOT). The most recent AADT counts from the NCDOT are for 2017 on the study area roadways.

N. Duke Street/N. Roxboro Street (US 501)

- › Within the study area limits, US 501 is a four-lane roadway divided by a two-way left-turn lane with a posted speed limit of 40 miles per hour (mph).
- › The land uses along US 501 are primarily commercial, residential, and institutional within the study area limits.
- › According to the NCDOT, the 2017 AADT along US 501 was 28,000 vehicles per day (vpd) south of Horton Road, 26,000 vpd north of Horton Road and 32,000 vpd north of Seven Oaks Road.

Guess Road (NC 157)

- › Within the study area limits, Guess Road (NC 157) is a four-lane roadway divided by a two-way left-turn lane with a posted speed limit of 40 mph.
- › The land uses along Guess Road (NC 157) are primarily institutional, residential, and commercial within the study area limits.
- › According to the NCDOT, the 2017 AADT along Guess Road (NC 157) was 25,000 vpd north of Horton Road.

Horton Road

- › Within the study area limits, Horton Road is a two-lane undivided roadway with a posted speed limit of 35 mph.
- › The land use along Horton Road is primarily residential within the study area limits.
- › According to the NCDOT, the 2017 AADT along Horton Road was 7,600 vpd west of Guess Road (NC 157), 13,000 vpd west of N. Duke Street (US 501), and 12,000 vpd east of N. Duke Street (US 501).

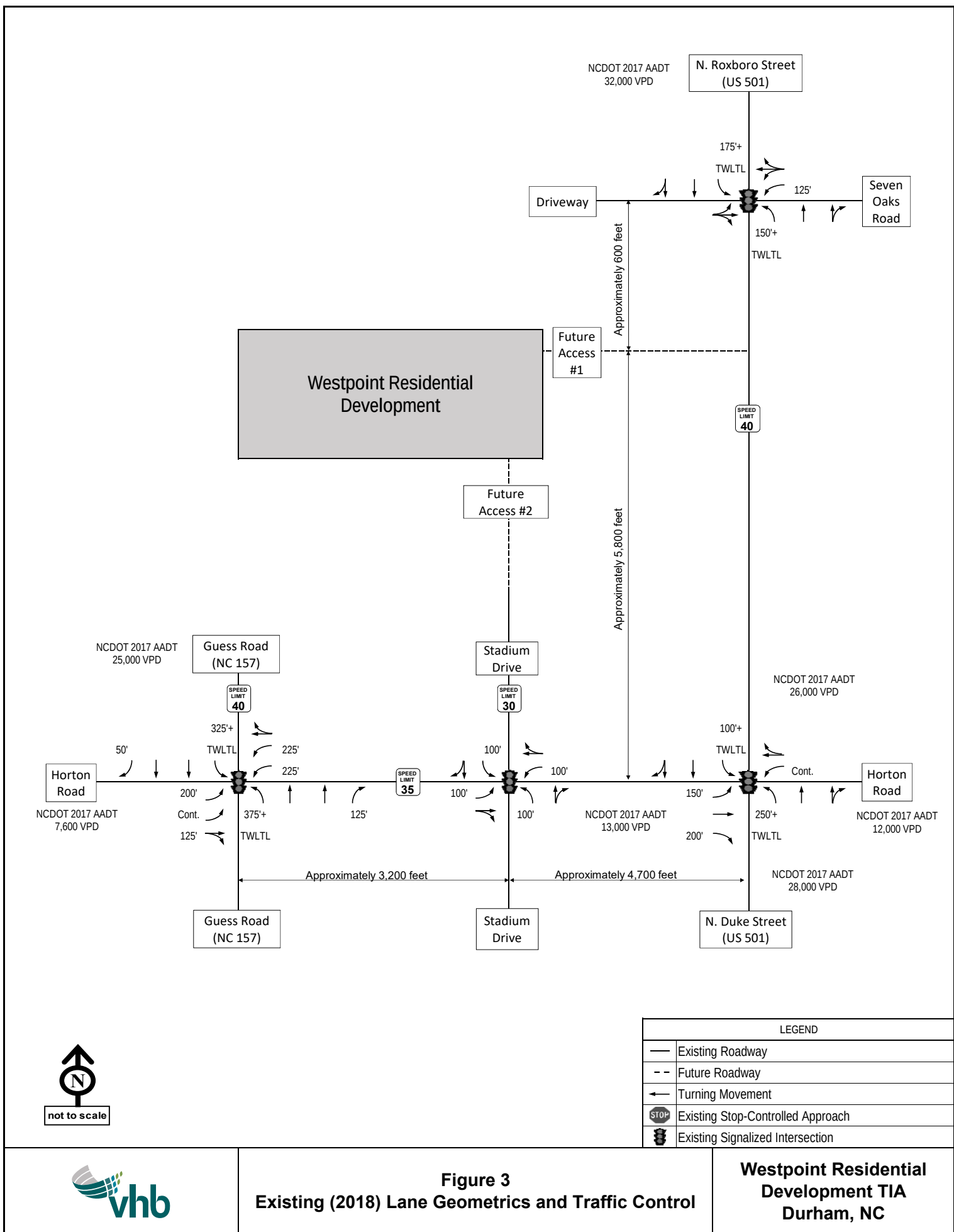
Stadium Drive

- › Within the study area limits, Stadium Drive is a two-lane undivided roadway with a posted speed limit of 30 mph.
- › The land use along Stadium Drive is primarily residential within the study area limits.
- › No AADT information was available for Stadium Drive.

Seven Oaks Road

- › Within the study area limits, Seven Oaks Road is a two-lane undivided roadway with no posted speed limit.
- › The land use along Seven Oaks Road is primarily residential within the study area limits.
- › No AADT information was available for Seven Oaks Road.

Figure 3 provides a schematic diagram of the existing roadways near the proposed development, including the intersection geometrics.



Existing Turning Movement Data

VHB Engineering NC, P.C. collected the weekday AM and PM peak hour intersection turning movement counts in December 2018. Table 1 summarizes the schedule used to obtain the turning movement data. A detailed summary of the traffic counts can be found in Appendix A. The existing peak hour turning movement volumes are shown in Figure 4.

Table 1 Weekday Peak Hour Turning Movement Count Schedule

Intersection	Time Period	Data Collection Date
Guess Road (NC 157) and Horton Road	7:00 AM – 9:00 AM 4:00 PM – 6:00 PM	Tuesday December 18, 2018
Horton Road and Stadium Drive	7:00 AM – 9:00 AM 4:00 PM – 6:00 PM	Tuesday December 18, 2018
N. Duke Street (US 501) and Horton Road	7:00 AM – 9:00 AM 4:00 PM – 6:00 PM	Tuesday December 18, 2018
N. Roxboro Street (US 501) and Seven Oaks Road	7:00 AM – 9:00 AM 4:00 PM – 6:00 PM	Tuesday December 18, 2018

Level of Service Criteria

Peak hour level of service (LOS) measures the adequacy of the intersection geometrics and traffic controls of a particular intersection or approach for the given turning volumes. Levels of service range from A through F, based on the average control delay experienced by vehicles traveling through the intersection during the peak hour. Control delay represents the portion of total delay attributed to traffic control devices (e.g., signals or stop signs). The engineering professional generally accepts LOS D as an acceptable operating condition for signalized intersections in urban areas and LOS C for rural areas.

At unsignalized intersections, LOS E is generally considered acceptable only if the side street encounters the delay. Nevertheless, side streets sometimes function at LOS F during peak traffic periods; however, the traffic volume often does not warrant a traffic signal to assist side street traffic. Table 2 provides a general description of various levels of service categories and delay ranges.

Table 2 Level of Service Description for Intersections

Level of Service	Description	Signalized Intersection	Unsignalized Intersection
A	Little or no delay	≤ 10 sec.	≤ 10 sec.
B	Short traffic delay	10-20 sec.	10-15 sec.
C	Average traffic delay	20-35 sec.	15-25 sec.
D	Long traffic delay	35-55 sec.	25-35 sec.
E	Very long traffic delay	55-80 sec.	35-50 sec.
F	Unacceptable delay	> 80 sec.	> 50 sec.

Level of Service Analysis

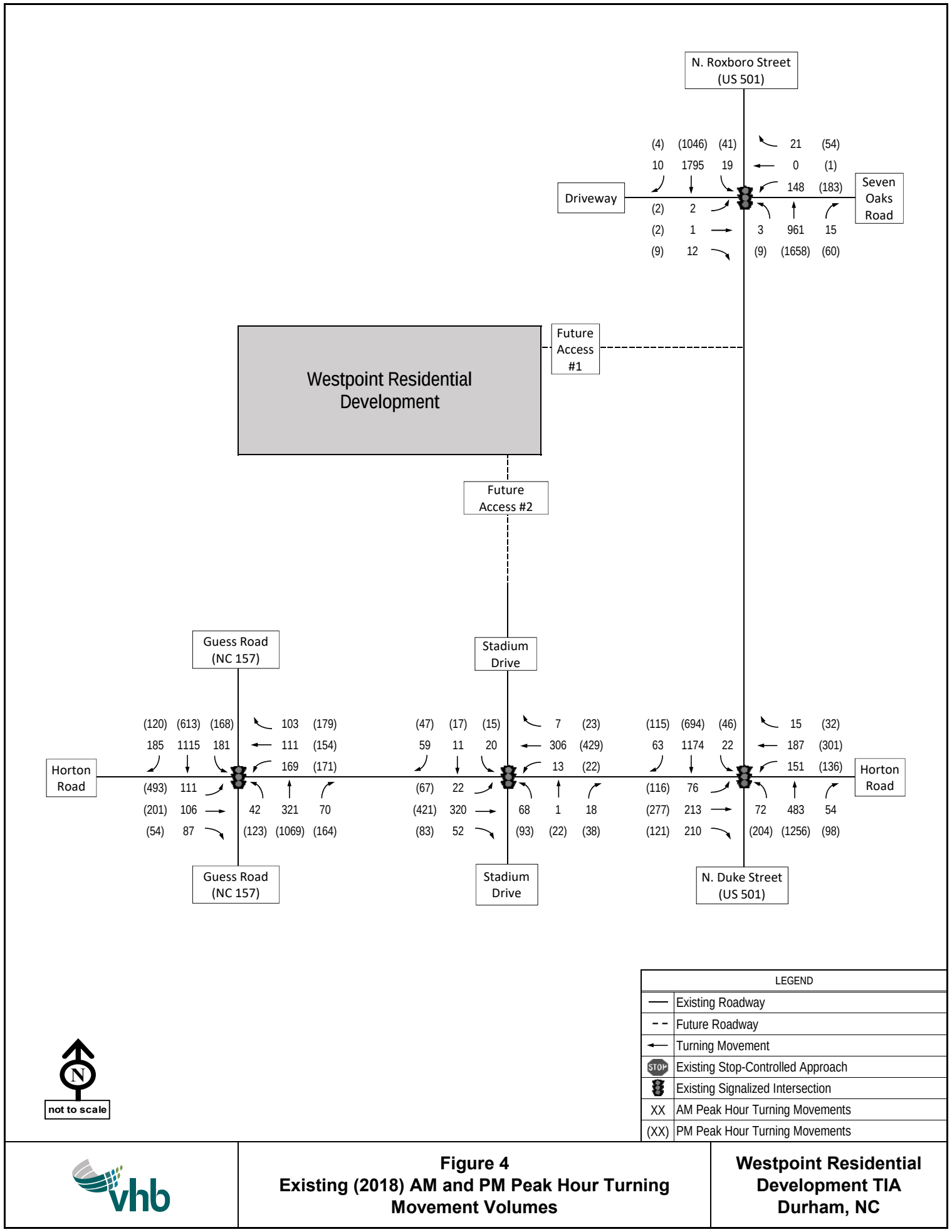
Intersection levels of service analyses were performed for the typical weekday AM and PM peak hour using *Synchro/SimTraffic Professional Version 10*. The existing signal plans and timings provided by the NCDOT and City of Durham were utilized in the analysis and are included in Appendix B. A summary of the findings for the Existing (2018) scenario LOS analysis can be found in Table 3 and the full *Synchro* output can be found in Appendix C.

As reported in Table 3, one signalized intersection within the study area does not operate at acceptable levels of service (i.e., LOS D or better) during the PM peak hour. The signalized intersection of Guess Road (NC 157) and Horton Road operates at LOS E during the PM peak hour. All other signalized intersections operate acceptably during both peak hours.

Table 3 Existing (2018) LOS Results

Intersection and Approach	Traffic Control	Existing (2018)	
		AM	PM
Guess Road (NC 157) and Horton Road	Signalized	C (32.2 sec/veh)	E (55.0 sec/veh)
Eastbound		E-61.0	E-71.5
Westbound		E-59.8	E-64.4
Northbound		B-17.9	D-53.6
Southbound		C-23.3	D-38.3
Horton Road and Stadium Drive/Future Access #2	Signalized	B (12.5 sec/veh)	B (12.6 sec/veh)
Eastbound		A-3.8	A-5.2
Westbound		A-3.4	A-4.8
Northbound		D-51.6	D-50.2
Southbound		D-45.5	D-41.4
N. Duke Street (US 501) and Horton Road	Signalized	C (30.3 sec/veh)	D (37.2 sec/veh)
Eastbound		D-42.9	D-39.1
Westbound		D-49.5	D-51.9
Northbound		B-15.1	D-36.8
Southbound		C-27.3	C-28.8
N. Roxboro Street (US 501) and Seven Oaks Road	Signalized	B (14.6 sec/veh)	C (20.4 sec/veh)
Eastbound		E-59.6	E-72.8
Westbound		F-128.1	F-133.5
Northbound		A-7.4	B-14.2
Southbound		A-7.6	A-5.1

X (X sec/veh) = Overall intersection LOS (average delay), X-XX = Approach LOS and average delay





3

No-Build (2023) Background Conditions

Background Growth and Development

Based on the City of Durham requirements, an annual growth rate of three percent (3%) was applied to the existing traffic to account for the normal growth between the base year (2018) and the build year (2022+1). No background projects in the area were identified; therefore, no additional site trips from surrounding developments were included in the No-Build (2023) scenario. The No-Build (2023) AM and PM peak hour volumes are shown in Figure 5.

Level of Service Analysis

Intersection levels of service analyses were performed for the typical weekday AM and PM peak hours using *Synchro/SimTraffic Professional Version 10*. Signal cycle lengths and offsets were maintained from the Existing (2018) scenario; however, the splits at all signalized intersections were optimized from the Existing (2018) scenario. A summary of the findings for the No-Build (2023) scenario LOS analysis can be found in Table 4 and the full *Synchro* output can be found in Appendix C.

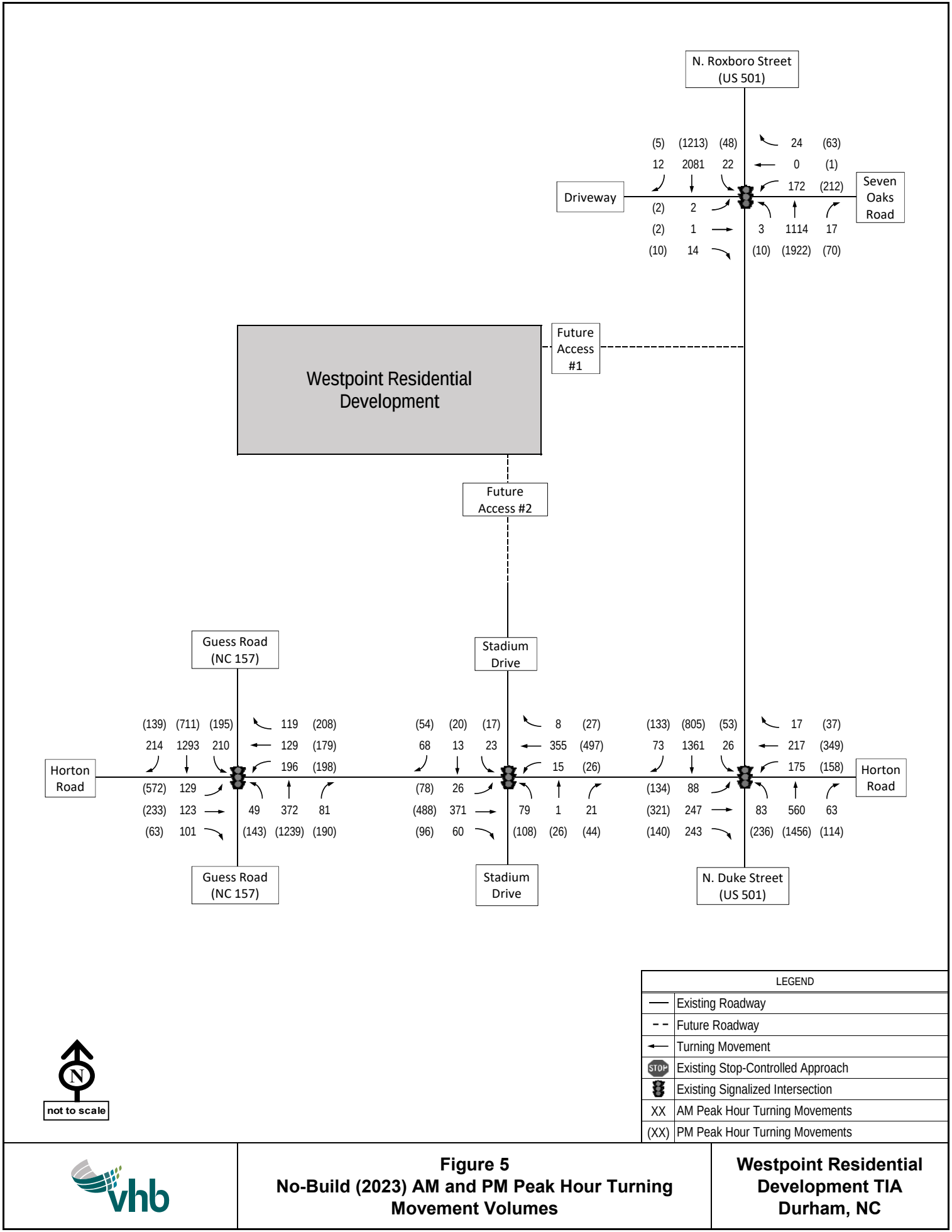
As reported in Table 4, two out of four signalized study intersections operate at an unacceptable level of service during the PM peak hour. The intersection of Guess Road (NC 157) and Horton Road continues to operate at LOS E during the PM peak hour, and the

intersection of N. Duke Street (US 501) and Horton Road deteriorates to LOS E during the PM peak hour.

Table 4 No-Build (2023) LOS Results

Intersection and Approach	Traffic Control	No-Build (2023)	
		AM	PM
Guess Road (NC 157) and Horton Road	Signalized	D (35.9 sec/veh)	E (74.4 sec/veh)
Eastbound		E-62.0	F-87.1
Westbound		E-65.6	F-101.1
Northbound		C-20.3	E-71.8
Southbound		C-27.5	D-52.9
Horton Road and Stadium Drive/Future Access #2	Signalized	B (12.9 sec/veh)	B (13.5 sec/veh)
Eastbound		A-4.4	A-6.4
Westbound		A-3.9	A-5.8
Northbound		D-52.2	D-50.4
Southbound		D-44.9	D-40.3
N. Duke Street (US 501) and Horton Road	Signalized	D (38.2 sec/veh)	E (62.2 sec/veh)
Eastbound		D-42.5	D-42.1
Westbound		E-59.6	E-58.2
Northbound		B-18.6	F-83.9
Southbound		D-39.9	D-37.1
N. Roxboro Street (US 501) and Seven Oaks Road	Signalized	B (19.0 sec/veh)	C (26.7 sec/veh)
Eastbound		E-60.3	E-73.2
Westbound		F-165.2	F-173.6
Northbound		A-8.2	B-19.0
Southbound		B-10.9	A-6.2

X (X sec/veh) = Overall intersection LOS (average delay), X-XX = Approach LOS and average delay





4

Build (2023) Conditions

Sun Forest Systems has plans to construct a residential development on the west side of N. Roxboro Street (US 501) in Durham, NC (Figure 1). The site will be bordered by N. Roxboro Street (US 501) to the east, existing residential developments to the south, and the Eno River to the north. The development will consist of approximately 170 single-family homes and approximately 210 townhomes. The development is expected to be constructed by 2022.

Trip Generation

Trip generation was conducted based on the most appropriate corresponding trip generation codes included in the *ITE Trip Generation Manual, 10th Edition* and the suggested method of calculation in the NCDOT's *"Rate vs. Equation" Spreadsheet*. The proposed Westpoint at Eno Development is to consist of approximately 170 single-family homes and 210 townhomes; ITE LUC 210 (Single-Family Detached Housing) and LUC 220 (Multifamily Housing (Low Rise)) were used based on the NCDOT guidance.

As a result, the proposed development is projected to generate 3,407 daily weekday site trips, with 219 trips (52 entering, 167 exiting) occurring in the AM peak hour and 268 trips (169 entering, 99 exiting) occurring in the PM peak hour. The generated site trips were distributed in accordance with the existing turning movement counts and land uses.

Table 5 summarizes the assumed trip generation for the proposed development for typical weekday AM and PM peak hours.

Table 5 Trip Generation Rates (Vehicle Trips)

Land Use Code ¹	Land Use	Unit	ADT	AM Peak Hour			PM Peak Hour		
				Enter	Exit	Total	Enter	Exit	Total
Total Site Trips (including Internal Trips between Mixed Uses and Pass-By Trips for Commercial Uses) ²									
210	Single-Family Detached Housing	102 du	1,059	19	58	77	66	38	104
220	Multifamily Housing (Low-Rise)	316 du	2,348	33	109	142	103	61	164
Development Total			3,407	52	167	219	169	99	268

Notes:

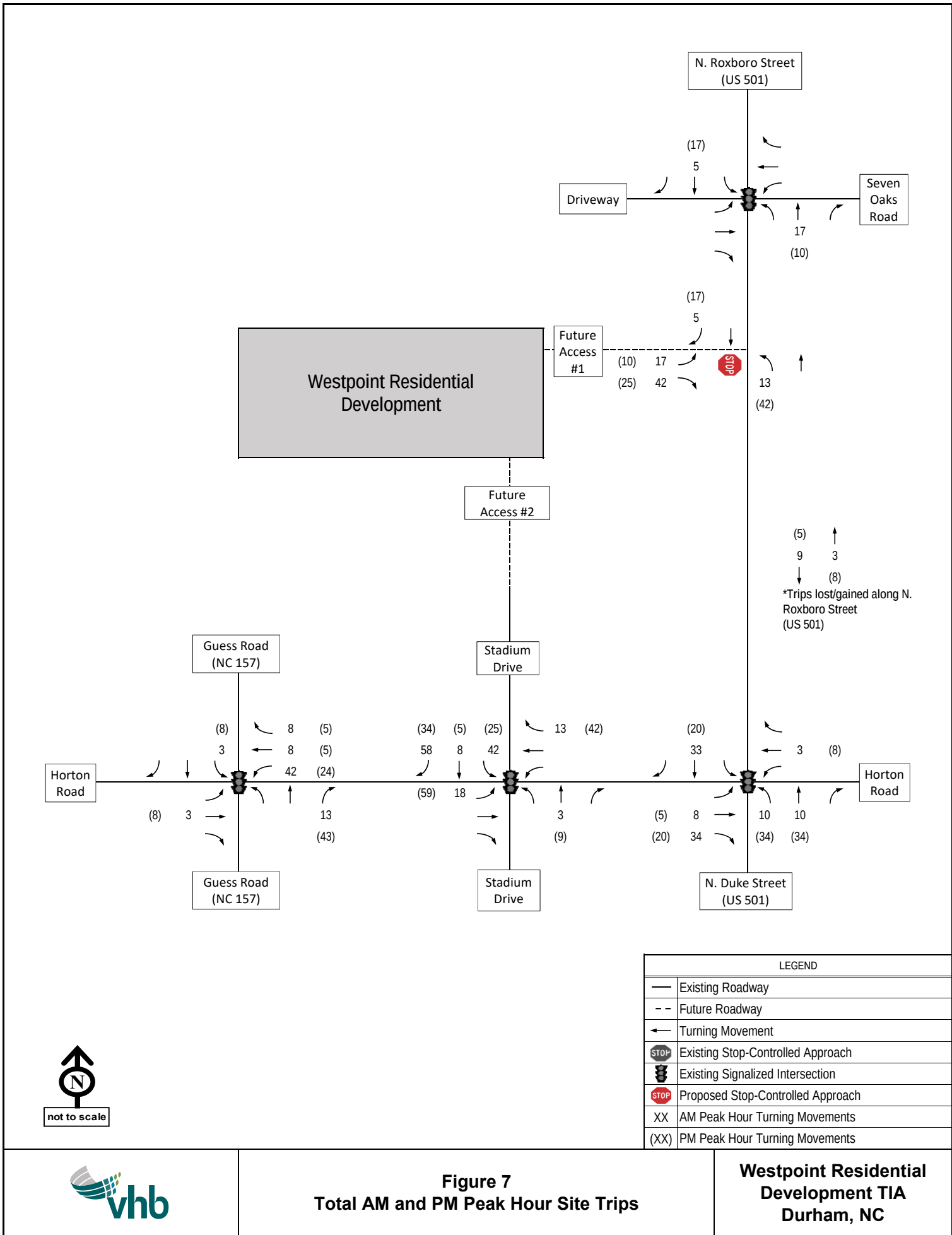
1. Land Use Code and trip generation rates are determined based on *ITE Trip Generation, 10th Edition*
2. Total site trips are determined based on the suggested method in the NCDOT Rate Vs Equation Spreadsheet

Trip Distribution and Assignment

The proposed development will construct Future Access #1 to connect to N. Roxboro Street (US 501) and will construct Future Access #2 to connect to Stadium Drive with the complete build-out. The generated site trips were distributed in accordance with the existing traffic patterns and land uses in the vicinity of the study area as follows:

- › N. Roxboro Street (US 501) to/from the north – 10%
- › Duke Street (US 501) to/from the south – 40%
- › Horton Road to/from the east – 5%
- › Horton Road to/from the west – 5%
- › Guess Road (NC 157) to/from the north – 5%
- › Guess Road (NC 157) to/from the south – 25%
- › Stadium Drive to/from the south – 5%
- › Trips lost along N. Roxboro Street (US 501) – 5%

The site trip percentages are depicted in Figure 6 and the resulting site generated trips are depicted in Figure 7.



Level of Service Analysis

The Build (2023) analysis scenario includes the No-Build (2023) traffic and site generated trips from the proposed development as described previously. Figure 8 depicts the turning movement volumes used in the Build (2023) scenario analysis.

Intersection levels of service analyses were performed for the typical weekday AM and PM peak hours using *Synchro/SimTraffic Professional Version 10*. Table 6 summarizes the findings of the LOS analysis, and Appendix C contains the full *Synchro* reports of the analyses.

As reported in Table 6, with the addition of site trips, the study area signalized intersections continue to operate similarly to the No-Build (2023) scenario. The intersections of Guess Road (NC 157) at Horton Road and N. Duke Street (US 501) at Horton Road continue to operate at LOS E during the PM peak hour with slight increases in delay. The proposed eastbound stop-controlled approach for Future Access #1 is projected to operate at LOS F during both peak hours.

Table 6 Build (2023) LOS Results

Intersection and Approach	Traffic Control	Build (2023)	
		AM	PM
Guess Road (NC 157) and Horton Road	Signalized	D (38.6 sec/veh)	E (76.1 sec/veh)
Eastbound		E-60.4	F-97.0
Westbound		E-75.1	F-105.0
Northbound		C-21.0	E-66.2
Southbound		C-28.5	E-56.5
Horton Road and Stadium Drive/Future Access #2	Signalized	B (17.9 sec/veh)	B (15.7 sec/veh)
Eastbound		A-5.8	A-7.0
Westbound		A-5.3	A-6.6
Northbound		E-56.4	D-54.0
Southbound		D-49.3	D-44.0
N. Duke Street (US 501) and Horton Road	Signalized	D (40.9 sec/veh)	E (69.3 sec/veh)
Eastbound		D-42.9	D-41.0
Westbound		E-58.9	E-59.2
Northbound		B-19.7	F-95.4
Southbound		D-45.4	D-43.7
N. Roxboro Street (US 501) and Seven Oaks Road	Signalized	B (19.0 sec/veh)	C (26.7 sec/veh)
Eastbound		E-60.3	E-73.2
Westbound		F-165.2	F-173.6
Northbound		A-8.3	B-19.2
Southbound		B-11.0	A-6.3
N. Roxboro Street (US 501) and Future Access #1	Unsignalized	-	-
Eastbound		F-1260.5	F-349.3

X (X sec/veh) = Overall intersection LOS (average delay), X-XX = Approach LOS and average delay



5

Findings and Conclusions

As indicated in the traffic operations analyses, the proposed development is projected to have minimal impact on the traffic operations of the surrounding roadway network and intersections. Generally, intersections within the study area are more affected by background growth in the area instead of trips generated by the proposed development. The aforementioned changes in LOS for the described intersections minimally change the overall functionality of the intersections. Therefore, no offsite improvements are recommended; however, the following driveway configurations should be considered.

N. Roxboro Street (US 501) and Future Access #1

The stop-controlled approach along Future Access #1 is projected to operate at LOS F during both peak hours. The peak hour volumes projected to use Future Access #1 are not expected to meet peak hour signal warrants. The driveway will be able to operate as stop-controlled with vehicles leaving the development needing to wait to make a turning movement until a gap in traffic along N. Roxboro Street (US 501) is available. The following is recommended for the Future Access #1 connection:

- › Construct Future Access #1 to connect to N. Roxboro Street (US 501) as a full access intersection.
- › Utilize the existing two-way left-turn lane to accommodate northbound left-turning vehicles entering the site.
- › Provide one ingress lane and two egress lanes that will consist of a continuous eastbound left-turn lane and an eastbound right-turn lane with at least 150 feet of storage.

Future Access #2/Stadium Drive

The site plan submitted proposes to extend existing Stadium Drive to provide a direct connection to the development. This connection will have no effect on the existing alignment of Stadium Drive, and no additional improvements to Stadium Drive are recommended in addition to the extension of the roadway.

Future Access #3/Burnt Oak Lane

The site plan submitted proposes to extend existing Burnt Oak Lane to provide a direct connection to the development. This connection will have no effect on the existing alignment of Burnt Oak Lane, and no additional improvements to Burnt Oak Lane, or the surrounding residential roadways, are recommended. Vehicles utilizing Future Access #3 will use the residential streets of Woodside Park Lane and Woodgreen Drive to get to Stadium Drive. Therefore, Future Access #3 was analyzed with Future Access #2 since both will utilize Stadium Drive to reach the rest of the roadway network.

As shown on the Summary LOS table on page v, two signalized intersections operate at LOS E during the PM peak hour in the No-Build (2023) and Build (2023) scenarios. The intersections see significant increases in delay due to projected background growth between the Existing (2018) and No-Build (2023) scenarios. With the addition of generated site trips, the two signalized intersections only see minimal increases in delay compared to what was observed in the No-Build (2023) scenario.

The trips generated by the development are not projected to make up at least 10% of any approach during the peak hour that either of the signalized intersection operate at failing levels of service (PM peak hour). Since the site trips generated do not cause any of the study area intersections to deteriorate to a failing level of service, this study does not require any additional improvements within the study area.

Multiple intersection improvements would help improve overall operations across the roadway network; however, these improvements are not required to be constructed in addition to the build-out of the development. The following intersection geometry improvements would help improve operations throughout the study area:

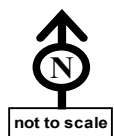
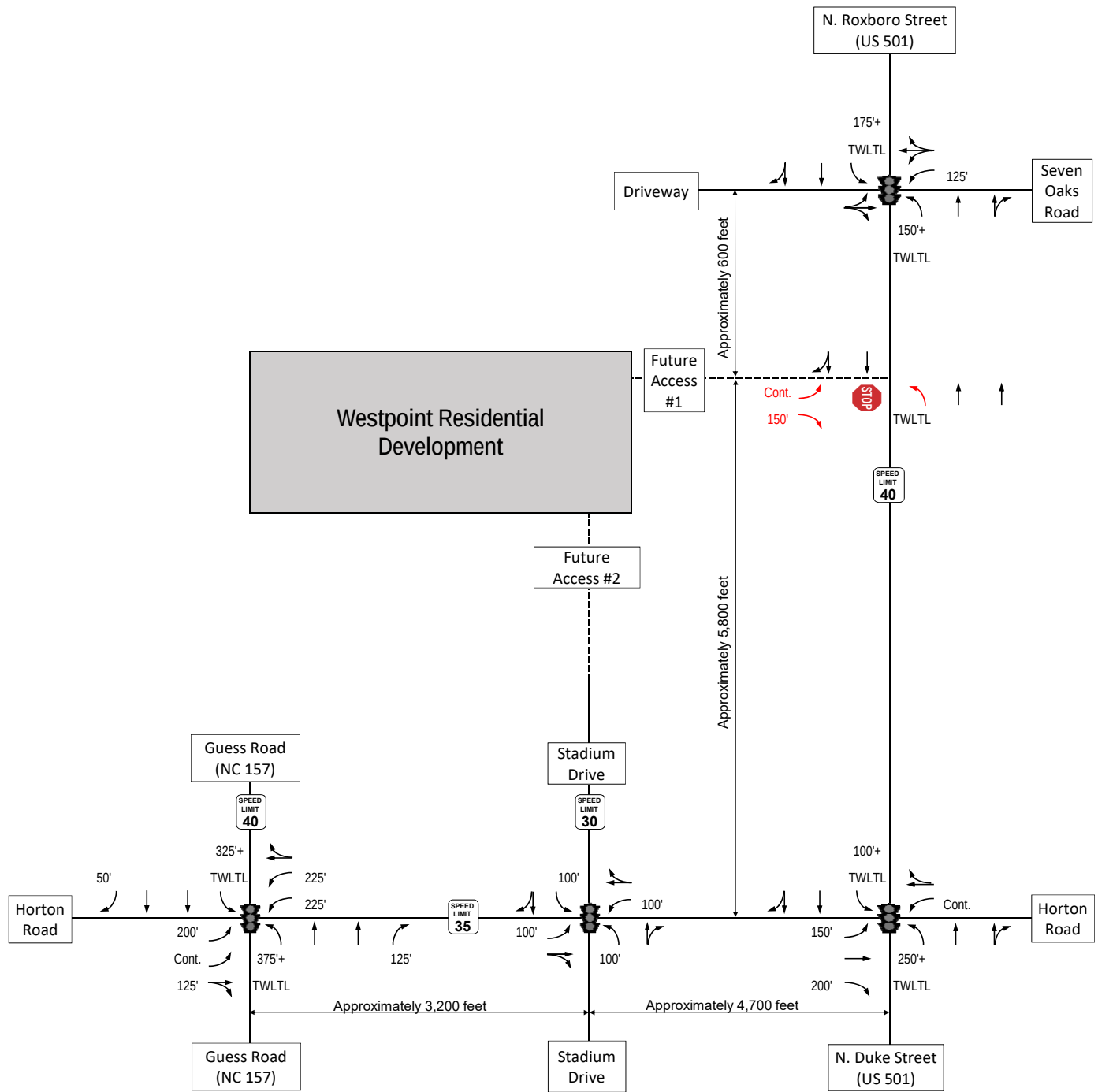
- › Construct a northbound right-turn lane along N. Duke Street (US 501) at Horton Road.
- › Construct a southbound right-turn lane along N. Duke Street (US 501) at Horton Road.
- › Construct a westbound right-turn lane along Horton Road at Guess Road (NC 157).

If funding is available for future projects in the area, these improvements should be considered.

Table 7 Summary of LOS Results

Intersection and Approach	Traffic Control	Existing (2018)		No-Build (2023)		Build (2023)		Build (2023) with Improvements	
		AM	PM	AM	PM	AM	PM	AM	PM
Guess Road (NC 157) and Horton Road	Signalized	C (32.2 sec/veh)	E (55.0 sec/veh)	D (35.9 sec/veh)	E (74.4 sec/veh)	D (38.5 sec/veh)	E (76.1 sec/veh)	D (38.5 sec/veh)	E (76.1 sec/veh)
Eastbound		E-61.0	E-71.5	E-62.0	F-87.1	E-60.6	F-97.0	E-60.6	F-97.0
Westbound		E-59.8	E-64.4	E-65.6	F-101.1	E-75.1	F-104.6	E-75.1	F-104.6
Northbound		B-17.9	D-53.6	C-20.3	E-71.8	C-20.9	E-66.2	C-20.9	E-66.2
Southbound		C-23.3	D-38.3	C-27.5	D-52.9	C-28.3	E-56.5	C-28.3	E-56.5
Horton Road and Stadium Drive/Future Access #2	Signalized	B (12.5 sec/veh)	B (12.6 sec/veh)	B (12.9 sec/veh)	B (13.5 sec/veh)	B (17.9 sec/veh)	B (15.5 sec/veh)	B (17.9 sec/veh)	B (15.5 sec/veh)
Eastbound		A-3.8	A-5.2	A-4.4	A-6.4	A-5.8	A-6.9	A-5.8	A-6.9
Westbound		A-3.4	A-4.8	A-3.9	A-5.8	A-5.2	A-6.5	A-5.2	A-6.5
Northbound		D-51.6	D-50.2	D-52.2	D-50.4	E-56.8	D-53.6	E-56.8	D-53.6
Southbound		D-45.5	D-41.4	D-44.9	D-40.3	D-49.6	D-43.9	D-49.6	D-43.9
N. Duke Street (US 501) and Horton Road	Signalized	C (30.3 sec/veh)	D (37.2 sec/veh)	D (38.2 sec/veh)	E (62.2 sec/veh)	D (40.8 sec/veh)	E (68.9 sec/veh)	D (40.8 sec/veh)	E (68.9 sec/veh)
Eastbound		D-42.9	D-39.1	D-42.5	D-42.1	D-42.9	D-41.1	D-42.9	D-41.1
Westbound		D-49.5	D-51.9	E-59.6	E-58.2	E-58.9	E-59.0	E-58.9	E-59.0
Northbound		B-15.1	D-36.8	B-18.6	F-83.9	B-19.6	F-94.7	B-19.6	F-94.7
Southbound		C-27.3	C-28.8	D-39.9	D-37.1	D-45.3	D-43.4	D-45.3	D-43.4
N. Roxboro Street (US 501) and Seven Oaks Road	Signalized	B (14.6 sec/veh)	C (20.4 sec/veh)	B (19.0 sec/veh)	C (26.7 sec/veh)	B (19.0 sec/veh)	C (26.7 sec/veh)	B (19.0 sec/veh)	C (26.7 sec/veh)
Eastbound		E-59.6	E-72.8	E-60.3	E-73.2	E-60.3	E-73.2	E-60.3	E-73.2
Westbound		F-128.1	F-133.5	F-165.2	F-173.6	F-165.2	F-173.6	F-165.2	F-173.6
Northbound		A-7.4	B-14.2	A-8.2	B-19.0	A-8.3	B-19.2	A-8.3	B-19.2
Southbound		A-7.6	A-5.1	B-10.9	A-6.2	B-11.0	A-6.3	B-11.0	A-6.3
N. Roxboro Street (US 501) and Future Access #1	Unsignalized	-	-	-	-	-	-	-	-
Eastbound		-	-	-	-	F-1260.5	F-313.9	F-538.4	F-195.8

X (X sec/veh) = Overall intersection LOS (average delay), X-XX = Approach LOS and average delay



LEGEND	
—	Existing Roadway
--	Future Roadway
←	Turning Movement
STOP	Existing Stop-Controlled Approach
⬇	Existing Signalized Intersection
→	Proposed Turning Movement
STOP	Proposed Stop-Controlled Approach



Figure 9
Future (2023) Lane Geometrics and Traffic Control

Westpoint Residential
Development TIA
Durham, NC

Appendices

Appendix A:

Turning Movement Counts

VHB Engineering NC, P.C.

Venture I
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
p: 919.829.0328 f: 919.833.0034

File Name : Horton@Guess
Site Code :
Start Date : 12/18/2018
Page No : 1

Groups Printed- Passenger Vehicles - Single Unit - TTST - Bicycles on Crosswalk - Pedestrians

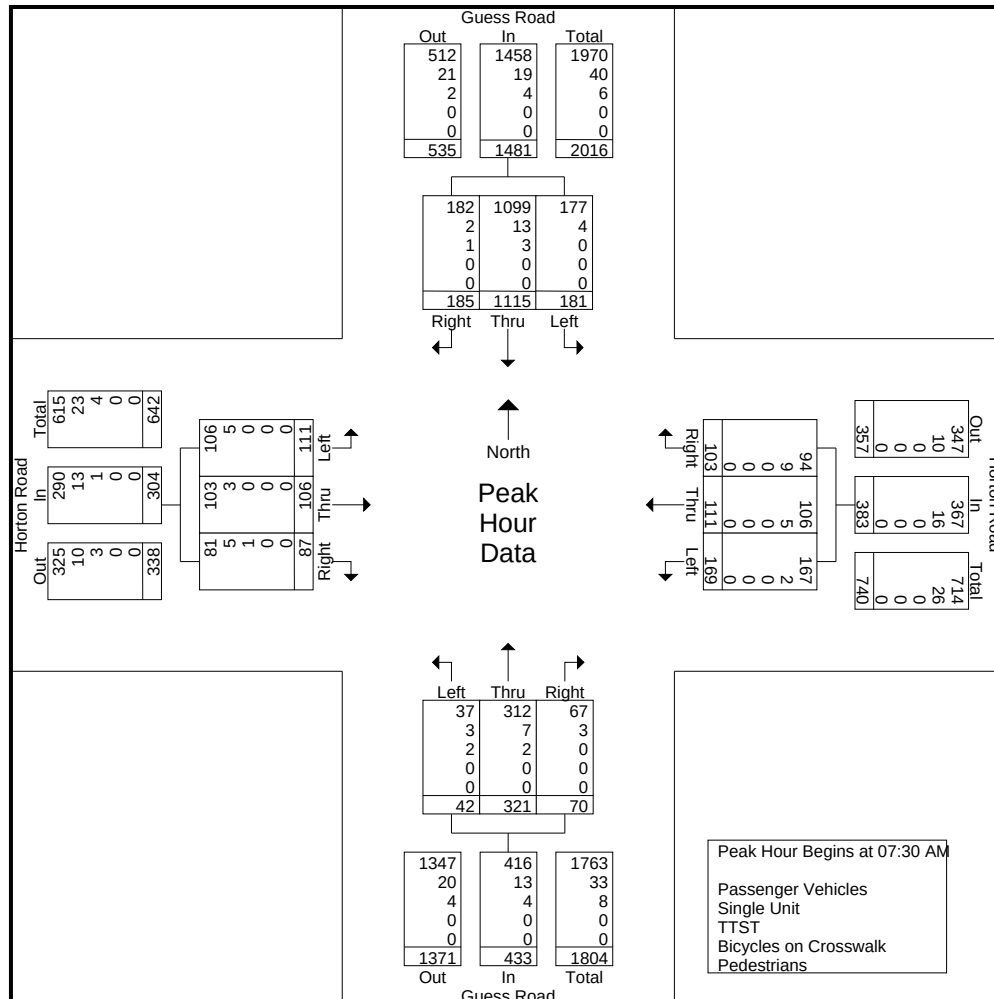
	Guess Road Southbound				Horton Road Westbound				Guess Road Northbound				Horton Road Eastbound				Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
07:00 AM	33	236	45	0	36	16	12	0	3	60	11	0	16	16	13	0	0	497	497
07:15 AM	39	317	47	0	47	35	13	0	6	48	17	0	13	20	15	0	0	617	617
07:30 AM	45	295	57	1	56	19	14	1	16	68	20	1	28	20	19	0	3	657	660
07:45 AM	48	290	44	0	40	24	26	0	13	86	19	0	22	22	21	0	0	655	655
Total	165	1138	193	1	179	94	65	1	38	262	67	1	79	78	68	0	3	2426	2429
08:00 AM	42	251	39	0	40	38	29	0	6	66	18	0	30	30	23	0	0	612	612
08:15 AM	46	279	45	0	33	30	34	0	7	101	13	0	31	34	24	0	0	677	677
08:30 AM	43	252	35	0	41	29	29	0	16	88	21	0	30	38	23	0	0	645	645
08:45 AM	43	235	40	0	33	32	49	0	15	111	12	0	22	35	25	0	0	652	652
Total	174	1017	159	0	147	129	141	0	44	366	64	0	113	137	95	0	0	2586	2586
*** BREAK ***																			
04:00 PM	43	132	26	0	33	45	33	2	18	188	41	1	105	47	16	0	3	727	730
04:15 PM	49	147	36	0	41	40	33	0	26	224	50	0	113	32	20	0	0	811	811
04:30 PM	34	126	34	0	44	36	30	0	32	247	44	0	138	42	14	1	1	821	822
04:45 PM	39	157	30	1	44	38	39	1	27	261	61	1	121	52	12	0	3	881	884
Total	165	562	126	1	162	159	135	3	103	920	196	2	477	173	62	1	7	3240	3247
05:00 PM	43	123	23	0	50	40	59	0	29	248	28	1	123	51	16	1	2	833	835
05:15 PM	39	176	36	0	37	35	42	0	33	292	42	1	131	53	13	0	1	929	930
05:30 PM	47	157	31	0	40	41	39	0	34	268	33	1	118	45	13	0	1	866	867
05:45 PM	35	141	34	1	37	35	40	0	26	231	56	0	113	47	19	0	1	814	815
Total	164	597	124	1	164	151	180	0	122	1039	159	3	485	196	61	1	5	3442	3447
Grand Total	668	3314	602	3	652	533	521	4	307	2587	486	6	1154	584	286	2	15	11694	11709
Apprch %	14.6	72.3	13.1		38.2	31.2	30.5		9.1	76.5	14.4		57	28.9	14.1				
Total %	5.7	28.3	5.1		5.6	4.6	4.5		2.6	22.1	4.2		9.9	5	2.4		0.1	99.9	
Passenger Vehicles	653	3277	595		635	519	496		299	2551	471		1141	543	272		0	0	11452
% Passenger Vehicles	97.8	98.9	98.8	0	97.4	97.4	95.2	0	97.4	98.6	96.9	0	98.9	93	95.1	0	0	0	97.8
Single Unit	15	32	6		17	14	24		6	34	13		13	41	11		0	0	226
% Single Unit	2.2	1	1	0	2.6	2.6	4.6	0	2	1.3	2.7	0	1.1	7	3.8	0	0	0	1.9
TTST	0	5	1		0	0	1		2	2	2		0	0	3		0	0	16
% TTST	0	0.2	0.2	0	0	0	0.2	0	0.7	0.1	0.4	0	0	0	1	0	0	0	0.1
Bicycles on Crosswalk	0	0	0		0	0	0		0	0	0		0	0	0		0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0		0	0	0		0	0	0		0	0	0		0	0	15
% Pedestrians	0	0	0	100	0	0	0	100	0	0	0	100	0	0	0	100	0	0	0.1

VHB Engineering NC, P.C.

Venture I
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
p: 919.829.0328 f: 919.833.0034

File Name : Horton@Guess
Site Code :
Start Date : 12/18/2018
Page No : 2

	Guess Road Southbound				Horton Road Westbound				Guess Road Northbound				Horton Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	45	295	57	397	56	19	14	89	16	68	20	104	28	20	19	67	657
07:45 AM	48	290	44	382	40	24	26	90	13	86	19	118	22	22	21	65	655
08:00 AM	42	251	39	332	40	38	29	107	6	66	18	90	30	30	23	83	612
08:15 AM	46	279	45	370	33	30	34	97	7	101	13	121	31	34	24	89	677
Total Volume	181	1115	185	1481	169	111	103	383	42	321	70	433	111	106	87	304	2601
% App. Total	12.2	75.3	12.5		44.1	29	26.9		9.7	74.1	16.2		36.5	34.9	28.6		
PHF	.943	.945	.811	.933	.754	.730	.757	.895	.656	.795	.875	.895	.895	.779	.906	.854	.960
Passenger Vehicles	177	1099	182	1458	167	106	94	367	37	312	67	416	106	103	81	290	2531
% Passenger Vehicles	97.8	98.6	98.4	98.4	98.8	95.5	91.3	95.8	88.1	97.2	95.7	96.1	95.5	97.2	93.1	95.4	97.3
Single Unit	4	13	2	19	2	5	9	16	3	7	3	13	5	3	5	13	61
% Single Unit	2.2	1.2	1.1	1.3	1.2	4.5	8.7	4.2	7.1	2.2	4.3	3.0	4.5	2.8	5.7	4.3	2.3
TTST	0	3	1	4	0	0	0	0	2	2	0	4	0	0	1	1	9
% TTST	0	0.3	0.5	0.3	0	0	0	0	4.8	0.6	0	0.9	0	0	1.1	0.3	0.3
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



VHB Engineering NC, P.C.

Venture I
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
p: 919.829.0328 f: 919.833.0034

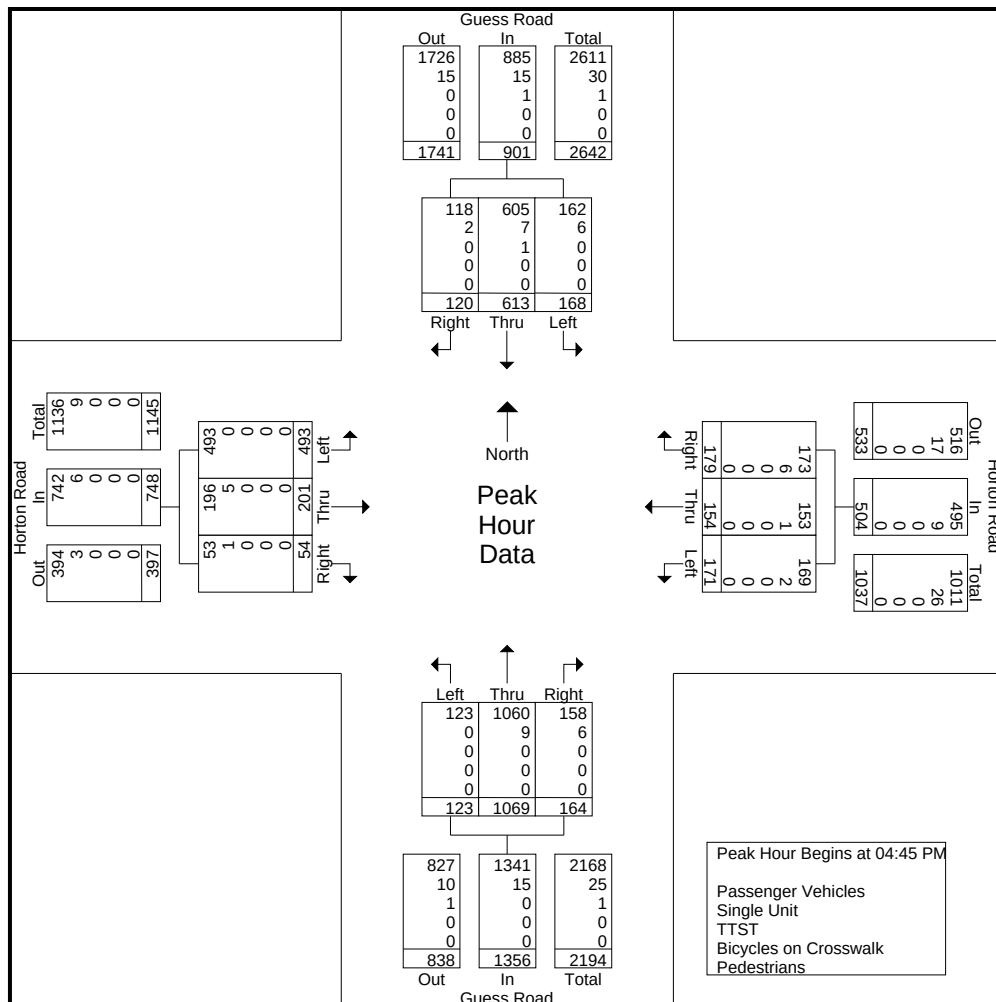
File Name : Horton@Guess
Site Code :
Start Date : 12/18/2018
Page No : 3

	Guess Road Southbound				Horton Road Westbound				Guess Road Northbound				Horton Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 04:45 PM

04:45 PM	39	157	30	226	44	38	39	121	27	261	61	349	121	52	12	185	881
05:00 PM	43	123	23	189	50	40	59	149	29	248	28	305	123	51	16	190	833
05:15 PM	39	176	36	251	37	35	42	114	33	292	42	367	131	53	13	197	929
05:30 PM	47	157	31	235	40	41	39	120	34	268	33	335	118	45	13	176	866
Total Volume	168	613	120	901	171	154	179	504	123	1069	164	1356	493	201	54	748	3509
% App. Total	18.6	68	13.3		33.9	30.6	35.5		9.1	78.8	12.1		65.9	26.9	7.2		
PHF	.894	.871	.833	.897	.855	.939	.758	.846	.904	.915	.672	.924	.941	.948	.844	.949	.944
Passenger Vehicles	162	605	118	885	169	153	173	495	123	1060	158	1341	493	196	53	742	3463
% Passenger Vehicles	96.4	98.7	98.3	98.2	98.8	99.4	96.6	98.2	100	99.2	96.3	98.9	100	97.5	98.1	99.2	98.7
Single Unit	6	7	2	15	2	1	6	9	0	9	6	15	0	5	1	6	45
% Single Unit	3.6	1.1	1.7	1.7	1.2	0.6	3.4	1.8	0	0.8	3.7	1.1	0	2.5	1.9	0.8	1.3
TTST	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
% TTST	0	0.2	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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Venture I

940 Main Campus Drive, Suite 500

Raleigh, NC 27606

$p: 919.829.0328$ $f: 919.833.0034$

File Name : Horton@Stadium

Site Code :

Start Date : 12/18/2018

Page No : 1

Groups Printed- Passenger Vehicles - Single Unit - TTST - Bicycles on Crosswalk - Pedestrians

	Stadium Drive Southbound				Horton Road Westbound				Stadium Drive Northbound				Horton Road Eastbound						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	12	4	15	0	5	38	1	0	9	1	8	0	3	48	8	0	0	152	152
07:15 AM	4	3	21	0	2	52	4	0	15	2	4	0	3	63	7	0	0	180	180
07:30 AM	8	7	24	0	8	43	3	0	10	2	6	0	7	62	8	0	0	188	188
07:45 AM	5	5	13	0	8	57	2	0	9	0	4	0	8	74	11	0	0	196	196
Total	29	19	73	0	23	190	10	0	43	5	22	0	21	247	34	0	0	716	716
08:00 AM	5	5	22	0	3	68	4	0	17	1	6	0	6	81	16	0	0	234	234
08:15 AM	8	2	10	0	7	79	1	0	17	0	3	0	4	80	13	0	0	224	224
08:30 AM	3	1	15	0	2	72	1	0	20	0	4	0	8	82	13	0	0	221	221
08:45 AM	4	3	12	0	1	87	1	0	14	0	5	0	4	77	10	0	0	218	218
Total	20	11	59	0	13	306	7	0	68	1	18	0	22	320	52	0	0	897	897

*** BREAK ***

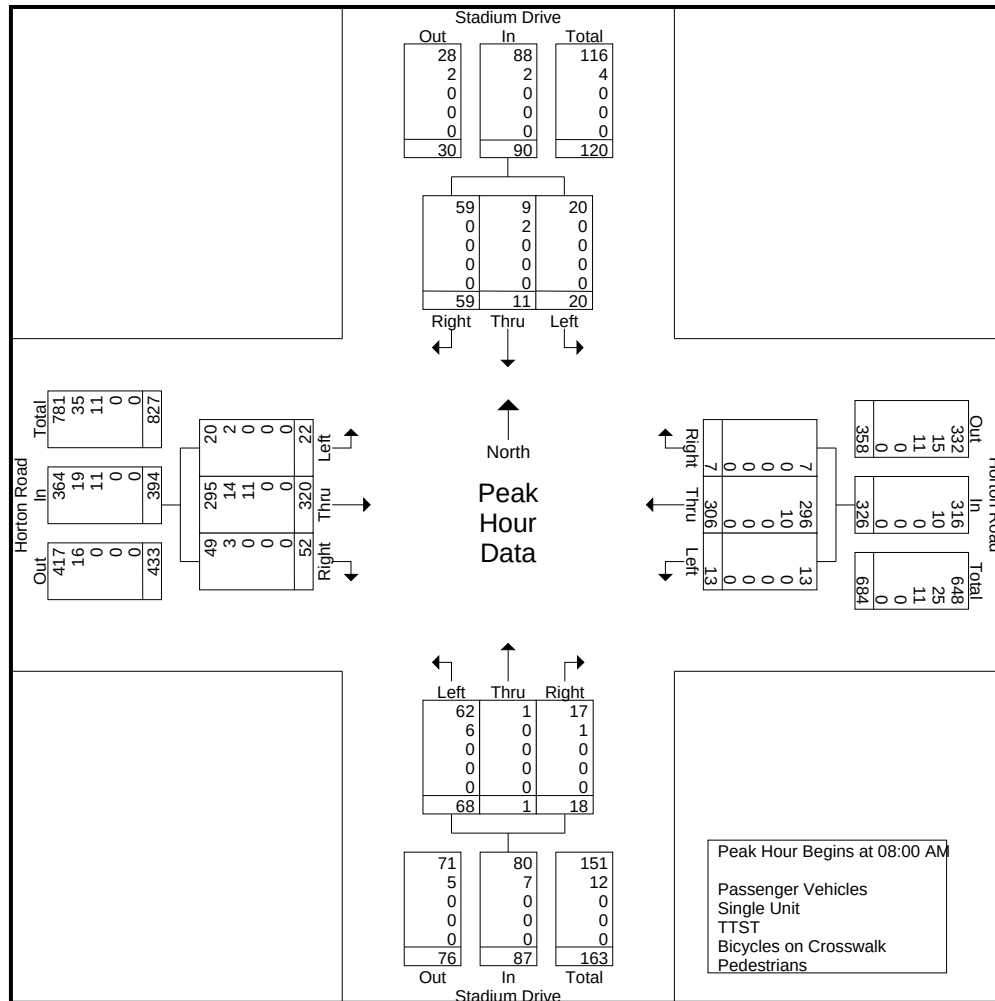
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Venture I
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
p: 919.829.0328 f: 919.833.0034

File Name : Horton@Stadium
Site Code :
Start Date : 12/18/2018
Page No : 2

	Stadium Drive Southbound				Horton Road Westbound				Stadium Drive Northbound				Horton Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	5	5	22	32	3	68	4	75	17	1	6	24	6	81	16	103	234
08:15 AM	8	2	10	20	7	79	1	87	17	0	3	20	4	80	13	97	224
08:30 AM	3	1	15	19	2	72	1	75	20	0	4	24	8	82	13	103	221
08:45 AM	4	3	12	19	1	87	1	89	14	0	5	19	4	77	10	91	218
Total Volume	20	11	59	90	13	306	7	326	68	1	18	87	22	320	52	394	897
% App. Total	22.2	12.2	65.6		4	93.9	2.1		78.2	1.1	20.7		5.6	81.2	13.2		
PHF	.625	.550	.670	.703	.464	.879	.438	.916	.850	.250	.750	.906	.688	.976	.813	.956	.958
Passenger Vehicles	20	9	59	88	13	296	7	316	62	1	17	80	20	295	49	364	848
% Passenger Vehicles	100	81.8	100	97.8	100	96.7	100	96.9	91.2	100	94.4	92.0	90.9	92.2	94.2	92.4	94.5
Single Unit	0	2	0	2	0	10	0	10	6	0	1	7	2	14	3	19	38
% Single Unit	0	18.2	0	2.2	0	3.3	0	3.1	8.8	0	5.6	8.0	9.1	4.4	5.8	4.8	4.2
TTST	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	11	11
% TTST	0	0	0	0	0	0	0	0	0	0	0	0	0	3.4	0	2.8	1.2
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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940 Main Campus Drive, Suite 500
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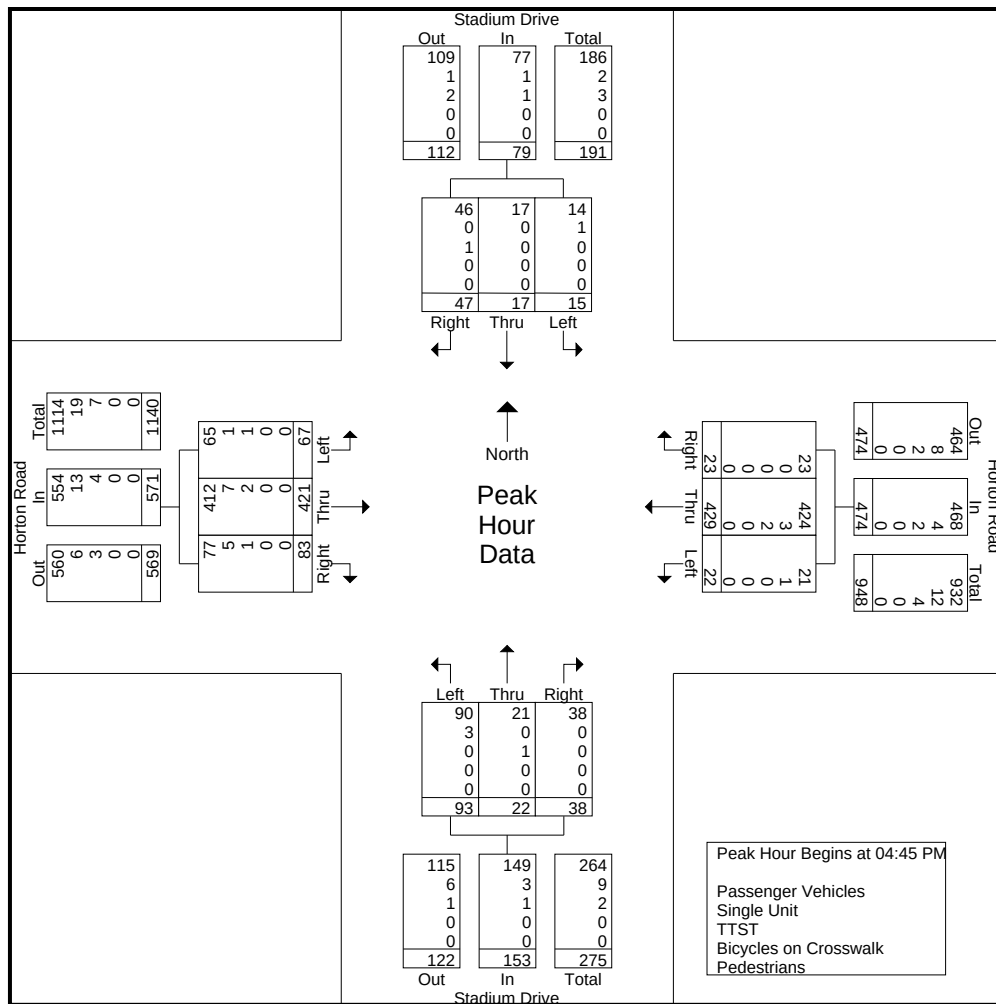
File Name : Horton@Stadium
Site Code :
Start Date : 12/18/2018
Page No : 3

	Stadium Drive Southbound				Horton Road Westbound				Stadium Drive Northbound				Horton Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 04:45 PM

04:45 PM	3	6	13	22	6	107	5	118	18	1	10	29	17	112	21	150	319
05:00 PM	6	4	15	25	7	115	4	126	21	8	8	37	15	96	27	138	326
05:15 PM	4	2	11	17	5	115	6	126	27	6	10	43	11	115	17	143	329
05:30 PM	2	5	8	15	4	92	8	104	27	7	10	44	24	98	18	140	303
Total Volume	15	17	47	79	22	429	23	474	93	22	38	153	67	421	83	571	1277
% App. Total	19	21.5	59.5		4.6	90.5	4.9		60.8	14.4	24.8		11.7	73.7	14.5		
PHF	.625	.708	.783	.790	.786	.933	.719	.940	.861	.688	.950	.869	.698	.915	.769	.952	.970
Passenger Vehicles	14	17	46	77	21	424	23	468	90	21	38	149	65	412	77	554	1248
% Passenger Vehicles	93.3	100	97.9	97.5	95.5	98.8	100	98.7	96.8	95.5	100	97.4	97.0	97.9	92.8	97.0	97.7
Single Unit	1	0	0	1	1	3	0	4	3	0	0	3	1	7	5	13	21
% Single Unit	6.7	0	0	1.3	4.5	0.7	0	0.8	3.2	0	0	2.0	1.5	1.7	6.0	2.3	1.6
TTST	0	0	1	1	0	2	0	2	0	1	0	1	1	2	1	4	8
% TTST	0	0	2.1	1.3	0	0.5	0	0.4	0	4.5	0	0.7	1.5	0.5	1.2	0.7	0.6
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



VHB Engineering NC, P.C.

Venture I
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
p: 919.829.0328 f: 919.833.0034

File Name : US501@Horton
Site Code :
Start Date : 12/18/2018
Page No : 1

Groups Printed- Passenger Vehicles - Single Unit - TTST - Bicycles on Crosswalk - Pedestrians

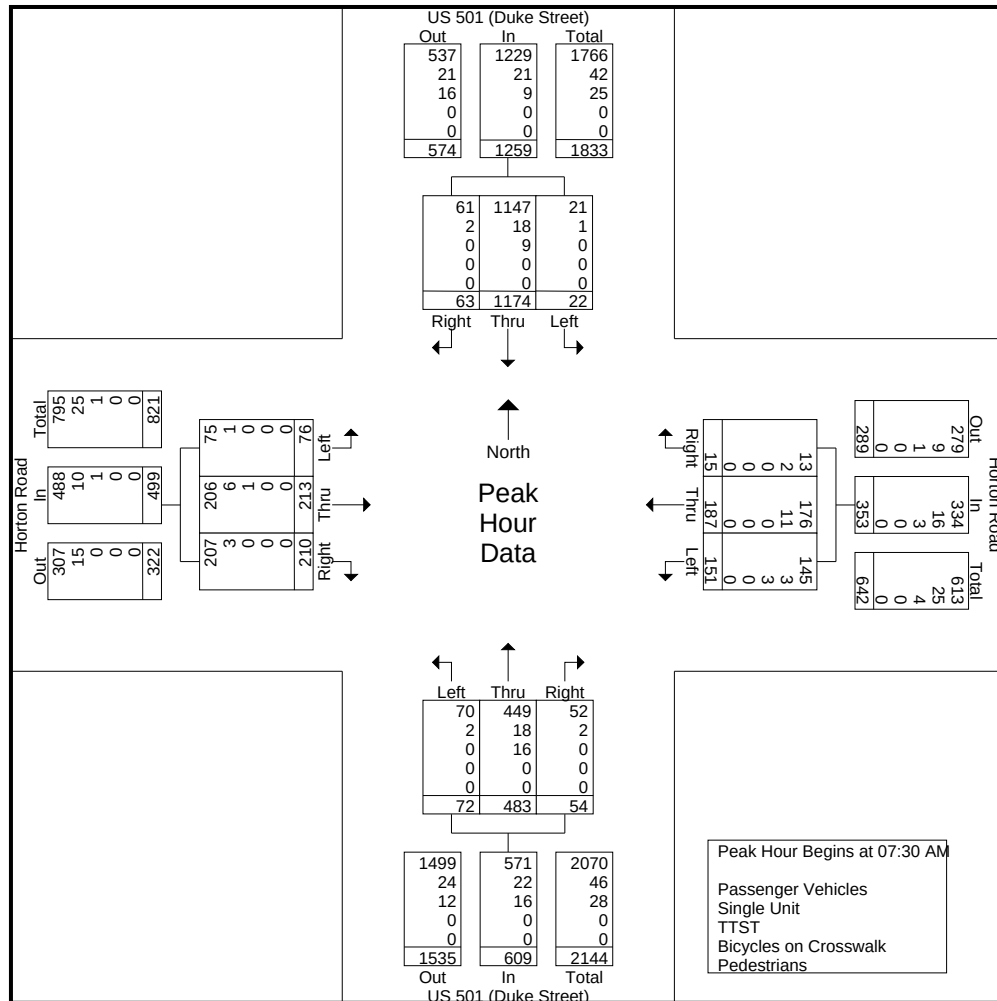
	US 501 (Duke Street) Southbound				Horton Road Westbound				US 501 (Duke Street) Northbound				Horton Road Eastbound				Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
07:00 AM	5	324	12	0	31	26	2	0	7	103	13	0	26	38	49	0	0	636	636
07:15 AM	5	341	12	1	37	36	0	0	19	94	16	0	24	57	52	0	1	693	694
07:30 AM	2	316	15	0	52	42	4	0	10	103	12	0	19	50	55	0	0	680	680
07:45 AM	3	290	11	2	36	31	2	0	22	124	9	0	18	50	57	0	2	653	655
Total	15	1271	50	3	156	135	8	0	58	424	50	0	87	195	213	0	3	2662	2665
08:00 AM	11	297	14	1	32	58	6	0	17	117	17	0	21	46	56	0	1	692	693
08:15 AM	6	271	23	1	31	56	3	0	23	139	16	0	18	67	42	0	1	695	696
08:30 AM	7	275	11	2	29	43	6	0	20	129	16	0	26	47	51	0	2	660	662
08:45 AM	9	289	18	4	23	41	3	0	21	132	19	0	15	54	40	0	4	664	668
Total	33	1132	66	8	115	198	18	0	81	517	68	0	80	214	189	0	8	2711	2719
*** BREAK ***																			
04:00 PM	21	157	26	2	29	99	0	0	40	258	16	0	29	57	30	0	2	762	764
04:15 PM	26	178	26	5	39	78	8	0	54	228	23	0	40	71	28	0	5	799	804
04:30 PM	13	181	27	2	30	73	7	1	38	341	20	0	22	63	29	0	3	844	847
04:45 PM	15	153	29	3	32	60	10	0	52	324	26	0	35	80	28	0	3	844	847
Total	75	669	108	12	130	310	25	1	184	1151	85	0	126	271	115	0	13	3249	3262
05:00 PM	12	152	31	3	37	85	6	0	64	311	19	1	34	64	40	1	5	855	860
05:15 PM	6	208	28	0	37	83	9	0	50	280	33	0	25	70	24	0	0	853	853
05:30 PM	10	168	32	1	18	74	6	1	50	285	36	0	44	66	42	0	2	831	833
05:45 PM	13	190	29	2	28	66	10	0	49	285	28	0	36	69	32	0	2	835	837
Total	41	718	120	6	120	308	31	1	213	1161	116	1	139	269	138	1	9	3374	3383
Grand Total	164	3790	344	29	521	951	82	2	536	3253	319	1	432	949	655	1	33	11996	12029
Apprch %	3.8	88.2	8		33.5	61.2	5.3		13	79.2	7.8		21.2	46.6	32.2				
Total %	1.4	31.6	2.9		4.3	7.9	0.7		4.5	27.1	2.7		3.6	7.9	5.5		0.3	99.7	
Passenger Vehicles	161	3696	336		505	926	79		519	3154	298		421	903	642		0	0	11640
% Passenger Vehicles	98.2	97.5	97.7	0	96.9	97.4	96.3	0	96.8	97	93.4	0	97.5	95.2	98	0	0	0	96.8
Single Unit	3	56	8		12	25	2		16	64	16		11	45	12		0	0	270
% Single Unit	1.8	1.5	2.3	0	2.3	2.6	2.4	0	3	2	5	0	2.5	4.7	1.8	0	0	0	2.2
TTST	0	38	0		4	0	1		1	35	5		0	1	1		0	0	86
% TTST	0	1	0	0	0.8	0	1.2	0	0.2	1.1	1.6	0	0	0.1	0.2	0	0	0	0.7
Bicycles on Crosswalk	0	0	0		0	0	0		0	0	0		0	0	0		0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0		0	0	0		0	0	0		0	0	0		0	0	33
% Pedestrians	0	0	0	100	0	0	0	100	0	0	0	100	0	0	0	100	0	0	0.3

VHB Engineering NC, P.C.

Venture I
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
p: 919.829.0328 f: 919.833.0034

File Name : US501@Horton
Site Code :
Start Date : 12/18/2018
Page No : 2

	US 501 (Duke Street) Southbound				Horton Road Westbound				US 501 (Duke Street) Northbound				Horton Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	2	316	15	333	52	42	4	98	10	103	12	125	19	50	55	124	680
07:45 AM	3	290	11	304	36	31	2	69	22	124	9	155	18	50	57	125	653
08:00 AM	11	297	14	322	32	58	6	96	17	117	17	151	21	46	56	123	692
08:15 AM	6	271	23	300	31	56	3	90	23	139	16	178	18	67	42	127	695
Total Volume	22	1174	63	1259	151	187	15	353	72	483	54	609	76	213	210	499	2720
% App. Total	1.7	93.2	5		42.8	53	4.2		11.8	79.3	8.9		15.2	42.7	42.1		
PHF	.500	.929	.685	.945	.726	.806	.625	.901	.783	.869	.794	.855	.905	.795	.921	.982	.978
Passenger Vehicles	21	1147	61	1229	145	176	13	334	70	449	52	571	75	206	207	488	2622
% Passenger Vehicles	95.5	97.7	96.8	97.6	96.0	94.1	86.7	94.6	97.2	93.0	96.3	93.8	98.7	96.7	98.6	97.8	96.4
Single Unit	1	18	2	21	3	11	2	16	2	18	2	22	1	6	3	10	69
% Single Unit	4.5	1.5	3.2	1.7	2.0	5.9	13.3	4.5	2.8	3.7	3.7	3.6	1.3	2.8	1.4	2.0	2.5
TTST	0	9	0	9	3	0	0	3	0	16	0	16	0	1	0	1	29
% TTST	0	0.8	0	0.7	2.0	0	0	0.8	0	3.3	0	2.6	0	0.5	0	0.2	1.1
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

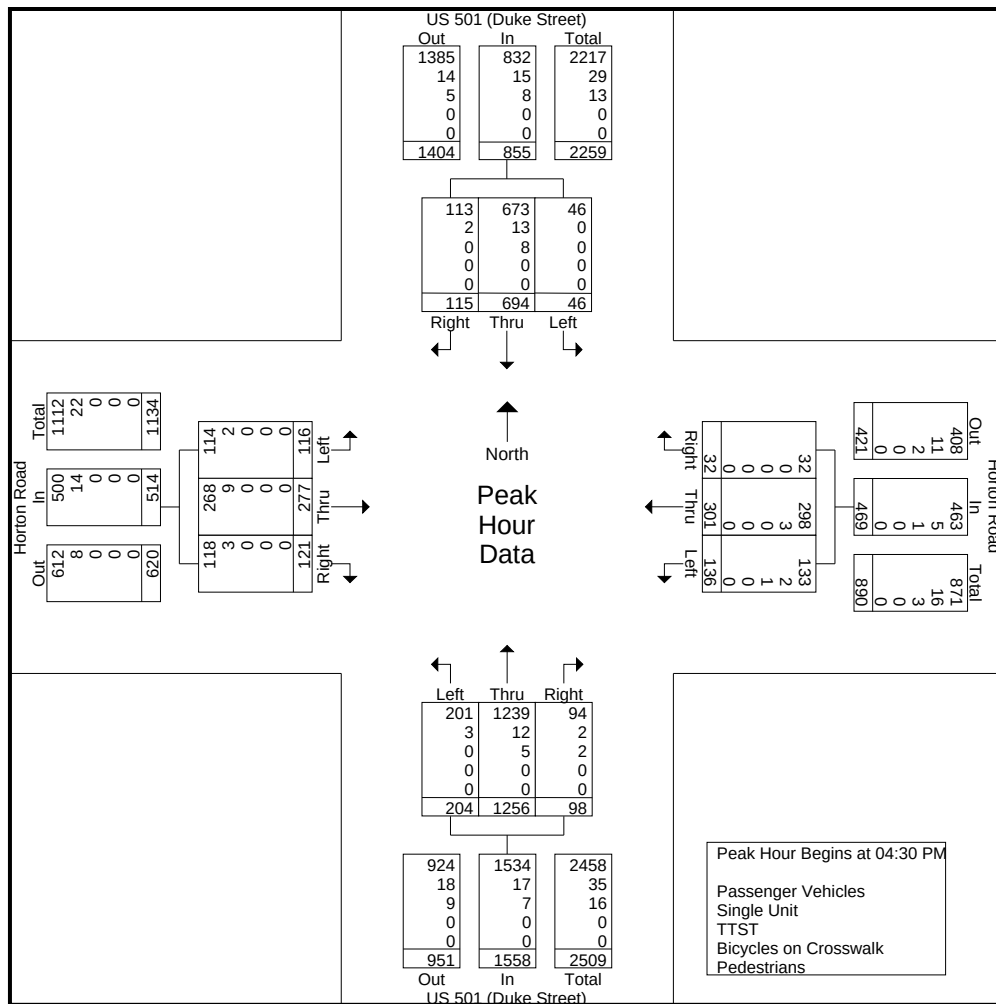


VHB Engineering NC, P.C.

Venture I
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
p: 919.829.0328 f: 919.833.0034

File Name : US501@Horton
Site Code :
Start Date : 12/18/2018
Page No : 3

	US 501 (Duke Street) Southbound				Horton Road Westbound				US 501 (Duke Street) Northbound				Horton Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	13	181	27	221	30	73	7	110	38	341	20	399	22	63	29	114	844
04:45 PM	15	153	29	197	32	60	10	102	52	324	26	402	35	80	28	143	844
05:00 PM	12	152	31	195	37	85	6	128	64	311	19	394	34	64	40	138	855
05:15 PM	6	208	28	242	37	83	9	129	50	280	33	363	25	70	24	119	853
Total Volume	46	694	115	855	136	301	32	469	204	1256	98	1558	116	277	121	514	3396
% App. Total	5.4	81.2	13.5		29	64.2	6.8		13.1	80.6	6.3		22.6	53.9	23.5		
PHF	.767	.834	.927	.883	.919	.885	.800	.909	.797	.921	.742	.969	.829	.866	.756	.899	.993
Passenger Vehicles	46	673	113	832	133	298	32	463	201	1239	94	1534	114	268	118	500	3329
% Passenger Vehicles	100	97.0	98.3	97.3	97.8	99.0	100	98.7	98.5	98.6	95.9	98.5	98.3	96.8	97.5	97.3	98.0
Single Unit	0	13	2	15	2	3	0	5	3	12	2	17	2	9	3	14	51
% Single Unit	0	1.9	1.7	1.8	1.5	1.0	0	1.1	1.5	1.0	2.0	1.1	1.7	3.2	2.5	2.7	1.5
TTST	0	8	0	8	1	0	0	1	0	5	2	7	0	0	0	0	16
% TTST	0	1.2	0	0.9	0.7	0	0	0.2	0	0.4	2.0	0.4	0	0	0	0	0.5
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



VHB Engineering NC, P.C.

Venture I

940 Main Campus Drive, Suite 500

Raleigh, NC 27606

$p: 919.829.0328$ $f: 919.833.0034$

File Name : US501@SevenOaks

Site Code :

Start Date : 12/18/2018

Page No : 1

Groups Printed- Passenger Vehicles - Single Unit - TTST - Bicycles on Crosswalk - Pedestrians

	US 501 (Roxboro Street) Southbound				Seven Oaks Road Westbound				US 501 (Roxboro Street) Northbound				West Point Park Eastbound						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	1	476	1	0	42	0	7	0	1	188	1	0	0	0	0	0	0	717	717
07:15 AM	3	547	0	0	32	1	2	0	3	178	1	0	0	0	0	0	0	767	767
07:30 AM	2	527	1	0	43	0	5	1	1	152	1	0	0	0	2	0	1	734	735
07:45 AM	1	453	2	0	37	0	2	0	0	213	0	0	0	0	2	0	0	710	710
Total	7	2003	4	0	154	1	16	1	5	731	3	0	0	0	4	0	1	2928	2929
08:00 AM	5	442	1	0	53	0	6	0	0	233	2	0	0	0	0	0	0	742	742
08:15 AM	7	465	4	0	31	0	6	0	3	231	2	0	1	1	2	0	0	753	753
08:30 AM	3	417	4	0	31	0	3	0	0	269	6	0	0	0	7	0	0	740	740
08:45 AM	4	471	1	0	33	0	6	0	0	228	5	0	1	0	3	0	0	752	752
Total	19	1795	10	0	148	0	21	0	3	961	15	0	2	1	12	0	0	2987	2987

*** BREAK ***

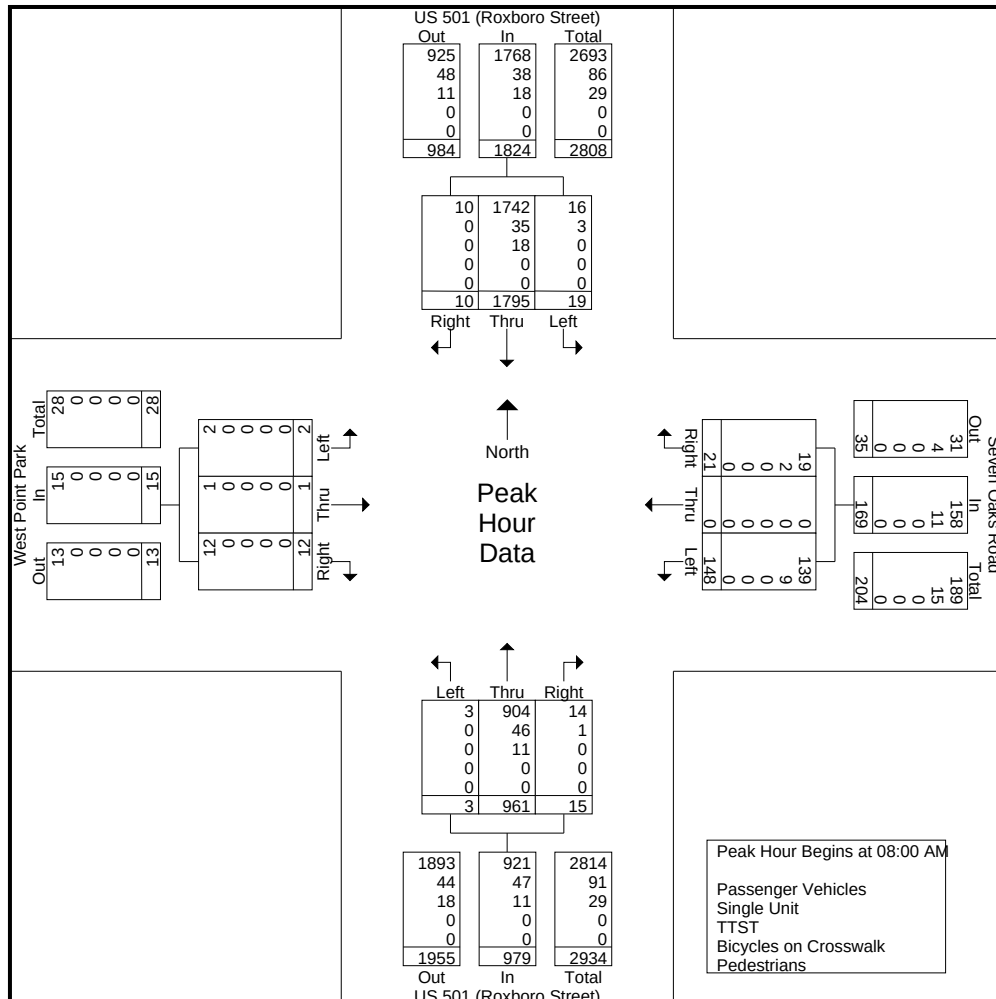
04:00 PM	10	314	1	0		42	0	11	0		1	411	20	0		0	0	1	0		0	811	811
04:15 PM	8	259	3	0		45	0	7	0		3	389	12	0		0	0	1	0		0	727	727
04:30 PM	10	251	0	0		46	1	16	0		3	450	14	0		2	2	2	0		0	797	797
04:45 PM	13	222	0	0		50	0	20	0		2	408	14	0		0	0	5	0		0	734	734
Total	41	1046	4	0		183	1	54	0		9	1658	60	0		2	2	9	0		0	3069	3069
05:00 PM	7	191	3	0		54	0	15	0		4	379	6	0		0	1	4	0		0	664	664
05:15 PM	10	293	2	0		53	0	10	0		1	400	4	0		4	0	2	0		0	779	779
05:30 PM	12	241	0	0		37	0	12	0		0	407	9	0		2	0	1	0		0	721	721
05:45 PM	11	257	0	0		55	0	6	0		1	402	15	0		0	0	4	0		0	751	751
Total	40	982	5	0		199	0	43	0		6	1588	34	0		6	1	11	0		0	2915	2915
Grand Total	107	5826	23	0		684	2	134	1		23	4938	112	0		10	4	36	0		1	11899	11900
Apprch %	1.8	97.8	0.4			83.4	0.2	16.3			0.5	97.3	2.2			20	8	72					
Total %	0.9	49	0.2			5.7	0	1.1			0.2	41.5	0.9			0.1	0	0.3			0	100	
Passenger Vehicles	101	5645	23			651	2	126			22	4787	109			10	4	35			0	0	11515
% Passenger Vehicles	94.4	96.9	100	0		95.2	100	94	0		95.7	96.9	97.3	0		100	100	97.2	0		0	0	96.8
Single Unit	6	134	0			33	0	8			1	114	3			0	0	1			0	0	300
% Single Unit	5.6	2.3	0	0		4.8	0	6	0		4.3	2.3	2.7	0		0	0	2.8	0		0	0	2.5
TTST	0	47	0			0	0	0			0	37	0			0	0	0			0	0	84
% TTST	0	0.8	0	0		0	0	0	0		0	0.7	0	0		0	0	0	0		0	0	0.7
Bicycles on Crosswalk	0	0	0			0	0	0			0	0	0			0	0	0			0	0	0
% Bicycles on Crosswalk	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0
Pedestrians	0	0	0			0	0	0			0	0	0			0	0	0			0	0	1
% Pedestrians	0	0	0	0		0	0	0	100		0	0	0	0		0	0	0	0		0	0	0

VHB Engineering NC, P.C.

Venture I
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
p: 919.829.0328 f: 919.833.0034

File Name : US501@SevenOaks
Site Code :
Start Date : 12/18/2018
Page No : 2

	US 501 (Roxboro Street) Southbound				Seven Oaks Road Westbound				US 501 (Roxboro Street) Northbound				West Point Park Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	5	442	1	448	53	0	6	59	0	233	2	235	0	0	0	0	742
08:15 AM	7	465	4	476	31	0	6	37	3	231	2	236	1	1	2	4	753
08:30 AM	3	417	4	424	31	0	3	34	0	269	6	275	0	0	7	7	740
08:45 AM	4	471	1	476	33	0	6	39	0	228	5	233	1	0	3	4	752
Total Volume	19	1795	10	1824	148	0	21	169	3	961	15	979	2	1	12	15	2987
% App. Total	1	98.4	0.5		87.6	0	12.4		0.3	98.2	1.5		13.3	6.7	80		
PHF	.679	.953	.625	.958	.698	.000	.875	.716	.250	.893	.625	.890	.500	.250	.429	.536	.992
Passenger Vehicles	16	1742	10	1768	139	0	19	158	3	904	14	921	2	1	12	15	2862
% Passenger Vehicles	84.2	97.0	100	96.9	93.9	0	90.5	93.5	100	94.1	93.3	94.1	100	100	100	100	95.8
Single Unit	3	35	0	38	9	0	2	11	0	46	1	47	0	0	0	0	96
% Single Unit	15.8	1.9	0	2.1	6.1	0	9.5	6.5	0	4.8	6.7	4.8	0	0	0	0	3.2
TTST	0	18	0	18	0	0	0	0	0	11	0	11	0	0	0	0	29
% TTST	0	1.0	0	1.0	0	0	0	0	0	1.1	0	1.1	0	0	0	0	1.0
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



VHB Engineering NC, P.C.

Venture I
940 Main Campus Drive, Suite 500
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p: 919.829.0328 f: 919.833.0034

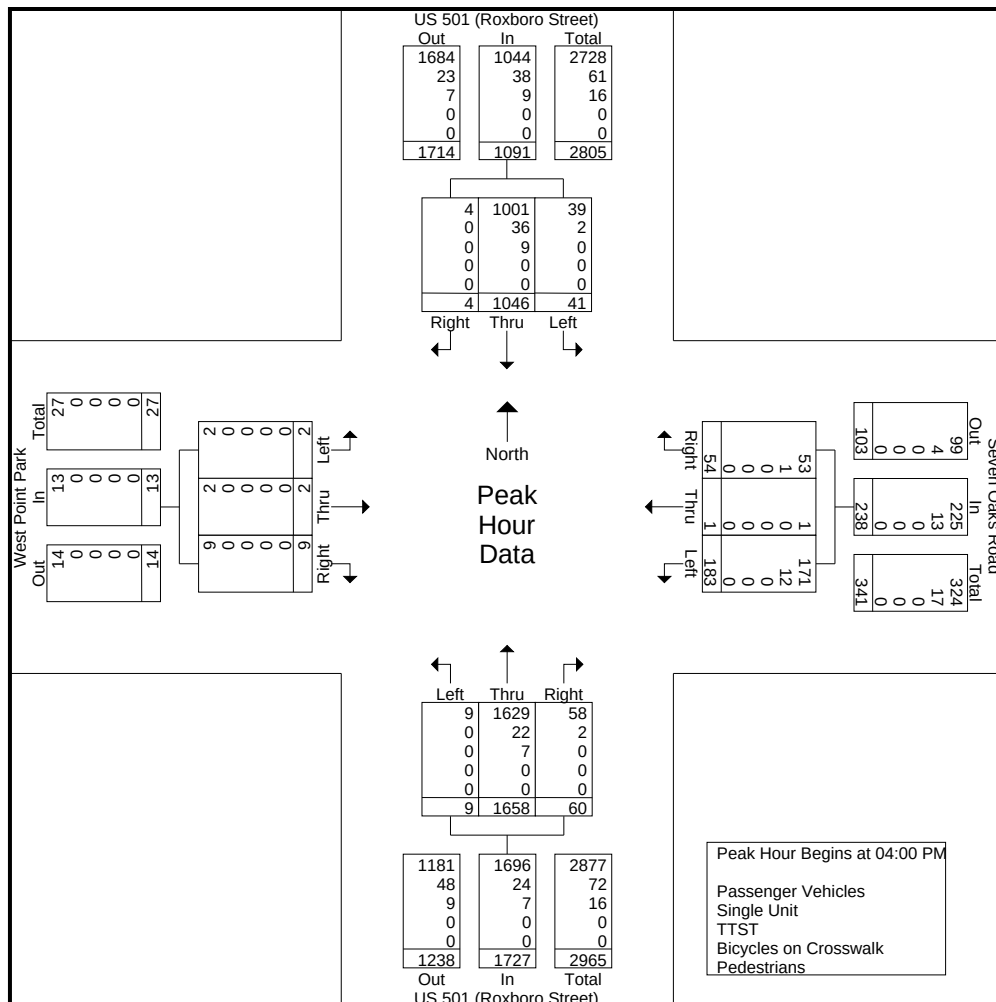
File Name : US501@SevenOaks
Site Code :
Start Date : 12/18/2018
Page No : 3

	US 501 (Roxboro Street) Southbound				Seven Oaks Road Westbound				US 501 (Roxboro Street) Northbound				West Point Park Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total

Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 04:00 PM

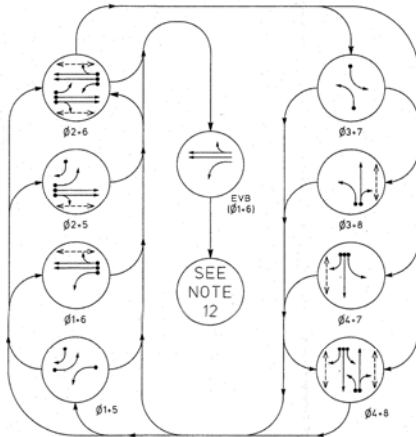
04:00 PM	10	314	1	325	42	0	11	53	1	411	20	432	0	0	1	1	811
04:15 PM	8	259	3	270	45	0	7	52	3	389	12	404	0	0	1	1	727
04:30 PM	10	251	0	261	46	1	16	63	3	450	14	467	2	2	2	6	797
04:45 PM	13	222	0	235	50	0	20	70	2	408	14	424	0	0	5	5	734
Total Volume	41	1046	4	1091	183	1	54	238	9	1658	60	1727	2	2	9	13	3069
% App. Total	3.8	95.9	0.4		76.9	0.4	22.7		0.5	96	3.5		15.4	15.4	69.2		
PHF	.788	.833	.333	.839	.915	.250	.675	.850	.750	.921	.750	.925	.250	.250	.450	.542	.946
Passenger Vehicles	39	1001	4	1044	171	1	53	225	9	1629	58	1696	2	2	9	13	2978
% Passenger Vehicles	95.1	95.7	100	95.7	93.4	100	98.1	94.5	100	98.3	96.7	98.2	100	100	100	100	97.0
Single Unit	2	36	0	38	12	0	1	13	0	22	2	24	0	0	0	0	75
% Single Unit	4.9	3.4	0	3.5	6.6	0	1.9	5.5	0	1.3	3.3	1.4	0	0	0	0	2.4
TTST	0	9	0	9	0	0	0	0	0	7	0	7	0	0	0	0	16
% TTST	0	0.9	0	0.8	0	0	0	0	0	0.4	0	0.4	0	0	0	0	0.5
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Appendix B:

Traffic Signal Plans

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND
 ● DETECTED MOVEMENT
 ○ UNDETECTED MOVEMENT (OVERLAP)
 --- UNUSUALIZED MOVEMENT
 - - - PEDESTRIAN MOVEMENT

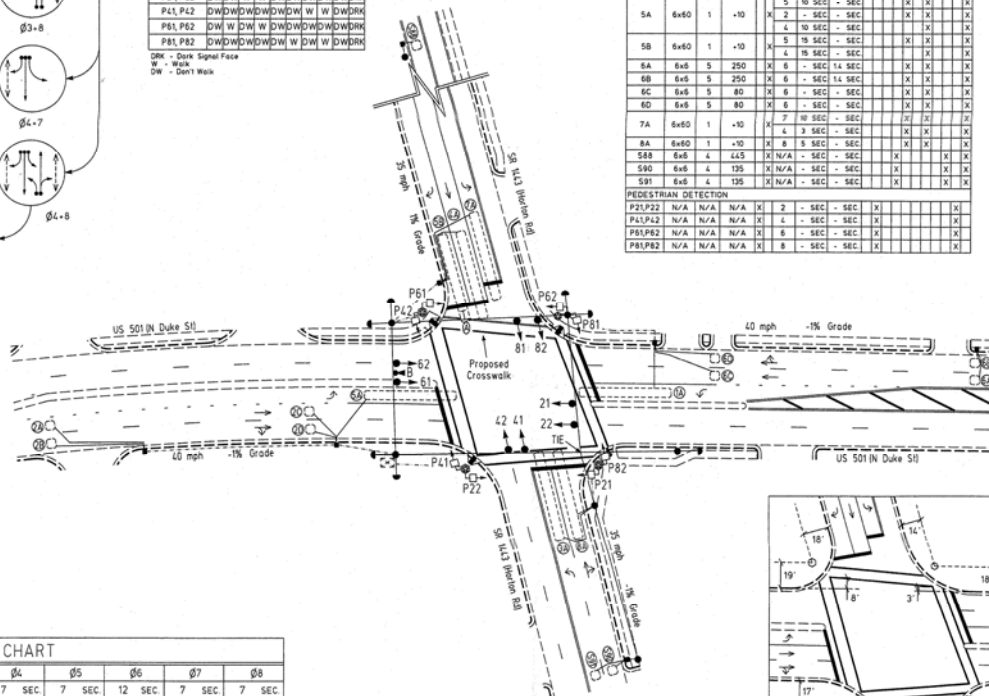
170 EV PREEMPTION	
FUNCTION	EVB
DELAY BEFORE PREEMPT	0
MIN PED CLEAR	x
MIN GREEN BEFORE PREEMPT	1.0
CLEARANCE TIME	1.0
PREEMPT EXTEND**	2.0

*See Min Ped Clear, this Sheet
 **Program Timing on Optical Detection Unit

TABLE OF OPERATION	
SIGNAL FACE	PHASE
21	R R G R R R R R Y
22	R R G R R R R R Y
41	R R R R R R G R R
42	R R R R R R G R R
61	R R R R R R G R Y
62	R R R R R R G R Y
81	R R R R R R G R R
82	R R R R R R G R R
P21, P22	D W D W W W D W D W D W D W R
P41, P42	D W D W D W D W D W W W D W R
P61, P62	D W W D W W D W D W D W D W R
P81, P82	D W D W D W D W D W W D W D W R

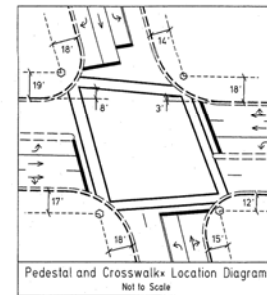
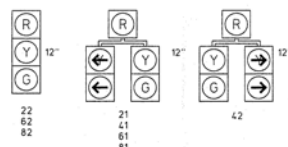
DRK - Dark Signal Face
 W - Walk
 DW - Don't Walk

170 LOOP & DETECTOR UNIT INSTALLATION CHART											
INDUCTIVE LOOPS						DETECTOR PROGRAMMING					
LOOP NO.	SIZE (FT)	TURN	DET FROM (FT)	TIME	PHASE	RECALL DELAY	CARRY	PHASE	RECALL DELAY	CARRY	PHASE
1A	6x60	1	+10	1 10 SEC - SEC	X	6 - SEC - SEC	X	X	X	X	X
2A	6x6	5	250	2 - SEC 14 SEC	X	X	X	X	X	X	X
2B	6x6	5	250	2 - SEC 14 SEC	X	X	X	X	X	X	X
2C	6x6	5	80	2 - SEC - SEC	X	X	X	X	X	X	X
2D	6x6	5	80	2 - SEC - SEC	X	X	X	X	X	X	X
3A	6x60	1	+10	3 10 SEC - SEC	X	8 - SEC - SEC	X	X	X	X	X
4A	6x60	1	+10	4 - SEC - SEC	X	4 - SEC - SEC	X	X	X	X	X
5A	6x60	1	+10	5 10 SEC - SEC	X	2 - SEC - SEC	X	X	X	X	X
5B	6x60	1	+10	5 10 SEC - SEC	X	10 SEC - SEC	X	X	X	X	X
6A	6x6	5	250	6 - SEC 14 SEC	X	6 - SEC 14 SEC	X	X	X	X	X
6B	6x6	5	250	6 - SEC 14 SEC	X	6 - SEC 14 SEC	X	X	X	X	X
6C	6x6	5	80	6 - SEC - SEC	X	6 - SEC - SEC	X	X	X	X	X
6D	6x6	5	80	6 - SEC - SEC	X	6 - SEC - SEC	X	X	X	X	X
7A	6x60	1	+10	7 10 SEC - SEC	X	4 - SEC - SEC	X	X	X	X	X
8A	6x60	1	+10	8 10 SEC - SEC	X	8 - SEC - SEC	X	X	X	X	X
S88	6x6	4	145	N/A - SEC - SEC	X	N/A - SEC - SEC	X	X	X	X	X
S90	6x6	4	135	N/A - SEC - SEC	X	N/A - SEC - SEC	X	X	X	X	X
S91	6x6	4	135	N/A - SEC - SEC	X	N/A - SEC - SEC	X	X	X	X	X
P21/P22	N/A	N/A	N/A	2 - SEC - SEC	X	2 - SEC - SEC	X	X	X	X	X
P41/P42	N/A	N/A	N/A	4 - SEC - SEC	X	4 - SEC - SEC	X	X	X	X	X
P61/P62	N/A	N/A	N/A	6 - SEC - SEC	X	6 - SEC - SEC	X	X	X	X	X
P81/P82	N/A	N/A	N/A	8 - SEC - SEC	X	8 - SEC - SEC	X	X	X	X	X



SIGNAL FACE I.D.

All Heads L.E.D.



*Crosswalk lines are 8 inches thick with 8 feet of approach.

8 Phase
 Fully Actuated
 with EV Preemption
 (Durham Signal System)

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012, "Standard Specifications for Roads and Structures" dated January 2012, and all applicable sections of the latest version of the generic Project Special Provisions. The PSP can be accessed at the following website:
<http://www.ncdot.org/doh/preconstruction/traffic/its/>
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Pavement markings are existing, except where otherwise noted.
- Program phases 1, 3, 5 and 7 as protected/permissive.
- Program controller to clear from phase 2-6 to phases 1 and/or 5 by progressing through phase 4-8 (see Electrical Details).
- Set all detector units to presence mode.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Program all timing information into phase banks 1, 2 and 3 unless otherwise noted.
- Set phase bank 3 maximum limit to 250 seconds for phases used.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Upon completion of emergency vehicle preemption phase, controller returns to normal operation based on vehicle demand.
- In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
- This intersection features an optical preemption system. Shown locations of optical detectors are conceptual only.
- Program signal heads numbered 61 and 62 to clear to all red before going into preempt.

LEGEND

- PROPOSED**
- Traffic Signal Head
 - Sign
 - Pedestrian Signal Head
 - Pedestrian Signal Button
 - Signal Pole with Guy
 - Signal Pole with Sidewalk Guy
 - Inductive Loop Detector
 - Controller & Cabinet
 - Pull Box
 - 2 in. Underground Conduit
 - Directional Arrow
 - Signal Pedestal
 - Optical Detector
 - Stop Bar
 - Wheelchair Ramp
 - Right Arrow "Only" Sign (R3-5R)
- EXISTING**
- Traffic Signal Head
 - Sign
 - Pedestrian Signal Head
 - Pedestrian Signal Button
 - Signal Pole with Guy
 - Signal Pole with Sidewalk Guy
 - Inductive Loop Detector
 - Controller & Cabinet
 - Pull Box
 - 2 in. Underground Conduit
 - Directional Arrow
 - Signal Pedestal
 - Optical Detector
 - Stop Bar
 - Wheelchair Ramp
 - Right Arrow "Only" Sign (R3-5R)

170 TIMING CHART									
PHASE	g1	g2	g3	g4	g5	g6	g7	g8	
MINIMUM INITIAL*	7 SEC	12 SEC	7 SEC	7 SEC	7 SEC	12 SEC	7 SEC	7 SEC	
VEHICLE EXTENSION*	2.0 SEC	2.0 SEC	2.0 SEC	2.0 SEC	2.0 SEC	2.0 SEC	2.0 SEC	2.0 SEC	
YELLOW CHANGE INT.	3.2 SEC	4.2 SEC	3.2 SEC	3.8 SEC	3.2 SEC	4.2 SEC	3.1 SEC	3.9 SEC	
RED CLEARANCE	1.8 SEC	1.7 SEC	2.4 SEC	2.2 SEC	2.0 SEC	1.6 SEC	2.9 SEC	1.8 SEC	
MAXIMUM LIMIT*	15 SEC	60 SEC	20 SEC	30 SEC	15 SEC	60 SEC	20 SEC	30 SEC	
RECALL POSITION	NONE	VEH RECALL	NONE	NONE	NONE	VEH RECALL	NONE	NONE	
VEHICLE CALL MEMORY	NONE	YELLOW LOCK	NONE	NONE	NONE	YELLOW LOCK	NONE	NONE	
DOUBLE ENTRY	OFF	OFF	OFF	ON	OFF	OFF	OFF	ON	
WALK*	- SEC	7 SEC	- SEC	7 SEC	- SEC	7 SEC	- SEC	7 SEC	
FLASHING DON'T WALK	- SEC	20 SEC	- SEC	22 SEC	- SEC	19 SEC	- SEC	21 SEC	
MIN PED CLEAR*	- SEC	10 SEC	- SEC	11 SEC	- SEC	10 SEC	- SEC	11 SEC	
TYPE 3 LIMIT	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	
ADD PER VEHICLE*	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	
MAXIMUM INITIAL*	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	
MAXIMUM GAP*	2.0 SEC	2.0 SEC	2.0 SEC	2.0 SEC	2.0 SEC	2.0 SEC	2.0 SEC	2.0 SEC	
REDUCE Q1 SEC EVERY*	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	
MINIMUM GAP	2.0 SEC	2.0 SEC	2.0 SEC	2.0 SEC	2.0 SEC	2.0 SEC	2.0 SEC	2.0 SEC	

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 8 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

NC DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 FINAL DRAWING DATE: 1/12/12
 PREPARED BY: L. TRACEY
 CHECKED BY: R. J. HARRIS
 TITLED BY: R. J. HARRIS
 Traffic Engineering Branch



SIGNAL UPGRADE



US 501 (North Duke Street)
 at
 SR 1443 (Horton Road)

DIVISION 5 DURHAM COUNTY DURHAM

PLAN DATE: APRIL 2011 PREPARED BY: L. TRACEY REVIEWED BY: P. NICHOLAS

REVISIONS

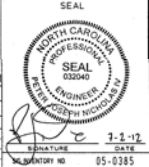
DATE

INIT

DATE

INIT

DATE



Display Indications:
 0=Walk
 1=Flashing Don't Walk
 2=Minimum Green

4=Variable Initial
 5=Extention
 7=Reduce GAP
 8=Red Rest
 9=Preemption
 A=Stop Time

B=Red Revert
 C=Yellow Gap Term
 D=Yellow Gap Max Term
 E=Yellow Force-Off Term
 F=Red Clearance

INTERSECTION: 0385-Duke St & Horton Rd

Page 3 (of 8)

		Plan								
Column Numbers ---->		1	2	3	4	5	6	7	8	9
Row	Plan Name ---->									
0	Cycle Length	110	90	110	0	0	0	0	0	0
1	Phase 1 - ForceOff	58	55	72	55	0	0	0	0	0
2	Phase 2 - ForceOff	0	0	0	0	0	0	0	0	0
3	Phase 3 - ForceOff	18	15	18	0	0	0	0	0	0
4	Phase 4 - ForceOff	43	38	48	40	0	0	0	0	0
5	Phase 5 - ForceOff	58	55	65	60	0	0	0	0	0
6	Phase 6 - ForceOff	0	0	0	0	0	0	0	0	0
7	Phase 7 - ForceOff	18	15	18	0	0	0	0	0	0
8	Phase 8 - ForceOff	43	38	48	40	0	0	0	0	0
9	Ring Offset	0	0	0	0	0	0	0	0	0
A	Offset A	41	2	71	0	0	0	0	0	0
B	Offset B	41	2	71	0	0	0	0	0	0
C	Offset C	41	2	71	0	0	0	0	0	0
D	Perm 1 - End	8	8	8	15	0	0	0	0	0
E	Hold Release	255	255	255	255	255	255	255	255	255
F	Zone Offset	0	0	0	0	0	0	0	0	0

Coordination - Bank 1

<C+0+C=1>

[Coordination Timing 1 -]

Row										
0	Ped Adjustment	0	0	0	0	0	0	0	0	0
1	Perm 2 - Start	8	9	9	0	0	0	0	0	0
2	Perm 2 - End	22	22	30	0	0	0	0	0	0
3	Perm 3 - Start	23	23	31	0	0	0	0	0	0
4	Perm 3 - End	37	37	42	0	0	0	0	0	0
5	Reservice Time	0	0	0	0	0	0	0	0	0
6	Reservice Phases									
7										
8	Pretimed Phases									
9	Max Recall									
A	Perm 1 Veh Phase	3 7	3 7	3 7	12345678	12345678	12345678	12345678	12345678	12345678
B	Perm 1 Ped Phase				12345678	12345678	12345678	12345678	12345678	12345678
C	Perm 2 Veh Phase	4 8	4 8	4 8						
D	Perm 2 Ped Phase	4 8	4 8	4 8						
E	Perm 3 Veh Phase	1 5	1 5	1 5						
F	Perm 3 Ped Phase									

Coordination - Bank 2

<C+0+C=2>

[Coordination Timing 2]

Coord Extra

1 = Programmed WALK Time for Sync Phases

2 = Always Terminate Sync Phase Peds

Row		E	Row
0			0
1	Plan 1 - Sync	2 6	1
2	Plan 2 - Sync	2 6	2
3	Plan 3 - Sync	2 6	3
4	Plan 4 - Sync	2 6	4
5	Plan 5 - Sync		5
6	Plan 6 - Sync		6
7	Plan 7 - Sync		7
8	Plan 8 - Sync		8
9	Plan 9 - Sync		9
A	NEMA Sync		A
B	NEMA Hold		B
C			C
D			D
E	Coord Extra		E
F			F

Sync Phases

<C+0+C=1>

[Coordination Functions]

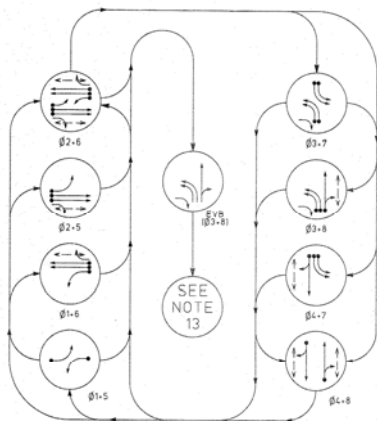
Row		F	Row
0	Free Lag	2 4 6 8	0
1	Plan 1 - Lag	2 4 6 8	1
2	Plan 2 - Lag	2 4 6 8	2
3	Plan 3 - Lag	2 4 6 8	3
4	Plan 4 - Lag	2 4 6 8	4
5	Plan 5 - Lag		5
6	Plan 6 - Lag		6
7	Plan 7 - Lag		7
8	Plan 8 - Lag		8
9	Plan 9 - Lag		9
A	External Lag		A
B			B
C			C
D			D
E			E
F			F

Lag Phases

<C+0+C=1>

[Coordination Functions]

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNIONIALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

170 EV PREEMPTION	
FUNCTION	EV
DELAY BEFORE PREEMPT	0
RED CLEAR BEFORE PREEMPT	0
MIN GREEN BEFORE PREEMPT	10
CLEARANCE TIME	20
PREEMPT EXTEND	20
*Program Timing on Optical Detection Unit	

TIMING CHART

PHASE	01	02	03	04	05	06	07	08
MINIMUM INITIAL	7 SEC	10 SEC	7 SEC	7 SEC	7 SEC	10 SEC	7 SEC	7 SEC
VEHICLE EXTENSION	20 SEC	20 SEC	20 SEC	20 SEC	20 SEC	20 SEC	20 SEC	20 SEC
YELLOW CHANGE INT	31 SEC	40 SEC	30 SEC	41 SEC	30 SEC	37 SEC	33 SEC	34 SEC
RED CLEARANCE	24 SEC	21 SEC	29 SEC	23 SEC	28 SEC	20 SEC	31 SEC	23 SEC
MAXIMUM LIMIT	20 SEC	50 SEC	20 SEC	15 SEC	20 SEC	50 SEC	20 SEC	15 SEC
RECALL POSITION	NONE	VEH RECALL	NONE	NONE	VEH RECALL	NONE	NONE	NONE
VEHICLE CALL MEMORY	NONE	YELLOW LOCK	NONE	NONE	YELLOW LOCK	NONE	NONE	NONE
DOUBLE ENTRY	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
WALK	- SEC	7 SEC	- SEC	7 SEC	- SEC	7 SEC	- SEC	7 SEC
FLASHING DON'T WALK	- SEC	19 SEC	- SEC	21 SEC	- SEC	21 SEC	- SEC	25 SEC
TYPE 3 LIMIT	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC
ALTERNATE EXTENSION	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC
ADD PER VEHICLE	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC
MAXIMUM INITIAL	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC
MAXIMUM GAP	20 SEC	20 SEC	20 SEC	20 SEC	20 SEC	20 SEC	20 SEC	20 SEC
REDUCE 0.1 SEC EVERY	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC
MINIMUM GAP	20 SEC	20 SEC	20 SEC	20 SEC	20 SEC	20 SEC	20 SEC	20 SEC

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown.
 Min Green for all other phases should not be lower than 4 seconds.
 Set Maximum Limit to 355 seconds.

TABLE OF OPERATION

SIGNAL FACE	PHASE							
	01	02	03	04	05	06	07	08
21	R	R	G	R	R	R	R	Y
22	R	R	G	R	R	R	R	Y
23	R	R	G	R	R	R	R	Y
31, 32	R	R	G	R	R	R	R	Y
41, 42	R	R	G	R	R	R	R	Y
61	R	R	G	R	R	R	R	Y
82	R	R	G	R	R	R	R	Y
71, 72	R	R	G	R	R	R	R	Y
81, 82	R	R	G	R	R	R	R	Y
P21, P22	D	W	W	W	D	W	W	W
P41, P42	D	W	W	W	D	W	W	W
P61, P62	D	W	W	W	D	W	W	W
P81, P82	D	W	W	W	D	W	W	W

DR - Dark Signal Face
 W - Walk
 DW - Don't Walk

LOOP & DETECTOR UNIT INSTALLATION CHART

770 CONTROLLER AND CABINET					DETECTOR PROGRAMMING													
INDUCTIVE LOOPS					TIMING			EXTENSION										STATUS
LOOP NO.	SIZE (FT)	TURNS	SET FROM STOP (FT)	X	NORMA- PHASE DELAY	CARRY	INITIAL	EXTENSION	YELLOW	RED	WALK	WALK	WALK	WALK	WALK	WALK		
1A	6X40	2-4-2	0	X	1	15 SEC	- SEC				X	X	X					
2A	6X6	4	70	X	2	- SEC	- SEC				X	X	X					
3B	6X40	2-4-2	0	X	3	15 SEC	- SEC				X	X	X					
3A	6X40	2-4-2	0	X	3	15 SEC	- SEC				X	X	X					
3B	6X40	2-4-2	0	X	3	15 SEC	- SEC				X	X	X					
4A	6X40	2-4-2	0	X	4	10 SEC	- SEC				X	X	X					
					5	15 SEC	- SEC				X	X	X					
5A	6X40	2-4-2	0	X	4	10 SEC	- SEC				X	X	X					
					5	15 SEC	- SEC				X	X	X					
6A	6X6	4	70	X	6	- SEC	- SEC				X	X	X					
6B	6X6	4	70	X	6	- SEC	- SEC				X	X	X					
7A	6X40	2-4-2	0	X	7	3 SEC	- SEC				X	X	X					
7B	6X40	2-4-2	0	X	7	3 SEC	- SEC				X	X	X					
8A	6X40	2-4-2	0	X	8	10 SEC	- SEC				X	X	X					
5236	N/A	N/A	+450	X	8	10 SEC	- SEC				X	X	X					
5237	N/A	N/A	360	X	8	- SEC	- SEC				X	X	X					
PEDESTRIAN DETECTION																		
P1/P22	N/A	N/A	N/A	X	2	- SEC	- SEC	X										
P1/P12	N/A	N/A	N/A	X	4	- SEC	- SEC	X										
P1/P16	N/A	N/A	N/A	X	6	- SEC	- SEC	X										
P1/P12	N/A	N/A	N/A	X	8	- SEC	- SEC	X										
Microprocessor System Reflectors																		

Display Indications:
0=Walk
1=Flashing Don't Walk
2=Minimum Green

4=Variable Initial
5=Extention
7=Reduce GAP
8=Red Rest
9=Preemption
A=Stop Time

B=Red Revert
C=Yellow Gap Term
D=Yellow Gap Max Term
E=Yellow Force-Off Term
F=Red Clearance

INTERSECTION: 0956-Guess Rd & Horton Rd

Page 3 (of 8)

Column Numbers ---->		Plan								
Plan Name ---->		1	2	3	4	5	6	7	8	9
0	Cycle Length	0	0	0	0	0	0	0	0	0
1	Phase 1 - ForceOff	0	0	0	0	0	0	0	0	0
2	Phase 2 - ForceOff	0	0	0	0	0	0	0	0	0
3	Phase 3 - ForceOff	0	0	0	0	0	0	0	0	0
4	Phase 4 - ForceOff	0	0	0	0	0	0	0	0	0
5	Phase 5 - ForceOff	0	0	0	0	0	0	0	0	0
6	Phase 6 - ForceOff	0	0	0	0	0	0	0	0	0
7	Phase 7 - ForceOff	0	0	0	0	0	0	0	0	0
8	Phase 8 - ForceOff	0	0	0	0	0	0	0	0	0
9	Ring Offset	0	0	0	0	0	0	0	0	0
A	Offset A	0	0	0	0	0	0	0	0	0
B	Offset B	0	0	0	0	0	0	0	0	0
C	Offset C	0	0	0	0	0	0	0	0	0
D	Perm 1 - End	0	0	0	0	0	0	0	0	0
E	Hold Release	0	0	0	0	0	0	0	0	0
F	Zone Offset	0	0	0	0	0	0	0	0	0

Coordination - Bank 1 <C+0+C=1>
[Coordination Timing 1 -]

Row										
0	Ped Adjustment	0	0	0	0	0	0	0	0	0
1	Perm 2 - Start	0	0	0	0	0	0	0	0	0
2	Perm 2 - End	0	0	0	0	0	0	0	0	0
3	Perm 3 - Start	0	0	0	0	0	0	0	0	0
4	Perm 3 - End	0	0	0	0	0	0	0	0	0
5	Reservice Time	0	0	0	0	0	0	0	0	0
6	Reservice Phases									
7										
8	Pretimed Phases									
9	Max Recall									
A	Perm 1 Veh Phase	12345678	12345678	12345678	12345678	12345678	12345678	12345678	12345678	12345678
B	Perm 1 Ped Phase	12345678	12345678	12345678	12345678	12345678	12345678	12345678	12345678	12345678
C	Perm 2 Veh Phase									
D	Perm 2 Ped Phase									
E	Perm 3 Veh Phase									
F	Perm 3 Ped Phase									

Coordination - Bank 2 <C+0+C=2>
[Coordination Timing 2]

Coord Extra
1 = Programmed WALK Time for Sync Phases
2 = Always Terminate Sync Phase Peds

	E	
0		0
1	Plan 1 - Sync	2 6
2	Plan 2 - Sync	2 6
3	Plan 3 - Sync	2 6
4	Plan 4 - Sync	2 6
5	Plan 5 - Sync	2 6
6	Plan 6 - Sync	2 6
7	Plan 7 - Sync	2 6
8	Plan 8 - Sync	2 6
9	Plan 9 - Sync	2 6
A	NEMA Sync	
B	NEMA Hold	
C		
D		
E	Coord Extra	
F		

Sync Phases <C+0+C=1>
[Coordination Functions]

	F	
0	Free Lag	2 4 6 8
1	Plan 1 - Lag	2 4 6 8
2	Plan 2 - Lag	2 4 6 8
3	Plan 3 - Lag	2 4 6 8
4	Plan 4 - Lag	2 4 6 8
5	Plan 5 - Lag	2 4 6 8
6	Plan 6 - Lag	2 4 6 8
7	Plan 7 - Lag	2 4 6 8
8	Plan 8 - Lag	2 4 6 8
9	Plan 9 - Lag	2 4 6 8
A	External Lag	
B		
C		
D		
E		
F		

Lag Phases <C+0+C=1>
[Coordination Functions]

PHASING DIAGRAM

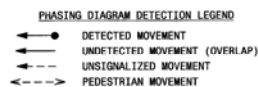
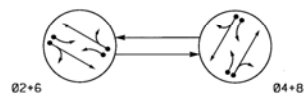


TABLE OF OPERATION

SIGNAL FACE	PHASE	21	22, 23	41	42, 43	61	62, 63	81	82, 83
02+6	04+8	Y	Y	Y	Y	Y	Y	Y	Y
02+6	04+8	Y	Y	Y	Y	Y	Y	Y	Y
02+6	04+8	Y	Y	Y	Y	Y	Y	Y	Y
02+6	04+8	Y	Y	Y	Y	Y	Y	Y	Y
02+6	04+8	Y	Y	Y	Y	Y	Y	Y	Y
02+6	04+8	Y	Y	Y	Y	Y	Y	Y	Y
02+6	04+8	Y	Y	Y	Y	Y	Y	Y	Y
02+6	04+8	Y	Y	Y	Y	Y	Y	Y	Y
02+6	04+8	Y	Y	Y	Y	Y	Y	Y	Y
02+6	04+8	Y	Y	Y	Y	Y	Y	Y	Y

SIGNAL FACE I.D.

All Heads L.E.D.

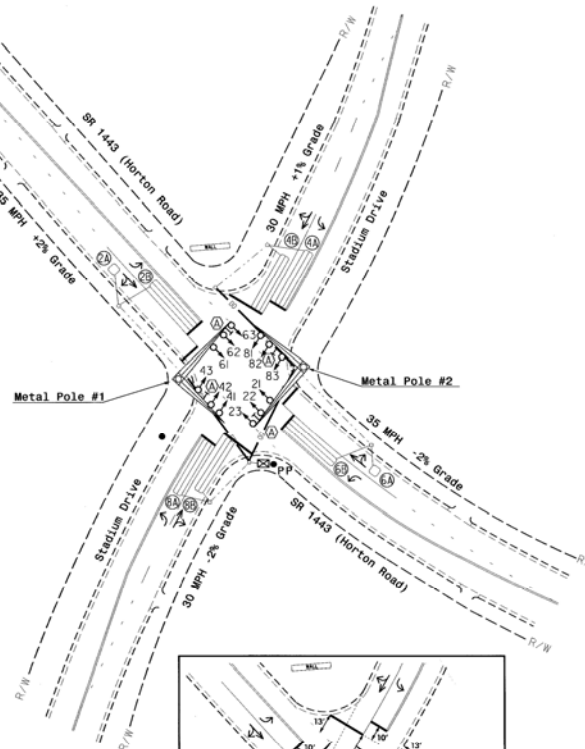


2033 SOFTWARE w/ 2070 CONTROLLER LOOP & DETECTOR UNIT INSTALLATION CHART									
INDUCTIVE LOOPS					DETECTOR PROGRAMMING				
LOOP NO.	SIZE (ft)	TURNS	DET FROM STOP (ft)	DETECT TYPE	NEMA PHASE	DELAY	CARRY (SEC)	STATUS	NOTES
2A	6X6	4	70	X	2	-	SEC	-	-
2B	6X40	2-4-2	0	X	2	-	SEC	-	-
4A	6X40	2-4-2	0	X	4	3	SEC	-	-
4B	6X40	2-4-2	0	X	4	10	SEC	-	-
6A	6X6	4	70	X	6	-	SEC	-	-
6B	6X40	2-4-2	0	X	6	-	SEC	-	-
8A	6X40	2-4-2	0	X	8	3	SEC	-	-
8B	6X40	2-4-2	0	X	8	10	SEC	-	-

2 Phase Fully Actuated (Durham Signal System)

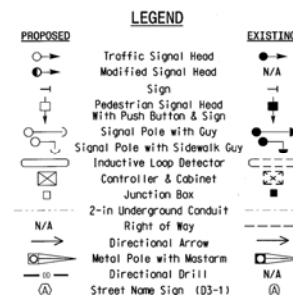
NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



TIMING CHART									
2033 Software w/ 2070 CONTROLLER									
PHASE	02	04	06	08	01	02	03	04	05
MINIMUM INITIAL *	10 SEC	7 SEC	10 SEC	7 SEC	10 SEC	7 SEC	10 SEC	7 SEC	10 SEC
VEHICLE EXTENSION *	3.0 SEC	2.0 SEC	3.0 SEC	2.0 SEC	3.0 SEC	2.0 SEC	3.0 SEC	2.0 SEC	3.0 SEC
YELLOW CHANGE INT.	4.0 SEC	3.6 SEC	4.0 SEC	3.6 SEC	4.0 SEC	3.6 SEC	4.0 SEC	3.6 SEC	4.0 SEC
RED CLEARANCE	1.2 SEC	1.9 SEC	1.2 SEC	1.9 SEC	1.2 SEC	1.9 SEC	1.2 SEC	1.9 SEC	1.2 SEC
MAXIMUM LIMIT *	45 SEC	20 SEC	45 SEC	20 SEC	45 SEC	20 SEC	45 SEC	20 SEC	45 SEC
RECALL POSITION	VEH. RECALL	NONE	VEH. RECALL	NONE	VEH. RECALL	NONE	VEH. RECALL	NONE	VEH. RECALL
VEHICLE CALL MEMORY	YELLOW LOCK	NONLOCK	YELLOW LOCK	NONLOCK	YELLOW LOCK	NONLOCK	YELLOW LOCK	NONLOCK	YELLOW LOCK
DOUBLE ENTRY	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF
WALK *	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC
FLASHING DON'T WALK	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC
TYPE 3 LIMIT	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC
ALTERNATE EXTENSION	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC
ADD PER VEHICLE *	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC
MAXIMUM INITIAL *	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC
MAXIMUM GAP *	3.0 SEC	2.0 SEC	3.0 SEC	2.0 SEC	3.0 SEC	2.0 SEC	3.0 SEC	2.0 SEC	3.0 SEC
REDUCE 0.1 SEC EVERY *	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC
MINIMUM GAP	3.0 SEC	2.0 SEC	3.0 SEC	2.0 SEC	3.0 SEC	2.0 SEC	3.0 SEC	2.0 SEC	3.0 SEC

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.



New Installation

		SR 1443 (Horton Road) at Stadium Drive	
Division 5 Durham County Durham		Division 5 Durham County Durham	
PLAN DATE: March 2014	REVIEWED BY:	PREPARED BY: G.E. Carter	REVIEWED BY:
REVISIONS:	DATE:	INITIALS:	DATE:
1"=40'		4/23/14	
05-0108		05-0108	

Note:
The Ring-Barrier Sum of these Minimums will be the Minimum Cycle Length During Transition

Transition Type	0.3
Coord Extra Functions	
Phase 1 - Minimum	10
Phase 2 - Minimum	10
Phase 3 - Minimum	10
Phase 4 - Minimum	10
Phase 5 - Minimum	10
Phase 6 - Minimum	10
Phase 7 - Minimum	10
Phase 8 - Minimum	10

Coordination - General

Coord Extra
 1 = Programmed Walk Time for Sync Phases
 2 = Always Terminate Sync Phase Peds
 3 = Use "Floating Force Off"
 4 =
 5 = Use "Start of Green" for Sync Point

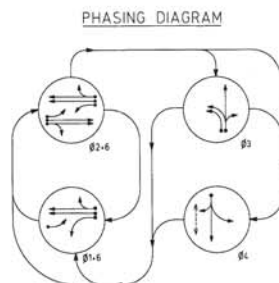
Transition Type
 0.X = Shortway
 1.X = Lengthen Only
 2.X = Shorten Only
 X.1 thru X.4 = Number of Cycles to get "In Step"

Coordination Plan									
	1	2	3	4	5	6	7	8	9
Cycle	100	100	100	100	100	100	100	100	100
Offset - 1	0	0	0	0	0	0	0	0	0
Offset - 2	0	0	0	0	0	0	0	0	0
Offset - 3	0	0	0	0	0	0	0	0	0
Zone Offset	0	0	0	0	0	0	0	0	0
Ring Offset	0	0	0	0	0	0	0	0	0
Hold Release	255	255	255	255	255	255	255	255	255
Ped Adjust	0	0	0	0	0	0	0	0	0
Force Off - 1	60	60	60	60	60	60	60	60	60
Force Off - 2	0	0	0	0	0	0	0	0	0
Force Off - 3	20	20	20	20	20	20	20	20	20
Force Off - 4	40	40	40	40	40	40	40	40	40
Force Off - 5	60	60	60	60	60	60	60	60	60
Force Off - 6	0	0	0	0	0	0	0	0	0
Force Off - 7	20	20	20	20	20	20	20	20	20
Force Off - 8	40	40	40	40	40	40	40	40	40

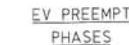
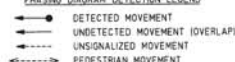
Coordination - Cycle, Offsets, & Force Offs

Coordination Plan									
	1	2	3	4	5	6	7	8	9
Perm 1 - Begin	0	0	0	0	0	0	0	0	0
Perm 1 - End	5	5	5	5	5	5	5	5	5
Perm 1 - Veh Phases	12345678	12345678	12345678	12345678	12345678	12345678	12345678	12345678	12345678
Perm 1 - Ped Phases	12345678	12345678	12345678	12345678	12345678	12345678	12345678	12345678	12345678
Perm 2 - Begin	0	0	0	0	0	0	0	0	0
Perm 2 - End	0	0	0	0	0	0	0	0	0
Perm 2 - Veh Phases									
Perm 2 - Ped Phases									
Perm 3 - Begin	0	0	0	0	0	0	0	0	0
Perm 3 - End	0	0	0	0	0	0	0	0	0
Perm 3 - Veh Phases									
Perm 3 - Ped Phases									
Max Inhibit Phases	12345678	12345678	12345678	12345678	12345678	12345678	12345678	12345678	12345678
Max Recall Phases									
Sync Phases	2_6	2_6	2_6	2_6	2_6	2_6	2_6	2_6	2_6
Lag Phases	2_4_6_8	2_4_6_8	2_4_6_8	2_4_6_8	2_4_6_8	2_4_6_8	2_4_6_8	2_4_6_8	2_4_6_8
Pre-Timed Phases									

Coordination - Permissives & Phase Sequence



PHASING DIAGRAM DETECTION LEGEND



*See Note 16



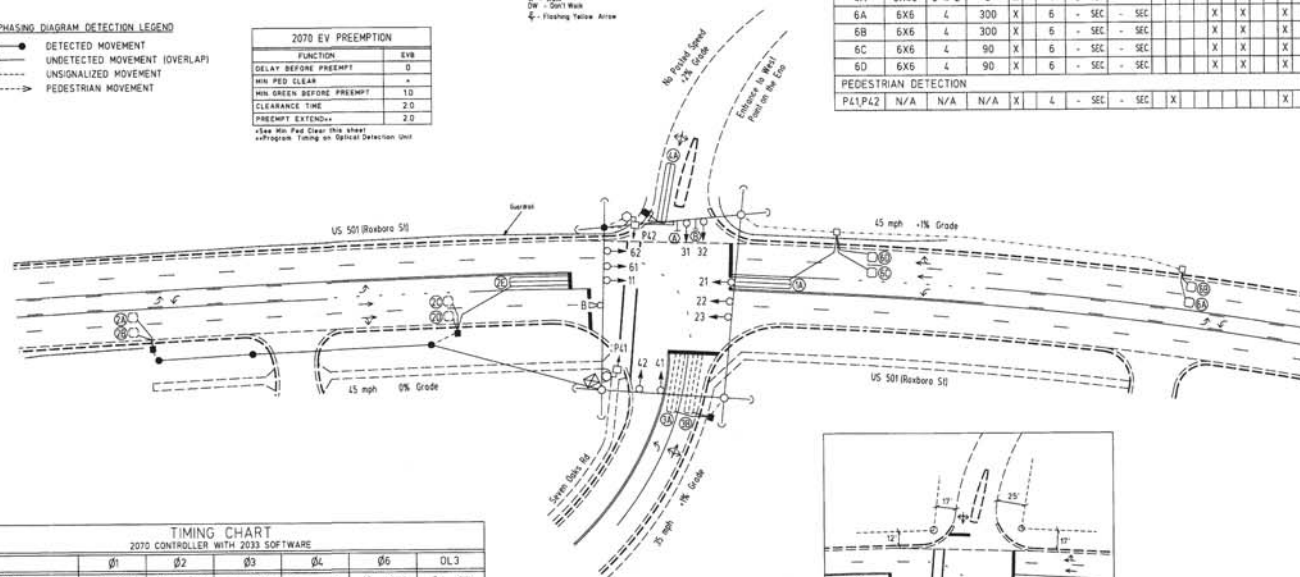
DATA EV. RECEIPTION

FUNCTION	EV8
DELAY BEFORE PREEMPT	0
MIN PED CLEAR	*
MIN GREEN BEFORE PREEMPT	10
CLEARANCE TIME	20
PREEMPT EXTEND**	20

*See Min. Pad Clear this sheet
*Program: Timing on Optical Detection Unit

SIGNAL FACE	PHASE					
	1 F	2 F	3 F	4 F	FLASH	FLASH
11	+	+	+	+	+	+
21	F	F	+	+	F	+
22, 23	R	R	R	R	G	Y
31	R	R	G	R	R	R
32	R	R	G	R	R	R
41	R	R	R	G	R	R
42	R	R	R	G	R	R
61, 62	G	G	R	R	R	Y
P1, P2	D	W	D	W	D	W

DRK - Dark Signal Face
 W - Walk
 OW - Don't Walk
 FLY - Flashing Yellow Arrow

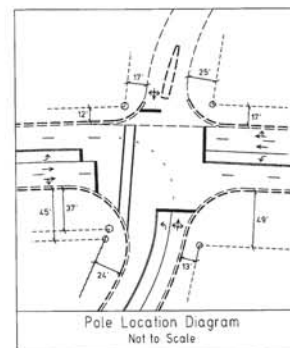
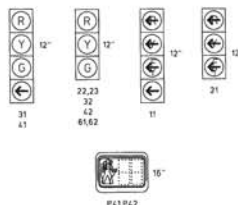


TIMING CHART							
2070 CONTROLLER WITH 2033 SOFTWARE							
PHASE	φ1	φ2	φ3	φ4	φ6	OL3	
MINIMUM INITIAL	7 SEC	12 SEC	7 SEC	7 SEC	12 SEC	0 SEC	0 SEC
VEHICLE EXTENSION	2.0 SEC	3.0 SEC	2.0 SEC	2.0 SEC	3.0 SEC	- SEC	- SEC
YELLOW CHANGE INTERVAL	3.0 SEC	4.5 SEC	3.1 SEC	3.7 SEC	4.5 SEC	4.5 SEC	4.5 SEC
RED CLEARANCE	1.9 SEC	1.3 SEC	2.8 SEC	1.6 SEC	1.3 SEC	1.3 SEC	1.3 SEC
MAXIMUM LIMIT	15 SEC	60 SEC	30 SEC	20 SEC	60 SEC	60 SEC	60 SEC
RECALL POSITION	NONE	VEH RECALL	NONE	NONE	VEH RECALL	NONE	NONE
VEHICLE CALL MEMORY	NONE	YELLOW LOCK	NONE	NONE	YELLOW LOCK	NONE	NONE
DOUBLE ENTRY	OFF	OFF	OFF	OFF	OFF	OFF	OFF
WALK	- SEC	- SEC	- SEC	7 SEC	- SEC	- SEC	- SEC
FLASHING DON'T WALK	- SEC	- SEC	- SEC	24 SEC	- SEC	- SEC	- SEC
MIN PED CLEAR	- SEC	- SEC	- SEC	12 SEC	- SEC	- SEC	- SEC
TYPE 3 LIMIT	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC
ADD PER VEHICLE	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC
MAXIMUM INITIAL	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC
MAXIMUM GAP	2.0 SEC	3.0 SEC	2.0 SEC	2.0 SEC	3.0 SEC	3.0 SEC	3.0 SEC
REDUCE D1 SEC EVERY	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC	- SEC
MINIMUM GAP	2.0 SEC	3.0 SEC	2.0 SEC	2.0 SEC	3.0 SEC	3.0 SEC	3.0 SEC

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

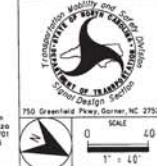
SIGNAL FACE ID

All Heads LED



DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
FINAL DRAWING Date: 1/28/15
R. W. Hough
-The Engineer in Charge

SIGNAL UPGRADE

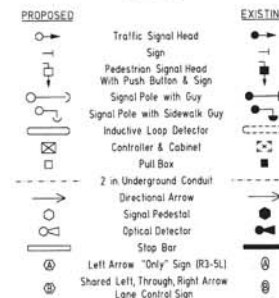


4 Phase
Fully Actuated
with EV Preemption
(Durham Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012, "Standard Specifications for Roads and Structures" dated January 2012, and all applicable sections of the latest version of the generic Project Special Provisions The PSP can be accessed at the following website <http://www.ncdot.org/doh/preconstruct/traffic/itsa/>
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Pavement markings are existing.
4. Phase 1 may be lagged.
5. The order of phase 3 and phase 4 may be reversed.
6. Set all detector units to presence mode.
7. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
8. Program all timing information into phase banks 1, 2 and 3 unless otherwise noted.
9. Set phase bank 3 maximum limit to 250 seconds for phases used.
10. Omit "WALK" and flashing "DON'T WALK" with no pedestrian call.
11. Program pedestrian heads to count down the flashing "Don't Walk" time only.
12. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
13. Upon completion of emergency vehicle preemption phase, controller returns to normal operation based on vehicle demand.
14. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
15. This intersection features an optical preemption system. Shown locations of optical detectors are conceptual only.
16. When Emergency Vehicle Preemption initializes during side street service signal head 11 will display a red arrow,

LEGEND



SEAL



Note:
The Ring-Barrier Sum of these Minimums will be the Minimum Cycle Length During Transition

Transition Type	0.2
Coord Extra Functions	
Phase 1 - Minimum	7
Phase 2 - Minimum	12
Phase 3 - Minimum	7
Phase 4 - Minimum	7
Phase 5 - Minimum	7
Phase 6 - Minimum	12
Phase 7 - Minimum	7
Phase 8 - Minimum	7

Coordination - General

Coord Extra
 1 = Programmed Walk Time for Sync Phases
 2 = Always Terminate Sync Phase Peds
 3 = Use "Floating Force Off"
 4 =
 5 = Use "Start of Green" for Sync Point

Transition Type
 0.X = Shortway
 1.X = Lengthen Only
 2.X = Shorten Only
 X.1 thru X.4 = Number of Cycles to get "In Step"

	Coordination Plan								
	1	2	3	4	5	6	7	8	9
Cycle	125	0	0	0	0	0	0	0	0
Offset - 1	90	0	0	0	0	0	0	0	0
Offset - 2	90	0	0	0	0	0	0	0	0
Offset - 3	90	0	0	0	0	0	0	0	0
Zone Offset	0	0	0	0	0	0	0	0	0
Ring Offset	0	0	0	0	0	0	0	0	0
Hold Release	255	255	255	255	255	255	255	255	255
Ped Adjust	0	0	0	0	0	0	0	0	0
Force Off - 1	62	0	0	0	0	0	0	0	0
Force Off - 2	0	0	0	0	0	0	0	0	0
Force Off - 3	45	0	0	0	0	0	0	0	0
Force Off - 4	14	0	0	0	0	0	0	0	0
Force Off - 5	0	0	0	0	0	0	0	0	0
Force Off - 6	0	0	0	0	0	0	0	0	0
Force Off - 7	0	0	0	0	0	0	0	0	0
Force Off - 8	0	0	0	0	0	0	0	0	0

Coordination - Cycle, Offsets, & Force Offs

	Coordination Plan								
	1	2	3	4	5	6	7	8	9
Perm 1 - Begin	0	0	0	0	0	0	0	0	0
Perm 1 - End	0	0	0	0	0	0	0	0	0
Perm 1 - Veh Phases	4								
Perm 1 - Ped Phases	4								
Perm 2 - Begin	0	0	0	0	0	0	0	0	0
Perm 2 - End	31	0	0	0	0	0	0	0	0
Perm 2 - Veh Phases	3								
Perm 2 - Ped Phases									
Perm 3 - Begin	0	0	0	0	0	0	0	0	0
Perm 3 - End	42	0	0	0	0	0	0	0	0
Perm 3 - Veh Phases	1								
Perm 3 - Ped Phases									
Max Inhibit Phases									
Max Recall Phases									
Sync Phases	2 6								
Lag Phases	23 6								
Pre-Timed Phases									

Coordination - Permissives & Phase Sequence

Appendix C:

Intersection Capacity Analysis

Westpoint Residential TIA
1: Guess Road (NC 157) & Horton Road

Existing (2018) AM

06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	111	106	87	169	111	103	42	321	70	181	1115	185
Future Volume (vph)	111	106	87	169	111	103	42	321	70	181	1115	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		125	225		0	375		125	325		50
Storage Lanes	1		1	2		0	1		1	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.932			0.928				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3335	1690	0	3467	1649	0	1612	3505	1553	1770	3539	1583
Flt Permitted	0.950			0.950			0.129			0.488		
Satd. Flow (perm)	3335	1690	0	3467	1649	0	219	3505	1553	909	3539	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		728			786			2115			2616	
Travel Time (s)		14.2			15.3			36.1			44.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	5%	3%	7%	1%	5%	9%	12%	3%	4%	2%	2%	2%
Adj. Flow (vph)	123	118	97	188	123	114	47	357	78	201	1239	206
Shared Lane Traffic (%)												
Lane Group Flow (vph)	123	215	0	188	237	0	47	357	78	201	1239	206
Turn Type	Prot	NA		Prot	NA		pm+pt	NA	pm+ov	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases							2		2	6		6
Detector Phase	7	4		3	8		5	2	3	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	10.0	7.0	7.0	10.0	10.0
Minimum Split (s)	13.4	34.4		12.9	37.7		13.1	32.1	12.9	12.5	33.7	33.7
Total Split (s)	13.4	34.6		16.5	37.7		13.1	54.1	16.5	14.8	55.8	55.8
Total Split (%)	11.2%	28.8%		13.8%	31.4%		10.9%	45.1%	13.8%	12.3%	46.5%	46.5%
Maximum Green (s)	7.0	28.2		10.6	32.0		7.0	48.0	10.6	9.3	50.1	50.1
Yellow Time (s)	3.3	4.1		3.0	3.4		3.3	4.0	3.0	3.1	3.7	3.7
All-Red Time (s)	3.1	2.3		2.9	2.3		2.8	2.1	2.9	2.4	2.0	2.0
Lost Time Adjust (s)	-1.4	-1.4		-0.9	-0.7		-1.1	-1.1	-0.9	-0.5	-0.7	-0.7
Total Lost Time (s)	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	Lag		Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Recall Mode	None	None		None	None		None	C-Max	None	None	C-Max	C-Max
Walk Time (s)		7.0			7.0			7.0			7.0	7.0
Flash Dont Walk (s)		21.0			25.0			19.0			21.0	21.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effect Green (s)	8.4	21.1		10.7	23.4		66.1	57.8	73.5	71.4	62.5	62.5
Actuated g/C Ratio	0.07	0.18		0.09	0.20		0.55	0.48	0.61	0.60	0.52	0.52
v/c Ratio	0.53	0.72		0.61	0.74		0.22	0.21	0.08	0.33	0.67	0.25
Control Delay	62.6	60.1		61.4	58.5		14.0	19.8	11.4	13.0	25.6	19.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

Westpoint Residential TIA
1: Guess Road (NC 157) & Horton Road

Existing (2018) AM

06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	62.6	60.1		61.4	58.5		14.0	19.8	11.4	13.0	25.6	19.3
LOS	E	E		E	E		B	B	B	B	C	B
Approach Delay		61.0			59.8			17.9			23.3	
Approach LOS		E			E			B			C	
Queue Length 50th (ft)	48	159		73	173		14	83	23	65	381	90
Queue Length 95th (ft)	80	228		112	245		35	130	53	120	530	162
Internal Link Dist (ft)		648			706			2035			2536	
Turn Bay Length (ft)	200			225			375		125	325		50
Base Capacity (vph)	233	416		332	449		216	1687	961	620	1843	825
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	0.53	0.52		0.57	0.53		0.22	0.21	0.08	0.32	0.67	0.25

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 32.2

Intersection Capacity Utilization 71.3%

Analysis Period (min) 15

Intersection LOS: C

ICU Level of Service C

Splits and Phases: 1: Guess Road (NC 157) & Horton Road

 Ø1	 Ø2 (R)	 Ø3	 Ø4
14.8 s	54.1 s	16.5 s	34.6 s
 Ø5	 Ø6 (R)	 Ø7	 Ø8
13.1 s	55.8 s	13.4 s	37.7 s

Westpoint Residential TIA
2: Stadium Drive & Horton Road

Existing (2018) AM

06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	320	52	13	306	7	68	1	18	20	11	59
Future Volume (vph)	22	320	52	13	306	7	68	1	18	20	11	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	100		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
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
Frt		0.979			0.997			0.857			0.873	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1656	1727	0	1805	1840	0	1656	1540	0	1805	1614	0
Flt Permitted	0.552			0.513			0.706			0.744		
Satd. Flow (perm)	962	1727	0	975	1840	0	1231	1540	0	1414	1614	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		2452			1495			1126			1263	
Travel Time (s)		47.8			29.1			25.6			28.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	9%	8%	6%	0%	3%	0%	9%	0%	6%	0%	18%	0%
Adj. Flow (vph)	24	356	58	14	340	8	76	1	20	22	12	66
Shared Lane Traffic (%)												
Lane Group Flow (vph)	24	414	0	14	348	0	76	21	0	22	78	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	15.2	15.2		15.2	15.2		12.5	12.5		12.5	12.5	
Total Split (s)	70.0	70.0		70.0	70.0		30.0	30.0		30.0	30.0	
Total Split (%)	70.0%	70.0%		70.0%	70.0%		30.0%	30.0%		30.0%	30.0%	
Maximum Green (s)	64.8	64.8		64.8	64.8		24.5	24.5		24.5	24.5	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.6	3.6		3.6	3.6	
All-Red Time (s)	1.2	1.2		1.2	1.2		1.9	1.9		1.9	1.9	
Lost Time Adjust (s)	-0.2	-0.2		-0.2	-0.2		-0.5	-0.5		-0.5	-0.5	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effect Green (s)	82.0	82.0		82.0	82.0		11.5	11.5		11.5	11.5	
Actuated g/C Ratio	0.82	0.82		0.82	0.82		0.12	0.12		0.12	0.12	
v/c Ratio	0.03	0.29		0.02	0.23		0.54	0.12		0.14	0.42	
Control Delay	3.1	3.8		3.2	3.4		55.1	39.2		39.8	47.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	3.1	3.8		3.2	3.4		55.1	39.2		39.8	47.1	
LOS	A	A		A	A		E	D		D	D	
Approach Delay		3.8			3.4			51.6			45.5	

Westpoint Residential TIA
2: Stadium Drive & Horton Road

Existing (2018) AM
06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			A			D			D	
Queue Length 50th (ft)	3	57		2	45		47	12		13	47	
Queue Length 95th (ft)	10	116		7	92		89	33		34	88	
Internal Link Dist (ft)		2372			1415			1046			1183	
Turn Bay Length (ft)	100			100			100			100		
Base Capacity (vph)	789	1416		799	1509		307	385		353	403	
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	0.03	0.29		0.02	0.23		0.25	0.05		0.06	0.19	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 40
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.54
Intersection Signal Delay: 12.5
Intersection Capacity Utilization 38.8%
Analysis Period (min) 15

Intersection LOS: B
ICU Level of Service A

Splits and Phases: 2: Stadium Drive & Horton Road



Westpoint Residential TIA
3: N Duke Street (US 501) & Horton Road

Existing (2018) AM

06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	76	213	210	151	187	15	72	483	54	22	1174	63
Future Volume (vph)	76	213	210	151	187	15	72	483	54	22	1174	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		200	0		0	250		0	100		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.989			0.985			0.992	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	1845	1599	1736	1764	0	1752	3333	0	1719	3509	0
Flt Permitted	0.422			0.343			0.070			0.419		
Satd. Flow (perm)	794	1845	1599	627	1764	0	129	3333	0	758	3509	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1974			505			1329			2255	
Travel Time (s)		38.5			9.8			22.7			38.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	3%	1%	4%	6%	13%	3%	7%	4%	5%	2%	3%
Adj. Flow (vph)	84	237	233	168	208	17	80	537	60	24	1304	70
Shared Lane Traffic (%)												
Lane Group Flow (vph)	84	237	233	168	225	0	80	597	0	24	1374	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Detector Phase	7	4	5	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	12.0		7.0	12.0	
Minimum Split (s)	13.0	35.0	12.2	12.6	33.7		12.2	32.9		12.0	31.8	
Total Split (s)	13.0	35.0	12.3	12.6	34.6		12.3	50.4		12.0	50.1	
Total Split (%)	11.8%	31.8%	11.2%	11.5%	31.5%		11.2%	45.8%		10.9%	45.5%	
Maximum Green (s)	7.0	29.0	7.1	7.0	28.9		7.1	44.5		7.0	44.3	
Yellow Time (s)	3.1	3.8	3.2	3.2	3.9		3.2	4.2		3.2	4.2	
All-Red Time (s)	2.9	2.2	2.0	2.4	1.8		2.0	1.7		1.8	1.6	
Lost Time Adjust (s)	-1.0	-1.0	-0.2	-0.6	-0.7		-0.2	-0.9		0.0	-0.8	
Total Lost Time (s)	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	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		22.0			21.0			20.0			19.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effect Green (s)	27.6	19.6	32.2	27.8	21.8		66.4	63.0		62.2	55.2	
Actuated g/C Ratio	0.25	0.18	0.29	0.25	0.20		0.60	0.57		0.57	0.50	
v/c Ratio	0.31	0.72	0.50	0.71	0.65		0.42	0.31		0.05	0.78	
Control Delay	30.6	54.9	35.1	48.8	50.0		19.1	14.6		10.2	27.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	

Westpoint Residential TIA
3: N Duke Street (US 501) & Horton Road

Existing (2018) AM
06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	30.6	54.9	35.1	48.8	50.0		19.1	14.6		10.2	27.6	
LOS	C	D	D	D	D		B	B		B	C	
Approach Delay		42.9			49.5			15.1			27.3	
Approach LOS		D			D			B			C	
Queue Length 50th (ft)	44	159	137	93	152		21	96		6	400	
Queue Length 95th (ft)	76	228	190	139	219		59	192		20	#621	
Internal Link Dist (ft)		1894			425			1249			2175	
Turn Bay Length (ft)	150		200				250			100		
Base Capacity (vph)	271	503	469	235	474		191	1910		489	1760	
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	0.31	0.47	0.50	0.71	0.47		0.42	0.31		0.05	0.78	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 41 (37%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 105

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 30.3

Intersection LOS: C

Intersection Capacity Utilization 76.5%

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: 3: N Duke Street (US 501) & Horton Road

 Ø1	 Ø2 (R)	 Ø3	 Ø4
12 s	50.4 s	12.6 s	35 s
 Ø5	 Ø6 (R)	 Ø7	 Ø8
12.3 s	50.1 s	13 s	34.6 s

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	1	12	148	0	21	3	961	15	19	1795	10
Future Volume (vph)	2	1	12	148	0	21	3	961	15	19	1795	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	125		0	150		0	175		0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.890			0.962			0.998			0.999	
Flt Protected		0.994		0.950	0.964		0.950			0.950		
Satd. Flow (prot)	0	1681	0	1618	1564	0	1805	3398	0	1556	3502	0
Flt Permitted		0.994		0.950	0.964		0.077			0.230		
Satd. Flow (perm)	0	1681	0	1618	1564	0	146	3398	0	377	3502	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			35			45			45	
Link Distance (ft)		355			718			526			1606	
Travel Time (s)		9.7			14.0			8.0			24.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	6%	0%	10%	0%	6%	7%	16%	3%	0%
Adj. Flow (vph)	2	1	13	164	0	23	3	1068	17	21	1994	11
Shared Lane Traffic (%)				42%								
Lane Group Flow (vph)	0	16	0	95	92	0	3	1085	0	21	2005	0
Turn Type	Split	NA		Split	NA		Perm	NA		D.P+P	NA	
Protected Phases	4	4		3	3			2		1	6	
Permitted Phases							2			2		
Detector Phase	4	4		3	3		2	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		12.0	12.0		7.0	12.0	
Minimum Split (s)	36.3	36.3		12.9	12.9		17.8	17.8		11.9	17.8	
Total Split (s)	36.3	36.3		13.0	13.0		63.8	63.8		11.9	75.7	
Total Split (%)	29.0%	29.0%		10.4%	10.4%		51.0%	51.0%		9.5%	60.6%	
Maximum Green (s)	31.0	31.0		7.1	7.1		58.0	58.0		7.0	69.9	
Yellow Time (s)	3.7	3.7		3.1	3.1		4.5	4.5		3.0	4.5	
All-Red Time (s)	1.6	1.6		2.8	2.8		1.3	1.3		1.9	1.3	
Lost Time Adjust (s)		-0.3		-0.9	-0.9		-0.8	-0.8		0.1	-0.8	
Total Lost Time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag		Lead	Lead		Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes		
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	3.0		2.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	7.0	7.0										
Flash Dont Walk (s)	24.0	24.0										
Pedestrian Calls (#/hr)	0	0										
Act Effect Green (s)		7.4		8.0	8.0		94.8	94.8		98.9	101.9	
Actuated g/C Ratio		0.06		0.06	0.06		0.76	0.76		0.79	0.82	
v/c Ratio		0.16		0.92	0.92		0.03	0.42		0.06	0.70	
Control Delay		59.6		127.8	128.5		8.0	7.4		3.6	7.6	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	

Westpoint Residential TIA
4: N Roxboro Street (US 501) & Driveway/Seven Oaks Road

Existing (2018) AM

06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		59.6		127.8	128.5		8.0	7.4		3.6	7.6	
LOS		E		F	F		A	A		A	A	
Approach Delay		59.6			128.1			7.4			7.6	
Approach LOS		E			F			A			A	
Queue Length 50th (ft)		13		82	78		1	139		2	206	
Queue Length 95th (ft)		36		#196	#192		5	262		10	515	
Internal Link Dist (ft)		275			638			446			1526	
Turn Bay Length (ft)				125			150			175		
Base Capacity (vph)		420		103	100		110	2576		363	2855	
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		0.04		0.92	0.92		0.03	0.42		0.06	0.70	

Intersection Summary

Area Type: Other

Cycle Length: 125

Actuated Cycle Length: 125

Offset: 90 (72%), Referenced to phase 2:NBSB and 6:SBT, Start of Green

Natural Cycle: 130

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 14.6

Intersection LOS: B

Intersection Capacity Utilization 69.7%

ICU Level of Service C

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 4: N Roxboro Street (US 501) & Driveway/Seven Oaks Road



Westpoint Residential TIA
5: N Roxboro Street (US 501) & Future Site Access #1

Existing (2018) AM
06/26/2019

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	979	1955	0
Future Volume (vph)	0	0	0	979	1955	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	150			0
Storage Lanes	1	0	1			0
Taper Length (ft)	100		100			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Flt						
Flt Protected						
Satd. Flow (prot)	1863	0	1863	3406	3505	0
Flt Permitted						
Satd. Flow (perm)	1863	0	1863	3406	3505	0
Link Speed (mph)	25			45	45	
Link Distance (ft)	714			1529	526	
Travel Time (s)	19.5			23.2	8.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	6%	3%	2%
Adj. Flow (vph)	0	0	0	1088	2172	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1088	2172	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 57.4%
Analysis Period (min) 15
ICU Level of Service B

Westpoint Residential TIA
5: N Roxboro Street (US 501) & Future Site Access #1

Existing (2018) AM
06/26/2019

Intersection

Int Delay, s/veh 0

Movement EBL EBR NBL NBT SBT SBR

Lane Configurations 

Traffic Vol, veh/h 0 0 0 979 1955 0

Future Vol, veh/h 0 0 0 979 1955 0

Conflicting Peds, #/hr 0 0 0 0 0 0

Sign Control Stop Stop Free Free Free Free

RT Channelized - None - None - None

Storage Length 0 - 150 - - -

Veh in Median Storage, # 0 - - 0 0 -

Grade, % 0 - - 0 0 -

Peak Hour Factor 90 90 90 90 90 90

Heavy Vehicles, % 2 2 2 6 3 2

Mvmt Flow 0 0 0 1088 2172 0

Major/Minor Minor2 Major1 Major2

Conflicting Flow All 2716 1086 2172 0 - 0

Stage 1 2172 - - - - -

Stage 2 544 - - - - -

Critical Hdwy 6.84 6.94 4.14 - - -

Critical Hdwy Stg 1 5.84 - - - - -

Critical Hdwy Stg 2 5.84 - - - - -

Follow-up Hdwy 3.52 3.32 2.22 - - -

Pot Cap-1 Maneuver 17 212 242 - - -

Stage 1 73 - - - - -

Stage 2 546 - - - - -

Platoon blocked, % - - -

Mov Cap-1 Maneuver 17 212 242 - - -

Mov Cap-2 Maneuver 17 - - - - -

Stage 1 73 - - - - -

Stage 2 546 - - - - -

Approach EB NB SB

HCM Control Delay, s 0 0 0

HCM LOS A

Minor Lane/Major Mvmt NBL NBT EBLn1 SBT SBR

Capacity (veh/h) 242 - - - -

HCM Lane V/C Ratio - - - - -

HCM Control Delay (s) 0 - 0 - -

HCM Lane LOS A - A - -

HCM 95th %tile Q(veh) 0 - - - -

Westpoint Residential TIA
1: Guess Road (NC 157) & Horton Road

Existing (2018) PM

06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 			 				 			 	
Traffic Volume (vph)	493	201	54	171	154	179	123	1069	164	168	613	120
Future Volume (vph)	493	201	54	171	154	179	123	1069	164	168	613	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		125	225		0	375		125	325		50
Storage Lanes	1		1	2		0	1		1	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.968			0.919				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3502	1789	0	3467	1711	0	1805	3574	1553	1736	3574	1583
Flt Permitted	0.950			0.950			0.268			0.095		
Satd. Flow (perm)	3502	1789	0	3467	1711	0	509	3574	1553	174	3574	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		728			786			2115			2616	
Travel Time (s)		14.2			15.3			36.1			44.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	3%	2%	1%	1%	3%	0%	1%	4%	4%	1%	2%
Adj. Flow (vph)	548	223	60	190	171	199	137	1188	182	187	681	133
Shared Lane Traffic (%)												
Lane Group Flow (vph)	548	283	0	190	370	0	137	1188	182	187	681	133
Turn Type	Prot	NA		Prot	NA		pm+pt	NA	pm+ov	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases							2		2	6		6
Detector Phase	7	4		3	8		5	2	3	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	10.0	7.0	7.0	10.0	10.0
Minimum Split (s)	13.4	34.4		12.9	37.7		13.1	32.1	12.9	12.5	33.7	33.7
Total Split (s)	23.8	44.7		16.8	37.7		15.0	44.4	16.8	14.1	43.5	43.5
Total Split (%)	19.8%	37.3%		14.0%	31.4%		12.5%	37.0%	14.0%	11.8%	36.3%	36.3%
Maximum Green (s)	17.4	38.3		10.9	32.0		8.9	38.3	10.9	8.6	37.8	37.8
Yellow Time (s)	3.3	4.1		3.0	3.4		3.3	4.0	3.0	3.1	3.7	3.7
All-Red Time (s)	3.1	2.3		2.9	2.3		2.8	2.1	2.9	2.4	2.0	2.0
Lost Time Adjust (s)	-1.4	-1.4		-0.9	-0.7		-1.1	-1.1	-0.9	-0.5	-0.7	-0.7
Total Lost Time (s)	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	Lag		Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Recall Mode	None	None		None	None		None	C-Max	None	None	C-Max	C-Max
Walk Time (s)		7.0			7.0			7.0			7.0	7.0
Flash Dont Walk (s)		21.0			25.0			19.0			21.0	21.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effect Green (s)	18.8	37.3		10.9	29.4		50.2	40.6	56.5	53.3	42.1	42.1
Actuated g/C Ratio	0.16	0.31		0.09	0.24		0.42	0.34	0.47	0.44	0.35	0.35
v/c Ratio	1.00	0.51		0.61	0.88		0.43	0.98	0.25	0.84	0.54	0.24
Control Delay	89.2	37.1		60.9	66.3		23.7	62.1	20.4	59.5	34.0	30.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

Westpoint Residential TIA
1: Guess Road (NC 157) & Horton Road

Existing (2018) PM

06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	89.2	37.1		60.9	66.3		23.7	62.1	20.4	59.5	34.0	30.5
LOS	F	D		E	E		C	E	C	E	C	C
Approach Delay		71.5			64.4			53.6			38.3	
Approach LOS		E			E			D			D	
Queue Length 50th (ft)	221	176		73	271		61	~494	83	98	231	76
Queue Length 95th (ft)	#339	259		112	#412		104	#646	134	#255	295	129
Internal Link Dist (ft)		648			706			2035			2536	
Turn Bay Length (ft)	200			225			375		125	325		50
Base Capacity (vph)	548	591		340	466		325	1208	742	223	1254	555
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	1.00	0.48		0.56	0.79		0.42	0.98	0.25	0.84	0.54	0.24

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 120

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.00

Intersection Signal Delay: 55.0

Intersection LOS: E

Intersection Capacity Utilization 88.7%

ICU Level of Service E

Analysis Period (min) 15

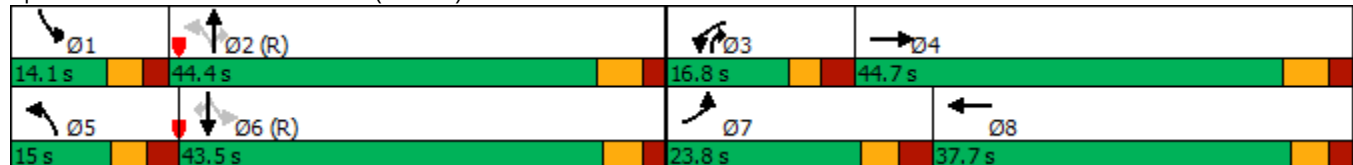
~ Volume exceeds capacity, queue is theoretically infinite.

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: 1: Guess Road (NC 157) & Horton Road



Westpoint Residential TIA
2: Stadium Drive & Horton Road

Existing (2018) PM

06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	421	83	22	429	23	93	22	38	15	17	47
Future Volume (vph)	67	421	83	22	429	23	93	22	38	15	17	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	100		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
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
Frt		0.975			0.992			0.905			0.890	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1802	0	1719	1867	0	1752	1689	0	1687	1667	0
Flt Permitted	0.455			0.423			0.711			0.714		
Satd. Flow (perm)	839	1802	0	765	1867	0	1312	1689	0	1268	1667	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		2452			1495			1126			1263	
Travel Time (s)		47.8			29.1			25.6			28.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	2%	7%	5%	1%	0%	3%	5%	0%	7%	0%	2%
Adj. Flow (vph)	74	468	92	24	477	26	103	24	42	17	19	52
Shared Lane Traffic (%)												
Lane Group Flow (vph)	74	560	0	24	503	0	103	66	0	17	71	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	15.2	15.2		15.2	15.2		12.5	12.5		12.5	12.5	
Total Split (s)	72.0	72.0		72.0	72.0		28.0	28.0		28.0	28.0	
Total Split (%)	72.0%	72.0%		72.0%	72.0%		28.0%	28.0%		28.0%	28.0%	
Maximum Green (s)	66.8	66.8		66.8	66.8		22.5	22.5		22.5	22.5	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.6	3.6		3.6	3.6	
All-Red Time (s)	1.2	1.2		1.2	1.2		1.9	1.9		1.9	1.9	
Lost Time Adjust (s)	-0.2	-0.2		-0.2	-0.2		-0.5	-0.5		-0.5	-0.5	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effect Green (s)	77.2	77.2		77.2	77.2		12.8	12.8		12.8	12.8	
Actuated g/C Ratio	0.77	0.77		0.77	0.77		0.13	0.13		0.13	0.13	
v/c Ratio	0.11	0.40		0.04	0.35		0.61	0.31		0.10	0.33	
Control Delay	4.1	5.3		3.8	4.8		55.8	41.6		37.4	42.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	4.1	5.3		3.8	4.8		55.8	41.6		37.4	42.3	
LOS	A	A		A	A		E	D		D	D	
Approach Delay		5.2			4.8			50.2			41.4	

Westpoint Residential TIA
2: Stadium Drive & Horton Road

Existing (2018) PM
06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			A			D			D	
Queue Length 50th (ft)	9	94		3	80		63	39		10	42	
Queue Length 95th (ft)	27	186		11	157		111	74		28	80	
Internal Link Dist (ft)		2372			1415			1046			1183	
Turn Bay Length (ft)	100			100			100			100		
Base Capacity (vph)	647	1390		590	1440		301	388		291	383	
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	0.11	0.40		0.04	0.35		0.34	0.17		0.06	0.19	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 40

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.61

Intersection Signal Delay: 12.6

Intersection Capacity Utilization 59.9%

Analysis Period (min) 15

Intersection LOS: B

ICU Level of Service B

Splits and Phases: 2: Stadium Drive & Horton Road



Westpoint Residential TIA
3: N Duke Street (US 501) & Horton Road

Existing (2018) PM

06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	116	277	121	136	301	32	204	1256	98	46	694	115
Future Volume (vph)	116	277	121	136	301	32	204	1256	98	46	694	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		200	0		0	250		0	100		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.985			0.989			0.979	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1845	1568	1770	1855	0	1770	3527	0	1805	3436	0
Flt Permitted	0.186			0.308			0.168			0.090		
Satd. Flow (perm)	346	1845	1568	574	1855	0	313	3527	0	171	3436	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1974			505			1329			2255	
Travel Time (s)		38.5			9.8			22.7			38.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	3%	3%	2%	1%	0%	2%	1%	4%	0%	3%	2%
Adj. Flow (vph)	129	308	134	151	334	36	227	1396	109	51	771	128
Shared Lane Traffic (%)												
Lane Group Flow (vph)	129	308	134	151	370	0	227	1505	0	51	899	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Detector Phase	7	4	5	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	12.0		7.0	12.0	
Minimum Split (s)	13.0	35.0	12.2	12.6	33.7		12.2	32.9		12.0	31.8	
Total Split (s)	13.0	35.0	17.0	12.6	34.6		17.0	50.4		12.0	45.4	
Total Split (%)	11.8%	31.8%	15.5%	11.5%	31.5%		15.5%	45.8%		10.9%	41.3%	
Maximum Green (s)	7.0	29.0	11.8	7.0	28.9		11.8	44.5		7.0	39.6	
Yellow Time (s)	3.1	3.8	3.2	3.2	3.9		3.2	4.2		3.2	4.2	
All-Red Time (s)	2.9	2.2	2.0	2.4	1.8		2.0	1.7		1.8	1.6	
Lost Time Adjust (s)	-1.0	-1.0	-0.2	-0.6	-0.7		-0.2	-0.9		0.0	-0.8	
Total Lost Time (s)	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	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		22.0			21.0			20.0			19.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effect Green (s)	34.2	26.2	42.2	33.4	25.8		61.0	51.6		52.2	45.2	
Actuated g/C Ratio	0.31	0.24	0.38	0.30	0.23		0.55	0.47		0.47	0.41	
v/c Ratio	0.61	0.70	0.22	0.59	0.85		0.71	0.91		0.28	0.64	
Control Delay	37.3	47.1	22.6	35.2	58.8		26.8	38.2		17.1	29.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	

Westpoint Residential TIA
3: N Duke Street (US 501) & Horton Road

Existing (2018) PM

06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	37.3	47.1	22.6	35.2	58.8		26.8	38.2		17.1	29.5	
LOS	D	D	C	D	E		C	D		B	C	
Approach Delay		39.1			51.9			36.8			28.8	
Approach LOS		D			D			D			C	
Queue Length 50th (ft)	62	197	60	73	247		80	537		16	274	
Queue Length 95th (ft)	103	285	101	118	350		#153	#740		36	357	
Internal Link Dist (ft)		1894			425			1249			2175	
Turn Bay Length (ft)	150		200				250			100		
Base Capacity (vph)	211	503	616	256	499		334	1655		185	1410	
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	0.61	0.61	0.22	0.59	0.74		0.68	0.91		0.28	0.64	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 71 (65%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 105

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 37.2

Intersection LOS: D

Intersection Capacity Utilization 84.5%

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: 3: N Duke Street (US 501) & Horton Road

				
Ø1	Ø2 (R)		Ø3	Ø4
12 s	50.4 s		12.6 s	35 s
				
Ø5	Ø6 (R)		Ø7	Ø8
17 s	45.4 s		13 s	34.6 s

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	2	9	183	1	54	9	1658	60	41	1046	4
Future Volume (vph)	2	2	9	183	1	54	9	1658	60	41	1046	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	125		0	150		0	175		0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.904			0.930			0.995			0.999	
Flt Protected		0.993		0.950	0.974		0.950			0.950		
Satd. Flow (prot)	0	1706	0	1603	1563	0	1805	3520	0	1719	3468	0
Flt Permitted		0.993		0.950	0.974		0.242			0.063		
Satd. Flow (perm)	0	1706	0	1603	1563	0	460	3520	0	114	3468	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			35			45			45	
Link Distance (ft)		355			718			526			1606	
Travel Time (s)		9.7			14.0			8.0			24.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	7%	0%	2%	0%	2%	3%	5%	4%	0%
Adj. Flow (vph)	2	2	10	203	1	60	10	1842	67	46	1162	4
Shared Lane Traffic (%)				33%								
Lane Group Flow (vph)	0	14	0	136	128	0	10	1909	0	46	1166	0
Turn Type	Split	NA		Split	NA		Perm	NA		D.P+P	NA	
Protected Phases	4	4		3	3			2		1	6	
Permitted Phases							2			2		
Detector Phase	4	4		3	3		2	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		12.0	12.0		7.0	12.0	
Minimum Split (s)	36.3	36.3		12.9	12.9		17.8	17.8		11.9	17.8	
Total Split (s)	36.3	36.3		18.1	18.1		83.7	83.7		11.9	95.6	
Total Split (%)	24.2%	24.2%		12.1%	12.1%		55.8%	55.8%		7.9%	63.7%	
Maximum Green (s)	31.0	31.0		12.2	12.2		77.9	77.9		7.0	89.8	
Yellow Time (s)	3.7	3.7		3.1	3.1		4.5	4.5		3.0	4.5	
All-Red Time (s)	1.6	1.6		2.8	2.8		1.3	1.3		1.9	1.3	
Lost Time Adjust (s)		-0.3		-0.9	-0.9		-0.8	-0.8		0.1	-0.8	
Total Lost Time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag		Lead	Lead		Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes		
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	3.0		2.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	7.0	7.0										
Flash Dont Walk (s)	24.0	24.0										
Pedestrian Calls (#/hr)	0	0										
Act Effect Green (s)		7.4		13.1	13.1		112.1	112.1		117.8	121.8	
Actuated g/C Ratio		0.05		0.09	0.09		0.75	0.75		0.79	0.81	
v/c Ratio		0.17		0.98	0.94		0.03	0.73		0.28	0.41	
Control Delay		72.8		137.4	129.4		7.6	14.2		8.0	5.0	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		72.8		137.4	129.4		7.6	14.2		8.0	5.0	
LOS		E		F	F		A	B		A	A	
Approach Delay		72.8			133.5			14.2			5.1	
Approach LOS		E			F			B			A	
Queue Length 50th (ft)		13		142	133		2	442		6	110	
Queue Length 95th (ft)		39		#292	#274		10	757		20	228	
Internal Link Dist (ft)		275			638			446			1526	
Turn Bay Length (ft)				125			150			175		
Base Capacity (vph)		355		139	136		343	2631		165	2816	
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		0.04		0.98	0.94		0.03	0.73		0.28	0.41	

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:NBSB and 6:SBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.98

Intersection Signal Delay: 20.4

Intersection LOS: C

Intersection Capacity Utilization 69.5%

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.

Splits and Phases: 4: N Roxboro Street (US 501) & Driveway/Seven Oaks Road

				
Ø1	Ø2 (R)		Ø3	Ø4
11.9 s	83.7 s		18.1 s	36.3 s
	Ø6 (R)			
95.6 s				

Westpoint Residential TIA
5: N Roxboro Street (US 501) & Future Site Access #1

Existing (2018) PM
06/26/2019

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	1727	1238	0
Future Volume (vph)	0	0	0	1727	1238	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	150			0
Storage Lanes	1	0	1			0
Taper Length (ft)	100		100			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Flt						
Flt Protected						
Satd. Flow (prot)	1863	0	1863	3539	3471	0
Flt Permitted						
Satd. Flow (perm)	1863	0	1863	3539	3471	0
Link Speed (mph)	25			45	45	
Link Distance (ft)	714			1529	526	
Travel Time (s)	19.5			23.2	8.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	4%	2%
Adj. Flow (vph)	0	0	0	1919	1376	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1919	1376	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 51.1%
Analysis Period (min) 15
ICU Level of Service A

Westpoint Residential TIA
5: N Roxboro Street (US 501) & Future Site Access #1

Existing (2018) PM
06/26/2019

Intersection

Int Delay, s/veh 0

Movement EBL EBR NBL NBT SBT SBR

Lane Configurations						
Traffic Vol, veh/h	0	0	0	1727	1238	0
Future Vol, veh/h	0	0	0	1727	1238	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	150	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	4	2
Mvmt Flow	0	0	0	1919	1376	0

Major/Minor Minor2 Major1 Major2

Conflicting Flow All	2336	688	1376	0	-	0
Stage 1	1376	-	-	-	-	-
Stage 2	960	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	31	389	494	-	-	-
Stage 1	200	-	-	-	-	-
Stage 2	332	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	31	389	494	-	-	-
Mov Cap-2 Maneuver	31	-	-	-	-	-
Stage 1	200	-	-	-	-	-
Stage 2	332	-	-	-	-	-

Approach EB NB SB

HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt NBL NBT EBLn1 SBT SBR

Capacity (veh/h)	494	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	0	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-

Westpoint Residential TIA
1: Guess Road (NC 157) & Horton Road

No-Build (2023) AM

06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 			 				 			 	
Traffic Volume (vph)	129	123	101	196	129	119	49	372	81	210	1293	214
Future Volume (vph)	129	123	101	196	129	119	49	372	81	210	1293	214
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		125	225		0	375		125	325		50
Storage Lanes	1		1	2		0	1		1	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.933			0.928				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3335	1692	0	3467	1649	0	1612	3505	1553	1770	3539	1583
Flt Permitted	0.950			0.950			0.073			0.434		
Satd. Flow (perm)	3335	1692	0	3467	1649	0	124	3505	1553	808	3539	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		728			786			2115			2616	
Travel Time (s)		14.2			15.3			36.1			44.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	5%	3%	7%	1%	5%	9%	12%	3%	4%	2%	2%	2%
Adj. Flow (vph)	143	137	112	218	143	132	54	413	90	233	1437	238
Shared Lane Traffic (%)												
Lane Group Flow (vph)	143	249	0	218	275	0	54	413	90	233	1437	238
Turn Type	Prot	NA		Prot	NA		pm+pt	NA	pm+ov	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases							2		2	6		6
Detector Phase	7	4		3	8		5	2	3	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	10.0	7.0	7.0	10.0	10.0
Minimum Split (s)	13.4	34.4		12.9	37.7		13.1	32.1	12.9	12.5	33.7	33.7
Total Split (s)	13.4	35.9		15.2	37.7		13.1	51.1	15.2	17.8	55.8	55.8
Total Split (%)	11.2%	29.9%		12.7%	31.4%		10.9%	42.6%	12.7%	14.8%	46.5%	46.5%
Maximum Green (s)	7.0	29.5		9.3	32.0		7.0	45.0	9.3	12.3	50.1	50.1
Yellow Time (s)	3.3	4.1		3.0	3.4		3.3	4.0	3.0	3.1	3.7	3.7
All-Red Time (s)	3.1	2.3		2.9	2.3		2.8	2.1	2.9	2.4	2.0	2.0
Lost Time Adjust (s)	-1.4	-1.4		-0.9	-0.7		-1.1	-1.1	-0.9	-0.5	-0.7	-0.7
Total Lost Time (s)	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	Lag		Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Recall Mode	None	None		None	None		None	C-Max	None	None	C-Max	C-Max
Walk Time (s)		7.0			7.0			7.0			7.0	7.0
Flash Dont Walk (s)		21.0			25.0			19.0			21.0	21.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effect Green (s)	8.4	23.4		10.1	25.1		63.0	54.9	70.0	70.8	61.1	61.1
Actuated g/C Ratio	0.07	0.20		0.08	0.21		0.52	0.46	0.58	0.59	0.51	0.51
v/c Ratio	0.61	0.76		0.75	0.80		0.33	0.26	0.10	0.41	0.80	0.30
Control Delay	66.1	59.7		70.4	61.8		19.1	22.0	13.4	14.7	30.7	20.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

Westpoint Residential TIA
1: Guess Road (NC 157) & Horton Road

No-Build (2023) AM
06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	66.1	59.7		70.4	61.8		19.1	22.0	13.4	14.7	30.7	20.6
LOS	E	E		E	E		B	C	B	B	C	C
Approach Delay		62.0			65.6			20.3			27.5	
Approach LOS		E			E			C			C	
Queue Length 50th (ft)	56	184		86	203		17	102	30	80	493	109
Queue Length 95th (ft)	91	257		#140	281		42	156	64	143	#722	189
Internal Link Dist (ft)		648			706			2035			2536	
Turn Bay Length (ft)	200			225			375		125	325		50
Base Capacity (vph)	233	435		294	449		165	1604	907	585	1800	805
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	0.61	0.57		0.74	0.61		0.33	0.26	0.10	0.40	0.80	0.30

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 35.9

Intersection LOS: D

Intersection Capacity Utilization 78.1%

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: 1: Guess Road (NC 157) & Horton Road

								
Ø1	Ø2 (R)	Ø3	Ø4	Ø5	Ø6 (R)	Ø7	Ø8	
17.8 s	51.1 s	15.2 s	35.9 s	13.1 s	55.8 s	13.4 s	37.7 s	

Westpoint Residential TIA
2: Stadium Drive & Horton Road

No-Build (2023) AM

06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	371	60	15	355	8	79	1	21	23	13	68
Future Volume (vph)	26	371	60	15	355	8	79	1	21	23	13	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	100		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
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
Frt		0.979			0.997			0.856			0.873	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1656	1727	0	1805	1840	0	1656	1538	0	1805	1614	0
Flt Permitted	0.518			0.473			0.699			0.742		
Satd. Flow (perm)	903	1727	0	899	1840	0	1218	1538	0	1410	1614	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		2452			1495			1126			1263	
Travel Time (s)		47.8			29.1			25.6			28.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	9%	8%	6%	0%	3%	0%	9%	0%	6%	0%	18%	0%
Adj. Flow (vph)	29	412	67	17	394	9	88	1	23	26	14	76
Shared Lane Traffic (%)												
Lane Group Flow (vph)	29	479	0	17	403	0	88	24	0	26	90	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	15.2	15.2		15.2	15.2		12.5	12.5		12.5	12.5	
Total Split (s)	71.0	71.0		71.0	71.0		29.0	29.0		29.0	29.0	
Total Split (%)	71.0%	71.0%		71.0%	71.0%		29.0%	29.0%		29.0%	29.0%	
Maximum Green (s)	65.8	65.8		65.8	65.8		23.5	23.5		23.5	23.5	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.6	3.6		3.6	3.6	
All-Red Time (s)	1.2	1.2		1.2	1.2		1.9	1.9		1.9	1.9	
Lost Time Adjust (s)	-0.2	-0.2		-0.2	-0.2		-0.5	-0.5		-0.5	-0.5	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effect Green (s)	81.1	81.1		81.1	81.1		12.4	12.4		12.4	12.4	
Actuated g/C Ratio	0.81	0.81		0.81	0.81		0.12	0.12		0.12	0.12	
v/c Ratio	0.04	0.34		0.02	0.27		0.59	0.13		0.15	0.45	
Control Delay	3.5	4.5		3.5	4.0		56.0	38.2		38.9	46.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	3.5	4.5		3.5	4.0		56.0	38.2		38.9	46.7	
LOS	A	A		A	A		E	D		D	D	
Approach Delay		4.4			3.9			52.2			44.9	

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			A			D			D	
Queue Length 50th (ft)	3	74		2	58		54	14		15	54	
Queue Length 95th (ft)	12	150		8	117		99	36		38	98	
Internal Link Dist (ft)		2372			1415			1046			1183	
Turn Bay Length (ft)	100			100			100			100		
Base Capacity (vph)	732	1401		729	1492		292	369		338	387	
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	0.34		0.02	0.27		0.30	0.07		0.08	0.23	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 40
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.59
 Intersection Signal Delay: 12.9
 Intersection Capacity Utilization 42.5%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 2: Stadium Drive & Horton Road

	
71 s	29 s
	
71 s	29 s

Westpoint Residential TIA
3: N Duke Street (US 501) & Horton Road

No-Build (2023) AM

06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	88	247	243	175	217	17	83	560	63	26	1361	73
Future Volume (vph)	88	247	243	175	217	17	83	560	63	26	1361	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		200	0		0	250		0	100		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.989			0.985			0.992	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	1845	1599	1736	1764	0	1752	3333	0	1719	3509	0
Flt Permitted	0.312			0.300			0.072			0.350		
Satd. Flow (perm)	587	1845	1599	548	1764	0	133	3333	0	633	3509	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1974			505			1329			2255	
Travel Time (s)		38.5			9.8			22.7			38.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	3%	1%	4%	6%	13%	3%	7%	4%	5%	2%	3%
Adj. Flow (vph)	98	274	270	194	241	19	92	622	70	29	1512	81
Shared Lane Traffic (%)												
Lane Group Flow (vph)	98	274	270	194	260	0	92	692	0	29	1593	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Detector Phase	7	4	5	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	12.0		7.0	12.0	
Minimum Split (s)	13.0	35.0	12.2	12.6	33.7		12.2	32.9		12.0	31.8	
Total Split (s)	13.0	35.0	12.2	12.6	34.6		12.2	50.4		12.0	50.2	
Total Split (%)	11.8%	31.8%	11.1%	11.5%	31.5%		11.1%	45.8%		10.9%	45.6%	
Maximum Green (s)	7.0	29.0	7.0	7.0	28.9		7.0	44.5		7.0	44.4	
Yellow Time (s)	3.1	3.8	3.2	3.2	3.9		3.2	4.2		3.2	4.2	
All-Red Time (s)	2.9	2.2	2.0	2.4	1.8		2.0	1.7		1.8	1.6	
Lost Time Adjust (s)	-1.0	-1.0	-0.2	-0.6	-0.7		-0.2	-0.9		0.0	-0.8	
Total Lost Time (s)	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	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		22.0			21.0			20.0			19.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effect Green (s)	29.7	21.7	34.4	28.9	21.3		63.2	58.5		60.0	53.0	
Actuated g/C Ratio	0.27	0.20	0.31	0.26	0.19		0.57	0.53		0.55	0.48	
v/c Ratio	0.40	0.75	0.54	0.86	0.76		0.49	0.39		0.07	0.94	
Control Delay	31.1	54.3	34.7	64.4	55.9		23.2	18.0		11.4	40.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	

Westpoint Residential TIA
3: N Duke Street (US 501) & Horton Road

No-Build (2023) AM
06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	31.1	54.3	34.7	64.4	55.9		23.2	18.0		11.4	40.4	
LOS	C	D	C	E	E		C	B		B	D	
Approach Delay		42.5			59.6			18.6			39.9	
Approach LOS		D			E			B			D	
Queue Length 50th (ft)	50	184	158	106	175		26	160		8	539	
Queue Length 95th (ft)	83	256	216	#180	247		73	237		24	#814	
Internal Link Dist (ft)		1894			425			1249			2175	
Turn Bay Length (ft)	150		200				250			100		
Base Capacity (vph)	245	503	499	226	474		188	1771		414	1692	
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	0.40	0.54	0.54	0.86	0.55		0.49	0.39		0.07	0.94	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 41 (37%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 115

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.94

Intersection Signal Delay: 38.2

Intersection LOS: D

Intersection Capacity Utilization 85.1%

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.

Splits and Phases: 3: N Duke Street (US 501) & Horton Road

				
Ø1	Ø2 (R)		Ø3	Ø4
12 s	50.4 s		12.6 s	35 s
				
Ø5	Ø6 (R)		Ø7	Ø8
12.2 s	50.2 s		13 s	34.6 s

Westpoint Residential TIA
4: N Roxboro Street (US 501) & Driveway/Seven Oaks Road

No-Build (2023) AM

06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	1	14	172	0	24	3	1114	17	22	2081	12
Future Volume (vph)	2	1	14	172	0	24	3	1114	17	22	2081	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	125		0	150		0	175		0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.886			0.962			0.998			0.999	
Flt Protected		0.995		0.950	0.964		0.950			0.950		
Satd. Flow (prot)	0	1675	0	1618	1564	0	1805	3398	0	1556	3502	0
Flt Permitted		0.995		0.950	0.964		0.045			0.183		
Satd. Flow (perm)	0	1675	0	1618	1564	0	86	3398	0	300	3502	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			35			45			45	
Link Distance (ft)		355			718			526			1606	
Travel Time (s)		9.7			14.0			8.0			24.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	6%	0%	10%	0%	6%	7%	16%	3%	0%
Adj. Flow (vph)	2	1	16	191	0	27	3	1238	19	24	2312	13
Shared Lane Traffic (%)				42%								
Lane Group Flow (vph)	0	19	0	111	107	0	3	1257	0	24	2325	0
Turn Type	Split	NA		Split	NA		Perm	NA		D.P+P	NA	
Protected Phases	4	4		3	3			2		1	6	
Permitted Phases							2			2		
Detector Phase	4	4		3	3		2	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		12.0	12.0		7.0	12.0	
Minimum Split (s)	36.3	36.3		12.9	12.9		17.8	17.8		11.9	17.8	
Total Split (s)	36.3	36.3		13.0	13.0		63.8	63.8		11.9	75.7	
Total Split (%)	29.0%	29.0%		10.4%	10.4%		51.0%	51.0%		9.5%	60.6%	
Maximum Green (s)	31.0	31.0		7.1	7.1		58.0	58.0		7.0	69.9	
Yellow Time (s)	3.7	3.7		3.1	3.1		4.5	4.5		3.0	4.5	
All-Red Time (s)	1.6	1.6		2.8	2.8		1.3	1.3		1.9	1.3	
Lost Time Adjust (s)		-0.3		-0.9	-0.9		-0.8	-0.8		0.1	-0.8	
Total Lost Time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag		Lead	Lead		Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes		
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	3.0		2.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	7.0	7.0										
Flash Dont Walk (s)	24.0	24.0										
Pedestrian Calls (#/hr)	0	0										
Act Effect Green (s)		7.5		8.0	8.0		94.7	94.7		98.9	101.9	
Actuated g/C Ratio		0.06		0.06	0.06		0.76	0.76		0.79	0.82	
v/c Ratio		0.19		1.08	1.07		0.05	0.49		0.08	0.81	
Control Delay		60.3		165.5	164.9		9.3	8.2		3.9	11.0	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	

Westpoint Residential TIA
4: N Roxboro Street (US 501) & Driveway/Seven Oaks Road

No-Build (2023) AM

06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		60.3		165.5	164.9		9.3	8.2		3.9	11.0	
LOS		E		F	F		A	A		A	B	
Approach Delay		60.3			165.2			8.2			10.9	
Approach LOS		E			F			A			B	
Queue Length 50th (ft)		15		~105	~101		1	174		2	303	
Queue Length 95th (ft)		40		#233	#226		5	330		11	785	
Internal Link Dist (ft)		275			638			446			1526	
Turn Bay Length (ft)				125			150			175		
Base Capacity (vph)		419		103	100		65	2574		306	2853	
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		0.05		1.08	1.07		0.05	0.49		0.08	0.81	

Intersection Summary

Area Type: Other

Cycle Length: 125

Actuated Cycle Length: 125

Offset: 90 (72%), Referenced to phase 2:NBSB and 6:SBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.08

Intersection Signal Delay: 19.0

Intersection LOS: B

Intersection Capacity Utilization 78.4%

ICU Level of Service D

Analysis Period (min) 15

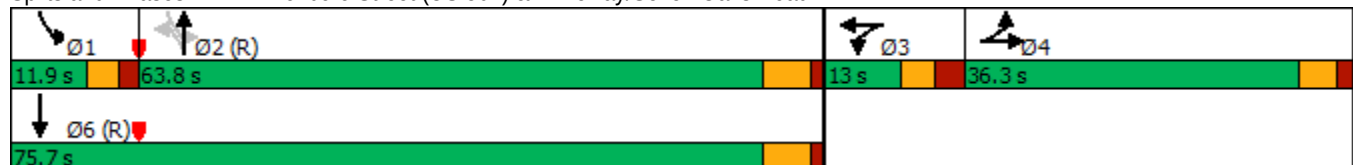
~ Volume exceeds capacity, queue is theoretically infinite.

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: 4: N Roxboro Street (US 501) & Driveway/Seven Oaks Road



Westpoint Residential TIA
5: N Roxboro Street (US 501) & Future Site Access #1

No-Build (2023) AM
06/26/2019

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	1134	2267	0
Future Volume (vph)	0	0	0	1134	2267	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	150			0
Storage Lanes	1	0	1			0
Taper Length (ft)	100		100			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Flt						
Flt Protected						
Satd. Flow (prot)	1863	0	1863	3406	3505	0
Flt Permitted						
Satd. Flow (perm)	1863	0	1863	3406	3505	0
Link Speed (mph)	25			45	45	
Link Distance (ft)	714			1529	526	
Travel Time (s)	19.5			23.2	8.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	6%	3%	2%
Adj. Flow (vph)	0	0	0	1260	2519	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1260	2519	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 66.0%
Analysis Period (min) 15

ICU Level of Service C

Westpoint Residential TIA
5: N Roxboro Street (US 501) & Future Site Access #1

No-Build (2023) AM

06/26/2019

Intersection

Int Delay, s/veh 0

Movement EBL EBR NBL NBT SBT SBR

Lane Configurations						
Traffic Vol, veh/h	0	0	0	1134	2267	0
Future Vol, veh/h	0	0	0	1134	2267	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	150	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	6	3	2
Mvmt Flow	0	0	0	1260	2519	0

Major/Minor Minor2 Major1 Major2

Conflicting Flow All	3149	1260	2519	0	-	0
Stage 1	2519	-	-	-	-	-
Stage 2	630	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	8	162	176	-	-	-
Stage 1	46	-	-	-	-	-
Stage 2	493	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	8	162	176	-	-	-
Mov Cap-2 Maneuver	8	-	-	-	-	-
Stage 1	46	-	-	-	-	-
Stage 2	493	-	-	-	-	-

Approach EB NB SB

HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt NBL NBT EBLn1 SBT SBR

Capacity (veh/h)	176	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	0	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-

Westpoint Residential TIA
1: Guess Road (NC 157) & Horton Road

No-Build (2023) PM

06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	572	233	63	198	179	208	143	1239	190	195	711	139
Future Volume (vph)	572	233	63	198	179	208	143	1239	190	195	711	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		125	225		0	375		125	325		50
Storage Lanes	1		1	2		0	1		1	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.968			0.919				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3502	1789	0	3467	1711	0	1805	3574	1553	1736	3574	1583
Flt Permitted	0.950			0.950			0.207			0.078		
Satd. Flow (perm)	3502	1789	0	3467	1711	0	393	3574	1553	142	3574	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		728			786			2115			2616	
Travel Time (s)		14.2			15.3			36.1			44.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	3%	2%	1%	1%	3%	0%	1%	4%	4%	1%	2%
Adj. Flow (vph)	636	259	70	220	199	231	159	1377	211	217	790	154
Shared Lane Traffic (%)												
Lane Group Flow (vph)	636	329	0	220	430	0	159	1377	211	217	790	154
Turn Type	Prot	NA		Prot	NA		pm+pt	NA	pm+ov	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases							2		2	6		6
Detector Phase	7	4		3	8		5	2	3	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	10.0	7.0	7.0	10.0	10.0
Minimum Split (s)	13.4	34.4		12.9	37.7		13.1	32.1	12.9	12.5	33.7	33.7
Total Split (s)	29.0	46.8		20.0	37.8		18.2	56.0	20.0	17.2	55.0	55.0
Total Split (%)	20.7%	33.4%		14.3%	27.0%		13.0%	40.0%	14.3%	12.3%	39.3%	39.3%
Maximum Green (s)	22.6	40.4		14.1	32.1		12.1	49.9	14.1	11.7	49.3	49.3
Yellow Time (s)	3.3	4.1		3.0	3.4		3.3	4.0	3.0	3.1	3.7	3.7
All-Red Time (s)	3.1	2.3		2.9	2.3		2.8	2.1	2.9	2.4	2.0	2.0
Lost Time Adjust (s)	-1.4	-1.4		-0.9	-0.7		-1.1	-1.1	-0.9	-0.5	-0.7	-0.7
Total Lost Time (s)	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	Lag		Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Recall Mode	None	None		None	None		None	C-Max	None	None	C-Max	C-Max
Walk Time (s)		7.0			7.0			7.0			7.0	7.0
Flash Dont Walk (s)		21.0			25.0			19.0			21.0	21.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effect Green (s)	24.0	43.4		13.4	32.8		62.7	51.0	69.4	63.7	51.5	51.5
Actuated g/C Ratio	0.17	0.31		0.10	0.23		0.45	0.36	0.50	0.46	0.37	0.37
v/c Ratio	1.06	0.59		0.66	1.07		0.54	1.06	0.27	1.07	0.60	0.26
Control Delay	108.1	46.6		71.0	116.4		27.6	84.7	21.5	119.1	38.5	33.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

Westpoint Residential TIA
1: Guess Road (NC 157) & Horton Road

No-Build (2023) PM

06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	108.1	46.6		71.0	116.4		27.6	84.7	21.5	119.1	38.5	33.0
LOS	F	D		E	F		C	F	C	F	D	C
Approach Delay		87.1			101.1			71.8			52.9	
Approach LOS		F			F			E			D	
Queue Length 50th (ft)	~327	256		101	~434		80	~722	108	~169	308	99
Queue Length 95th (ft)	#448	365		144	#647		125	#862	162	#341	381	159
Internal Link Dist (ft)		648			706			2035			2536	
Turn Bay Length (ft)	200			225			375		125	325		50
Base Capacity (vph)	600	554		371	400		313	1301	787	203	1314	582
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	1.06	0.59		0.59	1.07		0.51	1.06	0.27	1.07	0.60	0.26

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 140

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.07

Intersection Signal Delay: 74.4

Intersection LOS: E

Intersection Capacity Utilization 100.2%

ICU Level of Service G

Analysis Period (min) 15

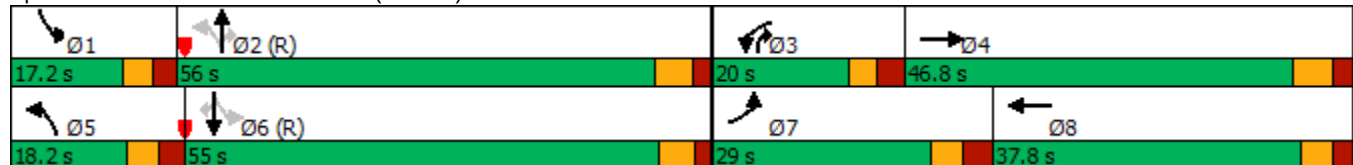
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 1: Guess Road (NC 157) & Horton Road



Westpoint Residential TIA
2: Stadium Drive & Horton Road

No-Build (2023) PM

06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	78	488	96	26	497	27	108	26	44	17	20	54
Future Volume (vph)	78	488	96	26	497	27	108	26	44	17	20	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	100		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
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
Frt		0.975			0.992			0.906			0.890	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1802	0	1719	1867	0	1752	1690	0	1687	1667	0
Flt Permitted	0.407			0.371			0.704			0.706		
Satd. Flow (perm)	751	1802	0	671	1867	0	1299	1690	0	1254	1667	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		2452			1495			1126			1263	
Travel Time (s)		47.8			29.1			25.6			28.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	2%	7%	5%	1%	0%	3%	5%	0%	7%	0%	2%
Adj. Flow (vph)	87	542	107	29	552	30	120	29	49	19	22	60
Shared Lane Traffic (%)												
Lane Group Flow (vph)	87	649	0	29	582	0	120	78	0	19	82	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	15.2	15.2		15.2	15.2		12.5	12.5		12.5	12.5	
Total Split (s)	72.0	72.0		72.0	72.0		28.0	28.0		28.0	28.0	
Total Split (%)	72.0%	72.0%		72.0%	72.0%		28.0%	28.0%		28.0%	28.0%	
Maximum Green (s)	66.8	66.8		66.8	66.8		22.5	22.5		22.5	22.5	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.6	3.6		3.6	3.6	
All-Red Time (s)	1.2	1.2		1.2	1.2		1.9	1.9		1.9	1.9	
Lost Time Adjust (s)	-0.2	-0.2		-0.2	-0.2		-0.5	-0.5		-0.5	-0.5	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effect Green (s)	75.9	75.9		75.9	75.9		14.1	14.1		14.1	14.1	
Actuated g/C Ratio	0.76	0.76		0.76	0.76		0.14	0.14		0.14	0.14	
v/c Ratio	0.15	0.47		0.06	0.41		0.66	0.33		0.11	0.35	
Control Delay	4.9	6.6		4.4	5.9		56.6	40.7		36.1	41.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	4.9	6.6		4.4	5.9		56.6	40.7		36.1	41.3	
LOS	A	A		A	A		E	D		D	D	
Approach Delay		6.4			5.8			50.4			40.3	

Westpoint Residential TIA
2: Stadium Drive & Horton Road

No-Build (2023) PM
06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			A			D			D	
Queue Length 50th (ft)	12	128		4	107		73	45		11	48	
Queue Length 95th (ft)	35	250		14	207		125	83		30	87	
Internal Link Dist (ft)		2372			1415			1046			1183	
Turn Bay Length (ft)	100			100			100			100		
Base Capacity (vph)	570	1368		509	1417		298	388		288	383	
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	0.15	0.47		0.06	0.41		0.40	0.20		0.07	0.21	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.66
Intersection Signal Delay: 13.5
Intersection Capacity Utilization 65.0%
Analysis Period (min) 15

Intersection LOS: B
ICU Level of Service C

Splits and Phases: 2: Stadium Drive & Horton Road



Westpoint Residential TIA
3: N Duke Street (US 501) & Horton Road

No-Build (2023) PM

06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	134	321	140	158	349	37	236	1456	114	53	805	133
Future Volume (vph)	134	321	140	158	349	37	236	1456	114	53	805	133
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		200	0		0	250		0	100		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.986			0.989			0.979	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1845	1568	1770	1857	0	1770	3527	0	1805	3436	0
Flt Permitted	0.141			0.257			0.090			0.100		
Satd. Flow (perm)	263	1845	1568	479	1857	0	168	3527	0	190	3436	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1974			505			1329			2255	
Travel Time (s)		38.5			9.8			22.7			38.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	3%	3%	2%	1%	0%	2%	1%	4%	0%	3%	2%
Adj. Flow (vph)	149	357	156	176	388	41	262	1618	127	59	894	148
Shared Lane Traffic (%)												
Lane Group Flow (vph)	149	357	156	176	429	0	262	1745	0	59	1042	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Detector Phase	7	4	5	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	12.0		7.0	12.0	
Minimum Split (s)	13.0	35.0	12.2	12.6	33.7		12.2	32.9		12.0	31.8	
Total Split (s)	13.0	35.0	18.0	12.6	34.6		18.0	50.4		12.0	44.4	
Total Split (%)	11.8%	31.8%	16.4%	11.5%	31.5%		16.4%	45.8%		10.9%	40.4%	
Maximum Green (s)	7.0	29.0	12.8	7.0	28.9		12.8	44.5		7.0	38.6	
Yellow Time (s)	3.1	3.8	3.2	3.2	3.9		3.2	4.2		3.2	4.2	
All-Red Time (s)	2.9	2.2	2.0	2.4	1.8		2.0	1.7		1.8	1.6	
Lost Time Adjust (s)	-1.0	-1.0	-0.2	-0.6	-0.7		-0.2	-0.9		0.0	-0.8	
Total Lost Time (s)	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	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		22.0			21.0			20.0			19.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effect Green (s)	36.4	28.4	46.6	35.6	28.0		59.0	49.4		47.8	40.8	
Actuated g/C Ratio	0.33	0.26	0.42	0.32	0.25		0.54	0.45		0.43	0.37	
v/c Ratio	0.76	0.75	0.23	0.72	0.91		0.93	1.10		0.32	0.82	
Control Delay	49.6	48.2	21.0	43.4	64.3		66.3	86.5		18.7	38.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	

Westpoint Residential TIA
3: N Duke Street (US 501) & Horton Road

No-Build (2023) PM
06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	49.6	48.2	21.0	43.4	64.3		66.3	86.5		18.7	38.1	
LOS	D	D	C	D	E		E	F		B	D	
Approach Delay		42.1			58.2			83.9			37.1	
Approach LOS		D			E			F			D	
Queue Length 50th (ft)	69	227	67	83	288		134	~788		20	353	
Queue Length 95th (ft)	#148	335	114	#153	#460		#296	#927		41	441	
Internal Link Dist (ft)		1894			425			1249			2175	
Turn Bay Length (ft)	150		200				250			100		
Base Capacity (vph)	196	503	665	244	499		283	1585		185	1274	
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	0.76	0.71	0.23	0.72	0.86		0.93	1.10		0.32	0.82	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 71 (65%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 125

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.10

Intersection Signal Delay: 62.2

Intersection LOS: E

Intersection Capacity Utilization 94.4%

ICU Level of Service F

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 3: N Duke Street (US 501) & Horton Road

 Ø1	 Ø2 (R)	 Ø3	 Ø4
12 s	50.4 s	12.6 s	35 s
 Ø5	 Ø6 (R)	 Ø7	 Ø8
18 s	44.4 s	13 s	34.6 s

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	2	10	212	1	63	10	1922	70	48	1213	5
Future Volume (vph)	2	2	10	212	1	63	10	1922	70	48	1213	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	125		0	150		0	175		0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.901			0.930			0.995			0.999	
Flt Protected		0.993		0.950	0.974		0.950			0.950		
Satd. Flow (prot)	0	1700	0	1603	1563	0	1805	3520	0	1719	3468	0
Flt Permitted		0.993		0.950	0.974		0.192			0.037		
Satd. Flow (perm)	0	1700	0	1603	1563	0	365	3520	0	67	3468	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			35			45			45	
Link Distance (ft)		355			718			526			1606	
Travel Time (s)		9.7			14.0			8.0			24.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	7%	0%	2%	0%	2%	3%	5%	4%	0%
Adj. Flow (vph)	2	2	11	236	1	70	11	2136	78	53	1348	6
Shared Lane Traffic (%)				33%								
Lane Group Flow (vph)	0	15	0	158	149	0	11	2214	0	53	1354	0
Turn Type	Split	NA		Split	NA		Perm	NA		D.P+P	NA	
Protected Phases	4	4		3	3			2		1	6	
Permitted Phases							2			2		
Detector Phase	4	4		3	3		2	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		12.0	12.0		7.0	12.0	
Minimum Split (s)	36.3	36.3		12.9	12.9		17.8	17.8		11.9	17.8	
Total Split (s)	36.3	36.3		18.0	18.0		83.8	83.8		11.9	95.7	
Total Split (%)	24.2%	24.2%		12.0%	12.0%		55.9%	55.9%		7.9%	63.8%	
Maximum Green (s)	31.0	31.0		12.1	12.1		78.0	78.0		7.0	89.9	
Yellow Time (s)	3.7	3.7		3.1	3.1		4.5	4.5		3.0	4.5	
All-Red Time (s)	1.6	1.6		2.8	2.8		1.3	1.3		1.9	1.3	
Lost Time Adjust (s)		-0.3		-0.9	-0.9		-0.8	-0.8		0.1	-0.8	
Total Lost Time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag		Lead	Lead		Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes		
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	3.0		2.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	7.0	7.0										
Flash Dont Walk (s)	24.0	24.0										
Pedestrian Calls (#/hr)	0	0										
Act Effect Green (s)		7.5		13.0	13.0		112.0	112.0		117.9	121.9	
Actuated g/C Ratio		0.05		0.09	0.09		0.75	0.75		0.79	0.81	
v/c Ratio		0.18		1.14	1.10		0.04	0.84		0.40	0.48	
Control Delay		73.2		178.7	168.1		8.0	19.1		23.9	5.5	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	

Westpoint Residential TIA
4: N Roxboro Street (US 501) & Driveway/Seven Oaks Road

No-Build (2023) PM

06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		73.2		178.7	168.1		8.0	19.1		23.9	5.5	
LOS		E		F	F		A	B		C	A	
Approach Delay		73.2			173.6			19.0			6.2	
Approach LOS		E			F			B			A	
Queue Length 50th (ft)		14		~189	~173		2	631		6	138	
Queue Length 95th (ft)		40		#349	#329		11	1113		51	287	
Internal Link Dist (ft)		275			638			446			1526	
Turn Bay Length (ft)				125			150			175		
Base Capacity (vph)		354		138	135		272	2629		132	2818	
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		0.04		1.14	1.10		0.04	0.84		0.40	0.48	

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:NBSB and 6:SBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.14

Intersection Signal Delay: 26.7

Intersection LOS: C

Intersection Capacity Utilization 78.2%

ICU Level of Service D

Analysis Period (min) 15

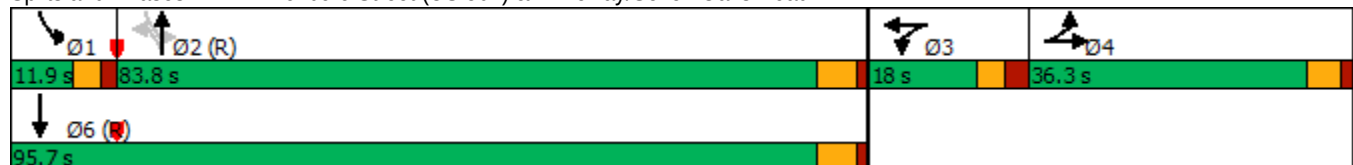
~ Volume exceeds capacity, queue is theoretically infinite.

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: 4: N Roxboro Street (US 501) & Driveway/Seven Oaks Road



Westpoint Residential TIA
5: N Roxboro Street (US 501) & Future Site Access #1

No-Build (2023) PM
06/26/2019

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	2002	1435	0
Future Volume (vph)	0	0	0	2002	1435	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	150			0
Storage Lanes	1	0	1			0
Taper Length (ft)	100		100			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Flt						
Flt Protected						
Satd. Flow (prot)	1863	0	1863	3539	3471	0
Flt Permitted						
Satd. Flow (perm)	1863	0	1863	3539	3471	0
Link Speed (mph)	25			45	45	
Link Distance (ft)	714			1529	526	
Travel Time (s)	19.5			23.2	8.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	4%	2%
Adj. Flow (vph)	0	0	0	2224	1594	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	2224	1594	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 58.7%
Analysis Period (min) 15

ICU Level of Service B

Westpoint Residential TIA
5: N Roxboro Street (US 501) & Future Site Access #1

No-Build (2023) PM
06/26/2019

Intersection

Int Delay, s/veh 0

Movement EBL EBR NBL NBT SBT SBR

Lane Configurations						
Traffic Vol, veh/h	0	0	0	2002	1435	0
Future Vol, veh/h	0	0	0	2002	1435	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	150	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	4	2
Mvmt Flow	0	0	0	2224	1594	0

Major/Minor Minor2 Major1 Major2

Conflicting Flow All	2706	797	1594	0	-	0
Stage 1	1594	-	-	-	-	-
Stage 2	1112	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	17	329	407	-	-	-
Stage 1	152	-	-	-	-	-
Stage 2	276	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	17	329	407	-	-	-
Mov Cap-2 Maneuver	17	-	-	-	-	-
Stage 1	152	-	-	-	-	-
Stage 2	276	-	-	-	-	-

Approach EB NB SB

HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt NBL NBT EBLn1 SBT SBR

Capacity (veh/h)	407	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	0	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-

Westpoint Residential TIA
1: Guess Road (NC 157) & Horton Road

Build (2023) AM

06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 			 				 			 	
Traffic Volume (vph)	129	126	101	238	137	127	49	372	81	213	1293	214
Future Volume (vph)	129	126	101	238	137	127	49	372	81	213	1293	214
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		125	225		0	375		125	325		50
Storage Lanes	1		1	2		0	1		1	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.933			0.928				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3335	1692	0	3467	1649	0	1612	3505	1553	1770	3539	1583
Flt Permitted	0.950			0.950			0.074			0.431		
Satd. Flow (perm)	3335	1692	0	3467	1649	0	126	3505	1553	803	3539	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		728			786			2115			2616	
Travel Time (s)		14.2			15.3			36.1			44.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	5%	3%	7%	1%	5%	9%	12%	3%	4%	2%	2%	2%
Adj. Flow (vph)	143	140	112	264	152	141	54	413	90	237	1437	238
Shared Lane Traffic (%)												
Lane Group Flow (vph)	143	252	0	264	293	0	54	413	90	237	1437	238
Turn Type	Prot	NA		Prot	NA		pm+pt	NA	pm+ov	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases							2		2	6		6
Detector Phase	7	4		3	8		5	2	3	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	10.0	7.0	7.0	10.0	10.0
Minimum Split (s)	13.4	34.4		12.9	37.7		13.1	32.1	12.9	12.5	33.7	33.7
Total Split (s)	13.4	36.0		15.1	37.7		13.1	50.9	15.1	18.0	55.8	55.8
Total Split (%)	11.2%	30.0%		12.6%	31.4%		10.9%	42.4%	12.6%	15.0%	46.5%	46.5%
Maximum Green (s)	7.0	29.6		9.2	32.0		7.0	44.8	9.2	12.5	50.1	50.1
Yellow Time (s)	3.3	4.1		3.0	3.4		3.3	4.0	3.0	3.1	3.7	3.7
All-Red Time (s)	3.1	2.3		2.9	2.3		2.8	2.1	2.9	2.4	2.0	2.0
Lost Time Adjust (s)	-1.4	-1.4		-0.9	-0.7		-1.1	-1.1	-0.9	-0.5	-0.7	-0.7
Total Lost Time (s)	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	Lag		Lead	Lag	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Recall Mode	None	None		None	None		None	C-Max	None	None	C-Max	C-Max
Walk Time (s)		7.0			7.0			7.0			7.0	7.0
Flash Dont Walk (s)		21.0			25.0			19.0			21.0	21.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effect Green (s)	8.4	24.2		10.1	25.9		61.9	53.8	68.9	70.1	60.2	60.2
Actuated g/C Ratio	0.07	0.20		0.08	0.22		0.52	0.45	0.57	0.58	0.50	0.50
v/c Ratio	0.61	0.74		0.91	0.82		0.33	0.26	0.10	0.42	0.81	0.30
Control Delay	66.1	57.5		88.3	63.3		19.3	22.7	13.9	15.2	31.7	21.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

Westpoint Residential TIA
1: Guess Road (NC 157) & Horton Road

Build (2023) AM
06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	66.1	57.5		88.3	63.3		19.3	22.7	13.9	15.2	31.7	21.1
LOS	E	E		F	E		B	C	B	B	C	C
Approach Delay		60.6			75.1			20.9			28.3	
Approach LOS		E			E			C			C	
Queue Length 50th (ft)	56	184		106	217		17	105	31	83	503	111
Queue Length 95th (ft)	91	260		#185	300		42	157	65	145	#722	189
Internal Link Dist (ft)		648			706			2035			2536	
Turn Bay Length (ft)	200			225			375		125	325		50
Base Capacity (vph)	233	437		291	449		165	1571	891	580	1774	793
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	0.61	0.58		0.91	0.65		0.33	0.26	0.10	0.41	0.81	0.30

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 38.5

Intersection LOS: D

Intersection Capacity Utilization 79.1%

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: 1: Guess Road (NC 157) & Horton Road

				
Ø1	Ø2 (R)		Ø3	Ø4
18 s	50.9 s		15.1 s	36 s
				
Ø5	Ø6 (R)		Ø7	Ø8
13.1 s	55.8 s		13.4 s	37.7 s

Westpoint Residential TIA
2: Stadium Drive & Horton Road

Build (2023) AM
06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	371	60	15	355	21	79	4	21	65	21	126
Future Volume (vph)	44	371	60	15	355	21	79	4	21	65	21	126
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	100		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
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
Frt		0.979			0.992			0.872			0.871	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1656	1727	0	1805	1833	0	1656	1576	0	1805	1614	0
Flt Permitted	0.501			0.463			0.503			0.740		
Satd. Flow (perm)	873	1727	0	880	1833	0	877	1576	0	1406	1614	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		2452			1495			1126			1263	
Travel Time (s)		47.8			29.1			25.6			28.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	9%	8%	6%	0%	3%	0%	9%	0%	6%	0%	18%	0%
Adj. Flow (vph)	49	412	67	17	394	23	88	4	23	72	23	140
Shared Lane Traffic (%)												
Lane Group Flow (vph)	49	479	0	17	417	0	88	27	0	72	163	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	15.2	15.2		15.2	15.2		12.5	12.5		12.5	12.5	
Total Split (s)	66.0	66.0		66.0	66.0		34.0	34.0		34.0	34.0	
Total Split (%)	66.0%	66.0%		66.0%	66.0%		34.0%	34.0%		34.0%	34.0%	
Maximum Green (s)	60.8	60.8		60.8	60.8		28.5	28.5		28.5	28.5	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.6	3.6		3.6	3.6	
All-Red Time (s)	1.2	1.2		1.2	1.2		1.9	1.9		1.9	1.9	
Lost Time Adjust (s)	-0.2	-0.2		-0.2	-0.2		-0.5	-0.5		-0.5	-0.5	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effect Green (s)	75.0	75.0		75.0	75.0		15.0	15.0		15.0	15.0	
Actuated g/C Ratio	0.75	0.75		0.75	0.75		0.15	0.15		0.15	0.15	
v/c Ratio	0.07	0.37		0.03	0.30		0.67	0.11		0.34	0.67	
Control Delay	4.6	5.9		4.4	5.3		63.4	35.4		40.9	53.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	4.6	5.9		4.4	5.3		63.4	35.4		40.9	53.4	
LOS	A	A		A	A		E	D		D	D	
Approach Delay		5.8			5.2			56.8			49.6	

Westpoint Residential TIA
2: Stadium Drive & Horton Road

Build (2023) AM
06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			A			E			D	
Queue Length 50th (ft)	7	87		2	71		54	15		42	99	
Queue Length 95th (ft)	21	171		10	139		101	37		79	157	
Internal Link Dist (ft)		2372			1415			1046			1183	
Turn Bay Length (ft)	100			100			100			100		
Base Capacity (vph)	654	1295		660	1374		254	457		407	468	
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	0.07	0.37		0.03	0.30		0.35	0.06		0.18	0.35	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 40
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.67
Intersection Signal Delay: 17.9
Intersection Capacity Utilization 62.9%
Analysis Period (min) 15

Intersection LOS: B
ICU Level of Service B

Splits and Phases: 2: Stadium Drive & Horton Road



Westpoint Residential TIA
3: N Duke Street (US 501) & Horton Road

Build (2023) AM

06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	88	255	277	175	220	17	93	570	63	26	1394	73
Future Volume (vph)	88	255	277	175	220	17	93	570	63	26	1394	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		200	0		0	250		0	100		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.989			0.985			0.993	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	1845	1599	1736	1764	0	1752	3333	0	1719	3513	0
Flt Permitted	0.315			0.290			0.072			0.344		
Satd. Flow (perm)	593	1845	1599	530	1764	0	133	3333	0	622	3513	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1974			505			1329			2255	
Travel Time (s)		38.5			9.8			22.7			38.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	3%	1%	4%	6%	13%	3%	7%	4%	5%	2%	3%
Adj. Flow (vph)	98	283	308	194	244	19	103	633	70	29	1549	81
Shared Lane Traffic (%)												
Lane Group Flow (vph)	98	283	308	194	263	0	103	703	0	29	1630	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Detector Phase	7	4	5	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	12.0		7.0	12.0	
Minimum Split (s)	13.0	35.0	12.2	12.6	33.7		12.2	32.9		12.0	31.8	
Total Split (s)	13.0	35.0	12.2	12.6	34.6		12.2	50.4		12.0	50.2	
Total Split (%)	11.8%	31.8%	11.1%	11.5%	31.5%		11.1%	45.8%		10.9%	45.6%	
Maximum Green (s)	7.0	29.0	7.0	7.0	28.9		7.0	44.5		7.0	44.4	
Yellow Time (s)	3.1	3.8	3.2	3.2	3.9		3.2	4.2		3.2	4.2	
All-Red Time (s)	2.9	2.2	2.0	2.4	1.8		2.0	1.7		1.8	1.6	
Lost Time Adjust (s)	-1.0	-1.0	-0.2	-0.6	-0.7		-0.2	-0.9		0.0	-0.8	
Total Lost Time (s)	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	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		22.0			21.0			20.0			19.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effect Green (s)	30.2	22.2	34.9	29.4	21.8		62.8	58.0		59.5	52.5	
Actuated g/C Ratio	0.27	0.20	0.32	0.27	0.20		0.57	0.53		0.54	0.48	
v/c Ratio	0.39	0.76	0.61	0.86	0.75		0.55	0.40		0.07	0.97	
Control Delay	30.5	54.2	36.4	64.7	54.6		27.2	18.5		11.6	45.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	

Westpoint Residential TIA
3: N Duke Street (US 501) & Horton Road

Build (2023) AM
06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	30.5	54.2	36.4	64.7	54.6		27.2	18.5		11.6	45.9	
LOS	C	D	D	E	D		C	B		B	D	
Approach Delay		42.9			58.9			19.6			45.3	
Approach LOS		D			E			B			D	
Queue Length 50th (ft)	50	190	183	105	176		30	165		8	571	
Queue Length 95th (ft)	82	263	249	#181	248		86	244		24	#842	
Internal Link Dist (ft)		1894			425			1249			2175	
Turn Bay Length (ft)	150		200				250			100		
Base Capacity (vph)	249	503	507	225	474		188	1756		405	1675	
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	0.39	0.56	0.61	0.86	0.55		0.55	0.40		0.07	0.97	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 41 (37%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 115

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.97

Intersection Signal Delay: 40.8

Intersection LOS: D

Intersection Capacity Utilization 86.5%

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: 3: N Duke Street (US 501) & Horton Road

				
Ø1	Ø2 (R)		Ø3	Ø4
12 s	50.4 s		12.6 s	35 s
				
Ø5	Ø6 (R)		Ø7	Ø8
12.2 s	50.2 s		13 s	34.6 s

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	1	14	172	0	24	3	1131	17	22	2086	12
Future Volume (vph)	2	1	14	172	0	24	3	1131	17	22	2086	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	125		0	150		0	175		0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.886			0.962			0.998			0.999	
Flt Protected		0.995		0.950	0.964		0.950			0.950		
Satd. Flow (prot)	0	1675	0	1618	1564	0	1805	3398	0	1556	3502	0
Flt Permitted		0.995		0.950	0.964		0.045			0.178		
Satd. Flow (perm)	0	1675	0	1618	1564	0	86	3398	0	292	3502	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			35			45			45	
Link Distance (ft)		355			718			526			1606	
Travel Time (s)		9.7			14.0			8.0			24.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	6%	0%	10%	0%	6%	7%	16%	3%	0%
Adj. Flow (vph)	2	1	16	191	0	27	3	1257	19	24	2318	13
Shared Lane Traffic (%)				42%								
Lane Group Flow (vph)	0	19	0	111	107	0	3	1276	0	24	2331	0
Turn Type	Split	NA		Split	NA		Perm	NA		D.P+P	NA	
Protected Phases	4	4		3	3			2		1	6	
Permitted Phases							2			2		
Detector Phase	4	4		3	3		2	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		12.0	12.0		7.0	12.0	
Minimum Split (s)	36.3	36.3		12.9	12.9		17.8	17.8		11.9	17.8	
Total Split (s)	36.3	36.3		13.0	13.0		63.8	63.8		11.9	75.7	
Total Split (%)	29.0%	29.0%		10.4%	10.4%		51.0%	51.0%		9.5%	60.6%	
Maximum Green (s)	31.0	31.0		7.1	7.1		58.0	58.0		7.0	69.9	
Yellow Time (s)	3.7	3.7		3.1	3.1		4.5	4.5		3.0	4.5	
All-Red Time (s)	1.6	1.6		2.8	2.8		1.3	1.3		1.9	1.3	
Lost Time Adjust (s)		-0.3		-0.9	-0.9		-0.8	-0.8		0.1	-0.8	
Total Lost Time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag		Lead	Lead		Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes		
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	3.0		2.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	7.0	7.0										
Flash Dont Walk (s)	24.0	24.0										
Pedestrian Calls (#/hr)	0	0										
Act Effect Green (s)		7.5		8.0	8.0		94.7	94.7		98.9	101.9	
Actuated g/C Ratio		0.06		0.06	0.06		0.76	0.76		0.79	0.82	
v/c Ratio		0.19		1.08	1.07		0.05	0.50		0.08	0.82	
Control Delay		60.3		165.5	164.9		9.3	8.3		3.9	11.0	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		60.3		165.5	164.9		9.3	8.3		3.9	11.0	
LOS		E		F	F		A	A		A	B	
Approach Delay		60.3			165.2			8.3			11.0	
Approach LOS		E			F			A			B	
Queue Length 50th (ft)		15		~105	~101		1	178		2	307	
Queue Length 95th (ft)		40		#233	#226		5	337		11	792	
Internal Link Dist (ft)		275			638			446			1526	
Turn Bay Length (ft)				125			150			175		
Base Capacity (vph)		419		103	100		65	2574		300	2853	
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		0.05		1.08	1.07		0.05	0.50		0.08	0.82	

Intersection Summary

Area Type: Other

Cycle Length: 125

Actuated Cycle Length: 125

Offset: 90 (72%), Referenced to phase 2:NBSB and 6:SBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.08

Intersection Signal Delay: 19.0

Intersection LOS: B

Intersection Capacity Utilization 78.5%

ICU Level of Service D

Analysis Period (min) 15

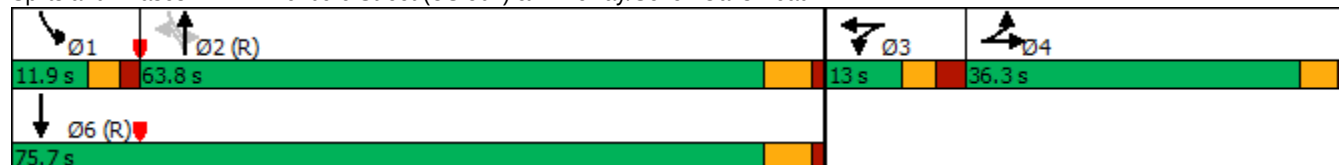
~ Volume exceeds capacity, queue is theoretically infinite.

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: 4: N Roxboro Street (US 501) & Driveway/Seven Oaks Road



Westpoint Residential TIA
5: N Roxboro Street (US 501) & Future Site Access #1

Build (2023) AM
06/26/2019

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	 		 	 	 	
Traffic Volume (vph)	17	42	13	1134	2267	5
Future Volume (vph)	17	42	13	1134	2267	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	150			0
Storage Lanes	1	0	1			0
Taper Length (ft)	100		100			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Frt	0.904					
Flt Protected	0.986		0.950			
Satd. Flow (prot)	1660	0	1770	3406	3505	0
Flt Permitted	0.986		0.950			
Satd. Flow (perm)	1660	0	1770	3406	3505	0
Link Speed (mph)	25			45	45	
Link Distance (ft)	714			1529	526	
Travel Time (s)	19.5			23.2	8.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	6%	3%	2%
Adj. Flow (vph)	19	47	14	1260	2519	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	66	0	14	1260	2525	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 73.0%
Analysis Period (min) 15

ICU Level of Service D

Westpoint Residential TIA
5: N Roxboro Street (US 501) & Future Site Access #1

Build (2023) AM
06/26/2019

Intersection

Int Delay, s/veh 21.5

Movement EBL EBR NBL NBT SBT SBR

Lane Configurations						
Traffic Vol, veh/h	17	42	13	1134	2267	5
Future Vol, veh/h	17	42	13	1134	2267	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	150	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	6	3	2
Mvmt Flow	19	47	14	1260	2519	6

Major/Minor Minor2 Major1 Major2

Conflicting Flow All	3180	1263	2525	0	-	0
Stage 1	2522	-	-	-	-	-
Stage 2	658	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	~ 8	161	175	-	-	-
Stage 1	46	-	-	-	-	-
Stage 2	477	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 7	161	175	-	-	-
Mov Cap-2 Maneuver	~ 7	-	-	-	-	-
Stage 1	42	-	-	-	-	-
Stage 2	477	-	-	-	-	-

Approach EB NB SB

HCM Control Delay, \$	1260.5	0.3	0
HCM LOS	F		

Minor Lane/Major Mvmt NBL NBT EBLn1 SBT SBR

Capacity (veh/h)	175	-	22	-	-
HCM Lane V/C Ratio	0.083	-	2.98	-	-
HCM Control Delay (s)	27.4	\$	1260.5	-	-
HCM Lane LOS	D	-	F	-	-
HCM 95th %tile Q(veh)	0.3	-	8.4	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Westpoint Residential TIA
1: Guess Road (NC 157) & Horton Road

Build (2023) PM
06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 			 				 			 	
Traffic Volume (vph)	572	241	63	222	184	213	143	1239	190	203	711	139
Future Volume (vph)	572	241	63	222	184	213	143	1239	190	203	711	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		125	225		0	375		125	325		50
Storage Lanes	1		1	2		0	1		1	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.969			0.919				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3502	1791	0	3467	1711	0	1805	3574	1553	1736	3574	1583
Flt Permitted	0.950			0.950			0.207			0.077		
Satd. Flow (perm)	3502	1791	0	3467	1711	0	393	3574	1553	141	3574	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		728			786			2115			2616	
Travel Time (s)		14.2			15.3			36.1			44.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	3%	2%	1%	1%	3%	0%	1%	4%	4%	1%	2%
Adj. Flow (vph)	636	268	70	247	204	237	159	1377	211	226	790	154
Shared Lane Traffic (%)												
Lane Group Flow (vph)	636	338	0	247	441	0	159	1377	211	226	790	154
Turn Type	Prot	NA		Prot	NA		pm+pt	NA	pm+ov	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases							2		2	6		6
Detector Phase	7	4		3	8		5	2	3	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	10.0	7.0	7.0	10.0	10.0
Minimum Split (s)	13.4	34.4		12.9	37.7		13.1	32.1	12.9	12.5	33.7	33.7
Total Split (s)	28.0	46.2		19.8	38.0		19.2	57.0	19.8	17.0	54.8	54.8
Total Split (%)	20.0%	33.0%		14.1%	27.1%		13.7%	40.7%	14.1%	12.1%	39.1%	39.1%
Maximum Green (s)	21.6	39.8		13.9	32.3		13.1	50.9	13.9	11.5	49.1	49.1
Yellow Time (s)	3.3	4.1		3.0	3.4		3.3	4.0	3.0	3.1	3.7	3.7
All-Red Time (s)	3.1	2.3		2.9	2.3		2.8	2.1	2.9	2.4	2.0	2.0
Lost Time Adjust (s)	-1.4	-1.4		-0.9	-0.7		-1.1	-1.1	-0.9	-0.5	-0.7	-0.7
Total Lost Time (s)	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	Lag		Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Recall Mode	None	None		None	None		None	C-Max	None	None	C-Max	C-Max
Walk Time (s)		7.0			7.0			7.0			7.0	7.0
Flash Dont Walk (s)		21.0			25.0			19.0			21.0	21.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effect Green (s)	23.0	42.2		13.8	33.0		64.0	52.0	70.8	64.0	52.0	52.0
Actuated g/C Ratio	0.16	0.30		0.10	0.24		0.46	0.37	0.51	0.46	0.37	0.37
v/c Ratio	1.11	0.63		0.72	1.09		0.53	1.04	0.27	1.12	0.60	0.26
Control Delay	122.7	48.5		73.8	121.8		26.6	77.8	20.7	136.7	38.2	32.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

Westpoint Residential TIA
1: Guess Road (NC 157) & Horton Road

Build (2023) PM
06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	122.7	48.5		73.8	121.8		26.6	77.8	20.7	136.7	38.2	32.8
LOS	F	D		E	F		C	E	C	F	D	C
Approach Delay		97.0			104.6			66.2			56.5	
Approach LOS		F			F			E			E	
Queue Length 50th (ft)	~339	268		113	~452		79	~709	106	~188	305	98
Queue Length 95th (ft)	#460	378		160	#666		124	#849	160	#364	382	159
Internal Link Dist (ft)		648			706			2035			2536	
Turn Bay Length (ft)	200			225			375		125	325		50
Base Capacity (vph)	575	540		366	403		329	1327	796	201	1326	587
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	1.11	0.63		0.67	1.09		0.48	1.04	0.27	1.12	0.60	0.26

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 140

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.12

Intersection Signal Delay: 76.1

Intersection LOS: E

Intersection Capacity Utilization 101.2%

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.

Splits and Phases: 1: Guess Road (NC 157) & Horton Road

 Ø1	 Ø2 (R)	 Ø3	 Ø4
17 s	57 s	19.8 s	46.2 s
 Ø5	 Ø6 (R)	 Ø7	 Ø8
19.2 s	54.8 s	28 s	38 s

Westpoint Residential TIA
2: Stadium Drive & Horton Road

Build (2023) PM
06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	137	488	96	26	497	69	108	35	44	42	25	88
Future Volume (vph)	137	488	96	26	497	69	108	35	44	42	25	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	100		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
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
Frt		0.975			0.982			0.916			0.883	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1802	0	1719	1850	0	1752	1703	0	1687	1652	0
Flt Permitted	0.379			0.368			0.612			0.700		
Satd. Flow (perm)	699	1802	0	666	1850	0	1129	1703	0	1243	1652	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		2452			1495			1126			1263	
Travel Time (s)		47.8			29.1			25.6			28.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	2%	7%	5%	1%	0%	3%	5%	0%	7%	0%	2%
Adj. Flow (vph)	152	542	107	29	552	77	120	39	49	47	28	98
Shared Lane Traffic (%)												
Lane Group Flow (vph)	152	649	0	29	629	0	120	88	0	47	126	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	15.2	15.2		15.2	15.2		12.5	12.5		12.5	12.5	
Total Split (s)	71.0	71.0		71.0	71.0		29.0	29.0		29.0	29.0	
Total Split (%)	71.0%	71.0%		71.0%	71.0%		29.0%	29.0%		29.0%	29.0%	
Maximum Green (s)	65.8	65.8		65.8	65.8		23.5	23.5		23.5	23.5	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.6	3.6		3.6	3.6	
All-Red Time (s)	1.2	1.2		1.2	1.2		1.9	1.9		1.9	1.9	
Lost Time Adjust (s)	-0.2	-0.2		-0.2	-0.2		-0.5	-0.5		-0.5	-0.5	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effect Green (s)	75.2	75.2		75.2	75.2		14.8	14.8		14.8	14.8	
Actuated g/C Ratio	0.75	0.75		0.75	0.75		0.15	0.15		0.15	0.15	
v/c Ratio	0.29	0.48		0.06	0.45		0.72	0.35		0.26	0.52	
Control Delay	6.5	7.0		4.7	6.6		63.2	40.4		39.0	45.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	6.5	7.0		4.7	6.6		63.2	40.4		39.0	45.7	
LOS	A	A		A	A		E	D		D	D	
Approach Delay		6.9			6.5			53.6			43.9	

Westpoint Residential TIA
2: Stadium Drive & Horton Road

Build (2023) PM
06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			A			D			D	
Queue Length 50th (ft)	25	133		4	125		74	51		27	75	
Queue Length 95th (ft)	68	262		15	245		126	91		57	123	
Internal Link Dist (ft)		2372			1415			1046			1183	
Turn Bay Length (ft)	100			100			100			100		
Base Capacity (vph)	525	1355		501	1391		270	408		298	396	
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	0.29	0.48		0.06	0.45		0.44	0.22		0.16	0.32	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.72
Intersection Signal Delay: 15.5
Intersection Capacity Utilization 65.0%
Analysis Period (min) 15

Intersection LOS: B
ICU Level of Service C

Splits and Phases: 2: Stadium Drive & Horton Road

 Ø2 (R)	 Ø4
71 s	29 s
 Ø6 (R)	 Ø8
71 s	29 s

Westpoint Residential TIA
3: N Duke Street (US 501) & Horton Road

Build (2023) PM

06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	134	326	160	158	357	37	270	1490	114	53	825	133
Future Volume (vph)	134	326	160	158	357	37	270	1490	114	53	825	133
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		200	0		0	250		0	100		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.986			0.989			0.979	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1845	1568	1770	1857	0	1770	3527	0	1805	3436	0
Flt Permitted	0.139			0.254			0.094			0.106		
Satd. Flow (perm)	259	1845	1568	473	1857	0	175	3527	0	201	3436	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1974			505			1329			2255	
Travel Time (s)		38.5			9.8			22.7			38.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	3%	3%	2%	1%	0%	2%	1%	4%	0%	3%	2%
Adj. Flow (vph)	149	362	178	176	397	41	300	1656	127	59	917	148
Shared Lane Traffic (%)												
Lane Group Flow (vph)	149	362	178	176	438	0	300	1783	0	59	1065	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Detector Phase	7	4	5	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	12.0		7.0	12.0	
Minimum Split (s)	13.0	35.0	12.2	12.6	33.7		12.2	32.9		12.0	31.8	
Total Split (s)	13.0	35.0	20.4	12.6	34.6		20.4	50.4		12.0	42.0	
Total Split (%)	11.8%	31.8%	18.5%	11.5%	31.5%		18.5%	45.8%		10.9%	38.2%	
Maximum Green (s)	7.0	29.0	15.2	7.0	28.9		15.2	44.5		7.0	36.2	
Yellow Time (s)	3.1	3.8	3.2	3.2	3.9		3.2	4.2		3.2	4.2	
All-Red Time (s)	2.9	2.2	2.0	2.4	1.8		2.0	1.7		1.8	1.6	
Lost Time Adjust (s)	-1.0	-1.0	-0.2	-0.6	-0.7		-0.2	-0.9		0.0	-0.8	
Total Lost Time (s)	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	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		22.0			21.0			20.0			19.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effect Green (s)	36.7	28.7	49.0	35.9	28.3		58.7	49.1		45.4	38.4	
Actuated g/C Ratio	0.33	0.26	0.45	0.33	0.26		0.53	0.45		0.41	0.35	
v/c Ratio	0.76	0.75	0.26	0.72	0.92		0.95	1.13		0.32	0.89	
Control Delay	49.6	48.1	19.8	43.4	65.3		69.7	99.0		19.1	44.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	

Intersection Summary

Queue shown is maximum after two cycles.

			
12 s	50.4 s	12.6 s	35 s
			
20.4 s	42 s	13 s	34.6 s

Westpoint Residential TIA
4: N Roxboro Street (US 501) & Driveway/Seven Oaks Road

Build (2023) PM

06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	2	10	212	1	63	10	1932	70	48	1230	5
Future Volume (vph)	2	2	10	212	1	63	10	1932	70	48	1230	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	125		0	150		0	175		0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.901			0.930			0.995			0.999	
Flt Protected		0.993		0.950	0.974		0.950			0.950		
Satd. Flow (prot)	0	1700	0	1603	1563	0	1805	3520	0	1719	3468	0
Flt Permitted		0.993		0.950	0.974		0.188			0.037		
Satd. Flow (perm)	0	1700	0	1603	1563	0	357	3520	0	67	3468	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			35			45			45	
Link Distance (ft)		355			718			526			1606	
Travel Time (s)		9.7			14.0			8.0			24.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	7%	0%	2%	0%	2%	3%	5%	4%	0%
Adj. Flow (vph)	2	2	11	236	1	70	11	2147	78	53	1367	6
Shared Lane Traffic (%)				33%								
Lane Group Flow (vph)	0	15	0	158	149	0	11	2225	0	53	1373	0
Turn Type	Split	NA		Split	NA		Perm	NA		D.P+P	NA	
Protected Phases	4	4		3	3			2		1	6	
Permitted Phases							2			2		
Detector Phase	4	4		3	3		2	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		12.0	12.0		7.0	12.0	
Minimum Split (s)	36.3	36.3		12.9	12.9		17.8	17.8		11.9	17.8	
Total Split (s)	36.3	36.3		18.0	18.0		83.8	83.8		11.9	95.7	
Total Split (%)	24.2%	24.2%		12.0%	12.0%		55.9%	55.9%		7.9%	63.8%	
Maximum Green (s)	31.0	31.0		12.1	12.1		78.0	78.0		7.0	89.9	
Yellow Time (s)	3.7	3.7		3.1	3.1		4.5	4.5		3.0	4.5	
All-Red Time (s)	1.6	1.6		2.8	2.8		1.3	1.3		1.9	1.3	
Lost Time Adjust (s)		-0.3		-0.9	-0.9		-0.8	-0.8		0.1	-0.8	
Total Lost Time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag		Lead	Lead		Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes		
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	3.0		2.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	7.0	7.0										
Flash Dont Walk (s)	24.0	24.0										
Pedestrian Calls (#/hr)	0	0										
Act Effect Green (s)		7.5		13.0	13.0		112.0	112.0		117.9	121.9	
Actuated g/C Ratio		0.05		0.09	0.09		0.75	0.75		0.79	0.81	
v/c Ratio		0.18		1.14	1.10		0.04	0.85		0.40	0.49	
Control Delay		73.2		178.7	168.1		8.0	19.3		23.9	5.6	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		73.2		178.7	168.1		8.0	19.3		23.9	5.6	
LOS		E		F	F		A	B		C	A	
Approach Delay		73.2			173.6			19.2			6.3	
Approach LOS		E			F			B			A	
Queue Length 50th (ft)		14		~189	~173		2	639		6	141	
Queue Length 95th (ft)		40		#349	#329		11	1127		51	293	
Internal Link Dist (ft)		275			638			446			1526	
Turn Bay Length (ft)				125			150			175		
Base Capacity (vph)		354		138	135		266	2629		132	2818	
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		0.04		1.14	1.10		0.04	0.85		0.40	0.49	

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:NBSB and 6:SBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.14

Intersection Signal Delay: 26.7

Intersection LOS: C

Intersection Capacity Utilization 78.5%

ICU Level of Service D

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: 4: N Roxboro Street (US 501) & Driveway/Seven Oaks Road

				
Ø1	Ø2 (R)		Ø3	Ø4
11.9 s	83.8 s		18 s	36.3 s
	Ø6 (R)			
95.7 s				

Westpoint Residential TIA
5: N Roxboro Street (US 501) & Future Site Access #1

Build (2023) PM
06/26/2019

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	10	25	42	2002	1435	17
Future Volume (vph)	10	25	42	2002	1435	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	150			0
Storage Lanes	1	0	1			0
Taper Length (ft)	100		100			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Frt	0.903				0.998	
Flt Protected	0.986		0.950			
Satd. Flow (prot)	1659	0	1770	3539	3465	0
Flt Permitted	0.986		0.950			
Satd. Flow (perm)	1659	0	1770	3539	3465	0
Link Speed (mph)	25			45	45	
Link Distance (ft)	714			1529	526	
Travel Time (s)	19.5			23.2	8.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	4%	2%
Adj. Flow (vph)	11	28	47	2224	1594	19
Shared Lane Traffic (%)						
Lane Group Flow (vph)	39	0	47	2224	1613	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 65.3%
Analysis Period (min) 15

ICU Level of Service C

Westpoint Residential TIA
5: N Roxboro Street (US 501) & Future Site Access #1

Build (2023) PM
06/26/2019

Intersection

Int Delay, s/veh 3.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	25	42	2002	1435	17
Future Vol, veh/h	10	25	42	2002	1435	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	150	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	4	2
Mvmt Flow	11	28	47	2224	1594	19

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	2810	807	1613
Stage 1	1604	-	-
Stage 2	1206	-	-
Critical Hdwy	6.84	6.94	4.14
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	2.22
Pot Cap-1 Maneuver	14	324	400
Stage 1	150	-	-
Stage 2	246	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	12	324	400
Mov Cap-2 Maneuver	12	-	-
Stage 1	132	-	-
Stage 2	246	-	-

Approach	EB	NB	SB
HCM Control Delay, s	313.9	0.3	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	400	-	38	-	-
HCM Lane V/C Ratio	0.117	-	1.023	-	-
HCM Control Delay (s)	15.2	-	313.9	-	-
HCM Lane LOS	C	-	F	-	-
HCM 95th %tile Q(veh)	0.4	-	3.9	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Westpoint Residential TIA
1: Guess Road (NC 157) & Horton Road

Build (2023) with Improvements AM

06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 			 				 			 	
Traffic Volume (vph)	129	126	101	238	137	127	49	372	81	213	1293	214
Future Volume (vph)	129	126	101	238	137	127	49	372	81	213	1293	214
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		125	225		0	375		125	325		50
Storage Lanes	1		1	2		0	1		1	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.933			0.928				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3335	1692	0	3467	1649	0	1612	3505	1553	1770	3539	1583
Flt Permitted	0.950			0.950			0.074			0.431		
Satd. Flow (perm)	3335	1692	0	3467	1649	0	126	3505	1553	803	3539	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		728			786			2115			2616	
Travel Time (s)		14.2			15.3			36.1			44.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	5%	3%	7%	1%	5%	9%	12%	3%	4%	2%	2%	2%
Adj. Flow (vph)	143	140	112	264	152	141	54	413	90	237	1437	238
Shared Lane Traffic (%)												
Lane Group Flow (vph)	143	252	0	264	293	0	54	413	90	237	1437	238
Turn Type	Prot	NA		Prot	NA		pm+pt	NA	pm+ov	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases							2		2	6		6
Detector Phase	7	4		3	8		5	2	3	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	10.0	7.0	7.0	10.0	10.0
Minimum Split (s)	13.4	34.4		12.9	37.7		13.1	32.1	12.9	12.5	33.7	33.7
Total Split (s)	13.4	36.0		15.1	37.7		13.1	50.9	15.1	18.0	55.8	55.8
Total Split (%)	11.2%	30.0%		12.6%	31.4%		10.9%	42.4%	12.6%	15.0%	46.5%	46.5%
Maximum Green (s)	7.0	29.6		9.2	32.0		7.0	44.8	9.2	12.5	50.1	50.1
Yellow Time (s)	3.3	4.1		3.0	3.4		3.3	4.0	3.0	3.1	3.7	3.7
All-Red Time (s)	3.1	2.3		2.9	2.3		2.8	2.1	2.9	2.4	2.0	2.0
Lost Time Adjust (s)	-1.4	-1.4		-0.9	-0.7		-1.1	-1.1	-0.9	-0.5	-0.7	-0.7
Total Lost Time (s)	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	Lag		Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Recall Mode	None	None		None	None		None	C-Max	None	None	C-Max	C-Max
Walk Time (s)		7.0			7.0			7.0			7.0	7.0
Flash Dont Walk (s)		21.0			25.0			19.0			21.0	21.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effect Green (s)	8.4	24.2		10.1	25.9		61.9	53.8	68.9	70.1	60.2	60.2
Actuated g/C Ratio	0.07	0.20		0.08	0.22		0.52	0.45	0.57	0.58	0.50	0.50
v/c Ratio	0.61	0.74		0.91	0.82		0.33	0.26	0.10	0.42	0.81	0.30
Control Delay	66.1	57.5		88.3	63.3		19.3	22.7	13.9	15.2	31.7	21.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

Westpoint Residential TIA
1: Guess Road (NC 157) & Horton Road

Build (2023) with Improvements AM

06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	66.1	57.5		88.3	63.3		19.3	22.7	13.9	15.2	31.7	21.1
LOS	E	E		F	E		B	C	B	B	C	C
Approach Delay		60.6			75.1			20.9			28.3	
Approach LOS		E			E			C			C	
Queue Length 50th (ft)	56	184		106	217		17	105	31	83	503	111
Queue Length 95th (ft)	91	260		#185	300		42	157	65	145	#722	189
Internal Link Dist (ft)		648			706			2035			2536	
Turn Bay Length (ft)	200			225			375		125	325		50
Base Capacity (vph)	233	437		291	449		165	1571	891	580	1774	793
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	0.61	0.58		0.91	0.65		0.33	0.26	0.10	0.41	0.81	0.30

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 38.5

Intersection LOS: D

Intersection Capacity Utilization 79.1%

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: 1: Guess Road (NC 157) & Horton Road

				
Ø1	Ø2 (R)		Ø3	Ø4
18 s	50.9 s		15.1 s	36 s
				
Ø5	Ø6 (R)		Ø7	Ø8
13.1 s	55.8 s		13.4 s	37.7 s

Westpoint Residential TIA
2: Stadium Drive & Horton Road

Build (2023) with Improvements AM

06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	371	60	15	355	21	79	4	21	65	21	126
Future Volume (vph)	44	371	60	15	355	21	79	4	21	65	21	126
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	100		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
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
Frt		0.979			0.992			0.872			0.871	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1656	1727	0	1805	1833	0	1656	1576	0	1805	1614	0
Flt Permitted	0.501			0.463			0.503			0.740		
Satd. Flow (perm)	873	1727	0	880	1833	0	877	1576	0	1406	1614	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		2452			1495			1126			1263	
Travel Time (s)		47.8			29.1			25.6			28.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	9%	8%	6%	0%	3%	0%	9%	0%	6%	0%	18%	0%
Adj. Flow (vph)	49	412	67	17	394	23	88	4	23	72	23	140
Shared Lane Traffic (%)												
Lane Group Flow (vph)	49	479	0	17	417	0	88	27	0	72	163	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	15.2	15.2		15.2	15.2		12.5	12.5		12.5	12.5	
Total Split (s)	66.0	66.0		66.0	66.0		34.0	34.0		34.0	34.0	
Total Split (%)	66.0%	66.0%		66.0%	66.0%		34.0%	34.0%		34.0%	34.0%	
Maximum Green (s)	60.8	60.8		60.8	60.8		28.5	28.5		28.5	28.5	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.6	3.6		3.6	3.6	
All-Red Time (s)	1.2	1.2		1.2	1.2		1.9	1.9		1.9	1.9	
Lost Time Adjust (s)	-0.2	-0.2		-0.2	-0.2		-0.5	-0.5		-0.5	-0.5	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effect Green (s)	75.0	75.0		75.0	75.0		15.0	15.0		15.0	15.0	
Actuated g/C Ratio	0.75	0.75		0.75	0.75		0.15	0.15		0.15	0.15	
v/c Ratio	0.07	0.37		0.03	0.30		0.67	0.11		0.34	0.67	
Control Delay	4.6	5.9		4.4	5.3		63.4	35.4		40.9	53.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	4.6	5.9		4.4	5.3		63.4	35.4		40.9	53.4	
LOS	A	A		A	A		E	D		D	D	
Approach Delay		5.8			5.2			56.8			49.6	

Westpoint Residential TIA
2: Stadium Drive & Horton Road

Build (2023) with Improvements AM

06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			A			E			D	
Queue Length 50th (ft)	7	87		2	71		54	15		42	99	
Queue Length 95th (ft)	21	171		10	139		101	37		79	157	
Internal Link Dist (ft)		2372			1415			1046			1183	
Turn Bay Length (ft)	100			100			100			100		
Base Capacity (vph)	654	1295		660	1374		254	457		407	468	
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	0.07	0.37		0.03	0.30		0.35	0.06		0.18	0.35	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 40

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 17.9

Intersection Capacity Utilization 62.9%

Analysis Period (min) 15

Intersection LOS: B

ICU Level of Service B

Splits and Phases: 2: Stadium Drive & Horton Road



Westpoint Residential TIA
3: N Duke Street (US 501) & Horton Road

Build (2023) with Improvements AM

06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	88	255	277	175	220	17	93	570	63	26	1394	73
Future Volume (vph)	88	255	277	175	220	17	93	570	63	26	1394	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		200	0		0	250		0	100		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.989			0.985			0.993	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	1845	1599	1736	1764	0	1752	3333	0	1719	3513	0
Flt Permitted	0.315			0.290			0.072			0.344		
Satd. Flow (perm)	593	1845	1599	530	1764	0	133	3333	0	622	3513	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1974			505			1329			2255	
Travel Time (s)		38.5			9.8			22.7			38.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	3%	1%	4%	6%	13%	3%	7%	4%	5%	2%	3%
Adj. Flow (vph)	98	283	308	194	244	19	103	633	70	29	1549	81
Shared Lane Traffic (%)												
Lane Group Flow (vph)	98	283	308	194	263	0	103	703	0	29	1630	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Detector Phase	7	4	5	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	12.0		7.0	12.0	
Minimum Split (s)	13.0	35.0	12.2	12.6	33.7		12.2	32.9		12.0	31.8	
Total Split (s)	13.0	35.0	12.2	12.6	34.6		12.2	50.4		12.0	50.2	
Total Split (%)	11.8%	31.8%	11.1%	11.5%	31.5%		11.1%	45.8%		10.9%	45.6%	
Maximum Green (s)	7.0	29.0	7.0	7.0	28.9		7.0	44.5		7.0	44.4	
Yellow Time (s)	3.1	3.8	3.2	3.2	3.9		3.2	4.2		3.2	4.2	
All-Red Time (s)	2.9	2.2	2.0	2.4	1.8		2.0	1.7		1.8	1.6	
Lost Time Adjust (s)	-1.0	-1.0	-0.2	-0.6	-0.7		-0.2	-0.9		0.0	-0.8	
Total Lost Time (s)	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	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		22.0			21.0			20.0			19.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effect Green (s)	30.2	22.2	34.9	29.4	21.8		62.8	58.0		59.5	52.5	
Actuated g/C Ratio	0.27	0.20	0.32	0.27	0.20		0.57	0.53		0.54	0.48	
v/c Ratio	0.39	0.76	0.61	0.86	0.75		0.55	0.40		0.07	0.97	
Control Delay	30.5	54.2	36.4	64.7	54.6		27.2	18.5		11.6	45.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	

Westpoint Residential TIA
3: N Duke Street (US 501) & Horton Road

Build (2023) with Improvements AM

06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	30.5	54.2	36.4	64.7	54.6		27.2	18.5		11.6	45.9	
LOS	C	D	D	E	D		C	B		B	D	
Approach Delay		42.9			58.9			19.6			45.3	
Approach LOS		D			E			B			D	
Queue Length 50th (ft)	50	190	183	105	176		30	165		8	571	
Queue Length 95th (ft)	82	263	249	#181	248		86	244		24	#842	
Internal Link Dist (ft)		1894			425			1249			2175	
Turn Bay Length (ft)	150		200				250			100		
Base Capacity (vph)	249	503	507	225	474		188	1756		405	1675	
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	0.39	0.56	0.61	0.86	0.55		0.55	0.40		0.07	0.97	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 41 (37%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 115

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.97

Intersection Signal Delay: 40.8

Intersection LOS: D

Intersection Capacity Utilization 86.5%

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: 3: N Duke Street (US 501) & Horton Road

 Ø1	 Ø2 (R)	 Ø3	 Ø4
12 s	50.4 s	12.6 s	35 s
 Ø5	 Ø6 (R)	 Ø7	 Ø8
12.2 s	50.2 s	13 s	34.6 s

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	1	14	172	0	24	3	1131	17	22	2086	12
Future Volume (vph)	2	1	14	172	0	24	3	1131	17	22	2086	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	125		0	150		0	175		0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.886			0.962			0.998			0.999	
Flt Protected		0.995		0.950	0.964		0.950			0.950		
Satd. Flow (prot)	0	1675	0	1618	1564	0	1805	3398	0	1556	3502	0
Flt Permitted		0.995		0.950	0.964		0.045			0.178		
Satd. Flow (perm)	0	1675	0	1618	1564	0	86	3398	0	292	3502	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			35			45			45	
Link Distance (ft)		355			718			526			1606	
Travel Time (s)		9.7			14.0			8.0			24.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	6%	0%	10%	0%	6%	7%	16%	3%	0%
Adj. Flow (vph)	2	1	16	191	0	27	3	1257	19	24	2318	13
Shared Lane Traffic (%)				42%								
Lane Group Flow (vph)	0	19	0	111	107	0	3	1276	0	24	2331	0
Turn Type	Split	NA		Split	NA		Perm	NA		D.P+P	NA	
Protected Phases	4	4		3	3			2		1	6	
Permitted Phases							2			2		
Detector Phase	4	4		3	3		2	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		12.0	12.0		7.0	12.0	
Minimum Split (s)	36.3	36.3		12.9	12.9		17.8	17.8		11.9	17.8	
Total Split (s)	36.3	36.3		13.0	13.0		63.8	63.8		11.9	75.7	
Total Split (%)	29.0%	29.0%		10.4%	10.4%		51.0%	51.0%		9.5%	60.6%	
Maximum Green (s)	31.0	31.0		7.1	7.1		58.0	58.0		7.0	69.9	
Yellow Time (s)	3.7	3.7		3.1	3.1		4.5	4.5		3.0	4.5	
All-Red Time (s)	1.6	1.6		2.8	2.8		1.3	1.3		1.9	1.3	
Lost Time Adjust (s)		-0.3		-0.9	-0.9		-0.8	-0.8		0.1	-0.8	
Total Lost Time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag		Lead	Lead		Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes		
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	3.0		2.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	7.0	7.0										
Flash Dont Walk (s)	24.0	24.0										
Pedestrian Calls (#/hr)	0	0										
Act Effect Green (s)		7.5		8.0	8.0		94.7	94.7		98.9	101.9	
Actuated g/C Ratio		0.06		0.06	0.06		0.76	0.76		0.79	0.82	
v/c Ratio		0.19		1.08	1.07		0.05	0.50		0.08	0.82	
Control Delay		60.3		165.5	164.9		9.3	8.3		3.9	11.0	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		60.3		165.5	164.9		9.3	8.3		3.9	11.0	
LOS		E		F	F		A	A		A	B	
Approach Delay		60.3			165.2			8.3			11.0	
Approach LOS		E			F			A			B	
Queue Length 50th (ft)		15		~105	~101		1	178		2	307	
Queue Length 95th (ft)		40		#233	#226		5	337		11	792	
Internal Link Dist (ft)		275			638			446			1526	
Turn Bay Length (ft)				125			150			175		
Base Capacity (vph)		419		103	100		65	2574		300	2853	
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		0.05		1.08	1.07		0.05	0.50		0.08	0.82	

Intersection Summary

Area Type: Other

Cycle Length: 125

Actuated Cycle Length: 125

Offset: 90 (72%), Referenced to phase 2:NBSB and 6:SBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.08

Intersection Signal Delay: 19.0

Intersection LOS: B

Intersection Capacity Utilization 78.5%

ICU Level of Service D

Analysis Period (min) 15

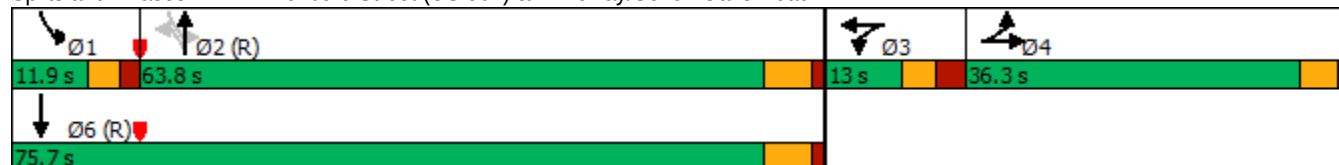
~ Volume exceeds capacity, queue is theoretically infinite.

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: 4: N Roxboro Street (US 501) & Driveway/Seven Oaks Road



Westpoint Residential TIA
5: N Roxboro Street (US 501) & Future Site Access #1

Build (2023) with Improvements AM

06/26/2019

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	17	42	13	1134	2267	5
Future Volume (vph)	17	42	13	1134	2267	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	150	150			0
Storage Lanes	1	1	1			0
Taper Length (ft)	100		100			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Flt		0.850				
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	1583	1770	3406	3505	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1770	1583	1770	3406	3505	0
Link Speed (mph)	25			45	45	
Link Distance (ft)	714			1529	526	
Travel Time (s)	19.5			23.2	8.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	6%	3%	2%
Adj. Flow (vph)	19	47	14	1260	2519	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	19	47	14	1260	2525	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 72.8%

ICU Level of Service C

Analysis Period (min) 15

Westpoint Residential TIA
5: N Roxboro Street (US 501) & Future Site Access #1

Build (2023) with Improvements AM

06/26/2019

Intersection

Int Delay, s/veh 9.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
----------	-----	-----	-----	-----	-----	-----

Lane Configurations						
Traffic Vol, veh/h	17	42	13	1134	2267	5
Future Vol, veh/h	17	42	13	1134	2267	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	150	150	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	6	3	2
Mvmt Flow	19	47	14	1260	2519	6

Major/Minor	Minor2	Major1	Major2
-------------	--------	--------	--------

Conflicting Flow All	3180	1263	2525	0	-	0
Stage 1	2522	-	-	-	-	-
Stage 2	658	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	~ 8	161	175	-	-	-
Stage 1	46	-	-	-	-	-
Stage 2	477	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 7	161	175	-	-	-
Mov Cap-2 Maneuver	~ 7	-	-	-	-	-
Stage 1	42	-	-	-	-	-
Stage 2	477	-	-	-	-	-

Approach	EB	NB	SB
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HCM Control Delay, s	538.4	0.3	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
-----------------------	-----	-----	-------	-------	-----	-----

Capacity (veh/h)	175	-	7	161	-	-
HCM Lane V/C Ratio	0.083	-	2.698	0.29	-	-
HCM Control Delay (s)	27.4	\$	1779.2	36.2	-	-
HCM Lane LOS	D	-	F	E	-	-
HCM 95th %tile Q(veh)	0.3	-	3.5	1.1	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Westpoint Residential TIA
1: Guess Road (NC 157) & Horton Road

Build (2023) with Improvements PM

06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 			 				 			 	
Traffic Volume (vph)	572	241	63	222	184	213	143	1239	190	203	711	139
Future Volume (vph)	572	241	63	222	184	213	143	1239	190	203	711	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		125	225		0	375		125	325		50
Storage Lanes	1		1	2		0	1		1	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.969			0.919				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3502	1791	0	3467	1711	0	1805	3574	1553	1736	3574	1583
Flt Permitted	0.950			0.950			0.207			0.077		
Satd. Flow (perm)	3502	1791	0	3467	1711	0	393	3574	1553	141	3574	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		728			786			2115			2616	
Travel Time (s)		14.2			15.3			36.1			44.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	3%	2%	1%	1%	3%	0%	1%	4%	4%	1%	2%
Adj. Flow (vph)	636	268	70	247	204	237	159	1377	211	226	790	154
Shared Lane Traffic (%)												
Lane Group Flow (vph)	636	338	0	247	441	0	159	1377	211	226	790	154
Turn Type	Prot	NA		Prot	NA		pm+pt	NA	pm+ov	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases							2		2	6		6
Detector Phase	7	4		3	8		5	2	3	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	10.0	7.0	7.0	10.0	10.0
Minimum Split (s)	13.4	34.4		12.9	37.7		13.1	32.1	12.9	12.5	33.7	33.7
Total Split (s)	28.0	46.2		19.8	38.0		19.2	57.0	19.8	17.0	54.8	54.8
Total Split (%)	20.0%	33.0%		14.1%	27.1%		13.7%	40.7%	14.1%	12.1%	39.1%	39.1%
Maximum Green (s)	21.6	39.8		13.9	32.3		13.1	50.9	13.9	11.5	49.1	49.1
Yellow Time (s)	3.3	4.1		3.0	3.4		3.3	4.0	3.0	3.1	3.7	3.7
All-Red Time (s)	3.1	2.3		2.9	2.3		2.8	2.1	2.9	2.4	2.0	2.0
Lost Time Adjust (s)	-1.4	-1.4		-0.9	-0.7		-1.1	-1.1	-0.9	-0.5	-0.7	-0.7
Total Lost Time (s)	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	Lag		Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Recall Mode	None	None		None	None		None	C-Max	None	None	C-Max	C-Max
Walk Time (s)		7.0			7.0			7.0			7.0	7.0
Flash Dont Walk (s)		21.0			25.0			19.0			21.0	21.0
Pedestrian Calls (#/hr)		0			0			0			0	0
Act Effect Green (s)	23.0	42.2		13.8	33.0		64.0	52.0	70.8	64.0	52.0	52.0
Actuated g/C Ratio	0.16	0.30		0.10	0.24		0.46	0.37	0.51	0.46	0.37	0.37
v/c Ratio	1.11	0.63		0.72	1.09		0.53	1.04	0.27	1.12	0.60	0.26
Control Delay	122.7	48.5		73.8	121.8		26.6	77.8	20.7	136.7	38.2	32.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

Westpoint Residential TIA
1: Guess Road (NC 157) & Horton Road

Build (2023) with Improvements PM

06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	122.7	48.5		73.8	121.8		26.6	77.8	20.7	136.7	38.2	32.8
LOS	F	D		E	F		C	E	C	F	D	C
Approach Delay		97.0			104.6			66.2			56.5	
Approach LOS		F			F			E			E	
Queue Length 50th (ft)	~339	268		113	~452		79	~709	106	~188	305	98
Queue Length 95th (ft)	#460	378		160	#666		124	#849	160	#364	382	159
Internal Link Dist (ft)		648			706			2035			2536	
Turn Bay Length (ft)	200			225			375		125	325		50
Base Capacity (vph)	575	540		366	403		329	1327	796	201	1326	587
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	1.11	0.63		0.67	1.09		0.48	1.04	0.27	1.12	0.60	0.26

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 140

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.12

Intersection Signal Delay: 76.1

Intersection LOS: E

Intersection Capacity Utilization 101.2%

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.

Splits and Phases: 1: Guess Road (NC 157) & Horton Road

 Ø1	 Ø2 (R)	 Ø3	 Ø4
17 s	57 s	19.8 s	46.2 s
 Ø5	 Ø6 (R)	 Ø7	 Ø8
19.2 s	54.8 s	28 s	38 s

Westpoint Residential TIA
2: Stadium Drive & Horton Road

Build (2023) with Improvements PM

06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	137	488	96	26	497	69	108	35	44	42	25	88
Future Volume (vph)	137	488	96	26	497	69	108	35	44	42	25	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	100		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
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
Frt		0.975			0.982			0.916			0.883	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1802	0	1719	1850	0	1752	1703	0	1687	1652	0
Flt Permitted	0.379			0.368			0.612			0.700		
Satd. Flow (perm)	699	1802	0	666	1850	0	1129	1703	0	1243	1652	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		2452			1495			1126			1263	
Travel Time (s)		47.8			29.1			25.6			28.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	2%	7%	5%	1%	0%	3%	5%	0%	7%	0%	2%
Adj. Flow (vph)	152	542	107	29	552	77	120	39	49	47	28	98
Shared Lane Traffic (%)												
Lane Group Flow (vph)	152	649	0	29	629	0	120	88	0	47	126	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	15.2	15.2		15.2	15.2		12.5	12.5		12.5	12.5	
Total Split (s)	71.0	71.0		71.0	71.0		29.0	29.0		29.0	29.0	
Total Split (%)	71.0%	71.0%		71.0%	71.0%		29.0%	29.0%		29.0%	29.0%	
Maximum Green (s)	65.8	65.8		65.8	65.8		23.5	23.5		23.5	23.5	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.6	3.6		3.6	3.6	
All-Red Time (s)	1.2	1.2		1.2	1.2		1.9	1.9		1.9	1.9	
Lost Time Adjust (s)	-0.2	-0.2		-0.2	-0.2		-0.5	-0.5		-0.5	-0.5	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Act Effect Green (s)	75.2	75.2		75.2	75.2		14.8	14.8		14.8	14.8	
Actuated g/C Ratio	0.75	0.75		0.75	0.75		0.15	0.15		0.15	0.15	
v/c Ratio	0.29	0.48		0.06	0.45		0.72	0.35		0.26	0.52	
Control Delay	6.5	7.0		4.7	6.6		63.2	40.4		39.0	45.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	6.5	7.0		4.7	6.6		63.2	40.4		39.0	45.7	
LOS	A	A		A	A		E	D		D	D	
Approach Delay		6.9			6.5			53.6			43.9	

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		A			A			D			D	
Queue Length 50th (ft)	25	133		4	125		74	51		27	75	
Queue Length 95th (ft)	68	262		15	245		126	91		57	123	
Internal Link Dist (ft)		2372			1415			1046			1183	
Turn Bay Length (ft)	100			100			100			100		
Base Capacity (vph)	525	1355		501	1391		270	408		298	396	
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	0.29	0.48		0.06	0.45		0.44	0.22		0.16	0.32	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 50

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.72

Intersection Signal Delay: 15.5

Intersection Capacity Utilization 65.0%

Analysis Period (min) 15

Intersection LOS: B

ICU Level of Service C

Splits and Phases: 2: Stadium Drive & Horton Road



Westpoint Residential TIA
3: N Duke Street (US 501) & Horton Road

Build (2023) with Improvements PM

06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	134	326	160	158	357	37	270	1490	114	53	825	133
Future Volume (vph)	134	326	160	158	357	37	270	1490	114	53	825	133
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		200	0		0	250		0	100		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.986			0.989			0.979	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1845	1568	1770	1857	0	1770	3527	0	1805	3436	0
Flt Permitted	0.139			0.254			0.094			0.106		
Satd. Flow (perm)	259	1845	1568	473	1857	0	175	3527	0	201	3436	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			40			40	
Link Distance (ft)		1974			505			1329			2255	
Travel Time (s)		38.5			9.8			22.7			38.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	3%	3%	2%	1%	0%	2%	1%	4%	0%	3%	2%
Adj. Flow (vph)	149	362	178	176	397	41	300	1656	127	59	917	148
Shared Lane Traffic (%)												
Lane Group Flow (vph)	149	362	178	176	438	0	300	1783	0	59	1065	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Detector Phase	7	4	5	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	12.0		7.0	12.0	
Minimum Split (s)	13.0	35.0	12.2	12.6	33.7		12.2	32.9		12.0	31.8	
Total Split (s)	13.0	35.0	20.4	12.6	34.6		20.4	50.4		12.0	42.0	
Total Split (%)	11.8%	31.8%	18.5%	11.5%	31.5%		18.5%	45.8%		10.9%	38.2%	
Maximum Green (s)	7.0	29.0	15.2	7.0	28.9		15.2	44.5		7.0	36.2	
Yellow Time (s)	3.1	3.8	3.2	3.2	3.9		3.2	4.2		3.2	4.2	
All-Red Time (s)	2.9	2.2	2.0	2.4	1.8		2.0	1.7		1.8	1.6	
Lost Time Adjust (s)	-1.0	-1.0	-0.2	-0.6	-0.7		-0.2	-0.9		0.0	-0.8	
Total Lost Time (s)	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	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		22.0			21.0			20.0			19.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effect Green (s)	36.7	28.7	49.0	35.9	28.3		58.7	49.1		45.4	38.4	
Actuated g/C Ratio	0.33	0.26	0.45	0.33	0.26		0.53	0.45		0.41	0.35	
v/c Ratio	0.76	0.75	0.26	0.72	0.92		0.95	1.13		0.32	0.89	
Control Delay	49.6	48.1	19.8	43.4	65.3		69.7	99.0		19.1	44.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	

Westpoint Residential TIA
3: N Duke Street (US 501) & Horton Road

Build (2023) with Improvements PM

06/26/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	49.6	48.1	19.8	43.4	65.3		69.7	99.0		19.1	44.7	
LOS	D	D	B	D	E		E	F		B	D	
Approach Delay		41.1			59.0			94.7			43.4	
Approach LOS		D			E			F			D	
Queue Length 50th (ft)	69	232	75	83	296		161	~817		20	377	
Queue Length 95th (ft)	#149	340	124	#154	#475		#334	#956		41	#509	
Internal Link Dist (ft)		1894			425			1249			2175	
Turn Bay Length (ft)	150		200				250			100		
Base Capacity (vph)	196	503	701	243	499		318	1574		185	1199	
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	0.76	0.72	0.25	0.72	0.88		0.94	1.13		0.32	0.89	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 71 (65%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 135

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.13

Intersection Signal Delay: 68.9

Intersection LOS: E

Intersection Capacity Utilization 95.8%

ICU Level of Service F

Analysis Period (min) 15

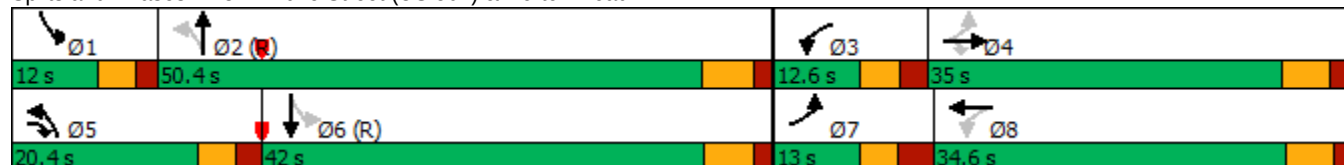
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 3: N Duke Street (US 501) & Horton Road



												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	2	10	212	1	63	10	1932	70	48	1230	5
Future Volume (vph)	2	2	10	212	1	63	10	1932	70	48	1230	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	125		0	150		0	175		0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.901			0.930			0.995			0.999	
Flt Protected		0.993		0.950	0.974		0.950			0.950		
Satd. Flow (prot)	0	1700	0	1603	1563	0	1805	3520	0	1719	3468	0
Flt Permitted		0.993		0.950	0.974		0.188			0.037		
Satd. Flow (perm)	0	1700	0	1603	1563	0	357	3520	0	67	3468	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			35			45			45	
Link Distance (ft)		355			718			526			1606	
Travel Time (s)		9.7			14.0			8.0			24.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	0%	7%	0%	2%	0%	2%	3%	5%	4%	0%
Adj. Flow (vph)	2	2	11	236	1	70	11	2147	78	53	1367	6
Shared Lane Traffic (%)				33%								
Lane Group Flow (vph)	0	15	0	158	149	0	11	2225	0	53	1373	0
Turn Type	Split	NA		Split	NA		Perm	NA		D.P+P	NA	
Protected Phases	4	4		3	3			2		1	6	
Permitted Phases							2			2		
Detector Phase	4	4		3	3		2	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		12.0	12.0		7.0	12.0	
Minimum Split (s)	36.3	36.3		12.9	12.9		17.8	17.8		11.9	17.8	
Total Split (s)	36.3	36.3		18.0	18.0		83.8	83.8		11.9	95.7	
Total Split (%)	24.2%	24.2%		12.0%	12.0%		55.9%	55.9%		7.9%	63.8%	
Maximum Green (s)	31.0	31.0		12.1	12.1		78.0	78.0		7.0	89.9	
Yellow Time (s)	3.7	3.7		3.1	3.1		4.5	4.5		3.0	4.5	
All-Red Time (s)	1.6	1.6		2.8	2.8		1.3	1.3		1.9	1.3	
Lost Time Adjust (s)		-0.3		-0.9	-0.9		-0.8	-0.8		0.1	-0.8	
Total Lost Time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag		Lead	Lead		Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes		
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	3.0		2.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max		None	C-Max	
Walk Time (s)	7.0	7.0										
Flash Dont Walk (s)	24.0	24.0										
Pedestrian Calls (#/hr)	0	0										
Act Effect Green (s)		7.5		13.0	13.0		112.0	112.0		117.9	121.9	
Actuated g/C Ratio		0.05		0.09	0.09		0.75	0.75		0.79	0.81	
v/c Ratio		0.18		1.14	1.10		0.04	0.85		0.40	0.49	
Control Delay		73.2		178.7	168.1		8.0	19.3		23.9	5.6	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		73.2		178.7	168.1		8.0	19.3		23.9	5.6	
LOS		E		F	F		A	B		C	A	
Approach Delay		73.2			173.6			19.2			6.3	
Approach LOS		E			F			B			A	
Queue Length 50th (ft)		14		~189	~173		2	639		6	141	
Queue Length 95th (ft)		40		#349	#329		11	1127		51	293	
Internal Link Dist (ft)		275			638			446			1526	
Turn Bay Length (ft)				125			150			175		
Base Capacity (vph)		354		138	135		266	2629		132	2818	
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		0.04		1.14	1.10		0.04	0.85		0.40	0.49	

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:NBSB and 6:SBT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.14

Intersection Signal Delay: 26.7

Intersection LOS: C

Intersection Capacity Utilization 78.5%

ICU Level of Service D

Analysis Period (min) 15

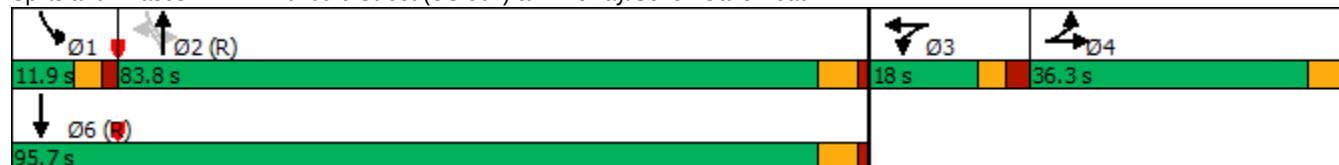
~ Volume exceeds capacity, queue is theoretically infinite.

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: 4: N Roxboro Street (US 501) & Driveway/Seven Oaks Road



Westpoint Residential TIA
5: N Roxboro Street (US 501) & Future Site Access #1

Build (2023) with Improvements PM

06/26/2019

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	10	25	42	2002	1435	17
Future Volume (vph)	10	25	42	2002	1435	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	150	150			0
Storage Lanes	1	1	1			0
Taper Length (ft)	100		100			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Frt		0.850			0.998	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	1583	1770	3539	3465	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1770	1583	1770	3539	3465	0
Link Speed (mph)	25			45	45	
Link Distance (ft)	714			1529	526	
Travel Time (s)	19.5			23.2	8.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	4%	2%
Adj. Flow (vph)	11	28	47	2224	1594	19
Shared Lane Traffic (%)						
Lane Group Flow (vph)	11	28	47	2224	1613	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 65.3%

ICU Level of Service C

Analysis Period (min) 15

Westpoint Residential TIA
5: N Roxboro Street (US 501) & Future Site Access #1

Build (2023) with Improvements PM

06/26/2019

Intersection

Int Delay, s/veh 2.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	25	42	2002	1435	17
Future Vol, veh/h	10	25	42	2002	1435	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	150	150	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	4	2
Mvmt Flow	11	28	47	2224	1594	19

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	2810	807	1613
Stage 1	1604	-	-
Stage 2	1206	-	-
Critical Hdwy	6.84	6.94	4.14
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	2.22
Pot Cap-1 Maneuver	14	324	400
Stage 1	150	-	-
Stage 2	246	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	12	324	400
Mov Cap-2 Maneuver	12	-	-
Stage 1	132	-	-
Stage 2	246	-	-

Approach	EB	NB	SB
HCM Control Delay, s	195.8	0.3	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	400	-	12	324	-	-
HCM Lane V/C Ratio	0.117	-	0.926	0.086	-	-
HCM Control Delay (s)	15.2	-	642.3	17.2	-	-
HCM Lane LOS	C	-	F	C	-	-
HCM 95th %tile Q(veh)	0.4	-	2	0.3	-	-

Appendix D:

Memorandum of Understanding



Memorandum

To: Preston Royster, PE
Coulter Jewell Thames, PA
111 West Main Street
Durham, NC 27701

Date: December 19, 2018

Project #: 82965.18

From: Lyle Overcash, PE
Managing Director, Raleigh Office

Re: Westpoint Residential Traffic Impact Analysis
Memorandum of Understanding

This memorandum summarizes the assumptions for a Traffic Impact Analysis (TIA) prepared for the proposed development consisting of approximately 170 single-family homes and 210 townhomes located west of N. Roxboro Street (US 501) in Durham, North Carolina (MOU-1).

Based on the preliminary plan (MOU-2 attached), the proposed development is to consist of the following uses:

- 170 Single-Family Dwelling Units
- 210 Townhome Dwelling Units

In addition, the development will be accessed through the following new connections:

- Access #1, full movement access on N. Roxboro Street (US 501), approximately 500 feet south of Seven Oaks Road.
- Access #2, full movement access via the extension of existing Stadium Drive.

In accordance with the City of Durham standards, a build-out year of 2023 (Build Year 2022 + 1) will be analyzed.

Study Area

Based on the preliminary site plan and VHB's familiarity with the area, the following intersections will be analyzed for the weekday AM and PM peak hour conditions for all scenarios:

Existing and Future

- Horton Road and Guess Road (NC 157) (signalized)
- Horton Road and Duke Street (US 501) (signalized)
- N. Roxboro Street (US 501) and Seven Oaks Road (signalized)
- N. Roxboro Street (US 501) and Future Access #1 (unsignalized)
- Horton Road and Stadium Drive/Future Access #2 (signalized)

Data Collection

Turning movement data at all study intersections was collected by VHB. All traffic data will be collected December 18, 2018 during the weekday AM (7:00 AM – 9:00 AM) and weekday PM (4:00 PM – 6:00 PM) peak periods while area schools are in session.

Analysis Scenarios

Based on the City of Durham requirements, weekday AM and PM peak hour analysis for the proposed development will be performed for four (4) scenarios:

- Existing (2018) Conditions
- No-Build (2023) Conditions – includes Existing (2018) scenario peak hour volumes with an annual growth between the existing (2018) and future analysis year (Build Year 2022 + 1 = 2023), and site trips generated by approved developments in the study area
- Build (2023) Conditions
- Build (2023) Conditions – With Improvements (if necessary)

Background Growth

As required by NCDOT and the City of Durham, a 3% annual background traffic growth rate will be applied to the existing (2018) year traffic to project future conditions (2023).

Any geometric and traffic control improvements associated with the background developments will be included in the future year analysis, if applicable to the study area.

Trip Generation

Based on the preliminary plan enclosed in the application package, the proposed development is to consist of the following uses:

- 170 Single-Family Dwelling Units
- 210 Townhome Dwelling Units

Trip Generation will be conducted based on the most appropriate corresponding trip generation codes included in the *ITE Trip Generation Manual, 10th Edition*, and will be based on the suggested method in the NCDOT's "Rate vs. Equation" spreadsheet. To provide a conservative analysis, no transit, walking, or bicycling reductions will be applied.

Land Use Code ¹	Land Use	Unit	ADT	AM Peak Hour			PM Peak Hour		
				Enter	Exit	Total	Enter	Exit	Total
Total Site Trips (including Internal Trips between Mixed Uses and Pass-By Trips for Commercial Uses) ²									
210	Single-Family Detached Housing	170 du	1,694	32	94	126	106	63	169
220	Multifamily Housing (Low-Rise)	210 du	1,547	22	75	97	72	42	114
Development Total			3,241	54	169	223	178	105	283

Notes:

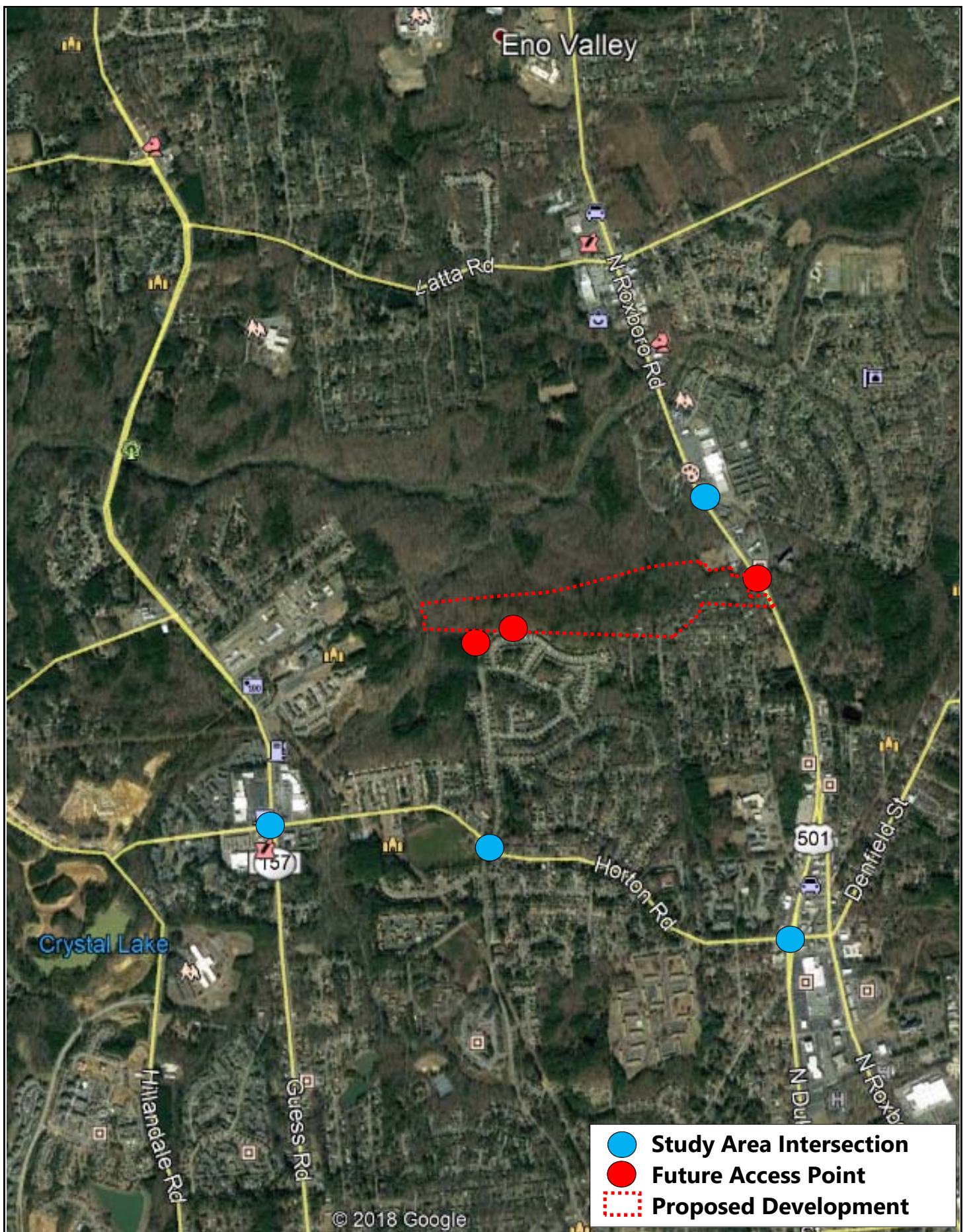
1. Land Use Code and trip generation rates are determined based on *ITE Trip Generation, 10th Edition*
2. Total site trips are determined based on the suggested method in the NCDOT Rate Vs Equation Spreadsheet

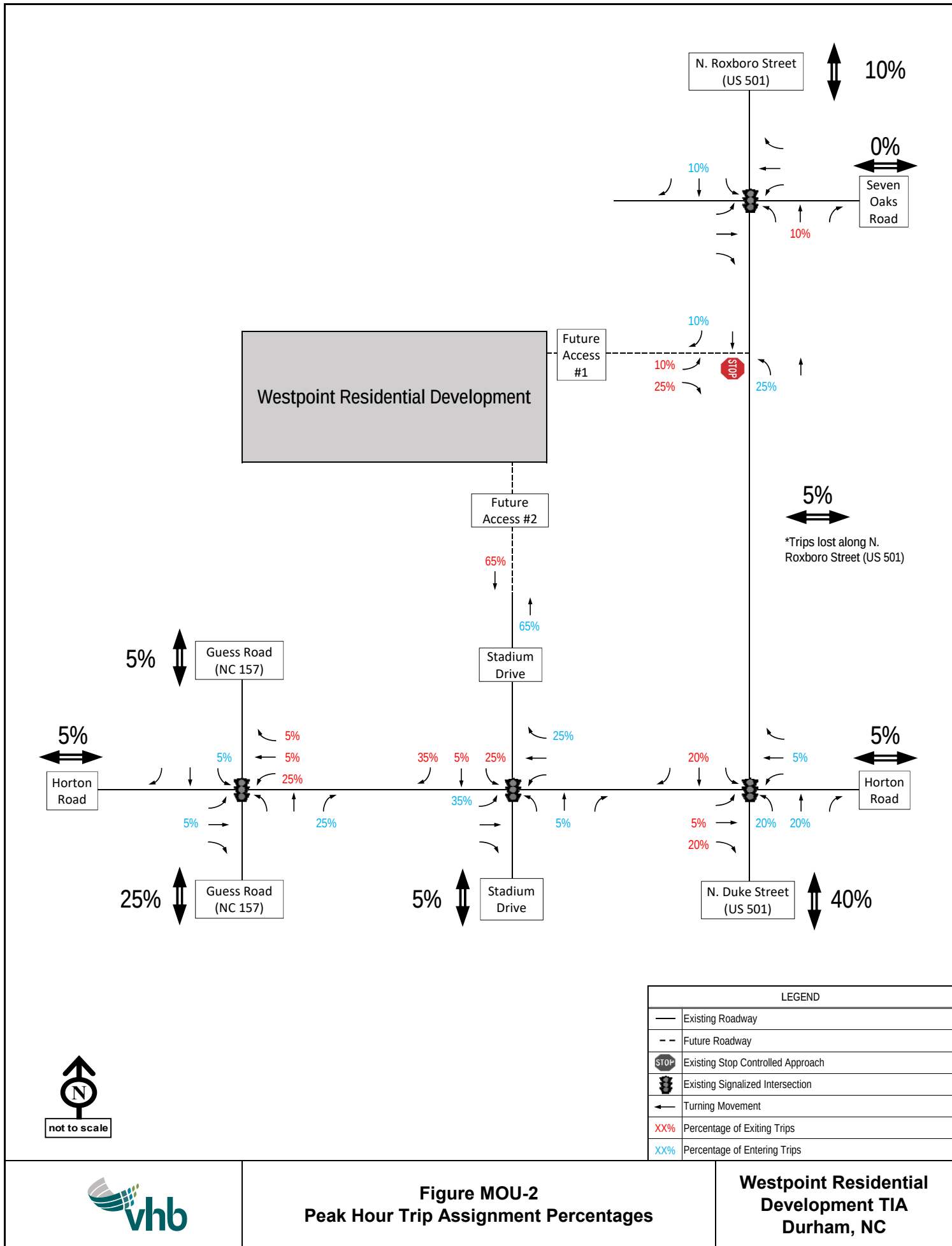
Trip Distribution and Assignment

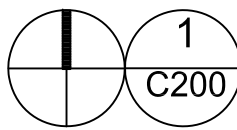
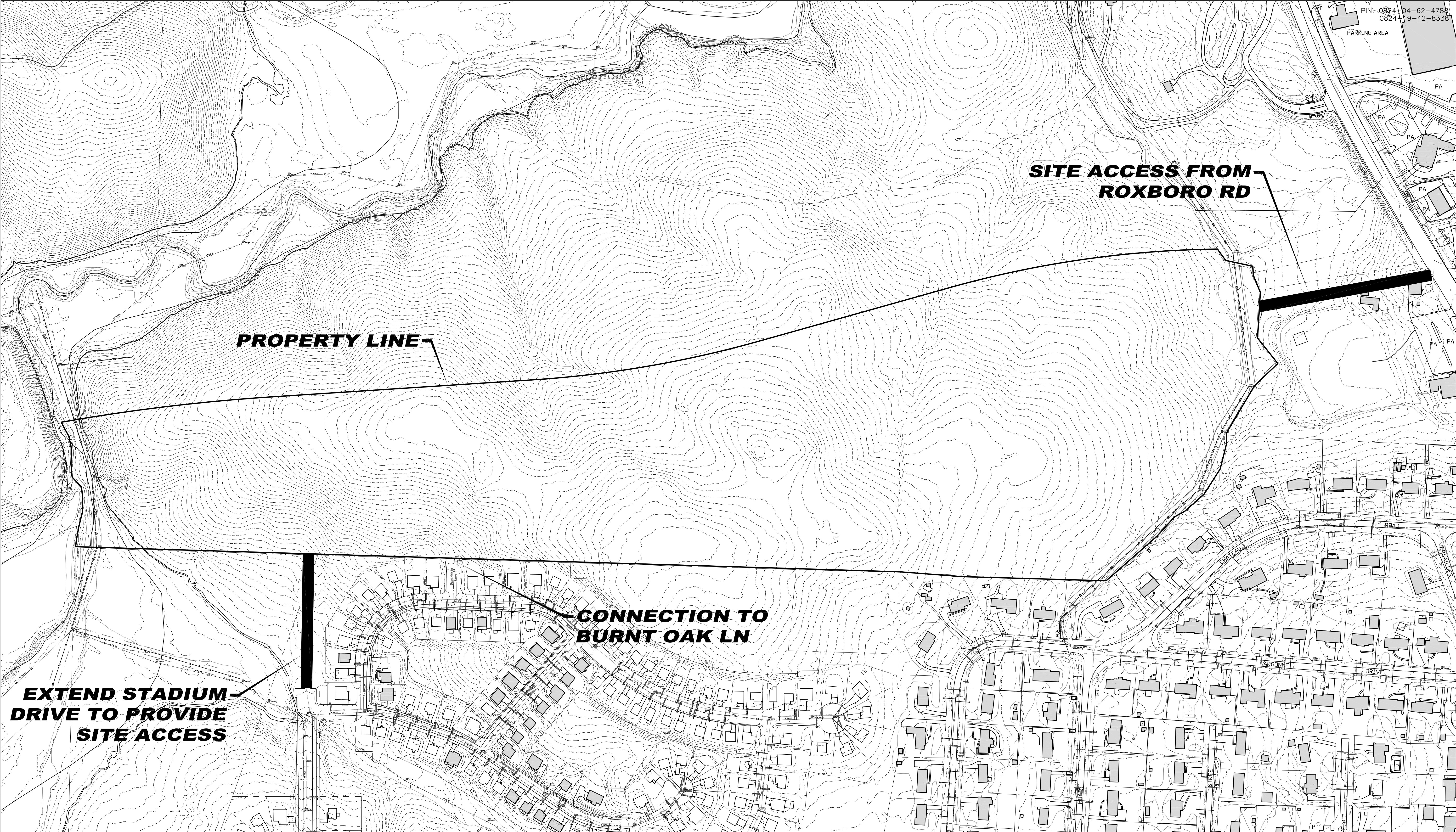
The generated site trips will be distributed in accordance with the existing traffic patterns and land uses in the vicinity of the study area. The non-pass-by site trips will be distributed as follows:

- from/to the north via N. Roxboro Street (US 501) – 10%
- from/to the south via Duke Street (US 501) – 40%
- from/to the east via Horton Road – 5%
- from/to the west via Horton Road – 5%
- from/to the north via Guess Road (NC 157) – 5%
- from/to the south via Guess Road (NC 157) – 25%
- from/to the south via Stadium Drive – 5%
- trips lost along N. Roxboro Street – 5%

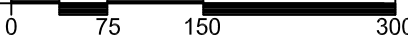
Site trips will be distributed among site accesses based on the specific land use areas, existing traffic distributions, and traffic assignment will be conducted separately.







CONCEPT PLAN
1" = 150'-0"





**Coulter
Jewell
Thames**P.A.

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Durham, N.C. 27701
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N.C. BOARD OF EXAMINERS FOR ENGINEERS & SURVEYORS
PIN: 0824-04-62-4788
0824-19-42-8338

Project:

5001 North
Roxboro St.

Durham County,
North Carolina

PRELIMINARY-DO NOT USE FOR CONSTRUCTION	
Job Number: 1801	
Drawn	DAJ, PBR, MTC
Checked	DAJ, PBR
Date	12-14-18
Revisions	
Concept Plan	

Sheet Title:

**CONCEPT
PLAN**

Sheet Number
C200

				SB				
			(60)	(675)	(65)			
			57	1406	87			
	(228)	94				53	(53)	
EB	(126)	108		Count (2012)		106	(106)	WB
	(63)	179				273	(146)	
			59	638	37			
			(105)	(1298)	(206)			
				NB				
				SB				
			0%	10%	0%			
		0%				0%		
EB		0%	Trip Assignment Percentages			0%		WB
		0%				0%		
			0%	10%	0%			
				NB				
				SB				
			(0)	(18)	(0)			
			0	5	0			
	(0)	0				0	(0)	
EB	(0)	0	Total Site Trips			0	(0)	WB
	(0)	0				0	(0)	
			0	17	0			
			(0)	(11)	(0)			
				NB				
				SB				
			0.0%	2.7%	0.0%			
			0	0.4%	0.0%			
	0.0%	0.0%				0.0%	0.0%	
EB	0.0%	0.0%	Percentage of Movement			0.0%	0.0%	WB
	0.0%	0.0%				0.0%	0.0%	
			0.0%	2.7%	0.0%			
			0.0%	0.8%	0.0%			
				NB				



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