KIMLEY-HORN AND ASSOCIATES, INC
NC License #F-0102

12/18/2024

MEMORANDUM

To:	Bill Judge, P.E. – City of Durham John Sandor, P.E. – NCDOT
From:	Earl Lewellyn, P.E. – Kimley-Horn and Associates, Inc.
Date:	December 18, 2024
Subject:	Massey Chapel Road Realignment – Traffic Memo

This analysis is prepared in conjunction with a request to modify the Durham CTP with an alternate alignment for Massey Chapel Road Realignment.

Background

The Durham - Chapel Hill - Carrboro Comprehensive Transportation Plan (DCHC CTP) proposes to realign the eastern leg of Massey Chapel Road southward, creating a four-leg intersection with Fayetteville Road and the existing western leg of Massey Chapel Road. Recognizing that this CTP alignment results in impacts to: environmental features, the existing Children's Campus preschool, and multiple existing single-family residents, this study considers an alternate alignment for relocating the eastern leg of Massey Chapel, generally using the existing James Ross Drive alignment.

Study Area

Per discussion with City and NCDOT staff, the following intersections were included in this study:

- Fayetteville Road – Kentington Drive
- Fayetteville Road – Massey Chapel Road *realigned* (existing James Ross Drive)
- Fayetteville Road – Massey Chapel Road/Children's Campus Driveway
- Massey Chapel Road – Massey Chapel Road *realigned* (existing James Ross Drive)/East Site Driveway
- Massey Chapel Road – West Site Driveway

Future Year Volumes

The Triangle Regional Model (TRM) was used to project future year (2050) volumes at both Fayetteville Road – Massey Chapel Road intersections. The TRM was modified to agree with the adopted CTP alignment as a means of accurately determining east-west through traffic demands on Massey Chapel Road. Resulting turning movement counts at this intersection were then reassigned to the study scenario with the two legs of Massey Chapel Road offset as shown in **Figure 1 and 2.** Additionally, peak hour turning movement counts were collected at the Fayetteville Road – Kentington Drive intersection. Turning movements to and from Kentington Drive were not grown to the 2050 study year, as that area is fully built out. Through volumes along Fayetteville Road at this intersection were balanced with TRM volumes at Fayetteville Road – Massey Chapel Road. Where projected volumes were less than 4 vehicles, a minimum volume of 4 was used to be conservative.

Exhibit A indicates properties that have been assembled to accommodate a proposed residential development. As part of this study, approximately 110 single-family units and 320 low-rise multifamily

units are assumed within this assemblage. This site is assumed to be accessed via one full-movement, western driveway along existing Massey Chapel Road and one full-movement, eastern driveway as the south leg of a roundabout at the Massey Chapel Road/James Ross Drive intersection. A future year of 2050 was studied.

Trip Generation

The trip generation potential of the assumed development was calculated based on data included in *Trip Generation* (Institute of Transportation Engineers, 11th Edition, 2021).

Table 1 below shows the trip generation potential of the land uses in this analysis.

Table 1
ITE Traffic Generation (Vehicles)

LUC	Land Use	Intensity	Daily	AM Peak Hour		PM Peak Hour	
				In	Out	In	Out
215	Single Family Attached	110 d.u.	788	13	39	37	25
220	Multifamily Housing (Low-Rise)	320 d.u.	2,128	29	93	100	58
Total Net New External Trips			**2,916**	**42**	**132**	**137**	**83**

Trip Distribution and Assignment

The above trip generation was assigned to the site driveways based on the following distribution:

East Site Driveway

- 75% to/from Fayetteville Road via Massey Chapel Road *realigned* (existing James Ross Drive)
- 5% to/from the east via Massey Chapel Road

West Site Driveway

- 15% to/from Fayetteville Road via Massey Chapel Road *realigned* (existing James Ross Drive)
- 5% to/from the east via Massey Chapel Road

The TRM model already assumes significant trips from the traffic analysis zone (TAZ) where the proposed development is located; therefore, generated trips were not assigned further than the site driveways. Additionally, in order to not double-count trips from the TAZ and the assumed site, volumes were removed from movements between Massey Chapel Road *realigned* (James Ross Drive) and Massey Chapel Road.

Figures 3 and 4 show the assumed site traffic assignment and the future year (2050) traffic volumes, respectively.

Capacity Analysis

Capacity analyses were performed using Synchro Version 11 and SIDRA Intersection 9.1 software. Synchro and SIDRA intersection level-of-service (LOS) reports for the 2050 Future Year Scenario are attached. Table 2 summarizes the levels-of-service at the study intersections.

Table 2 Level-of-Service Summary		
Condition	**AM Peak Hour LOS (Delay)**	**PM Peak Hour LOS (Delay)**
Fayetteville Road – Kentington Drive (Unsignalized)		
Future Year (2050) Traffic	EB – A (9.4) NBL – A (8.4)	EB – B (11.4) NBL – A (8.9)
Fayetteville Road – Massey Chapel Road *realigned* (Signalized)		
Future Year (2050) Traffic	A (8.6)	B (12.5)
Fayetteville Road – Massey Chapel Road/Children's Campus Driveway (Signalized)		
Future Year (2050) Traffic	B (10.7)	B (15.3)
Massey Chapel Road – Massey Chapel Road *realigned*/East Site Driveway (Roundabout)^		
Future Year (2050) Traffic	A (3.7) *Max v/c = 0.11*	A (4.3) *Max v/c = 0.24*
Massey Chapel Road – West Site Driveway (Unsignalized)		
Future Year (2050) Traffic	NB – A (8.4) WBL – A (7.2)	NB – A (8.4) WBL – A (7.3)

^Overall intersection LOS, delay, and maximum v/c ratio reported from SIDRA

With the east leg of Massey Chapel Road realigned to the existing James Ross Drive, all study intersections are expected to operate with acceptable LOS and queues in both peak hours in the 2050 study year. **Figure 5** shows the assumed future laneage at the study area intersections.

Summary

Based on the analyses, future total east-west traffic demands on Massey Chapel Road are relatively low (85 in the AM peak hour and 141 in the PM peak hour) thereby not necessitating alignment at Fayetteville Road to maintain acceptable operations. Additionally, delays and queues are acceptable at all study area intersections in the 2050 study year. Therefore, and in light of the conflicts and number of properties adversely impacted by the current CTP alignment, we recommend modifying the CTP to realign the eastern leg of Massey Chapel Road to use the current alignment of James Ross Road.

Should you have any questions or comments, please do not hesitate to contact me at (919) 653-5874 or earl.lewellyn@kimley-horn.com.

Sincerely,

Kimley-Horn and Associates, Inc.
NC License # F-0102

Earl Lewellyn, P.E.
Vice President

Attachments: Exhibit A, Figures 1-4, CTP Realignment, Triangle Regional Model Forecasts, Trip Generation Calculations, Volume Development Spreadsheets, Synchro/SIDRA Output, Signal Plans

Recommended CTP Modification for Massey Chapel Road Realignment

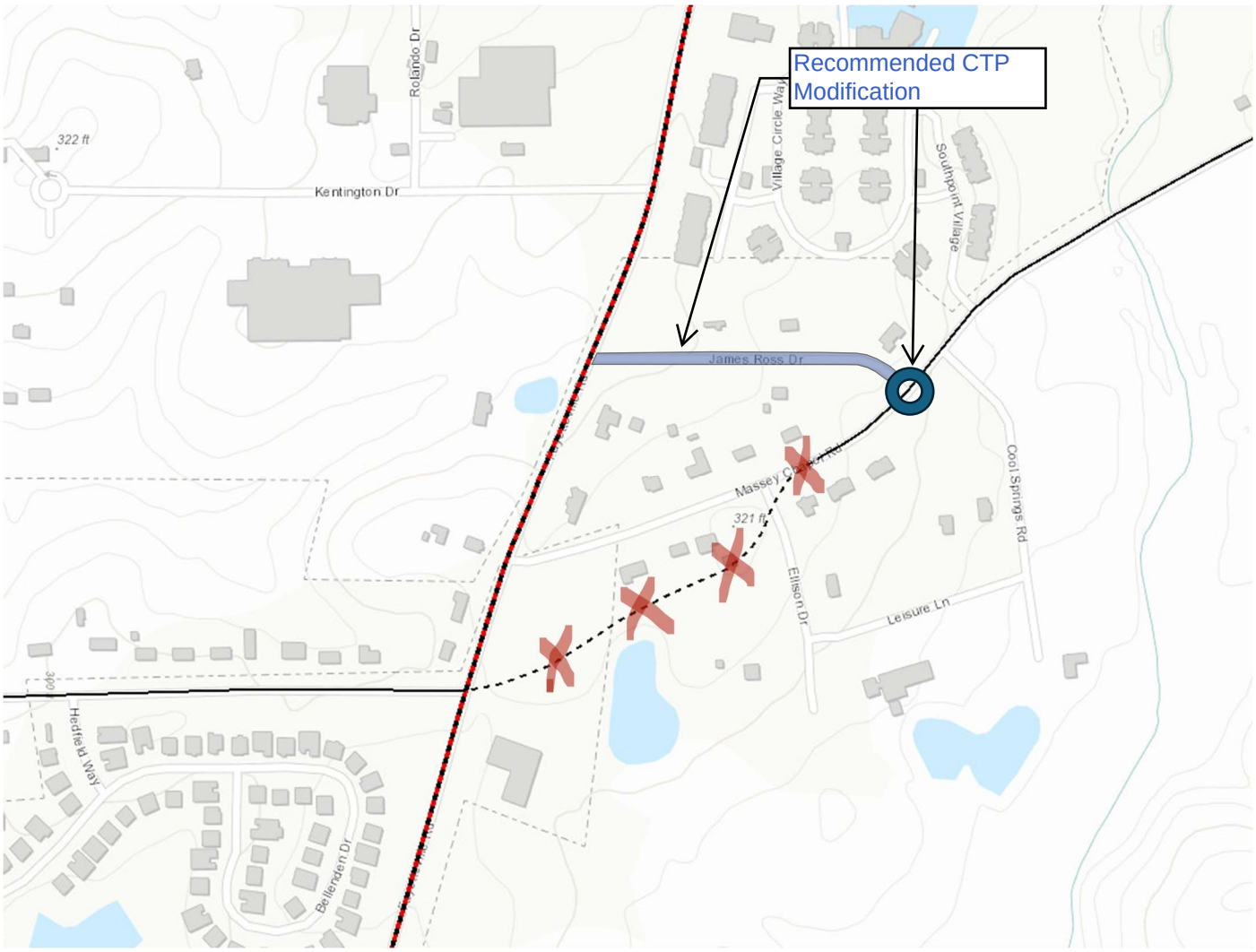
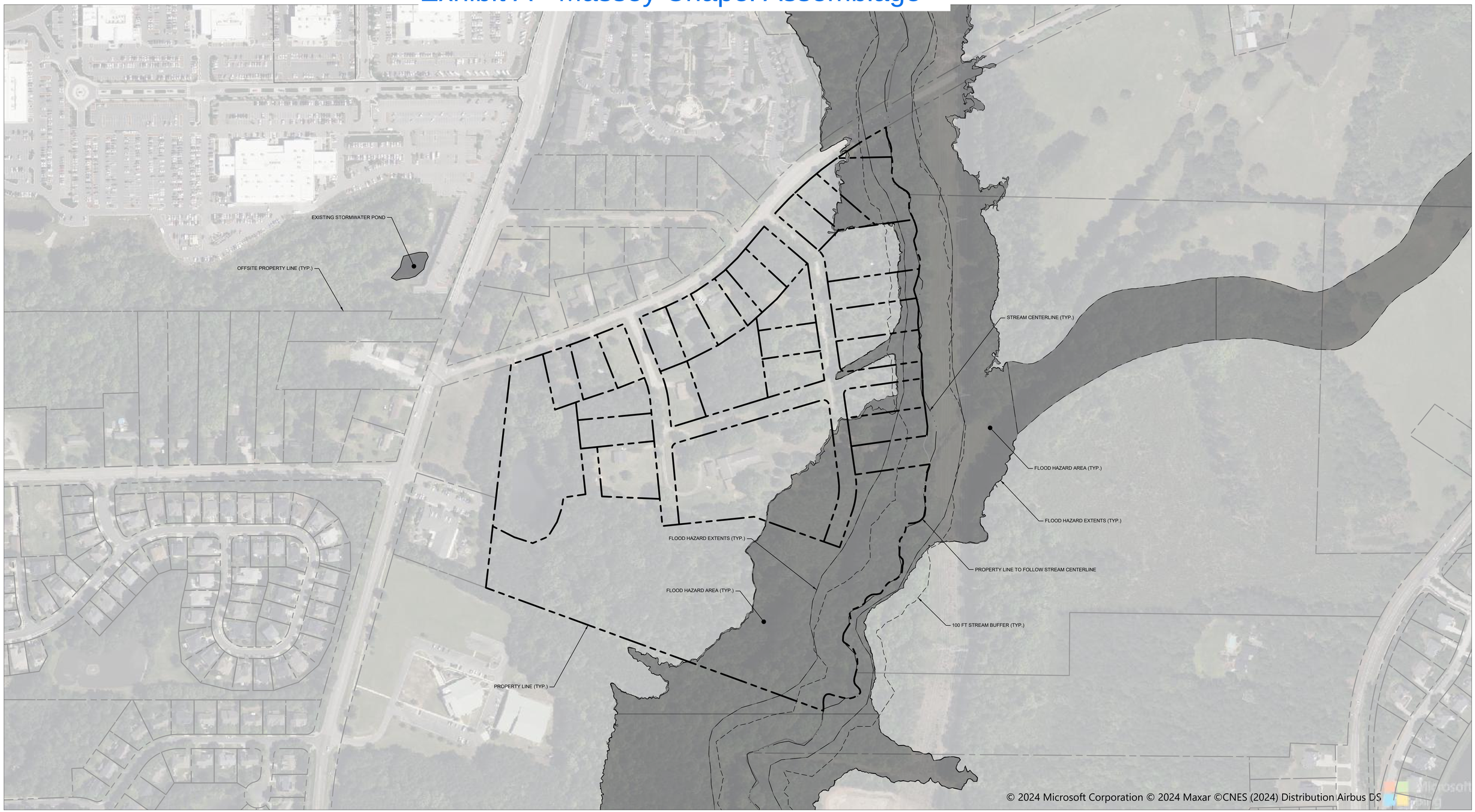


Exhibit A - Massey Chapel Assemblage



MASSEY CHAPEL BASE MAP EXHIBIT
DATE: 9/10/2024

NORTH

GRAPHIC SCALE IN FEET
0 75 150 300

Kimley»Horn
300 Morris Street, Suite 200
Durham, NC 27701
919-682-3583

NOTE: THIS PLAN IS CONCEPTUAL IN NATURE AND HAS BEEN PREPARED WITHOUT THE BENEFIT OF A SURVEY, TOPOGRAPHY, UTILITIES, CONTACT WITH THE CITY, ETC.

MASSEY CHAPEL RD ALIGNED WITH MASSEY CHAPEL RD

MASSEY CHAPEL RD ALIGNED AT EXISTING JAMES ROSS ROAD

FIGURE 1

MASSEY CHAPEL REALIGNMENT
DIVERSION ASSUMPTIONS

MASSEY CHAPEL ASSEMBLAGE
DURHAM, NC
TRAFFIC IMPACT ANALYSIS

Kimley»Horn

MASSEY CHAPEL RD ALIGNED AT EXISTING JAMES ROSS ROAD

MASSEY CHAPEL RD ALIGNED WITH MASSEY CHAPEL RD

FIGURE 2

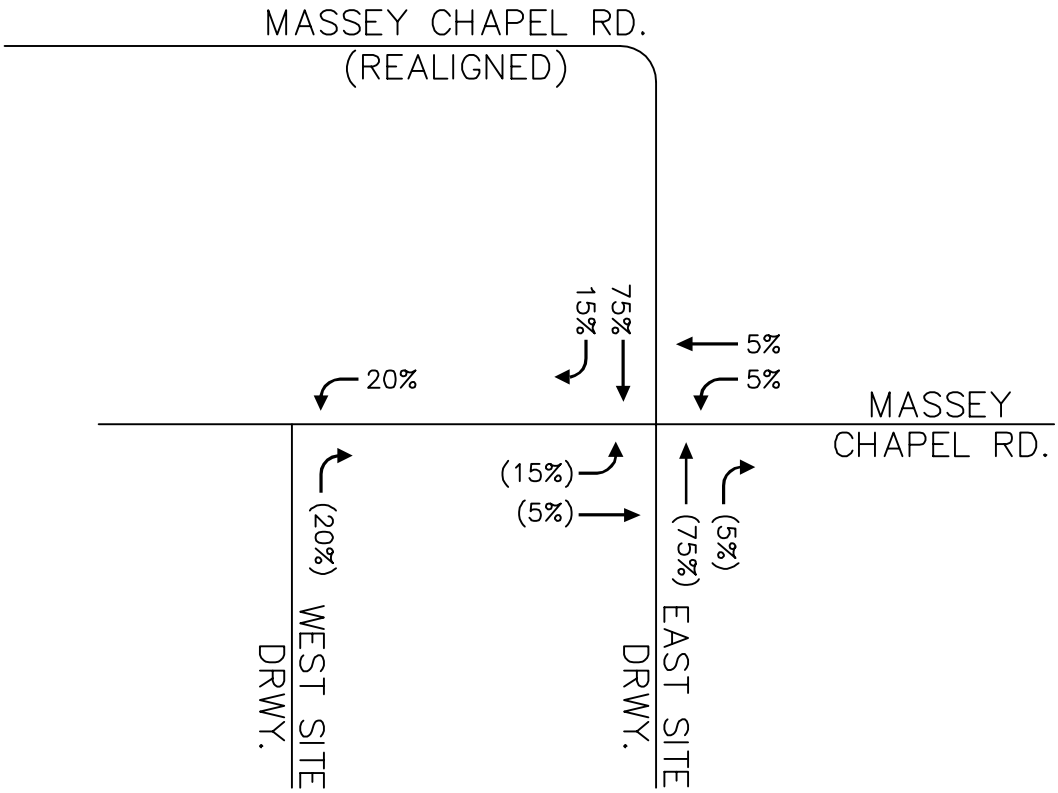
FUTURE YEAR (2050)
TRIANGLE REGIONAL MODEL VOLUMES

MASSEY CHAPEL ASSEMBLAGE
DURHAM, NC
TRAFFIC IMPACT ANALYSIS

Kimley»Horn

K:\DUR_LDEV\Massey Chapel - Patel\T5 - Report-Submittals\Massey Chapel Assemblage - Figures.dwg

NOT TO SCALE

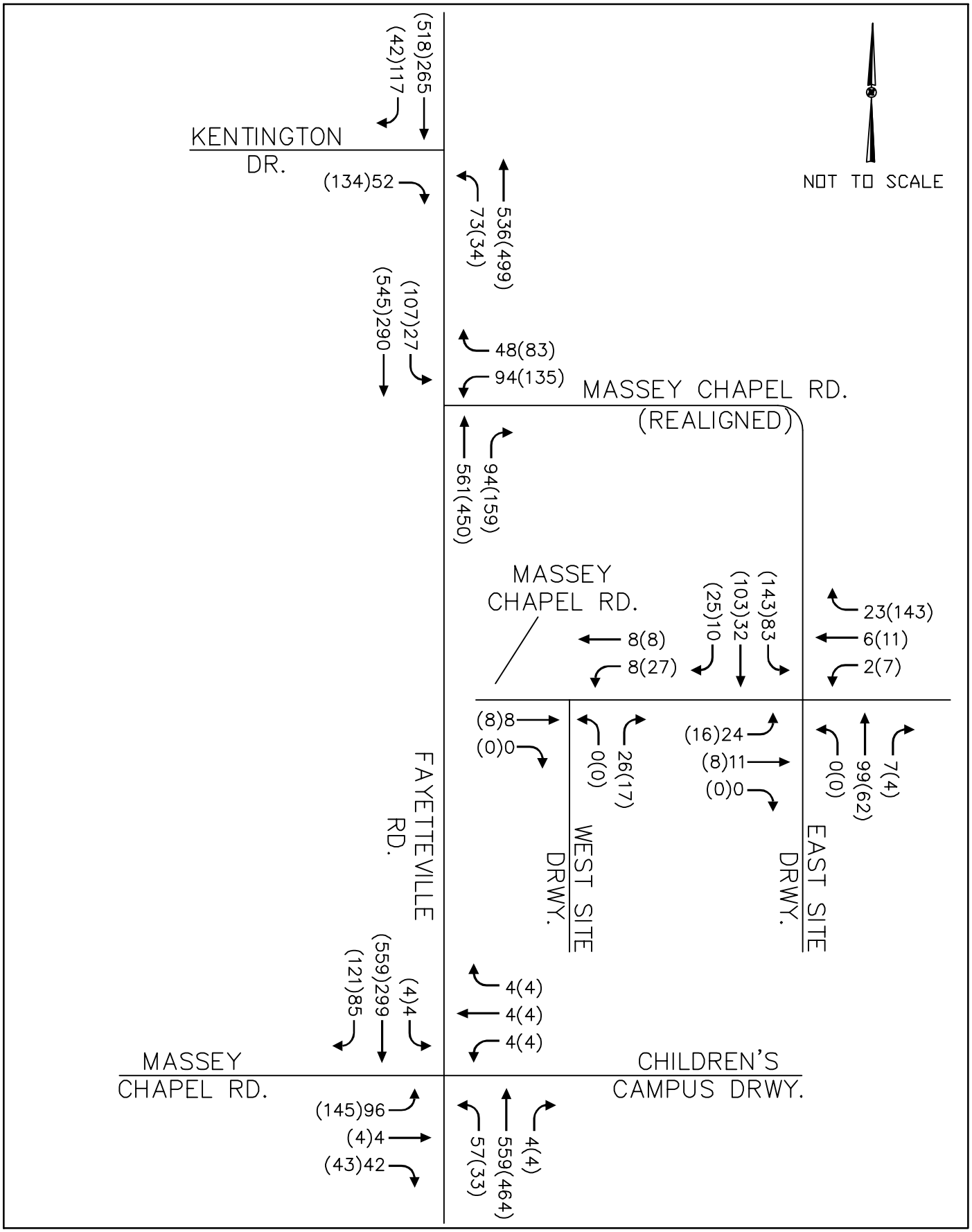


LEGEND

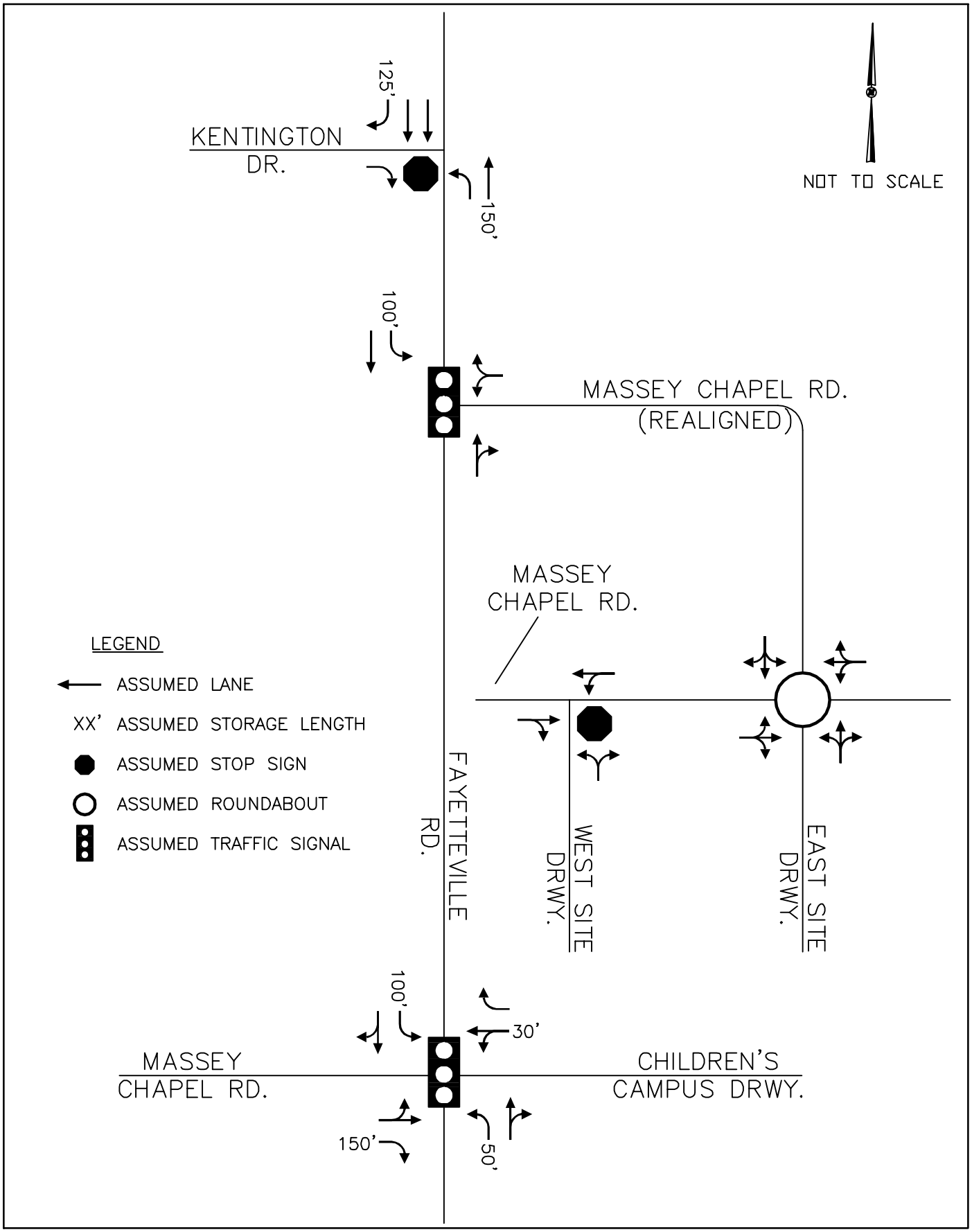
XX% INBOUND PERCENT ASSIGNMENT

(XX%) OUTBOUND PERCENT ASSIGNMENT

Kimley»Horn	MASSEY CHAPEL ASSEMBLAGE DURHAM, NC TRAFFIC IMPACT ANALYSIS	DEVELOPMENT TRAFFIC ASSIGNMENT	FIGURE 3



Kimley»Horn	MASSEY CHAPEL ASSEMBLAGE DURHAM, NC TRAFFIC IMPACT ANALYSIS	FUTURE YEAR (2050) PEAK HOUR TRAFFIC VOLUMES	FIGURE 4



Kimley»Horn	MASSEY CHAPEL ASSEMBLAGE DURHAM, NC TRAFFIC IMPACT ANALYSIS	ASSUMED FUTURE LANEAGE WITH REALIGNMENT	FIGURE 5

MASSEY CHAPEL ROAD REALIGNMENT FIGURE DESIGN SPEED 40 MPH

DURHAM, NORTH CAROLINA
APRIL 11, 2022

N
W E
S

GRAPHIC SCALE

60 0 30 60 120 240

(IN FEET)

LEGEND

- PROPOSED ROAD CENTERLINE
- ANTICIPATED RIGHT OF WAY
- EXISTING PROPERTY LINES

JAMES ROSS ROAD

EXISTING 1400' RADIUS

COOL SPRINGS ROAD

FAYETTEVILLE ROAD

EXISTING MASSEY CHAPEL ROAD

60'

974' TANGENT

535' RADIUS
4% MAX SUPER ELEVATION

157' TANGENT
FROM FAYETTEVILLE
ROAD RIGHT OF WAY

75'

60'

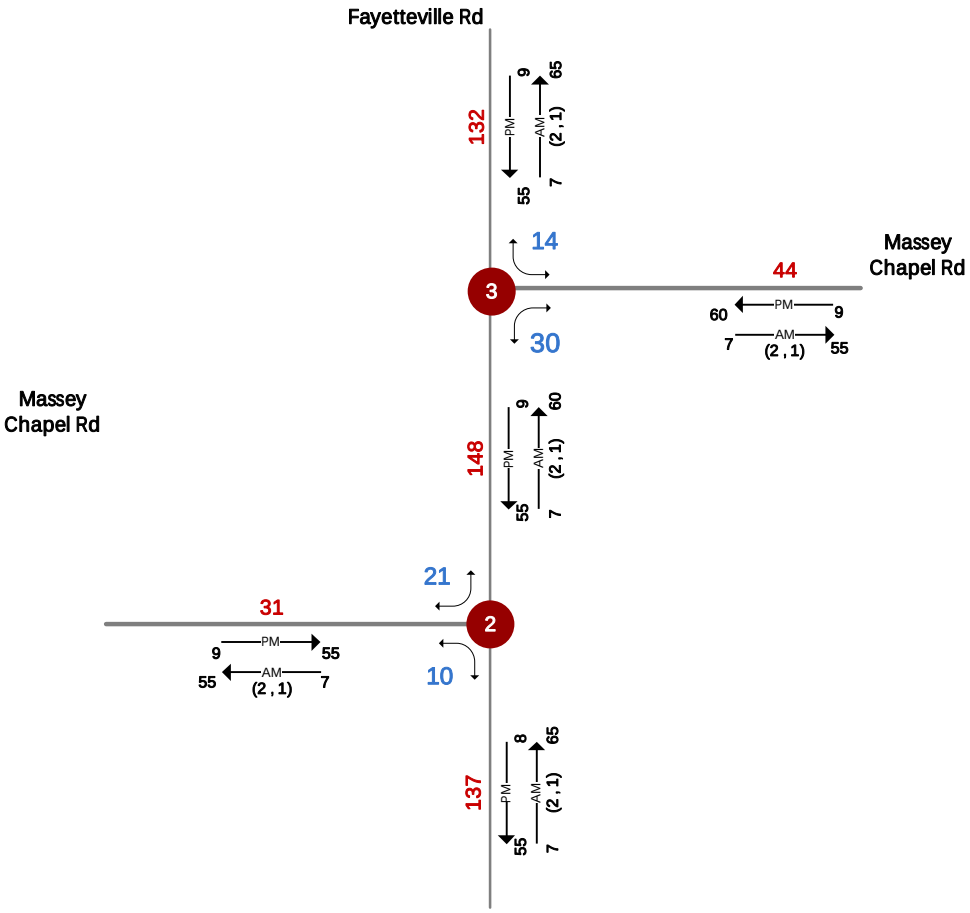
MASSEY CHAPEL ROAD REALIGNMENT

ELLISON DRIVE

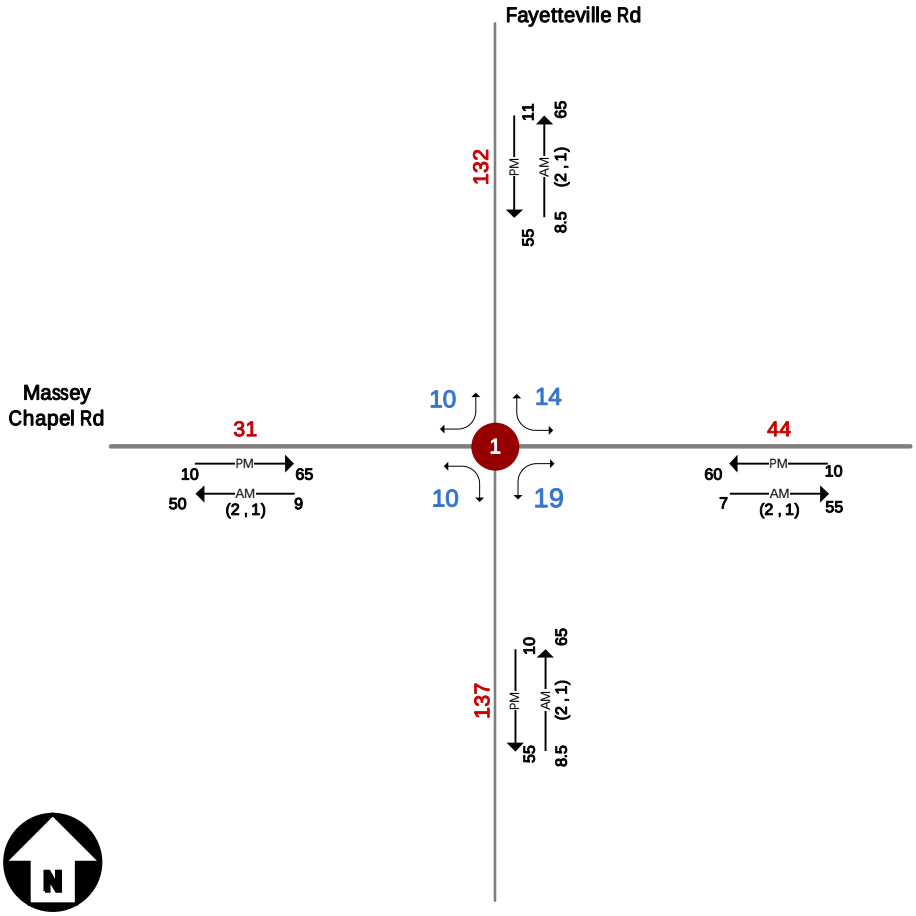
MASSEY CHAPEL ROAD

PREPARED IN THE OFFICE OF:
Kimley»Horn
300 MORRIS ST., SUITE 200 - DURHAM, NC 27701
PHONE: (919) 882-2333 PE NO. F-0102

2050 No Build



2050 Build



Massey Chapel Road

2050
No Build/Build

##	Vehicles Per Day in 100s
1-	Less than 50 VPD

PM
D DHV
AM
DHV (d, t) D

DHV	Design Hourly Volume (%) = K30
AM/PM	Peak Period
D	Peak Hour Directional Split (%)
→	Indicates Direction of D
(d,t)	Dual, TT-STs (%)

Existing Roadway
Road Widening
Proposed Roadway

Durham **Division 5**

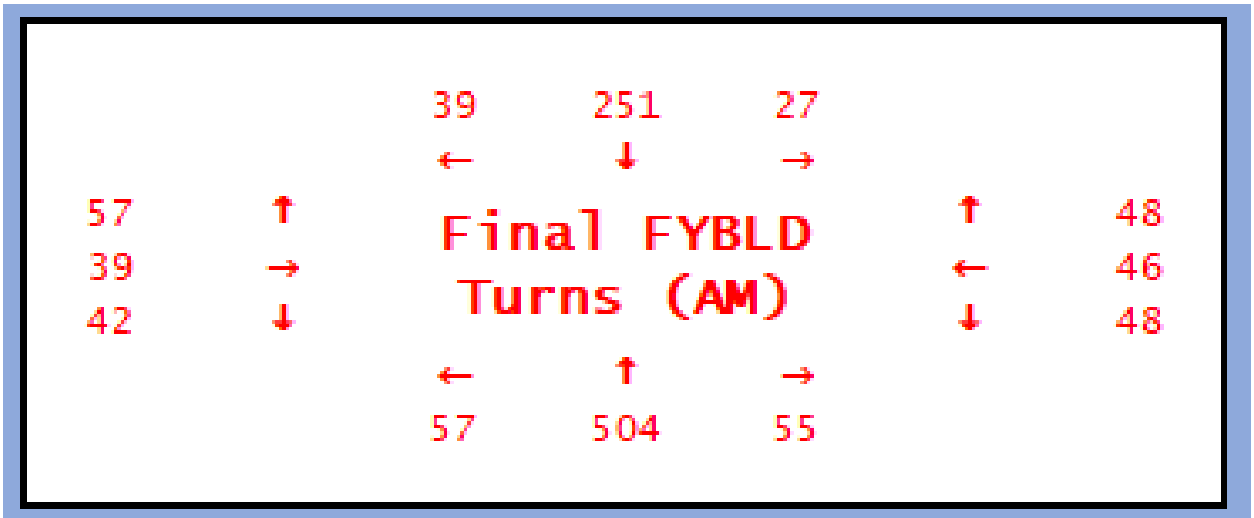
PROJECT

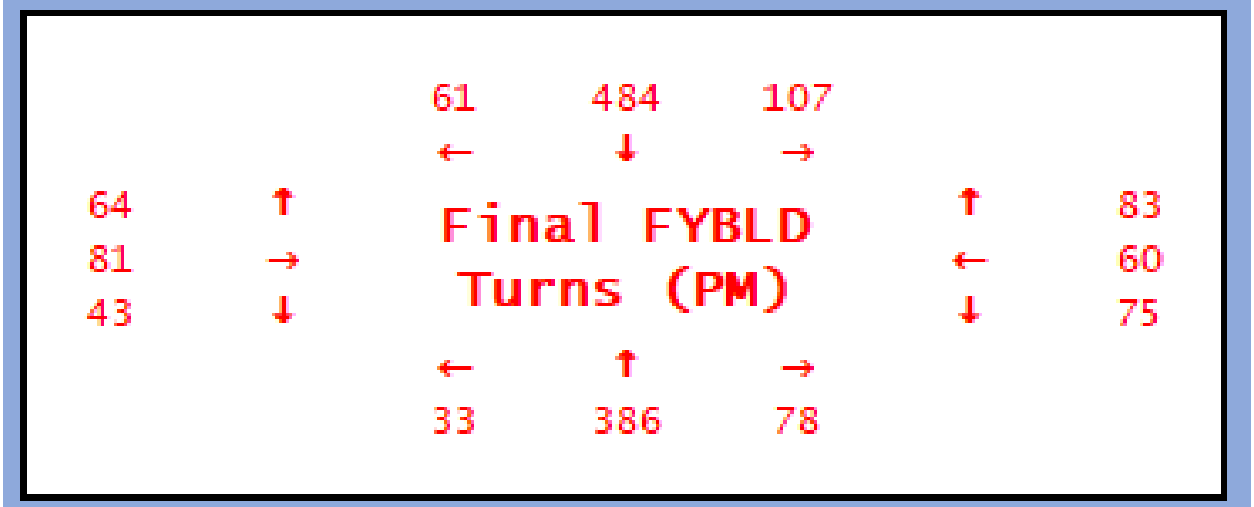
Realignment

September 24, 2024

Sheet 1 of 1

Kimley»Horn


39 251 27
← ↓ →
57 ↑
39 →
42 ↓
Final FYBLD
Turns (AM)
↑ 48
← 46
↓ 48
← ↑ →
57 504 55


61 484 107
← ↓ →
64 ↑
81 →
43 ↓
Final FYBLD
Turns (PM)
↑ 83
← 60
↓ 75
← ↑ →
33 386 78

Massey Chapel Assemblage

Table 1 - Trip Generation (11th Edition)

Land Use	Intensity		Daily			AM Peak Hour			PM Peak Hour		
			Total	In	Out	Total	In	Out	Total	In	Out
215 Single Family Attached Housing	110	d.u.	788	394	394	52	13	39	62	37	25
220 Multifamily Housing (Low-Rise)	320	d.u.	2,128	1,064	1,064	122	29	93	158	100	58
221 Multifamily Housing (Mid-Rise)		d.u.	0	0	0	0	0	0	0	0	0
Total Net New External Trips			**2,916**	**1,458**	**1,458**	**174**	**42**	**132**	**220**	**137**	**83**

INTERSECTION ANALYSIS SHEET

Project:	Massey Chapel Assemblage
Location:	Durham, NC
Scenario:	TRM 2050
Ct. Date	9/26/2024
Ct. Peaks	8:00 - 9:00 AM; 5:00 - 6:00 PM
E/W Street:	Kentington Drive
N/S Street:	Fayetteville Road

	AM In	AM Out	PM In	PM Out
Residential New Trips:	42	132	137	83
Non-Residential New Trips:	0	0	0	0
Pass-By Trips:	0	0	0	0

Annual Growth Rate:	0.0%	**Existing Year:**	2024
Growth Factor:	0.000	**Buildout Year:**	2050

AM PEAK HOUR
PHF = 0.87

Description	Kentington Drive Eastbound U-Turn	Left	Through	Right	Kentington Drive Westbound U-Turn	Left	Through	Right	Fayetteville Road Northbound U-Turn	Left	Through	Right	Fayetteville Road Southbound U-Turn	Left	Through	Right
2024 Traffic Count	0	0	0	52	0	0	0	0	0	73	0	0	0	0	0	117
Count Balancing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2024 Existing Traffic	0	0	0	52	0	0	0	0	0	73	0	0	0	0	0	117
2050 Background Traffic	0	0	0	52	0	0	0	0	0	73	536	0	0	0	265	117
Project Traffic																
Residential																
Percent Assignment Inbound	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Percent Assignment Outbound	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)
Residential Project Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-Residential																
Percent Assignment Inbound	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Percent Assignment Outbound	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)
Non-Residential Project Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total External Site Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Capture Reduction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Capture Assignment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Pass-By Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Project Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Movement % Impact (vs Existing) HIDE	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2050 Buildout Total	0	0	0	52	0	0	0	0	0	73	536	0	0	0	265	117
Approach Percent Impact (vs. Existing		0.00%				-				0.00%				0.00%		
Overall Percent Impact (vs. Buildout)	0.0%															

PM PEAK HOUR
PHF = 0.96

Description	Kentington Drive Eastbound U-Turn	Left	Through	Right	Kentington Drive Westbound U-Turn	Left	Through	Right	Fayetteville Road Northbound U-Turn	Left	Through	Right	Fayetteville Road Southbound U-Turn	Left	Through	Right
2024 Traffic Count	0	0	0	134	0	0	0	0	0	34	0	0	0	0	0	42
Count Balancing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2024 Existing Traffic	0	0	0	134	0	0	0	0	0	34	0	0	0	0	0	42
2050 Background Traffic	0	0	0	134	0	0	0	0	0	34	499	0	0	0	518	42
Project Traffic																
Residential																
Percent Assignment Inbound	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Percent Assignment Outbound	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)
Residential Project Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-Residential																
Percent Assignment Inbound	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Percent Assignment Outbound	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)
Non-Residential Project Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total External Site Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Capture Reduction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Capture Assignment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Pass-By Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Project Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Movement % Impact (vs Existing) HIDE	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2050 Buildout Total	0	0	0	134	0	0	0	0	0	34	499	0	0	0	518	42
Approach Percent Impact (vs. Existing		0.00%				-				0.00%				0.00%		
Overall Percent Impact (vs. Buildout)	0.0%															

INTERSECTION ANALYSIS SHEET

Project:	Massey Chapel Assemblage
Location:	Durham, NC
Scenario:	TRM 2050
Ct. Date / **Ct. Peaks**	From Triangle Region Model
E/W Street:	Massey Chapel Road (realigned)
N/S Street:	Fayetteville Road

	AM In	AM Out	PM In	PM Out
Residential New Trips:	42	132	137	83
Non-Residential New Trips:	0	0	0	0
Pass-By Trips:	0	0	0	0

Annual Growth Rate:	0.0%	**Existing Year:**	2024
Growth Factor:	0.000	**Buildout Year:**	2050

AM PEAK HOUR
PHF =

Description	Eastbound				Massey Chapel Road (realigned) Westbound				Fayetteville Road Northbound				Fayetteville Road Southbound			
	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right
2050 Background Traffic	0	0	0	0	0	94	0	48	0	0	561	94	0	27	290	0
Project Traffic																
Residential																
Percent Assignment Inbound	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Percent Assignment Outbound	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)
Residential Project Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-Residential																
Percent Assignment Inbound	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Percent Assignment Outbound	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)
Non-Residential Project Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total External Site Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Capture Reduction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Capture Assignment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Pass-By Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Project Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Movement % Impact (vs Existing) HIDE	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2050 Buildout Total	0	0	0	0	0	94	0	48	0	0	561	94	0	27	290	0
Approach Percent Impact (vs. Existing			-				-				-				-	
Overall Percent Impact (vs. Buildout)	0.0%															

PM PEAK HOUR
PHF =

Description	Eastbound				Massey Chapel Road (realigned) Westbound				Fayetteville Road Northbound				Fayetteville Road Southbound			
	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right
2050 Background Traffic	0	0	0	0	0	135	0	83	0	0	450	159	0	107	545	0
Project Traffic																
Residential																
Percent Assignment Inbound	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Percent Assignment Outbound	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)
Residential Project Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-Residential																
Percent Assignment Inbound	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Percent Assignment Outbound	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)
Non-Residential Project Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total External Site Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Capture Reduction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Capture Assignment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Pass-By Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Project Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Movement % Impact (vs Existing) HIDE	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2050 Buildout Total	0	0	0	0	0	135	0	83	0	0	450	159	0	107	545	0
Approach Percent Impact (vs. Existing			-				-				-				-	
Overall Percent Impact (vs. Buildout)	0.0%															

INTERSECTION ANALYSIS SHEET

Project:	Massey Chapel Assemblage
Location:	Durham, NC
Scenario:	TRM 2050
Ct. Date / **Ct. Peaks**	From Triangle Region Model
E/W Street:	Massey Chapel Road/Children's Campus Drive
N/S Street:	Fayetteville Road

	AM In	AM Out	PM In	PM Out
Residential New Trips:	42	132	137	83
Non-Residential New Trips:	0	0	0	0
Pass-By Trips:	0	0	0	0

Annual Growth Rate:	0.0%	**Existing Year:**	2024
Growth Factor:	0.000	**Buildout Year:**	2050

AM PEAK HOUR
PHF =

Description	Massey Chapel Road Eastbound				Children's Campus Driveway Westbound				Fayetteville Road Northbound				Fayetteville Road Southbound			
	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right
2050 Background Traffic	0	96	4	42	0	4	4	4	0	57	559	4	0	4	299	85
Project Traffic																
Residential																
Percent Assignment Inbound	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Percent Assignment Outbound	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)
Residential Project Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-Residential																
Percent Assignment Inbound	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Percent Assignment Outbound	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)
Non-Residential Project Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total External Site Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Capture Reduction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Capture Assignment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Pass-By Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Project Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Movement % Impact (vs Existing) HIDE	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2050 Buildout Total	0	96	4	42	0	4	4	4	0	57	559	4	0	4	299	85
Approach Percent Impact (vs. Existing		-				-				-				-		
Overall Percent Impact (vs. Buildout)	0.0%															

PM PEAK HOUR
PHF =

Description	Massey Chapel Road Eastbound				Children's Campus Driveway Westbound				Fayetteville Road Northbound				Fayetteville Road Southbound			
	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right
2050 Background Traffic	0	145	4	43	0	4	4	4	0	33	464	4	0	4	559	121
Project Traffic																
Residential																
Percent Assignment Inbound	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Percent Assignment Outbound	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)
Residential Project Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-Residential																
Percent Assignment Inbound	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Percent Assignment Outbound	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)
Non-Residential Project Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total External Site Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Capture Reduction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Capture Assignment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Pass-By Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Project Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Movement % Impact (vs Existing) HIDE	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2050 Buildout Total	0	145	4	43	0	4	4	4	0	33	464	4	0	4	559	121
Approach Percent Impact (vs. Existing		-				-				-				-		
Overall Percent Impact (vs. Buildout)	0.0%															

INTERSECTION ANALYSIS SHEET

Project:	Massey Chapel Assemblage
Location:	Durham, NC
Scenario:	TRM 2050
Ct. Date / **Ct. Peaks**	From Triangle Region Model
E/W Street:	Massey Chapel Road
N/S Street:	Site Driveway/Massey Chapel Road (realigned)

	AM In	AM Out	PM In	PM Out
Residential New Trips:	42	132	137	83
Non-Residential New Trips:	0	0	0	0
Pass-By Trips:	0	0	0	0

Annual Growth Rate:	0.0%	**Existing Year:**	2024
Growth Factor:	0.000	**Buildout Year:**	2050

AM PEAK HOUR
PHF =

Description	Massey Chapel Road Eastbound				Massey Chapel Road Westbound				Site Driveway Northbound				Massey Chapel Road (realigned) Southbound			
	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right
2050 Background Traffic	0	4	4	0	0	0	4	142	0	0	0	0	0	121	0	4
Project Traffic																
Residential																
Percent Assignment Inbound	0%	0%	0%	0%	0%	5%	5%	0%	0%	0%	0%	0%	0%	-90%	75%	15%
Percent Assignment Outbound	(0%)	(15%)	(5%)	(0%)	(0%)	(0%)	(0%)	-(90%)	(0%)	(0%)	(75%)	(5%)	(0%)	(0%)	(0%)	(0%)
Residential Project Traffic	0	20	7	0	0	2	2	-119	0	0	99	7	0	-38	32	6
Non-Residential																
Percent Assignment Inbound	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Percent Assignment Outbound	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)
Non-Residential Project Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total External Site Traffic	0	20	7	0	0	2	2	-119	0	0	99	7	0	-38	32	6
Pass-By Capture Reduction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Capture Assignment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Pass-By Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Project Traffic	0	20	7	0	0	2	2	-119	0	0	99	7	0	-38	32	6
Movement % Impact (vs Existing) HIDE	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2050 Buildout Total	0	24	11	0	0	2	6	23	0	0	99	7	0	83	32	10
Approach Percent Impact (vs. Existing)		-				-				-				-		
Overall Percent Impact (vs. Buildout)	6.1%															

PM PEAK HOUR
PHF =

Description	Massey Chapel Road Eastbound				Massey Chapel Road Westbound				Site Driveway Northbound				Massey Chapel Road (realigned) Southbound			
	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right
2050 Background Traffic	0	4	4	0	0	0	4	218	0	0	0	0	0	266	0	4
Project Traffic																
Residential																
Percent Assignment Inbound	0%	0%	0%	0%	0%	5%	5%	0%	0%	0%	0%	0%	0%	-90%	75%	15%
Percent Assignment Outbound	(0%)	(15%)	(5%)	(0%)	(0%)	(0%)	(0%)	-(90%)	(0%)	(0%)	(75%)	(5%)	(0%)	(0%)	(0%)	(0%)
Residential Project Traffic	0	12	4	0	0	7	7	-75	0	0	62	4	0	-123	103	21
Non-Residential																
Percent Assignment Inbound	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Percent Assignment Outbound	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)
Non-Residential Project Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total External Site Traffic	0	12	4	0	0	7	7	-75	0	0	62	4	0	-123	103	21
Pass-By Capture Reduction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Capture Assignment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Pass-By Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Project Traffic	0	12	4	0	0	7	7	-75	0	0	62	4	0	-123	103	21
Movement % Impact (vs Existing) HIDE	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2050 Buildout Total	0	16	8	0	0	7	11	143	0	0	62	4	0	143	103	25
Approach Percent Impact (vs. Existing)		-				-				-				-		
Overall Percent Impact (vs. Buildout)	4.2%															

INTERSECTION ANALYSIS SHEET

Project:	Massey Chapel Assemblage
Location:	Durham, NC
Scenario:	TRM 2050
Ct. Date / **Ct. Peaks**	From Triangle Region Model
E/W Street:	Massey Chapel Road
N/S Street:	Site Driveway

	AM In	AM Out	PM In	PM Out
Residential New Trips:	42	132	137	83
Non-Residential New Trips:	0	0	0	0
Pass-By Trips:	0	0	0	0

Annual Growth Rate:	0.0%	**Existing Year:**	2024
Growth Factor:	0.000	**Buildout Year:**	2050

AM PEAK HOUR
PHF =

Description	Massey Chapel Road Eastbound				Massey Chapel Road Westbound				Site Driveway Northbound				Southbound			
	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right
2050 Background Traffic	0	0	8	0	0	0	8	0	0	0	0	0	0	0	0	0
Project Traffic																
Residential																
Percent Assignment Inbound	0%	0%	0%	0%	0%	20%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Percent Assignment Outbound	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(20%)	(0%)	(0%)	(0%)	(0%)
Residential Project Traffic	0	0	0	0	0	8	0	0	0	0	0	26	0	0	0	0
Non-Residential																
Percent Assignment Inbound	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Percent Assignment Outbound	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)
Non-Residential Project Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total External Site Traffic	0	0	0	0	0	8	0	0	0	0	0	26	0	0	0	0
Pass-By Capture Reduction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Capture Assignment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Pass-By Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Project Traffic	0	0	0	0	0	8	0	0	0	0	0	26	0	0	0	0
Movement % Impact (vs Existing) HIDE	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2050 Buildout Total	0	0	8	0	0	8	8	0	0	0	0	26	0	0	0	0
Approach Percent Impact (vs. Existing		-				-				-				-		
Overall Percent Impact (vs. Buildout)	68.0%															

PM PEAK HOUR
PHF =

Description	Massey Chapel Road Eastbound				Massey Chapel Road Westbound				Site Driveway Northbound				Southbound			
	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right
2050 Background Traffic	0	0	8	0	0	0	8	0	0	0	0	0	0	0	0	0
Project Traffic																
Residential																
Percent Assignment Inbound	0%	0%	0%	0%	0%	20%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Percent Assignment Outbound	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(20%)	(0%)	(0%)	(0%)	(0%)
Residential Project Traffic	0	0	0	0	0	27	0	0	0	0	0	17	0	0	0	0
Non-Residential																
Percent Assignment Inbound	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Percent Assignment Outbound	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)
Non-Residential Project Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total External Site Traffic	0	0	0	0	0	27	0	0	0	0	0	17	0	0	0	0
Pass-By Capture Reduction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Capture Assignment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Pass-By Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Project Traffic	0	0	0	0	0	27	0	0	0	0	0	17	0	0	0	0
Movement % Impact (vs Existing) HIDE	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2050 Buildout Total	0	0	8	0	0	27	8	0	0	0	0	17	0	0	0	0
Approach Percent Impact (vs. Existing		-				-				-				-		
Overall Percent Impact (vs. Buildout)	73.3%															

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	52	73	536	265	117
Future Volume (vph)	0	52	73	536	265	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	150			125
Storage Lanes	0	1	1			1
Taper Length (ft)	25		125			
Satd. Flow (prot)	0	1611	1770	1863	3539	1583
Flt Permitted			0.950			
Satd. Flow (perm)	0	1611	1770	1863	3539	1583
Link Speed (mph)	25			45	45	
Link Distance (ft)	1581			274	552	
Travel Time (s)	43.1			4.2	8.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	58	81	596	294	130
Enter Blocked Intersection	No	No	No	Yes	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			24	18	
Link Offset(ft)	0			4	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 31.5%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	52	73	536	265	117
Future Vol, veh/h	0	52	73	536	265	117
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	-	-	125
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	2	2
Mvmt Flow	0	58	81	596	294	130

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	147	424	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.93	4.13	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.319	2.219	-	-	-
Pot Cap-1 Maneuver	0	874	1133	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	874	1133	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	9.4	1	0
HCM LOS	A		

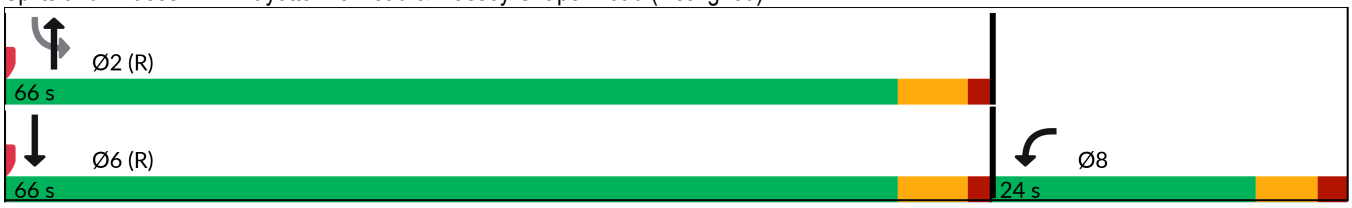
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1133	-	874	-	-
HCM Lane V/C Ratio	0.072	-	0.066	-	-
HCM Control Delay (s/veh)	8.4	-	9.4	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q (veh)	0.2	-	0.2	-	-

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	94	48	561	94	27	290
Future Volume (vph)	94	48	561	94	27	290
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0	100	
Storage Lanes	1	0		0	1	
Taper Length (ft)	25				25	
Satd. Flow (prot)	1720	0	1827	0	1770	1863
Flt Permitted	0.968				0.329	
Satd. Flow (perm)	1720	0	1827	0	613	1863
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	26		21			
Link Speed (mph)	35		45			45
Link Distance (ft)	892		953			194
Travel Time (s)	17.4		14.4			2.9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Lane Group Flow (vph)	157	0	727	0	30	322
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		18			18
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane			Yes			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors	1		1		1	1
Detector Template						
Leading Detector (ft)	35		306		40	306
Trailing Detector (ft)	-5		300		0	300
Detector 1 Position(ft)	-5		300		0	300
Detector 1 Size(ft)	40		6		40	6
Detector 1 Type	Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0		0.0	0.0
Detector 1 Queue (s)	0.0		0.0		0.0	0.0
Detector 1 Delay (s)	5.0		0.0		3.0	0.0
Turn Type	Prot		NA		D.Pm	NA
Protected Phases	8		2			6
Permitted Phases					2	
Detector Phase	8		2		2	6
Switch Phase						
Minimum Initial (s)	7.0		12.0		12.0	12.0
Minimum Split (s)	14.0		19.0		19.0	19.0
Total Split (s)	24.0		66.0		66.0	66.0
Total Split (%)	26.7%		73.3%		73.3%	73.3%
Yellow Time (s)	4.1		4.6		4.6	4.6
All-Red Time (s)	2.0		1.5		1.5	1.5
Lost Time Adjust (s)	-1.1		-1.1		-1.1	-1.1

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Total Lost Time (s)	5.0		5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None		C-Max		C-Max	C-Max
Act Effct Green (s)	12.7		67.3		67.3	67.3
Actuated g/C Ratio	0.14		0.75		0.75	0.75
v/c Ratio	0.59		0.53		0.07	0.23
Control Delay (s/veh)	38.8		4.2		4.3	4.4
Queue Delay	0.0		0.0		0.0	0.0
Total Delay (s/veh)	38.8		4.2		4.3	4.4
LOS	D		A		A	A
Approach Delay (s/veh)	38.8		4.2			4.4
Approach LOS	D		A			A
Queue Length 50th (ft)	70		99		4	45
Queue Length 95th (ft)	124		81		14	92
Internal Link Dist (ft)	812		873			114
Turn Bay Length (ft)					100	
Base Capacity (vph)	383		1371		458	1393
Starvation Cap Reductn	0		0		0	0
Spillback Cap Reductn	0		0		0	0
Storage Cap Reductn	0		0		0	0
Reduced v/c Ratio	0.41		0.53		0.07	0.23

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 88 (98%), Referenced to phase 2:NBSB and 6:SBT, Start of Green			
Natural Cycle: 45			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.59			
Intersection Signal Delay (s/veh): 8.6		Intersection LOS: A	
Intersection Capacity Utilization 51.7%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 2: Fayetteville Road & Massey Chapel Road (Realigned)



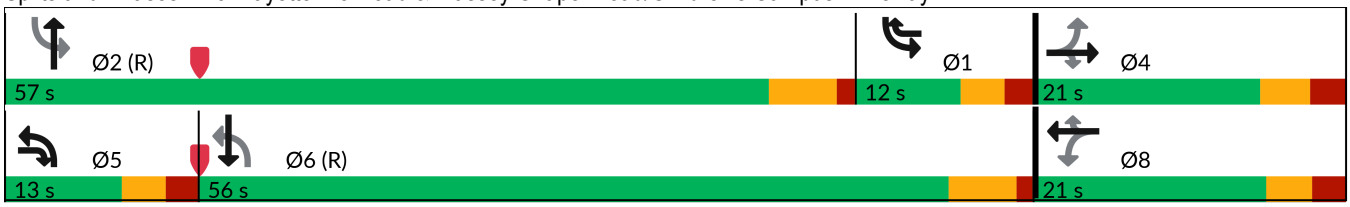
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	96	4	42	4	4	4	57	559	4	4	299	85
Future Volume (vph)	96	4	42	4	4	4	57	559	4	4	299	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	30		0	50		0	100		0
Storage Lanes	0		1	1		1	1		0	1		0
Taper Length (ft)	25			70			150			100		
Satd. Flow (prot)	0	1777	1583	0	1818	1583	1770	1861	0	1770	1801	0
Flt Permitted		0.728			0.856		0.472			0.363		
Satd. Flow (perm)	0	1356	1583	0	1595	1583	879	1861	0	676	1801	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			102			95		1			26	
Link Speed (mph)		45			20			45			45	
Link Distance (ft)		1053			278			965			953	
Travel Time (s)		16.0			9.5			14.6			14.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	111	47	0	8	4	63	625	0	4	426	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			-20			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane											Yes	
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1	1	1		1	1	
Detector Template	Left			Left								
Leading Detector (ft)	20	40	40	20	40	40	40	266		40	306	
Trailing Detector (ft)	0	0	0	0	0	0	0	260		0	300	
Detector 1 Position(ft)	0	0	0	0	0	0	0	260		0	300	
Detector 1 Size(ft)	20	40	40	20	40	40	40	6		40	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	3.0	15.0	0.0	3.0	15.0	15.0	0.0		15.0	0.0	
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+ov	D.P+P	NA		D.P+P	NA	
Protected Phases		4	5		8	1	5	2		1	6	
Permitted Phases	4		4	8		8	6			2		
Detector Phase	4	4	5	8	8	1	5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0		7.0	12.0	
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0	12.0	13.0	18.0		12.0	18.0	
Total Split (s)	21.0	21.0	13.0	21.0	21.0	12.0	13.0	57.0		12.0	56.0	
Total Split (%)	23.3%	23.3%	14.4%	23.3%	23.3%	13.3%	14.4%	63.3%		13.3%	62.2%	
Yellow Time (s)	3.3	3.3	3.0	3.0	3.0	3.0	3.0	4.6		3.0	4.6	
All-Red Time (s)	2.4	2.4	2.1	2.3	2.3	1.9	2.1	1.1		1.9	1.1	
Lost Time Adjust (s)		-0.7	-0.1		-0.3	0.1	-0.1	-0.7		0.1	-0.7	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Lost Time (s)		5.0	5.0		5.0	5.0	5.0	5.0		5.0	5.0	
Lead/Lag			Lead			Lag	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?			Yes			Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	C-Max		None	C-Max	
Act Effct Green (s)		12.2	21.7		12.1	18.5	66.4	69.0		70.4	61.7	
Actuated g/C Ratio		0.14	0.24		0.13	0.21	0.74	0.77		0.78	0.69	
v/c Ratio		0.61	0.10		0.04	0.01	0.09	0.44		0.01	0.34	
Control Delay (s/veh)		50.2	0.5		32.0	0.0	3.9	7.4		2.8	7.3	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay (s/veh)		50.2	0.5		32.0	0.0	3.9	7.4		2.8	7.3	
LOS		D	A		C	A	A	A		A	A	
Approach Delay (s/veh)		35.4			21.3			7.1			7.2	
Approach LOS		D			C			A			A	
Queue Length 50th (ft)		60	0		4	0	8	107		0	97	
Queue Length 95th (ft)		110	2		16	0	20	310		m2	139	
Internal Link Dist (ft)		973			198			885			873	
Turn Bay Length (ft)			150				50			100		
Base Capacity (vph)		241	474		283	452	734	1426		606	1242	
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		0.46	0.10		0.03	0.01	0.09	0.44		0.01	0.34	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 2 (2%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.61			
Intersection Signal Delay (s/veh): 10.7		Intersection LOS: B	
Intersection Capacity Utilization 60.2%		ICU Level of Service B	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Fayetteville Road & Massey Chapel Road/Children's Campus Driveway



MOVEMENT SUMMARY

Site: 4 [AM Peak Hour (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Massey Chapel Road at East Site Driveway
Site Category: -
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: East Site Driveway															
3	L2	All MCs	4	2.0	4	2.0	0.107	4.0	LOS A	0.6	15.2	0.34	0.17	0.34	23.4
		LV	4		4		0.107	4.0	LOS A	0.6	15.2	NA	NA	NA	23.4
		HV	0		0		0.107	7.5	LOS A	0.6	15.2	NA	NA	NA	22.6
8	T1	All MCs	110	2.0	110	2.0	0.107	4.0	LOS A	0.6	15.2	0.34	0.17	0.34	23.2
		LV	108		108		0.107	4.0	LOS A	0.6	15.2	NA	NA	NA	23.3
		HV	2		2		0.107	7.5	LOS A	0.6	15.2	NA	NA	NA	22.2
18	R2	All MCs	8	2.0	8	2.0	0.107	4.0	LOS A	0.6	15.2	0.34	0.17	0.34	23.5
		LV	8		8		0.107	4.0	LOS A	0.6	15.2	NA	NA	NA	23.5
		HV	0		0		0.107	7.5	LOS A	0.6	15.2	NA	NA	NA	22.7
Approach			122	2.0	122	2.0	0.107	4.0	LOS A	0.6	15.2	0.34	0.17	0.34	23.3
East: Massey Chapel Road															
1	L2	All MCs	4	2.0	4	2.0	0.033	3.4	LOS A	0.2	4.5	0.34	0.16	0.34	30.4
		LV	4		4		0.033	3.4	LOS A	0.2	4.5	NA	NA	NA	30.5
		HV	0		0		0.033	6.6	LOS A	0.2	4.5	NA	NA	NA	29.2
6	T1	All MCs	7	2.0	7	2.0	0.033	3.4	LOS A	0.2	4.5	0.34	0.16	0.34	30.9
		LV	7		7		0.033	3.4	LOS A	0.2	4.5	NA	NA	NA	30.9
		HV	0		0		0.033	6.6	LOS A	0.2	4.5	NA	NA	NA	29.6
16	R2	All MCs	26	2.0	26	2.0	0.033	3.4	LOS A	0.2	4.5	0.34	0.16	0.34	29.7
		LV	25		25		0.033	3.4	LOS A	0.2	4.5	NA	NA	NA	29.8
		HV	1		1		0.033	6.6	LOS A	0.2	4.5	NA	NA	NA	28.2
Approach			37	2.0	37	2.0	0.033	3.4	LOS A	0.2	4.5	0.34	0.16	0.34	30.1
North: Massey Chapel Road (Realigned)															
7	L2	All MCs	92	2.0	92	2.0	0.108	3.5	LOS A	0.6	16.2	0.11	0.02	0.11	28.3
		LV	90		90		0.108	3.4	LOS A	0.6	16.2	NA	NA	NA	28.3

		HV	2		2		0.108	6.3	LOS A	0.6	16.2	NA	NA	NA	27.1
4	T1	All MCs	36	2.0	36	2.0	0.108	3.5	LOS A	0.6	16.2	0.11	0.02	0.11	28.8
		LV	35		35		0.108	3.4	LOS A	0.6	16.2	NA	NA	NA	28.8
		HV	1		1		0.108	6.3	LOS A	0.6	16.2	NA	NA	NA	27.6
14	R2	All MCs	11	2.0	11	2.0	0.108	3.5	LOS A	0.6	16.2	0.11	0.02	0.11	28.6
		LV	11		11		0.108	3.4	LOS A	0.6	16.2	NA	NA	NA	28.6
		HV	0		0		0.108	6.3	LOS A	0.6	16.2	NA	NA	NA	27.4
Approach			139	2.0	139	2.0	0.108	3.5	LOS A	0.6	16.2	0.11	0.02	0.11	28.4
West: Massey Chapel Road															
5	L2	All MCs	27	2.0	27	2.0	0.038	3.5	LOS A	0.2	5.1	0.32	0.15	0.32	28.4
		LV	26		26		0.038	3.4	LOS A	0.2	5.1	NA	NA	NA	28.4
		HV	1		1		0.038	6.6	LOS A	0.2	5.1	NA	NA	NA	27.0
2	T1	All MCs	12	2.0	12	2.0	0.038	3.5	LOS A	0.2	5.1	0.32	0.15	0.32	30.0
		LV	12		12		0.038	3.4	LOS A	0.2	5.1	NA	NA	NA	30.0
		HV	0		0		0.038	6.6	LOS A	0.2	5.1	NA	NA	NA	28.8
12	R2	All MCs	4	2.0	4	2.0	0.038	3.5	LOS A	0.2	5.1	0.32	0.15	0.32	29.8
		LV	4		4		0.038	3.4	LOS A	0.2	5.1	NA	NA	NA	29.9
		HV	0		0		0.038	6.6	LOS A	0.2	5.1	NA	NA	NA	28.7
Approach			43	2.0	43	2.0	0.038	3.5	LOS A	0.2	5.1	0.32	0.15	0.32	29.1
All Vehicles			341	2.0	341	2.0	0.108	3.7	LOS A	0.6	16.2	0.24	0.11	0.24	26.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	8	0	8	8	0	26
Future Volume (vph)	8	0	8	8	0	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	1863	0	0	1818	1611	0
Flt Permitted				0.976		
Satd. Flow (perm)	1863	0	0	1818	1611	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	533			475	510	
Travel Time (s)	10.4			9.3	13.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Lane Group Flow (vph)	9	0	0	18	29	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	17.5%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	5.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	8	0	8	8	0	26
Future Vol, veh/h	8	0	8	8	0	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
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	2	2
Mvmt Flow	9	0	9	9	0	29

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	9	0	36	9
Stage 1	-	-	-	-	9	-
Stage 2	-	-	-	-	27	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1611	-	977	1073
Stage 1	-	-	-	-	1014	-
Stage 2	-	-	-	-	996	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1611	-	971	1073
Mov Cap-2 Maneuver	-	-	-	-	971	-
Stage 1	-	-	-	-	1014	-
Stage 2	-	-	-	-	990	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	3.6	8.4
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1073	-	-	1611	-
HCM Lane V/C Ratio	0.027	-	-	0.006	-
HCM Control Delay (s/veh)	8.4	-	-	7.2	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q (veh)	0.1	-	-	0	-

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	134	34	499	518	42
Future Volume (vph)	0	134	34	499	518	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	150			125
Storage Lanes	0	1	1			1
Taper Length (ft)	25		125			
Satd. Flow (prot)	0	1611	1770	1863	3539	1583
Flt Permitted			0.950			
Satd. Flow (perm)	0	1611	1770	1863	3539	1583
Link Speed (mph)	25			45	45	
Link Distance (ft)	1581			274	552	
Travel Time (s)	43.1			4.2	8.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	149	38	554	576	47
Enter Blocked Intersection	No	No	No	Yes	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			24	18	
Link Offset(ft)	0			4	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 29.6%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	134	34	499	518	42
Future Vol, veh/h	0	134	34	499	518	42
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	-	-	125
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	2	2
Mvmt Flow	0	149	38	554	576	47

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	288	623	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.93	4.13	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.319	2.219	-	-	-
Pot Cap-1 Maneuver	0	709	956	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	709	956	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	11.4	0.6	0
HCM LOS	B		

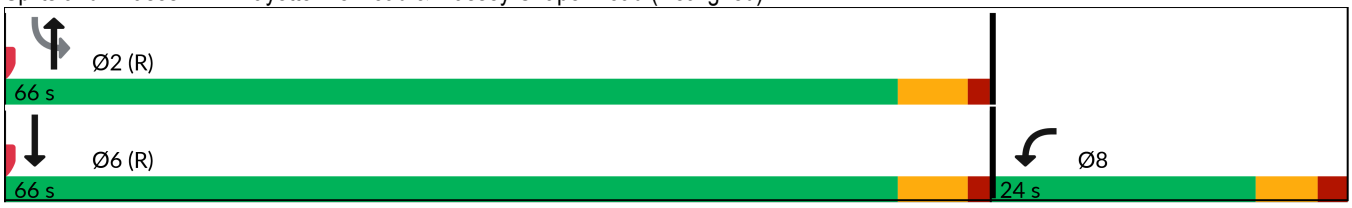
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	956	-	709	-	-
HCM Lane V/C Ratio	0.04	-	0.21	-	-
HCM Control Delay (s/veh)	8.9	-	11.4	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q (veh)	0.1	-	0.8	-	-

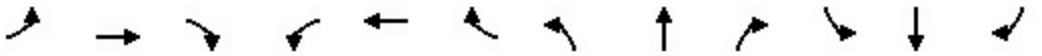
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	135	83	450	159	107	545
Future Volume (vph)	135	83	450	159	107	545
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0	100	
Storage Lanes	1	0		0	1	
Taper Length (ft)	25				25	
Satd. Flow (prot)	1715	0	1798	0	1770	1863
Flt Permitted	0.970				0.341	
Satd. Flow (perm)	1715	0	1798	0	635	1863
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	31		44			
Link Speed (mph)	35		45			45
Link Distance (ft)	892		953			194
Travel Time (s)	17.4		14.4			2.9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Lane Group Flow (vph)	242	0	677	0	119	606
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		18			18
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane			Yes			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors	1		1		1	1
Detector Template						
Leading Detector (ft)	35		306		40	306
Trailing Detector (ft)	-5		300		0	300
Detector 1 Position(ft)	-5		300		0	300
Detector 1 Size(ft)	40		6		40	6
Detector 1 Type	Cl+Ex		Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0		0.0	0.0
Detector 1 Queue (s)	0.0		0.0		0.0	0.0
Detector 1 Delay (s)	5.0		0.0		3.0	0.0
Turn Type	Prot		NA		D.Pm	NA
Protected Phases	8		2			6
Permitted Phases					2	
Detector Phase	8		2		2	6
Switch Phase						
Minimum Initial (s)	7.0		12.0		12.0	12.0
Minimum Split (s)	14.0		19.0		19.0	19.0
Total Split (s)	24.0		66.0		66.0	66.0
Total Split (%)	26.7%		73.3%		73.3%	73.3%
Yellow Time (s)	4.1		4.6		4.6	4.6
All-Red Time (s)	2.0		1.5		1.5	1.5
Lost Time Adjust (s)	-1.1		-1.1		-1.1	-1.1

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Total Lost Time (s)	5.0		5.0		5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None		C-Max		C-Max	C-Max
Act Effct Green (s)	15.8		64.2		64.2	64.2
Actuated g/C Ratio	0.18		0.71		0.71	0.71
v/c Ratio	0.74		0.52		0.26	0.46
Control Delay (s/veh)	44.5		6.7		7.0	7.3
Queue Delay	0.0		0.0		0.0	0.0
Total Delay (s/veh)	44.5		6.7		7.0	7.3
LOS	D		A		A	A
Approach Delay (s/veh)	44.5		6.7			7.3
Approach LOS	D		A			A
Queue Length 50th (ft)	113		123		21	129
Queue Length 95th (ft)	189		122		50	213
Internal Link Dist (ft)	812		873			114
Turn Bay Length (ft)					100	
Base Capacity (vph)	386		1295		453	1329
Starvation Cap Reductn	0		0		0	0
Spillback Cap Reductn	0		0		0	0
Storage Cap Reductn	0		0		0	0
Reduced v/c Ratio	0.63		0.52		0.26	0.46

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 88 (98%), Referenced to phase 2:NBSB and 6:SBT, Start of Green			
Natural Cycle: 45			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay (s/veh): 12.5		Intersection LOS: B	
Intersection Capacity Utilization 68.4%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 2: Fayetteville Road & Massey Chapel Road (Realigned)





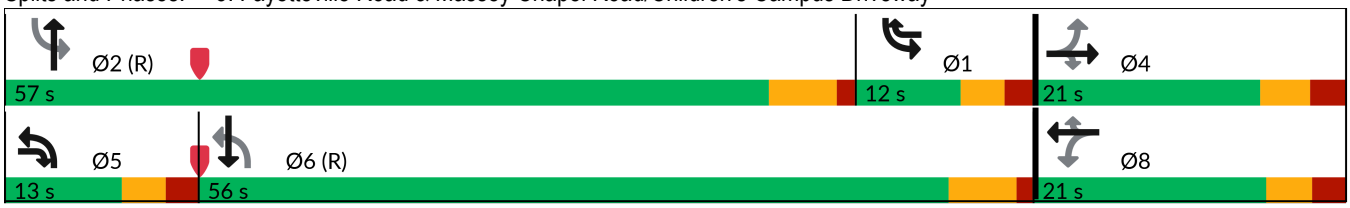
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	145	4	43	4	4	4	33	464	4	4	559	121
Future Volume (vph)	145	4	43	4	4	4	33	464	4	4	559	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	30		0	50		0	100		0
Storage Lanes	0		1	1		1	1		0	1		0
Taper Length (ft)	25			70			150			100		
Satd. Flow (prot)	0	1775	1583	0	1818	1583	1770	1861	0	1770	1812	0
Flt Permitted		0.726			0.866		0.238			0.412		
Satd. Flow (perm)	0	1352	1583	0	1613	1583	443	1861	0	767	1812	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			102			95		1			20	
Link Speed (mph)		45			20			45			45	
Link Distance (ft)		1053			278			965			953	
Travel Time (s)		16.0			9.5			14.6			14.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	165	48	0	8	4	37	520	0	4	755	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			-20			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane											Yes	
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1	1	1		1	1	
Detector Template	Left			Left								
Leading Detector (ft)	20	40	40	20	40	40	40	266		40	306	
Trailing Detector (ft)	0	0	0	0	0	0	0	260		0	300	
Detector 1 Position(ft)	0	0	0	0	0	0	0	260		0	300	
Detector 1 Size(ft)	20	40	40	20	40	40	40	6		40	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	3.0	15.0	0.0	3.0	15.0	15.0	0.0		15.0	0.0	
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+ov	D.P+P	NA		D.P+P	NA	
Protected Phases		4	5		8	1	5	2		1	6	
Permitted Phases	4		4	8		8	6			2		
Detector Phase	4	4	5	8	8	1	5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0		7.0	12.0	
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0	12.0	13.0	18.0		12.0	18.0	
Total Split (s)	21.0	21.0	13.0	21.0	21.0	12.0	13.0	57.0		12.0	56.0	
Total Split (%)	23.3%	23.3%	14.4%	23.3%	23.3%	13.3%	14.4%	63.3%		13.3%	62.2%	
Yellow Time (s)	3.3	3.3	3.0	3.0	3.0	3.0	3.0	4.6		3.0	4.6	
All-Red Time (s)	2.4	2.4	2.1	2.3	2.3	1.9	2.1	1.1		1.9	1.1	
Lost Time Adjust (s)		-0.7	-0.1		-0.3	0.1	-0.1	-0.7		0.1	-0.7	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Lost Time (s)		5.0	5.0		5.0	5.0	5.0	5.0		5.0	5.0	
Lead/Lag			Lead			Lag	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?			Yes			Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	C-Max		None	C-Max	
Act Effct Green (s)		14.2	26.3		14.2	22.2	61.8	63.4		64.8	56.1	
Actuated g/C Ratio		0.16	0.29		0.16	0.25	0.69	0.70		0.72	0.62	
v/c Ratio		0.77	0.09		0.03	0.01	0.09	0.40		0.01	0.66	
Control Delay (s/veh)		60.2	0.5		31.0	0.0	4.4	7.7		3.3	12.2	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay (s/veh)		60.2	0.5		31.0	0.0	4.4	7.7		3.3	12.2	
LOS		E	A		C	A	A	A		A	B	
Approach Delay (s/veh)		46.7			20.7			7.5			12.2	
Approach LOS		D			C			A			B	
Queue Length 50th (ft)		89	0		4	0	5	100		0	169	
Queue Length 95th (ft)		#178	2		16	0	13	238		m1	214	
Internal Link Dist (ft)		973			198			885			873	
Turn Bay Length (ft)			150				50			100		
Base Capacity (vph)		240	550		286	528	425	1310		629	1136	
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		0.69	0.09		0.03	0.01	0.09	0.40		0.01	0.66	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 2 (2%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.77
Intersection Signal Delay (s/veh): 15.3 Intersection LOS: B
Intersection Capacity Utilization 60.9% ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Fayetteville Road & Massey Chapel Road/Children's Campus Driveway



MOVEMENT SUMMARY

Site: 4 [PM Peak Hour (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Massey Chapel Road at East Site Driveway
Site Category: -
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: East Site Driveway															
3	L2	All MCs	4	2.0	4	2.0	0.072	3.9	LOS A	0.4	10.0	0.39	0.22	0.39	23.4
		LV	4		4		0.072	3.8	LOS A	0.4	10.0	NA	NA	NA	23.4
		HV	0		0		0.072	7.6	LOS A	0.4	10.0	NA	NA	NA	22.6
8	T1	All MCs	69	2.0	69	2.0	0.072	3.9	LOS A	0.4	10.0	0.39	0.22	0.39	23.2
		LV	68		68		0.072	3.8	LOS A	0.4	10.0	NA	NA	NA	23.3
		HV	1		1		0.072	7.6	LOS A	0.4	10.0	NA	NA	NA	22.2
18	R2	All MCs	4	2.0	4	2.0	0.072	3.9	LOS A	0.4	10.0	0.39	0.22	0.39	23.5
		LV	4		4		0.072	3.8	LOS A	0.4	10.0	NA	NA	NA	23.6
		HV	0		0		0.072	7.6	LOS A	0.4	10.0	NA	NA	NA	22.7
Approach			78	2.0	78	2.0	0.072	3.9	LOS A	0.4	10.0	0.39	0.22	0.39	23.3
East: Massey Chapel Road															
1	L2	All MCs	8	2.0	8	2.0	0.151	4.3	LOS A	0.9	23.6	0.31	0.13	0.31	30.2
		LV	8		8		0.151	4.2	LOS A	0.9	23.6	NA	NA	NA	30.3
		HV	0		0		0.151	7.7	LOS A	0.9	23.6	NA	NA	NA	28.9
6	T1	All MCs	12	2.0	12	2.0	0.151	4.3	LOS A	0.9	23.6	0.31	0.13	0.31	30.7
		LV	12		12		0.151	4.2	LOS A	0.9	23.6	NA	NA	NA	30.7
		HV	0		0		0.151	7.7	LOS A	0.9	23.6	NA	NA	NA	29.3
16	R2	All MCs	159	2.0	159	2.0	0.151	4.3	LOS A	0.9	23.6	0.31	0.13	0.31	29.5
		LV	156		156		0.151	4.2	LOS A	0.9	23.6	NA	NA	NA	29.5
		HV	3		3		0.151	7.7	LOS A	0.9	23.6	NA	NA	NA	27.9
Approach			179	2.0	179	2.0	0.151	4.3	LOS A	0.9	23.6	0.31	0.13	0.31	29.6
North: Massey Chapel Road (Realigned)															
7	L2	All MCs	159	2.0	159	2.0	0.236	4.6	LOS A	1.6	40.3	0.16	0.04	0.16	28.1
		LV	156		156		0.236	4.5	LOS A	1.6	40.3	NA	NA	NA	28.1

		HV	3		3		0.236	7.9	LOS A	1.6	40.3	NA	NA	NA	26.7
4	T1	All MCs	114	2.0	114	2.0	0.236	4.6	LOS A	1.6	40.3	0.16	0.04	0.16	28.6
		LV	112		112		0.236	4.5	LOS A	1.6	40.3	NA	NA	NA	28.6
		HV	2		2		0.236	7.9	LOS A	1.6	40.3	NA	NA	NA	27.1
14	R2	All MCs	28	2.0	28	2.0	0.236	4.6	LOS A	1.6	40.3	0.16	0.04	0.16	28.4
		LV	27		27		0.236	4.5	LOS A	1.6	40.3	NA	NA	NA	28.4
		HV	1		1		0.236	7.9	LOS A	1.6	40.3	NA	NA	NA	26.9
Approach			301	2.0	301	2.0	0.236	4.6	LOS A	1.6	40.3	0.16	0.04	0.16	28.3
West: Massey Chapel Road															
5	L2	All MCs	18	2.0	18	2.0	0.031	3.9	LOS A	0.2	4.3	0.47	0.27	0.47	28.3
		LV	17		17		0.031	3.8	LOS A	0.2	4.3	NA	NA	NA	28.3
		HV	0		0		0.031	8.1	LOS A	0.2	4.3	NA	NA	NA	26.5
2	T1	All MCs	9	2.0	9	2.0	0.031	3.9	LOS A	0.2	4.3	0.47	0.27	0.47	29.9
		LV	9		9		0.031	3.8	LOS A	0.2	4.3	NA	NA	NA	29.9
		HV	0		0		0.031	8.1	LOS A	0.2	4.3	NA	NA	NA	28.4
12	R2	All MCs	4	2.0	4	2.0	0.031	3.9	LOS A	0.2	4.3	0.47	0.27	0.47	29.7
		LV	4		4		0.031	3.8	LOS A	0.2	4.3	NA	NA	NA	29.8
		HV	0		0		0.031	8.1	LOS A	0.2	4.3	NA	NA	NA	28.2
Approach			31	2.0	31	2.0	0.031	3.9	LOS A	0.2	4.3	0.47	0.27	0.47	29.0
All Vehicles			589	2.0	589	2.0	0.236	4.3	LOS A	1.6	40.3	0.25	0.11	0.25	27.9

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA HCM.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	8	0	27	8	0	17
Future Volume (vph)	8	0	27	8	0	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	1863	0	0	1794	1611	0
Flt Permitted				0.963		
Satd. Flow (perm)	1863	0	0	1794	1611	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	533			475	510	
Travel Time (s)	10.4			9.3	13.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Lane Group Flow (vph)	9	0	0	39	19	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	18.6%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	5.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	8	0	27	8	0	17
Future Vol, veh/h	8	0	27	8	0	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
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	2	2
Mvmt Flow	9	0	30	9	0	19

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	9	0	78	9
Stage 1	-	-	-	-	9	-
Stage 2	-	-	-	-	69	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1611	-	925	1073
Stage 1	-	-	-	-	1014	-
Stage 2	-	-	-	-	954	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1611	-	907	1073
Mov Cap-2 Maneuver	-	-	-	-	907	-
Stage 1	-	-	-	-	1014	-
Stage 2	-	-	-	-	936	-

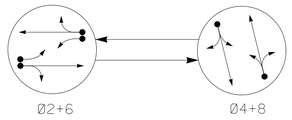
Approach	EB	WB	NB
HCM Control Delay, s/v	0	5.6	8.4
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1073	-	-	1611	-
HCM Lane V/C Ratio	0.018	-	-	0.019	-
HCM Control Delay (s/veh)	8.4	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q (veh)	0.1	-	-	0.1	-

PROJECT REFERENCE NO.	SHEET NO.
36249.3873	Sig 5.0

2 Phase
Fully Actuated
(Durham Signal System)

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+6	PHASE Ø4+8	PHASE FLASH
21	~~F Y~~	~~R~~	~~Y~~
22,23	G	R	Y
41,42	R	G	R
61	~~F Y~~	~~R~~	~~Y~~
62, 63	G	R	Y
81, 82	R	G	R

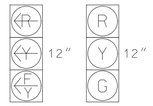
ASC/3 DETECTOR INSTALLATION CHART

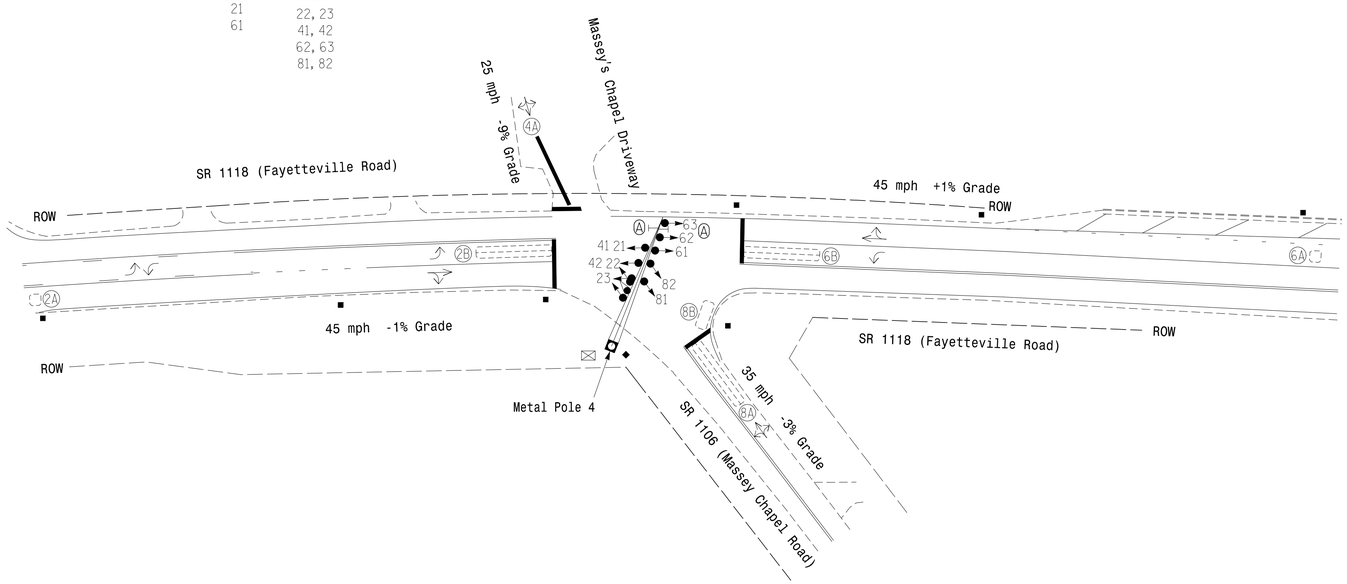
DETECTOR					PROGRAMMING							
LOOP/ ZONE NO.	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
2A	6X6	300	4	-	2	Yes	-	-	X	N	-	-
2B	6X40	0	2-4-2	-	2	Yes	-	3	-	G	-	-
4A ✳	6X40	0	✳	-	4	Yes	-	5	-	S	-	-
6A	6X6	300	5	-	6	Yes	-	-	X	N	-	-
6B	6X40	0	2-4-2	-	6	Yes	-	3	-	G	-	-
8A	6X40	+5	2-4-2	-	8	Yes	-	5	-	S	-	-
8B	6X15	+15	3	-	8	Yes	-	15	-	S	-	-

✳ Video Detection Zone

SIGNAL FACE I.D.

All Heads L.E.D.





NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Set all detector units to presence mode.
4. Pavement markings are existing.
5. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
6. Install new ASC/3 software in existing cabinet.
7. A video imaging loop emulator detection system is used to provide traffic detection on some approaches as noted on this plan. Perform installation according to the manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the plan.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
⊣	Sign	⊣
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
-----	2-in Underground Conduit	-----
N/A	Right of Way	———
→	Directional Arrow	→
○	Metal Pole with Mastarm	○
○	Video Detector	●
▬	Video Detection Area	N/A
Ⓐ	Street Name Sign (D3-1)	Ⓐ

ASC/3 TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 6	PHASE 8
Min Green *	12	7	12	7
Walk *	-	-	-	-
Ped Clear	-	-	-	-
Veh. Extension *	6.0	2.0	6.0	2.0
Max 1 *	90	20	90	20
Yellow	4.6	3.8	4.6	4.1
Red Clear	1.5	2.6	1.5	2.0
Actuations B4 Add *	-	-	-	-
Seconds /Actuation *	2.5	-	2.5	-
Max Initial *	34	-	34	-
Time Before Reduction *	20	-	20	-
Time To Reduce *	40	-	40	-
Minimum Gap	3.0	-	3.0	-
Locking Detector	X	-	X	-
Recall Position	VEH RECALL	-	VEH RECALL	-
Dual Entry	-	X	-	X
Simultaneous Gap	X	X	X	X

* 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.

NC Dept of Transportation
Division of Highways
Final Drawing Date: 10/8/2018
DocuSigned by: [signature] 8/9/2018
ITS & Signals Unit

VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
P: 919-829-0328

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Signal Upgrade

Prepared for the Offices of:
Transportation Mobility and Safety Division
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 1118 (Fayetteville Road) at SR 1106 (Massey Chapel Road) [North Intersection]

Division 5 Durham County Durham

PLAN DATE: August 2018 REVIEWED BY: J. L. Lewis
PREPARED BY: J. Ma REVIEWED BY: M. L. Styles

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

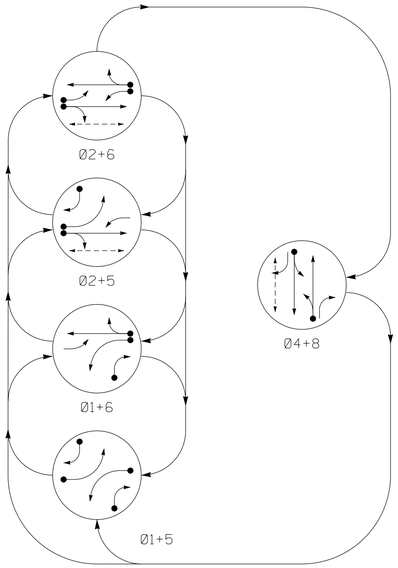
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 027696 ENGINEER JOSEPH L. LEWIS
DocuSigned by: [signature] 8/9/2018
SIGNATURE DATE

SIG. INVENTORY NO. 05-1431

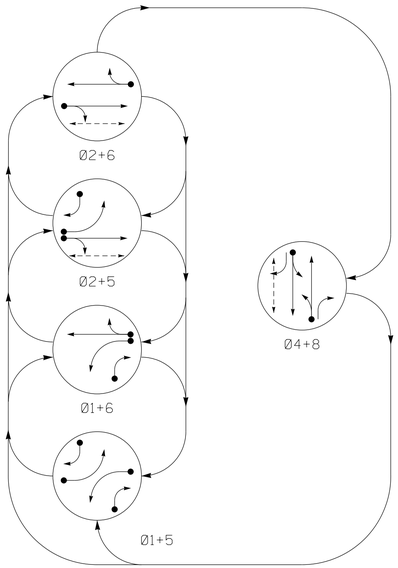
38210.01

PROJECT REFERENCE NO.	SHEET NO.
36249.3873	Sig 6.0

DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø4+8	FLASH
11	←	←	F Y	F Y	R	Y
21, 22	R	R	G	G	R	Y
41	R	R	R	G	R	R
42	R →	R	R →	G	R	R
51	←	F Y	←	F Y	R	Y
61, 62	R	G	R	G	R	Y
81	R	R	R	G	R	R
82	R →	R →	R	G	R	R
P21, P22	DW	DW	W	W	DW	DRK
P41, P42	DW	DW	DW	W	DW	DRK

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø4+8	FLASH
11	←	←	R	R	R	Y
21, 22	R	R	G	G	R	Y
41	R	R	R	G	R	R
42	R →	R	R →	G	R	R
51	←	R	←	R	R	Y
61, 62	R	G	R	G	R	Y
81	R	R	R	G	R	R
82	R →	R →	R	G	R	R
P21, P22	DW	DW	W	W	DW	DRK
P41, P42	DW	DW	DW	W	DW	DRK

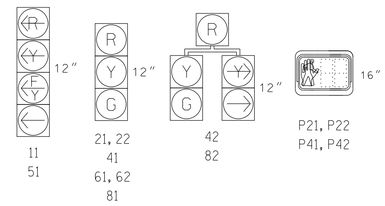
ASC/3 DETECTOR INSTALLATION CHART

DETECTOR LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	X	1	Yes	-	15✳	-	S	-	X
					6#	Yes	-	3	-	G	-	X
1B	6X40	0	2-4-2	X	1	Yes	-	15	-	S	-	X
2A	6X6	300	4	X	2	Yes	-	-	X	N	-	X
4A	6X40	0	2-4-2	X	4	Yes	-	3	-	S	-	X
5A	6X40	0	2-4-2	X	5	Yes	-	15✳	-	S	-	X
					2#	Yes	-	3	-	G	-	X
5B	6X40	0	2-4-2	X	5	Yes	-	15	-	S	-	X
5C	6X6	0	3	X	5	Yes	-	15	-	S	-	X
6A	6X6	260	4	X	6	Yes	-	-	X	N	-	X
8A	6X40	0	2-4-2	X	8	Yes	-	3	-	S	-	X

✳ Reduce delay to 3 seconds during Alternate Phasing Operation.
Disable Phase calls for loops during Alternate Phasing Operation.

SIGNAL FACE I.D.

All Heads L.E.D.



5 Phase Fully Actuated (Durham Signal System)

NOTES

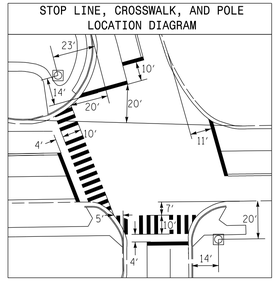
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. Set all detector units to presence mode.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
7. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
8. The Division (City) Traffic Engineer will determine the hours of use for each phasing plan.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

ASC/3 TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green *	7	12	7	7	12	7
Walk *	-	7	7	-	-	-
Ped Clear	-	7	13	-	-	-
Veh. Extension *	2.0	6.0	2.0	2.0	6.0	2.0
Max 1 *	20	90	30	20	90	30
Yellow	3.0	4.6	3.3	3.0	4.6	3.0
Red Clear	1.9	1.1	2.4	2.1	1.1	2.3
Actuations B4 Add *	-	-	-	-	-	-
Seconds /Actuation *	-	2.5	-	-	2.5	-
Max Initial *	-	34	-	-	30	-
Time Before Reduction *	-	20	-	-	20	-
Time To Reduce *	-	40	-	-	40	-
Minimum Gap	-	3.0	-	-	3.0	-
Locking Detector	-	X	-	-	X	-
Recall Position	-	VEH RECALL	-	-	VEH RECALL	-
Dual Entry	-	-	X	-	-	X
Simultaneous Gap	X	X	X	X	X	X

* 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.

STOP LINE, CROSSWALK, AND POLE LOCATION DIAGRAM



LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
⊣	Sign	⊣
□	Pedestrian Signal Head With Push Button & Sign	■
⬡	Type II Signal Pedestal	⬢
⬭	Metal Pole with Mast Arm	⬬
▭	Inductive Loop Detector	▬
⊠	Controller & Cabinet	⊠
□	Junction Box	■
-·-·-	2-in Underground Conduit	-·-·-
DD	Directional Drill	N/A
N/A	Right of Way	- - - - -
→	Directional Arrow	→
Ⓐ	Street Name Sign (D3-1)	Ⓐ

NC Dept of Transportation
Division of Highways
Final Drawing Date: 10/8/2018
DocuSigned by: [signature] 5DE1B9627A4A94...
ITS & Signals Unit

VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
P: 919-829-0328

New Installation

Prepared for the Offices of: Transportation Mobility and Safety Division, State of North Carolina Department of Transportation, Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 1118 (Fayetteville Road) at SR 1192 (Massey Chapel Road) [South Intersection]
Division 5 Durham County Durham

PLAN DATE: August 2018 REVIEWED BY: J. L. Lewis
PREPARED BY: M. L. Stygles REVIEWED BY: J. Ma

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 027696 ENGINEER JOSEPH L. LEWIS

DocuSigned by: [signature] 80D1EA0B279341E...
SIGNATURE 9/7/2018 DATE

SIG. INVENTORY NO. 05-1448

38210.01