CURRENT 2017-674
11/29/2017

TRAFFIC IMPACT ANALYSIS

DRAFT

MT. HARMONY TOWNHOMES

Mt. Harmony Church Road, North of Stevens Mill Road
Matthews, North Carolina

Zoning Application #TBD

for

2020 Ventures, LLC

November 2017

659-004 (C-2165)

2459 Wilkinson Boulevard, Suite 200
Charlotte, NC 28208

o 704.343.0608
w www.drgrp.com

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

EXECUTIVE SUMMARY

Mt. Harmony Church Road Facing North Along Site

2020 Ventures, LLC proposes to rezone (Zoning Application #TBD) approximately 17 acres in order to construct a maximum of 144 townhomes. The site is located on the west side of Mt. Harmony Church Road, between Stevens Mill Road and Interstate 485 in Matthews, NC. The site is expected to be fully developed in 2020.

This report provides analysis of the traffic operations within the area of influence, according to the standards set by the North Carolina Department of Transportation's (NCDOT) "Policy on Street and Driveway Access to North Carolina Highways, Chapter 4 Part C" and the Town of Matthews procedures (which follows NCDOT's guidelines). It provides intersection improvements needed for mitigating traffic impacts. This study evaluates the following scenarios:

- 2017 Existing Conditions
- 2020 No Build
- 2020 Build

The area of influence of the study site as indicated by Town of Matthews staff includes the following four existing intersections and two proposed access locations:

1. Mt. Harmony Church Road & Phillips Road (unsignalized)
2. Mt. Harmony Church Road & Marglyn Drive (unsignalized)
3. Mt. Harmony Church Road & Stevens Mill Road (unsignalized)
4. Moore Road & Matthews-Mint Hill Road (unsignalized)
5. Mt. Harmony Church Road & Proposed Access "A" (unsignalized)
6. Stevens Mill Road & Proposed Access "B" (unsignalized)

According to the site plan, access to the development will occur via two full movement locations:

- Proposed Access "A" – located on Mt. Harmony Church Road, approximately 825 feet north of Stevens Mill Road (on the east side of the site)
- Proposed Access "B" – located on Stevens Mill Road, approximately 500 feet west of Mt. Harmony Church Road (on the south side of the site)

The proposed buildout trip generation results indicate that the townhome development is expected to generate 63 AM peak hour trips and 75 PM peak hour trips.

Currently, the four existing unsignalized intersections operate with the following LOS:

- Phillips Road & Mt. Harmony Church Road - "E" in the AM peak hour and "B" in the PM peak hour

- Mt. Harmony Church Road & Marglyn Drive - “C” or better during both peak hours
- Mt. Harmony Church Road & Stevens Mill Road - “F” in the AM peak hour and “C” in the PM peak hour
- Matthews-Mint Hill Road & Moore Road - “F” in the AM peak hour and “C” in the PM peak hour

Typically, an intersection is said to be operating at capacity at a volume-to-capacity (v/c) ratio of 1.00 and acceptable at a LOS “D” or better.

2020 Build Suggested Recommendations:

Based on the results of the analyses, no roadway improvements should be deemed necessary at the existing study intersections. We suggest the following configurations for the proposed accesses:

5. Mt. Harmony Church Road & Proposed Access “A” (unsignalized)

- Construct Proposed Access “A” with one ingress lane and one egress lane (combined left-right lane). Due to the minor amount of traffic associated with the site and on Mt. Harmony Church Road, we do not recommend left or right turn lanes on Mt. Harmony Church Road at the access.

6. Stevens Mill Road & Proposed Access “B” (unsignalized)

- Construct Proposed Access “B” with one ingress lane and one egress lane (combined left-right lane). Due to the minor amount of traffic associated with the site and on Stevens Mill Road, we do not recommend left or right turn lanes on Stevens Mill Road at the access.

In conclusion, even though the Mt. Harmony Townhomes residential project will slightly increase the amount of traffic on the adjacent corridors the project will not materially impact adjacent roadways, intersections, or the general public traveling in the area if the site is developed according to the proposed plan and includes the suggested access configurations.

PROPOSED DEVELOPMENT

2020 Ventures, LLC proposes to rezone (Zoning Application #TBD) approximately 17 acres in order to construct a maximum of 144 townhomes. The site is located on the west side of Mt. Harmony Church Road, between Stevens Mill Road and Interstate 485 in Matthews, NC (see Figure 1). The site is expected to be fully developed in 2020.

Mt. Harmony Church Road Facing South Along Site

According to the site plan provided by LandDesign (see Site Plan on Aerial), access to the development will occur via two full movement locations:

- Proposed Access "A" – located on Mt. Harmony Church Road, approximately 825 feet north of Stevens Mill Road (on the east side of the site)
- Proposed Access "B" – located on Stevens Mill Road, approximately 500 feet west of Mt. Harmony Church Road (on the south side of the site)

DESIGN RESOURCE GROUP
LANDSCAPE ARCHITECTURE
CIVIL ENGINEERING
TRANSPORTATION PLANNING
O 2459 Wilkinson Blvd, Ste 200 Charlotte, NC 28208
P 704.343.0608
W www.drgrp.com

MT. HARMONY TOWNHOMES TIA

MATTHEWS, NC

2020 VENTURES, LLC
8905 PRIMULA DR.
GAITHERSBURG, MD 20882

AREA OF INFLUENCE MAP

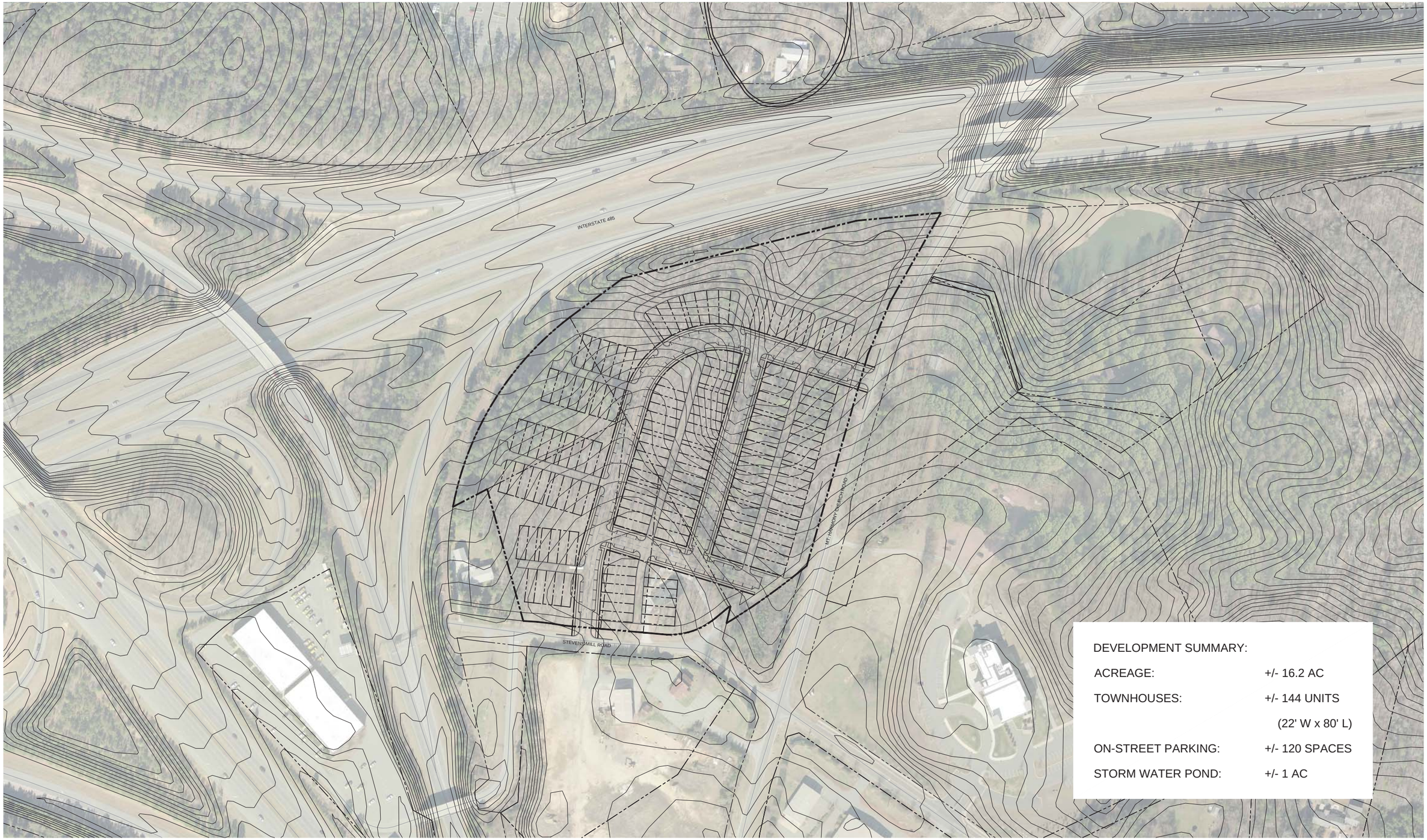
0 250 500
SCALE: 1" = 500'
N

PROJECT #: 659-004
DRAWN BY: JCZ
CHECKED BY: REG

OCTOBER 2017

REVISIONS:

Figure 1



DEVELOPMENT SUMMARY:

ACREAGE:	+/- 16.2 AC
TOWNHOUSES:	+/- 144 UNITS
	(22' W x 80' L)
ON-STREET PARKING:	+/- 120 SPACES
STORM WATER POND:	+/- 1 AC

LandDesign

MT. HARMONY TOWN HOUSES

CHARLOTTE, NORTH CAROLINA

OCTOBER 2017, LDI# 1017211

NORTH

50' 0' 50' 100' 200'
SCALE: 1" = 100'

AREA CONDITIONS

The area of influence of the study site as indicated by Town of Matthews staff includes the following four existing intersections and two proposed access locations:

1. Mt. Harmony Church Road & Phillips Road (unsignalized)
2. Mt. Harmony Church Road & Marglyn Drive (unsignalized)
3. Mt. Harmony Church Road & Stevens Mill Road (unsignalized)
4. Moore Road & Matthews-Mint Hill Road (unsignalized)
5. Mt. Harmony Church Road & Proposed Access "A" (unsignalized)
6. Stevens Mill Road & Proposed Access "B" (unsignalized)

Mt. Harmony Church Road Facing North Along Site

Stevens Mill Road at Mt. Harmony Church Road Facing West to Site

As indicated on the most current Charlotte Regional Transportation Planning Organization (CRTPO) Thoroughfare Plan, Mt. Harmony Church Road is a minor thoroughfare (a local road NCDOT functional classification) with a posted speed limit of 35 mph (located on the east side of the site). Mt. Harmony Church Road is a two-lane roadway; a southbound left turn lane is present for the Matthews Charter Academy along the majority of the school's/site frontage. Curb/gutter, planting strip, and sidewalk is present on the east side for a portion near Stevens Mill Road. Sight distance in both directions on Mt. Harmony Church Road at the proposed access location is adequate, meeting or exceeding normal NCDOT requirements for a 35-mph posted roadway (40 mph design speed = 400 feet of sight distance).

According to the CRTPO Thoroughfare Plan, Stevens Mill Road is a minor thoroughfare east of Mt. Harmony Church Road and unclassified west of Mt. Harmony Church Road (a local road NCDOT functional classification) with a posted speed limit of 35 mph (located on the south side of the site). Stevens Mill Road is a two-lane roadway that terminates to the west past the site at a NCDOT Maintenance facility; a westbound left turn lane is present at Mt. Harmony Church Road. Curb/gutter, planting strip, and sidewalk is present on the north side east of Mt. Harmony Church Road. Sight distance in both directions on Stevens Mill Road at the proposed access location is adequate, meeting or exceeding normal NCDOT requirements for a 35-mph posted roadway (40 mph design speed = 400 feet of sight distance).

Two future NCDOT roadway projects are planned in the vicinity of the proposed Mt. Harmony Townhomes site (copies of the transportation projects/pertinent information are located in the Appendix):

1. US 74 Widening/Express Lane Project (NCDOT TIP #U-2509B currently under design, with construction tentatively scheduled for completion in 2025) and is expected to include:

    - The extension of Northeast Parkway to the south to Matthews-Mint Hill Road
    - Grade separation of the existing signalized intersection of US 74 & Matthews-Mint Hill Road, which will include jughandle ramps

2. Monroe Bypass/Expressway (NCDOT TIP #s R-3329/R-2559 currently under construction, scheduled for completion in 2018) is a 19.5-mile all-toll facility from US 74 east of I-485 in Mecklenburg County to US 74 between Wingate and Marshville in Union County.

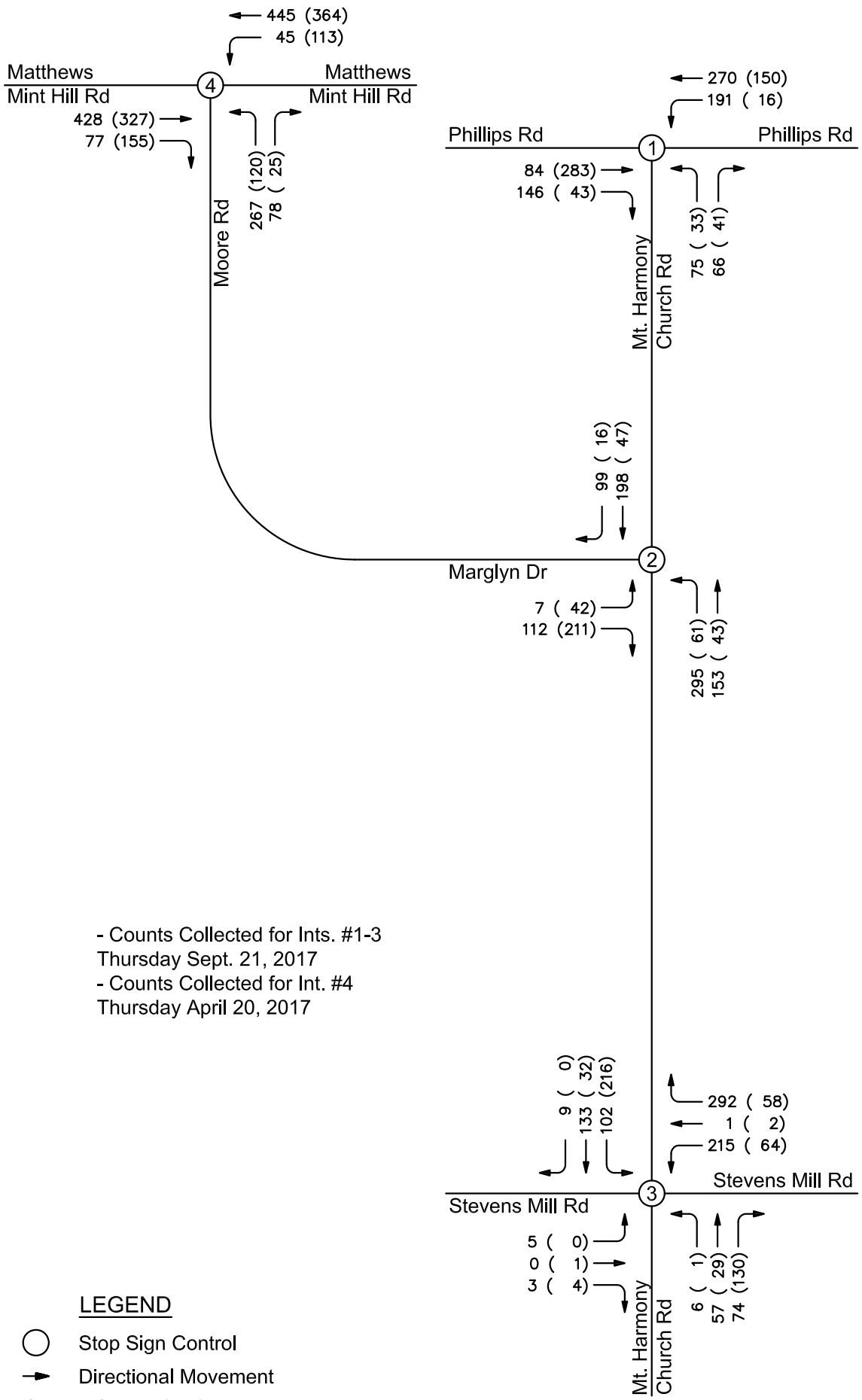
Morning (6:00-9:00 AM) and afternoon (4:00-7:00 PM) peak period turning movement counts were conducted at intersections #1 thru 3 on Thursday September 21, 2017; peak period turning movement counts were conducted at intersection #4 on Thursday April 20, 2017 (all while school was in session).

In addition to the intersection turning movement counts, NCDOT is the source for average annual two-way daily traffic (AADT) volumes within the area of influence. The latest (2016) AADT volumes are depicted in Table 1.

Table 1: Average Annual Daily Traffic Volumes (veh. per day)

Roadway	AADT
Mt. Harmony Rd. north of Marglyn Dr.	1,500
Matthews-Mint Hill Rd. near Moore Rd.	7,300

Figure 2 shows the 2017 existing traffic volumes for the AM and PM peak hours. Figure 3 illustrates the directional distribution for the site traffic; these directional distribution percentages were approved by Matthews.



- Counts Collected for Ints. #1-3
Thursday Sept. 21, 2017
- Counts Collected for Int. #4
Thursday April 20, 2017

LEGEND

Stop Sign Control

Directional Movement

VOLUMES: AM (PM)

DESIGN RESOURCE GROUP
LANDSCAPE ARCHITECTURE
CIVIL ENGINEERING
TRANSPORTATION PLANNING
O 2459 Wilkinson Blvd, Ste 200 Charlotte, NC 28208
P 704.343.0608
W www.drgrp.com

MT. HARMONY TOWNHOMES TIA

MATTHEWS, NC

2020 VENTURES, LLC
8905 PRIMULA DR.
GAITHERSBURG, MD 20882

2017 EXISTING PEAK HOUR TRAFFIC VOLUMES

0 NTS N

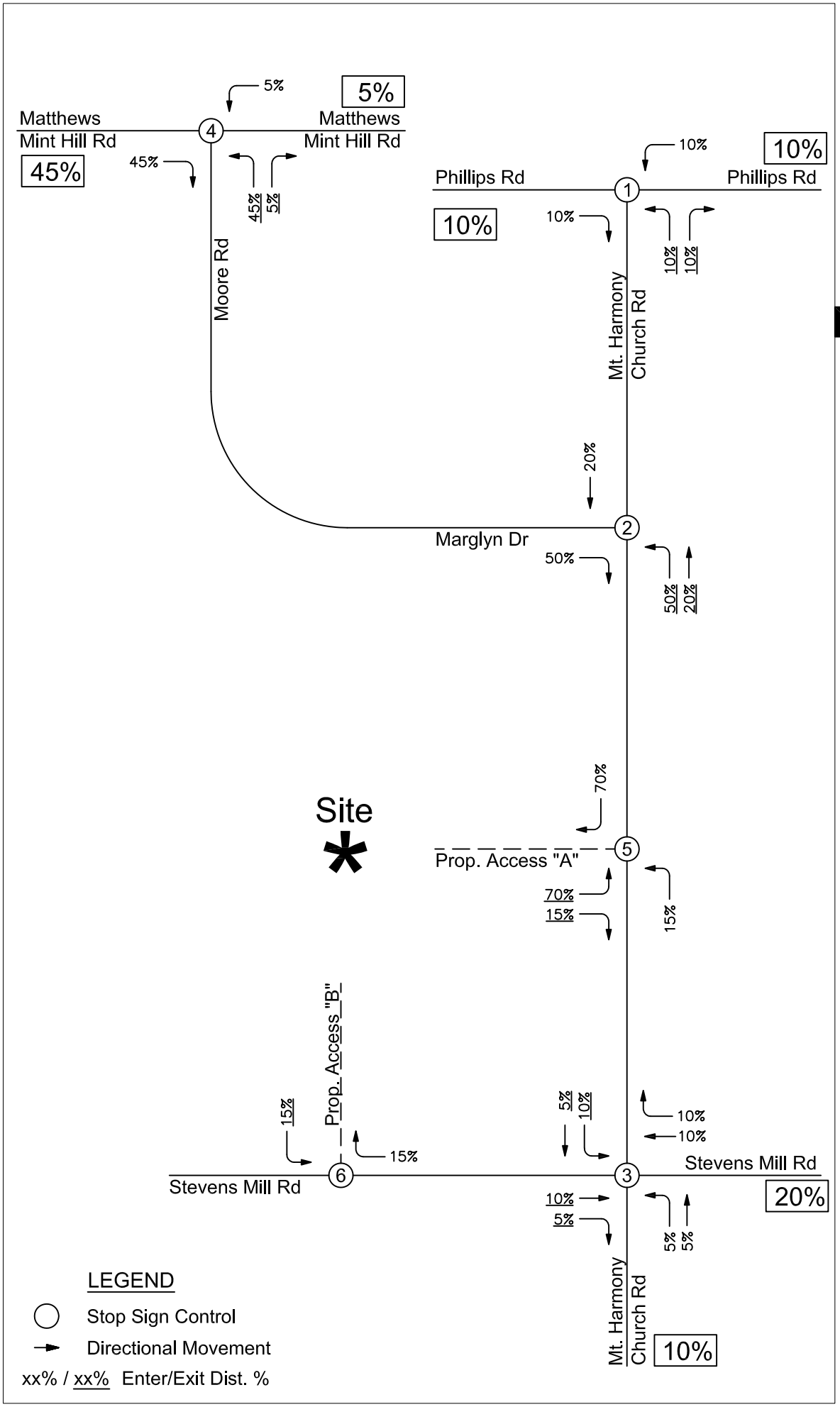
SCALE: NTS

PROJECT #: 659-004
DRAWN BY: JCZ
CHECKED BY: REG

OCTOBER 2017

REVISIONS:

Figure 2



DESIGN RESOURCE GROUP
LANDSCAPE ARCHITECTURE
CIVIL ENGINEERING
TRANSPORTATION PLANNING
O 2459 Wilkinson Blvd, Ste 200 Charlotte, NC 28208
P 704.343.0608
W www.drgrp.com

MT. HARMONY TOWNHOMES TIA

MATTHEWS, NC

2020 VENTURES, LLC
8905 PRIMULA DR.
GAITHERSBURG, MD 20882

SITE DIRECTIONAL DISTRIBUTION

0 NTS
SCALE: NTS

PROJECT #: 659-004
DRAWN BY: JCZ
CHECKED BY: REG

OCTOBER 2017

REVISIONS:

Figure 3

PROJECTED TRAFFIC

The projected background traffic volumes used in the analyses were developed from existing (year 2017) peak-hour-turning-movement-count data. These volumes were increased using a 2 percent per year growth rate to obtain 2020 background volumes, which was approved by Matthews.

The daily and peak-hour-trip-generation data for the site is presented in Table 2. The values for the trips generated by the residential land use are obtained from the Institute of Transportation Engineers, Trip Generation Manual, 9th Edition, 2012.

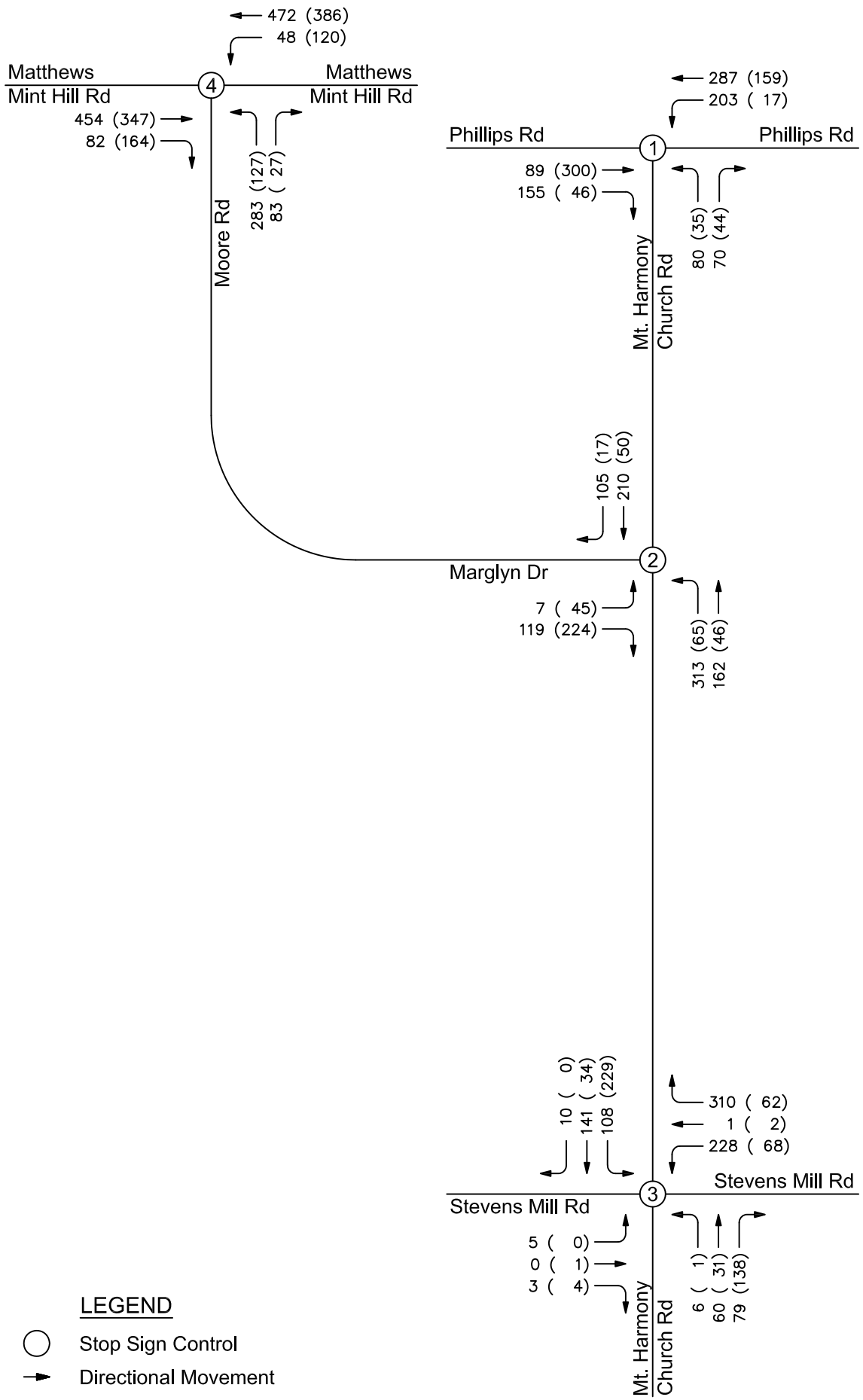
Table 2: Site Trip Generation

Land Use [ITE Code 230]			Weekday Daily	AM Peak Hour			PM Peak Hour		
				Enter	Exit	Total	Enter	Exit	Total
Townhomes	144	DUs	**837**	**11**	**52**	**63**	**50**	**25**	**75**

References: Trip Generation, 9th Edition, Institute of Transportation Engineers, Washington, DC. 2012.

The proposed buildout trip generation results indicate that the townhome development is expected to generate 63 AM peak hour trips and 75 PM peak hour trips.

The trip assignments for the 2020 morning and afternoon peak hour traffic volumes are presented in Figures 4 thru 6 (depending on scenario). The background traffic is indicated to the far left of the movement arrows, followed by the site traffic in parentheses. The one or two volumes (depending on scenario) are added to obtain the projected total traffic for that movement: Background + (Site) = Total.



DESIGN RESOURCE GROUP
LANDSCAPE ARCHITECTURE
CIVIL ENGINEERING
TRANSPORTATION PLANNING
O 2459 Wilkinson Blvd, Ste 200 Charlotte, NC 28208
P 704.343.0608
W www.drgrp.com

MT. HARMONY TOWNHOMES TIA

MATTHEWS, NC

2020 VENTURES, LLC
8905 PRIMULA DR.
GAITHERSBURG, MD 20882

2020 NO BUILD PEAK HOUR TRAFFIC VOLUMES

0 NTS N

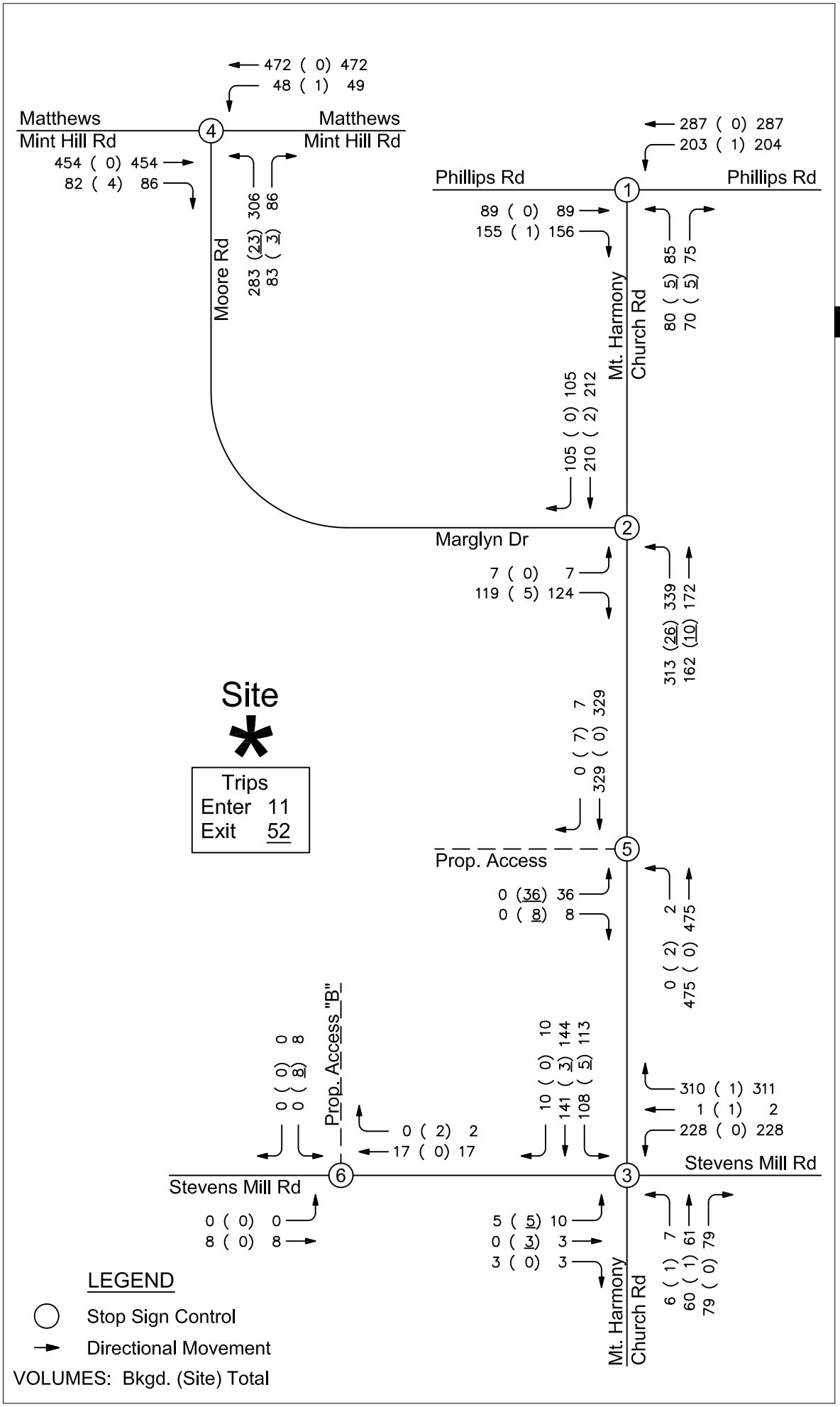
SCALE: NTS

PROJECT #: 659-004
DRAWN BY: JCZ
CHECKED BY: REG

OCTOBER 2017

REVISIONS:

Figure 4



DESIGN RESOURCE GROUP
LANDSCAPE ARCHITECTURE
CIVIL ENGINEERING
TRANSPORTATION PLANNING
O 2459 Wilkinson Blvd, Ste 200 Charlotte, NC 28208
P 704.343.0608
W www.drgrp.com

MT. HARMONY TOWNHOMES TIA

MATTHEWS, NC

2020 VENTURES, LLC
8905 PRIMULA DR.
GAITHERSBURG, MD 20882

2020 BUILD AM PEAK HOUR TRAFFIC VOLUMES

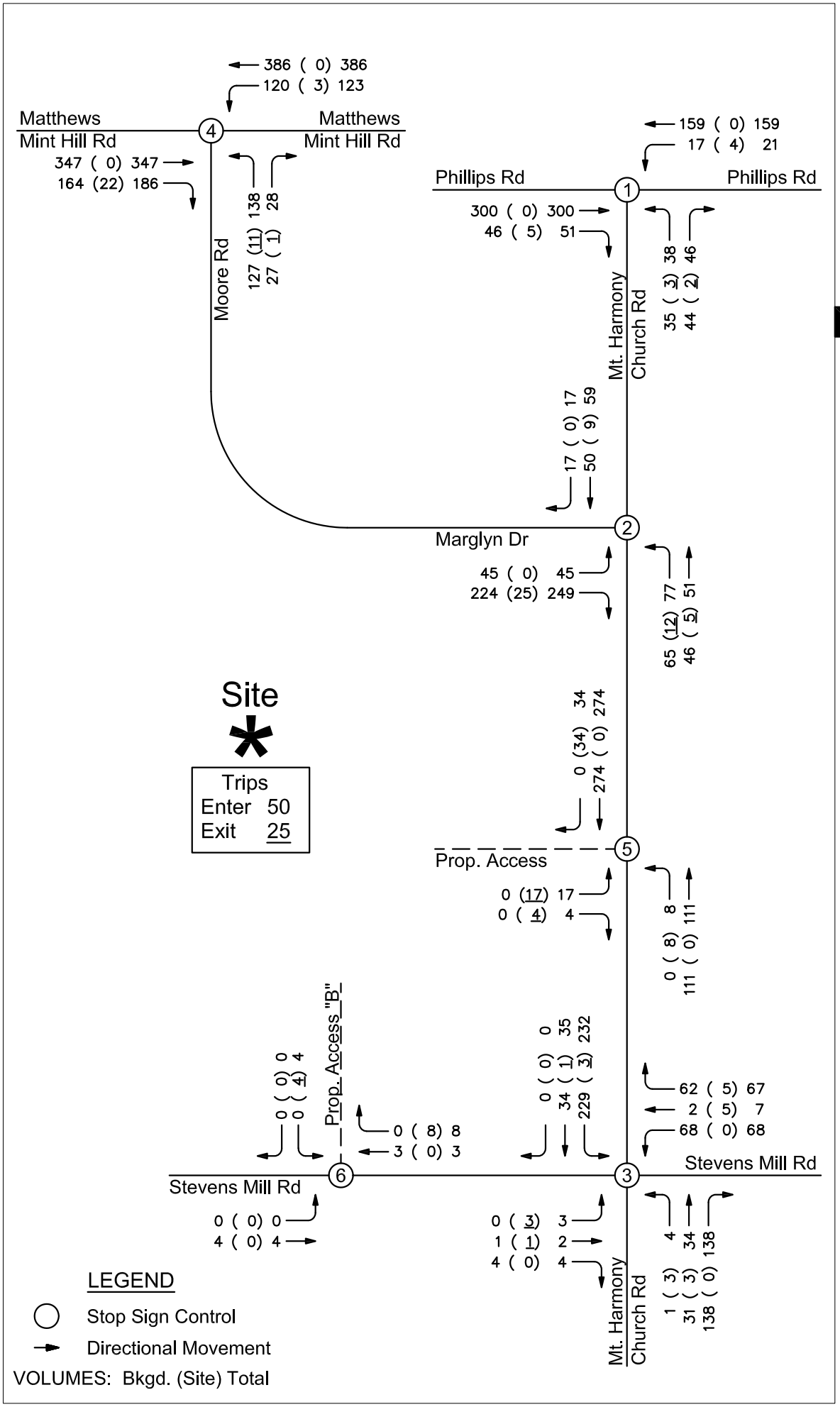
0 NTS N
SCALE: NTS

PROJECT #: 659-004
DRAWN BY: JCZ
CHECKED BY: REG

OCTOBER 2017

REVISIONS:

Figure 5



DESIGN RESOURCE GROUP
LANDSCAPE ARCHITECTURE
CIVIL ENGINEERING
TRANSPORTATION PLANNING
2459 Wilkinson Blvd, Ste 200 Charlotte, NC 28208
704.343.0608
www.drgrp.com

MT. HARMONY TOWNHOMES TIA

MATTHEWS, NC

2020 VENTURES, LLC
8905 PRIMULA DR.
GAITHERSBURG, MD 20882

2020 BUILD PM PEAK HOUR TRAFFIC VOLUMES

0 NTS
SCALE: NTS

PROJECT #: 659-004
DRAWN BY: JCZ
CHECKED BY: REG

OCTOBER 2017

REVISIONS:

Figure 6

TRAFFIC ANALYSIS

The intersections identified within the area of influence were analyzed to identify the traffic impact that the site development has under the build scenario. The traffic analysis is based on the LOS analysis at the identified intersections. The intersections were analyzed assuming buildout of the site in 2020.

LOS is a qualitative measurement of traffic operations. It is a measure of delay time. The Transportation Research Board's Highway Capacity Manual[1] (HCM) defines six levels of service for intersections with LOS "A" representing the best operating condition and LOS "F" the worst. The table below gives the criteria for both signalized and unsignalized intersections.

Intersection LOS	Signalized Intersection Control Delay per Vehicle (sec/vehicle)	Unsignalized Intersection Control Delay per Vehicle (sec/vehicle)
A	≤10.0	≤ 10.0
B	> 10.0 and ≤ 20.0	> 10.0 and ≤ 15.0
C	> 20.0 and ≤ 35.0	> 15.0 and ≤ 25.0
D	> 35.0 and ≤ 55.0	> 25.0 and ≤ 35.0
E	> 55.0 and ≤ 80.0	> 35.0 and ≤ 50.0
F	>80.0	> 50.0

SYNCHRO 9.1 was the software tool used in determining the delay, capacity and corresponding level of service at the study intersection. The intersection worksheet reports are provided in the Appendix.

This report provides analysis of the traffic operations within the area of influence, according to the standards set by the North Carolina Department of Transportation's (NCDOT) "Policy on Street and Driveway Access to North Carolina Highways, Chapter 4 Part C" and the Town of Matthews procedures (which follows NCDOT's guidelines). It provides intersection improvements needed for mitigating traffic impacts. This study evaluates the following scenarios:

- 2017 Existing Conditions
- 2020 No Build
- 2020 Build

An analysis software issue/limitation has been found of late where a higher traffic volume may calculate a better v/c or delay result for an approach or intersection (as well as a lower traffic volume calculating a worse v/c or delay result), whether the intersection is signalized or unsignalized. Theoretically, a volume increase should not produce better v/c or delay results (nor should a volume decrease produce a worse v/c or delay results). In addition, analysis results have also been found where the v/c or delay worsens with the addition of a turn lane at an intersection.

In order to account for the existing schools in the vicinity of the Mt. Harmony Townhomes project (i.e. Matthews Charter Academy, Butler High School, Stallings Elementary School, etc.), it should be noted that for all of the AM peak analyses the existing peak hour factor (phf) was

[1] National Research Council. Transportation Research Board. Highway Capacity Manual 6th Ed., Washington, DC. 2016.

utilized for the four existing intersections. For the PM peak hour, the standard 0.90 phf was used at all intersections in the 2020 analysis scenarios since schools dismiss considerably earlier than the typical afternoon "rush" (peak) hour.

Currently, the four existing unsignalized intersections operate with the following LOS:

- Phillips Road & Mt. Harmony Church Road - "E" in the AM peak hour and "B" in the PM peak hour
- Mt. Harmony Church Road & Marglyn Drive - "C" or better during both peak hours
- Mt. Harmony Church Road & Stevens Mill Road - "F" in the AM peak hour and "C" in the PM peak hour
- Matthews-Mint Hill Road & Moore Road - "F" in the AM peak hour and "C" in the PM peak hour

Typically, an intersection is said to be operating at capacity at a volume-to-capacity (v/c) ratio of 1.00 and acceptable at a LOS "D" or better. The results of the analysis scenarios are presented in Table 3.

Table 3: Levels of Service

Intersection	Intersection/ Approach	AM Peak			PM Peak		
		Delay (sec/veh)	Capacity (v/c)	LOS	Delay (sec/veh)	Capacity (v/c)	LOS
2017 Existing Conditions							
1. Phillips Rd. & Mt. Harmony Church Rd.		***35.6***	***261/367***	***E***	***12.5***	***110/592***	***B***
2. Mt. Harmony Church Rd. & Marglyn Dr.		***15.9***	***195/524***	***C***	***10.9***	***308/920***	***B***
3. Mt. Harmony Ch. Rd. & Stevens Mill Rd.		***119.0***	***643/551***	***F***	***17.2***	***139/432***	***C***
4. Matthews-Mint Hill Rd. & Moore Rd.		*******	***437/327***	***F***	***20.3***	***179/425***	***C***
2020 No Build							
1. Phillips Rd. & Mt. Harmony Church Rd.	***Intersection***	***50.1***	***279/339***	***F***	***12.4***	***88/572***	***B***
	Northbound	50.1	-	F	12.4	-	B
	Eastbound	0.0	-	A	0.0	-	A
	Westbound	4.7	-	A	0.9	-	A
2. Mt. Harmony Church Rd. & Marglyn Dr.	***Intersection***	***17.3***	***206/495***	***C***	***10.7***	***299/930***	***B***
	Northbound	8.4	-	A	4.5	-	A
	Southbound	0.0	-	A	0.0	-	A
	Eastbound	17.3	-	C	10.7	-	B
3. Mt. Harmony Church Rd. & Stevens Mill Rd.	***Intersection***	***170.6***	***682/526***	***F***	***16.3***	***147/463***	***C***
	Northbound	0.4	-	A	0.0	-	A
	Southbound	3.9	-	A	7.3	-	A
	Eastbound	31.0	-	D	10.4	-	B
	Westbound	170.6	-	F	16.3	-	C
4. Matthews-Mint Hill Rd. & Moore Rd. (unsignalized)	***Intersection***	*******	***463/302***	***F***	***20.0***	***171/423***	***C***
	Northbound	*	-	F	20.0	-	C
	Eastbound	0.0	-	A	0.0	-	A
	Westbound	1.0	-	A	2.2	-	A
4a. Matthews-Mint Hill Rd. & Moore Rd. (signalized)	***Intersection***	***20.6***	***0.76***	***C***	***11.9***	***0.37***	***B***
	Northbound	26.8	-	C	19.2	-	B
	Eastbound	21.8	-	C	11.6	-	B
	Westbound	15.4	-	B	10.0	-	A

Table 3: Levels of Service (cont.)

Intersection	Intersection/ Approach	AM Peak			PM Peak		
		Delay (sec/veh)	Capacity (v/c)	LOS	Delay (sec/veh)	Capacity (v/c)	LOS
2020 Build							
1. Phillips Rd. & Mt. Harmony Church Rd.	***Intersection***	***58.2***	***296/338***	***F***	***12.7***	***93/563***	***B***
	Northbound	58.2	-	F	12.7	-	B
	Eastbound	0.0	-	A	0.0	-	A
	Westbound	4.7	-	A	1.1	-	A
2. Mt. Harmony Church Rd. & Marglyn Dr.	***Intersection***	***19.0***	***214/469***	***C***	***11.1***	***327/913***	***B***
	Northbound	8.8	-	A	4.7	-	A
	Southbound	0.0	-	A	0.0	-	A
	Eastbound	19.0	-	C	11.1	-	B
3. Mt. Harmony Church Rd. & Stevens Mill Rd.	***Intersection***	***194.1***	***686/507***	***F***	***17.3***	***158/449***	***C***
	Northbound	0.4	-	A	0.2	-	A
	Southbound	4.0	-	A	7.3	-	A
	Eastbound	33.8	-	D	14.5	-	B
	Westbound	194.1	-	F	17.3	-	C
4. Matthews-Mint Hill Rd. & Moore Rd. (unsignalized)	***Intersection***	*******	***496/299***	***F***	***21.5***	***184/412***	***C***
	Northbound	*	-	F	21.5	-	C
	Eastbound	0.0	-	A	0.0	-	A
	Westbound	1.0	-	A	2.2	-	A
4a. Matthews-Mint Hill Rd. & Moore Rd. (signalized)	***Intersection***	***22.2***	***0.79***	***C***	***11.9***	***0.40***	***B***
	Northbound	27.0	-	C	19.9	-	B
	Eastbound	24.2	-	C	11.3	-	B
	Westbound	16.6	-	B	10.0	-	A
5. Mt. Harmony Church Rd. & Prop. Access "A"	***Intersection***	***17.3***	***49/342***	***C***	***11.5***	***23/575***	***B***
	Northbound	0.0	-	A	0.6	-	A
	Southbound	0.0	-	A	0.0	-	A
	Eastbound	17.3	-	C	11.5	-	B
6. Stevens Mill Rd. & Prop. Access "B"	***Intersection***	***8.7***	***9/986***	***A***	***8.6***	***4/1017***	***A***
	Southbound	8.7	-	A	8.6	-	A
	Eastbound	0.0	-	A	0.0	-	A
	Westbound	0.0	-	A	0.0	-	A

* Results are not meaningful (i.e. delay >180 sec. and/or v/c >1.50)

[1] Proposed Access includes 1 ingress lane + 1 egress lane (combined left-right lane)

Tables 4 shows the 2020 maximum queue lengths calculated by SimTraffic 9, a traffic simulation software application for unsignalized and signalized intersections.

Table 4: 2020 Vehicle Queue Lengths

Intersection/Approach		Existing Storage		AM Peak Queue Length (ft)			PM Peak Queue Length (ft)		
		Left	Right	Left	Thru	Right	Left	Thru	Right
2020 No Build									
1. Phillips Rd. & Mt. Harmony Church Rd.	NB	-	-	139'			74'		
	EB	-	-	-	0'		-	0'	
	WB	-	-	116'		-	31'		-
2. Mt. Harmony Church Rd. & Marglyn Dr.	NB	-	-	76'		-	27'		-
	SB	-	-	-	0'		-	0'	
	EB	-	-	55'			143'		
3. Mt. Harmony Church Rd. & Stevens Mill Rd.	NB	-	-	31'			22'		
	SB	-	-	55'			93'		
	EB	-	-	31'			30'		
	WB	-	-	266'			68'		
4. Matthews-Mint Hill Rd. & Moore Rd.	NB	Term.	50'	640'	-	75'	123'	-	75'
	EB	TWLTL	-	-	0'x2		-	0'x2	
	WB	135'+TWLTL	-	51'	0'	-	103'	0'	-
2020 Build									
1. Phillips Rd. & Mt. Harmony Church Rd.	NB	-	-	226'			55'		
	EB	-	-	-	0'		-	0'	
	WB	-	-	156'		-	54'		-
2. Mt. Harmony Church Rd. & Marglyn Dr.	NB	-	-	161'		-	31'		-
	SB	-	-	-	0'		-	0'	
	EB	-	-	79'			100'		
3. Mt. Harmony Church Rd. & Stevens Mill Rd.	NB	-	-	0'			22'		
	SB	-	-	54'			78'		
	EB	-	-	31'			31'		
	WB	-	-	357'			77'		
4. Matthews-Mint Hill Rd. & Moore Rd.	NB	Term.	50'	702'	-	75'	163'	-	78'
	EB	TWLTL	-	-	0'x2		-	0'x2	
	WB	135'+TWLTL	-	56'	0'	-	98'	0'	-
5. Mt. Harmony Church Rd. & Prop. Access "A" [1]	NB	-	-	0'		-	30'		-
	SB	-	-	-	0'		-	0'	
	EB	-	-	53'			31'		
6. Stevens Mill Rd. & Prop. Access "B"[1]	SB	-	-	31'			31'		
	EB	-	-	0'		-	0'		-
	WB	-	-	-	0'		-	0'	

[1] Proposed Access includes 1 ingress lane + 1 egress lane (combined left-right lane)

2020 Build Results/Suggested Recommendations:

When comparing the results of the 2020 No Build traffic and the 2020 Build traffic, all four of the unsignalized study intersections are within the allowable parameters during both peak hours.

ANALYSIS REQUIREMENTS - In order to determine the mitigation responsibility of the developer, this study compares 2020 Build results to the 2020 No Build results.

Chapter 5, Section J of the *July 2003 NCDOT Policy on Street and Driveway Access to North Carolina Highways,* the applicant shall be required to identify mitigation improvements to the roadway network if at least one of the following conditions exists when comparing base network conditions to project conditions:

- *The total average delay at an intersection or an individual approach increases by 25% or greater, while maintaining the same level of service,*
- *The Level of Service (LOS) degrades by at least one level at an intersection or an individual approach,*
- *Or the Level of Service is "F" for an intersection or an individual approach.*

This section of the access policy also states that, *mitigation improvements shall be identified when the analysis indicates that the 95th percentile queue exceeds the storage capacity of the existing lane.*

1. Phillips Road & Mt. Harmony Church Road (unsignalized)

When comparing the impact of the 2020 Build Scenario to the 2020 No Build conditions the intersection LOS remains an "F" in the AM peak hour and a "B" in the PM peak hour (all of the approaches remained the same LOS and were within the allowable increase in delay during both peak hours). The increase in intersection delay between the No Build and Build scenario is 16% in the AM peak hour and 2% in the PM peak hour. **Based on the results no roadway improvements should be deemed necessary.**

2. Mt. Harmony Church Road & Marglyn Drive (unsignalized)

When comparing the impact of the 2020 Build Scenario to the 2020 No Build conditions the intersection LOS remains a "C" in the AM peak hour and a "B" in the PM peak hour (all of the approaches remained the same LOS and were within the allowable increase in delay during both peak hours). The increase in intersection delay between the No Build and Build scenario is 10% in the AM peak hour and 4% in the PM peak hour. **Based on the results no roadway improvements should be deemed necessary.**

3. Mt. Harmony Church Road & Stevens Mill Road (unsignalized)

When comparing the impact of the 2020 Build Scenario to the 2020 No Build conditions the intersection LOS remains an "F" in the AM peak hour and a "C" in the PM peak hour (all of the approaches remained the same LOS and were within the allowable increase in delay during both peak hours). The increase in intersection delay between the No Build and Build scenario is 14% in the AM peak hour and 6% in the PM peak hour. **Based on the results no roadway improvements should be deemed necessary.**

4. Matthews-Mint Hill Road & Moore Road (unsignalized)

When comparing the impact of the 2020 Build Scenario to the 2020 No Build conditions the intersection LOS remains an "F" in the AM peak hour and a "C" in the PM peak hour (all of the approaches remained the same LOS and were within the allowable increase in delay during both peak hours). The increase in intersection delay between the No Build and Build scenario is not calculatable in the AM peak hour for both No Build and Build scenarios and 8% in the PM peak hour. **Based on the results no roadway improvements should be deemed necessary.**

A test improvement (per the Town of Matthews request) includes the introduction of a traffic signal to the intersection. With this test improvement in place, the intersection LOS is a "C" in the AM peak hour and a LOS "B" in the PM peak hour (matching the No Build results). **It should be at the Town of Matthews's/NCDOT's discretion to evaluate whether the possibility of a traffic signal is a viable improvement (and should not be the responsibility of the Mt. Harmony Townhomes project).**

5. Mt. Harmony Church Road & Proposed Access "A" (unsignalized)

The intersection operates with a LOS "C" in the AM peak hour and a LOS "B" in the PM peak hour with the following configuration:

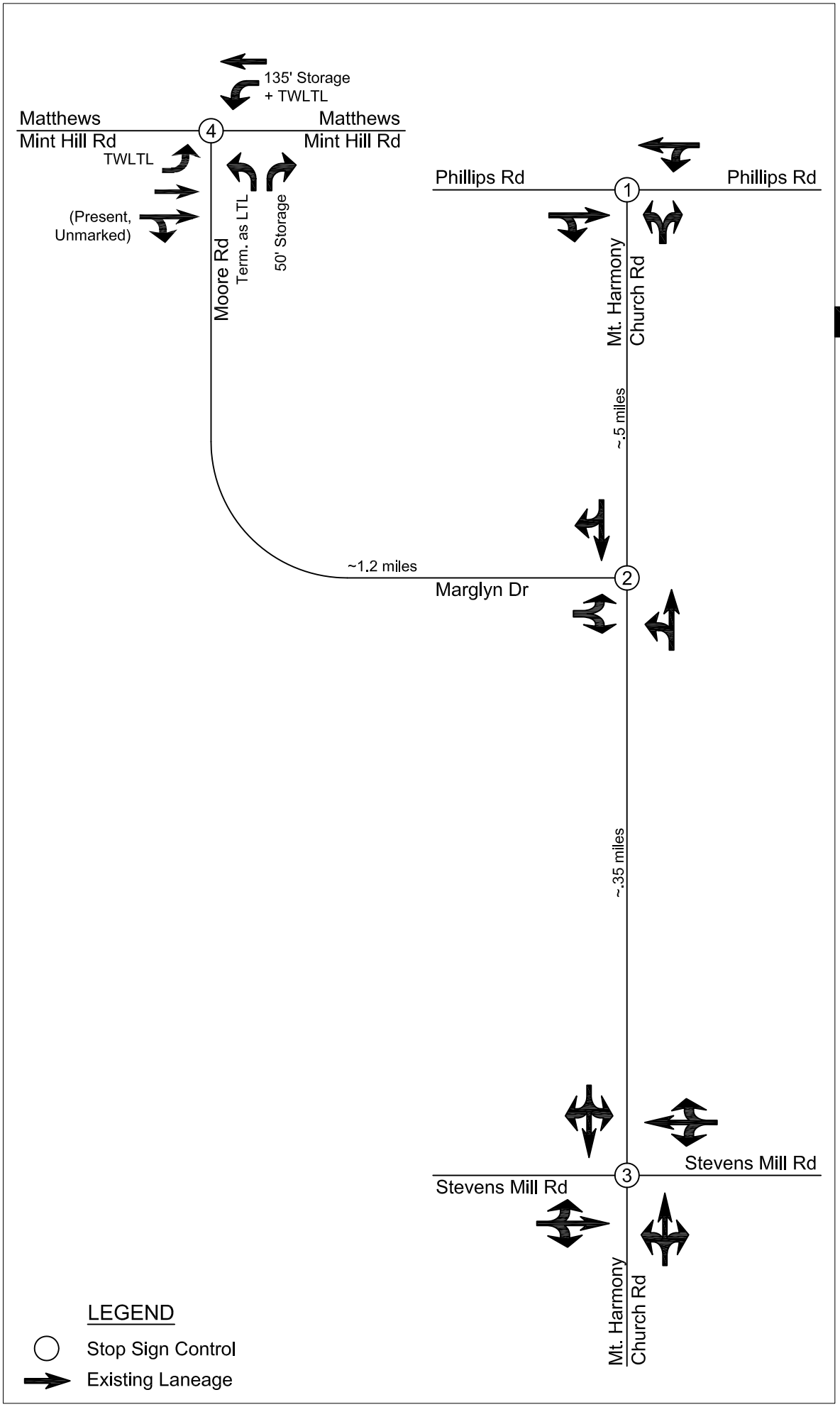
- Construct Proposed Access "A" with one ingress lane and one egress lane (combined left-right lane). Due to the minor amount of traffic associated with the site and on Mt. Harmony Church Road, we do not recommend left or right turn lanes on Mt. Harmony Church Road at the access.

6. Stevens Mill Road & Proposed Access "B" (unsignalized)

The intersection operates with a LOS "A" in both peak hours with the following configuration:

- Construct Proposed Access "B" with one ingress lane and one egress lane (combined left-right lane). Due to the minor amount of traffic associated with the site and on Stevens Mill Road, we do not recommend left or right turn lanes on Stevens Mill Road at the access.

The existing and suggested laneage is shown on Figures 7 and 8.



DESIGN RESOURCE GROUP
LANDSCAPE ARCHITECTURE
CIVIL ENGINEERING
TRANSPORTATION PLANNING
O 2459 Wilkinson Blvd, Ste 200 Charlotte, NC 28208
P 704.343.0608
W www.drgrp.com

MT. HARMONY TOWNHOMES TIA

MATTHEWS, NC

2020 VENTURES, LLC
8905 PRIMULA DR.
GAITHERSBURG, MD 20882

EXISTING LANEAGE

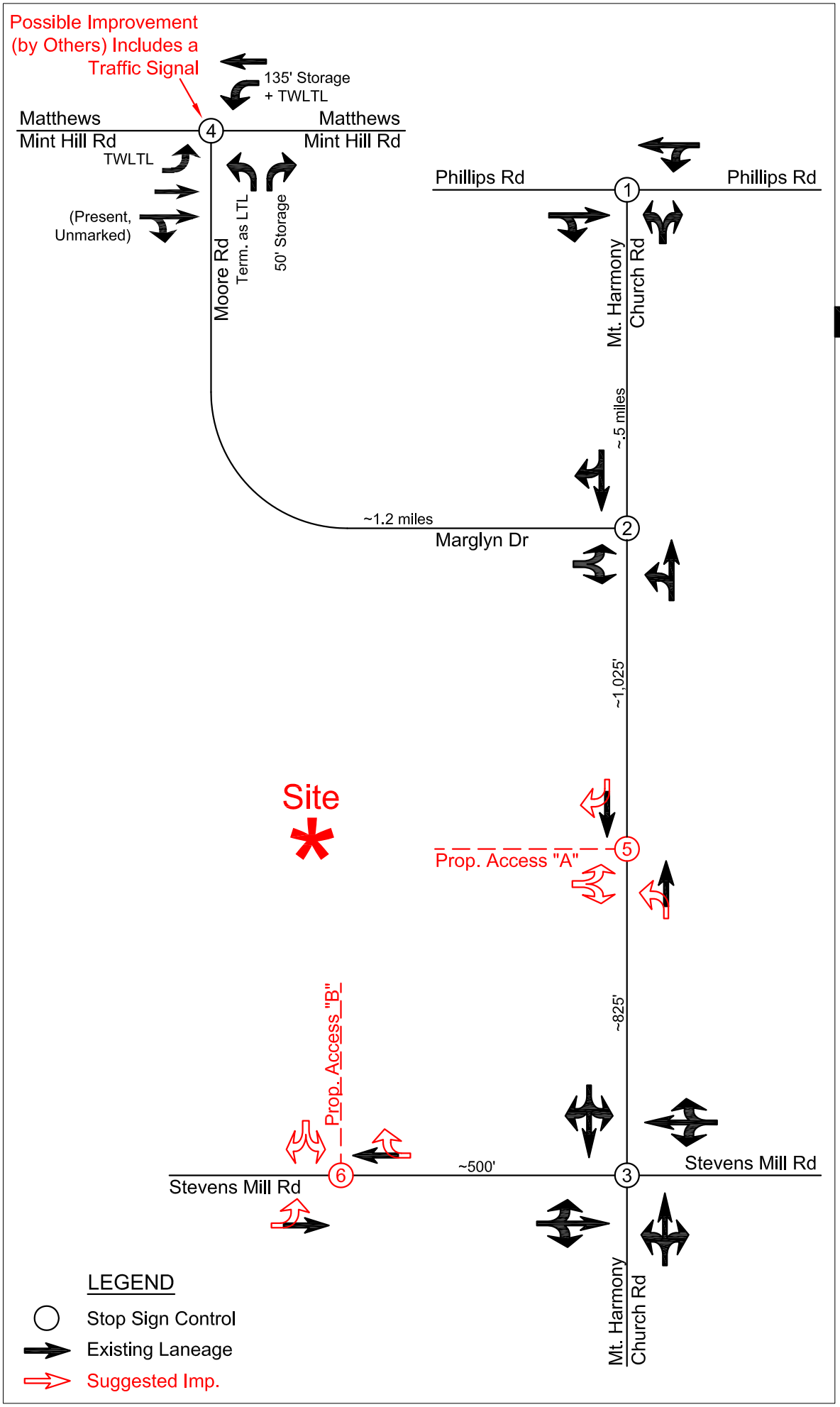
0 NTS N
SCALE: NTS

PROJECT #: 659-004
DRAWN BY: JCZ
CHECKED BY: REG

OCTOBER 2017

REVISIONS:

Figure 7



DESIGN RESOURCE GROUP
LANDSCAPE ARCHITECTURE
CIVIL ENGINEERING
TRANSPORTATION PLANNING
O 2459 Wilkinson Blvd, Ste 200 Charlotte, NC 28208
P 704.343.0608
W www.drgrp.com

MT. HARMONY TOWNHOMES TIA

MATTHEWS, NC

2020 VENTURES, LLC
8905 PRIMULA DR.
GAITHERSBURG, MD 20882

SUGGESTED LANEAGE

0 NTS N

SCALE: NTS

PROJECT #: 659-004
DRAWN BY: JCZ
CHECKED BY: REG

OCTOBER 2017

REVISIONS:

Figure 8

CONCLUSION

In conclusion, even though the Mt. Harmony Townhomes residential project will slightly increase the amount of traffic on the adjacent corridors the project will not materially impact adjacent roadways, intersections, or the general public traveling in the area if the site is developed according to the proposed plan and includes the suggested access configurations.

APPENDIX

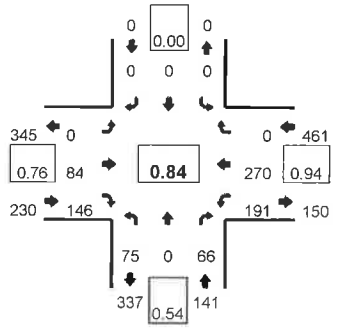
Type of peak hour being reported: Intersection Peak

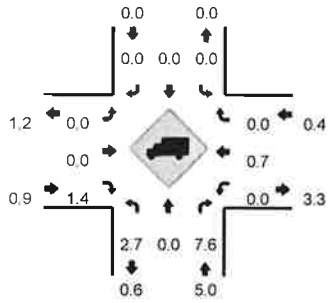
Method for determining peak hour: Total Entering Volume

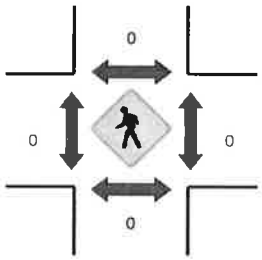
LOCATION: Mt Harmony Church Rd -- Phillips Rd
CITY/STATE: Matthews, NC

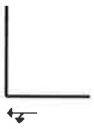
QC JOB #: 14503201
DATE: Thu, Sep 21 2017

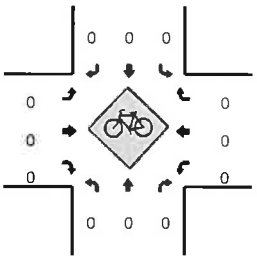
Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:30 AM -- 7:45 AM

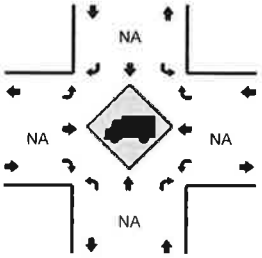


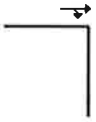


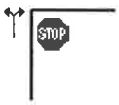


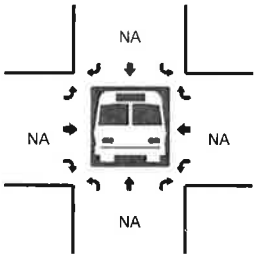












15-Min Count Period Beginning At	Mt Harmony Church Rd (Northbound)				Mt Harmony Church Rd (Southbound)				Phillips Rd (Eastbound)				Phillips Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:00 AM	0	0	0	0	0	0	0	0	0	4	2	0	0	12	0	0	18	
6:15 AM	1	0	3	0	0	0	0	0	0	13	3	0	6	17	0	0	43	
6:30 AM	3	0	1	0	0	0	0	0	0	8	18	0	5	19	0	0	54	
6:45 AM	1	0	2	0	0	0	0	0	0	12	16	0	19	48	0	0	98	213
7:00 AM	5	0	3	0	0	0	0	0	0	20	35	0	33	83	0	0	179	374
7:15 AM	19	0	17	0	0	0	0	0	0	19	57	0	64	59	0	0	235	566
7:30 AM	37	0	35	0	0	0	0	0	0	19	38	0	55	63	0	0	247	759
7:45 AM	14	0	11	0	0	0	0	0	0	26	16	0	39	65	0	0	171	832
8:00 AM	14	0	8	0	0	0	0	0	0	9	11	0	21	76	0	0	139	792
8:15 AM	11	0	3	0	0	0	0	0	0	13	2	0	13	60	0	0	102	659
8:30 AM	3	0	10	0	0	0	0	0	0	13	2	0	14	55	0	0	97	509
8:45 AM	8	0	10	0	0	0	0	0	0	10	7	0	7	40	0	0	82	420

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	148	0	140	0	0	0	0	0	0	76	152	0	220	252	0	0	988
Heavy Trucks	8	0	8		0	0	0		0	0	4		0	4	0		24
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 9/27/2017 12:40 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

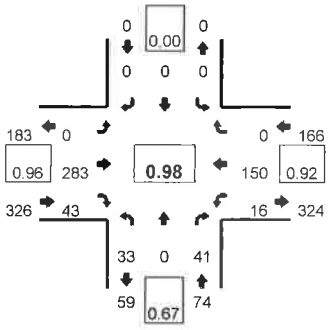
Type of peak hour being reported: Intersection Peak

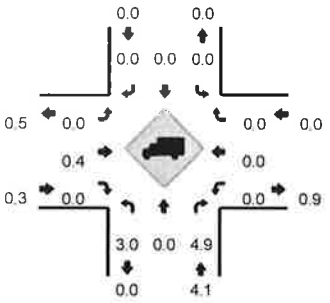
Method for determining peak hour: Total Entering Volume

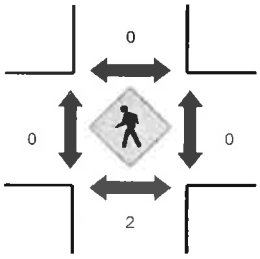
LOCATION: Mt Harmony Church Rd -- Phillips Rd
CITY/STATE: Matthews, NC

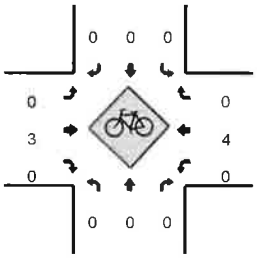
QC JOB #: 14503202
DATE: Thu, Sep 21 2017

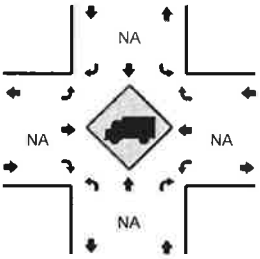
Peak-Hour: 4:45 PM -- 5:45 PM
Peak 15-Min: 5:00 PM -- 5:15 PM

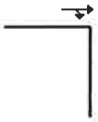


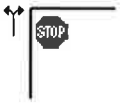


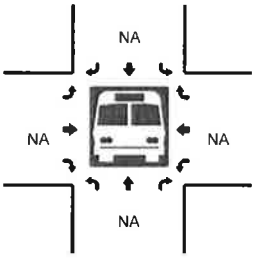












15-Min Count Period Beginning At	Mt Harmony Church Rd (Northbound)				Mt Harmony Church Rd (Southbound)				Phillips Rd (Eastbound)				Phillips Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	10	0	7	0	0	0	0	0	0	44	7	0	9	23	0	0	100	
4:15 PM	9	0	3	0	0	0	0	0	0	47	1	0	5	40	0	0	105	
4:30 PM	8	0	13	0	0	0	0	0	0	64	7	0	12	29	0	0	133	
4:45 PM	3	0	9	0	0	0	0	0	0	74	11	0	5	35	0	0	137	475
5:00 PM	16	0	14	0	0	0	0	0	0	65	13	0	3	34	0	0	145	520
5:15 PM	7	0	10	0	0	0	0	0	0	72	11	0	5	40	0	0	145	560
5:30 PM	7	0	8	0	0	0	0	0	0	72	8	0	3	41	0	0	139	566
5:45 PM	4	0	12	0	0	0	0	0	0	72	11	0	5	29	0	0	133	562
6:00 PM	9	0	4	0	0	0	0	0	0	46	9	0	4	29	0	0	101	518
6:15 PM	2	0	10	0	0	0	0	0	0	52	8	0	6	41	0	0	119	492
6:30 PM	8	0	3	0	0	0	0	0	0	45	5	0	4	25	0	0	90	443
6:45 PM	2	0	2	0	0	0	0	0	0	47	5	0	6	20	0	0	82	392

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	64	0	56	0	0	0	0	0	0	260	52	0	12	136	0	0	580
Heavy Trucks	0	0	4		0	0	0		0	0	0		0	0	0		4
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 9/27/2017 12:40 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

2

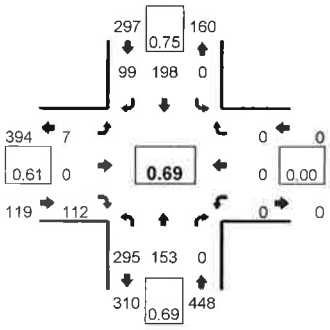
Type of peak hour being reported: Intersection Peak

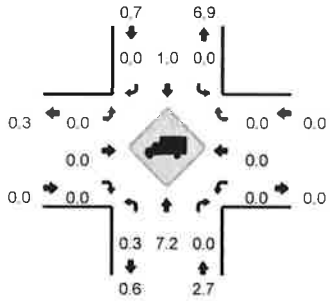
Method for determining peak hour: Total Entering Volume

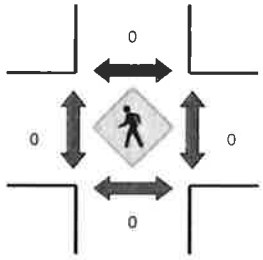
LOCATION: Mt Harmony Church Rd -- Marglyn Dr
CITY/STATE: Matthews, NC

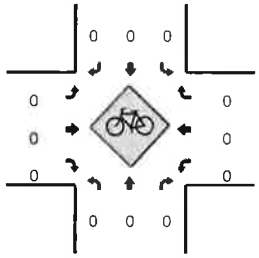
QC JOB #: 14503203
DATE: Thu, Sep 21 2017

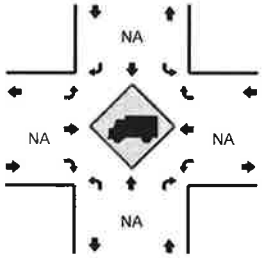
Peak-Hour: 7:15 AM -- 8:15 AM
Peak 15-Min: 7:30 AM -- 7:45 AM

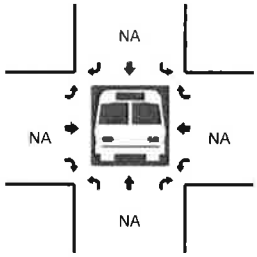












15-Min Count Period Beginning At	Mt Harmony Church Rd (Northbound)				Mt Harmony Church Rd (Southbound)				Marglyn Dr (Eastbound)				Marglyn Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:00 AM	3	0	0	0	0	2	1	0	0	0	1	0	0	0	0	0	7	
6:15 AM	12	1	0	0	0	7	0	0	3	0	8	0	0	0	0	0	31	
6:30 AM	8	2	0	0	0	20	3	0	1	0	3	0	0	0	0	0	37	
6:45 AM	17	3	0	0	0	32	5	0	1	0	9	0	0	0	0	0	67	142
7:00 AM	28	3	0	0	0	65	8	0	0	0	18	0	0	0	0	0	122	257
7:15 AM	58	42	0	0	0	97	15	0	1	0	32	0	0	0	0	0	245	471
7:30 AM	94	68	0	0	0	69	29	0	1	0	51	0	0	0	0	0	312	746
7:45 AM	85	21	0	0	0	17	36	0	2	0	21	0	0	0	0	0	182	861
8:00 AM	58	22	0	0	0	15	19	0	3	0	8	0	0	0	0	0	125	864
8:15 AM	40	13	0	0	0	4	13	0	0	0	13	0	0	0	0	0	83	702
8:30 AM	29	7	0	0	0	8	4	0	6	0	5	0	0	0	0	0	59	449
8:45 AM	16	14	0	0	0	7	11	1	5	0	8	0	0	0	0	0	62	329

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	376	272	0	0	0	276	116	0	4	0	204	0	0	0	0	0	1248
Heavy Trucks	4	12	0		0	4	0		0	0	0		0	0	0		20
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 9/27/2017 12:40 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

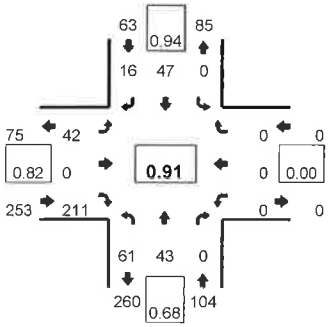
Type of peak hour being reported: Intersection Peak

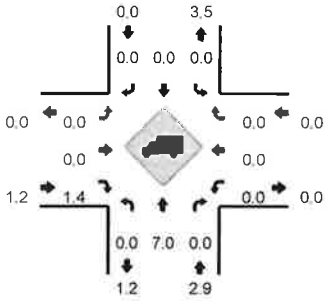
Method for determining peak hour: Total Entering Volume

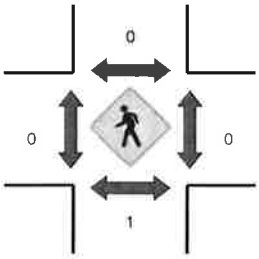
LOCATION: Mt Harmony Church Rd -- Marglyn Dr
CITY/STATE: Matthews, NC

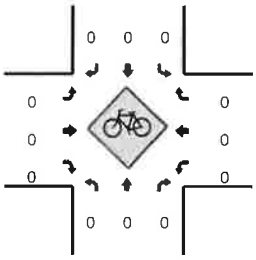
QC JOB #: 14503204
DATE: Thu, Sep 21 2017

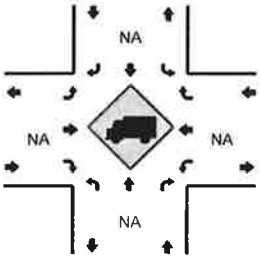
Peak-Hour: 4:45 PM -- 5:45 PM
Peak 15-Min: 5:15 PM -- 5:30 PM

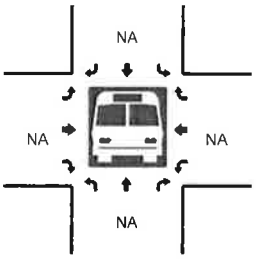












15-Min Count Period Beginning At	Mt Harmony Church Rd (Northbound)				Mt Harmony Church Rd (Southbound)				Marglyn Dr (Eastbound)				Marglyn Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	3	13	0	0	0	10	8	0	5	0	29	0	0	0	0	0	68	
4:15 PM	12	7	0	0	0	7	3	0	5	0	24	0	0	0	0	0	58	
4:30 PM	6	14	0	0	0	10	8	0	8	0	40	0	0	0	0	0	86	
4:45 PM	14	8	0	1	0	14	4	0	8	0	47	0	0	0	0	0	96	308
5:00 PM	17	21	0	0	0	14	3	0	12	0	47	0	0	0	0	0	114	354
5:15 PM	14	9	0	0	0	12	3	0	9	0	68	0	0	0	0	0	115	411
5:30 PM	14	5	0	1	0	7	6	0	13	0	49	0	0	0	0	0	95	420
5:45 PM	15	4	0	0	0	10	3	0	11	0	33	0	0	0	0	0	76	400
6:00 PM	12	6	0	0	0	6	5	0	5	0	41	0	0	0	0	0	75	361
6:15 PM	5	4	0	0	0	6	7	0	7	0	29	0	0	0	0	0	58	304
6:30 PM	13	6	0	0	0	8	3	0	5	0	21	0	0	0	0	0	56	265
6:45 PM	6	2	0	0	0	5	2	0	3	0	18	0	0	0	0	0	36	225

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	56	36	0	0	0	48	12	0	36	0	272	0	0	0	0	0	460
Heavy Trucks	0	4	0		0	0	0		0	0	8		0	0	0		12
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 9/27/2017 12:40 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

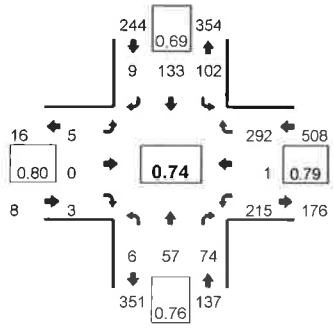
Type of peak hour being reported: Intersection Peak

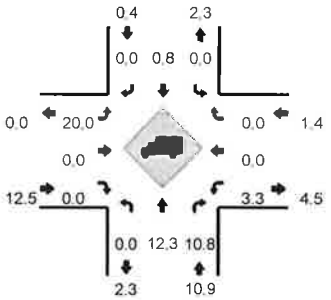
Method for determining peak hour: Total Entering Volume

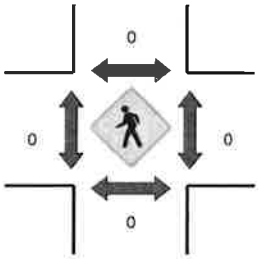
LOCATION: Mt Harmony Church Rd -- Stevens Mill Rd
CITY/STATE: Matthews, NC

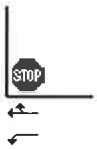
QC JOB #: 14503205
DATE: Thu, Sep 21 2017

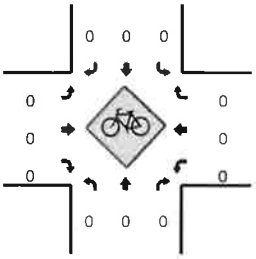
Peak-Hour: 7:15 AM -- 8:15 AM
Peak 15-Min: 7:30 AM -- 7:45 AM

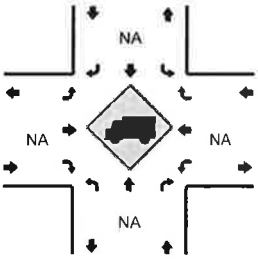


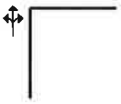


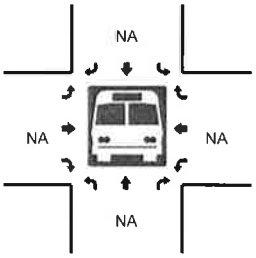












15-Min Count Period Beginning At	Mt Harmony Church Rd (Northbound)				Mt Harmony Church Rd (Southbound)				Stevens Mill Rd (Eastbound)				Stevens Mill Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:00 AM	0	0	2	0	1	1	0	0	0	1	1	0	15	0	4	0	25	
6:15 AM	2	3	5	0	3	3	2	0	1	0	0	0	24	5	10	0	58	
6:30 AM	4	7	4	0	2	13	2	0	0	0	1	0	25	1	10	0	69	
6:45 AM	2	7	5	0	9	13	4	0	1	0	2	0	34	0	26	0	103	255
7:00 AM	2	9	18	0	16	14	8	0	1	0	3	0	42	2	34	0	149	379
7:15 AM	2	12	30	0	40	32	2	0	1	0	1	0	61	0	65	0	246	567
7:30 AM	0	28	19	0	48	46	0	0	0	0	0	0	66	1	94	0	302	800
7:45 AM	2	7	13	0	11	38	4	0	1	0	1	0	50	0	72	0	199	896
8:00 AM	2	10	12	0	3	17	3	0	3	0	1	0	38	0	61	0	150	897
8:15 AM	2	8	7	0	7	9	2	0	1	1	2	0	29	0	41	0	109	760
8:30 AM	0	4	10	0	4	6	3	0	2	1	0	0	20	0	25	0	75	533
8:45 AM	1	7	7	0	8	3	1	0	2	2	1	0	17	0	16	0	65	399

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	112	76	0	192	184	0	0	0	0	0	0	264	4	376	0	1208
Heavy Trucks	0	8	0		0	0	0		0	0	0		4	0	0		12
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 9/27/2017 12:40 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

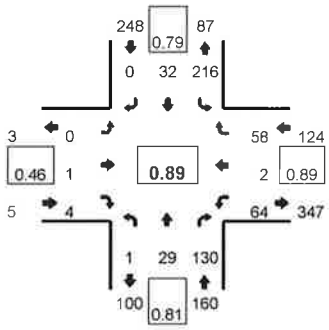
Type of peak hour being reported: Intersection Peak

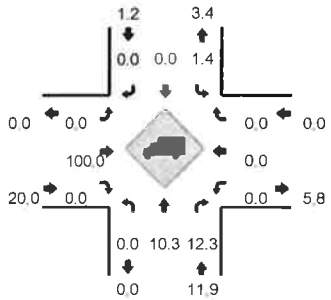
Method for determining peak hour: Total Entering Volume

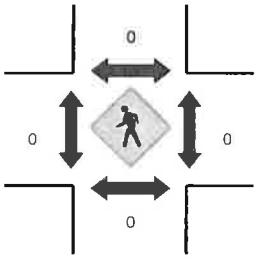
LOCATION: Mt Harmony Church Rd -- Stevens Mill Rd
CITY/STATE: Matthews, NC

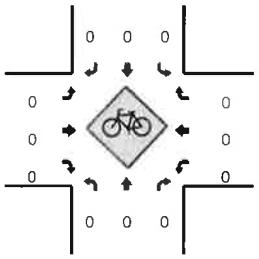
QC JOB #: 14503206
DATE: Thu, Sep 21 2017

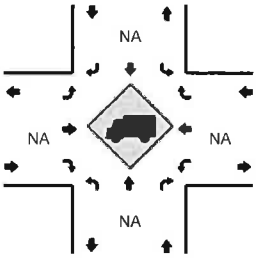
Peak-Hour: 4:45 PM -- 5:45 PM
Peak 15-Min: 5:15 PM -- 5:30 PM

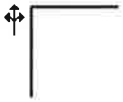


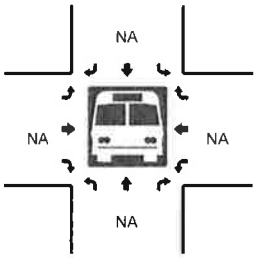












15-Min Count Period Beginning At	Mt Harmony Church Rd (Northbound)				Mt Harmony Church Rd (Southbound)				Stevens Mill Rd (Eastbound)				Stevens Mill Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	5	24	0	25	14	2	0	1	4	2	0	8	1	8	0	94	
4:15 PM	0	4	13	1	25	9	0	0	0	0	1	0	7	0	17	0	77	
4:30 PM	0	5	33	0	29	16	0	0	2	1	1	0	15	0	11	0	113	
4:45 PM	0	7	25	0	47	9	0	0	0	1	0	0	16	1	11	0	117	401
5:00 PM	0	11	39	0	45	12	0	0	0	0	3	0	14	0	21	0	145	452
5:15 PM	0	5	32	0	72	6	0	0	0	0	1	0	21	0	14	0	151	526
5:30 PM	1	6	34	0	52	5	0	0	0	0	0	0	13	1	12	0	124	537
5:45 PM	0	5	29	0	41	6	1	0	0	2	0	0	12	0	13	0	109	529
6:00 PM	1	6	31	0	44	3	0	0	0	0	0	0	7	0	12	0	104	488
6:15 PM	0	0	19	0	26	5	2	0	0	1	1	0	9	0	7	0	70	407
6:30 PM	0	4	14	0	23	7	0	0	0	0	1	0	6	0	14	0	69	352
6:45 PM	1	2	26	0	17	3	1	0	0	2	0	0	14	0	6	0	72	315

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	20	128	0	288	24	0	0	0	0	4	0	84	0	56	0	604
Heavy Trucks	0	4	16		8	0	0		0	0	0		0	0	0		28
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 9/27/2017 12:40 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

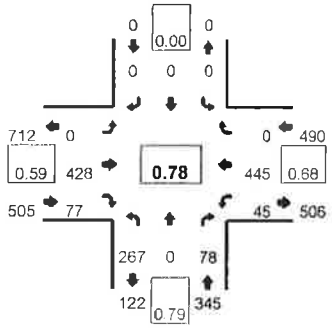
Type of peak hour being reported: Intersection Peak

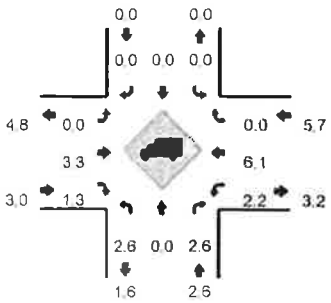
Method for determining peak hour: Total Entering Volume

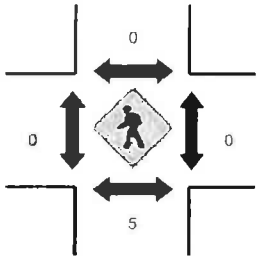
LOCATION: Moore Rd -- Matthews-Mint Hill Rd
CITY/STATE: Matthews, NC

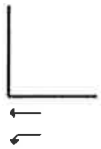
QC JOB #: 14271603
DATE: Thu, Apr 20 2017

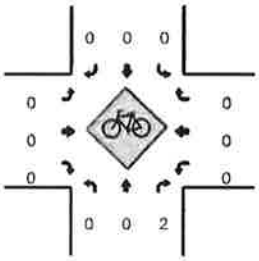
Peak-Hour: 6:45 AM -- 7:45 AM
Peak 15-Min: 6:55 AM -- 7:10 AM

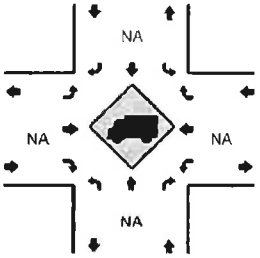


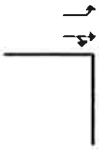


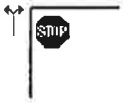


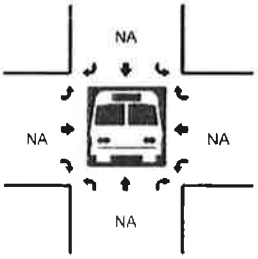












5-Min Count Period Beginning At	Moore Rd (Northbound)				Moore Rd (Southbound)				Matthews-Mint Hill Rd (Eastbound)				Matthews-Mint Hill Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:15 AM	5	0	0	0	0	0	0	0	0	5	0	0	0	11	0	0	21	
6:20 AM	6	0	1	0	0	0	0	0	0	10	1	0	1	15	0	0	34	
6:25 AM	8	0	4	0	0	0	0	0	0	19	2	0	2	20	0	0	55	
6:30 AM	11	0	4	0	0	0	0	0	0	17	3	0	1	25	0	0	61	
6:35 AM	8	0	1	0	0	0	0	0	0	23	3	0	1	19	0	0	55	
6:40 AM	9	0	3	0	0	0	0	0	0	29	6	0	2	27	0	0	76	
6:45 AM	**7**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**49**	**5**	**0**	**1**	**38**	**0**	**0**	**102**	
6:50 AM	**12**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**54**	**6**	**0**	**4**	**41**	**0**	**0**	**121**	
6:55 AM	**3**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**58**	**4**	**0**	**6**	**48**	**0**	**0**	**122**	**717**
7:00 AM	**14**	**0**	**14**	**0**	**0**	**0**	**0**	**0**	**0**	**97**	**5**	**0**	**2**	**38**	**0**	**0**	**170**	**862**
7:05 AM	**12**	**0**	**15**	**0**	**0**	**0**	**0**	**0**	**0**	**47**	**3**	**0**	**2**	**60**	**0**	**0**	**139**	**982**
7:10 AM	**10**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**29**	**1**	**0**	**8**	**67**	**0**	**0**	**118**	**1074**
7:15 AM	**20**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**23**	**10**	**0**	**3**	**42**	**0**	**0**	**103**	**1156**
7:20 AM	**32**	**0**	**11**	**0**	**0**	**0**	**0**	**0**	**0**	**14**	**5**	**0**	**2**	**25**	**0**	**0**	**89**	**1211**
7:25 AM	**35**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**20**	**8**	**0**	**5**	**18**	**0**	**0**	**89**	**1245**
7:30 AM	**35**	**0**	**6**	**0**	**0**	**0**	**0**	**0**	**0**	**12**	**13**	**0**	**4**	**29**	**0**	**0**	**99**	**1283**
7:35 AM	**43**	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**15**	**4**	**0**	**8**	**16**	**0**	**0**	**91**	**1319**
7:40 AM	**44**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**12**	**13**	**0**	**2**	**23**	**0**	**0**	**97**	**1340**
7:45 AM	44	0	10	0	0	0	0	0	0	11	7	0	1	23	0	0	96	1334
7:50 AM	33	0	6	0	0	0	0	0	0	16	6	0	3	26	0	0	90	1303
7:55 AM	34	0	3	0	0	0	0	0	0	16	4	0	3	20	0	0	80	1261
8:00 AM	34	0	3	0	0	0	0	0	0	11	2	0	3	27	0	0	80	1171
8:05 AM	30	0	4	0	0	0	0	0	0	6	5	0	2	15	0	0	62	1094
8:10 AM	27	0	2	0	0	0	0	0	0	12	2	0	1	22	0	0	66	1042

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	116	0	136	0	0	0	0	0	0	800	48	0	40	584	0	0	1724
Heavy Trucks	4	0	4		0	0	0		0	8	0		0	12	0		28
Pedestrians		16				0				0				0			16
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 4/26/2017 6:45 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

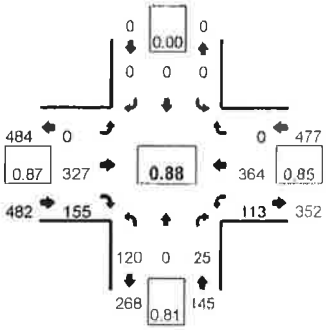
Type of peak hour being reported: Intersection Peak

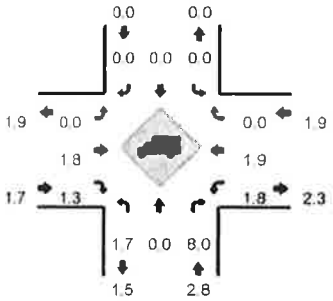
Method for determining peak hour: Total Entering Volume

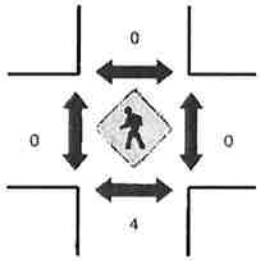
LOCATION: Moore Rd -- Matthews-Mint Hill Rd
CITY/STATE: Matthews, NC

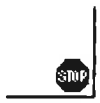
QC JOB #: 14271604
DATE: Thu, Apr 20 2017

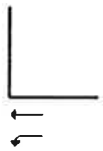
Peak-Hour: 4:55 PM -- 5:55 PM
Peak 15-Min: 5:20 PM -- 5:35 PM

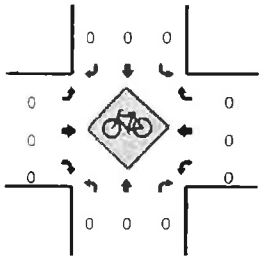


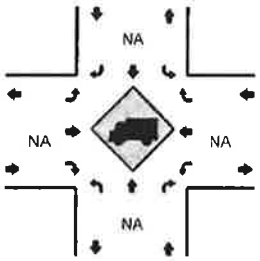


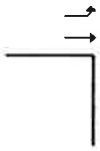


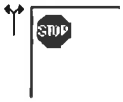


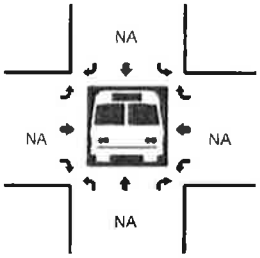












5-Min Count Period Beginning At	Moore Rd (Northbound)				Moore Rd (Southbound)				Matthews-Mint Hill Rd (Eastbound)				Matthews-Mint Hill Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:25 PM	7	0	5	0	0	0	0	0	0	28	8	0	5	22	0	0	75	
4:30 PM	12	0	3	0	0	0	0	0	0	19	7	0	6	31	0	0	78	
4:35 PM	9	0	4	0	0	0	0	0	0	26	11	0	5	23	0	0	78	
4:40 PM	6	0	2	0	0	0	0	0	0	27	8	0	7	27	0	0	77	
4:45 PM	13	0	3	0	0	0	0	0	0	29	8	0	3	30	0	0	86	
4:50 PM	4	0	2	0	0	0	0	0	0	23	13	0	4	27	0	0	73	
4:55 PM	**14**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**21**	**9**	**0**	**10**	**24**	**0**	**0**	**81**	**938**
5:00 PM	**12**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**23**	**10**	**0**	**5**	**31**	**0**	**0**	**84**	**945**
5:05 PM	**6**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**30**	**12**	**0**	**10**	**29**	**0**	**0**	**89**	**958**
5:10 PM	**10**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**27**	**12**	**0**	**14**	**36**	**0**	**0**	**100**	**978**
5:15 PM	**9**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**34**	**20**	**0**	**3**	**29**	**0**	**0**	**96**	**1006**
5:20 PM	**10**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**29**	**13**	**0**	**15**	**39**	**0**	**0**	**109**	**1026**
5:25 PM	**10**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**24**	**18**	**0**	**11**	**35**	**0**	**0**	**99**	**1050**
5:30 PM	**6**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**39**	**10**	**0**	**7**	**40**	**0**	**0**	**105**	**1077**
5:35 PM	**10**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**27**	**9**	**0**	**12**	**24**	**0**	**0**	**84**	**1083**
5:40 PM	**11**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**23**	**16**	**0**	**10**	**29**	**0**	**0**	**92**	**1098**
5:45 PM	**11**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**27**	**11**	**0**	**9**	**30**	**0**	**0**	**91**	**1103**
5:50 PM	**11**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**23**	**15**	**0**	**7**	**18**	**0**	**0**	**74**	**1104**
5:55 PM	6	0	1	0	0	0	0	0	0	18	10	0	4	28	0	0	67	1090
6:00 PM	8	0	3	0	0	0	0	0	0	22	11	0	11	38	0	0	93	1099
6:05 PM	10	0	1	0	0	0	0	0	0	18	7	0	2	24	0	0	62	1072
6:10 PM	16	0	2	0	0	0	0	0	0	18	12	0	9	56	0	0	113	1085
6:15 PM	12	0	2	0	0	0	0	0	0	18	7	0	10	34	0	0	83	1072
6:20 PM	10	0	5	0	0	0	0	0	0	21	7	0	8	35	0	0	86	1049

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	104	0	28	0	0	0	0	0	0	368	164	0	132	456	0	0	1252
Heavy Trucks	0	0	0		0	0	0		0	8	0		0	16	0		24
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 4/26/2017 6:45 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Peak Growth

AM Peak Approach		2017 Movement Left	2017 Movement Thru	2017 Movement Right	2020 Growth: 2% per year Movement Left	2020 Growth: 2% per year Movement Thru	2020 Growth: 2% per year Movement Right
1. Phillips Rd & Mt Harmony Ch Rd							
Mt Harmony Ch	NB	75		66	80	0	70
Phillips	EB		84	146	0	89	155
	SB				0	0	0
Phillips	WB	191	270		203	287	0
2. Mt Harmony Ch Rd & Marglyn Dr							
Mt Harmony Ch	NB	295	153		313	162	0
Marglyn	EB	7		112	7	0	119
Mt Harmony Ch	SB		198	99	0	210	105
	WB				0	0	0
3. Mt Harmony Ch Rd & Stevens Mill Rd							
Mt Harmony Ch	NB	6	57	74	6	60	79
Stevens Mill Rd	EB	5	0	3	5	0	3
Mt Harmony Ch	SB	102	133	9	108	141	10
Stevens Mill Rd	WB	215	1	292	228	1	310
4. Matthews Mint Hill Rd & Moore Rd							
Moore	NB	267		78	283	0	83
Matthews Mint Hill	EB		428	77	0	454	82
	SB				0	0	0
Matthews Mint Hill	WB	45	445		48	472	0

AM Peak Approach		2017 Movement Left	2017 Movement Thru	2017 Movement Right	2020 Growth: 2% per year Movement Left	2020 Growth: 2% per year Movement Thru	2020 Growth: 2% per year Movement Right
1. Phillips Rd & Mt Harmony Ch Rd							
Mt Harmony Ch	NB	33		41	35	0	44
Phillips	EB		283	43	0	300	46
	SB				0	0	0
Phillips	WB	16	150		17	159	0
2. Mt Harmony Ch Rd & Marglyn Dr							
Mt Harmony Ch	NB	61	43		65	46	0
Marglyn	EB	42		211	45	0	224
Mt Harmony Ch	SB		47	16	0	50	17
	WB				0	0	0
3. Mt Harmony Ch Rd & Stevens Mill Rd							
Mt Harmony Ch	NB	1	29	130	1	31	138
Stevens Mill Rd	EB	0	1	4	0	1	4
Mt Harmony Ch	SB	216	32	0	229	34	0
Stevens Mill Rd	WB	64	2	58	68	2	62
4. Matthews Mint Hill Rd & Moore Rd							
Moore	NB	120		25	127	0	27
Matthews Mint Hill	EB		327	155	0	347	164
	SB				0	0	0
Matthews Mint Hill	WB	113	364		120	386	0

1 - Phillips & Mt Harmony Ch

STOP

2 - Mt Harmony Ch & Marglyn

STOP

3 - Mt Harmony Ch & Stevens Mill

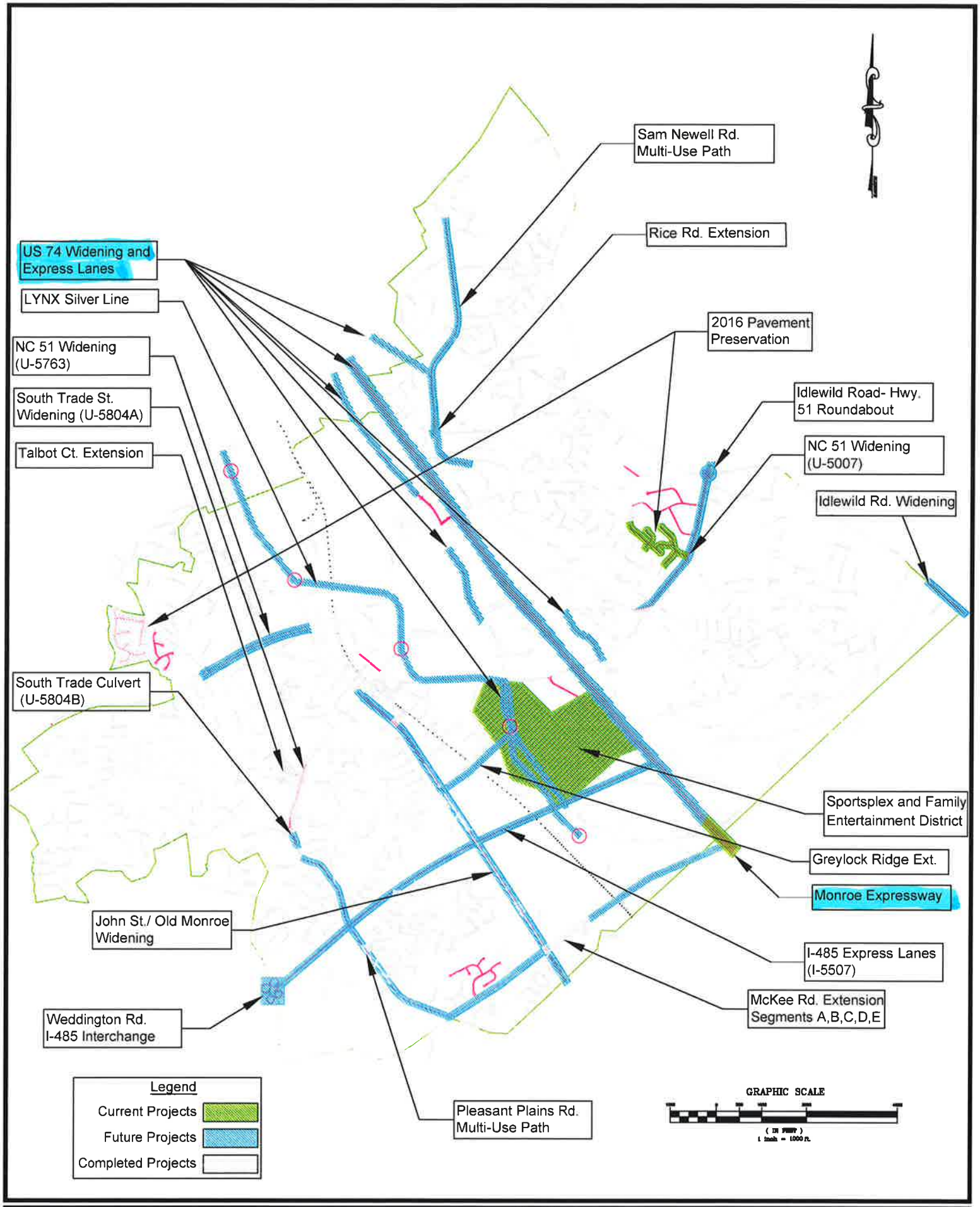
Stop

← 135' + TWLTL

4 - Matthews-Mint Hill & Moore

TWLTL →

Term. 50' (25')



1 of 1		Transportation Projects 2017		N.T.S	6/26/17	CJO	CJO	REVISION	DATE	DESCRIPTION	BY
		TOWN OF MATTHEWS PUBLIC WORKS DEPARTMENT 1600 TANK TOWN RD., MATTHEWS, NC 28105	Town of Matthews Public Works								

Town of Matthews Public Works

Transportation Project Status
September 21, 2017

Current as of September 21, 2017

Below is the current status of the project currently proposed or underway. Please note that all completion dates are tentative and are highly dependent on weather conditions. Portions changed since May 2017 are highlighted in yellow.

Note: All project with FY in their date are based on the Federal Fiscal Year, which runs from October1 of the previous year to September 30 of its listed year.

Current Projects

Idlewild and Hwy. 51 Roundabout (U-5115)- NCDOT project. Construction began on June 19, 2017 and required the closing of the intersection starting June 23. Intersection was opened August 26 and is substantially complete. Matthews and Mint Hill are partnering to beautify the center of the island. This portion of the project is expected to be done in the winter of 2017. The roundabout was designed to accommodate the future widening of NC 51 (U-5007). Construction estimates are around $1.6M. Matthews and Mint Hill were originally responsible for a combined 20% match (estimated at $162,500 each), plus the cost of additional amenities such as lighting, gateway signs, etc.; and any cost overruns. Bids opened on June 7, 2017 were higher than estimated, at $1,849,140.10. This increased the Town's share of the cost by $57,500, for a total Town commitment of $220,000. This increase was approved by the Town Board at their June 12 meeting. More information on roundabouts can be found in this NCDOT brochure.

Monroe Expressway (R-3329/R-2559)- NCDOT project. This $840 million, 19.5 mile project is an all-toll facility from U.S. 74 east of I-485 in Mecklenburg County to U.S. 74 between Wingate and Marshville in Union County. Clearing has been completed and grading/construction is underway. They have a tentative completion date set for FY 2018. NCDOT has more information about the project here. CRTPO has additional information on their website.

NCDOT Resurfacing- NCDOT project. NCDOT has contracted out several resurfacing projects within Matthews. We do not yet have a timeline on when they may be done. These areas include Pineville-Matthews Road, from Sardis Road to John Street; and East John Street from Trade Street to Friendship Drive.

2016 Pavement Preservation Program- Matthews project. Several pavement preservation techniques are being used on various local roads to extend their life. Roads in Sardis Mill and Coachman Ridge had a rejuvenator, called Reclamite, applied to them. This product replaces the volatile organic compounds lost from the asphalt when it is initially placed. It also helps to reverse oxidation that has occurred in the pavement since that time. This was placed on these roads and a small section of Phillips Road on September 20, 2016.

Two weeks later, on October 4, 2016, a high density mineral bond (HA5) was placed in the Sardis Mill subdivision. This is a coating that will help protect the pavement from UV damage for up to 7 years.

Millstone Ridge will have a seal coat, GSB-88, placed on it this spring. This product is a coating that will mitigate raveling in the road and help to protect the pavement from UV damage for up to 5 years. This will take about 10 days to apply, with most of that being prep work. This product takes about 2 hours to cure before it can be driven on. Patching and crack sealing these roads in preparation of the application have been completed by Town crews. The contractor should start work in early October 2017.

2017 Pavement Preservation Program- Matthews project. Several pavement preservation techniques are being used on various local roads to extend their life. The first project will be using a rejuvenator on newer roads throughout town. The second project will add a high-density mineral bond to roads a few years old. These will help to keep the roads in good condition. Details to come.

Transportation Project Status
September 21, 2017

Downtown Sidewalk Projects- Matthews project. The Town received a $500,000 grant from the NC General Assembly toward new sidewalks. Design is underway to construct a wide sidewalk on Matthews-Mint Hill Road from the Novant Health entrance to North Trade Street. Another section of sidewalk under design is along West John Street from Ames Street to Irwin Lane. Construction on these projects is anticipated fall/winter 2017.

Reverdy Signal- Private developer project. As part of the Carmel Baptist Church expansion project, they are adding a signal to Reverdy Lane at NC 51. Signal installation is anticipated for this fall. Charlotte is overseeing this project.

McKee Road Improvements- Developer project. As part of the Erickson Community development on McKee Road, they were required to add turn lanes at McKee's intersection with Pleasant Plains Road and Weddington Road. The work at Pleasant Plains Road has been delayed due to some utility conflicts. It is anticipated that this intersection will be completed by late September 2017. NCDOT is overseeing this project.

Future Projects

South Trade Street Culvert (U-5804B)- NCDOT Project. This project will widen South Trade Street to 4 lanes between Chaphyn Lane and Weddington Road and lengthen the culvert under South Trade Street in this area. Due to the new flood plain maps being released and the CLOMAR expiration, this project had to go back through environmental review process. The project is currently in the right-of-way acquisition stage. It is anticipated that construction on this project will begin in the fall of 2017, with it being completed by the end of 2018. Current cost estimate for the culvert is $1.5M. This is an NCDOT project.

South Trade Street Greenway/Tunnel (EB-5829)- Mecklenburg County Project. An additional project will build a pedestrian tunnel and greenway connection under South Trade Street, adjacent to the culvert. STP-DA funding for the pedestrian tunnel and associated greenway path was approved by the CRTPO at its August 2016 meeting. The pedestrian tunnel and greenway will be constructed separately from the culvert widening, but should only cause minimal traffic delays. The cost for the new 14' tunnel and greenway is estimated at $1.1M, and will be funded by NCDOT and Mecklenburg County.

Weddington Road/I-485 Interchange (R-0211EC)- NCDOT project. This will add an interchange at Weddington Road and I-485 and will also improve a section of Weddington Road. Due to additional funding from HB 97 in the TIP, the project is now funded fully from the TIP and will be built as part of the I-485 Express Lanes (I-5507) project (see below for more information). Design and construction may begin as early as 2017 or as late as 2019, depending on the contractor's direction of operation. Project estimate is $20M. Town is responsible for sidewalk costs, estimated at $200k. More information about the project can be found on the CRTPO website.

I-485 Express Lanes (I-5507)- NCDOT project. New express lane in each direction from I-77 to US 74. This is a design-build project with design, ROW and construction in FY18. Completion in FY19. Project estimate is $203M. This project now includes adding the Weddington Road Interchange (R-0211EC) and enhancements to the John Street interchange and will add an additional auxiliary lane in each direction from Weddington Road to John Street. NCDOT has more information about the project here. Click for the I-485 Express Lanes Public Hearing Map of this area.

I-485 Pavement Rehabilitation NCDOT project between Idlewild Road and U.S. 74 - Two projects **(I-5748 and I-5827)** propose to resurface both directions of I-485 in this area. The first project is funded for FY16 for $500,000 and has been completed. The second is funded for FY19 for $3 million.

Sam Newell Road Intersection Improvements- NCDOT project will add an additional lane on Sam Newell Road/North Trade Street on both approaches to NC51. They will also add an addition left turn lane onto North Trade Street from Hwy. 51. This project is estimated at $600k and will likely be funded with Congestion Mitigation Air Quality (CMAQ) money.

Sam Newell Road Multi-Use Path- Rice Road to Crown Point Elementary (EB-5783)- Matthews project. Design will begin in 2017. Project estimate is $1.3M, with the Town contributing $400k. Construction with STBG-DA funding likely in FY21 or FY22.

Transportation Project Status
September 21, 2017

Pleasant Plains Road Multi-Use Path- Trade St. to McKee Rd. (EB-5779)- Matthews project. Design in 2019. Construction not yet funded. Project estimate has recently been updated to $1.9M. The Town will contribute 20% of the project costs.

NC 51 Widening- Sardis Road to E. John St./Monroe Rd. (U-5763)- NCDOT project. This project will likely widen NC 51 from four to six lanes, including a median and a multi-use path on one side and sidewalk on the other. It is in the planning stages. ROW in FY18 and construction in FY20. Project estimate is $3.9M. The Town is responsible for the cost for the multi-use path and for sidewalk where there currently isn't any.

US 74 Widening and Express Lanes (U-2509A,B)- NCDOT project. This project is broken into two segments. Segment A proposes express lanes between Conference Drive and Sardis Road North. Segment B proposes express lanes between Sardis Road North and I-485. Additional general purpose lanes will likely be added as part of the project. The project may also include completing the unfinished portions of Krefeld Drive/Northeast Parkway and Independence Pointe Parkway. NCDOT has more information about the project here. The project is currently in the planning stages. Current ROW date is FY20 and construction date is FY22-25. This may move to a design-build project with the start in FY20. Project estimate for section B is $207M, with the total project estimate of $406M.

An additional project (**U-5526**) proposes to add express lanes on U.S. 74 from I-277 to Wallace Lane, with construction starting in FY 2017. More information about the $17.5 million project can be found here. There is a possibility that construction of U-5526 and U-2509B may be combined for economies of scale.

The most current version of the plans can be downloaded here: Sheet 1, Sheet 2.

Idlewild Road Widening (U-4913)- NCDOT project. Widen Idlewild Road from I-485 to Stevens Mill Road. ROW in FY20, construction in FY22. Project estimate is $7M.

Rice Road Extension is a project to extend existing Rice Road across Sam Newell Road to the existing Rice Road Extension, which intersects Independence Boulevard. NCDOT has committed to installing a traffic signal at the Rice Road and Sam Newell Drive intersection once this project is completed. This project is estimated to cost approximately $350k. Funds for this project have not yet been identified, but may be included as part of the U-2509B project.

John Street / Old Monroe Road Widening (U-4714)- NCDOT project. This project is likely to be a 4-lane median divided facility with a multi-use path along the majority of the section through Matthews. This widening project is divided into three segments. Section A is from its intersection with Trade Street in downtown Matthews to I-485. Section B is from I-485 to Waxhaw Indian Trail Road. Section C is from Waxhaw Indian Trail Road to Wesley Chapel-Stouts Road. These have been combined into one project. The design has been modified to take out the superstreet elements between I-485 and John Street. The most recent schedule shows right-of-way acquisitions FY19, and construction in FY21-FY23. The total cost for building these segments is $87.5M. NCDOT has prepared a flyer to help explain the design concept for the roadway. More information on the project can be found here at the NCDOT website.

Since the project is receiving federal funds, it is required to have an Environmental Assessment (EA). As part of the EA, the design team held a Charrette session for initial public input on August 27 through 29, 2013 and later public hearings.

John Street Widening Public Hearing Map A
John Street Widening Public Hearing Map B

The EA was approved in July 2016. The Town sent our U-4714 EA Comments to NCDOT on November 11, 2016.

The Town then hired a consultant to help determine how the roadway design might be modified in order to: mitigate speeds through the area; increase bicycle and pedestrian accessibility along and across the corridor; aesthetic treatments for median area; and possible alternative intersection alternatives. The consultant's contract is currently on hold until the larger aspects of the design can be determined.

Transportation Project Status
September 21, 2017

A public meeting for input on the design was held in the Town Hall Hood Room on January 31, 2017. Please see the John Street Handout for information on this corridor and to provide input to staff on your thoughts regarding aesthetics and pedestrian safety options.

The consultant presented the results of the public input session and additional project information to the Transportation Advisory Committee (TAC) on February 13, 2017. Please see East John Street Widening Presentation to TAC 2-16-17.

Town staff presented the Board various alternatives to the current design at their Planning Conference on February 24, 2017. Please see U-4714 Planning Conference Presentation. On March 24, 2017, the Town Board passed a Resolution regarding East John Street, which was sent to NCDOT. NCDOT responded to the Town and agreed to meet to work through various options that might be implemented with the project to meet the project and Town's needs, which resulted in their formal response to the resolution, on June 19, 2017, where they agreed to meet the majority of the Town's requests.

The changes to the design were presented by NCDOT at a public meeting on July 31, 2017. Please see the Town's dedicated web page for more information this project: http://www.matthewsnc.gov/newsview.aspx?nid=5994

NC 51 Widening- Matthews Township Parkway to Lawyers Road (U-5007)- NCDOT project to widen to multi-lanes. ROW in FY22, construction in FY24. Budget is $35.7M.

McKee Road Extension (U-4713)- This project is broken into several segments.

Segment A (U-4713A) of this proposed NCDOT project will extend McKee Road 4,000 feet from its existing terminus at Pleasant Plains Road to John Street. The Town Board voted at its April 25, 2016 meeting to obligate $2M toward this project to increase the probability of it being funded in the TIP as part of the P4.0 process. The money will come from the $3M the Town is receiving at the first building permit of Erickson's Windsor Run project. The project is funded in the current Draft TIP. Construction estimate is $9.8M. At Matthews' request, NCDOT accelerated the schedule for this section of roadway. Right-of-Way acquisition will be in FY19 and construction in FY20.

Segment B of the project was completed in September 2016 (see below for more information).

Segments C, D and E are proposed to further extend McKee Road to Independence Boulevard. Section C, which takes the roadway over the CSX rail line is currently unfunded. Section D will likely be built with the development of the adjacent property. Section E is being built as part of the NCDOT Monroe Expressway project (R-3329/R-2559).

Greylock Ridge Road Extension- This proposed 2,200 foot long road will connect John Street to the Sportsplex and Family Entertainment District. The preliminary design for the roadway is done. Estimated cost is $4.6M. The Town voted to purchase a portion of the right-of-way needed for the road. No funding has been identified to finalize plans or move toward construction.

North Ames Street Widening- Widen North Ames Street from West Matthews Street to West Charles Street. Estimated cost is $600k. No funding has been identified to finalize plans or move toward construction.

West Charles Street Widening- Widen West Charles Street from existing widening to Matthews Township Parkway. Preliminary plans have been done. Estimated cost is $1.15M. No funding has been identified to finalize plans or move toward construction.

LYNX Silver Line is a proposed CATS project that will build a rail line between uptown Charlotte and the Matthews area. CATS is currently conducting a rail alternative analysis and transit study, which extends 13.5 miles from Charlotte's City Center to the border of Mecklenburg and Union Counties, including the town of Matthews. The study will define a fixed-rail guideway alignment, provide an interim bus transit strategy that utilized the future Independence Boulevard managed lanes, and develop land development strategies to protect and preserve the fixed guideway alignment.

The Metropolitan Transit Commission (MTC) voted to approve the LYNX Silver Line Locally Preferred Alternative (LPA) at their November 2016 meeting and adopted it into the 2030 Transit System Plan. The Charlotte

Regional Transportation Planning Organization (CRTPO) voted to include it in the region's Long Range Transportation Plan at their January 18, 2017 meeting.

More information about the study, including maps and a survey for public input can be found at the LYNX Silver Line Web Page.

Completed Projects

South Trade Street Widening (U-5804A)- Matthews Project. The contract was awarded to Sealand Contractors Corporation for $4.2M. The original completion date was March 19, 2016. This was delayed by utility relocations and other issues. Except for minor repairs, the project is complete and is open to traffic. This is a Town-funded project on an NCDOT road. However, additional work on South Trade Street and Fullwood Lane will continue through several projects over the next year- Plantation Village, Fullwood Station and the South Trade Street Culvert Extension (U-5804B).

Matthews-Mint Hill Road Superstreet (U-5511) near Butler High School – Matthews Project. The contract was awarded to J.T. Russell for $675k. The Town has committed to $240k of this plus half of any overruns. The remainder of the funding is from a Federal grant given to the Town. Please note that the multi-use path shown on the conceptual drawing was not able to be constructed due to limited funding. The contractor has installed the storm drainage and begun widening and curb and gutter on the both sides of the road. The project is complete except for punch list items. The Town and NCDOT are working together to add in a new crosswalk across Hwy. 51 at Phillips Road.

2015 Resurfacing- The contract for this Matthews project was awarded to Trull Contracting, LLC for $716,410.75. The contractor has completed the full-depth reclamation (FDR) and paving in Matthews Estate, West Matthews Street, Oscar Drive area, Independence Pointe Parkway and Windsor Square Drive. Brigman Road was added to the contract for approximately $73,000 as it will tie into the new entrance to the Sportsplex and was in poor condition and has been completed. This is a Town-funded project. This project is complete.

Charles Buckley Way- Matthews project. Contract was awarded to Sealand Contractors Corporation for $433,213.07. Our Landscaping Division installed trees and shrubbery. Except for a culvert crossing under John Street and repairing the crosswalk markings, this 500 LF project is complete and is currently open to traffic. This is a Town-funded project.

McKee Road Segment B, Campus Ridge Road Relocation (U-4713B)- Matthews project extended McKee Road 1,500 feet from John Street to existing Campus Ridge Road. Contract was awarded to Blythe Development at the June 8, 2015 Board Meeting. The total construction cost was $1.7M, with the Town contributing $361,456 toward construction and construction oversight. Project was completed in September 2016.

Talbot Court Extension- Private Developer Project. This extension is being constructed as part of the Plantation Village project. Its completion was tied to the first building C/O for Plantation Village. Construction of the road started in March and is open for traffic. This is a privately funded roadway and has been turned over to the Town for maintenance.

Sportsplex- Mecklenburg County Project. Located at 1505 Tank Town Road, this project is a $32M athletic complex for field sports and includes adjoining privately held land for a Family Entertainment Complex. The project is being constructed jointly with the County. The Town of Matthews has agreed to invest $2M in the project. Phase I of this project is open and includes five multi-purpose fields, a shelter area and a playground built in tribute to the lives lost in the September 11, 2001 terrorist attack. Ultimate build-out includes 12 fields, including a stadium that sits approximately 2,700 people, with the capability of further seating expansion. Once complete, there will be a new public roadway connection between Tank Town Road and Brigman Road, named Sports Parkway. Project is substantially complete. All artificial turf fields are open for play. The Grand Opening of the Sportsplex was held June 17th with Charlotte Independence's first match at the stadium. Matthews received $1M from the general assembly for fiscal year 2017; and, with an additional $400K from each the Town and the County, will be used to expand the seating capacity for the stadium.

Transportation Project Status
September 21, 2017

Railroad Parking Lot Improvements- Matthews Project. The state legislature this past session gave Matthews $94,240 to revitalize a portion of our downtown. The Board voted on September 12 to use the money toward improving the parking lot adjacent to the railroad, between North Trade Street and North Ames Street. This money supplements the $72,000 that the Board put in the CIP to make the improvements. Improvements to the parking lot include creating a 10' pedestrian path along one side of the parking lot, installing stairs from the parking lot up to Bank Street, resurfacing the parking lot, and improving landscape in the area. The estimated cost of this project is $105,000. Any remaining funds will be put toward future projects. Parts of it were delayed due to Hurricane Matthew. This project was completed in August 2017.

Fullwood Signal- Private developer project. As part of the Plantation Estates expansion, they are installing a signal on Fullwood Lane at their new entrance. Signal was put into service in August 2017. Matthews is overseeing this project.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	84	146	191	270	75	66
Future Volume (vph)	84	146	191	270	75	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	1646	0	0	1765	1643	0
Flt Permitted				0.980	0.974	
Satd. Flow (perm)	1646	0	0	1765	1643	0
Link Speed (mph)	35			35	35	
Link Distance (ft)	1708			1580	2657	
Travel Time (s)	33.3			30.8	51.8	
Peak Hour Factor	0.76	0.76	0.90	0.90	0.54	0.54
Shared Lane Traffic (%)						
Lane Group Flow (vph)	303	0	0	512	261	0
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 56.4% ICU Level of Service B
Analysis Period (min) 15

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	84	146	191	270	75	66
Future Volume (Veh/h)	84	146	191	270	75	66
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.76	0.76	0.90	0.90	0.54	0.54
Hourly flow rate (vph)	111	192	212	300	139	122
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			303		931	207
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			303		931	207
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			83		44	85
cM capacity (veh/h)			1258		246	833

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	303	512	261
Volume Left	0	212	139
Volume Right	192	0	122
cSH	1700	1258	367
Volume to Capacity	0.18	0.17	0.71
Queue Length 95th (ft)	0	15	132
Control Delay (s)	0.0	4.5	35.6
Lane LOS		A	E
Approach Delay (s)	0.0	4.5	35.6
Approach LOS			E

Intersection Summary			
Average Delay	10.8		
Intersection Capacity Utilization	56.4%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	7	112	295	153	198	99
Future Volume (vph)	7	112	295	153	198	99
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	1567	0	0	1743	1720	0
Flt Permitted	0.997			0.968		
Satd. Flow (perm)	1567	0	0	1743	1720	0
Link Speed (mph)	35			35	35	
Link Distance (ft)	1765			997	2657	
Travel Time (s)	34.4			19.4	51.8	
Peak Hour Factor	0.61	0.61	0.69	0.69	0.75	0.75
Shared Lane Traffic (%)						
Lane Group Flow (vph)	195	0	0	650	396	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 58.2% ICU Level of Service B
Analysis Period (min) 15

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	7	112	295	153	198	99
Future Volume (Veh/h)	7	112	295	153	198	99
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.61	0.61	0.69	0.69	0.75	0.75
Hourly flow rate (vph)	11	184	428	222	264	132
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1408	330	396			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1408	330	396			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	89	74	63			
cM capacity (veh/h)	97	712	1163			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	195	650	396
Volume Left	11	428	0
Volume Right	184	0	132
cSH	524	1163	1700
Volume to Capacity	0.37	0.37	0.23
Queue Length 95th (ft)	43	43	0
Control Delay (s)	15.9	7.9	0.0
Lane LOS	C	A	
Approach Delay (s)	15.9	7.9	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	6.7		
Intersection Capacity Utilization	58.2%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	3	215	1	292	6	57	74	102	133	9
Future Volume (vph)	5	0	3	215	1	292	6	57	74	102	133	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	1665	0	0	1625	0	0	1666	0	0	1756	0
Flt Permitted		0.968			0.979			0.998			0.980	
Satd. Flow (perm)	0	1665	0	0	1625	0	0	1666	0	0	1756	0
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1129			1722			1947			819	
Travel Time (s)		22.0			33.5			37.9			16.0	
Peak Hour Factor	0.90	0.90	0.90	0.79	0.79	0.79	0.76	0.76	0.76	0.69	0.69	0.69
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	9	0	0	643	0	0	180	0	0	354	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 63.1% ICU Level of Service B
Analysis Period (min) 15

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	0	3	215	1	292	6	57	74	102	133	9
Future Volume (Veh/h)	5	0	3	215	1	292	6	57	74	102	133	9
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.79	0.79	0.79	0.76	0.76	0.76	0.69	0.69	0.69
Hourly flow rate (vph)	6	0	3	272	1	370	8	75	97	148	193	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1006	684	200	638	642	124	206			172		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1006	684	200	638	642	124	206			172		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	95	100	100	23	100	60	99			89		
cM capacity (veh/h)	121	330	841	355	349	927	1365			1405		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	9	643	180	354
Volume Left	6	272	8	148
Volume Right	3	370	97	13
cSH	169	551	1365	1405
Volume to Capacity	0.05	1.17	0.01	0.11
Queue Length 95th (ft)	4	559	0	9
Control Delay (s)	27.5	119.0	0.4	3.8
Lane LOS	D	F	A	A
Approach Delay (s)	27.5	119.0	0.4	3.8
Approach LOS	D	F		

Intersection Summary			
Average Delay	65.9		
Intersection Capacity Utilization	63.1%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	428	77	45	445	267	78
Future Volume (vph)	428	77	45	445	267	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	135		0	50
Storage Lanes		0	1		1	1
Taper Length (ft)			0		25	
Satd. Flow (prot)	3343	0	1711	1801	1711	1531
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3343	0	1711	1801	1711	1531
Link Speed (mph)	35			35	35	
Link Distance (ft)	1616			1955	1919	
Travel Time (s)	31.5			38.1	37.4	
Peak Hour Factor	0.59	0.59	0.68	0.68	0.79	0.79
Shared Lane Traffic (%)						
Lane Group Flow (vph)	856	0	66	654	338	99
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 44.9% ICU Level of Service A
Analysis Period (min) 15

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	428	77	45	445	267	78
Future Volume (Veh/h)	428	77	45	445	267	78
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.59	0.59	0.68	0.68	0.79	0.79
Hourly flow rate (vph)	725	131	66	654	338	99
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						2
Median type	None			TWLTL		
Median storage veh)				2		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			856		1576	428
vC1, stage 1 conf vol					790	
vC2, stage 2 conf vol					786	
vCu, unblocked vol			856		1576	428
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			92		0	83
cM capacity (veh/h)			780		284	575

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	483	373	66	654	437
Volume Left	0	0	66	0	338
Volume Right	0	131	0	0	99
cSH	1700	1700	780	1700	327
Volume to Capacity	0.28	0.22	0.08	0.38	1.34
Queue Length 95th (ft)	0	0	7	0	536
Control Delay (s)	0.0	0.0	10.0	0.0	203.5
Lane LOS			B		F
Approach Delay (s)	0.0		0.9		203.5
Approach LOS					F

Intersection Summary			
Average Delay	44.5		
Intersection Capacity Utilization	44.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	283	43	16	150	33	41
Future Volume (vph)	283	43	16	150	33	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	1768	0	0	1792	1629	0
Flt Permitted				0.995	0.978	
Satd. Flow (perm)	1768	0	0	1792	1629	0
Link Speed (mph)	35			35	35	
Link Distance (ft)	1708			1580	2657	
Travel Time (s)	33.3			30.8	51.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.67	0.67
Shared Lane Traffic (%)						
Lane Group Flow (vph)	362	0	0	185	110	0
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 32.2% ICU Level of Service A
Analysis Period (min) 15

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	283	43	16	150	33	41
Future Volume (Veh/h)	283	43	16	150	33	41
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.67	0.67
Hourly flow rate (vph)	314	48	18	167	49	61
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			362		541	338
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			362		541	338
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		90	91
cM capacity (veh/h)			1197		495	704

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	362	185	110
Volume Left	0	18	49
Volume Right	48	0	61
cSH	1700	1197	592
Volume to Capacity	0.21	0.02	0.19
Queue Length 95th (ft)	0	1	17
Control Delay (s)	0.0	0.9	12.5
Lane LOS		A	B
Approach Delay (s)	0.0	0.9	12.5
Approach LOS			B

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	32.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	42	211	61	43	47	16
Future Volume (vph)	42	211	61	43	47	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	1584	0	0	1748	1738	0
Flt Permitted	0.992			0.971		
Satd. Flow (perm)	1584	0	0	1748	1738	0
Link Speed (mph)	35			35	35	
Link Distance (ft)	1765			997	2657	
Travel Time (s)	34.4			19.4	51.8	
Peak Hour Factor	0.82	0.82	0.68	0.68	0.90	0.90
Shared Lane Traffic (%)						
Lane Group Flow (vph)	308	0	0	153	70	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 34.3% ICU Level of Service A
Analysis Period (min) 15

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	42	211	61	43	47	16
Future Volume (Veh/h)	42	211	61	43	47	16
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.68	0.68	0.90	0.90
Hourly flow rate (vph)	51	257	90	63	52	18
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	304	61	70			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	304	61	70			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	92	74	94			
cM capacity (veh/h)	647	1004	1531			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	308	153	70
Volume Left	51	90	0
Volume Right	257	0	18
cSH	920	1531	1700
Volume to Capacity	0.33	0.06	0.04
Queue Length 95th (ft)	37	5	0
Control Delay (s)	10.9	4.6	0.0
Lane LOS	B	A	
Approach Delay (s)	10.9	4.6	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	7.6		
Intersection Capacity Utilization	34.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1	4	64	2	58	1	29	130	216	32	0
Future Volume (vph)	0	1	4	64	2	58	1	29	130	216	32	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	1606	0	0	1645	0	0	1603	0	0	1725	0
Flt Permitted					0.975						0.958	
Satd. Flow (perm)	0	1606	0	0	1645	0	0	1603	0	0	1725	0
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1129			1722			1947			819	
Travel Time (s)		22.0			33.5			37.9			16.0	
Peak Hour Factor	0.90	0.90	0.90	0.89	0.89	0.89	0.81	0.81	0.81	0.79	0.79	0.79
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	5	0	0	139	0	0	197	0	0	314	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 47.1% ICU Level of Service A
Analysis Period (min) 15

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1	4	64	2	58	1	29	130	216	32	0
Future Volume (Veh/h)	0	1	4	64	2	58	1	29	130	216	32	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.89	0.89	0.89	0.81	0.81	0.81	0.79	0.79	0.79
Hourly flow rate (vph)	0	1	4	72	2	65	1	36	160	273	41	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	771	785	41	710	705	116	41			196		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	771	785	41	710	705	116	41			196		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	75	99	93	100			80		
cM capacity (veh/h)	249	260	1030	293	289	936	1568			1377		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	5	139	197	314
Volume Left	0	72	1	273
Volume Right	4	65	160	0
cSH	647	432	1568	1377
Volume to Capacity	0.01	0.32	0.00	0.20
Queue Length 95th (ft)	1	34	0	18
Control Delay (s)	10.6	17.2	0.0	7.4
Lane LOS	B	C	A	A
Approach Delay (s)	10.6	17.2	0.0	7.4
Approach LOS	B	C		

Intersection Summary			
Average Delay	7.3		
Intersection Capacity Utilization	47.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	327	155	113	364	120	25
Future Volume (vph)	327	155	113	364	120	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	135		0	50
Storage Lanes		0	1		1	1
Taper Length (ft)			0		25	
Satd. Flow (prot)	3257	0	1711	1801	1711	1531
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3257	0	1711	1801	1711	1531
Link Speed (mph)	35			35	35	
Link Distance (ft)	1616			1955	1919	
Travel Time (s)	31.5			38.1	37.4	
Peak Hour Factor	0.87	0.87	0.85	0.85	0.81	0.81
Shared Lane Traffic (%)						
Lane Group Flow (vph)	554	0	133	428	148	31
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 36.9% ICU Level of Service A
Analysis Period (min) 15

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	327	155	113	364	120	25
Future Volume (Veh/h)	327	155	113	364	120	25
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.87	0.87	0.85	0.85	0.81	0.81
Hourly flow rate (vph)	376	178	133	428	148	31
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						2
Median type	None			TWLTL		
Median storage veh)				2		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			554		1159	277
vC1, stage 1 conf vol					465	
vC2, stage 2 conf vol					694	
vCu, unblocked vol			554		1159	277
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			87		58	96
cM capacity (veh/h)			1012		352	720

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	251	303	133	428	179
Volume Left	0	0	133	0	148
Volume Right	0	178	0	0	31
cSH	1700	1700	1012	1700	425
Volume to Capacity	0.15	0.18	0.13	0.25	0.42
Queue Length 95th (ft)	0	0	11	0	51
Control Delay (s)	0.0	0.0	9.1	0.0	20.3
Lane LOS			A		C
Approach Delay (s)	0.0		2.2		20.3
Approach LOS					C

Intersection Summary			
Average Delay	3.7		
Intersection Capacity Utilization	36.9%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection: 1: Mt. Harmony Church Rd. & Phillips Rd.

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	22	116	139
Average Queue (ft)	1	45	51
95th Queue (ft)	7	89	95
Link Distance (ft)	1676	1558	2598
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Mt. Harmony Church Rd. & Marglyn Rd.

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	55	76
Average Queue (ft)	35	47
95th Queue (ft)	51	73
Link Distance (ft)	1738	948
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Mt. Harmony Church Rd. & Stevens Mill Rd.

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	31	266	31	55
Average Queue (ft)	6	123	1	19
95th Queue (ft)	24	219	10	47
Link Distance (ft)	461	1695	1920	764
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Moore Rd. & Matthews-Mint Hill Rd.

Movement	EB	WB	NB	NB
Directions Served	TR	L	L	R
Maximum Queue (ft)	22	51	640	75
Average Queue (ft)	1	16	374	63
95th Queue (ft)	7	43	624	106
Link Distance (ft)	1584		1876	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		135		50
Storage Blk Time (%)			88	1
Queuing Penalty (veh)			73	4

Network Summary

Network wide Queuing Penalty: 77

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	89	156	203	287	80	71
Future Volume (vph)	89	156	203	287	80	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	1646	0	0	1765	1643	0
Flt Permitted				0.980	0.974	
Satd. Flow (perm)	1646	0	0	1765	1643	0
Link Speed (mph)	35			35	35	
Link Distance (ft)	1708			1580	2657	
Travel Time (s)	33.3			30.8	51.8	
Peak Hour Factor	0.76	0.76	0.90	0.90	0.54	0.54
Shared Lane Traffic (%)						
Lane Group Flow (vph)	322	0	0	545	279	0
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 59.4% ICU Level of Service B
Analysis Period (min) 15

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	89	156	203	287	80	71
Future Volume (Veh/h)	89	156	203	287	80	71
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.76	0.76	0.90	0.90	0.54	0.54
Hourly flow rate (vph)	117	205	226	319	148	131
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			322		990	220
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			322		990	220
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			82		34	84
cM capacity (veh/h)			1238		223	820

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	322	545	279
Volume Left	0	226	148
Volume Right	205	0	131
cSH	1700	1238	339
Volume to Capacity	0.19	0.18	0.82
Queue Length 95th (ft)	0	17	179
Control Delay (s)	0.0	4.7	50.1
Lane LOS		A	F
Approach Delay (s)	0.0	4.7	50.1
Approach LOS			F

Intersection Summary			
Average Delay	14.4		
Intersection Capacity Utilization	59.4%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	7	119	313	162	210	105
Future Volume (vph)	7	119	313	162	210	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	1565	0	0	1743	1720	0
Flt Permitted	0.997			0.968		
Satd. Flow (perm)	1565	0	0	1743	1720	0
Link Speed (mph)	35			35	35	
Link Distance (ft)	1765			997	2657	
Travel Time (s)	34.4			19.4	51.8	
Peak Hour Factor	0.61	0.61	0.69	0.69	0.75	0.75
Shared Lane Traffic (%)						
Lane Group Flow (vph)	206	0	0	689	420	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 61.1% ICU Level of Service B
Analysis Period (min) 15

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	7	119	313	162	210	105
Future Volume (Veh/h)	7	119	313	162	210	105
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.61	0.61	0.69	0.69	0.75	0.75
Hourly flow rate (vph)	11	195	454	235	280	140
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1493	350	420			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1493	350	420			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	87	72	60			
cM capacity (veh/h)	82	693	1139			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	206	689	420
Volume Left	11	454	0
Volume Right	195	0	140
cSH	495	1139	1700
Volume to Capacity	0.42	0.40	0.25
Queue Length 95th (ft)	51	49	0
Control Delay (s)	17.3	8.4	0.0
Lane LOS	C	A	
Approach Delay (s)	17.3	8.4	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	7.1		
Intersection Capacity Utilization	61.1%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	3	228	1	310	6	60	79	108	141	10
Future Volume (vph)	5	0	3	228	1	310	6	60	79	108	141	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	1665	0	0	1625	0	0	1664	0	0	1754	0
Flt Permitted		0.968			0.979			0.998			0.979	
Satd. Flow (perm)	0	1665	0	0	1625	0	0	1664	0	0	1754	0
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		516			1722			1947			819	
Travel Time (s)		10.1			33.5			37.9			16.0	
Peak Hour Factor	0.90	0.90	0.90	0.79	0.79	0.79	0.76	0.76	0.76	0.69	0.69	0.69
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	9	0	0	682	0	0	191	0	0	375	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 66.3% ICU Level of Service C
Analysis Period (min) 15

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	0	3	228	1	310	6	60	79	108	141	10
Future Volume (Veh/h)	5	0	3	228	1	310	6	60	79	108	141	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.79	0.79	0.79	0.76	0.76	0.76	0.69	0.69	0.69
Hourly flow rate (vph)	6	0	3	289	1	392	8	79	104	157	204	14
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1064	724	211	675	679	131	218			183		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1064	724	211	675	679	131	218			183		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	100	100	13	100	57	99			89		
cM capacity (veh/h)	104	310	829	333	330	919	1352			1392		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	9	682	191	375
Volume Left	6	289	8	157
Volume Right	3	392	104	14
cSH	147	526	1352	1392
Volume to Capacity	0.06	1.30	0.01	0.11
Queue Length 95th (ft)	5	712	0	10
Control Delay (s)	31.0	170.6	0.4	3.9
Lane LOS	D	F	A	A
Approach Delay (s)	31.0	170.6	0.4	3.9
Approach LOS	D	F		

Intersection Summary			
Average Delay	94.0		
Intersection Capacity Utilization	66.3%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	454	82	48	472	283	83
Future Volume (vph)	454	82	48	472	283	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	135		0	50
Storage Lanes		0	1		1	1
Taper Length (ft)			0		25	
Satd. Flow (prot)	3343	0	1711	1801	1711	1531
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3343	0	1711	1801	1711	1531
Link Speed (mph)	35			35	35	
Link Distance (ft)	1616			1955	1919	
Travel Time (s)	31.5			38.1	37.4	
Peak Hour Factor	0.59	0.59	0.68	0.68	0.79	0.79
Shared Lane Traffic (%)						
Lane Group Flow (vph)	908	0	71	694	358	105
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 47.2% ICU Level of Service A
Analysis Period (min) 15

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	454	82	48	472	283	83
Future Volume (Veh/h)	454	82	48	472	283	83
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.59	0.59	0.68	0.68	0.79	0.79
Hourly flow rate (vph)	769	139	71	694	358	105
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						2
Median type	None			TWLTL		
Median storage veh)				2		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			908		1674	454
vC1, stage 1 conf vol					838	
vC2, stage 2 conf vol					836	
vCu, unblocked vol			908		1674	454
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			90		0	81
cM capacity (veh/h)			745		263	553

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	513	395	71	694	463
Volume Left	0	0	71	0	358
Volume Right	0	139	0	0	105
cSH	1700	1700	745	1700	302
Volume to Capacity	0.30	0.23	0.10	0.41	1.53
Queue Length 95th (ft)	0	0	8	0	665
Control Delay (s)	0.0	0.0	10.3	0.0	286.6
Lane LOS			B		F
Approach Delay (s)	0.0		1.0		286.6
Approach LOS					F

Intersection Summary			
Average Delay	62.5		
Intersection Capacity Utilization	47.2%	ICU Level of Service	A
Analysis Period (min)	15		

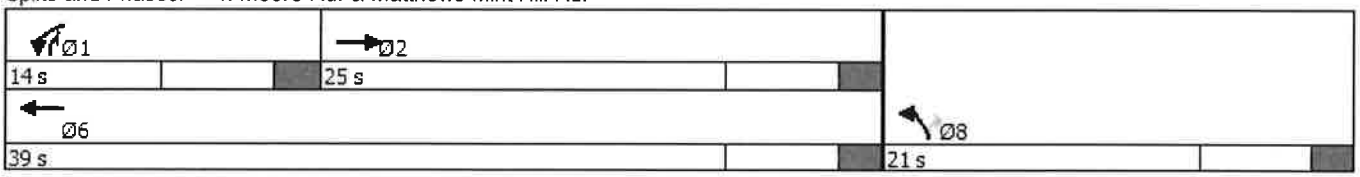
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	454	82	48	472	283	83
Future Volume (vph)	454	82	48	472	283	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	135		0	50
Storage Lanes		0	1		1	1
Taper Length (ft)			0		25	
Satd. Flow (prot)	3343	0	1711	1801	1711	1531
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3343	0	1711	1801	1711	1531
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	37					49
Link Speed (mph)	35			35	35	
Link Distance (ft)	1616			1955	1919	
Travel Time (s)	31.5			38.1	37.4	
Peak Hour Factor	0.59	0.59	0.68	0.68	0.79	0.79
Shared Lane Traffic (%)						
Lane Group Flow (vph)	908	0	71	694	358	105
Turn Type	NA		Prot	NA	Prot	pm+ov
Protected Phases	2		1	6	8	1
Permitted Phases						8
Detector Phase	2		1	6	8	1
Switch Phase						
Minimum Initial (s)	10.0		7.0	10.0	7.0	7.0
Minimum Split (s)	17.0		14.0	17.0	14.0	14.0
Total Split (s)	25.0		14.0	39.0	21.0	14.0
Total Split (%)	41.7%		23.3%	65.0%	35.0%	23.3%
Yellow Time (s)	5.0		5.0	5.0	5.0	5.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0		-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0		5.0	5.0	5.0	5.0
Lead/Lag	Lag		Lead			Lead
Lead-Lag Optimize?						
Recall Mode	Min		None	Min	None	None
Act Effct Green (s)	19.6		9.3	30.0	15.3	29.8
Actuated g/C Ratio	0.35		0.17	0.54	0.28	0.54
v/c Ratio	0.76		0.25	0.72	0.76	0.12
Control Delay	21.8		25.3	14.4	33.1	5.4
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	21.8		25.3	14.4	33.1	5.4
LOS	C		C	B	C	A
Approach Delay	21.8			15.4	26.8	
Approach LOS	C			B	C	
Queue Length 50th (ft)	147		23	157	119	10
Queue Length 95th (ft)	115		41	159	#191	25
Internal Link Dist (ft)	1536			1875	1839	
Turn Bay Length (ft)			135			50
Base Capacity (vph)	1265		285	1136	508	843
Starvation Cap Reductn	0		0	0	0	0

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.72		0.25	0.61	0.70	0.12

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 55.6
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 20.6 — Intersection LOS: C
Intersection Capacity Utilization 49.2% — ICU Level of Service A
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Moore Rd. & Matthews-Mint Hill Rd.



Intersection: 1: Mt. Harmony Church Rd. & Phillips Rd.

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	31	74
Average Queue (ft)	4	34
95th Queue (ft)	20	62
Link Distance (ft)	1558	2598
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Mt. Harmony Church Rd. & Marglyn Rd.

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	143	27
Average Queue (ft)	50	2
95th Queue (ft)	87	13
Link Distance (ft)	1738	948
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Mt. Harmony Church Rd. & Stevens Mill Rd.

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	30	68	22	93
Average Queue (ft)	6	35	1	35
95th Queue (ft)	24	53	7	80
Link Distance (ft)	454	1695	1920	764
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Moore Rd. & Matthews-Mint Hill Rd.

Movement	EB	WB	NB	NB
Directions Served	TR	L	L	R
Maximum Queue (ft)	22	103	123	75
Average Queue (ft)	1	34	55	24
95th Queue (ft)	7	73	92	63
Link Distance (ft)	1584		1876	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		135		50
Storage Blk Time (%)			11	0
Queuing Penalty (veh)			3	0

Network Summary

Network wide Queuing Penalty: 3

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	300	46	17	159	35	44
Future Volume (vph)	300	46	17	159	35	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	1768	0	0	1792	1629	0
Flt Permitted				0.995	0.978	
Satd. Flow (perm)	1768	0	0	1792	1629	0
Link Speed (mph)	35			35	35	
Link Distance (ft)	1708			1580	2657	
Travel Time (s)	33.3			30.8	51.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Lane Group Flow (vph)	384	0	0	196	88	0
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 33.8% ICU Level of Service A
Analysis Period (min) 15

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	300	46	17	159	35	44
Future Volume (Veh/h)	300	46	17	159	35	44
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	333	51	19	177	39	49
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			384		574	358
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			384		574	358
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		92	93
cM capacity (veh/h)			1174		473	686

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	384	196	88
Volume Left	0	19	39
Volume Right	51	0	49
cSH	1700	1174	572
Volume to Capacity	0.23	0.02	0.15
Queue Length 95th (ft)	0	1	14
Control Delay (s)	0.0	0.9	12.4
Lane LOS		A	B
Approach Delay (s)	0.0	0.9	12.4
Approach LOS			B

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	33.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	45	224	65	46	50	17
Future Volume (vph)	45	224	65	46	50	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	1586	0	0	1750	1739	0
Flt Permitted	0.992			0.972		
Satd. Flow (perm)	1586	0	0	1750	1739	0
Link Speed (mph)	35			35	35	
Link Distance (ft)	1765			997	2657	
Travel Time (s)	34.4			19.4	51.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Lane Group Flow (vph)	299	0	0	123	75	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 35.7% ICU Level of Service A
Analysis Period (min) 15

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	45	224	65	46	50	17
Future Volume (Veh/h)	45	224	65	46	50	17
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	50	249	72	51	56	19
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	260	66	75			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	260	66	75			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	75	95			
cM capacity (veh/h)	694	998	1524			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	299	123	75
Volume Left	50	72	0
Volume Right	249	0	19
cSH	930	1524	1700
Volume to Capacity	0.32	0.05	0.04
Queue Length 95th (ft)	35	4	0
Control Delay (s)	10.7	4.5	0.0
Lane LOS	B	A	
Approach Delay (s)	10.7	4.5	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	7.6		
Intersection Capacity Utilization	35.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1	4	68	2	62	1	31	138	229	34	0
Future Volume (vph)	0	1	4	68	2	62	1	31	138	229	34	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	1606	0	0	1645	0	0	1603	0	0	1725	0
Flt Permitted					0.975						0.958	
Satd. Flow (perm)	0	1606	0	0	1645	0	0	1603	0	0	1725	0
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		509			1722			1947			819	
Travel Time (s)		9.9			33.5			37.9			16.0	
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	5	0	0	147	0	0	188	0	0	292	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 49.0% ICU Level of Service A
Analysis Period (min) 15

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1	4	68	2	62	1	31	138	229	34	0
Future Volume (Veh/h)	0	1	4	68	2	62	1	31	138	229	34	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
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
Hourly flow rate (vph)	0	1	4	76	2	69	1	34	153	254	38	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	728	735	38	663	658	110	38			187		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	728	735	38	663	658	110	38			187		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	76	99	93	100			82		
cM capacity (veh/h)	268	283	1034	320	313	943	1572			1387		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	5	147	188	292
Volume Left	0	76	1	254
Volume Right	4	69	153	0
cSH	676	463	1572	1387
Volume to Capacity	0.01	0.32	0.00	0.18
Queue Length 95th (ft)	1	34	0	17
Control Delay (s)	10.4	16.3	0.0	7.3
Lane LOS	B	C	A	A
Approach Delay (s)	10.4	16.3	0.0	7.3
Approach LOS	B	C		

Intersection Summary			
Average Delay	7.3		
Intersection Capacity Utilization	49.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	347	164	120	386	127	27
Future Volume (vph)	347	164	120	386	127	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	135		0	50
Storage Lanes		0	1		1	1
Taper Length (ft)			0		25	
Satd. Flow (prot)	3257	0	1711	1801	1711	1531
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3257	0	1711	1801	1711	1531
Link Speed (mph)	35			35	35	
Link Distance (ft)	1616			1955	1919	
Travel Time (s)	31.5			38.1	37.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Lane Group Flow (vph)	568	0	133	429	141	30
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 38.5% ICU Level of Service A
Analysis Period (min) 15

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	347	164	120	386	127	27
Future Volume (Veh/h)	347	164	120	386	127	27
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	386	182	133	429	141	30
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						2
Median type	None			TWLTL		
Median storage veh)				2		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			568		1172	284
vC1, stage 1 conf vol					477	
vC2, stage 2 conf vol					695	
vCu, unblocked vol			568		1172	284
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			87		60	96
cM capacity (veh/h)			1000		349	713

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	257	311	133	429	171
Volume Left	0	0	133	0	141
Volume Right	0	182	0	0	30
cSH	1700	1700	1000	1700	423
Volume to Capacity	0.15	0.18	0.13	0.25	0.40
Queue Length 95th (ft)	0	0	11	0	48
Control Delay (s)	0.0	0.0	9.2	0.0	20.0
Lane LOS			A		C
Approach Delay (s)	0.0		2.2		20.0
Approach LOS					C

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	38.5%	ICU Level of Service	A
Analysis Period (min)	15		

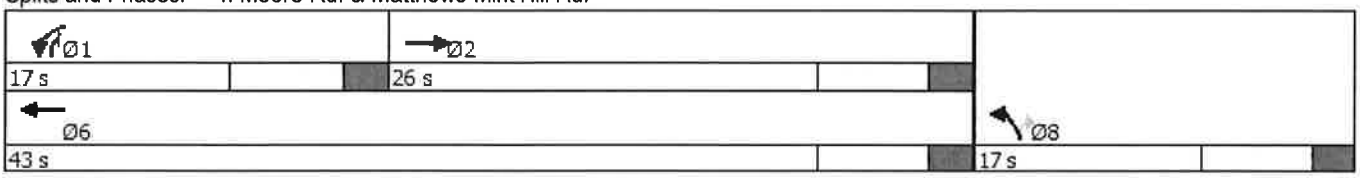
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	347	164	120	386	127	27
Future Volume (vph)	347	164	120	386	127	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	135		0	50
Storage Lanes		0	1		1	1
Taper Length (ft)			0		25	
Satd. Flow (prot)	3257	0	1711	1801	1711	1531
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3257	0	1711	1801	1711	1531
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	144					30
Link Speed (mph)	35			35	35	
Link Distance (ft)	1616			1955	1919	
Travel Time (s)	31.5			38.1	37.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Lane Group Flow (vph)	568	0	133	429	141	30
Turn Type	NA		Prot	NA	Prot	pm+ov
Protected Phases	2		1	6	8	1
Permitted Phases						8
Detector Phase	2		1	6	8	1
Switch Phase						
Minimum Initial (s)	10.0		7.0	10.0	7.0	7.0
Minimum Split (s)	17.0		14.0	17.0	14.0	14.0
Total Split (s)	26.0		17.0	43.0	17.0	17.0
Total Split (%)	43.3%		28.3%	71.7%	28.3%	28.3%
Yellow Time (s)	5.0		5.0	5.0	5.0	5.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0		-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0		5.0	5.0	5.0	5.0
Lead/Lag	Lag		Lead			Lead
Lead-Lag Optimize?						
Recall Mode	Min		None	None	None	None
Act Effct Green (s)	21.9		11.1	33.9	11.2	23.2
Actuated g/C Ratio	0.44		0.22	0.68	0.23	0.47
v/c Ratio	0.37		0.35	0.35	0.37	0.04
Control Delay	11.6		22.3	6.2	22.5	3.6
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	11.6		22.3	6.2	22.5	3.6
LOS	B		C	A	C	A
Approach Delay	11.6			10.0	19.2	
Approach LOS	B			A	B	
Queue Length 50th (ft)	56		36	61	38	0
Queue Length 95th (ft)	97		86	106	91	11
Internal Link Dist (ft)	1536			1875	1839	
Turn Bay Length (ft)			135			50
Base Capacity (vph)	1741		434	1381	434	776
Starvation Cap Reductn	0		0	0	0	0

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.33		0.31	0.31	0.32	0.04

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 49.7
Natural Cycle: 45
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.37
Intersection Signal Delay: 11.9 — Intersection LOS: B
Intersection Capacity Utilization 41.0% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 4: Moore Rd. & Matthews-Mint Hill Rd.



Intersection: 1: Mt. Harmony Church Rd. & Phillips Rd.

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	22	156	226
Average Queue (ft)	1	47	72
95th Queue (ft)	7	106	143
Link Distance (ft)	1676	1558	2598
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Mt. Harmony Church Rd. & Marglyn Rd.

Movement	EB	NB	SB
Directions Served	LR	LT	TR
Maximum Queue (ft)	79	161	22
Average Queue (ft)	38	72	1
95th Queue (ft)	62	145	10
Link Distance (ft)	1738	943	2598
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Mt. Harmony Church Rd. & Stevens Mill Rd.

Movement	EB	WB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	31	357	54
Average Queue (ft)	13	153	19
95th Queue (ft)	37	278	52
Link Distance (ft)	456	1695	770
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: Moore Rd. & Matthews-Mint Hill Rd.

Movement	WB	NB	NB
Directions Served	L	L	R
Maximum Queue (ft)	56	702	75
Average Queue (ft)	21	319	70
95th Queue (ft)	50	573	96
Link Distance (ft)		1876	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	135		50
Storage Blk Time (%)		88	3
Queuing Penalty (veh)		76	9

Intersection: 5: Mt. Harmony Church Rd. & Prop. Access "A"

Movement	EB
Directions Served	LR
Maximum Queue (ft)	53
Average Queue (ft)	27
95th Queue (ft)	50
Link Distance (ft)	627
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Stevens Mill Rd. & Prop. Access "B"

Movement	SB
Directions Served	LR
Maximum Queue (ft)	31
Average Queue (ft)	9
95th Queue (ft)	32
Link Distance (ft)	589
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 84

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	89	156	204	287	85	75
Future Volume (vph)	89	156	204	287	85	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	1646	0	0	1765	1643	0
Flt Permitted				0.980	0.974	
Satd. Flow (perm)	1646	0	0	1765	1643	0
Link Speed (mph)	35			35	35	
Link Distance (ft)	1708			1580	2657	
Travel Time (s)	33.3			30.8	51.8	
Peak Hour Factor	0.76	0.76	0.90	0.90	0.54	0.54
Shared Lane Traffic (%)						
Lane Group Flow (vph)	322	0	0	546	296	0
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 60.0% ICU Level of Service B
Analysis Period (min) 15

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	89	156	204	287	85	75
Future Volume (Veh/h)	89	156	204	287	85	75
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.76	0.76	0.90	0.90	0.54	0.54
Hourly flow rate (vph)	117	205	227	319	157	139
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			322		992	220
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			322		992	220
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			82		29	83
cM capacity (veh/h)			1238		222	820

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	322	546	296
Volume Left	0	227	157
Volume Right	205	0	139
cSH	1700	1238	338
Volume to Capacity	0.19	0.18	0.88
Queue Length 95th (ft)	0	17	206
Control Delay (s)	0.0	4.7	58.2
Lane LOS		A	F
Approach Delay (s)	0.0	4.7	58.2
Approach LOS			F

Intersection Summary			
Average Delay	17.0		
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	7	124	339	172	212	105
Future Volume (vph)	7	124	339	172	212	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	1565	0	0	1743	1720	0
Flt Permitted	0.997			0.968		
Satd. Flow (perm)	1565	0	0	1743	1720	0
Link Speed (mph)	35			35	35	
Link Distance (ft)	1765			997	2657	
Travel Time (s)	34.4			19.4	51.8	
Peak Hour Factor	0.61	0.61	0.69	0.69	0.75	0.75
Shared Lane Traffic (%)						
Lane Group Flow (vph)	214	0	0	740	423	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 63.4% ICU Level of Service B
Analysis Period (min) 15

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	7	124	339	172	212	105
Future Volume (Veh/h)	7	124	339	172	212	105
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.61	0.61	0.69	0.69	0.75	0.75
Hourly flow rate (vph)	11	203	491	249	283	140
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1584	353	423			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1584	353	423			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	84	71	57			
cM capacity (veh/h)	68	691	1136			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	214	740	423
Volume Left	11	491	0
Volume Right	203	0	140
cSH	469	1136	1700
Volume to Capacity	0.46	0.43	0.25
Queue Length 95th (ft)	59	56	0
Control Delay (s)	19.0	8.8	0.0
Lane LOS	C	A	
Approach Delay (s)	19.0	8.8	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	7.7		
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	3	4	228	2	311	7	61	79	113	144	10
Future Volume (vph)	10	3	4	228	2	311	7	61	79	113	144	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	1694	0	0	1625	0	0	1666	0	0	1754	0
Flt Permitted		0.970			0.979			0.998			0.979	
Satd. Flow (perm)	0	1694	0	0	1625	0	0	1666	0	0	1754	0
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		516			1722			1947			819	
Travel Time (s)		10.1			33.5			37.9			16.0	
Peak Hour Factor	0.90	0.90	0.90	0.79	0.79	0.79	0.76	0.76	0.76	0.69	0.69	0.69
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	18	0	0	686	0	0	193	0	0	387	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 67.8% ICU Level of Service C
Analysis Period (min) 15

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	3	4	228	2	311	7	61	79	113	144	10
Future Volume (Veh/h)	10	3	4	228	2	311	7	61	79	113	144	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.79	0.79	0.79	0.76	0.76	0.76	0.69	0.69	0.69
Hourly flow rate (vph)	11	3	4	289	3	394	9	80	104	164	209	14
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1090	746	216	700	701	132	223			184		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1090	746	216	700	701	132	223			184		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	89	99	100	9	99	57	99			88		
cM capacity (veh/h)	99	300	824	317	318	917	1346			1391		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	18	686	193	387
Volume Left	11	289	9	164
Volume Right	4	394	104	14
cSH	143	507	1346	1391
Volume to Capacity	0.13	1.35	0.01	0.12
Queue Length 95th (ft)	11	767	1	10
Control Delay (s)	33.8	194.1	0.4	4.0
Lane LOS	D	F	A	A
Approach Delay (s)	33.8	194.1	0.4	4.0
Approach LOS	D	F		

Intersection Summary			
Average Delay	105.4		
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	454	86	49	472	306	86
Future Volume (vph)	454	86	49	472	306	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	135		0	50
Storage Lanes		0	1		1	1
Taper Length (ft)			0		25	
Satd. Flow (prot)	3339	0	1711	1801	1711	1531
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3339	0	1711	1801	1711	1531
Link Speed (mph)	35			35	35	
Link Distance (ft)	1616			1955	1919	
Travel Time (s)	31.5			38.1	37.4	
Peak Hour Factor	0.59	0.59	0.68	0.68	0.79	0.79
Shared Lane Traffic (%)						
Lane Group Flow (vph)	915	0	72	694	387	109
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 48.5% ICU Level of Service A
Analysis Period (min) 15

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	454	86	49	472	306	86
Future Volume (Veh/h)	454	86	49	472	306	86
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.59	0.59	0.68	0.68	0.79	0.79
Hourly flow rate (vph)	769	146	72	694	387	109
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						2
Median type	None			TWLTL		
Median storage veh)				2		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			915		1680	458
vC1, stage 1 conf vol					842	
vC2, stage 2 conf vol					838	
vCu, unblocked vol			915		1680	458
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			90		0	80
cM capacity (veh/h)			741		262	550

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	513	402	72	694	496
Volume Left	0	0	72	0	387
Volume Right	0	146	0	0	109
cSH	1700	1700	741	1700	299
Volume to Capacity	0.30	0.24	0.10	0.41	1.66
Queue Length 95th (ft)	0	0	8	0	768
Control Delay (s)	0.0	0.0	10.4	0.0	342.3
Lane LOS			B		F
Approach Delay (s)	0.0		1.0		342.3
Approach LOS					F

Intersection Summary			
Average Delay	78.3		
Intersection Capacity Utilization	48.5%	ICU Level of Service	A
Analysis Period (min)	15		

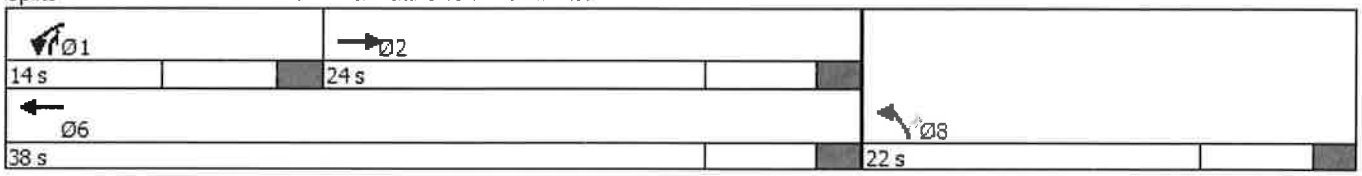
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	454	86	49	472	306	86
Future Volume (vph)	454	86	49	472	306	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	135		0	50
Storage Lanes		0	1		1	1
Taper Length (ft)			0		25	
Satd. Flow (prot)	3339	0	1711	1801	1711	1531
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3339	0	1711	1801	1711	1531
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	38					42
Link Speed (mph)	35			35	35	
Link Distance (ft)	1616			1955	1919	
Travel Time (s)	31.5			38.1	37.4	
Peak Hour Factor	0.59	0.59	0.68	0.68	0.79	0.79
Shared Lane Traffic (%)						
Lane Group Flow (vph)	915	0	72	694	387	109
Turn Type	NA		Prot	NA	Prot	pm+ov
Protected Phases	2		1	6	8	1
Permitted Phases						8
Detector Phase	2		1	6	8	1
Switch Phase						
Minimum Initial (s)	10.0		7.0	10.0	7.0	7.0
Minimum Split (s)	17.0		14.0	17.0	14.0	14.0
Total Split (s)	24.0		14.0	38.0	22.0	14.0
Total Split (%)	40.0%		23.3%	63.3%	36.7%	23.3%
Yellow Time (s)	5.0		5.0	5.0	5.0	5.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0		-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0		5.0	5.0	5.0	5.0
Lead/Lag	Lag		Lead			Lead
Lead-Lag Optimize?						
Recall Mode	Min		None	Min	None	None
Act Effct Green (s)	18.9		9.3	29.3	16.3	30.7
Actuated g/C Ratio	0.34		0.17	0.52	0.29	0.55
v/c Ratio	0.79		0.25	0.74	0.78	0.13
Control Delay	24.2		25.4	15.7	33.1	5.6
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	24.2		25.4	15.7	33.1	5.6
LOS	C		C	B	C	A
Approach Delay	24.2			16.6	27.0	
Approach LOS	C			B	C	
Queue Length 50th (ft)	153		24	165	129	11
Queue Length 95th (ft)	120		41	167	#204	26
Internal Link Dist (ft)	1536			1875	1839	
Turn Bay Length (ft)			135			50
Base Capacity (vph)	1193		283	1094	535	859
Starvation Cap Reductn	0		0	0	0	0

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.77		0.25	0.63	0.72	0.13

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 55.9
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 22.2 — Intersection LOS: C
Intersection Capacity Utilization 50.6% — ICU Level of Service A
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Moore Rd. & Matthews-Mint Hill Rd.



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	36	8	2	475	329	7
Future Volume (vph)	36	8	2	475	329	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	1687	0	0	1801	1795	0
Flt Permitted	0.961					
Satd. Flow (perm)	1687	0	0	1801	1795	0
Link Speed (mph)	25			35	35	
Link Distance (ft)	654			819	997	
Travel Time (s)	17.8			16.0	19.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Lane Group Flow (vph)	49	0	0	530	374	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 36.6% ICU Level of Service A
Analysis Period (min) 15

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	36	8	2	475	329	7
Future Volume (Veh/h)	36	8	2	475	329	7
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	40	9	2	528	366	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	902	370	374			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	902	370	374			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	87	99	100			
cM capacity (veh/h)	308	676	1184			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	49	530	374
Volume Left	40	2	0
Volume Right	9	0	8
cSH	342	1184	1700
Volume to Capacity	0.14	0.00	0.22
Queue Length 95th (ft)	12	0	0
Control Delay (s)	17.3	0.0	0.0
Lane LOS	C	A	
Approach Delay (s)	17.3	0.0	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	36.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	8	17	2	8	0
Future Volume (vph)	0	8	17	2	8	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	1801	1777	0	1711	0
Flt Permitted					0.950	
Satd. Flow (perm)	0	1801	1777	0	1711	0
Link Speed (mph)		35	35		25	
Link Distance (ft)		613	516		616	
Travel Time (s)		11.9	10.1		16.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	9	21	0	9	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 13.3% ICU Level of Service A
Analysis Period (min) 15

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	8	17	2	8	0
Future Volume (Veh/h)	0	8	17	2	8	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	9	19	2	9	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	21				29	20
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	21				29	20
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	100
cM capacity (veh/h)	1595				986	1058

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	9	21	9
Volume Left	0	0	9
Volume Right	0	2	0
cSH	1595	1700	986
Volume to Capacity	0.00	0.01	0.01
Queue Length 95th (ft)	0	0	1
Control Delay (s)	0.0	0.0	8.7
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.7
Approach LOS			A

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection: 1: Mt. Harmony Church Rd. & Phillips Rd.

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	54	55
Average Queue (ft)	7	30
95th Queue (ft)	32	38
Link Distance (ft)	1558	2598
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Mt. Harmony Church Rd. & Marglyn Rd.

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	100	31
Average Queue (ft)	54	5
95th Queue (ft)	80	24
Link Distance (ft)	1738	943
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Mt. Harmony Church Rd. & Stevens Mill Rd.

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	31	77	22	78
Average Queue (ft)	8	43	1	36
95th Queue (ft)	28	69	10	71
Link Distance (ft)	456	1695	1920	770
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Moore Rd. & Matthews-Mint Hill Rd.

Movement	EB	EB	WB	NB	NB
Directions Served	T	TR	L	L	R
Maximum Queue (ft)	20	22	98	163	78
Average Queue (ft)	1	4	38	64	25
95th Queue (ft)	7	18	79	129	69
Link Distance (ft)	1584	1584		1876	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			135		50
Storage Blk Time (%)				18	0
Queuing Penalty (veh)				5	0

Intersection: 5: Mt. Harmony Church Rd. & Prop. Access "A"

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	31	30
Average Queue (ft)	15	1
95th Queue (ft)	40	10
Link Distance (ft)	627	770
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Stevens Mill Rd. & Prop. Access "B"

Movement	SB
Directions Served	LR
Maximum Queue (ft)	31
Average Queue (ft)	4
95th Queue (ft)	21
Link Distance (ft)	589
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 5

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	300	51	21	159	38	46
Future Volume (vph)	300	51	21	159	38	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	1765	0	0	1790	1631	0
Flt Permitted				0.994	0.978	
Satd. Flow (perm)	1765	0	0	1790	1631	0
Link Speed (mph)	35			35	35	
Link Distance (ft)	1708			1580	2657	
Travel Time (s)	33.3			30.8	51.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Lane Group Flow (vph)	390	0	0	200	93	0
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 37.6% ICU Level of Service A
Analysis Period (min) 15

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	300	51	21	159	38	46
Future Volume (Veh/h)	300	51	21	159	38	46
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	333	57	23	177	42	51
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			390		584	362
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			390		584	362
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		91	93
cM capacity (veh/h)			1169		464	683

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	390	200	93
Volume Left	0	23	42
Volume Right	57	0	51
cSH	1700	1169	563
Volume to Capacity	0.23	0.02	0.17
Queue Length 95th (ft)	0	2	15
Control Delay (s)	0.0	1.1	12.7
Lane LOS		A	B
Approach Delay (s)	0.0	1.1	12.7
Approach LOS			B

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	37.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	45	249	77	51	59	17
Future Volume (vph)	45	249	77	51	59	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	1583	0	0	1748	1747	0
Flt Permitted	0.992			0.971		
Satd. Flow (perm)	1583	0	0	1748	1747	0
Link Speed (mph)	35			35	35	
Link Distance (ft)	1765			997	2657	
Travel Time (s)	34.4			19.4	51.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Lane Group Flow (vph)	327	0	0	143	85	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 38.1% ICU Level of Service A
Analysis Period (min) 15

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	45	249	77	51	59	17
Future Volume (Veh/h)	45	249	77	51	59	17
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	50	277	86	57	66	19
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	304	76	85			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	304	76	85			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	92	72	94			
cM capacity (veh/h)	648	986	1512			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	327	143	85
Volume Left	50	86	0
Volume Right	277	0	19
cSH	913	1512	1700
Volume to Capacity	0.36	0.06	0.05
Queue Length 95th (ft)	41	5	0
Control Delay (s)	11.1	4.7	0.0
Lane LOS	B	A	
Approach Delay (s)	11.1	4.7	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	7.8		
Intersection Capacity Utilization	38.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	2	4	68	7	67	4	34	138	232	35	0
Future Volume (vph)	3	2	4	68	7	67	4	34	138	232	35	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	1666	0	0	1648	0	0	1608	0	0	1725	0
Flt Permitted		0.984			0.977			0.999			0.958	
Satd. Flow (perm)	0	1666	0	0	1648	0	0	1608	0	0	1725	0
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		516			1722			1947			819	
Travel Time (s)		10.1			33.5			37.9			16.0	
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	9	0	0	158	0	0	195	0	0	297	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 47.9% ICU Level of Service A
Analysis Period (min) 15

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	2	4	68	7	67	4	34	138	232	35	0
Future Volume (Veh/h)	3	2	4	68	7	67	4	34	138	232	35	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
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
Hourly flow rate (vph)	3	2	4	76	8	74	4	38	153	258	39	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	756	754	39	682	678	114	39			191		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	756	754	39	682	678	114	39			191		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	100	75	97	92	100			81		
cM capacity (veh/h)	251	274	1033	308	304	938	1571			1383		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	9	158	195	297
Volume Left	3	76	4	258
Volume Right	4	74	153	0
cSH	389	449	1571	1383
Volume to Capacity	0.02	0.35	0.00	0.19
Queue Length 95th (ft)	2	39	0	17
Control Delay (s)	14.5	17.3	0.2	7.3
Lane LOS	B	C	A	A
Approach Delay (s)	14.5	17.3	0.2	7.3
Approach LOS	B	C		

Intersection Summary			
Average Delay	7.7		
Intersection Capacity Utilization	47.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	347	186	123	386	138	28
Future Volume (vph)	347	186	123	386	138	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	135		0	50
Storage Lanes		0	1		1	1
Taper Length (ft)			0		25	
Satd. Flow (prot)	3243	0	1711	1801	1711	1531
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3243	0	1711	1801	1711	1531
Link Speed (mph)	35			35	35	
Link Distance (ft)	1616			1955	1919	
Travel Time (s)	31.5			38.1	37.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Lane Group Flow (vph)	593	0	137	429	153	31
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 40.0% ICU Level of Service A
Analysis Period (min) 15

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	347	186	123	386	138	28
Future Volume (Veh/h)	347	186	123	386	138	28
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	386	207	137	429	153	31
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						2
Median type	None			TWLTL		
Median storage veh)				2		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			593		1192	296
vC1, stage 1 conf vol					490	
vC2, stage 2 conf vol					703	
vCu, unblocked vol			593		1192	296
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			86		55	96
cM capacity (veh/h)			979		342	700

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	257	336	137	429	184
Volume Left	0	0	137	0	153
Volume Right	0	207	0	0	31
cSH	1700	1700	979	1700	412
Volume to Capacity	0.15	0.20	0.14	0.25	0.45
Queue Length 95th (ft)	0	0	12	0	56
Control Delay (s)	0.0	0.0	9.3	0.0	21.5
Lane LOS			A		C
Approach Delay (s)	0.0		2.2		21.5
Approach LOS					C

Intersection Summary			
Average Delay	3.9		
Intersection Capacity Utilization	40.0%	ICU Level of Service	A
Analysis Period (min)	15		

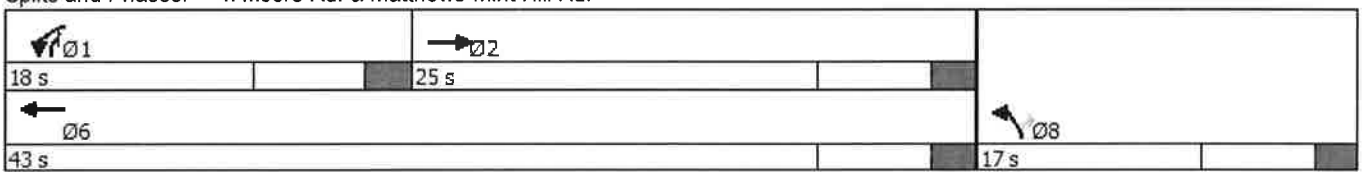
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	347	186	123	386	138	28
Future Volume (vph)	347	186	123	386	138	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	135		0	50
Storage Lanes		0	1		1	1
Taper Length (ft)			0		25	
Satd. Flow (prot)	3243	0	1711	1801	1711	1531
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3243	0	1711	1801	1711	1531
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	177					31
Link Speed (mph)	35			35	35	
Link Distance (ft)	1616			1955	1919	
Travel Time (s)	31.5			38.1	37.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Lane Group Flow (vph)	593	0	137	429	153	31
Turn Type	NA		Prot	NA	Prot	pm+ov
Protected Phases	2		1	6	8	1
Permitted Phases						8
Detector Phase	2		1	6	8	1
Switch Phase						
Minimum Initial (s)	10.0		7.0	10.0	7.0	7.0
Minimum Split (s)	17.0		14.0	17.0	14.0	14.0
Total Split (s)	25.0		18.0	43.0	17.0	18.0
Total Split (%)	41.7%		30.0%	71.7%	28.3%	30.0%
Yellow Time (s)	5.0		5.0	5.0	5.0	5.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0		-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0		5.0	5.0	5.0	5.0
Lead/Lag	Lag		Lead			Lead
Lead-Lag Optimize?						
Recall Mode	Min		None	Min	None	None
Act Effct Green (s)	22.0		11.5	34.4	11.3	23.7
Actuated g/C Ratio	0.44		0.23	0.68	0.22	0.47
v/c Ratio	0.39		0.35	0.35	0.40	0.04
Control Delay	11.3		22.0	6.1	23.3	3.5
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	11.3		22.0	6.1	23.3	3.5
LOS	B		C	A	C	A
Approach Delay	11.3			10.0	19.9	
Approach LOS	B			A	B	
Queue Length 50th (ft)	56		38	63	42	0
Queue Length 95th (ft)	100		86	106	98	11
Internal Link Dist (ft)	1536			1875	1839	
Turn Bay Length (ft)			135			50
Base Capacity (vph)	1693		466	1367	430	804
Starvation Cap Reductn	0		0	0	0	0

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.35		0.29	0.31	0.36	0.04

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 50.3
Natural Cycle: 45
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.40
Intersection Signal Delay: 11.9 — Intersection LOS: B
Intersection Capacity Utilization 42.5% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 4: Moore Rd. & Matthews-Mint Hill Rd.



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	17	4	8	111	274	34
Future Volume (vph)	17	4	8	111	274	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	1689	0	0	1795	1774	0
Flt Permitted	0.960			0.997		
Satd. Flow (perm)	1689	0	0	1795	1774	0
Link Speed (mph)	25			35	35	
Link Distance (ft)	654			819	997	
Travel Time (s)	17.8			16.0	19.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Lane Group Flow (vph)	23	0	0	132	342	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 26.5% ICU Level of Service A
Analysis Period (min) 15

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	17	4	8	111	274	34
Future Volume (Veh/h)	17	4	8	111	274	34
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	19	4	9	123	304	38
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	464	323	342			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	464	323	342			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	99	99			
cM capacity (veh/h)	552	718	1217			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	23	132	342
Volume Left	19	9	0
Volume Right	4	0	38
cSH	575	1217	1700
Volume to Capacity	0.04	0.01	0.20
Queue Length 95th (ft)	3	1	0
Control Delay (s)	11.5	0.6	0.0
Lane LOS	B	A	
Approach Delay (s)	11.5	0.6	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	26.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	8	4	0
Future Volume (vph)	0	0	0	8	4	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	1801	1558	0	1711	0
Flt Permitted					0.950	
Satd. Flow (perm)	0	1801	1558	0	1711	0
Link Speed (mph)		35	35		25	
Link Distance (ft)		613	516		616	
Travel Time (s)		11.9	10.1		16.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	9	0	4	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 13.3% ICU Level of Service A
Analysis Period (min) 15

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	8	4	0
Future Volume (Veh/h)	0	0	0	8	4	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	9	4	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	9				4	4
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	9				4	4
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1611				1017	1079

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	0	9	4
Volume Left	0	0	4
Volume Right	0	9	0
cSH	1700	1700	1017
Volume to Capacity	0.00	0.01	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	8.6
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.6
Approach LOS			A

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		