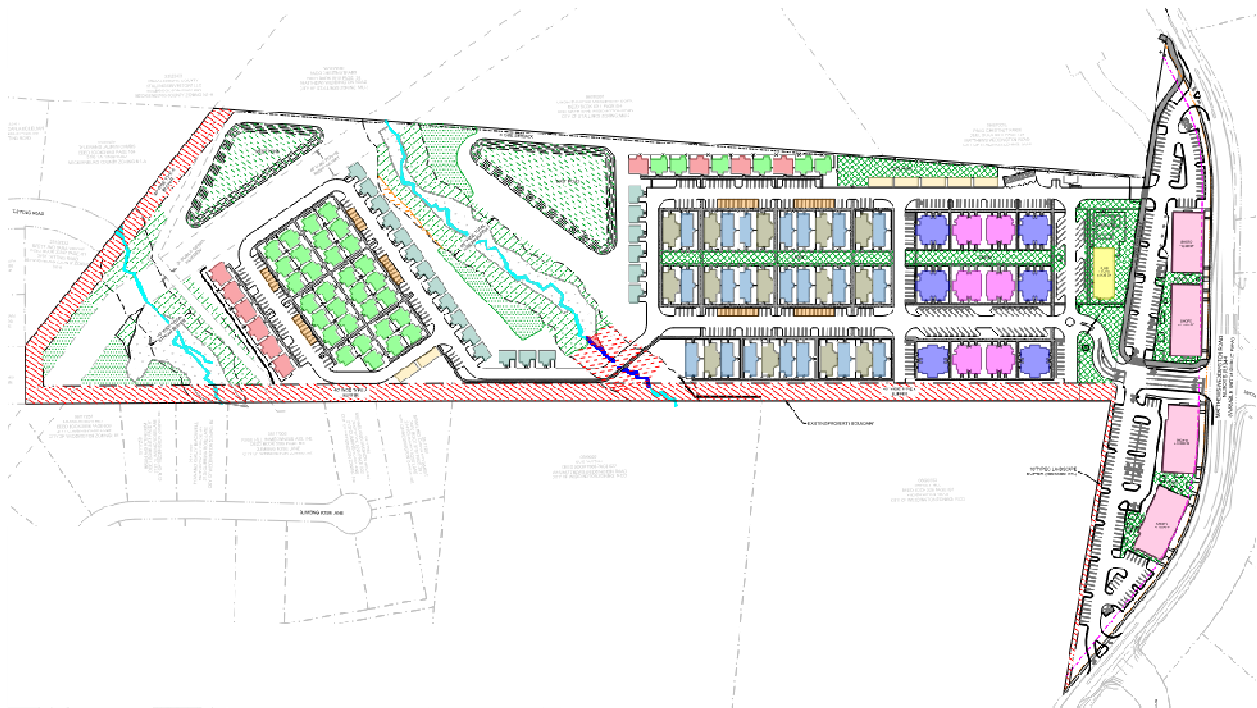


TRAFFIC IMPACT ANALYSIS

THE COTTAGE GREEN

West of Matthews Weddington Road, across from Antioch Church Road

Stallings, North Carolina



for

HMF Americana, LLC

August 2025

1134-001 (C-2165)





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EXECUTIVE SUMMARY

HMF Americana, LLC proposes to develop a mixed-use development located on the west side of Matthews Weddington Road, across from Antioch Church Road in Stallings, NC (see Figure 1). The development is expected to be completed in 2027 with the following land uses:

- 68 single family (detached) homes
- 70 single family (attached) homes
- 84 apartments
- 32,700 square feet of retail*
- 10,900 square feet of restaurant

These land uses vary slightly from those provided in the approved scoping and result in a higher trip generation, which provides for a more conservative analysis for the purpose of this study.



**Matthews Weddington Road facing north
at Antioch Church Road/Access "A"**

This study 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 Stallings' "Traffic Impact Analysis Ordinance". It provides intersection improvements needed for mitigating traffic impacts. This study evaluates the following scenarios:

- 2025 Existing Conditions
- 2027 No Build Conditions
- 2027 Build Conditions
- 2032 Build +5 Conditions

The area of influence of the site as defined by NCDOT and Town of Stallings staff includes the following four existing intersections and three proposed access locations (see Appendix for the approved scoping information):

1. Matthews Weddington Road & Chestnut Lane (roundabout)
2. Matthews Weddington Road & Antioch Church Road/Access "A" (signalized – full movement)
3. Matthews Weddington Road & Brayland Avenue/Access "B" (unsignalized – right-in/right-out)
4. Matthews Weddington Road & Tilley Morris Road (roundabout)
5. Matthews Weddington Road & Access "C" (unsignalized – right-in/right-out)

*The latest site plan has reduced retail to 19,100 SF. However, for the most conservative analysis, this was not assumed for intersections 1-3.



According to the rezoning plan (Site Plan), access to the site is expected to occur via one full movement access and two right-in/right-out accesses:

- Access "A" – signalized full movement access located on Matthews Weddington Road across from Antioch Church Road.
- Access "B" – unsignalized right-in/right-out access located on Matthews Weddington Road across from Brayland Avenue.
- Access "C" – unsignalized right-in/right-out access located on Matthews Weddington Road approximately 400 feet north of Antioch Church Road.

The trip generation results indicate that the site is expected to generate 305 new AM peak hour trips and 375 new PM peak hour trips.

With the results of our analysis (the specifics are described in the Traffic Analysis section of this report) we suggest the following improvements/modifications at the study intersections/proposed accesses:

Build Suggested Improvements:

1. Matthews Weddington Road & Chestnut Lane (Roundabout)

- Construct a second southbound receiving lane on Matthews Weddington Road to terminate as a right turn lane at Access "A"
- Modify the southbound approach channelizing median to allow a second circulating lane on the north side of the roundabout
- Restripe the southbound left to a shared thru/left with 250 feet of storage on Matthews Weddington Road
- Restripe the westbound approach to have a terminating left turn lane and a shared left/thru/right lane with 150 feet of storage on Chestnut Lane

2. Matthews Weddington Road & Antioch Church Road/Access "A" (Signalized)

We propose the following full movement access configuration:

- One ingress lane and three egress lanes (an eastbound left turn lane with 125 feet of storage, a thru lane, and a right turn lane with 125 feet of storage) on proposed Access "A"
- Re-mark the westbound right turn lane to a shared thru/right turn lane on Antioch Church Road
- Re-mark the existing pavement to include a northbound left turn lane with 150 feet of storage on Matthews Weddington Road
- Re-mark the existing pavement to include a southbound right turn lane on Matthews Weddington Road, which becomes a terminating right turn lane with the improvements at Matthews Weddington Road & Chestnut Lane
- Implement protected phasing for the eastbound and northbound left movements
- Implement permitted + overlap phasing for the eastbound and southbound right turn movements



- Provide a minimum 125-foot internal protected stem

The following improvements are suggested in addition to the above access configuration:

- Construct a northbound right turn lane with 225 feet of storage on Matthews Weddington Road
- Implement permitted + overlap phasing for the northbound right turn movement

3. Matthews Weddington Road & Brayland Avenue/Access “B” (Unsignalized)

We propose the following right-in/right-out access configuration:

- One ingress lane and one egress lane (a terminating southbound right turn lane) on proposed Access “B”
- Construct a westbound right turn lane with 100 feet of storage and appropriate deceleration taper on Matthews Weddington Road
- Provide a minimum 100-foot internal protected stem

4. Matthews Weddington Road & Tilley Morris Road (Roundabout)

- No suggested improvements

5. Matthews Weddington Road & Access “C” (Unsignalized)

We propose the following right-in/right-out access configuration:

- One ingress lane and one egress lane (a terminating eastbound right turn lane) on proposed Access “C”
- Construct a southbound combined thru/right turn lane continued from Chestnut Lane on Matthews Weddington Road
- Construct an extension of the center median within the painted out median on Matthews Weddington Road to provide minimum overlap with Access “C” and stop short to not impact the existing access for the storage facility on the east side of Matthews Weddington Road
- Provide a minimum 100-foot internal protected stem

This project is in compliance with plans, programs, and policies, including small area plans, adopted by the Town of Stallings for maintaining a safe and efficient multi-modal transportation system.

In summary, although the proposed mixed-use development will increase the amount of vehicular traffic on the adjacent roadways/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 and offsite improvements.

PROPOSED DEVELOPMENT

HMF Americana, LLC proposes to develop a mixed-use development located on the west side of Matthews Weddington Road, across from Antioch Church Road in Stallings, NC (see Figure 1). The development is expected to be completed 2 in 2027 with the following land uses:

- 68 single family (detached) homes
- 70 single family (attached) homes
- 84 apartments
- 32,700 square feet of retail*
- 10,900 square feet of restaurant



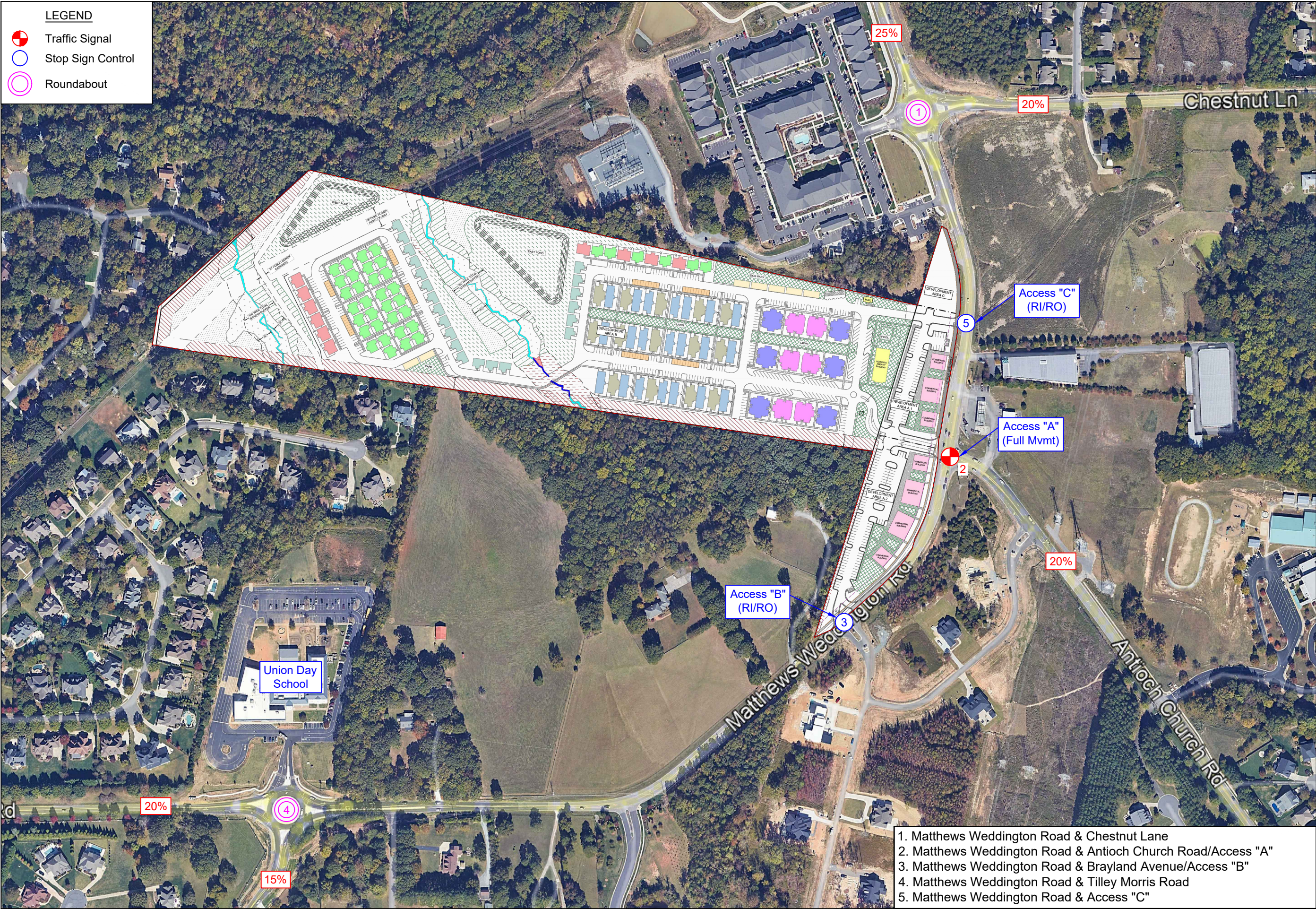
**Matthews Weddington Road facing north
at Antioch Church Road/Access "A"**

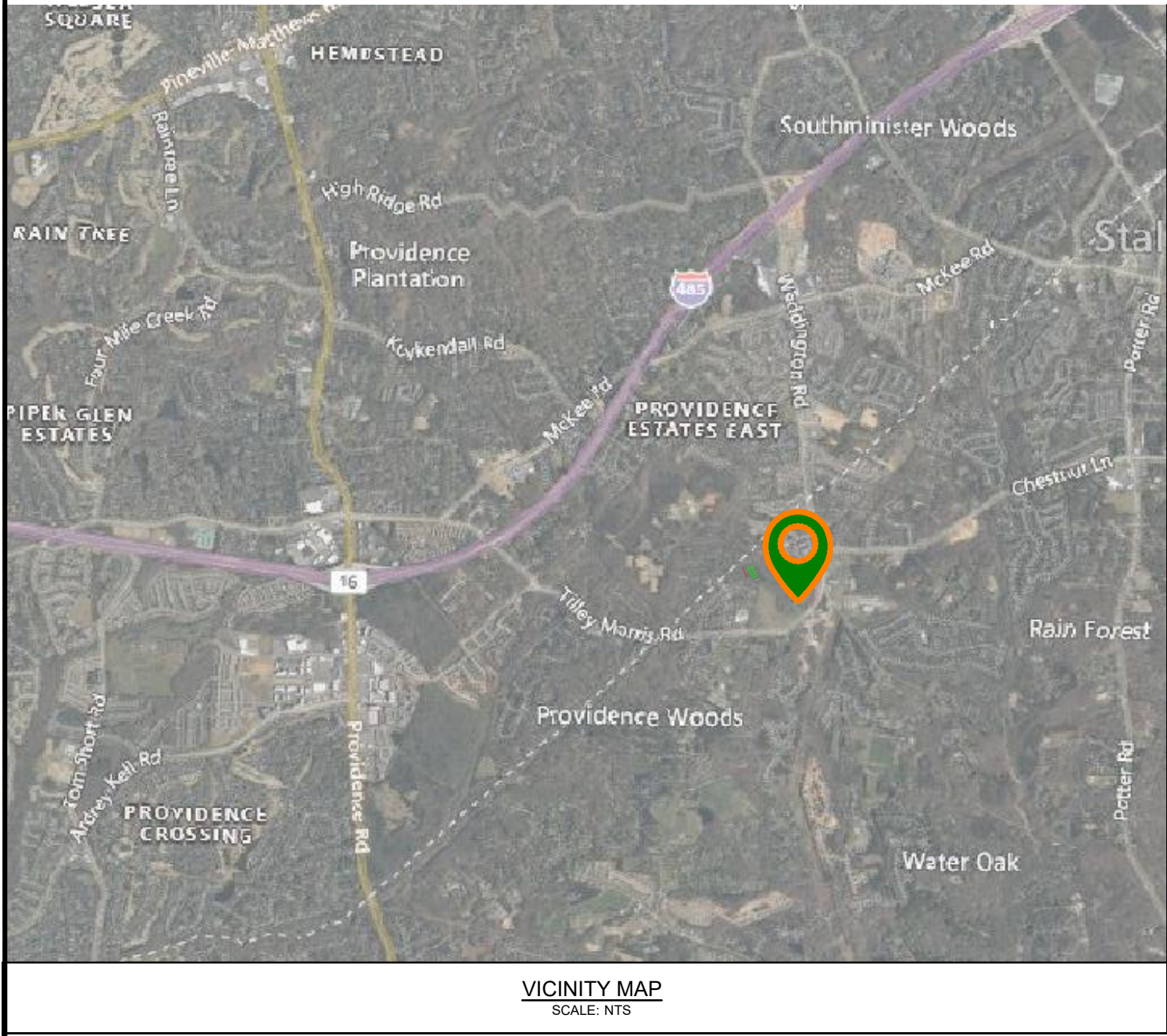
These land uses vary slightly from those provided in the approved scoping and result in a higher trip generation, which provides for a more conservative analysis for the purpose of this study.

According to the rezoning plan (Site Plan), access to the site is expected to occur via one full movement access and two right-in/right-out accesses:

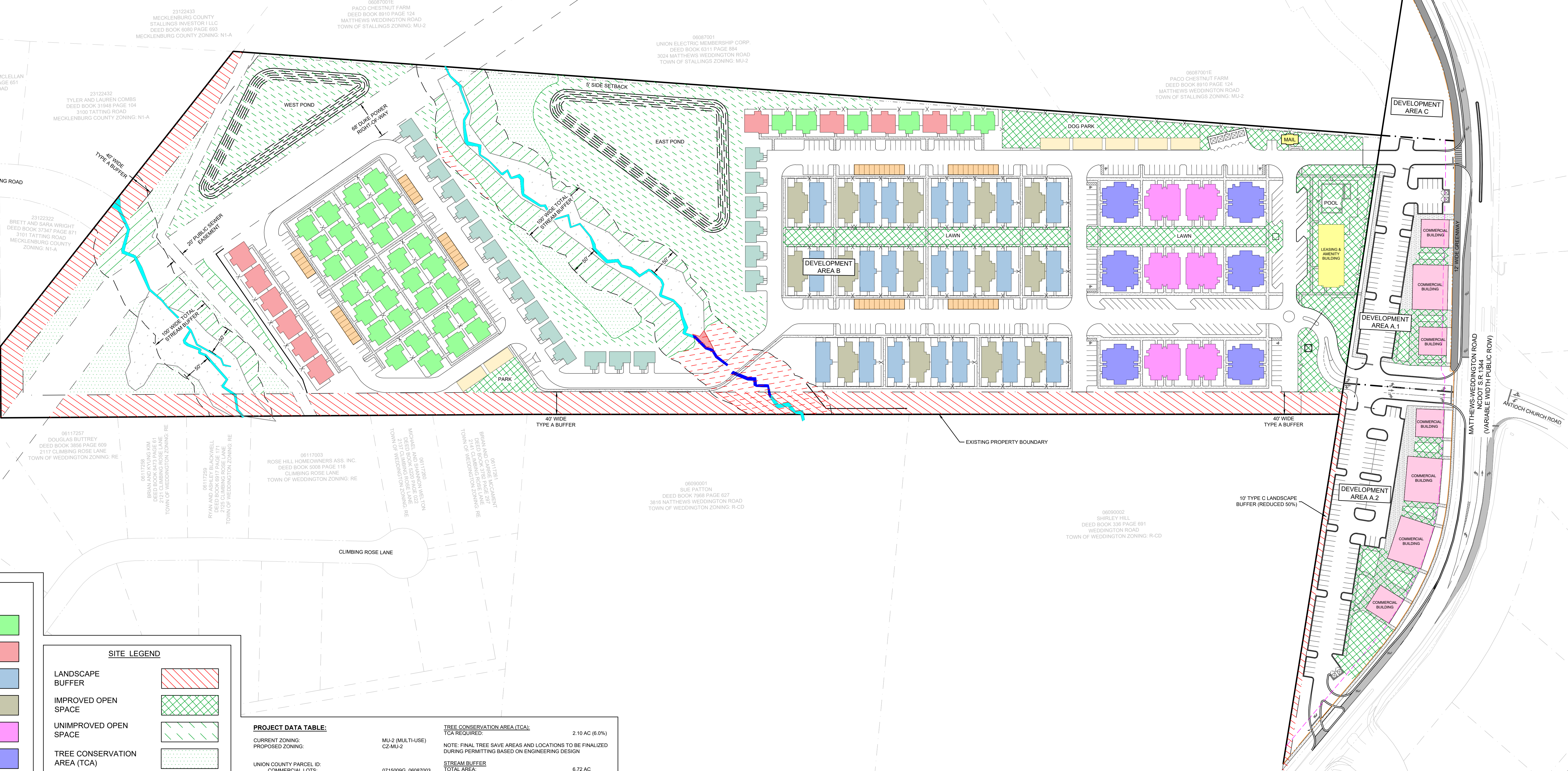
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- Access "C" – unsignalized right-in/right-out access located on Matthews Weddington Road approximately 400 feet north of Antioch Church Road.

*The latest site plan has reduced retail to 19,100 SF. However, for the most conservative analysis, this was not assumed for intersections 1-3.





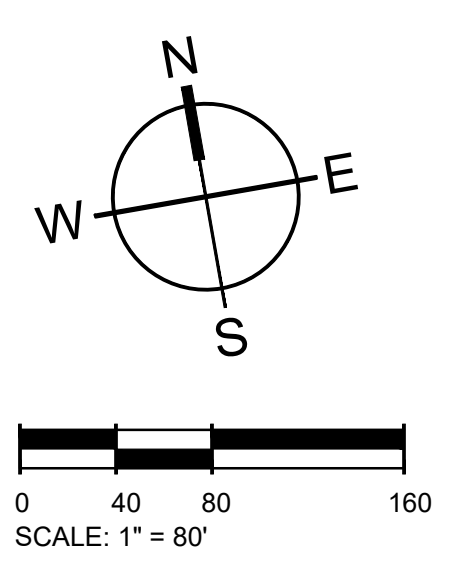
VICINITY MAP
SCALE: NTS



UNIT LEGEND	
2 BED ROOM COTTAGE	
3 BED ROOM COTTAGE	
1 BEDROOM PATIO HOME	
2 BEDROOM PATIO HOME	
6-PLEX BUILDING	
8-PLEX BUILDING	
TERRACE HOMES	
LEASING & AMENITY BUILDING	
CARPORT	
GARAGE	
COMMERCIAL BUILDING	
SECURITY FENCE	— X — X —
PROPOSED RIGHT-OF-WAY	
BUILD-TO-LINE	

SITE LEGEND	
LANDSCAPE BUFFER	
IMPROVED OPEN SPACE	
UNIMPROVED OPEN SPACE	
TREE CONSERVATION AREA (TCA)	
UNIMPROVED OPEN SPACE & TCA	
SIDEWALK	
GREENWAY	
EXISTING WETLAND	
DISTURBED WETLAND	
EXISTING STREAM	
DISTURBED STREAM	
PERMANENT STREAM BUFFER ENCROACHMENT	

PROJECT DATA TABLE:	
CURRENT ZONING:	MU-2 (MULTI-USE)
PROPOSED ZONING:	CZ-MU-2
UNION COUNTY PARCEL ID:	0715009G, 06087003
COMMERCIAL LOTS:	06087002, 06087002C
EXISTING LOT AREA:	6.37 AC
EXISTING COMMERCIAL LOT AREA:	30.44 AC
EXISTING RESIDENTIAL LOT AREA:	36.81 AC
TOTAL EXISTING LOT AREA:	67.62 AC
PROPOSED LOT AREA:	4.14 AC
PROP. COMMERCIAL LOT AREA:	2.48 AC
AREA A-1:	1.12 AC
AREA A-2:	0.61 AC
PROP. RESIDENTIAL LOT AREA:	35.07 AC
AREA B:	0.49 AC
AREA C:	1.73 AC
UNDEVELOPED LOT AREA:	1.12 AC
TOTAL PROP. DEDICATED ROW:	0.61 AC
EXISTING ROW:	35.07 AC
PROP. ROW:	0.61 AC
TOTAL PROP. LOT AREA:	35.07 AC
SETBACKS:	
SIDE SETBACK:	5'
REAR SETBACK:	5'
FRONT BUILD TO LINE:	16'
OPEN SPACE:	
TOTAL OPEN SPACE REQUIRED:	3.54 AC (10%)
RESIDENTIAL IMPROVED OPEN SPACE REQUIRED:	1.52 AC (5.0%)
COMMERCIAL IMPROVED OPEN SPACE REQUIRED:	0.21 AC (5.0%)
*PROVIDED AS REQUIRED PER ORDINANCE	
TOTAL PERVIOUS AREA:	
RESIDENTIAL: 22.86 AC (75.1%)	
COMMERCIAL: 1.03 AC (24.9%)	
TREE CONSERVATION AREA (TCA):	2.10 AC (6.0%)
TCA REQUIRED:	
NOTE: FINAL TREE SAVE AREAS AND LOCATIONS TO BE FINALIZED DURING PERMITTING BASED ON ENGINEERING DESIGN	
STREAM BUFFER:	
TOTAL AREA:	6.72 AC
PERMANENT DISTURBED AREA:	0.57 AC
WATERSHEDS:	
SIX MILE CREEK:	34.25 AC (96.7%)
TWELVE MILE CREEK:	1.17 AC (3.3%)
WETLAND IMPACT:	
WETLAND:	416 SF (0.01 AC)
STREAK:	177 LF, 692 SF (0.02 AC)
PARKING REQUIRED:	
COMMERCIAL: 1.5 SPACES / 1,000 SF OF GFA	
(1.5 SPACES X (25,000 SF / 1,000 SF)) = 38 SPACES	
RESIDENTIAL:	
TERRACE HOME: 1 DRIVEWAY SPACE / UNIT	= 21 DRIVEWAYS
6-PLEX BUILDING: 1 SPACE / UNIT	= 36 SPACES
8-PLEX BUILDING: 1 SPACE / UNIT	= 48 SPACES
PATIO HOME: 1 SPACE / UNIT	= 70 SPACES
COTTAGE: 1 SPACE / UNIT	= 47 SPACES
TOTAL:	= 222 SPACES
RESIDENTIAL UNIT ANALYSIS:	
1-BR HOMES IN 6-PLEX BUILDINGS:	24 UNITS
2-BR HOMES IN 6-PLEX BUILDINGS:	12 UNITS
1-BR HOMES IN 8-PLEX BUILDINGS:	48 UNITS
1-BR PATIO HOMES:	42 UNITS
2-BR PATIO HOMES:	28 UNITS
2-BR COTTAGES:	37 UNITS
3-BR COTTAGES:	10 UNITS
3-BR TERRACE HOMES:	21 UNITS
TOTAL UNITS:	222 UNITS



AREA CONDITIONS

The area of influence of the site as defined by NCDOT and Town of Stallings staff includes the following four existing intersections and three proposed access locations (see Appendix for the approved scoping information):

1. Matthews Weddington Road & Chestnut Lane (roundabout)
2. Matthews Weddington Road & Antioch Church Road/Access “A” (signalized – full movement)
3. Matthews Weddington Road & Brayland Avenue/Access “B” (unsignalized – right-in/right-out)
4. Matthews Weddington Road & Tilley Morris Road (roundabout)
5. Matthews Weddington Road & Access “C” (unsignalized – right-in/right-out)



**Matthews Weddington Road
facing south at Chestnut Lane**



**Tilley Morris Road facing east
at Matthews Weddington Road**

Morning (7:00-9:00 AM) and afternoon (2:00-6:00 PM) peak period turning movement counts were conducted at the study intersections on Tuesday, February 11, 2025, while the area schools were in session.

According to the latest NCDOT Roadway Functional Classification data, Matthews Weddington Road is a minor arterial with a posted speed limit of 45-mph. The roadway is a two-lane undivided facility (one lane in each direction). No curb/gutter, planting strip, sidewalk, or bike lanes are present on either side of the roadway in the vicinity of the site.

In addition to the intersection TMCs, geospatial information provided by NCDOT’s ArcGIS portal (*Go! NC*), such as annual average daily traffic (AADT) was collected.

AADT for two-way volumes on roadways within the area of influence are depicted in Table 1 based on the latest data.



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

Roadway	AADT (2022)
Matthews Weddington Road north of Chestnut Lane	14,000
Chestnut Lane east of Matthews Weddington Road	9,500
Matthews Weddington Road between Chestnut Lane and Antioch Church Road	14,000
Antioch Church Road east of Matthews Weddington Road	11,000
Matthews Weddington Road between Antioch Church Road and Tilley Morris Road	13,500
Weddington Matthews Road south of Matthews Weddington Road/Tilley Morris Road	7,900
Tilley Morris Road west of Weddington Matthews Road	12,000

Crash type and severity frequency per intersection are reported in Tables 2A and 2B, respectively, with data ranging from January 1, 2019, to December 31, 2023.

Table 2A: Crash Type Data from 2019-2023

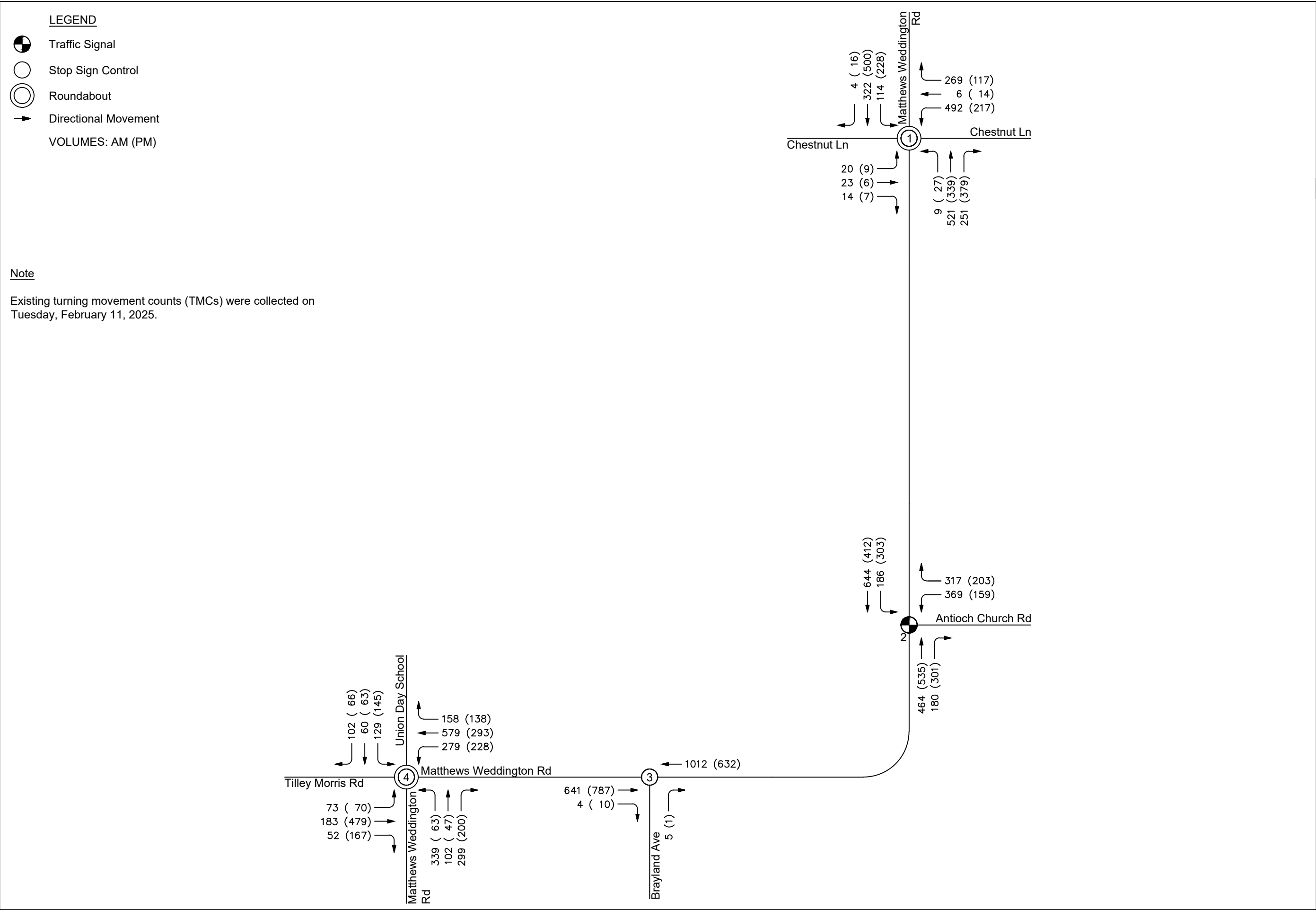
Intersection	Crash Type						
	Left Turn	Right Turn	Rear End	ROR & Fixed Object	Angle	Side Swipe	Other
Matthews Weddington Rd & Chestnut Ln	NA	NA	7	NA	NA	5	25
Matthews Weddington Rd & Antioch Ch Rd	NA	NA	3	NA	NA	0	8
Matthews Weddington Rd & Tilley Morris Rd	NA	NA	19	NA	NA	4	10

Table 2B: Crash Severity Data from 2019-2023

Intersection	Severity Type			Total Crashes
	K & A Injury Crashes	B & C Injury Crashes	PDO Crashes	
Matthews Weddington Rd & Chestnut Ln	0	8	29	37
Matthews Weddington Rd & Antioch Ch Rd	0	2	9	11
Matthews Weddington Rd & Tilley Morris Rd	1	3	29	33

Notes: **K**: Fatality **A**: A injury type (disabling) **B**: B injury type (evident) **C**: injury type (possible) **PDO**: Property Damage Only

Figure 2 portrays the existing TMCs for the AM and PM peak hours. Figures 3A and 3B include the site directional and pass-by distributions, respectively.



LANDSCAPE ARCHITECTURE
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THE COTTAGE GREEN

STALLINGS, NORTH CAROLINA

HMF AMERICANA, LLC

PO BOX 7862

THE WOODLANDS, TX 77387

EXISTING PEAK
HOUR TRAFFIC
VOLUMES

SCALE: NTS

PROJECT #: 1134-001
DRAWN BY: CRB
CHECKED BY: PAH

AUGUST 2025

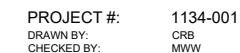
REVISIONS:

Figure 2

STALLINGS, NORTH CAROLINA

PO BOX 7862

SCALE: NTS

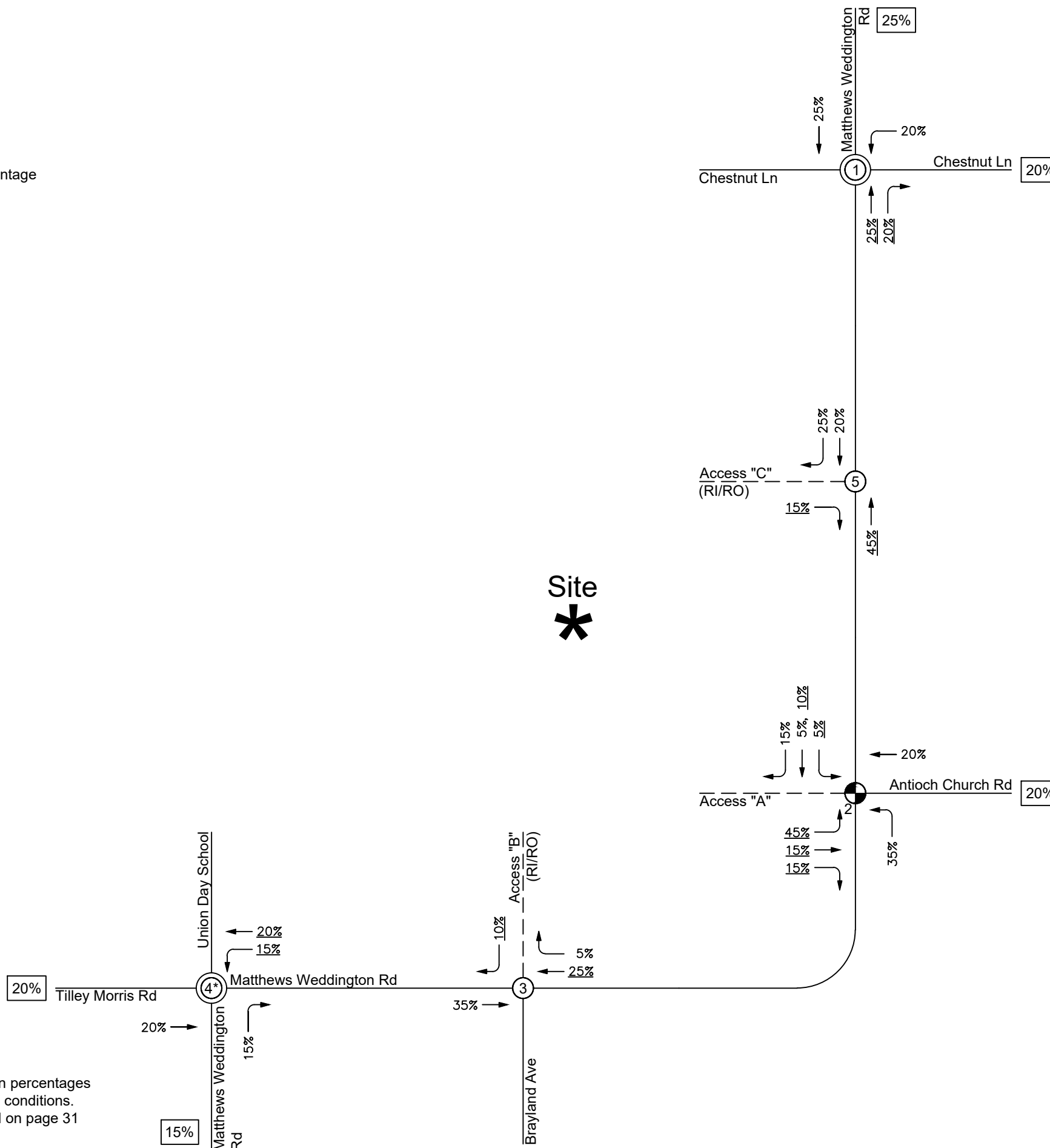


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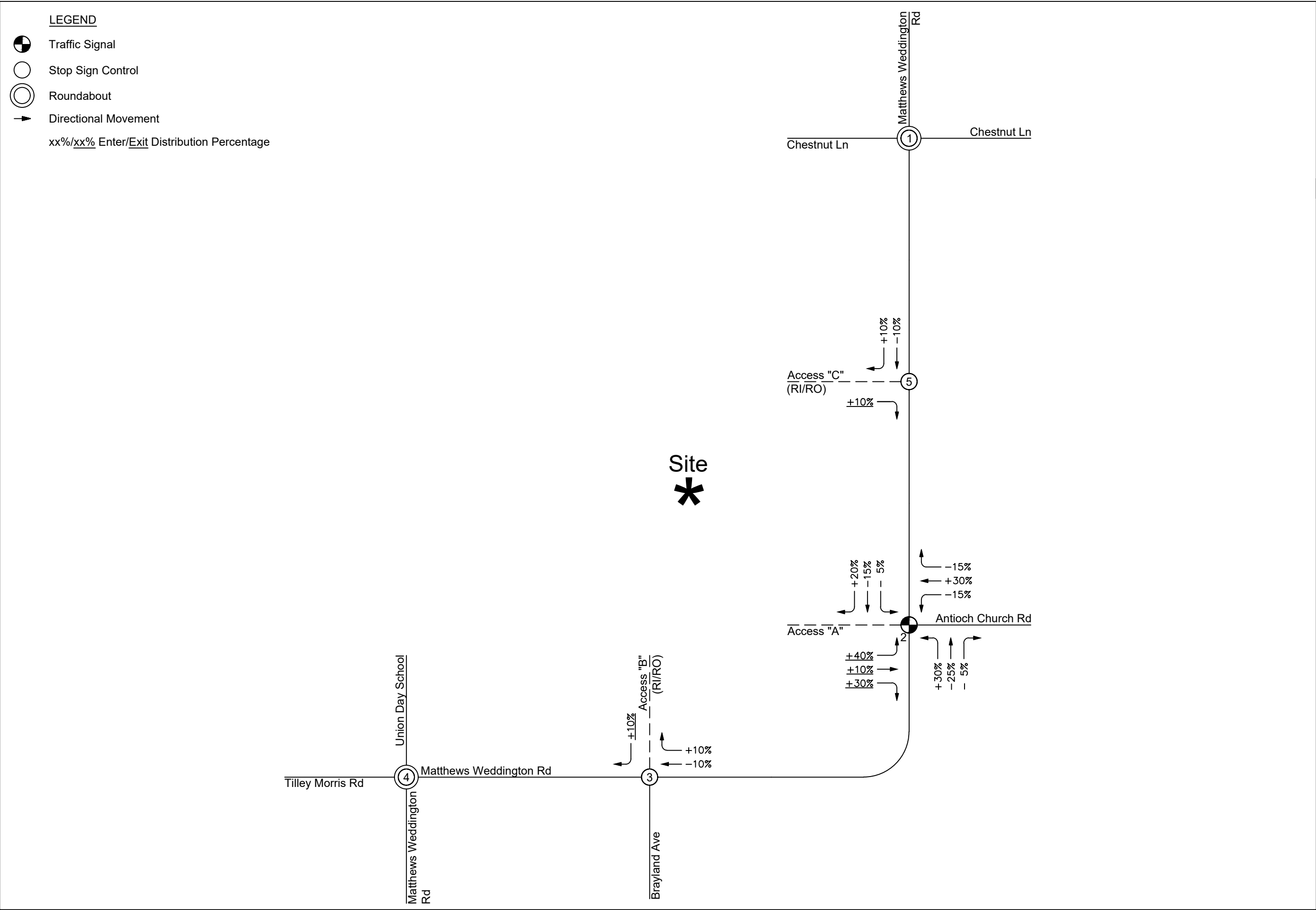
LEGEND

-  Traffic Signal
-  Stop Sign Control
-  Roundabout
-  Directional Movement

xx%/xx% Enter/Exit Distribution Percentage



*Per coordination with NCDOT, the distribution percentages were updated for the build with improvements conditions. The additional distribution details are included on page 31 and in the Appendix.





PROJECTED TRAFFIC

The daily and peak-hour-trip-generation data for the site is presented in Table 3. The estimates for the trips generated by the land use are obtained from the Institute of Transportation Engineers, Trip Generation Manual, 11th Edition, 2021.

Table 3: Trip Generation

Land Use [ITE Code]			Daily	AM Peak Hour			PM Peak Hour		
				Enter	Exit	Total	Enter	Exit	Total
Proposed Development									
Single Family (Detached) [210]	21	DU	240	5	13	18	14	9	23
Single Family (Detached) [210]	47	DU	504	9	28	37	31	18	49
Single Family (Attached) [215]	70	DU	483	8	23	31	22	16	38
Multi Family (Low Rise) [220]	84	DU	614	12	37	49	36	21	57
Strip Retail Plaza [822]	32,700*	SF	1,781	46	31	77	108	107	215
High-Turnover Sit-Down Restaurant [932]	10,900	SF	1,168	85	64	149	91	87	178
Subtotal Trips			4,790	165	196	361	302	258	560
Internal Capture Reductions			**	-27	-29	-56	-68	-68	-136
Pass-By Reductions			-49	0	0	0	-25	-24	-49
Total New Trips			4,741	138	167	305	209	166	375

References:

Trip Generation, 11th Edition, Institute of Transportation Engineers, Washington, DC. 2021.

*The latest site plan has reduced retail to 19,100 SF. However, for the most conservative analysis, this was not assumed for intersections 1-3.

**Internal Capture not applied to daily trips.

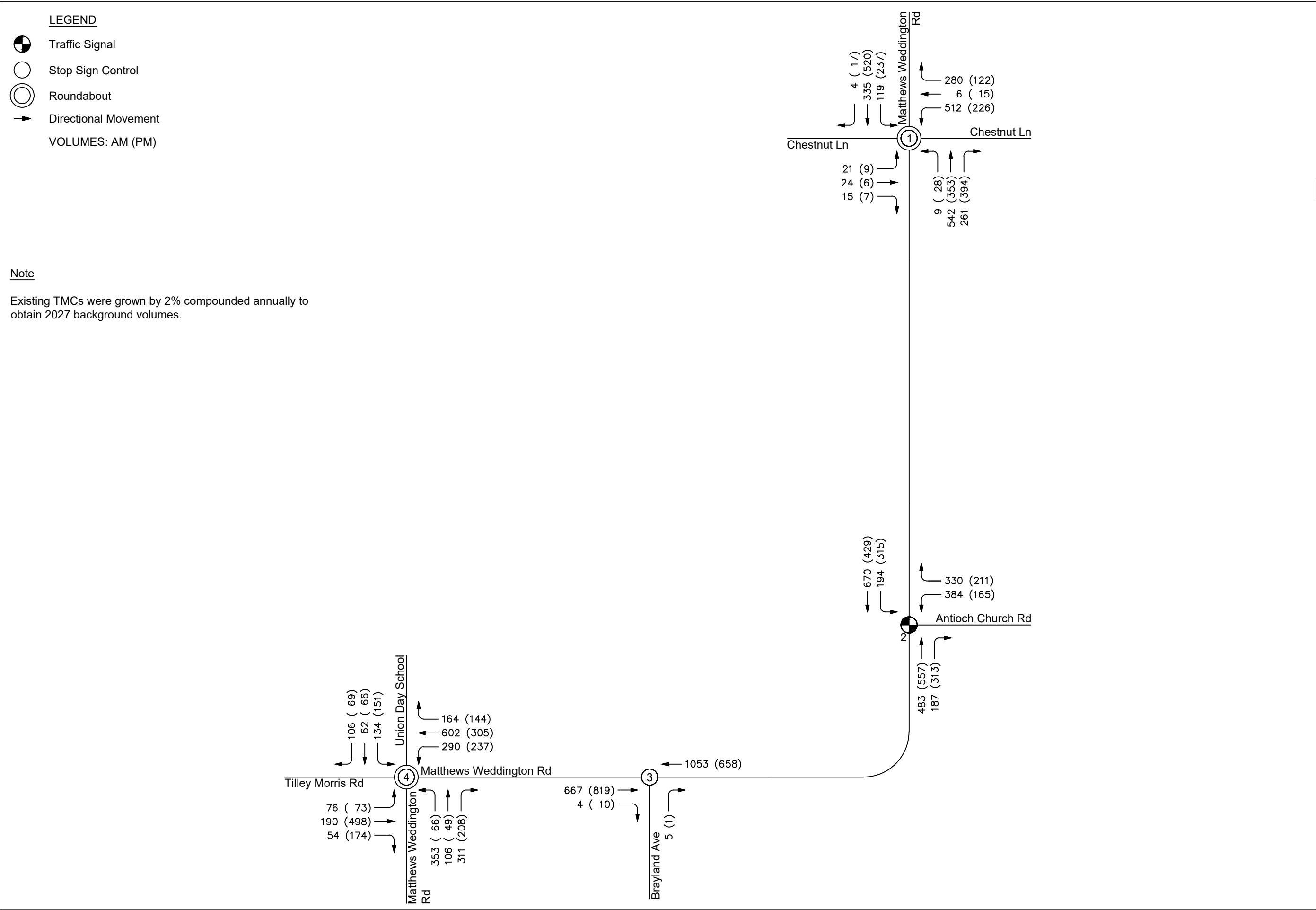
Pass-By Reduction for LUC 932 = 43% in PM Peak

The trip generation results indicate that the site is expected to generate 305 new AM peak hour trips and 375 new PM peak hour trips.

The projected background traffic volumes used in the analysis were developed from the existing peak hour TMCs. Per NCDOT and Town of Stallings staff, a 2% per year growth rate was used to obtain the 2027 and 2032 background volumes. The 2027 No Build peak hour traffic volumes are shown in Figure 4.

The 2027 Build AM and PM peak hour traffic volumes are shown in Figures 5 and 6, respectively. The 2032 Build +5 AM and PM peak hour traffic volumes are shown in Figures 7 and 8, respectively. The No Build traffic is indicated to the far left of the movement arrows, followed by the site traffic in parentheses. The two volumes are added to obtain the projected total Build traffic for that movement:

$$\underline{\text{No Build} + (\text{Site}) = \text{Build}}$$



LANDSCAPE ARCHITECTURE
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STALLINGS, NORTH CAROLINA

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THE WOODLANDS, TX 77387

2027 NO BUILD
PEAK HOUR
TRAFFIC VOLUMES

SCALE: NTS

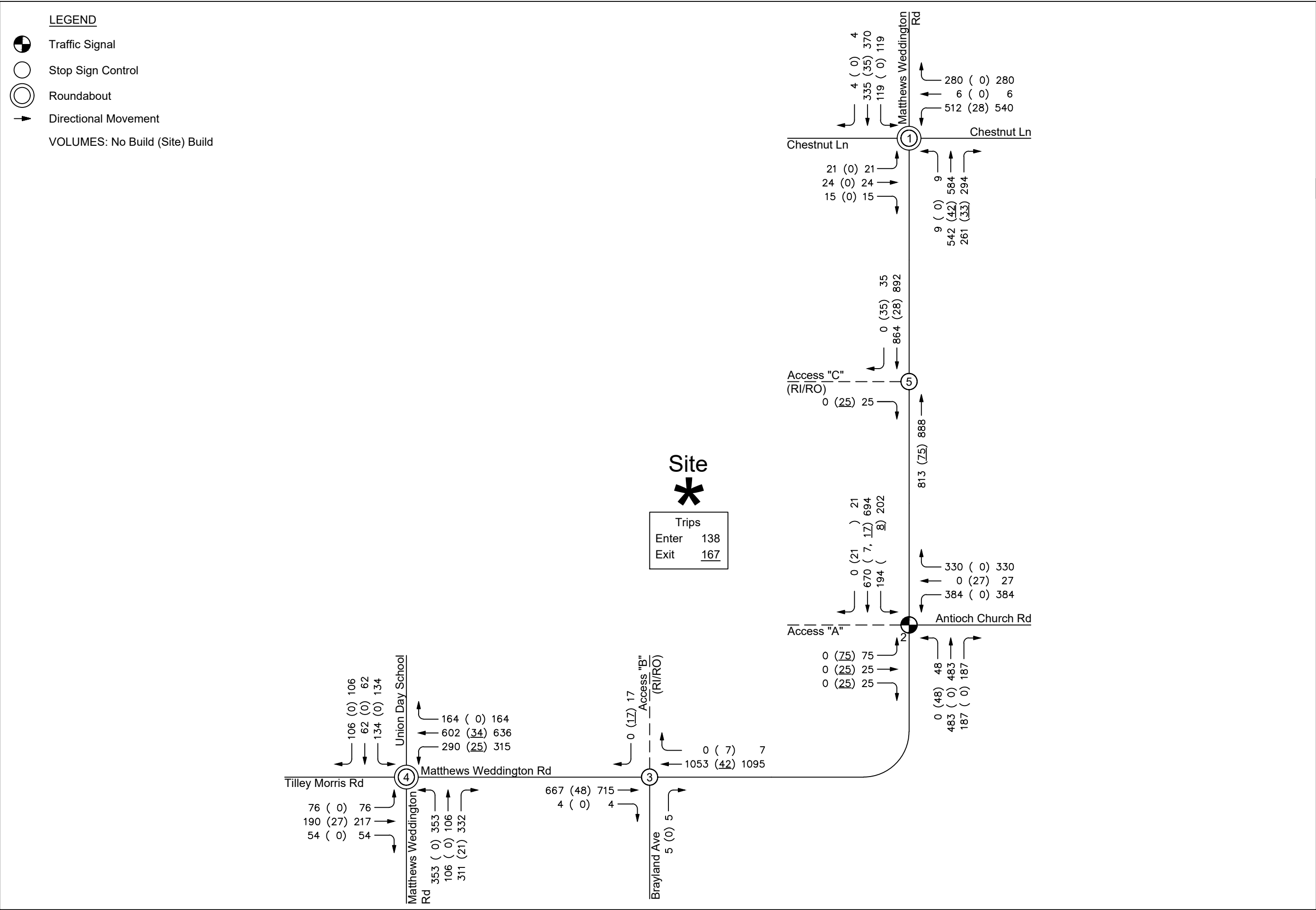


PROJECT #: 1134-001
DRAWN BY: CRB
CHECKED BY: PAH

AUGUST 2025

REVISIONS:

Figure 4



**DESIGN
RESOURCE
GROUP**

LANDSCAPE ARCHITECTURE
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TRANSPORTATION PLANNING

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THE COTTAGE GREEN
STALLINGS, NORTH CAROLINA

HMF AMERICANA, LLC
PO BOX 7862
THE WOODLANDS, TX 77387

**2027 BUILD
AM PEAK HOUR
TRAFFIC VOLUMES**

SCALE: NTS

PROJECT #: 1134-001
DRAWN BY: CRB
CHECKED BY: PAH

AUGUST 2025

REVISIONS:

Figure 5

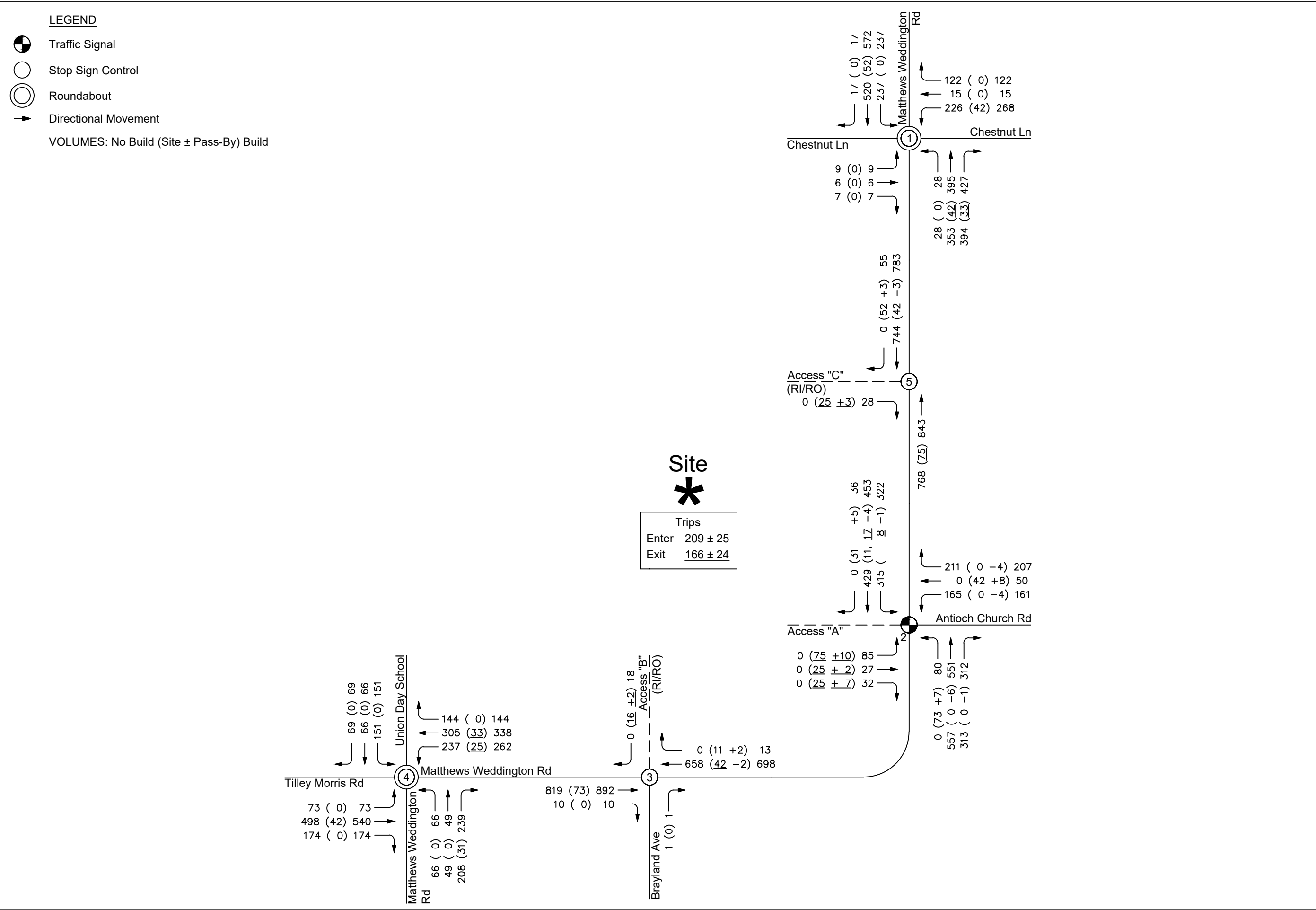
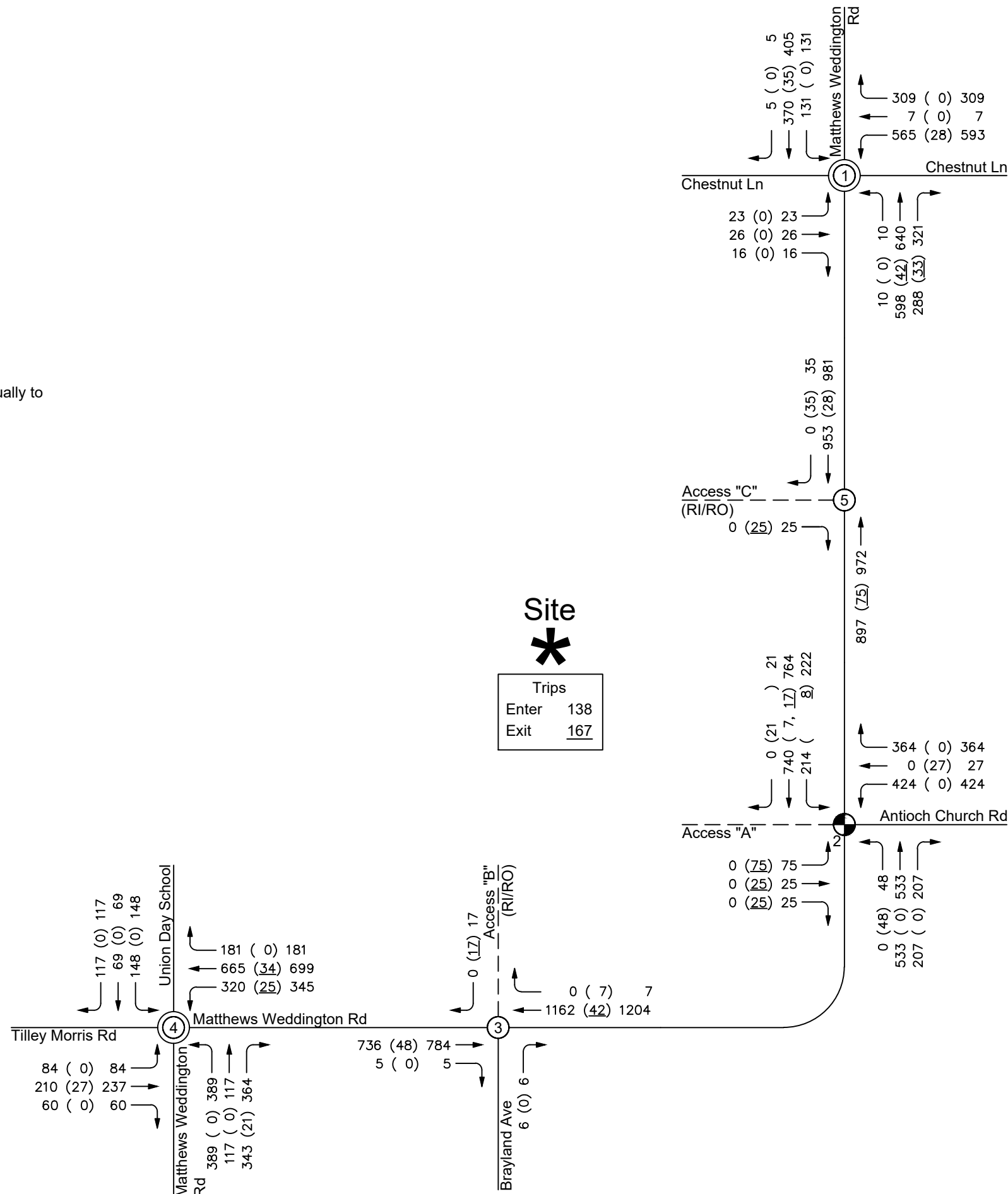


Figure 6

 Traffic Signal
 Stop Sign Control
 Roundabout
 Directional Movement

Note

Site
*
Trips
Enter 138
Exit 167



STALLINGS, NORTH CAROLINA
HMF AMERICANA, LLC
PO BOX 7862
THE WOODLANDS, TX 77387

2032 BUILD +5
AM PEAK HOUR
TRAFFIC VOLUMES

SCALE: NTS

PROJECT #: 1134-001
DRAWN BY: CRB
CHECKED BY: PAH

AUGUST 2025

REVISIONS:

Figure 7

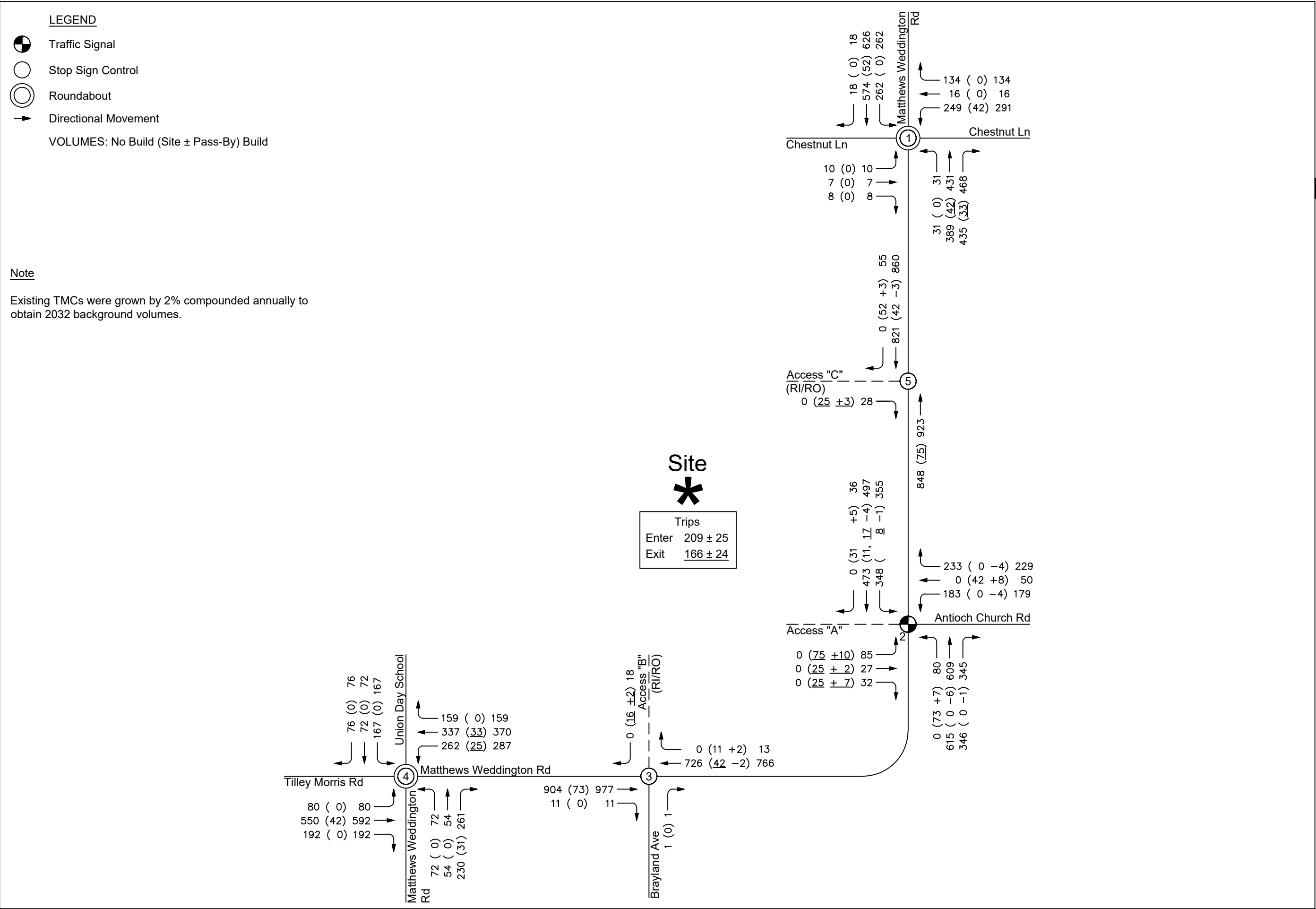


Figure 8



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.

Level of service (LOS) of an intersection or approach is a qualitative MOE of traffic operations. It is a measure of average control delay in time within a peak period. The Transportation Research Board's Highway Capacity Manual¹ (HCM) defines the LOS thresholds established for signalized and unsignalized intersections per the following exhibits:

Intersection LOS	Exhibit 19-8 Signalized Intersection Control Delay per Vehicle (sec/vehicle)	Exhibit 20-2 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

For the analysis of unsignalized intersections, intersection LOS is defined in terms of the average control delay for each minor-street movement (or shared movement) as well as major-street left-turns. It should be noted that stop sign-controlled streets/driveways intersecting major streets typically experience long delays during peak hours, while most of the traffic moving through the intersection on the major street experiences little or no delay.

This study 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 Stallings' "Traffic Impact Analysis Ordinance". It provides intersection improvements needed for mitigating traffic impacts. This study evaluates the following scenarios:

- 2025 Existing Conditions
- 2027 No Build Conditions
- 2027 Build Conditions
- 2032 Build +5 Conditions

1 National Research Council. Transportation Research Board. Highway Capacity Manual 7th Ed., Washington, DC. 2022.



NCDOT & TOWN OF STALLINGS ANALYSIS REQUIREMENTS - In order to determine the mitigation responsibility of the developer, this study compares 2027 Build results to the 2027 No Build results.

Per Chapter 5, Section J of the *July 2003 NCDOT Policy on Street and Driveway Access to North Carolina Highways* and the Town of Stallings' "Traffic Impact Analysis Ordinance" 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 (Future No-Build to Build):

- *The total average delay at an intersection or individual approach increases by 25% or greater, while maintaining the same level of service, or*
- *The Level of Service degrades by at least one level, or*
- *The 95th percentile queue exceeds the storage capacity of the existing lane (for turning lane mitigations), or*
- *The LOS is at or below the LOS threshold dictated by the zoning (outlined below) in background conditions and the proposed project shows a negative impact on the intersection or approach. (Stallings requirement)*

Zoning	Vehicular LOS Threshold
AG, CIV	C
SFR, MFT, VSR, IND	D
TC, MU, C-74, CP-485, CZ, CUP	E
Within a small area plan boundary	E
All Others	D

SYNCHRO 11 and SIDRA were the software tools used in determining the delay, capacity, and corresponding LOS at the study intersections. SimTraffic 11, a traffic simulation software application for unsignalized and signalized intersections, was used to calculate the maximum queue lengths at the study intersections. The Synchro, SIDRA, and SimTraffic results of each scenario are displayed per intersection and are presented in Tables 4 – 16.



Base assumptions for the analysis scenarios include:

- A 2% per year background growth rate between the existing TMC's and future 2027 and 2032 conditions.
- All study intersections and movements assume a 0.90 peak hour factor (PHF) unless otherwise noted on the TMCs in the Appendix to account for the school peak hours for Union Day School.
 - A minimum of 0.50 PHF is used for movements to/from the school during school peak hours at intersection 4.
 - A minimum of 0.75 for movements toward/away from the school during school peak hours at all other intersections.
- Observed heavy vehicle (HV) percentages (from TMCs) were used in all analysis for all intersections, a minimum of 2% was applied to proposed intersections and to approaches with less than 2% HV.
- A minimum volume of 4 vehicles per hour for all allowable movements.
- Existing signal operations were used in the existing conditions (see Appendix for existing signal plans).
- For all future scenarios permitted/protected left turns were adjusted to protected only.
- RTOR was disabled for all scenarios.
- Signal timings were optimized in all scenarios based on NCDOT parameters, with manual optimization performed where improved results could be obtained compared to automatic split optimization.
- Yellow, red, and lost times were adjusted to NCDOT parameters (5, 2, -2).
- The overall site distribution was updated from the one included in the approved scope based on the most recent AADT's and existing TMC's.
- Per coordination with NCDOT, the distribution percentages were updated for the build with improvements conditions at intersection 4. The additional distribution details are included on page 31 and in the Appendix.



1. Matthews Weddington Road & Chestnut Lane (Roundabout)

Table 4: Matthews Weddington Rd & Chestnut Ln Analysis Results

Approach	AM Peak Hour			PM Peak Hour		
	LOS	Delay (sec/veh)	Capacity (v/c)	LOS	Delay (sec/veh)	Capacity (v/c)
Existing Conditions						
Intersection	B	14.2	0.83	A	7.7	0.54
Eastbound - Chestnut Ln	A	8.9	-	A	6.9	-
Westbound - Chestnut Ln	C	22.3	-	A	6.1	-
Northbound - Matthews Weddington Rd	A	8.0	-	A	7.5	-
Southbound - Matthews Weddington Rd	B	11.8	-	A	8.6	-
2027 No Build Conditions						
Intersection	C	16.4	0.89	A	8.0	0.57
Eastbound - Chestnut Ln	A	9.5	-	A	7.2	-
Westbound - Chestnut Ln	D	27.3	-	A	6.3	-
Northbound - Matthews Weddington Rd	A	8.4	-	A	7.8	-
Southbound - Matthews Weddington Rd	B	12.9	-	A	9.1	-
2027 Build Conditions						
Intersection	C	22.1	0.98	A	9.2	0.65
Eastbound - Chestnut Ln	B	10.3	-	A	7.9	-
Westbound - Chestnut Ln	E	40.6	-	A	7.2	-
Northbound - Matthews Weddington Rd	A	9.1	-	A	8.4	-
Southbound - Matthews Weddington Rd	C	16.0	-	B	11.1	-
2027 Build with Improvements Conditions						
Intersection	B	13.7	0.71	A	8.2	0.46
Eastbound - Chestnut Ln	B	10.3	-	A	7.9	-
Westbound - Chestnut Ln	C	20.5	-	A	6.7	-
Northbound - Matthews Weddington Rd	A	9.1	-	A	8.2	-
Southbound - Matthews Weddington Rd	B	11.0	-	A	9.0	-
2032 Build with Improvements +5 Conditions						
Intersection	C	18.8	0.84	A	9.3	0.52
Eastbound - Chestnut Ln	B	11.5	-	A	8.9	-
Westbound - Chestnut Ln	D	31.6	-	A	7.3	-
Northbound - Matthews Weddington Rd	B	10.4	-	A	9.3	-
Southbound - Matthews Weddington Rd	B	13.2	-	B	10.3	-

Existing Conditions

Currently, the intersection operates at LOS “B” during the AM peak hour and LOS “A” during the PM peak hour.

2027 No Build Conditions

With the inclusion of growth in the background traffic, the intersection operates at LOS “C” during the AM peak hour and LOS “A” during the PM peak hour.



2027 Build Conditions

When comparing the impact of the 2027 Build conditions to the 2027 No Build conditions, the intersection continues to operate at LOS “C” during the AM peak hour and LOS “A” during the PM peak hour. The delay increases by 35% in the AM peak hour and 15% in the PM peak hour.

2027 Build with Improvements Conditions

Based on NCDOT guidelines, the analysis results indicate the need for mitigation to be identified at the study intersection.

The following improvements were tested and are suggested:

- Construct a second southbound receiving lane on Matthews Weddington Road to terminate as a right turn lane at Access “A”
- Modify the southbound approach channelizing median to allow a second circulating lane on the north side of the roundabout
- Restripe the southbound left to a shared thru/left with 250 feet of storage on Matthews Weddington Road
- Restripe the westbound approach to have a terminating left turn lane and a shared left/thru/right lane with 150 feet of storage on Chestnut Lane

Assuming these improvements in place, the intersection operates at LOS “B” during the AM peak hour and LOS “A” during the PM peak hour. A preliminary concept plan for these improvements is included in the Appendix.

2032 Full Build +5 with Improvements Conditions

With the inclusion of growth in the background traffic, intersection improvements, and site traffic, the intersection operates at LOS “C” during the AM peak hour and LOS “A” during the PM peak hour.



Table 5: Matthews Weddington Rd & Chestnut Ln Queue Lengths

	Storage (ft)	AM PEAK		PM PEAK	
		95th % Queue	Max Queue	95th % Queue	Max Queue
2027 No Build Conditions					
Eastbound left/thru/right (Chestnut Ln)	-	12'	684'	4'	55'
Westbound thru/left turn (Chestnut Ln)	-	396'	1245'	32'	105'
Westbound right turn (Chestnut Ln)	150'	57'	250'	15'	45'
Northbound thru/left turn (Matthews Weddington Rd)	-	93'	173'	54'	121'
Northbound right turn (Matthews Weddington Rd)	150'	33'	61'	51'	57'
Southbound left turn (Matthews Weddington Rd)	250'	17'	350'	28'	321'
Southbound thru/right turn (Matthews Weddington Rd)	-	120'	1003'	124'	619'
2027 Build with Improvements Conditions					
Eastbound left/thru/right (Chestnut Ln)	-	13'	793'	4'	38'
Westbound left turn (Chestnut Ln)	TERM.	173'	1318'	27'	116'
Westbound left/thru/right turn (Chestnut Ln)	150'	173'	250'	27'	68'
Northbound thru/left turn (Matthews Weddington Rd)	-	115'	218'	61'	174'
Northbound right turn (Matthews Weddington Rd)	150'	38'	104'	62'	79'
Southbound thru/left turn (Matthews Weddington Rd)	250'	59'	350'	68'	344'
Southbound thru/right turn (Matthews Weddington Rd)	-	59'	1005'	64'	629'

When comparing the Build conditions to the No Build conditions from the queueing and blocking reports, no developer required improvements should be deemed necessary.

Table 6: Matthews Weddington Rd & Chestnut Ln Build with Improvements AM Roundabout Flow Scale Analysis

Year	Eff. Cap.	Degree of Satn	Prac. Spare Cap.	Aver. Delay (sec)	Stop Rate	95% Back of Queue (veh)	Perf. Index	Cost Total \$/h
0	3876	0.713	19	13.7	0.73	6.8	97.3	1203.8
1	3824	0.737	15	14.5	0.76	7.4	101.8	1238.6
2	3771	0.762	12	15.4	0.79	8.0	107.8	1275.4
3	3720	0.787	8	16.4	0.83	8.7	114.5	1314.3
4	3669	0.813	5	17.6	0.87	9.6	121.8	1355.8
5	3619	0.840	1	19.0	0.91	10.6	129.9	1400.4
6	3570	0.867	-2	20.5	0.96	11.9	138.9	1448.8
7	3521	0.894	-5	22.4	1.01	13.4	149.0	1501.8
8	3473	0.923	-8	24.6	1.07	15.2	160.6	1560.1
9	3426	0.951	-11	27.1	1.14	17.4	173.8	1624.6
10	3379	0.981	-13	30.0	1.22	20.1	188.9	1696.0



Table 7: Matthews Weddington Rd & Chestnut Ln Build with Improvements PM Roundabout Flow Scale Analysis

Year	Eff. Cap.	Degree of Satn	Prac. Spare Cap.	Aver. Delay (sec)	Stop Rate	95% Back of Queue (veh)	Perf. Index	Cost Total \$/h
0	5063	0.461	84	8.2	0.48	2.7	63.6	945.2
1	5032	0.474	79	8.4	0.50	2.9	65.9	966.8
2	5001	0.486	75	8.6	0.51	3.1	68.2	988.6
3	4970	0.498	71	8.9	0.53	3.4	70.5	1010.6
4	4939	0.511	66	9.1	0.56	3.7	73.1	1032.9
5	4908	0.524	62	9.3	0.58	3.9	76.1	1055.5
6	4878	0.537	58	9.6	0.61	4.2	79.2	1078.4
7	4847	0.550	55	9.9	0.63	4.5	82.4	1101.5
8	4817	0.563	51	10.2	0.66	4.8	85.6	1124.9
9	4787	0.576	48	10.5	0.68	5.1	88.9	1148.6
10	4758	0.589	44	10.8	0.71	5.4	92.3	1172.7
11	4728	0.603	41	11.1	0.74	5.7	95.8	1197.1
12	4699	0.617	38	11.5	0.76	6.1	99.5	1222.0
13	4669	0.631	35	11.8	0.79	6.5	103.4	1247.3
14	4640	0.645	32	12.2	0.82	6.9	107.3	1273.1
15	4612	0.659	29	12.6	0.85	7.3	111.4	1299.4
16	4583	0.673	26	13.1	0.88	7.7	115.7	1326.3
17	4555	0.687	24	13.6	0.91	8.2	120.1	1353.8
18	4526	0.702	21	14.1	0.94	8.7	124.7	1382.0
19	4498	0.717	19	14.6	0.97	9.2	129.5	1411.0
20	4470	0.732	16	15.2	1.00	9.8	134.5	1440.9

Based on the 2027 Build with Improvements SIDRA analysis results, the roundabout is expected to reach the maximum v/c (degree of saturation) of 0.85 after 5 years during the AM peak hour and does not reach the maximum v/c of 0.85 after 20 years during the PM peak hour.



2. Matthews Weddington Road & Antioch Church Road/Access "A" (Signalized)

Table 8: Matthews Weddington Rd & Antioch Ch Rd/Access "A" Analysis Results

Approach	AM Peak Hour			PM Peak Hour		
	LOS	Delay (sec/veh)	Capacity (v/c)	LOS	Delay (sec/veh)	Capacity (v/c)
Existing Conditions						
Intersection	D	48.0	1.04	D	46.6	1.08
Westbound - Antioch Ch Rd	E	78.1	-	E	78.2	-
Northbound - Matthews Weddington Rd	D	51.2	-	C	34.6	-
Southbound - Matthews Weddington Rd	B	18.8	-	D	44.4	-
2027 No Build Conditions						
Intersection	E	65.4	1.08	E	68.9	1.09
Westbound - Antioch Ch Rd	F	88.2	-	F	83.8	-
Northbound - Matthews Weddington Rd	E	77.9	-	F	83.0	-
Southbound - Matthews Weddington Rd	C	33.9	-	D	45.0	-
2027 Build Conditions						
Intersection	F	86.9	1.14	F	98.3	1.19
Eastbound - Access "A"	F	93.1	-	F	100.9	-
Westbound - Antioch Ch Rd	F	102.1	-	F	131.8	-
Northbound - Matthews Weddington Rd	F	97.1	-	F	103.0	-
Southbound - Matthews Weddington Rd	E	63.6	-	E	75.0	-
2027 Build with Improvements Conditions						
Intersection	E	61.9	1.05	D	51.4	0.94
Eastbound - Access "A"	E	62.8	-	E	67.2	-
Westbound - Antioch Ch Rd	F	97.4	-	E	68.3	-
Northbound - Matthews Weddington Rd	D	50.6	-	D	45.8	-
Southbound - Matthews Weddington Rd	D	42.0	-	D	46.4	-
2032 Build with Improvements +5 Conditions						
Intersection	E	71.1	1.05	E	61.4	1.04
Eastbound - Access "A"	F	83.1	-	E	68.1	-
Westbound - Antioch Ch Rd	E	76.8	-	F	85.5	-
Northbound - Matthews Weddington Rd	E	60.0	-	D	55.0	-
Southbound - Matthews Weddington Rd	E	75.2	-	E	55.4	-

Existing Conditions

Currently, the intersection operates at LOS "D" during both the AM and PM peak hours.

2027 No Build Conditions

With the inclusion of growth in the background traffic, the intersection operates at LOS "E" during both the AM and PM peak hours.



2027 Build Conditions

We propose the following full movement access configuration:

- One ingress lane and three egress lanes (an eastbound left turn lane with 125 feet of storage, a thru lane, and a right turn lane with 125 feet of storage) on proposed Access “A”
- Re-mark the westbound right turn lane to a shared thru/right turn lane on Antioch Church Road
- Re-mark the existing pavement to include a northbound left turn lane with 150 feet of storage on Matthews Weddington Road
- Re-mark the existing pavement to include a southbound right turn lane on Matthews Weddington Road, which becomes a terminating right turn lane with the improvements at Matthews Weddington Road & Chestnut Lane
- Implement protected phasing for the eastbound and northbound left movements
- Implement permitted + overlap phasing for the eastbound and southbound right turn movements
- Provide a minimum 125-foot internal protected stem

Assuming this configuration in place, the intersection operates at LOS “F” during both the AM and PM peak hours.

2027 Build with Improvements Conditions

Based on NCDOT and Stallings guidelines, the analysis results indicate the need for mitigation at the study intersection:

The following improvements were tested and are suggested in addition to the above access configuration:

- Construct a northbound right turn lane with 225 feet of storage on Matthews Weddington Road
- Implement permitted + overlap phasing for the northbound right turn movement

Assuming these improvements in place, the intersection operates at LOS “E” during the AM peak hour and LOS “D” during the PM peak hour. Although the southbound approach drops from LOS “C” to LOS “D”, the increase in delay is less than 25% and the actual increase in delay is only 8.1 seconds and the overall intersection operates better under the build with improvements conditions than in the no build conditions. Therefore, no additional developer required improvements should be deemed necessary.

2032 Full Build with Improvements +5 Conditions

With the inclusion of growth in the background traffic, the proposed access configuration, intersection improvements, and site traffic, the intersection operates at LOS “E” during both the AM and PM peak hours.



Table 9: Matthews Weddington Rd & Antioch Ch Rd/Access "A" Queue Lengths

	Storage (ft)	AM PEAK		PM PEAK	
		95th % Queue	Max Queue	95th % Queue	Max Queue
2027 No Build Conditions					
Westbound left turn (Antioch Church Rd)	275'	#420'	375'	#196'	295'
Westbound right turn (Antioch Church Rd)	TERM.	#377'	1084'	#286'	552'
Northbound thru/right turn (Matthews Weddington Rd)	-	#581'	544'	#860'	695'
Southbound left turn (Matthews Weddington Rd)	250'	#270'	350'	#387'	350'
Southbound thru (Matthews Weddington Rd)	-	332'	700'	114'	650'
2027 Build with Improvements Conditions					
Eastbound left turn (Access "A")	125'	#133'	111'	#156'	141'
Eastbound thru (Access "A")	-	52'	79'	53'	113'
Eastbound right turn (Access "A")	125'	45'	59'	51'	73'
Westbound left turn (Antioch Church Rd)	275'	#556'	375'	206'	256'
Westbound thru/right turn (Antioch Church Rd)	-	#546'	1072'	#382'	408'
Northbound left turn (Matthews Weddington Rd)	150'	83'	204'	122'	250'
Northbound thru (Matthews Weddington Rd)	-	#555'	434'	#687'	616'
Northbound right turn (Matthews Weddington Rd)	225'	105'	285'	210'	325'
Southbound left turn (Matthews Weddington Rd)	250'	248'	350'	#457'	350'
Southbound thru (Matthews Weddington Rd)	-	#793'	623'	388'	579'
Southbound right turn (Matthews Weddington Rd)	TERM.	19'	601'	28'	111'

When comparing the Build conditions to the No Build conditions from the queueing and blocking reports, no additional developer required improvements should be deemed necessary.



3. Matthews Weddington Road & Brayland Avenue/Access "B" (Unsignalized)

Table 10: Matthews Weddington Rd & Brayland Ave/Access "B" Analysis Results

Approach	AM Peak Hour			PM Peak Hour		
	LOS	Delay (sec/veh)	Capacity (v/c)	LOS	Delay (sec/veh)	Capacity (v/c)
Existing Conditions						
Eastbound - Matthews Weddington Rd	A	0.0	-	A	0.0	-
Westbound - Matthews Weddington Rd	A	0.0	-	A	0.0	-
Northbound - Brayland Ave	B	14.2	-	C	15.5	-
2027 No Build Conditions						
Eastbound - Matthews Weddington Rd	A	0.0	-	A	0.0	-
Westbound - Matthews Weddington Rd	A	0.0	-	A	0.0	-
Northbound - Brayland Ave	B	14.6	-	C	16.1	-
2027 Build Conditions						
Eastbound - Matthews Weddington Rd	A	0.0	-	A	0.0	-
Westbound - Matthews Weddington Rd	A	0.0	-	A	0.0	-
Northbound - Brayland Ave	C	15.3	-	C	17.3	-
Southbound - Access "B"	C	23.4	-	B	14.6	-
2032 Build +5 Conditions						
Eastbound - Matthews Weddington Rd	A	0.0	-	A	0.0	-
Westbound - Matthews Weddington Rd	A	0.0	-	A	0.0	-
Northbound - Brayland Ave	C	16.6	-	C	19.0	-
Southbound - Access "B"	D	26.9	-	C	15.6	-

Existing Conditions

Currently, the worst leg of the intersection (northbound) operates at LOS "B" during the AM peak hour and LOS "C" during the PM peak hour.

2027 No Build Conditions

With the inclusion of growth in the background traffic, the worst leg of the intersection (northbound) operates at LOS "B" during the AM peak hour and LOS "C" during the PM peak hour.

2027 Build Conditions

We propose the following right-in/right-out access configuration:

- One ingress lane and one egress lane (a terminating southbound right turn lane) on proposed Access "B"
- Construct a westbound right turn lane with 100 feet of storage and appropriate deceleration taper on Matthews Weddington Road
- Provide a minimum 100-foot internal protected stem

Assuming this configuration in place, the worst leg of the intersection operates at LOS "C" during both the AM and PM peak hours.



Although the northbound approach drops from LOS “B” to LOS “C” during the AM peak hour, the increase in delay is less than 25% and the actual increase in delay is only 0.7 seconds. Additionally, the volume on Brayland Ave is only 5 vehicles during the AM peak hour. Therefore, no developer required improvements should be deemed necessary.

2032 Build +5 Conditions

With the inclusion of growth in the background traffic, the proposed access configuration, and site traffic, the worst leg of the intersection operates at LOS “D” during the AM peak hour and LOS “C” during the PM peak hour.

Table 11: Matthews Weddington Rd & Brayland Ave/Access “B” Queue Lengths

	Storage (ft)	AM PEAK		PM PEAK	
		95th % Queue	Max Queue	95th % Queue	Max Queue
2027 No Build Conditions					
Northbound right turn (Brayland Ave)	TERM.	0'	26'	0'	96'
2027 Build Conditions					
Northbound right turn (Brayland Ave)	TERM.	0'	26'	0'	28'
Southbound right turn (Access "B")	TERM.	7'	358'	5'	34'

When comparing the Build conditions to the No Build conditions from the queueing and blocking reports, no developer required improvements should be deemed necessary.



4. Matthews Weddington Road & Tilley Morris Road (Roundabout)

Table 12: Matthews Weddington Rd & Tilley Morris Rd Analysis Results

Approach	AM Peak Hour			PM Peak Hour		
	LOS	Delay (sec/veh)	Capacity (v/c)	LOS	Delay (sec/veh)	Capacity (v/c)
Existing Conditions						
Intersection	E	48.6	1.21	B	13.1	0.82
Eastbound - Tilley Morris Rd	B	10.4	-	C	21.4	-
Westbound - Matthews Weddington Rd	F	95.6	-	A	7.5	-
Northbound - Matthews Weddington Rd	B	14.2	-	B	10.3	-
Southbound - Union Day School	D	27.7	-	A	9.7	-
2027 No Build Conditions						
Intersection	F	59.6	1.28	C	15.1	0.87
Eastbound - Tilley Morris Rd	B	11.2	-	D	26.2	-
Westbound - Matthews Weddington Rd	F	120.1	-	A	7.8	-
Northbound - Matthews Weddington Rd	C	15.9	-	B	11.0	-
Southbound - Union Day School	D	31.2	-	B	10.5	-
2027 Build Conditions						
Intersection	F	67.2	1.34	C	19.6	0.95
Eastbound - Tilley Morris Rd	B	12.8	-	E	37.8	-
Westbound - Matthews Weddington Rd	F	135.0	-	A	8.3	-
Northbound - Matthews Weddington Rd	C	17.1	-	B	12.8	-
Southbound - Union Day School	D	34.5	-	B	11.5	-
2027 Build Conditions with Improvements at Int. 1 & 2						
Intersection	F	64.0	1.32	C	17.5	0.92
Eastbound - Tilley Morris Rd	B	12.2	-	D	32.5	-
Westbound - Matthews Weddington Rd	F	128.0	-	A	8.1	-
Northbound - Matthews Weddington Rd	C	16.5	-	B	12.2	-
Southbound - Union Day School	D	34.0	-	B	11.1	-
2032 Build +5 Conditions with Improvements at Int. 1 & 2						
Intersection	F	100.0	1.55	D	29.2	1.08
Eastbound - Tilley Morris Rd	C	15.4	-	F	64.0	-
Westbound - Matthews Weddington Rd	F	203.6	-	A	9.1	-
Northbound - Matthews Weddington Rd	C	24.3	-	B	14.0	-
Southbound - Union Day School	F	50.2	-	B	13.7	-

Existing Conditions

Currently, the intersection operates at LOS “E” during the AM peak hour and LOS “B” during the PM peak hour.

2027 No Build Conditions

With the inclusion of growth in the background traffic, the intersection operates at LOS “F” during the AM peak hour and LOS “C” during the PM peak hour.



2027 Build Conditions

When comparing the impact of the 2027 Build conditions to the 2027 No Build conditions, the intersection continues to operate at LOS “F” during the AM peak hour and LOS “C” during the PM peak hour. The delay increases by 13% in the AM peak hour and 30% in the PM peak hour.

Although the increase in overall intersection delay is greater than 25% and the eastbound approach LOS drops from LOS “D” to LOS “E” during the PM peak hour, the overall intersection LOS does not change, the actual increase in overall intersection delay is only 4.5 seconds, the actual increase in the eastbound approach delay is only 11.6 seconds, and the LOS “E” is within the threshold set by the Town of Stallings. Therefore, no mitigation should be required at this intersection.

2027 Build Conditions with Improvements at Intersection 1 & 2

Per coordination with NCDOT, it is likely that the improvements at the intersections of Matthews Weddington Road & Chestnut Lane and Matthews Weddington Road & Antioch Church Road would result in a change in the site traffic distribution. Therefore, the following assumptions were used for the analysis at this intersection (see Appendix for distributions and volumes):

- Retail trip generation assuming the Strip Retail [LUC 822] is reduced to 19,100 SF
- Commercial trip distribution with 10% to/from the west on Tilley Morris Road and 15% to/from the south on Weddington Matthews Road
- Residential trip distribution with 15% to/from the west on Tilley Morris Road and 15% to/from the south on Weddington Matthews Road

With these assumptions, the intersection operates at LOS “F” during the AM peak hour and LOS “C” during the PM peak hour.

The results indicate there are no changes in LOS and the increases in delay are all less than 25%. Therefore, no mitigation should be required at this intersection.

2032 Build +5 Conditions with Improvements at Intersection 1 & 2

With the inclusion of growth in the background traffic and site traffic, the intersection operates at LOS “F” during the AM peak hour and LOS “D” during the PM peak hour.



Table 13: Matthews Weddington Rd & Tilley Morris Rd Queue Lengths

	Storage (ft)	AM PEAK		PM PEAK	
		95th % Queue	Max Queue	95th % Queue	Max Queue
2027 No Build Conditions					
Eastbound thru/left turn (Tilley Morris Rd)	-	73'	101'	381'	854'
Eastbound right turn (Tilley Morris Rd)	150'	8'	32'	26'	250'
Westbound left turn (Matthews Weddington Rd)	150'	63'	250'	28'	156'
Westbound thru/right turn (Matthews Weddington Rd)	-	2101'	1986'	72'	200'
Northbound thru/left turn (Matthews Weddington Rd)	-	204'	474'	28'	100'
Northbound right turn (Matthews Weddington Rd)	150'	63'	250'	46'	75'
Southbound thru/left turn (Union Day School)	-	172'	154'	75'	143'
Southbound right turn (Union Day School)	75'	53'	68'	15'	44'
2027 Build with Improvements at Int. 1 & 2 Conditions					
Eastbound thru/left turn (Tilley Morris Rd)	-	83'	102'	479'	1219'
Eastbound right turn (Tilley Morris Rd)	150'	8'	50'	26'	250'
Westbound left turn (Matthews Weddington Rd)	150'	73'	250'	31'	222'
Westbound thru/right turn (Matthews Weddington Rd)	-	2272'	1984'	77'	281'
Northbound thru/left turn (Matthews Weddington Rd)	-	210'	389'	28'	74'
Northbound right turn (Matthews Weddington Rd)	150'	73'	213'	58'	55'
Southbound thru/left turn (Union Day School)	-	184'	235'	79'	134'
Southbound right turn (Union Day School)	75'	55'	129'	16'	70'

When comparing the Build conditions to the No Build conditions from the queueing and blocking reports, no developer required improvements should be deemed necessary.

Table 14: Matthews Weddington Rd & Tilley Morris Rd Existing PM Roundabout Flow Scale Analysis

Year	Eff. Cap.	Degree of Satn	Prac. Spare Cap.	Aver. Delay (sec)	Stop Rate	95% Back of Queue (veh)	Perf. Index	Cost Total \$/h
0	2985	0.816	4	13.1	0.78	12.0	90.8	1046.7
1	2951	0.842	1	14.0	0.81	13.4	95.8	1078.1
2	2917	0.868	-2	15.0	0.84	15.0	101.3	1111.6

Based on the existing SIDRA analysis results, the roundabout exceeds the maximum v/c (degree of saturation) of 0.85 during the AM peak hour in the existing conditions and is expected to reach the maximum v/c (degree of saturation) of 0.85 after 1 year during the PM peak hour.



5. Matthews Weddington Road & Access "C" (Unsignalized)

Table 15: Matthews Weddington Rd & Access "C" Analysis Results

Approach	AM Peak Hour			PM Peak Hour		
	LOS	Delay (sec/veh)	Capacity (v/c)	LOS	Delay (sec/veh)	Capacity (v/c)
2027 Build Conditions						
Eastbound - Access "C"	B	12.5	-	B	12.0	-
Northbound - Matthews Weddington Rd	A	0.0	-	A	0.0	-
Southbound - Matthews Weddington Rd	A	0.0	-	A	0.0	-
2032 Build +5 Conditions						
Eastbound - Access "C"	B	13.2	-	B	12.5	-
Northbound - Matthews Weddington Rd	A	0.0	-	A	0.0	-
Southbound - Matthews Weddington Rd	A	0.0	-	A	0.0	-

2027 Build Conditions

We propose the following right-in/right-out access configuration:

- One ingress lane and one egress lane (a terminating eastbound right turn lane) on proposed Access "C"
- Construct a southbound combined thru/right turn lane continued from Chestnut Lane on Matthews Weddington Road
- Construct an extension of the center median within the painted out median on Matthews Weddington Road to provide minimum overlap with Access "C" and stop short to not impact the existing access for the storage facility on the east side of Matthews Weddington Road
- Provide a minimum 100-foot internal protected stem

Assuming this configuration in place, the worst leg of the intersection (eastbound) operates at LOS "B" during both the AM and PM peak hours.

2032 Build +5 Conditions

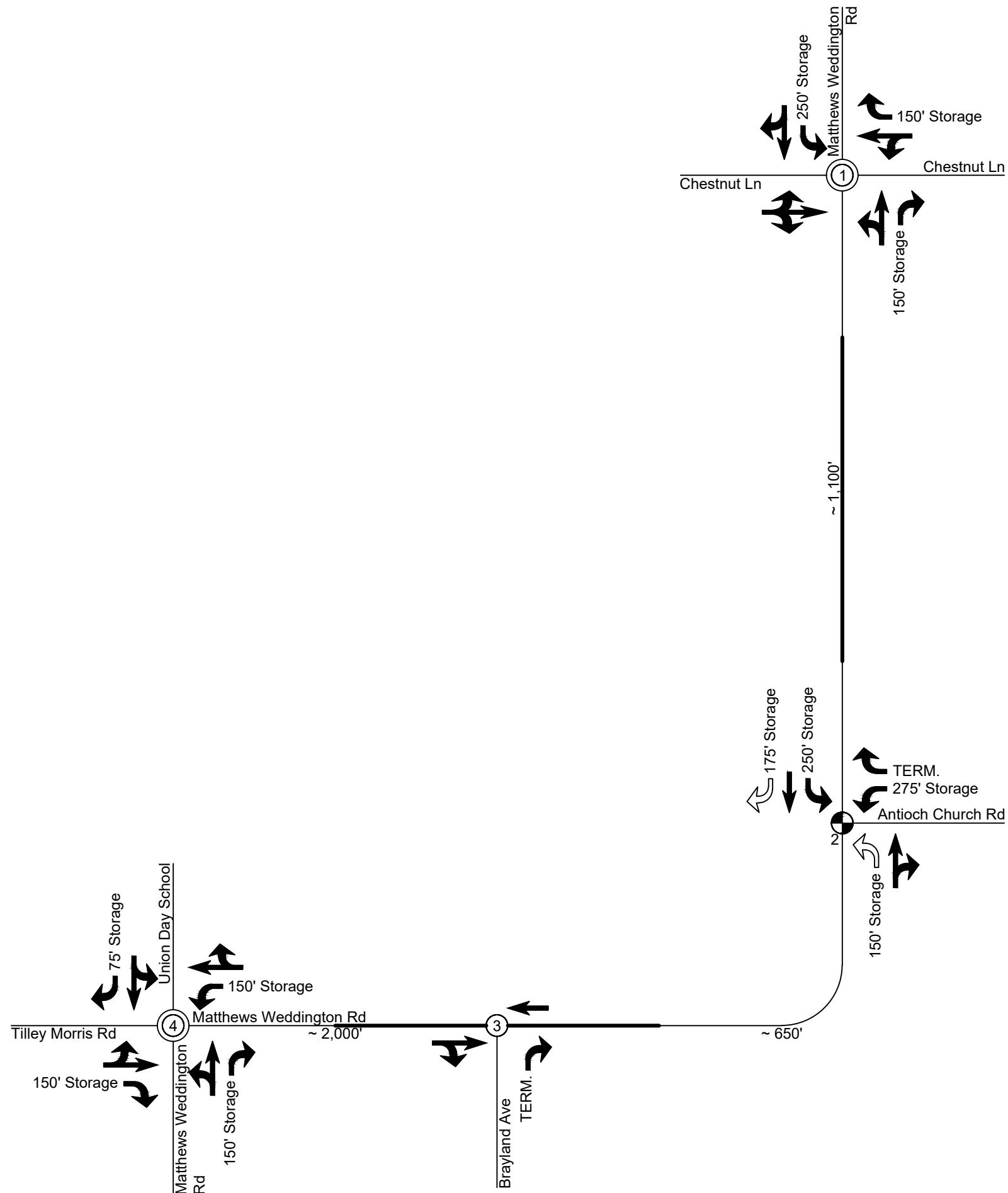
With the inclusion of growth in the background traffic, the proposed access configuration, and site traffic, the worst leg of the intersection (eastbound) operates at LOS "B" during both the AM and PM peak hours.

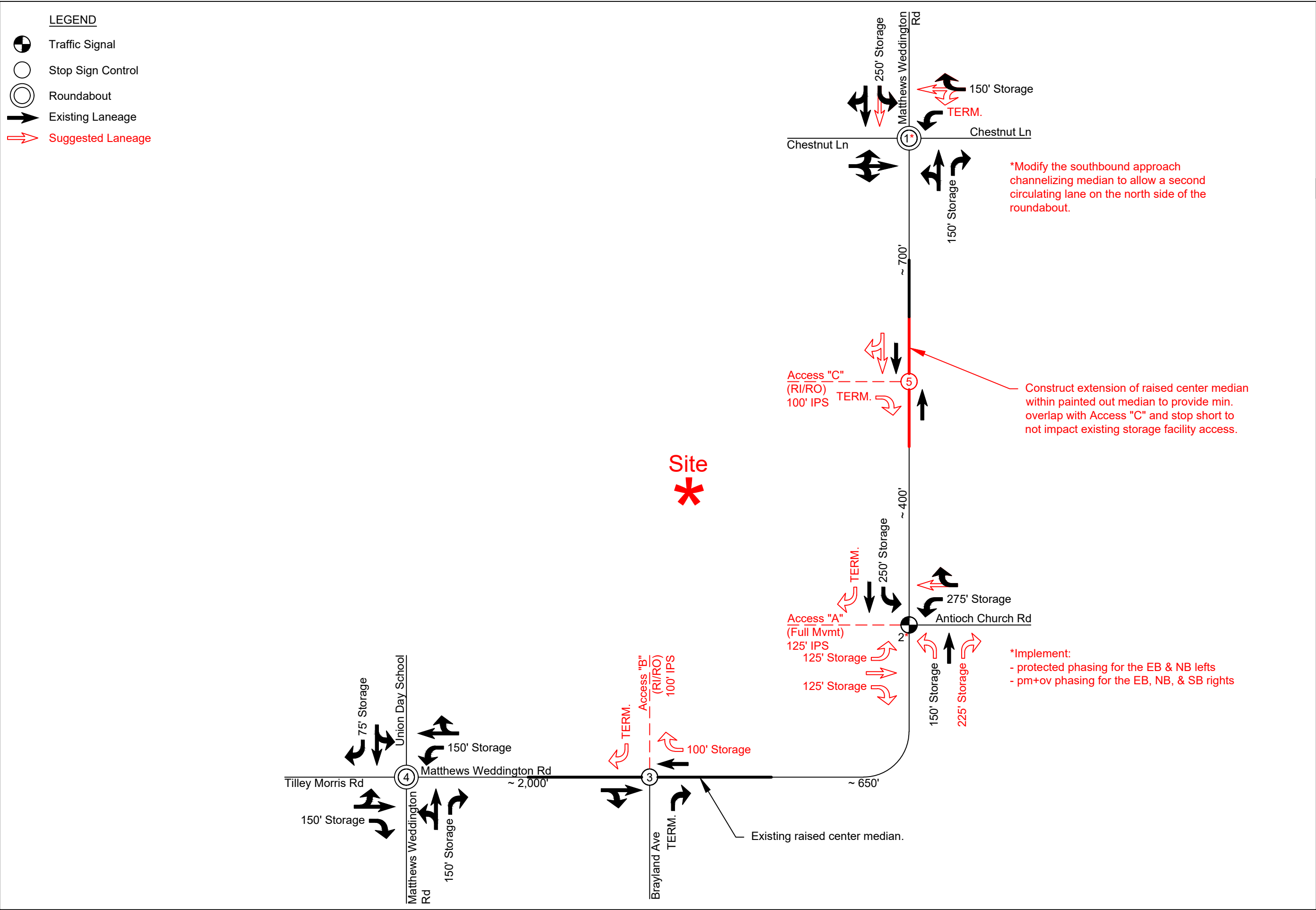
Table 16: Matthews Weddington Rd & Access "C" Queuing and Blocking Report

	Storage (ft)	AM PEAK		PM PEAK	
		95th % Queue	Max Queue	95th % Queue	Max Queue
2027 Build Conditions					
Eastbound right turn (Access "C")	TERM.	5'	216'	5'	78'

Based on the above queuing and blocking report, no additional turn lanes should be deemed necessary.

The existing laneage is shown in Figure 9. The suggested laneage is shown in Figure 10.







PEDESTRIAN AND BICYCLE INTERSECTION LOS

Per the Town of Stallings' "Traffic Impact Analysis Ordinance", pedestrian and bicycle LOS for comfort and safety while crossing signalized street intersections must be evaluated. The LOS threshold is dictated by the zoning as outlined below:

Zoning	Bike/Ped LOS Threshold
AG, CIV	E
SFR, MFT, VSR, IND	D
TC, MU, C-74, CP-485, CZ, CUP	C
Within a small area plan boundary	C
All Others	D

Key elements or features that enhance or reduce pedestrian or bicycle perceptions of comfort and safety are identified and weighed relative to one another by a point system. The parameters and worksheets for the study intersections are included in the Appendix.

Pedestrian Intersection LOS

The primary impediments to comfort and safety for pedestrians at signalized intersections are crossing distance and conflicts with turning vehicles. The following are identified key elements or features that enhance or reduce pedestrian perceptions of comfort and safety:

1. Pedestrian Crossing Distance
2. Signal Phasing and Timing
3. Corner Radius
4. Right-Turns-On-Red (RTOR)
5. Crosswalk
6. Traffic Flow Direction

The pedestrian intersection LOS for the study intersections under the existing and future conditions are presented in Table 17.



Table 17: Pedestrian LOS

Intersection	Crossing Approach (i.e. approach being crossed)	Existing		Future	
		Crossing Approach LOS	Intersection LOS	Crossing Approach LOS	Intersection LOS
1. Matthews Weddington Rd & Chestnut Ln	EB	N/A	Unsignalized No LOS	N/A	Unsignalized No LOS
	WB	N/A		N/A	
	NB	N/A		N/A	
	SB	N/A		N/A	
2. Matthews Weddington Rd & Antioch Church Rd/Access "A"	EB	N/A	C	E	E
	WB	E		F	
	NB	B		E	
	SB	C		E	
3. Matthews Weddington Rd & Brayland Ave/Access "B"	EB	N/A	Unsignalized No LOS	N/A	Unsignalized No LOS
	WB	N/A		N/A	
	NB	N/A		N/A	
	SB	N/A		N/A	
4. Matthews Weddington Rd & Tilley Morris Rd	EB	N/A	Unsignalized No LOS	N/A	Unsignalized No LOS
	WB	N/A		N/A	
	NB	N/A		N/A	
	SB	N/A		N/A	
5. Matthews Weddington Rd & Access "C"	EB	N/A	Unsignalized No LOS	N/A	Unsignalized No LOS
	NB	N/A		N/A	
	SB	N/A		N/A	

The overall pedestrian comfort and safety at the intersection of Matthews Weddington Road & Antioch Church Road is LOS "C" under the existing intersection configuration and LOS "E" under the proposed intersection configuration. The intersection does not currently have any marked crosswalks or pedestrian signals. Additionally, there are no existing sidewalks near the intersection. The proposed development would only impact pedestrian LOS at this intersection due to the addition of Access "A" as the fourth leg of the intersection. It is important that the access design take into consideration pedestrian features.



Bicycle Intersection LOS

The primary impediments to comfort and safety for bicyclists at signalized intersections are traffic signal features, potential conflicts with turning vehicles, and a desire for physical space in the roadway. The following are identified key elements or features that enhance or reduce bicyclist perceptions of comfort and safety:

1. Signal Phasing and Timing
2. Roadway Space for Bikes
3. Right-Turn Conflict Treatment
4. Approach Speed of Traffic
5. Right-Turns-On-Red (RTOR)
6. Intersection Crossing Width

The bicycle intersection LOS for the study intersections under the existing and future conditions are presented in Table 18.



Table 18: Bicycle LOS

Intersection	Approach	Existing		Future	
		Approach LOS	Intersection LOS	Approach LOS	Intersection LOS
1. Matthews Weddington Rd & Chestnut Ln	EB	N/A	Unsignalized No LOS	N/A	Unsignalized No LOS
	WB	N/A		N/A	
	NB	N/A		N/A	
	SB	N/A		N/A	
2. Matthews Weddington Rd & Antioch Church Rd/Access "A"	EB	N/A	F	E	F
	WB	F		F	
	NB	F		F	
	SB	F		F	
3. Matthews Weddington Rd & Brayland Ave/Access "B"	EB	N/A	Unsignalized No LOS	N/A	Unsignalized No LOS
	WB	N/A		N/A	
	NB	N/A		N/A	
	SB	N/A		N/A	
4. Matthews Weddington Rd & Tilley Morris Rd	EB	N/A	Unsignalized No LOS	N/A	Unsignalized No LOS
	WB	N/A		N/A	
	NB	N/A		N/A	
	SB	N/A		N/A	
5. Matthews Weddington Rd & Access "C"	EB	N/A	Unsignalized No LOS	N/A	Unsignalized No LOS
	NB	N/A		N/A	
	SB	N/A		N/A	

The overall bicycle comfort and safety at the intersection of Matthews Weddington Road & Antioch Church Road is LOS "F" under the existing intersection configuration and LOS "F" under the proposed intersection configuration. The intersection does not currently have any bicycle facilities. The proposed development would only impact bicycle LOS at this intersection due to the addition of Access "A" as the fourth leg of the intersection. It is important that the access design take into consideration bicycle facilities.

Additionally, the site includes a proposed greenway extension that follows the Town's Greenway Master Plan and extends the existing greenway from Ledgewood Drive to Antioch Church Road.



CONCLUSION

In conclusion, although the proposed mixed-use development will increase the amount of vehicular traffic on the adjacent roadways/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 and offsite improvements.



APPENDIX