DRMP

TRAFFIC IMPACT ANALYSIS

FOR

LAKE TYLER UPDATE

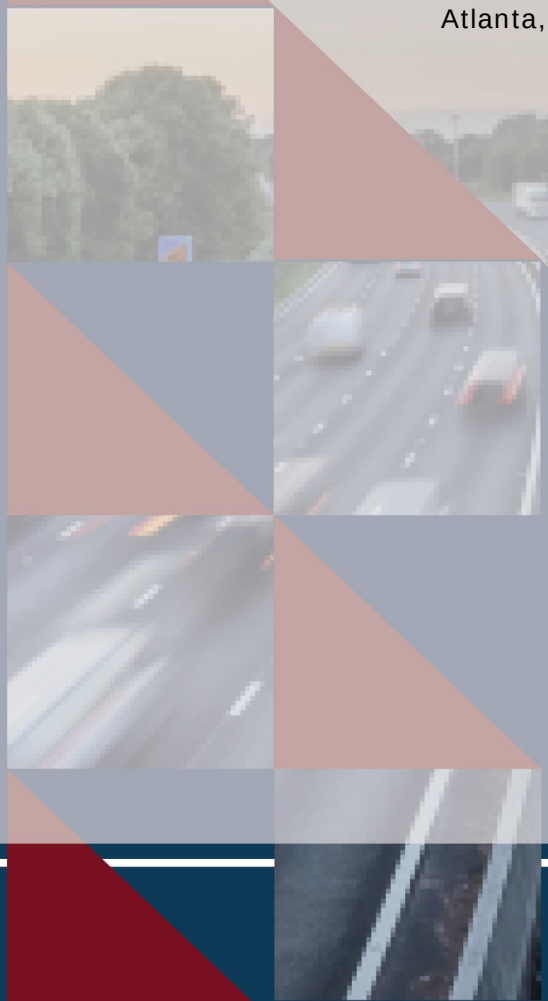
LOCATED

IN

NEW BERN, NC

Prepared For:

Stars and Stripes 4F, LLC
1031 Marietta Street NW
Atlanta, GA 30318



FEBRUARY 2024

DRMP Project No. 23269

Prepared By: CDS

Reviewed By: CTS

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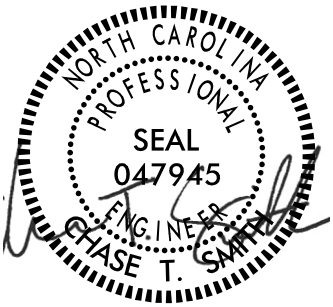
DRMP, Inc.
License #F-1524



02-08-24

FEBRUARY 2024

DRMP Project No. 23269

Prepared By: CDS

Reviewed By: CTS

TRAFFIC IMPACT ANALYSIS
LAKE TYLER UPDATE
NEW BERN, NORTH CAROLINA

EXECUTIVE SUMMARY

1. Development Overview

A Traffic Impact Analysis (TIA) was conducted to account for the remaining build out of the Lake Tyler development in accordance with the New Bern (City) Code of Ordinances and North Carolina Department of Transportation (NCDOT) capacity analysis guidelines. The proposed development is located east of NC-43 and south of Gracie Farms Road in New Bern, North Carolina. It is our understanding that 148 detached single-family homes are yet to be constructed within the Lake Tyler development with 145 additional townhomes proposed adjacent to NC-43. All remaining units are anticipated to be completed by the end of 2026. Site access to NC-43 is proposed via the existing Olivia Road connection while one (1) new full movement connection is proposed on Gracie Farms Road opposite Castlegate Drive.

2. Existing Traffic Conditions

The study area for the TIA was determined through coordination with the City and NCDOT and consists of the following existing intersections:

- NC-55 and NC-43
- NC-43 and Speedway Driveway South / Morning Star Drive
- NC-43 and Briarwood Lane
- NC-43 and Olivia Road / Morning Star Drive
- NC-43 and Rainmaker Drive
- NC-43 and Gracie Farms Road
- Gracie Farms Road and Gabrielle Street
- Gracie Farms Road and Sofia Street

Existing peak hour traffic volumes were determined based on traffic counts conducted at the study intersection listed below, in November of 2023 by Quality Counts during a typical weekday AM (7:00 AM – 9:00 AM) and PM (4:00 PM – 6:00 PM) peak periods:

- NC-55 and NC-43
- NC-43 and Speedway Driveway South / Morning Star Drive
- NC-43 and Briarwood Lane
- NC-43 and Olivia Road / Morning Star Drive
- NC-43 and Rainmaker Drive
- NC-43 and Gracie Farms Road
- Gracie Farms Road and Gabrielle Street
- Gracie Farms Road and Sofia Street

Traffic volumes were balanced between study intersections, where appropriate.

3. Site Trip Generation

Average weekday daily, AM peak hour, and PM peak hour trips for the proposed development were estimated using methodology contained within the ITE Trip Generation Manual, 11th Edition. Table E-1 provides a summary of the trip generation potential for the site.

Table E-1: Site Trip Generation

Land Use (ITE Code)	Intensity	Daily Traffic (vpd)	Weekday AM Peak Hour Trips (vph)		Weekday PM Peak Hour Trips (vph)	
			Enter	Exit	Enter	Exit
Single-Family Detached (210)	148 DU	1,448	27	79	90	54
Townhomes (215)	145 DU	1,054	17	53	49	34
Total Trips		2,502	44	132	139	88

4. Future Traffic Conditions

Through coordination with NCDOT and the City, it was determined that an annual growth rate of 1% would be used to generate 2026 projected weekday AM and PM peak hour traffic volumes. No adjacent developments were identified to be considered under future conditions.

The study analyzes traffic conditions during the weekday AM and PM peak hours for the following scenarios:

- 2023 Existing Traffic Conditions
- 2026 No-Build Traffic Conditions
- 2026 Build Traffic Conditions

5. Capacity Analysis Summary

The analysis considered weekday AM and PM peak hour traffic for 2023 existing, 2026 no-build, and 2026 build conditions. Refer to Section 7 of the TIA for the capacity analysis summary performed at each study intersection.

6. Recommendations

Based on the findings of this study, specific geometric and traffic control improvements have been identified at study intersections. The improvements are summarized below and are illustrated in Figure E-1.

Recommended Improvements by Developer

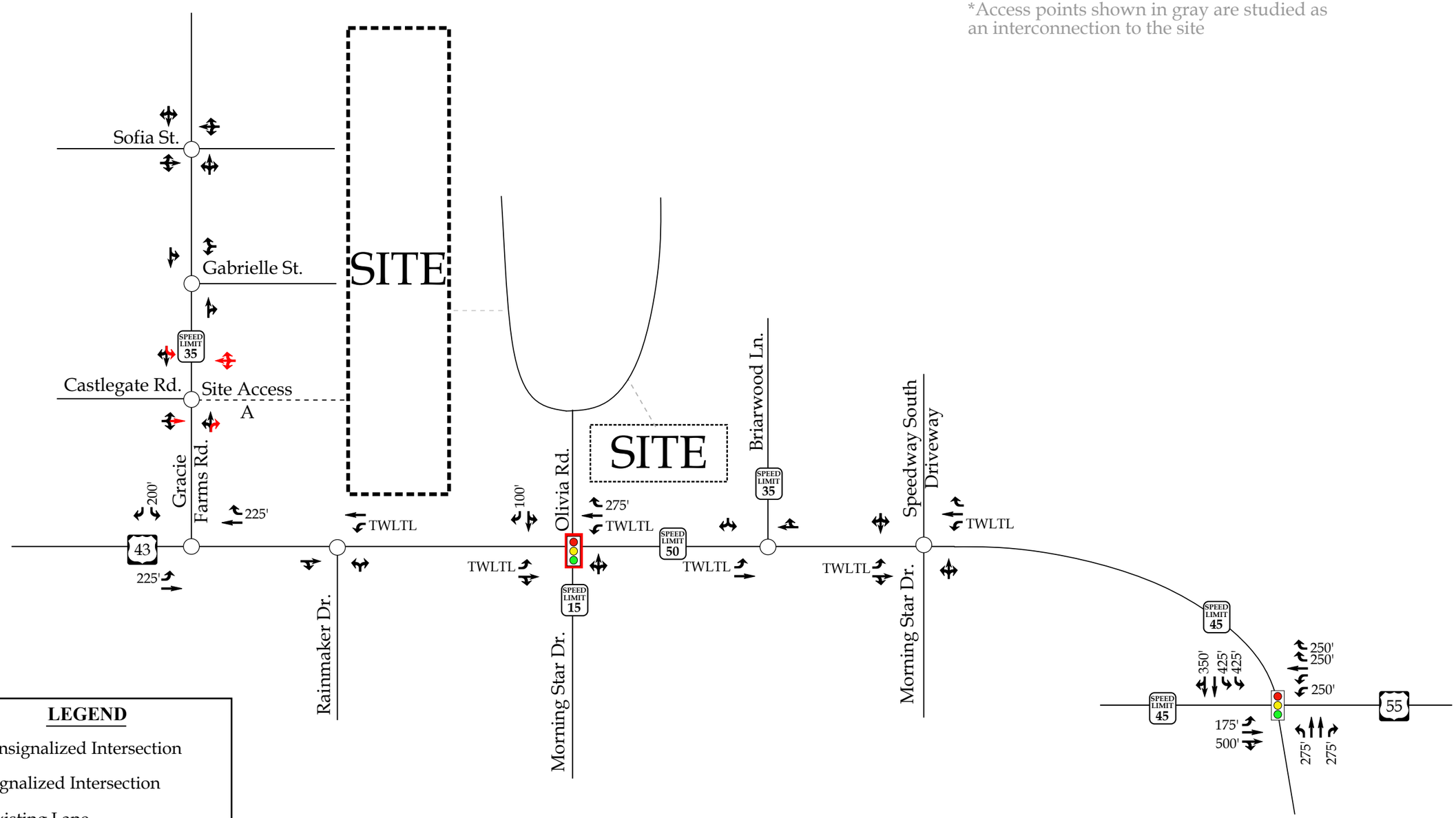
<u>NC-43 and Olivia Road/Morning Star Drive</u>

- Install a two-phase traffic signal. Coordinate with NCDOT to develop a signal plan.

<u>Gracie Farms Road and Castlegate Road/Site Access A</u>

- Construct Site Access A with one ingress and one egress lane.
- Provide stop control for the egress of Site Access A.

*Access points shown in gray are studied as an interconnection to the site



LEGEND

- Unsignalized Intersection
- Signalized Intersection
- Existing Lane
- Improvement by Developer
- Signal Installation by Developer
- X' Storage (In Feet)

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Lake Tyler Update
New Bern, NC

Recommended Lane Configurations

Scale: Not to Scale | Figure E-1

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TRAFFIC IMPACT ANALYSIS
LAKE TYLER UPDATE
NEW BERN, NORTH CAROLINA

1. INTRODUCTION

The contents of this report present the findings of the updated Traffic Impact Analysis (TIA) conducted to account for the remaining build out of the Lake Tyler development located east of NC-43 and south of Gracie Farms Road in New Bern, North Carolina. Ramey Kemp and Associates completed an initial TIA in September 2006. However, due to the revised development plan, an updated TIA was required. The purpose of this study is to determine the potential impacts to the surrounding transportation system created by traffic generated by the revised development plan, as well as recommend improvements to mitigate the impacts.

It is our understanding that 148 detached single-family homes are yet to be constructed within the Lake Tyler development with 145 additional townhomes proposed adjacent to NC-43. All remaining units are anticipated to be completed by the end of 2026.

The study analyzes traffic conditions during the weekday AM and PM peak hours for the following scenarios:

- 2023 Existing Traffic Conditions
- 2026 No-Build Traffic Conditions
- 2026 Build Traffic Conditions

1.1. Site Location and Study Area

The Lake Tyler development is located east of NC-43 and south of Gracie Farms Road in New Bern, NC. Refer to Figure 1 for the site location map.

The study area for the TIA was determined through coordination with the North Carolina Department of Transportation (NCDOT) and the City of New Bern (City) and consists of the following existing intersections:

- NC-55 and NC-43

- NC-43 and Speedway Driveway South / Morning Star Drive
- NC-43 and Briarwood Lane
- NC-43 and Olivia Road / Morning Star Drive
- NC-43 and Rainmaker Drive
- NC-43 and Gracie Farms Road
- Gracie Farms Road and Castlegate Road
- Gracie Farms Road and Gabrielle Street
- Gracie Farms Road and Sofia Street

Refer to Appendix A for the approved scoping documentation.

1.2. Proposed Land Use and Site Access

The site is located east of NC-43 and south of Gracie Farms Road in New Bern, North Carolina. The remaining residential units consist of 148 detached single-family homes and 145 townhomes.

Site access to NC-43 is proposed via the existing Olivia Road connection while one (1) new full movement connection is proposed on Gracie Farms Road opposite Castlegate Drive. Refer to Figure 2 for a copy of the preliminary site plan.

1.3. Adjacent Land Uses

The proposed development is located in an area consisting primarily of commercial and residential development.

1.4. Existing Roadways

Existing lane configurations (number of traffic lanes on each intersection approach), speed limits, storage capacities, and other intersection and roadway information within the study area are shown in Figure 3. Table 1 provides a summary of this information, as well.

Table 1: Existing Roadway Inventory

Road Name	Route Number	Typical Cross Section	Speed Limit	2019 AADT (vpd)
NC-43	NC-43	2-lane divided (TWLTL) / 4-lane divided	45 mph	19,000
NC-55	NC-55	4-lane divided (TWLTL)	45 mph	16,500
Morning Star Drive	N / A	2-lane undivided	15 mph	390*
Briarwood Lane	N / A	2-lane undivided	35 mph	250*
Olivia Road	N / A	2-lane undivided	Not Posted (25 mph assumed)	1,430*
Rainmaker Drive	N / A	2-lane undivided	25 mph	470*
Gracie Farms Road	N / A	2-lane undivided	35 mph	1,660*
Castlegate Road	N / A	2-lane undivided	Not Posted (25 mph assumed)	**
Gabrielle Street	N / A	2-lane undivided	Not Posted (25 mph assumed)	230*
Sofia Street	N / A	2-lane undivided	Not Posted (25 mph assumed)	250*

*ADT based on the traffic counts from 2023 and assuming the weekday PM peak hour volume is 10% of the average daily traffic.
**NO ADT data available. Turning movements at intersection negligible based on balancing of traffic counts. Traffic counts not recorded at intersection.

N

LEGEND

- Study Intersection
- Proposed Site Access
- Study Area

DRMP	Lake Tyler Update New Bern, NC	Site Location Map
		Scale: Not to Scale — Figure 1

GENERAL NOTES AND SITE DATA

1. ALL DISTANCES ARE HORIZONTAL GROUND MEASUREMENTS, NO GRID FACTORS APPLIED.
2. ALL CORNERS ARE TO BE MARKED WITH IRON PIPES, UNLESS OTHERWISE NOTED.
3. DEED REFERENCE: DB 3470, PG 210.
4. MAP REFERENCE: PC H, SL 126-C.
5. PARCEL ID# 8-223-003 & 8-223-004.
6. THIS PROJECT SCALES WITHIN ZONE "X" AS PER FLOCD INSURANCE RATE MAP 3720556100K, DATED: JUNE 19, 2020 AS ESTABLISHED BY FEMA. THIS REPORT IN NO WAY SUPERCEDES THE ABOVE MENTIONED FIRM.

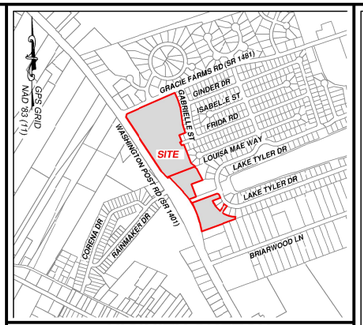
CURVE DATA

C#	LENGTH	RADIUS	CHD. DIR.	CHD. L	DELTA
C1	39.50'	25.00'	S65° 13' 56"E	35.52'	90° 32' 06"
C2	15.54'	255.50'	S21° 42' 13"E	15.54'	3° 29' 07"
C3	90.81'	375.49'	S29° 26' 03"E	90.59'	13° 51' 25"
C4	92.43'	375.49'	S43° 24' 53"E	92.20'	14° 06' 18"
C5	51.09'	255.50'	S54° 21' 38"E	51.00'	11° 27' 21"
C6	103.14'	375.49'	S66° 07' 28"E	102.82'	15° 44' 19"
C7	96.71'	375.49'	S81° 22' 16"E	96.44'	14° 45' 23"
C8	227.93'	954.92'	N19° 43' 20"W	227.39'	13° 40' 34"
C9	75.82'	954.92'	N29° 50' 05"W	75.80'	4° 32' 57"
C10	62.49'	954.92'	N33° 59' 03"W	62.48'	3° 44' 58"
C11	79.32'	954.92'	N37° 12' 31"W	78.30'	4° 41' 56"
C12	61.81'	954.92'	N41° 25' 25"W	61.80'	3° 42' 31"

ADJACENT PROPERTY OWNER TABULATION (##)

TAG	PARCEL ID	OWNER (NOW OR FORMERLY)	ADDRESS	DB	PG	PC	SLIDE	ZONING
01	8-223-3-801	MICHAEL E & CAMILLE S BLACK	230 GABRIELLE ST	3680	877	I	160-F	R-10A
02	8-223-3-802	JUSTIN S & MADISON M REDNICK	232 GABRIELLE ST	3709	986	I	160-F	R-10A
03	8-223-3-803	CURTIS J POLLARA	234 GABRIELLE ST	3675	490	I	160-F	R-10A
04	8-223-3-804	JAMES L & ARLENE C LOSPINUSO	236 GABRIELLE ST	3676	711	I	160-F	R-10A
05	8-223-3-805	ALEKSANDR D MARTIN-NAVES	238 GABRIELLE ST	3675	487	I	160-F	R-10A
06	8-223-3-806	CATHY LANE & WILDRED LANE, W/R/O.S.	310 GABRIELLE ST	3658	36	I	160-F	R-10A
07	8-223-3-807	MATTHEW E & MELISSA D STRICKLAND	312 GABRIELLE ST	3680	1060	I	160-F	R-10A
08	8-223-3-808	CLYDE P & LOUISA COWARD-MURRELL	314 GABRIELLE ST	3649	1809	I	160-F	R-10A
09	8-223-3-809	LATOYA S WILLIAMS	316 GABRIELLE ST	3662	1404	I	160-F	R-10A
10	8-223-3-810	MYINT THEIN, TUNG AUNG, ET. AL.	318 GABRIELLE ST	3662	1061	I	160-F	R-10A
11	8-223-3-811	CHRISTOPHER S & KRAVONE WARD	211 FRIDA RD	3627	1893	I	135-C	R-10A
12	8-223-3-812	ALEXANDER J DEBRA CARSON	209 FRIDA RD	3629	100	I	135-C	R-10A
13	8-223-3-813	DWAJE D RICKEREY & JULIA M SPOUJI	207 FRIDA RD	3627	1875	I	135-C	R-10A
14	8-223-3-814	DEBORAH W GRAB	206 FRIDA RD	3629	294	I	135-C	R-10A
15	8-223-3-815	JOHN R & AMANDA DALEY, III	208 FRIDA RD	3627	1268	I	135-C	R-10A
16	8-223-3-816	BARRY E & MICHELLE A VALDEK	210 FRIDA RD	3585	552	I	135-C	R-10A
17	8-223-3-845	HAROLD J & JULIA BURKHARDT	300 LOUISA MAE WAY	3549	1645	H	126-C	R-10A
18	8-223-3-846	ARTAN & BARBARA A MUCHOJ	302 LOUISA MAE WAY	3664	431	H	126-C	R-10A
19	8-223-3-847	MICHAEL A M YERS	304 LOUISA MAE WAY	3621	723	H	126-C	R-10A
20	8-223-3-848	CLARENCE M BROWN, III & LISA M JANIS	306 LOUISA MAE WAY	3635	1941	H	126-C	R-10A
21	8-223-3-849	ADAM & SAMANTHA D SCHOCH	308 LOUISA MAE WAY	3678	496	H	126-C	R-10A
22	8-225-3-00C	LAKE TYLER HOMEOWNERS ASSOCIATION	---	2878	809	H	126-C	R-10A
23	8-225-3-00F	LAKE TYLER HOMEOWNERS ASSOCIATION	---	2878	809	I	160-F	R-10A
24	8-223-3-872	STARS & STRIPES 4F, LLC	428 LAKE TYLER DR	3470	210	J	22-F	R-10A
25	8-223-3-873	STARS & STRIPES 4F, LLC	427 LAKE TYLER DR	3470	210	J	22-F	R-10A
26	8-223-3-871	STARS & STRIPES 4F, LLC	429 LAKE TYLER DR	3470	210	J	22-F	R-10A
27	8-223-3-748	STARS & STRIPES 4F LLC	464 LAKE TYLER DR	3470	210	J	22-F	R-10A
28	8-223-3-744	STARS & STRIPES 4F, LLC	422 LAKE TYLER DR	3470	210	J	22-F	R-10A
29	8-225-3-00B	LAKE TYLER HOMEOWNERS ASSOCIATION	---	2878	809	H	126-C	R-10A

TAG	PARCEL ID	OWNER (NOW OR FORMERLY)	ADDRESS	DB	PG	PC	SLIDE	ZONING
30	8-223-3-743	STARS & STRIPES 4F LLC	205 LAKE TYLER DR	3470	210	H	126-C	R-10A
31	8-223-3-742	STARS & STRIPES 4F LLC	207 LAKE TYLER DR	3470	210	H	126-C	R10-A
32	8-223-3-675	STARS & STRIPES 4F LLC	204 LAKE TYLER DR	3470	210	H	126-C	R-10A
33	8-223-3-676	STARS & STRIPES 4F LLC	206 LAKE TYLER DR	3470	210	H	126-C	R-10A
34	8-223-3-677	STARS & STRIPES 4F LLC	208 LAKE TYLER DR	3470	210	H	126-C	R-10A
35	8-223-3-678	STARS & STRIPES 4F LLC	210 LAKE TYLER DR	3470	210	H	126-C	R-10A
36	8-223-3-679	ANGELA F LITTLE	212 LAKE TYLER DR	3049	20	H	126-C	R-10A
37	8-112-006	YVONNE JARRETT	201 BRIARWOOD LN	1119	972	M/E/ L	P3-66	R-15
38	8-112-005	LISA SHIVAR	111 BRIARWOOD LN	3525	1977	M/E/ L	P3-66	R-15
39	8-112-080	ARCHIE L & LINDA S SAULTER	109 BRIARWOOD LN	1169	364	M/E/ L	P3-66	R-15
40	8-112-081	WILLIE JONES	850 WASHINGTON POST RD	1000	807	M/E/ L	P3-66	R-15
41	8-220-042	FEDERAL NATIONAL MORTGAGE ASSOC	836 WASHINGTON POST RD	3697	84	A	94-A	C-3
42	8-220-051	COLONIAL MHPT LLC	WASHINGTON POST RD	3646	1	H	116-D	R-6
43	8-220-A-00C	PLANTERS RIDGE HOMEOWNERS	4602 RAINMAKER DR	2789	912	H	12-D	R-6
44	8-220-A-00B	PLANTERS RIDGE HOMEOWNERS	RAINMAKER DR	2789	912	H	12-D	R-6
45	8-220-166	HEATHER WHITMAN	845 WASHINGTON POST RD	3554	133	---	---	A-5
46	8-220-047	HEATHER WHITMAN	---	3554	133	---	---	A-5
47	8-220-168	FREDERICK L HAGNER	849 WASHINGTON POST RD	3418	670	D	408	R-20
48	8-220-045	WRIGHT BEST, III	---	1262	872	---	---	A-5
49	8-220-044	TYRON A MURPHY	---	3551	182	---	---	A-5
50	8-220-102	GERALD T FRANKLIN	---	980	784	---	---	A-5
51	8-223-1-SCT1-002	STEVE HOLLOWAY	101 GRACE FARMS RD	3517	1823	G	34-F	---
52	8-223-1-SCT1-002	TROHA'S HOME RENTALS LLC	103 GRACE FARMS RD	3742	288	G	34-F	---
53	8-223-1-SCT1-001	CATHERINE C MAESTAS	105 GRACE FARMS RD	3646	1406	G	34-F	---
54	8-220-001	USA SECRETARY OF VETERANS AFFAIRS	101 CASTLEGATE RD	2758	1595	C	395	---
55	8-223-1-044	GROVER C & EARNINE M HARGETT	100 CASTLEGATE RD	1125	625	C	395	---
56	8-223-1-043	SERENA FULCHER	104 LITTLE LAMOR	3533	332	C	395	---
57	8-223-1-042	JOSE C & ANA R MARTINEZ	106 LITTLE LAKE CIR	3042	895	C	395	---
58	8-223-1-041	GLORIA PARKER	108 LITTLE LAKE CIR	2630	47	C	395	---



VICINITY SKETCH 1" = 1000'

P. O. Box 1309, New Bern, NC 28563
www.ThomasEngineeringPA.com
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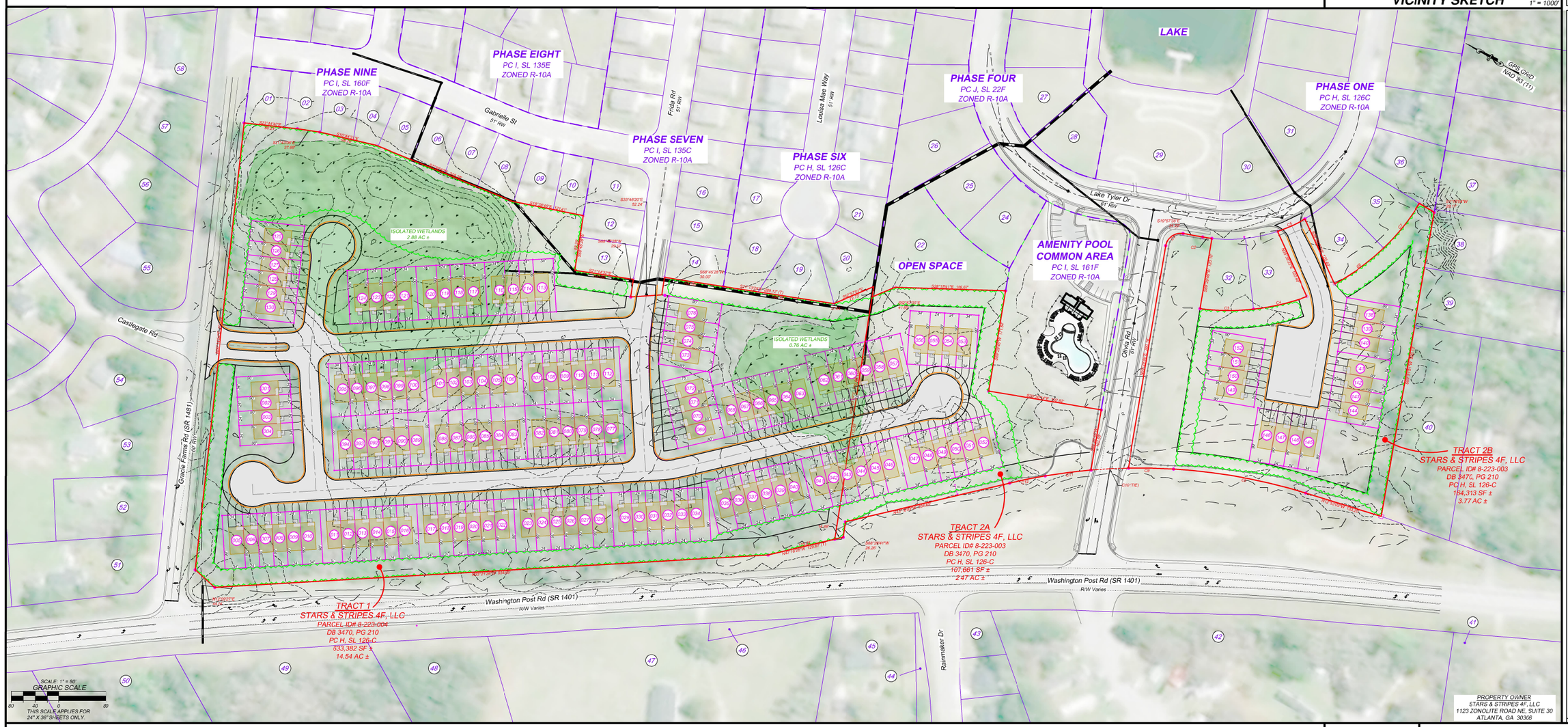

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PROGRESS DRAWINGS
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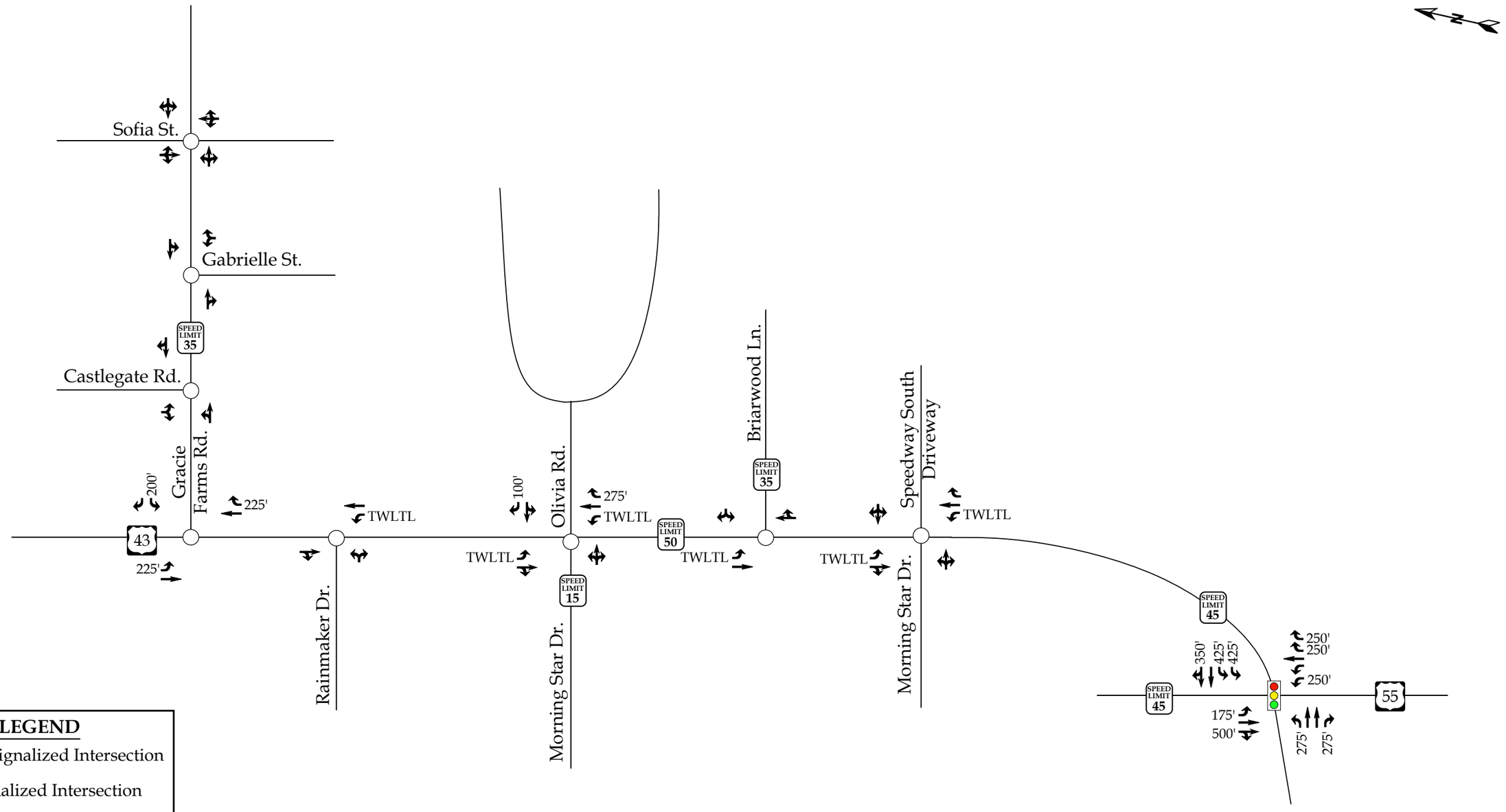
CONCEPT 'B'
FOR
TYLER - HOME ON THE LAKE TOWNHOMES

NEW BERN TOWNSHIP 8 CRAVEN COUNTY NORTH CAROLINA

PROPERTY OWNER
STARS & STRIPES 4F, LLC
1123 ZONOLITE ROAD NE, SUITE 30
ATLANTA, GA 30306

SCALE: 1" = 80'	DATE : 10/09/2023
PROJECT #: 2023-007	SHEET : 1 of 1



LEGEND

- Unsignalized Intersection
- Signalized Intersection
- Existing Lane
- X' Storage (In Feet)
- TWLTL Two-Way Left-Turn Lane
- SPEED LIMIT XX Posted Speed Limit

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Lake Tyler Update
New Bern, NC

2023 Existing
Lane Configurations

Scale: Not to Scale | Figure 3

2. 2023 EXISTING PEAK HOUR CONDITIONS

2.1. 2023 Existing Peak Hour Traffic Volumes

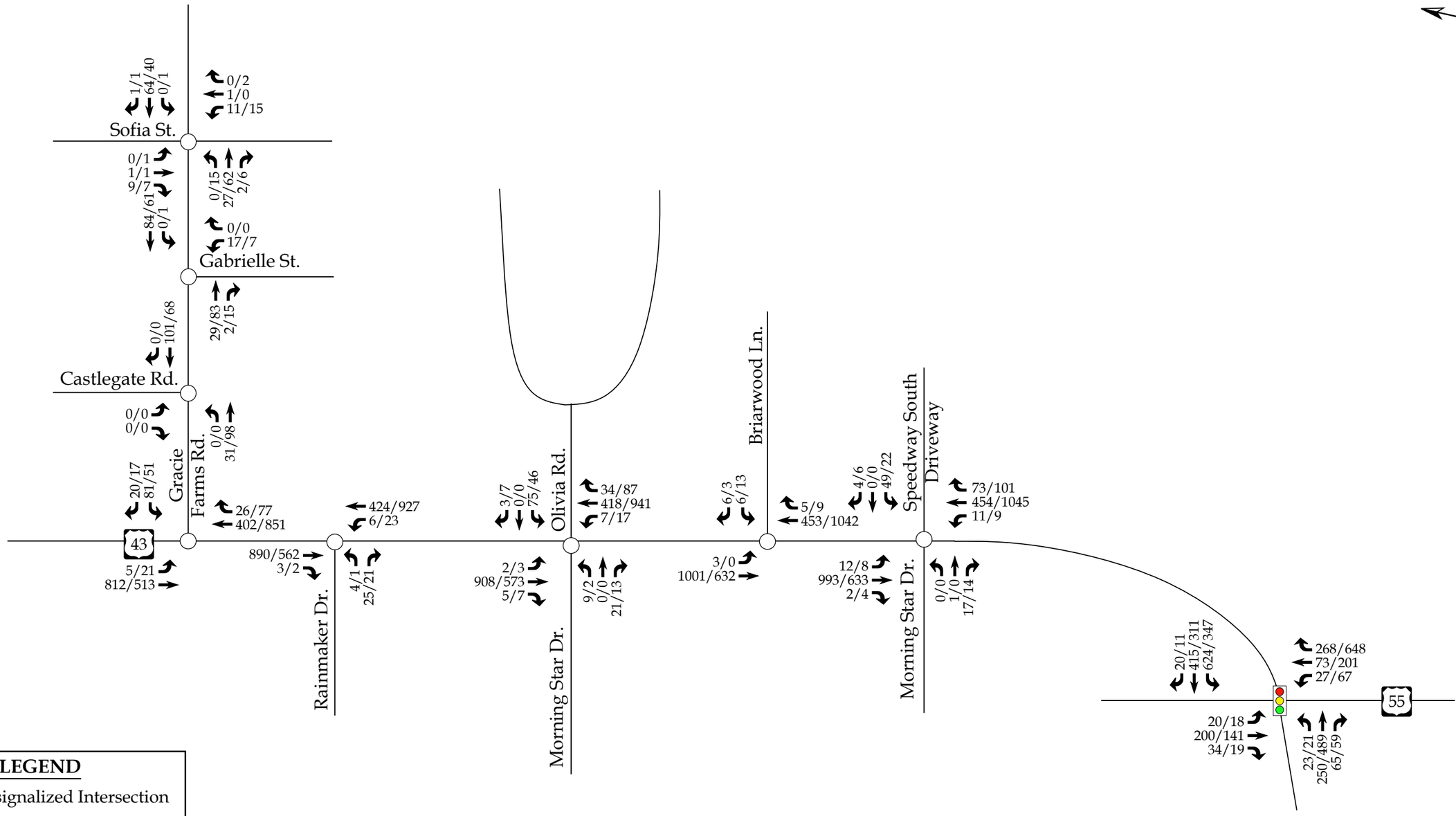
Existing peak hour traffic volumes were determined based on traffic counts conducted at the study intersections listed below, in November of 2023 by Quality Counts during a typical weekday AM (7:00 AM – 9:00 AM) and PM (4:00 PM – 6:00 PM) peak periods:

- NC-55 and NC-43
- NC-43 and Speedway Driveway South / Morning Star Drive
- NC-43 and Briarwood Lane
- NC-43 and Olivia Road / Morning Star Drive
- NC-43 and Rainmaker Drive
- NC-43 and Gracie Farms Road
- Gracie Farms Road and Gabrielle Street
- Gracie Farms Road and Sofia Street

Weekday AM and PM traffic volumes were balanced between study intersections, where appropriate. It should be noted that counts were not recorded at the intersection of Gracie Farms Road and Castlegate Road, however, no driveways exist between the study intersections to the east and west. Any imbalances between the intersections were added to the Gracie Farms Road and Castlegate Road intersection. Refer to Figure 4 for 2023 existing weekday AM and PM peak hour traffic volumes. A copy of the count data can be found in Appendix B of this report.

2.2. Analysis of 2023 Existing Peak Hour Traffic Conditions

The 2023 existing weekday AM and PM peak hour traffic volumes were analyzed to determine the current levels of service at the study intersections under existing roadway conditions. Signal information was obtained from NCDOT and is included in Appendix C. The results of the analysis are presented in Section 7 of this report.



LEGEND

- Unsignalized Intersection
- Signalized Intersection
- X / Y → Weekday AM / PM Peak Hour Traffic

Note: Based on NCDOT Congestion Management guidelines, a volume of 4 vehicles per hour (vph) was analyzed for any movement with less than 4 vph.

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Lake Tyler Update
New Bern, NC

2023 Existing
Peak Hour Traffic

Scale: Not to Scale | Figure 4

3. 2026 NO-BUILD PEAK HOUR CONDITIONS

In order to account for growth of traffic and subsequent traffic conditions at a future year, no-build traffic projections are needed. No-build traffic is the component of traffic due to the growth of the community and surrounding area that is anticipated to occur regardless of whether or not the proposed development is constructed. No-build traffic is comprised of existing traffic growth within the study area and additional traffic created as a result of adjacent approved developments.

3.1. Ambient Traffic Growth

Through coordination with NCDOT and the City, it was determined that an annual growth rate of 1% would be used to generate 2026 projected weekday AM and PM peak hour traffic volumes. Refer to Figure 5 for 2026 no-build peak hour traffic.

3.2. Adjacent Development Traffic

Based on coordination with NCDOT and the City, it was determined there were no adjacent developments to consider with this study.

3.3. Future Roadway Improvements

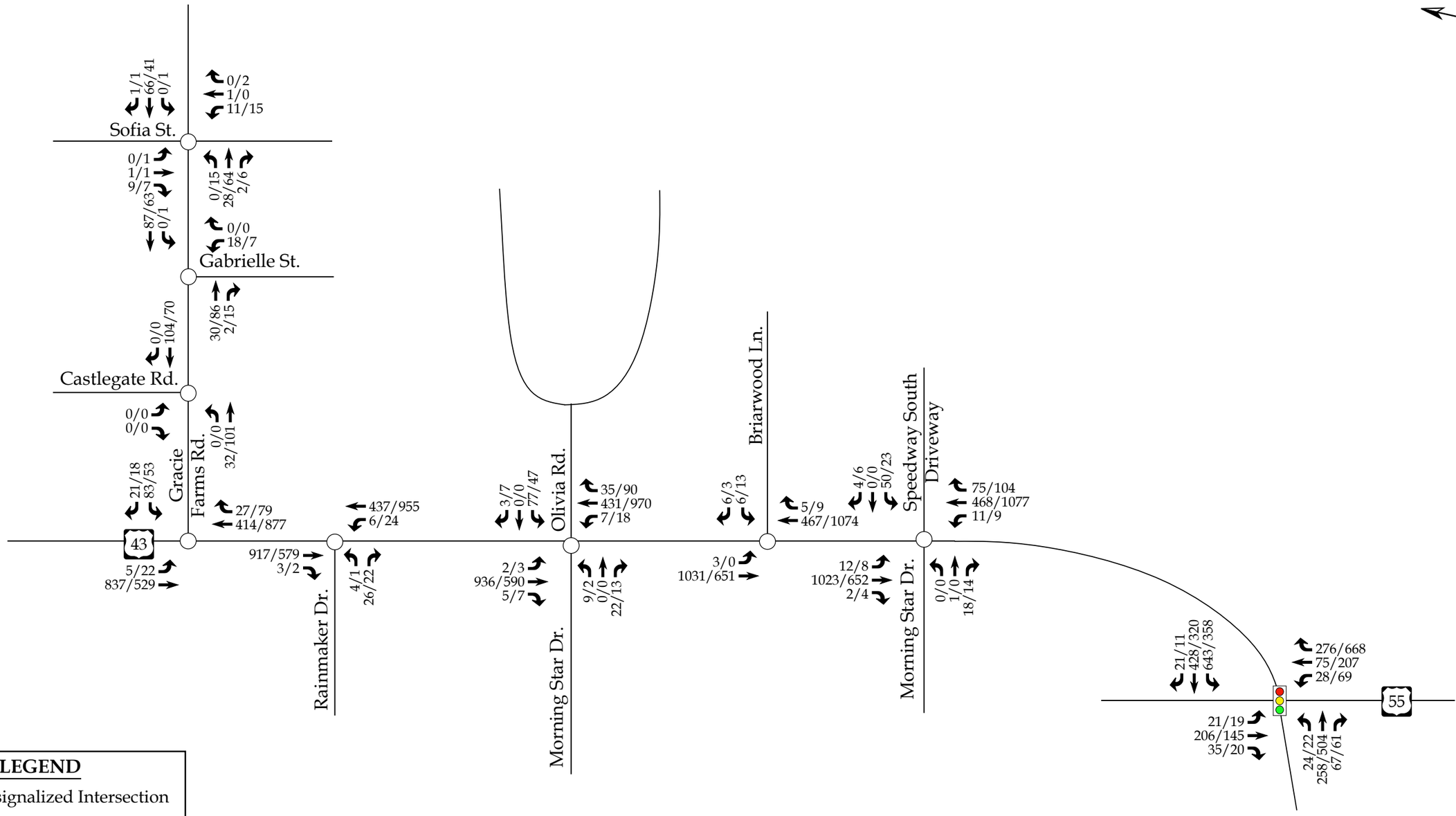
Based on coordination with the NCDOT and the City, it was determined there were no future roadway improvements to consider with this study.

3.4. 2026 No-Build Peak Hour Traffic Volumes

The 2026 no-build traffic volumes were determined by projecting the 2023 existing peak hour traffic to the year 2026. Refer to Figure 5 for an illustration of the 2026 no-build peak hour traffic volumes at the study intersections.

3.5. Analysis of 2026 No-Build Peak Hour Traffic Conditions

The 2026 no-build AM and PM peak hour traffic volumes at the study intersections were analyzed with future geometric roadway conditions and traffic control. The analysis results are presented in Section 7 of this report.



LEGEND

- Unsignalized Intersection
- Signalized Intersection
- X / Y → Weekday AM / PM Peak Hour Traffic

Note: Based on NCDOT Congestion Management guidelines, a volume of 4 vehicles per hour (vph) was analyzed for any movement with less than 4 vph.

DRMP

Lake Tyler Update
New Bern, NC

2026 No-Build
Peak Hour Traffic

Scale: Not to Scale | Figure 5

4. SITE TRIP GENERATION AND DISTRIBUTION

4.1. Trip Generation

Average weekday daily, AM peak hour, and PM peak hour trips for the proposed development were estimated using methodology contained within the ITE *Trip Generation Manual*, 11.1 Edition. Table 2 provides a summary of the trip generation potential for the site.

Table 2: Trip Generation Summary

Land Use (ITE Code)	Intensity	Daily Traffic (vpd)	Weekday AM Peak Hour Trips (vph)		Weekday PM Peak Hour Trips (vph)	
			Enter	Exit	Enter	Exit
Single-Family Detached (210)	148 DU	1,448	27	79	90	54
Townhomes (215)	145 DU	1,054	17	53	49	34
Total Trips		2,502	44	132	139	88

It is estimated that the proposed development will generate approximately 2,502 total site trips on the roadway network during a typical 24-hour weekday period. Of the daily traffic volume, it is anticipated that 176 trips (44 entering and 132 exiting) will occur during the weekday AM peak hour and 227 trips (139 entering and 88 exiting) will occur during the weekday PM peak hour.

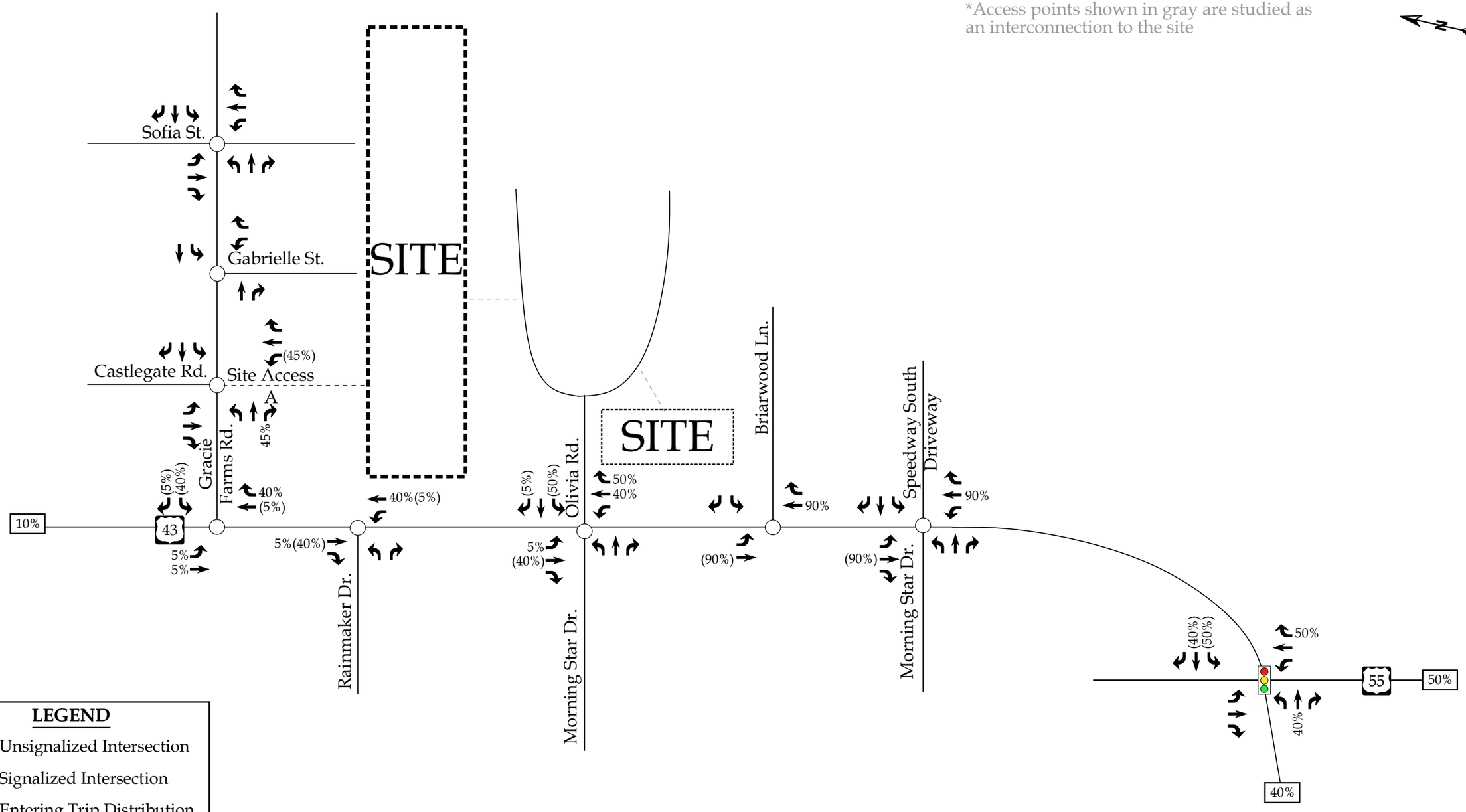
4.2. Site Trip Distribution and Assignment

Trip distribution percentages used in assigning site traffic for this development were estimated based on a combination of existing traffic patterns, population centers adjacent to the study area, and engineering judgment. It is estimated that the site trips will be regionally distributed as follows:

- 50% to / from the east via NC-55
- 40% to / from the south via NC-43
- 10% to / from the north via NC-43

The site trip distribution is shown in Figure 6. Refer to Figure 7 for the site trip assignment.

*Access points shown in gray are studied as an interconnection to the site



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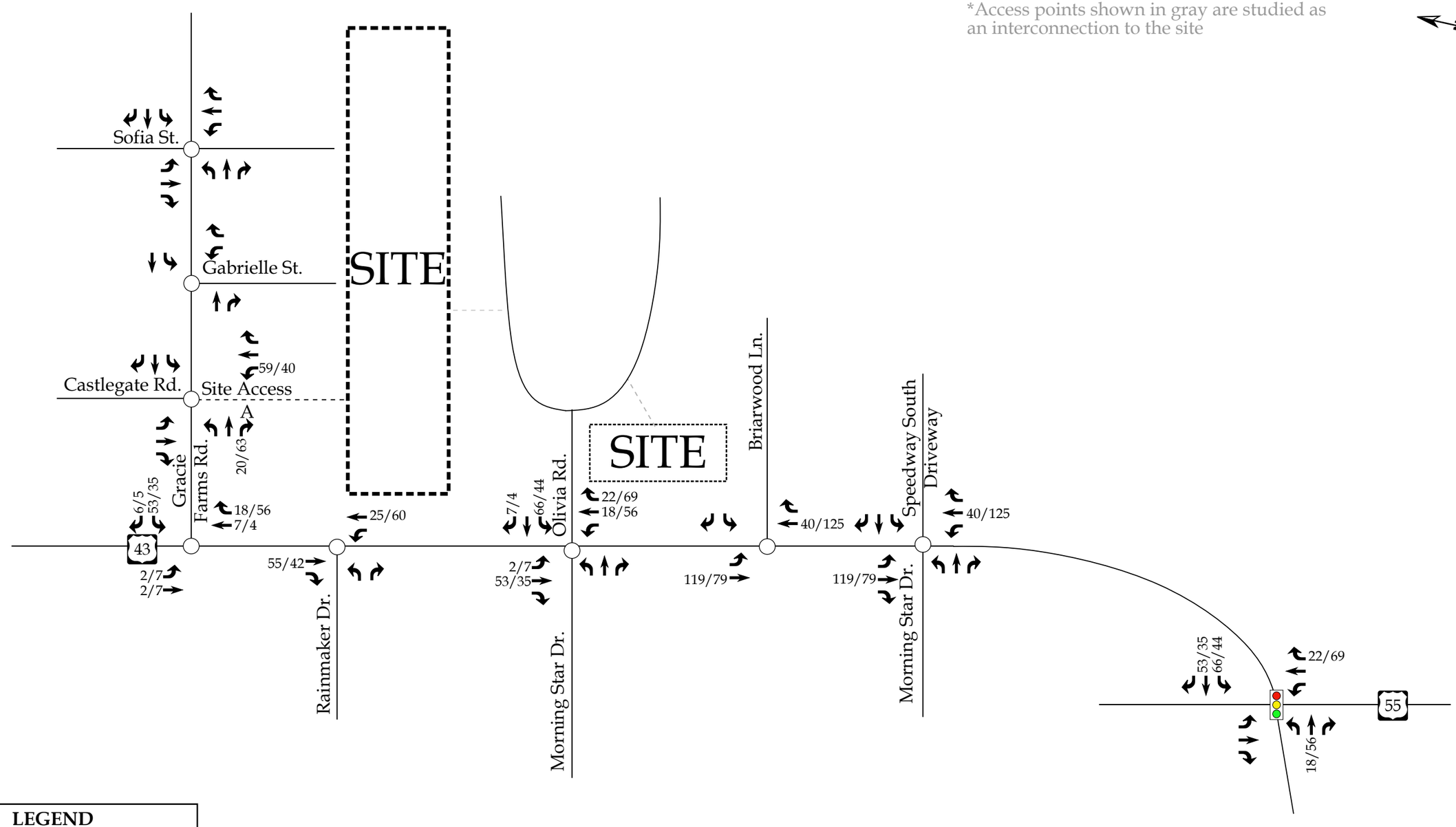
New Bern, NC

Site Trip Distribution

Scale: Not to Scale | Figure 6

*Access points shown in gray are studied as an interconnection to the site



LEGEND

- Unsignalized Intersection
- Signalized Intersection
- X / Y → Weekday AM / PM Peak Hour Site Trips

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Site Trip Assignment

Scale: Not to Scale | Figure 7

5. 2026 BUILD TRAFFIC CONDITIONS

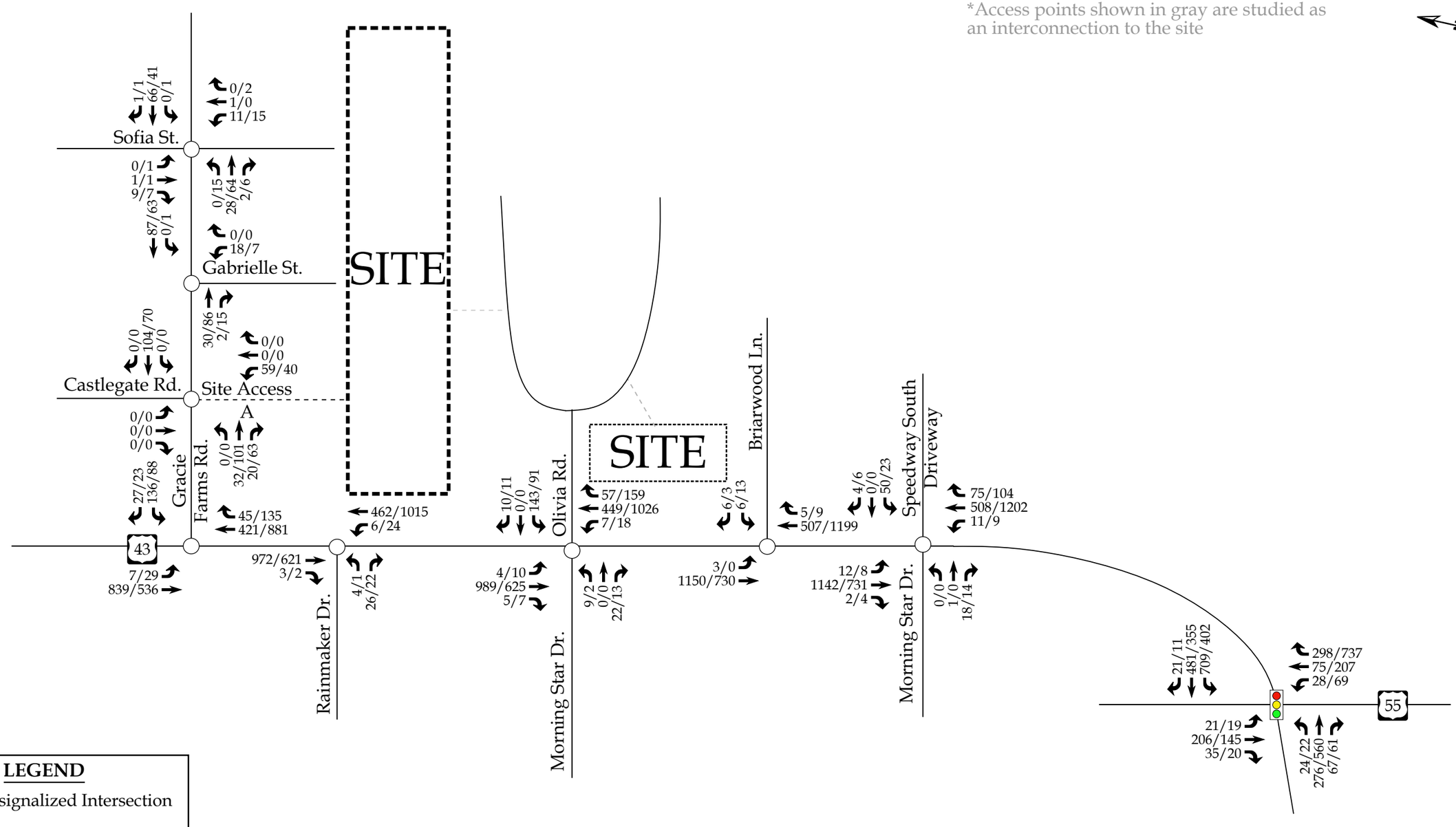
5.1. 2026 Build Peak Hour Traffic Volumes

To estimate traffic conditions with the site fully built-out, the site trips were added to the 2026 no-build traffic volumes to determine the 2026 build traffic volumes. Refer to Figure 8 for an illustration of the 2026 build peak hour traffic volumes with the proposed site fully developed.

5.2. Analysis of 2026 Build Peak Hour Traffic Conditions

Study intersections were analyzed with the 2026 build traffic volumes using the same methodology previously discussed for existing and no-build traffic conditions. Intersections were analyzed with improvements necessary to accommodate future traffic volumes. The results of the capacity analysis for each intersection are presented in Section 7 of this report.

*Access points shown in gray are studied as an interconnection to the site



LEGEND

- ○ Unsignalized Intersection
- Signalized Intersection
- X / Y → Weekday AM / PM Peak Hour Traffic

Note: Based on NCDOT Congestion Management guidelines, a volume of 4 vehicles per hour (vph) was analyzed for any movement with less than 4 vph.

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2026 Build
Peak Hour Traffic

Scale: Not to Scale | Figure 8

6. TRAFFIC ANALYSIS PROCEDURE

Study intersections were analyzed using the methodology outlined in the *Highway Capacity Manual* (HCM), 6th Edition published by the Transportation Research Board. Capacity and level of service are the design criteria for this traffic study. A computer software package, Synchro (Version 11.1), was used to complete the analyses for the study area intersections. Please note that the unsignalized capacity analysis does not provide an overall level of service for an intersection; only delay for an approach with a conflicting movement.

The HCM defines capacity as "the maximum hourly rate at which persons or vehicles can reasonably be expected to traverse a point or uniform section of a lane or roadway during a given time period under prevailing roadway, traffic, and control conditions." Level of service (LOS) is a term used to represent different driving conditions, and is defined as a "qualitative measure describing operational conditions within a traffic stream, and their perception by motorists and/or passengers." Level of service varies from Level "A" representing free flow, to Level "F" where breakdown conditions are evident. Refer to Table 3 for HCM levels of service and related average control delay per vehicle for both signalized and unsignalized intersections. Control delay as defined by the HCM includes "initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay". An average control delay of 50 seconds at a signalized intersection results in LOS "D" operation at the intersection.

Table 3: Highway Capacity Manual – Levels-of-Service and Delay

UNSIGNALIZED INTERSECTION		SIGNALIZED INTERSECTION	
LEVEL OF SERVICE	AVERAGE CONTROL DELAY PER VEHICLE (SECONDS)	LEVEL OF SERVICE	AVERAGE CONTROL DELAY PER VEHICLE (SECONDS)
A	0-10	A	0-10
B	10-15	B	10-20
C	15-25	C	20-35
D	25-35	D	35-55
E	35-50	E	55-80
F	>50	F	>80

6.1. Adjustments to Analysis Guidelines

Capacity analysis at all study intersections was completed according to the NCDOT Congestion Management Guidelines.

7. CAPACITY ANALYSIS

7.1. NC-55 and NC-43

The existing signalized intersection was analyzed under all traffic conditions with the existing lane configurations and traffic control shown in Table 4. Refer to Table 4 for a summary of the analysis results. Refer to Appendix D for the Synchro capacity analysis reports.

Table 4: Analysis Summary of NC-55 and NC-43

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
2023 Existing	EB WB NB SB	1 LT, 1 TH, 1 TH-RT 2 LT, 1 TH, 2 RT 1 LT, 2 TH, 1 RT 2 LT, 1 TH, 1 TH-RT	D B C C	C (25)	D B C C	C (25)
2026 No-Build	EB WB NB SB	1 LT, 1 TH, 1 TH-RT 2 LT, 1 TH, 2 RT 1 LT, 2 TH, 1 RT 2 LT, 1 TH, 1 TH-RT	D B C C	C (26)	D B C C	C (26)
2026 Build	EB WB NB SB	1 LT, 1 TH, 1 TH-RT 2 LT, 1 TH, 2 RT 1 LT, 2 TH, 1 RT 2 LT, 1 TH, 1 TH-RT	D B C C	C (26)	D B D C	C (27)

Capacity analysis of all traffic conditions indicates the intersection is expected to operate at LOS C or better during both weekday AM and PM peak hours. No significant queuing is expected at the intersection.

No improvements are recommended by the developer.

7.2. NC-43 and Speedway Driveway South/Morning Star Drive

The existing unsignalized intersection was analyzed under all traffic conditions with the existing lane configurations and traffic control shown in Table 5. Refer to Table 5 for a summary of the analysis results. Refer to Appendix E for the Synchro capacity analysis reports.

Table 5: Analysis Summary of NC-43 and Speedway Driveway South/Morning Star Drive

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
2023 Existing	EB WB NB SB	1 LT-TH-RT 1 LT-TH-RT 1 LT, 1 TH, 1 RT 1 LT, 1 TH-RT	E[2] F[2] B[1] A[1]	N/A	E[2] F[2] A[1] B[1]	N/A
2026 No-Build	EB WB NB SB	1 LT-TH-RT 1 LT-TH-RT 1 LT, 1 TH, 1 RT 1 LT, 1 TH-RT	E[2] F[2] B[1] A[1]	N/A	E[2] F[2] A[1] B[1]	N/A
2026 Build	EB WB NB SB	1 LT-TH-RT 1 LT-TH-RT 1 LT, 1 TH, 1 RT 1 LT, 1 TH-RT	F[2] F[2] B[1] A[1]	N/A	F[2] F[2] B[1] A[1]	N/A

1. Level of service for major-street left-turn movement.
2. Level of service for minor-street approach.

Capacity analysis of all traffic conditions indicates the major-street left-turn movements are expected to operate at LOS B or better during the AM and PM peak hours. The minor-street approaches are expected to operate at a failing LOS during the AM and PM peak hours under all existing and future traffic conditions. It should be noted that higher delays are not uncommon along the minor street at an unsignalized intersection. No significant queuing is expected at the intersection.

It should also be noted that the proposed development is only expected to contribute volumes to the through movements along NC-43. Based on the results of this analysis, no improvements are recommended by the developer.

7.3. NC-43 and Briarwood Lane

The existing unsignalized intersection was analyzed under all traffic conditions with the existing lane configurations and traffic control shown in Table 6. Refer to Table 6 for a summary of the analysis results. Refer to Appendix F for the Synchro capacity analysis reports.

Table 6: Analysis Summary of NC-43 and Briarwood Lane

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
2023 Existing	WB NB SB	1 LT, 1 RT 1 TH-RT 1 LT, 1 TH	C[2] -- A[1]	N/A	C[2] -- B[1]	N/A
2026 No-Build	WB NB SB	1 LT, 1 RT 1 TH-RT 1 LT, 1 TH	C[2] -- A[1]	N/A	C[2] -- B[1]	N/A
2026 Build	WB NB SB	1 LT, 1 RT 1 TH-RT 1 LT, 1 TH	C[2] -- A[1]	N/A	D[2] -- B[1]	N/A

1. Level of service for major-street left-turn movement.
2. Level of service for minor-street approach.

Capacity analysis of all traffic conditions indicates the minor-street approach is expected to operate at LOS D or better and the major-street left-turn movement is expected to operate at LOS B or better during the AM and PM peak hours. No significant queues are expected at the intersection.

No improvements are recommended by the developer.

7.4. NC-43 and Olivia Road/Morning Star Drive

The existing unsignalized intersection was analyzed under all traffic conditions with the lane configurations and traffic control shown in Table 7. Refer to Table 7 for a summary of the analysis results. Refer to Appendix G for the Synchro capacity analysis reports.

Table 7: Analysis Summary of NC-43 and Olivia Road/Morning Star Drive

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
2023 Existing	EB WB NB SB	1 LT-TH-RT 1 LT-TH, 1 RT 1 LT, 1 TH, 1 RT 1 LT, 1 TH-RT	D[2] F[2] B[1] A[1]	N / A	E[2] F[2] A[1] B[1]	N / A
2026 No-Build	EB WB NB SB	1 LT-TH-RT 1 LT-TH, 1 RT 1 LT, 1 TH, 1 RT 1 LT, 1 TH-RT	E[2] F[2] B[1] A[1]	N / A	E[2] F[2] A[1] B[1]	N / A
2026 Build	EB WB NB SB	1 LT-TH-RT 1 LT-TH, 1 RT 1 LT, 1 TH, 1 RT 1 LT, 1 TH-RT	E[2] F[2] B[1] A[1]	N / A	F[2] F[2] A[1] B[1]	N / A
2026 Build-Signalized	EB WB NB SB	1 LT-TH-RT 1 LT-TH, 1 RT 1 LT, 1 TH, 1 RT 1 LT, 1 TH-RT	C E A B	B (18)	C C B A	B (12)

Improvements by proposed development shown in bold.
1. Level of service for major-street left-turn movement.
2. Level of service for minor-street approach.

Capacity analysis of all traffic conditions indicates the major-street left-turn movements are expected to operate at LOS B or better during the weekday AM and PM peak hours. The westbound minor-street approach is expected to operate at a failing LOS under all traffic conditions during the weekday AM and PM peak hours.

8-hour, 4-hour, and peak hour signal warrants were all analyzed to determine if a signal is necessary to improve delays at the intersection. Under existing and no-build conditions, the peak hour warrant is satisfied for only one hour. Under build conditions, the 8-hour, 4-hour,

and peak hour warrants are satisfied. Refer to Appendix M for the signal warrant analysis spreadsheets.

Due to the increase in warrants being met from no-build to build conditions, installation of a traffic signal is recommended by the developer. Coordination with NCDOT should take place in order to develop a signal plan.

No other improvements are recommended at this intersection.

7.5. NC-43 and Rainmaker Drive

The existing unsignalized intersection was analyzed under all traffic conditions with the existing lane configurations and traffic control shown in Table 8. Refer to Table 8 for a summary of the analysis results. Refer to Appendix H for the Synchro capacity analysis reports.

Table 8: Analysis Summary of NC-43 and Rainmaker Drive

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
2023 Existing	EB NB SB	1 LT-RT 1 LT, 1 TH 1 TH-RT	C[2] B[1] --	N/A	B[2] A[1] --	N/A
2026 No-Build	EB NB SB	1 LT-RT 1 LT, 1 TH 1 TH-RT	C[2] B[1] --	N/A	B[2] A[1] --	N/A
2026 Build	EB NB SB	1 LT-RT 1 LT, 1 TH 1 TH-RT	C[2] B[1] --	N/A	C[2] A[1] --	N/A

1. Level of service for major-street left-turn movement.
2. Level of service for minor-street approach.

Capacity analysis of all traffic conditions indicates the major-street left-turn movements are expected to operate at LOS B or better during the weekday AM and PM peak hours. Minor street approaches are expected to operate at LOS C or better during the AM and PM peak hours. No significant queuing is expected at the intersection.

No improvements are recommended by the developer.

7.6. NC-43 and Gracie Farms Road

The existing unsignalized intersection was analyzed under all traffic conditions with the existing lane configurations and traffic control shown in Table 9. Refer to Table 9 for a summary of the analysis results. Refer to Appendix I for the Synchro capacity analysis reports.

Table 9: Analysis Summary of NC-43 and Gracie Farms Road

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
2023 Existing	WB NB SB	1 LT, 1 RT 1 TH, 1 RT 1 LT, 1 TH	C[2] -- A[1]	N/A	C[2] -- B[1]	N/A
2026 No-Build	WB NB SB	1 LT, 1 RT 1 TH, 1 RT 1 LT, 1 TH	C[2] -- A[1]	N/A	C[2] -- B[1]	N/A
2026 Build	WB NB SB	1 LT, 1 RT 1 TH, 1 RT 1 LT, 1 TH	D[2] -- A[1]	N/A	D[2] -- B[1]	N/A

1. Level of service for major-street left-turn movement.
2. Level of service for minor-street approach.

Capacity analysis of all traffic conditions indicates the major-street left-turn movement is expected to operate at LOS B or better while the minor-street approach is expected to operate at LOS D or better during the weekday AM and PM peak hours. No significant queuing is expected at the intersection.

Due to acceptable operations at the intersection, no improvements are recommended by the developer.

7.7. Gracie Farms Road and Castlegate Road

The existing unsignalized intersection was analyzed under all traffic conditions with lane configurations and traffic control shown in Table 10. Refer to Table 10 for a summary of the analysis results. Refer to Appendix J for the Synchro capacity analysis reports.

Table 10: Analysis Summary of Gracie Farms Road and Castlegate Road

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
2023 Existing	EB WB SB	1 LT-TH 1 TH-RT 1 LT-RT	A[1] -- A[2]	N/A	A[1] -- A[2]	N/A
2026 No-Build	EB WB SB	1 LT-TH 1 TH-RT 1 LT-RT	A[1] -- A[2]	N/A	A[1] -- A[2]	N/A
2026 Build	EB WB NB SB	1 LT-TH-RT 1 LT-TH-RT 1 LT-TH-RT 1 LT-TH-RT	A[1] A[1] B[2] A[2]	N/A	A[1] A[1] B[2] B[2]	N/A

Modifications to lane configurations are shown in bold.
1. Level of service for major-street left-turn movement.
2. Level of service for minor-street approach.

Capacity analysis of all traffic conditions indicates the major-street left-turn movements are expected to operate at LOS A during the AM and PM peak hours. The minor-street approaches are expected to operate at LOS B or better during the AM and PM peak hours. No significant queuing is expected at the intersection.

Right-turn lane warrants were considered based on the NCDOT *Policy on Street and Driveway Access to North Carolina Highways.* Based on volumes, a right-turn lane is not warranted. Refer to Appendix N for turn lane warrants.

7.8. Gracie Farms Road and Gabrielle Street

The existing unsignalized intersection was analyzed under all traffic conditions with the existing lane configurations and traffic control shown in Table 11. Refer to Table 11 for a summary of the analysis results. Refer to Appendix K for the Synchro capacity analysis reports.

Table 11: Analysis Summary of Gracie Farms Road and Gabrielle Street

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
2023 Existing	EB WB NB	1 TH-RT 1 LT-TH 1 LT-RT	-- A[1] A[2]	N/A	-- A[1] A[2]	N/A
2026 No-Build	EB WB NB	1 TH-RT 1 LT-TH 1 LT-RT	-- A[1] A[2]	N/A	-- A[1] A[2]	N/A
2026 Build	EB WB NB	1 TH-RT 1 LT-TH 1 LT-RT	-- A[1] A[2]	N/A	-- A[1] A[2]	N/A

1. Level of service for major-street left-turn movement.
2. Level of service for minor-street approach.

Capacity analysis of all traffic conditions indicates the major-street left-turn and minor-street approach are expected to operate at LOS A during the AM and PM peak hours. No significant queuing is expected at the intersection.

No improvements are recommended by the developer.

7.9. Gracie Farms Road and Sofia Street

The existing unsignalized intersection was analyzed under all traffic conditions with existing lane configurations and traffic control shown in Table 12. Refer to Table 12 for a summary of the analysis results. Refer to Appendix L for the Synchro capacity analysis reports.

Table 12: Analysis Summary of Gracie Farms Road and Sofia Street

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
2023 Existing	EB	1 LT-TH-RT	A[1]	N/A	A[1]	N/A
	WB	1 LT-TH-RT	A[1]		A[1]	
	NB	1 LT-TH-RT	A[2]		A[2]	
	SB	1 LT-TH-RT	A[2]		A[2]	
2026 No-Build	EB	1 LT-TH-RT	A[1]	N/A	A[1]	N/A
	WB	1 LT-TH-RT	A[1]		A[1]	
	NB	1 LT-TH-RT	A[2]		A[2]	
	SB	1 LT-TH-RT	A[2]		A[2]	
2026 Build	EB	1 LT-TH-RT	A[1]	N/A	A[1]	N/A
	WB	1 LT-TH-RT	A[1]		A[1]	
	NB	1 LT-TH-RT	A[2]		A[2]	
	SB	1 LT-TH-RT	A[2]		A[2]	

1. Level of service for major-street left-turn movement.
2. Level of service for minor-street approach.

Capacity analysis of all traffic conditions indicates the major-street left-turn movements and the minor-street approaches are expected to operate at LOS A during the AM and PM peak hours. No significant queuing is expected at the intersection.

No improvements are recommended by the developer.

8. CONCLUSIONS

This Traffic Impact Analysis was conducted to determine the potential traffic impacts of the proposed build out of the existing Lake Tyler development located east of NC-43 and south of Gracie Farms Road in New Bern, North Carolina. The remaining units, anticipated to be completed in 2026, are expected to consist of 148 single-family homes and 145 townhomes. Site access to NC-43 is proposed via the existing Olivia Road connection while one (1) new full movement connection is proposed on Gracie Farms Road opposite Castlegate Drive.

The study analyzes traffic conditions during the weekday AM and PM peak hours for the following scenarios:

- 2023 Existing Traffic Conditions
- 2026 No-Build Traffic Conditions
- 2026 Build Traffic Conditions

Trip Generation

It is estimated that remaining residential units will generate approximately 2,502 total site trips on the roadway network during a typical 24-hour weekday period. Of the daily traffic volume, it is anticipated that 176 trips (44 entering and 132 exiting) will occur during the weekday AM peak hour and 227 trips (139 entering and 88 exiting) will occur during the weekday PM peak hour.

Adjustments to Analysis Guidelines

Capacity analysis at all study intersections was completed according to NCDOT Congestion Management Guidelines. Refer to section 6.1 of this report for a detailed description of any adjustments to these guidelines made throughout the analysis.

9. RECOMMENDATIONS

Based on the findings of this study, specific geometric improvements have been identified and are recommended to accommodate future traffic conditions. See a more detailed description of the recommended improvements below. Refer to Figure 9 for an illustration of the recommended lane configuration for the proposed development.

Recommended Improvements by Developer

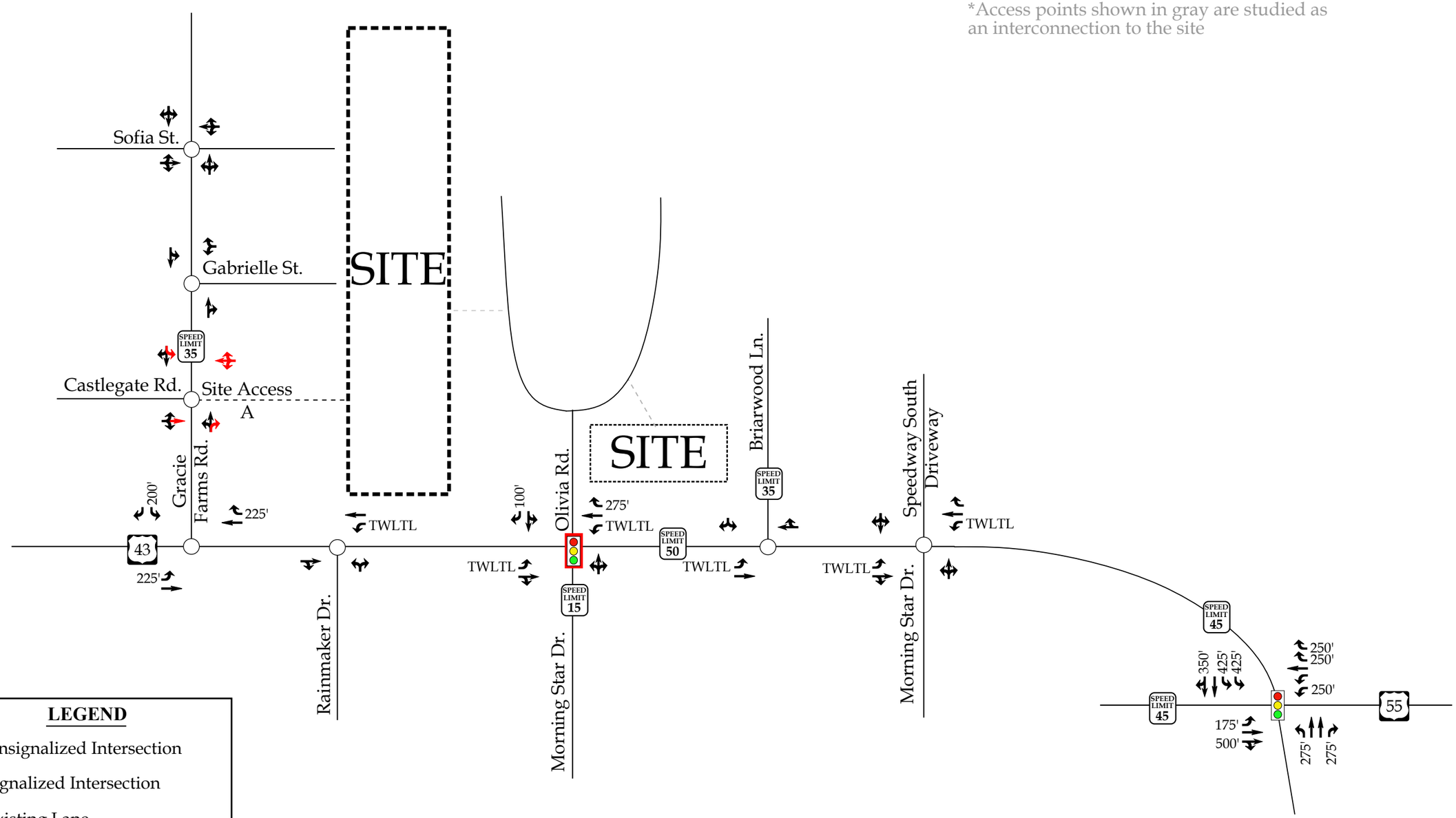
NC-43 and Olivia Road/Morning Star Drive

- Install a two-phase traffic signal. Coordinate with NCDOT to develop a signal plan.

Gracie Farms Road and Castlegate Road/Site Access A

- Construct Site Access A with one ingress and one egress lane.
- Provide stop control for the egress of Site Access A.

*Access points shown in gray are studied as an interconnection to the site



LEGEND

- Unsignalized Intersection
- Signalized Intersection
- Existing Lane
- Improvement by Developer
- Signal Installation by Developer
- X' Storage (In Feet)

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Recommended Lane Configurations

Scale: Not to Scale | Figure 9