



TRAFFIC IMPACT ANALYSIS

FOR

FLYBRIDGE

LOCATED

IN

SWANSBORO, NC

Prepared For:

Carolina Commercial Contractors
1600 Colon Road
Sanford, NC



September 2025

DRMP Project No. 23103

Prepared By: GB

Reviewed By: DC

**TRAFFIC IMPACT
ANALYSIS
FOR
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SWANSBORO, NC**



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Prepared By:

DRMP, Inc.
License #F-1524

TRAFFIC IMPACT ANALYSIS FLYBRIDGE

Swansboro, North Carolina

EXECUTIVE SUMMARY

1. Development Overview

A Traffic Impact Analysis (TIA) was conducted for the proposed Flybridge development in accordance with the Swansboro (Town) Unified Development Ordinance (UDO) and North Carolina Department of Transportation (NCDOT) capacity analysis guidelines. The proposed Flybridge development to be located south of NC 24 and east of Queens Creek Road in Swansboro, North Carolina. The proposed development, anticipated to be completed in 2026, is assumed to consist of 300 apartments, 25,000 square feet (s.f.) shopping plaza, 7,000 s.f. high-turnover restaurant, 3,000 s.f. fast-food restaurant with drive-through, and a convenience store with a gas station with 12 fueling positions. Site access is proposed via one full movement driveway creating a fourth leg to the intersection of NC 24 and Belgrade Swansboro Road and one right-in/right-out driveway along NC 24.

2. Existing Traffic Conditions

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

- NC 24 & Belgrade Swansboro Road (signalized)
- NC 24 & Queens Creek Road (signalized)
- NC 24 & Norris Road (signalized)
- NC 24 & Hammocks Beach Road (signalized)
- Belgrade-Swansboro Road & Swansboro Loop Road (unsignalized)

Existing peak hour traffic volumes were determined based on traffic counts conducted at the study intersection listed above, in May of 2023 during a typical weekday AM (7:00 AM – 9:00 AM) and PM (4:00 PM – 6:00 PM) peak periods. Traffic volumes were balanced between study intersections, where appropriate.

3. Future Traffic Conditions

Through coordination with the NCDOT and the Town, it was determined that an annual growth rate of 3% would be used to generate 2026 projected weekday AM and PM peak hour traffic volumes. It was also determined that a seasonal growth of 7% in addition to the annual growth rate of 3% would be used to generate 2027 (Build year +1) projected weekday AM and PM peak hour traffic volumes. The following adjacent developments were identified to be included as an approved adjacent development in this study:

- Swansboro Wawa
- West Corbett Avenue Starbucks

4. 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, 11.1 Edition. Table E-1, on the following page, 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
Multifamily Housing Low Rise (220)	300 Units	1,998	28	88	96	54
Strip Retail Plaza (822)	25,000 s.f.	1,286	32	21	75	74
High-Turnover Restaurant (932)	7,000 s.f.	750	37	30	38	25
Fast-Food Restaurant with Drive- Through (934)	3,000 s.f.	1,402	68	66	52	47
C-Store with Gas Station (945)	12 VFP	3,182	97	97	111	111
Total Trips		8,618	262	301	371	311
<i>Internal Capture (16% AM & 30% PM) *</i>			-43	-47	-111	-94
Total External Trips			243	274	357	306
<i>Pass-By Trips: Shopping Center (29% PM)</i>			-0	-0	-15	-15
<i>Pass-By Trips: High-Turnover Restaurant (43% PM)</i>			-0	-0	-9	-9
<i>Pass-By Trips: Fast-Food Restaurant with Drive-Through (49% AM, 50% PM)</i>			-28	-28	-19	-19
<i>Pass-By Trips: C-Store with Gas Station (76% AM, 75% PM)</i>			-61	-61	-58	-58
Total Primary Trips			130	165	159	116

*Utilizing methodology contained in the NCHRP Report 684.

To estimate traffic conditions with the site fully built-out, the total site trips were added to the 2026 and 2027 no-build traffic volumes to determine the 2026 and 2027 build traffic volumes. 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
- 2026 Build Traffic Conditions with Improvements
- 2027 No-Build Traffic Conditions
- 2027 Build Traffic Conditions
- 2027 Build Traffic Conditions with Improvements

5. Capacity Analysis Summary

The analysis considered weekday AM and PM peak hour traffic for 2023 existing, 2026 and 2027 no-build, and 2026 and 2027 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

NC 24 & Belgrade-Swansboro Road/Access A

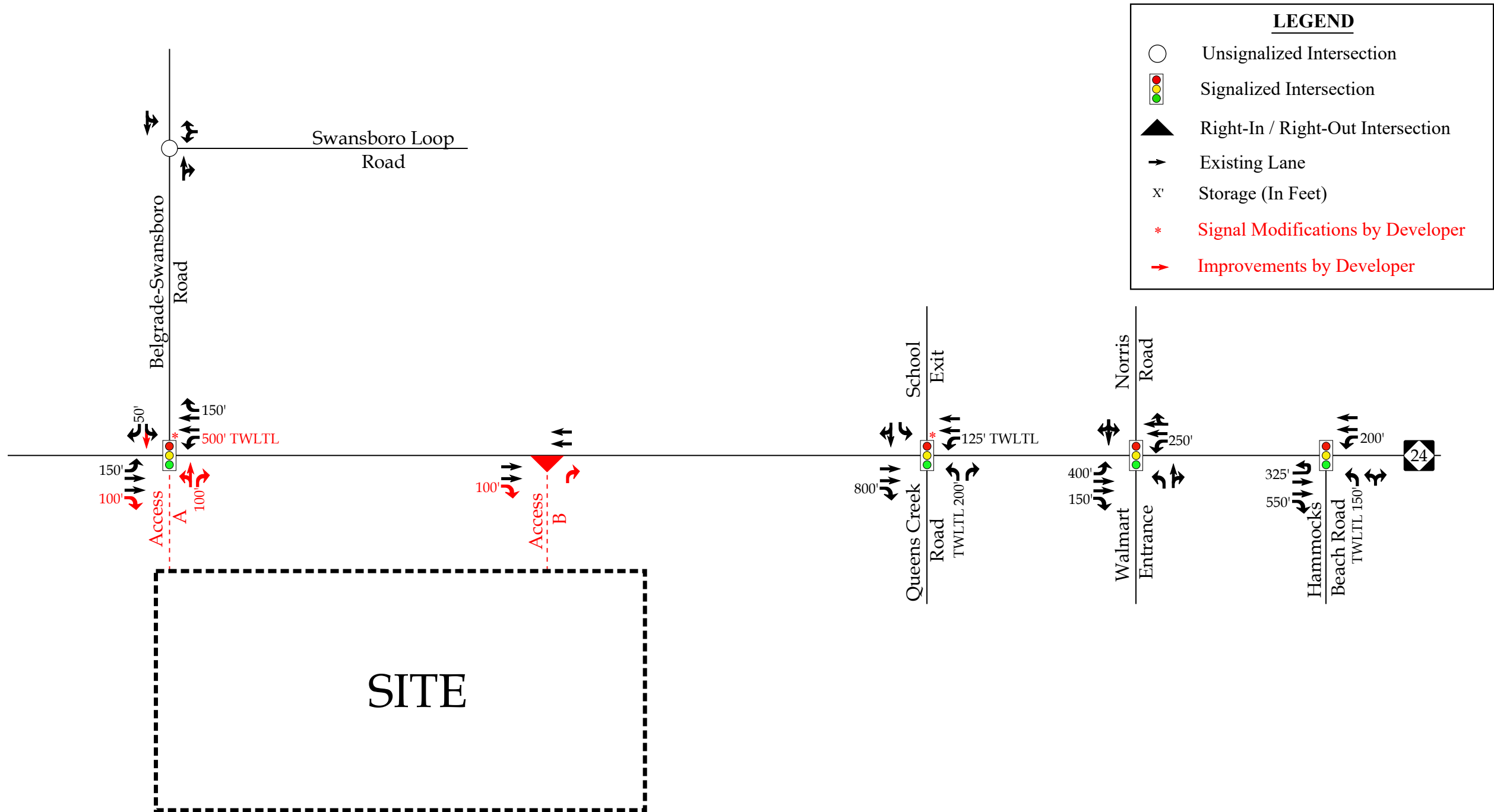
- Restripe the existing southbound left-turn lane to a shared left-through lane.
- Extend the westbound left-turn lane to 500 feet of storage and appropriate taper length.
- Construct the northbound approach with one ingress lane and two egress lanes striped as a shared left-through lane and a right-turn lane.
- Construct an eastbound right-turn lane with 100 feet of storage and appropriate taper length.
- Signal timing modifications.

NC 24 & Queens Creek Road/School Exit

- Signal timing modifications.

NC 24 & Access B

- Construct the northbound approach with one ingress lane and one egress lane striped as a right-turn lane.
- Provide stop control for the northbound approach.
- Construct an eastbound right-turn lane with 100 feet of storage and appropriate taper length.



Flybridge
Swansboro, NC

Recommended Lane
Configurations

Scale: Not to Scale | Figure E-1

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TRAFFIC IMPACT ANALYSIS

FLYBRIDGE Swansboro, North Carolina

1. INTRODUCTION

The contents of this report present the findings of the updated Traffic Impact Analysis (TIA) conducted for the proposed development to be located south of NC 24 and west of Queens Creek Road in Swansboro, North Carolina. The purpose of this study is to determine the potential impacts to the surrounding transportation system created by traffic generated by the proposed development, as well as recommend improvements to mitigate the impacts.

The proposed development, anticipated to be completed in 2026, is assumed to consist of the following uses:

- 300 apartment units
- 25,000 s.f. shopping plaza
- 7,000 s.f. high-turnover restaurant
- 3,000 s.f. fast-food restaurant with drive-through
- Convenience store with gas station with 12 fueling positions

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
- 2026 Build Traffic Conditions with Improvements
- 2027 No-Build Traffic Conditions
- 2027 Build Traffic Conditions
- 2027 Build Traffic Conditions with Improvements

1.1. Site Location and Study Area

The development is proposed to be located south of NC 24 and east of Queens Creek Road in Swansboro, North Carolina. 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 Town of Swansboro (Town) and consists of the following existing intersections:

- NC 24 & Belgrade Swansboro Road (signalized)
- NC 24 & Queens Creek Road (signalized)
- NC 24 & Norris Road (signalized)
- NC 24 & Hammocks Beach Road (signalized)
- Belgrade-Swansboro Road & Swansboro Loop Road (unsignalized)

Refer to Appendix A for the approved scoping documentation.

1.2. Proposed Land Use and Site Access

The site is expected to be located south of NC 24 and west of Queens Creek Road. The proposed development, anticipated to be completed in 2026, is assumed to consist of the following uses:

- 300 apartment units
- 25,000 s.f. shopping plaza
- 7,000 s.f. high-turnover restaurant
- 3,000 s.f. fast-food restaurant with drive-through
- Convenience store with gas station with 12 fueling positions

Site access is proposed via one full movement driveway creating a fourth leg to the intersection of NC 24 and Belgrade Swansboro Road and one right-in/right-out (RIRO) driveway along NC 24. 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 development 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, on the following page, provides a summary of this information, as well.

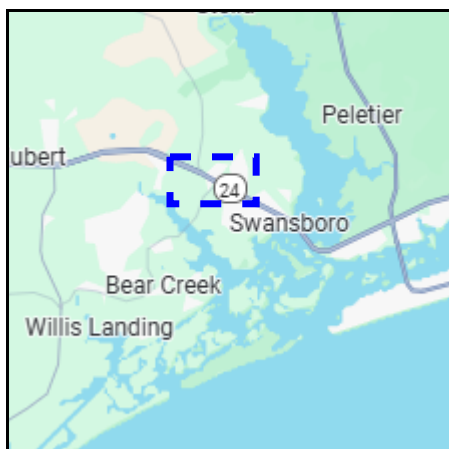
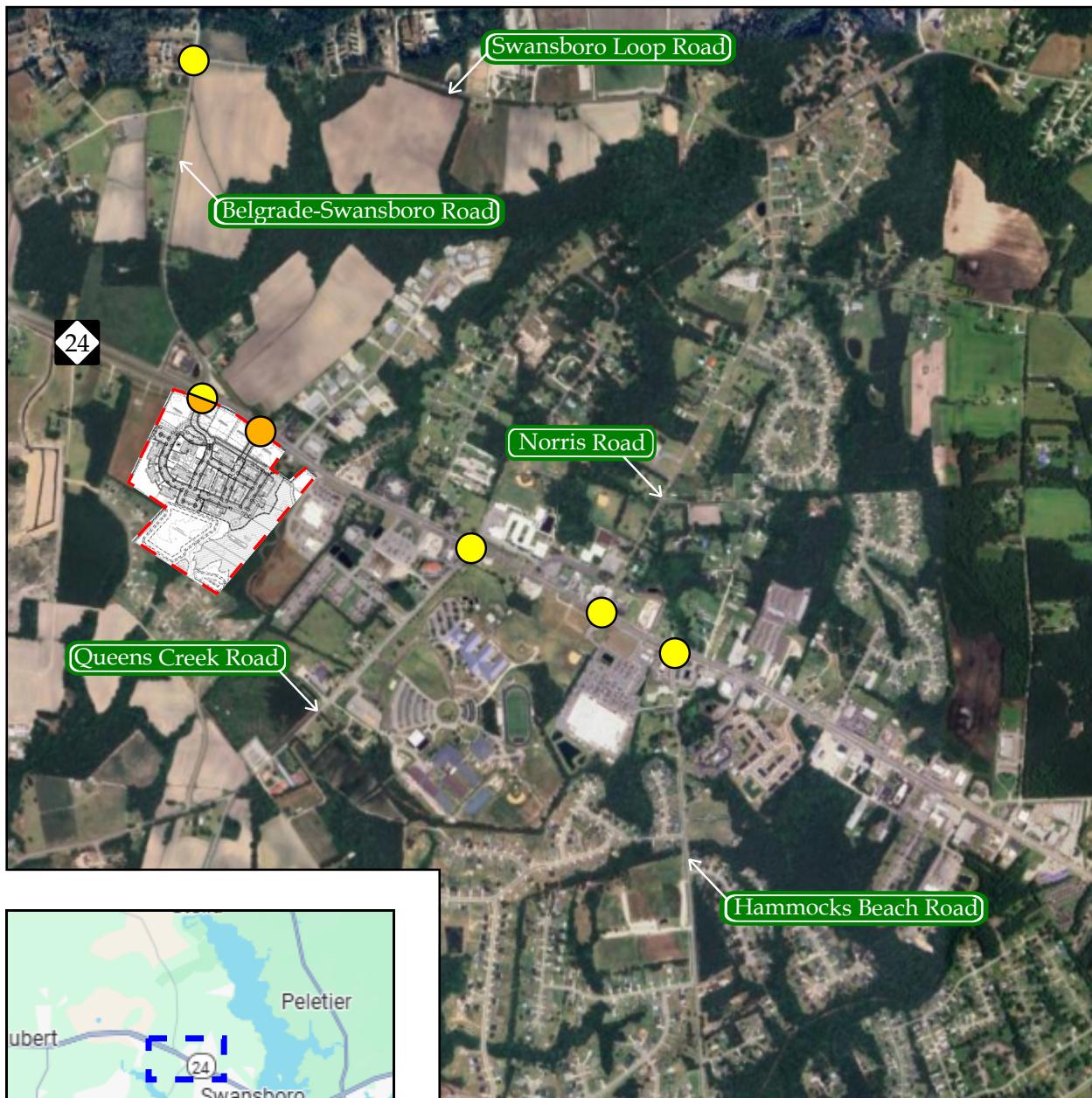
Table 1: Existing Roadway Inventory

Road Name	Route Number	Typical Cross Section	Speed Limit	2019 AADT (vpd)
W Corbett Avenue	NC 24	4-lane divided	35 mph/45 mph	29,000
Belgrade Swansboro Road	SR 1434	2-lane undivided	50 mph	5,400**
Queens Creek Road	1509	2-lane undivided	45 mph	14,000
Norris Road	SR 1445	2-lane undivided	45 mph	710***
Hammocks Beach Road	SR 1511	2-lane undivided	45 mph	3,400*
Swansboro Loop Road	SR 1444	2-lane undivided	45 mph	1,600

*ADT from 2016

**ADT from 2018

***ADT based on the traffic counts from 2023 and assuming the weekday PM peak hour volume is 10% of the average daily traffic.



LEGEND

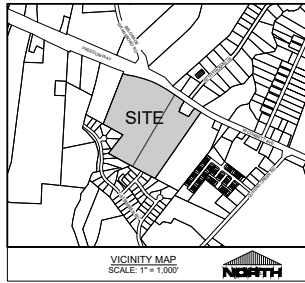
- Study Intersection
- Proposed Site Access
- Study Area



Flybridge
Swansboro, NC

Site Location Map

Scale: Not to Scale Figure 1



SITE DATA TABULATION

PROJECT ADDRESS:	1481 W CORBETT AVE SWANSBORO, NC 28584
PROPERTY OWNER:	FLYBRIDGE SWANSBORO, LLC PO BOX 130 SANFORD, NC 27331
PARCEL ID:	019494
PN:	027733 535503221934 535503227635
DEED BOOK / PAGE:	5998 / 846 6000 / 163
CURRENT ZONING:	RA (RESIDENTIAL / AGRICULTURAL)
TOTAL SITE AREA:	438.92 ACRES OR 1,695,500 SF
PROPOSED USE:	MULTI-FAMILY / COMMERCIAL OUTPARCELS CONDITIONAL B1
PROPOSED ZONING:	
FLOOD INFORMATION:	THIS SITE IS NOT LOCATED IN A SPECIAL HAZARD AREA AS DETERMINED BY FEMA FLOOD PANEL 372053500K, DATED JUNE 19, 2020
SOIL TYPES:	Ra - RAINS FINE SANDY LOAM GaA - GOLDSBORO FINE SANDY LOAM
DEVELOPMENT DATA	
ACREAGE	
MULTI-FAMILY:	431.37 AC
COMMERCIAL OUTPARCEL 1:	41.68 AC
COMMERCIAL OUTPARCEL 2:	46.86 AC
COMMERCIAL OUTPARCEL 3:	41.17 AC
COMMERCIAL OUTPARCEL 4:	41.04 AC
COMMERCIAL OUTPARCEL 5:	41.28 AC
ROADWAYS:	41.72 AC
TOTAL:	438.92 AC
PRIVATE ROADWAY LENGTH:	1,484 LF
PROPOSED WATER LINE LENGTH:	4,028 LF
PROPOSED SEWER LINE LENGTH:	3,602 LF
MULTI-FAMILY (MF):	
PROPOSED RESIDENTIAL UNITS:	300 UNITS
PROPOSED RESIDENTIAL DENSITY:	9.6 DU / AC
SETBACKS:	
FRONT:	25'
SIDE:	13'
CORNER SIDE:	18'
REAR:	15'
MAX BUILDING HEIGHT:	42' (BUILDINGS LOCATED MORE THAN 200' FROM THE HWY 24 / CORBETT AVE CORRIDOR)
PARKING PROVIDED:	569 TOTAL SPACES (1.9 SPACES PER UNIT) 28 ADA SPACES (11 REQUIRED)
COMMERCIAL OUTPARCELS	
SETBACKS:	
FRONT:	25'
INTERNAL SIDE:	0'
CORNER SIDE:	10'
SIDE ADJ. RESIDENTIAL:	10'
REAR:	10'
MAX BUILDING HEIGHT:	35'
ALLOWABLE USES:	
1. USES SHALL BE LIMITED TO THOSE PERMITTED IN THE B1 ZONING DISTRICT. REFER TO THE TABLE OF PERMITTED / SPECIAL USES (UDO SECTION 152.179) FOR USES PERMITTED BY RIGHT AND BY SPECIAL USE.	
2. CERTAIN USES MAY BE SUBJECT TO ADDITIONAL USE STANDARDS AS NOTED ON THE TABLE OF PERMITTED / SPECIAL USES.	
3. THE APPLICABLE PERMITS AND ZONING APPROVALS SHALL BE OBTAINED FOR THE COMMERCIAL OUTPARCELS AT THE TIME OF THE DEVELOPMENT PROPOSAL.	

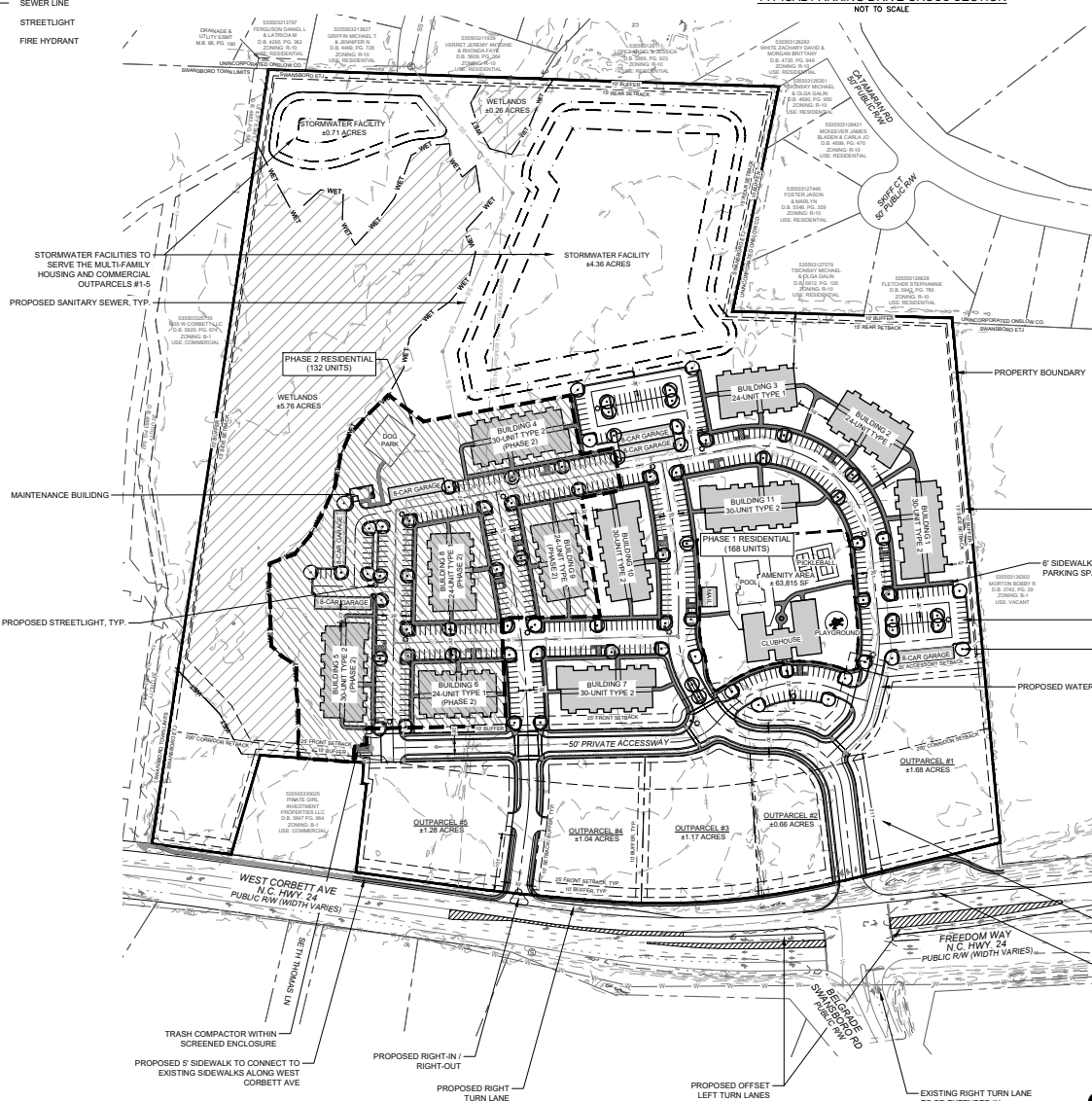
ACCESSORY USES:

- ACCESSORY STRUCTURES SHALL BE SUBJECT TO THE SETBACKS LISTED IN TABLE 152.185 OF THE UDO.

LEGEND
PROPERTY BOUNDARY
ADJACENT PROPERTY BOUNDARY
WET
WETLAND BOUNDARY
W- WATER LINE
SS- SEWER LINE
ST- STREETLIGHT
F- FIRE HYDRANT

GENERAL NOTES

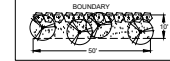
- NO CHANGES TO ANY ASPECT OF THIS SITE PLAN, INCLUDING BUT NOT LIMITED TO, LANDSCAPING, GRADING, BUILDING ELEVATIONS, LIGHTING OR UTILITIES WILL BE MADE WITHOUT THE APPROVAL OF THE TOWN.
- THE SITE SHALL BE STABILIZED AND SEEDING PRIOR TO THE ISSUANCE OF A CERTIFICATION OF OCCUPANCY OR GUARANTEED BY APPROVED METHODS IF APPLICABLE.
- ALL REQUIRED IMPROVEMENT SHALL COMPLY WITH THE STANDARDS OF THE CODE OF ORDINANCES.



TYPICAL PARKING DRIVE CROSS SECTION
NOT TO SCALE

REQUIRED BUFFER YARDS

- THE PROPOSED MULTI-FAMILY AND COMMERCIAL OUTPARCELS SHALL PROVIDE A PERIMETER AND STREETSCAPE BUFFER.
- EXISTING VEGETATION SHALL BE PRESERVED WITHIN REQUIRED BUFFERS. IN AREAS WHERE EXISTING VEGETATION DOES NOT COMPLY WITH THE BELOW SPECIFICATIONS, ADDITIONAL LANDSCAPING SHALL BE INSTALLED.
- THE REQUIRED BUFFER SHALL BE A MINIMUM OF 10' IN WIDTH AND CONTAIN AT LEAST 2 CANOPY TREES OR FOUR UNDERSTORY TREES, AND 12 SHRUBS FOR EVERY 50 LINEAR FEET.
- THE BUFFER SHALL INCLUDE A 6" WOODEN FENCE WHERE ABUTTING RESIDENTIALLY ZONED PROPERTY, EXCEPT IN AREAS THAT CONTAIN EXISTING WETLANDS.



PARKING LOT LANDSCAPING

- AT LEAST 8% OF THE GROSS PAVED AREA OF A PARKING FACILITY SHALL BE LANDSCAPED.
- CONSECUTIVE PARKING SPACES SHALL INCORPORATE LANDSCAPE ISLANDS NO MORE THAN 15 SPACES APART AND AT THE ENDS OF ALL PARKING ROWS.
- LANDSCAPE ISLANDS SHALL BE A MINIMUM OF 100 SQUARE FEET IN AREA AND AT LEAST 8 FEET IN WIDTH.

MF LANDSCAPING REQUIRED:	16,534 SF
8% OF THE 206,479 SF GROSS PAVED AREA LANDSCAPING PROVIDED:	21,502 SF (10.4%)

SCREENING

- ALL TRASH CONTAINMENT AREAS SHALL BE SCREENED WITH AN ENCLOSURE AT LEAST 8 FEET IN HEIGHT OR 2 FEET TALLER THAN THE HIGHEST POINT OF THE COMPACTOR / DUMPSTER (WHICHEVER IS GREATER).
- THE ENCLOSURE SHALL BE MADE OF A MASONRY, WOOD, OR SIMILAR MATERIAL THAT IS 80% OPAQUE.
- THE ENCLOSURE SHALL BE SURROUNDED BY A CONTINUOUS LANDSCAPE BUFFER.

TRAFFIC

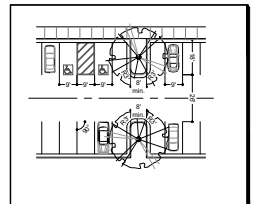
- A TRAFFIC IMPACT ANALYSIS (TIA) HAS BEEN COMPLETED AND WAS APPROVED BY NCDOT. REQUIRED ROADWAY IMPROVEMENTS SHALL BE INSTALLED IN ACCORDANCE WITH NCDOT STANDARDS.

STREETLIGHTS

- STREETLIGHT LOCATIONS SHOWN ON PLAN ARE PRELIMINARY. FINAL DESIGN AND LOCATIONS WILL BE PROVIDED AND MUST COMPLY WITH THE LIGHTING REQUIREMENTS FOUND IN SECTIONS 152.500 - 152.512 OF THE UDO.

EXISTING VEGETATION SHALL SERVE AS THE REQUIRED BUFFER. WHERE EXISTING VEGETATION IS INADEQUATE TO PROVIDE THE REQUIRED BUFFER, ADDITIONAL VEGETATION SHALL BE INSTALLED AS SHOWN IN BUFFER DETAIL. THIS SHEET

- 6" SIDEWALKS ALONG PARKING SPACES
- 9' X 18' PARKING SPACES
- PARKING LOT LANDSCAPING, TYP.



TYPICAL 90' PARKING SPACE DETAIL - NOT TO SCALE

DRIVEWAY STEM LENGTHS PROVIDED IN ACCORDANCE WITH APPROVED TIA

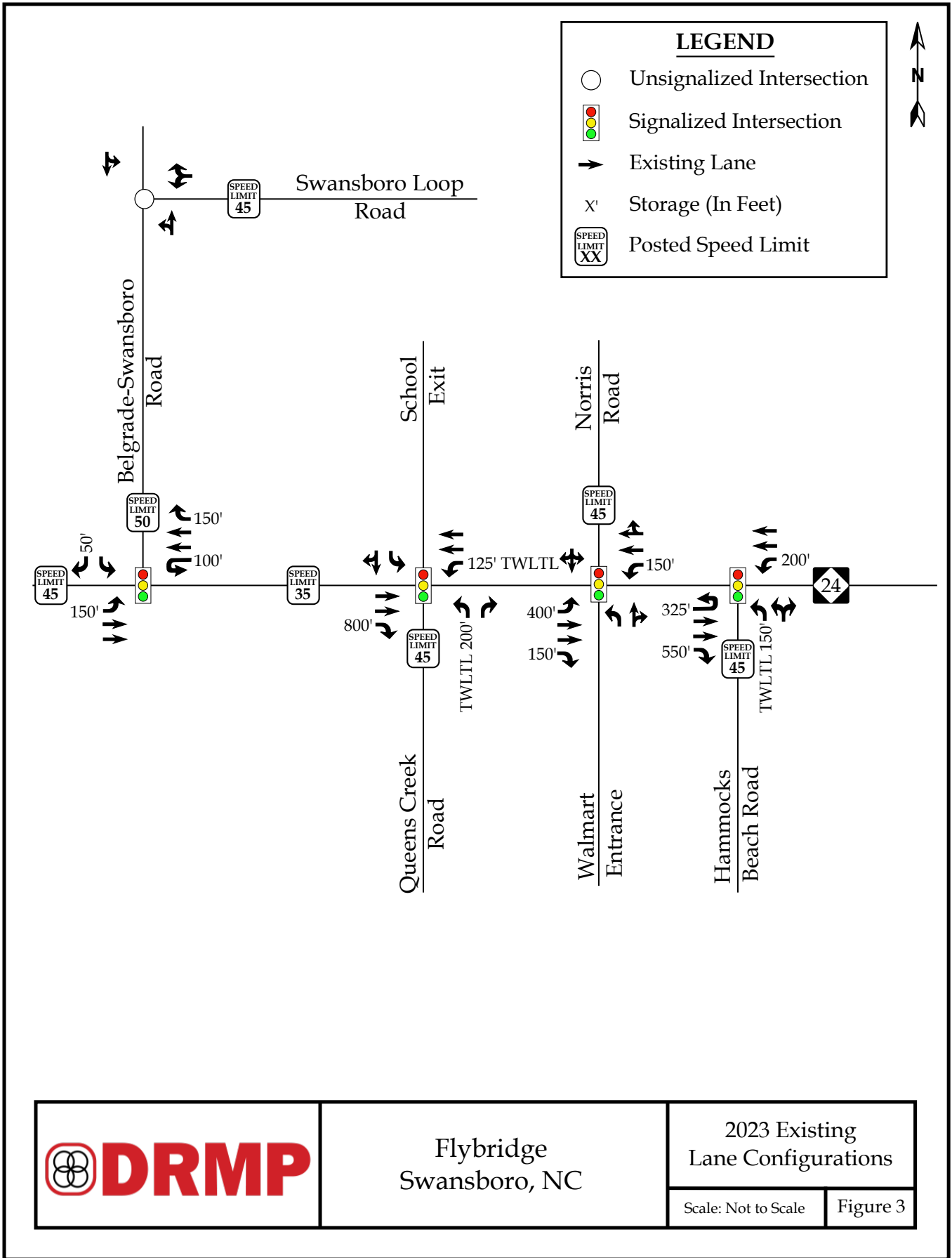
PROPOSED RIGHT TURN LANE

EXISTING RIGHT TURN LANE TO BE EXTENDED IN ACCORDANCE WITH THE APPROVED TIA



PRELIMINARY DESIGN - NOT RELEASED FOR CONSTRUCTION

REVISIONS:	CLIENT INFORMATION:	PROJECT STATUS:	SEALED:
	FLYBRIDGE SWANSBORO LLC PO BOX 130 SANFORD, NC 27331	CONCEPTUAL / AVAIL PRELIMINARY / PERMITS PERMITS / CONSTRUCTION CONSTRUCTION / COMPLETED	SEALED 01/12/25
	PARAMOUNT ENGINEERING 122 Cinema Drive Wilmington, NC 28403 (910) 791-6707 (O) (910) 791-6760 (F) NC License #: C-2846	DRAWING INFORMATION: PROJECT NO: 23124 SHEET NO: 1 OF 1 DATE: 01/12/25	01/12/25
	SITE PLAN FLYBRIDGE SWANSBORO 1481 W CORBETT AVE SWANSBORO, NC 28584		
			C-2.0
			PEI JOB# 23124 PE



2. 2023 EXISTING PEAK HOUR CONDITIONS

2.1. 2023 Existing Peak Hour Traffic Volumes

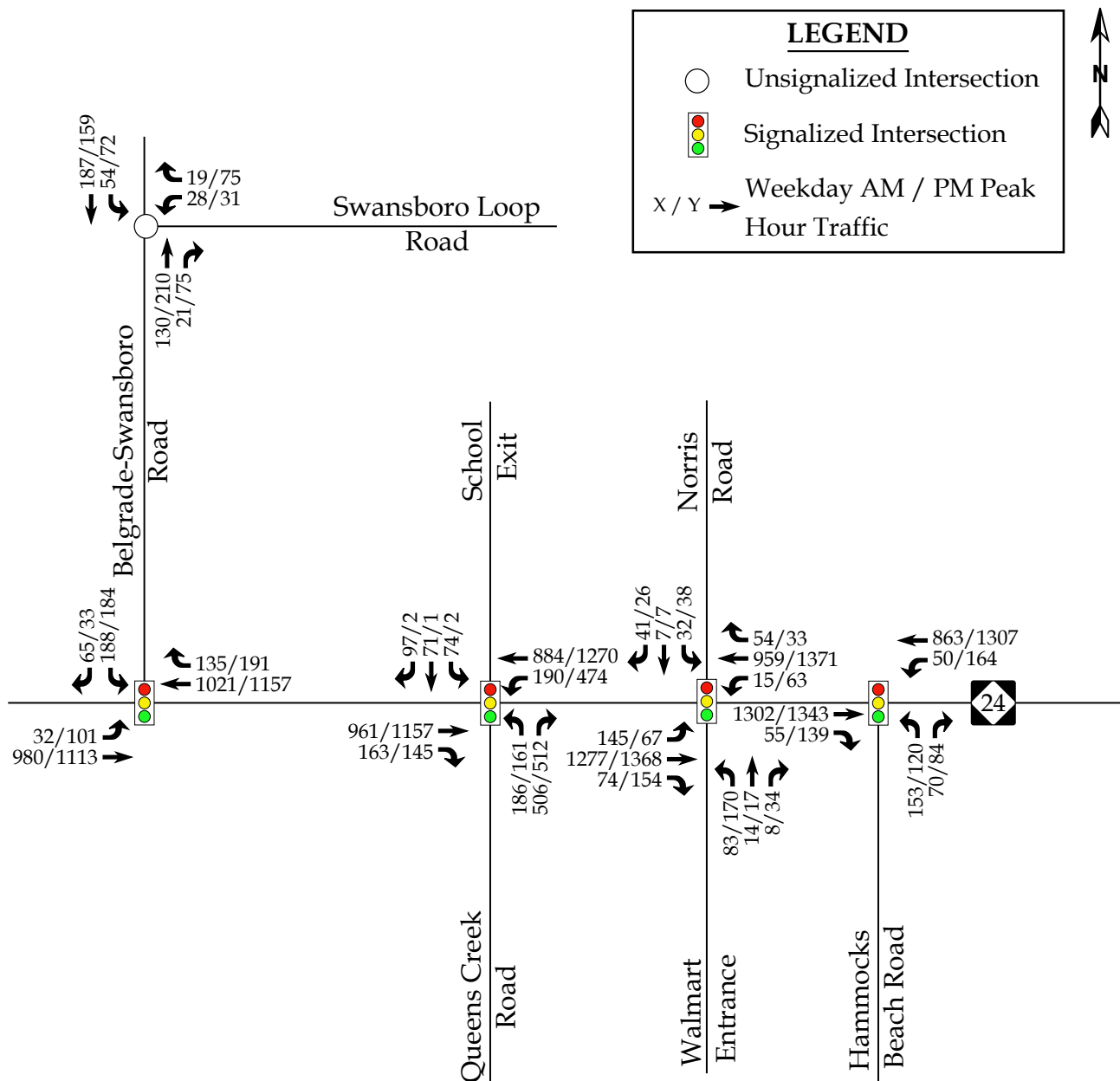
Existing peak hour traffic volumes were determined based on traffic counts conducted at the study intersections listed below, in May of 2023 during a typical weekday AM (7:00 AM – 9:00 AM) and PM (4:00 PM – 6:00 PM) peak periods:

- NC 24 & Belgrade Swansboro Road
- NC 24 & Queens Creek Road
- NC 24 & Norris Road
- NC 24 & Hammocks Beach Road
- Belgrade-Swansboro Road & Swansboro Loop Road

Weekday AM and PM traffic volumes were balanced between study intersections, where appropriate. Refer to Figure 4 for 2023 existing weekday AM and PM peak hour traffic volumes. A copy of the count data is located 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.



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.



Flybridge
Swansboro, NC

2023 Existing
Peak Hour Traffic

Scale: Not to Scale

Figure 4

3. 2026 and 2027 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 the NCDOT and the Town, it was determined that an annual growth rate of 3% would be used to generate 2026 projected weekday AM and PM peak hour traffic volumes. Refer to Figure 5a for 2026 projected peak hour traffic. It was also determined that a seasonal growth rate of 7% in addition to the annual growth rate of 3% would be used to generate 2027 projected weekday AM and PM peak hour traffic volumes. Refer to Figure 5b for 2027 projected peak hour traffic.

3.2. Adjacent Development Traffic

Through coordination with the NCDOT and the Town, the following adjacent developments were identified to be included as an approved adjacent development in this study:

- Swansboro Wawa
- West Corbett Avenue Starbucks

Table 2, on the following page, provides a summary of the adjacent developments.

Table 2: Adjacent Development Information

Development Name	Location	Build-Out Year	Land Use / Intensity	TIA Performed
Swansboro Wawa	Southwest corner of W. Corbett Avenue (NC 24) and Hammocks Beach Road	2023	5,915 s.f. convenience store with 16 fueling positions	February of 2023 by TPD
West Corbett Avenue Starbucks	South of NC 24 and west of Hammocks Beach Road	2023	2,223 s.f. coffee shop with drive-through	September of 2022 by Stantec

It should be noted that the adjacent developments were approved, during scoping, by the NCDOT and the Town. Adjacent development trips are shown in Figure 6. Adjacent development information can be found in Appendix D.

3.3. Future Roadway Improvements

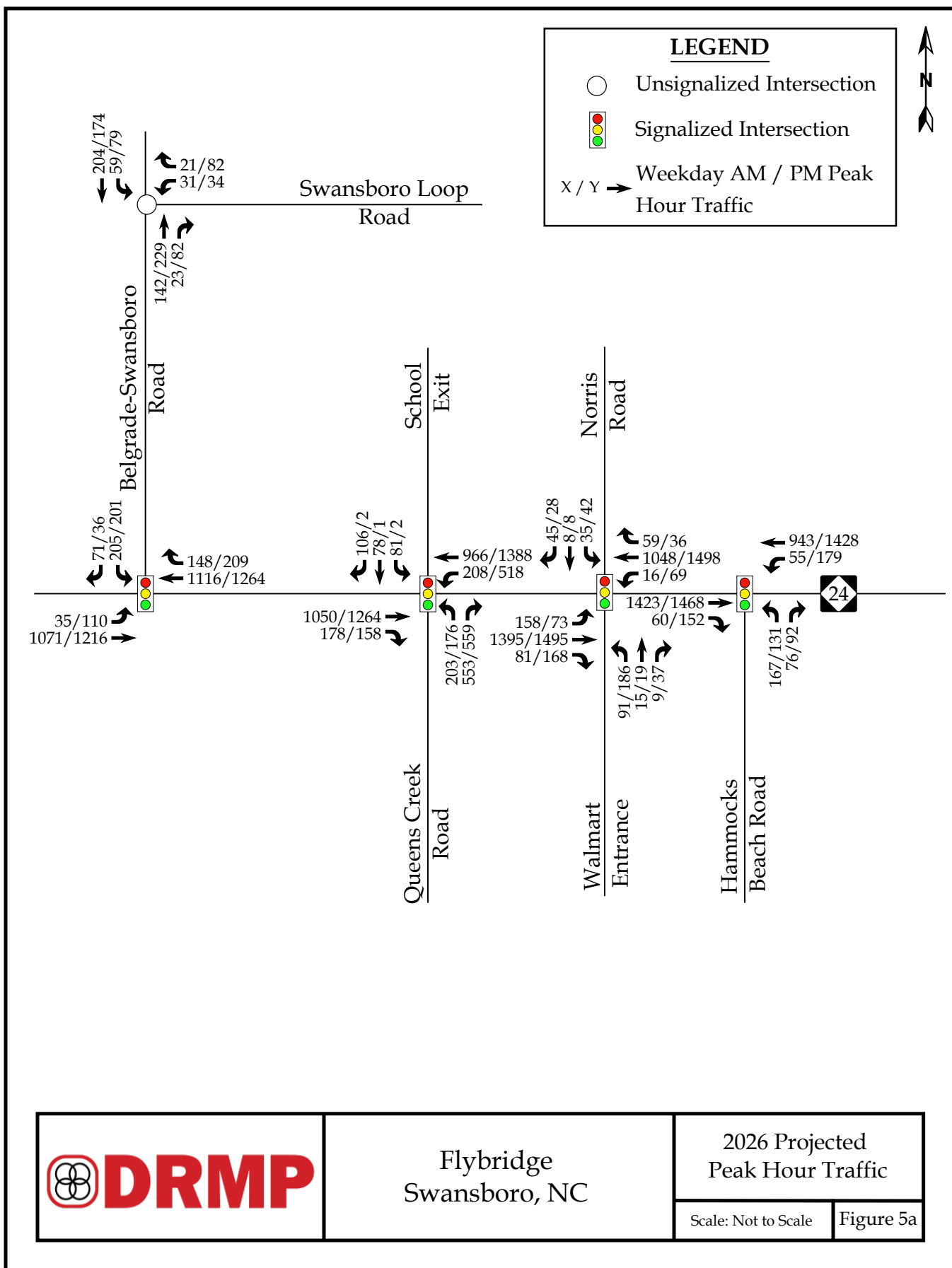
Based on coordination with the NCDOT and the Town, it was determined there were no future roadway improvements to consider with this study.

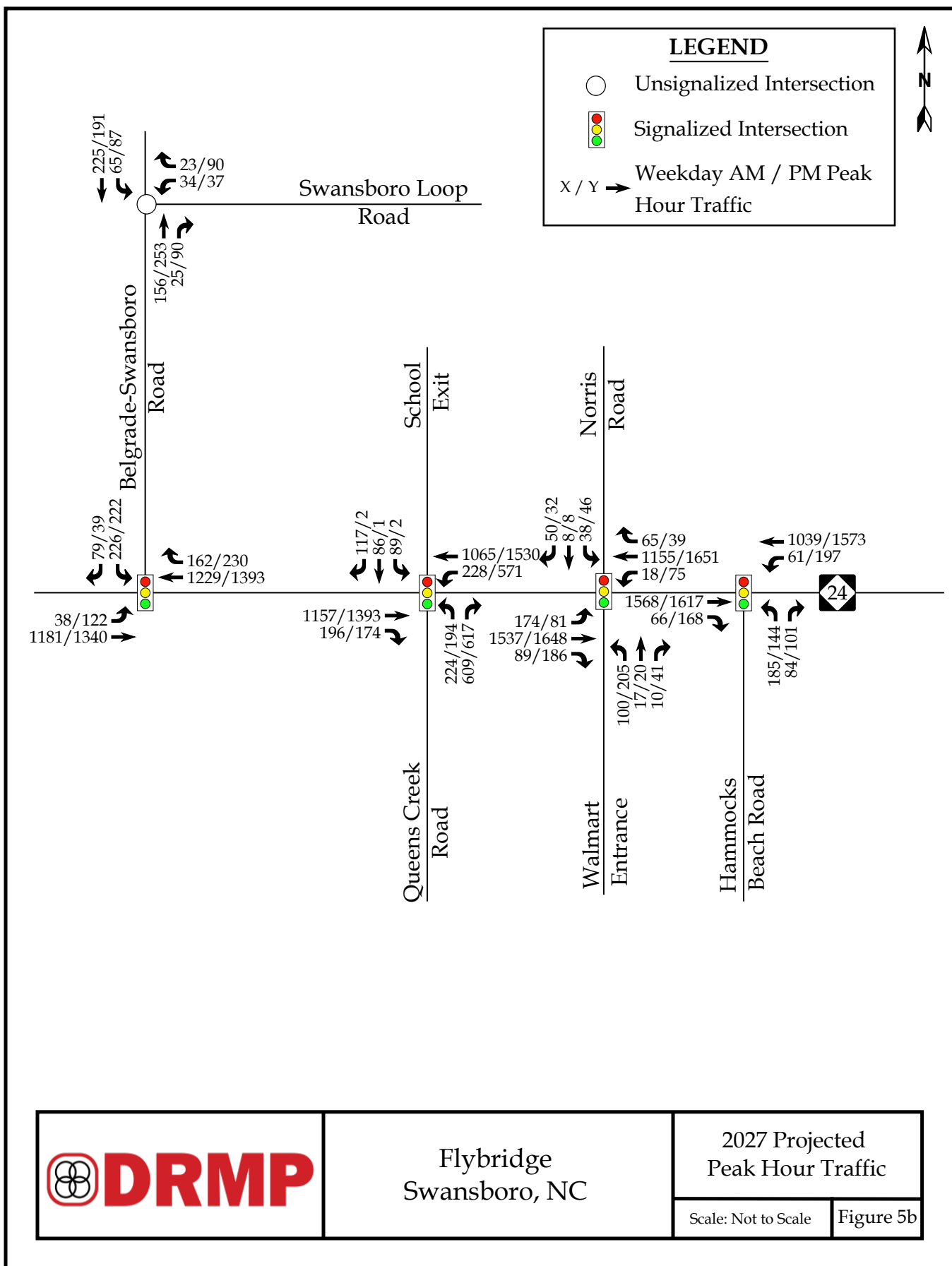
3.4. 2026 and 2027 No-Build Peak Hour Traffic Volumes

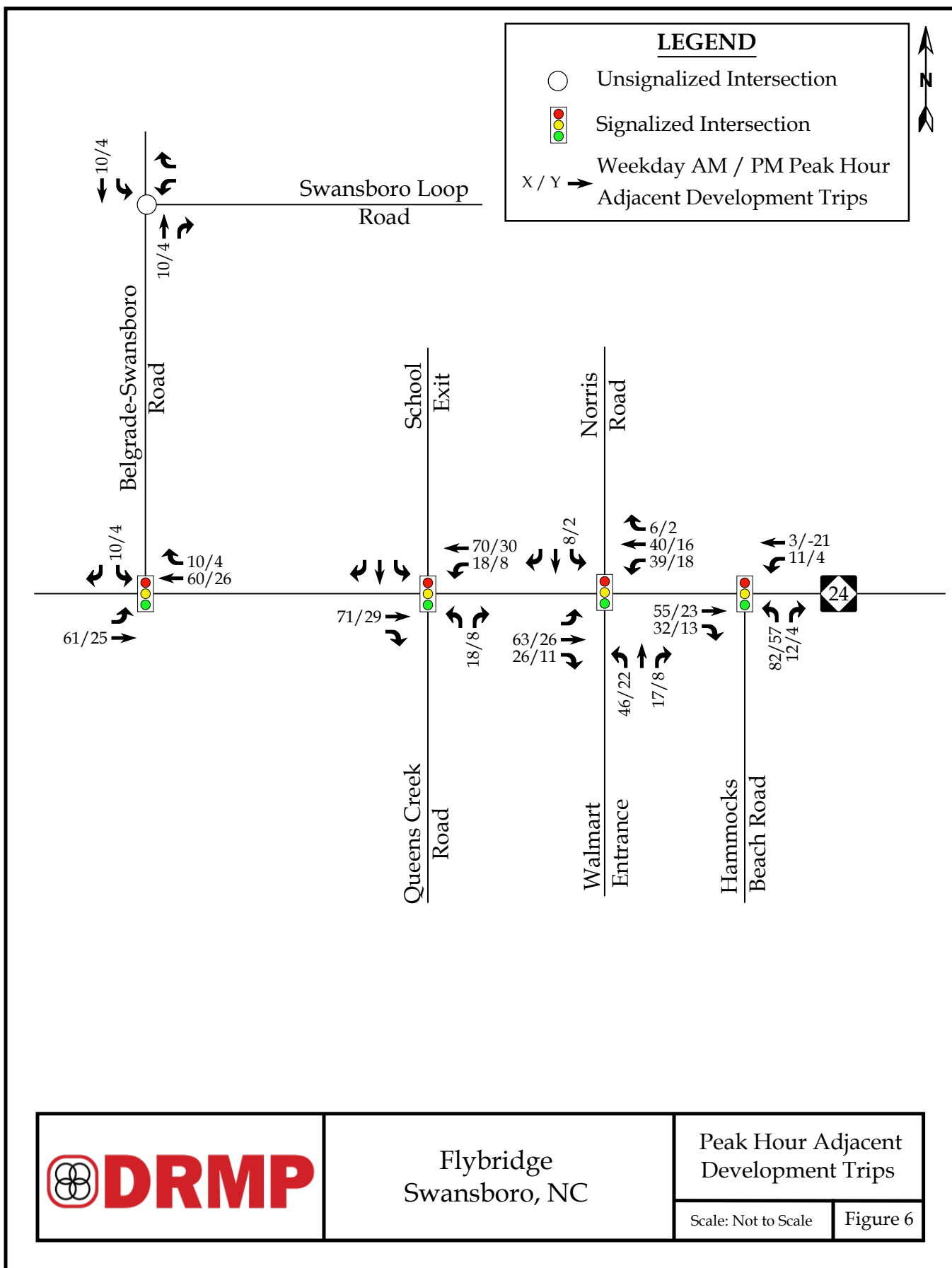
The 2026 and 2027 no-build traffic volumes were determined by projecting the 2023 existing peak hour traffic to the years 2026 and 2027 and adding the adjacent development trips. Refer to Figure 7a for an illustration of the 2026 no-build peak hour traffic volumes at the study intersections. Refer to Figure 7b for an illustration of the 2027 no-build peak hour traffic volumes at the study intersections.

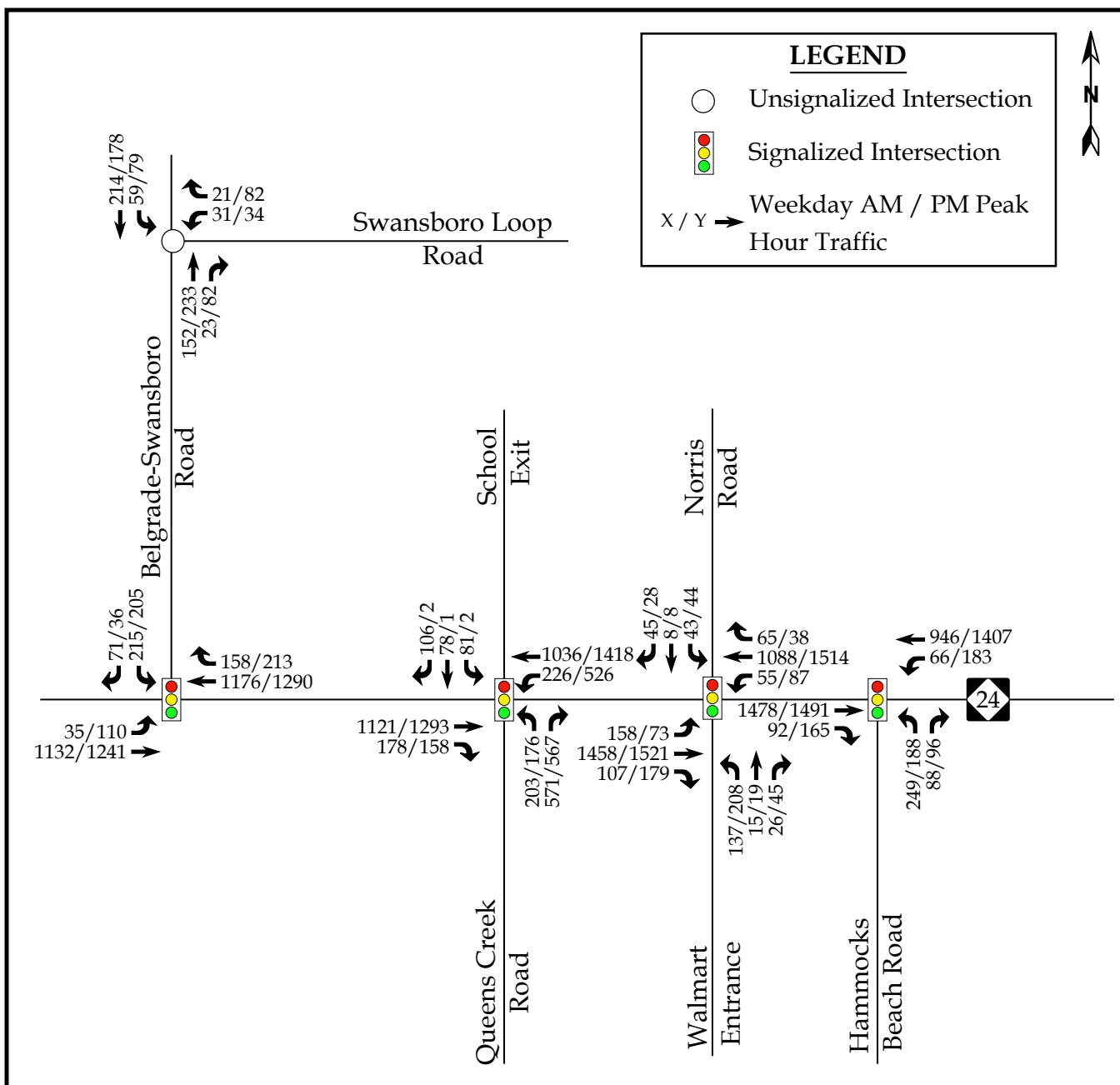
3.5. Analysis of 2026 and 2027 No-Build Peak Hour Traffic Conditions

The 2026 and 2027 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.









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.

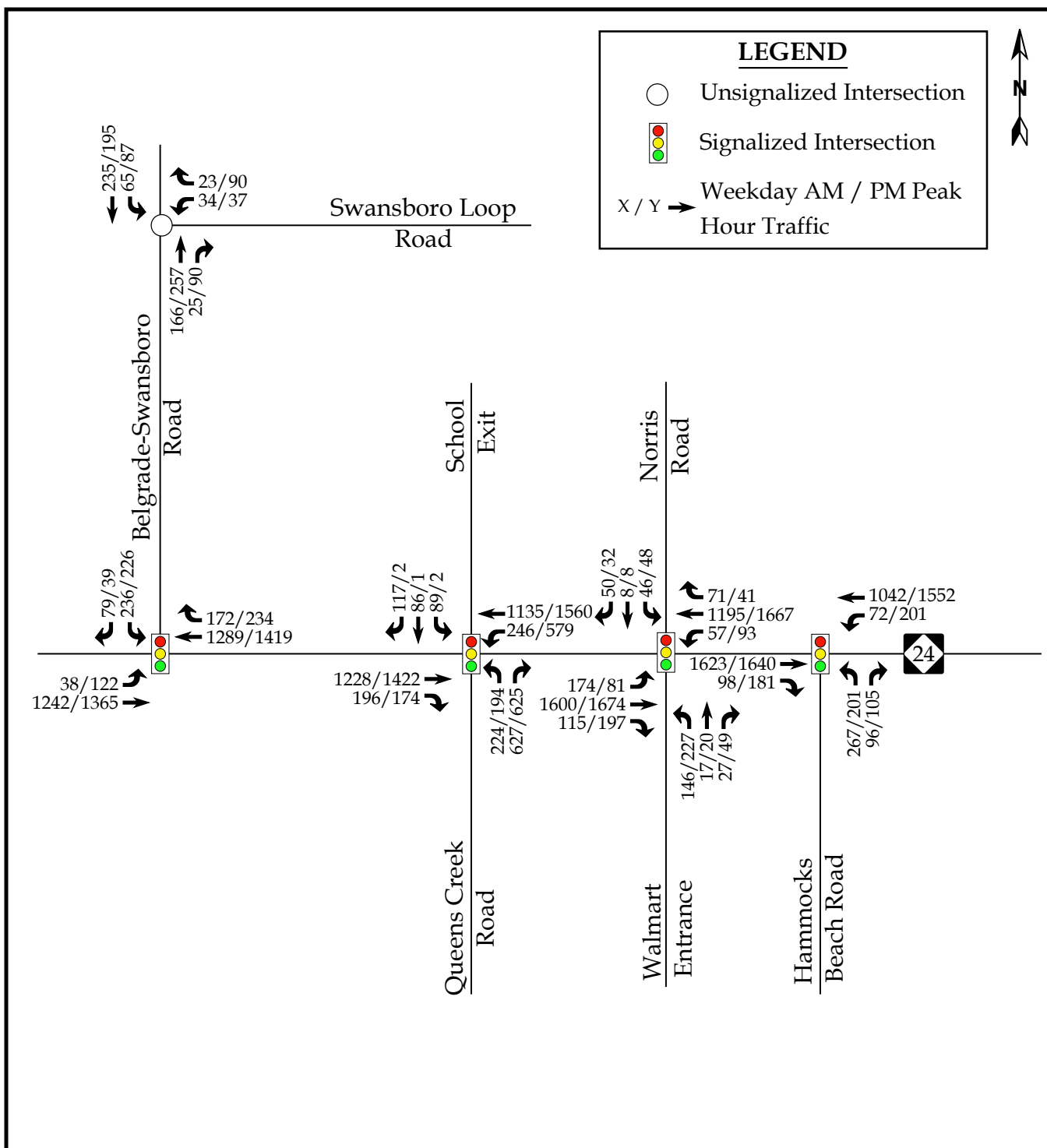


Flybridge
Swansboro, NC

2026 No-Build
Peak Hour Traffic

Scale: Not to Scale

Figure 7a



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.



Flybridge
Swansboro, NC

2027 No-Build
Peak Hour Traffic

Scale: Not to Scale

Figure 7b

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 3 provides a summary of the trip generation potential for the site.

Table 3: 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
Multifamily Housing Low Rise (220)	300 Units	1,998	28	88	96	54
Strip Retail Plaza (822)	25,000 s.f.	1,286	32	21	75	74
High-Turnover Restaurant (932)	7,000 s.f.	750	37	30	38	25
Fast-Food Restaurant with Drive- Through (934)	3,000 s.f.	1,402	68	66	52	47
C-Store with Gas Station (945)	12 VFP	3,182	97	97	111	111
Total Trips		8,618	262	301	371	311
<i>Internal Capture (16% AM & 30% PM) *</i>			-43	-47	-111	-94
Total External Trips			243	274	357	306
<i>Pass-By Trips: Shopping Center (29% PM)</i>			-0	-0	-15	-15
<i>Pass-By Trips: High-Turnover Restaurant (43% PM)</i>			-0	-0	-9	-9
<i>Pass-By Trips: Fast-Food Restaurant with Drive-Through (49% AM, 50% PM)</i>			-28	-28	-19	-19
<i>Pass-By Trips: C-Store with Gas Station (76% AM, 75% PM)</i>			-61	-61	-58	-58
Total Primary Trips			130	165	159	116

*Utilizing methodology contained in the NCHRP Report 684.

It is estimated that the proposed development will generate approximately 8,618 total site trips on the roadway network during a typical 24-hour weekday period. Of the daily traffic volume, it is anticipated that 563 trips (262 entering and 301 exiting) will occur

during the weekday AM peak hour and 682 trips (371 entering and 311 exiting) will occur during the weekday PM peak hour.

Internal capture of trips between the restaurant, residential, and retail uses was considered in this study. Internal capture is the consideration for trips that will be made within the site between different land uses, so the vehicle technically never leaves the internal site but can still be considered as a trip to that specific land use. Internal capture typically only considers trips between residential, office, and retail/restaurant land uses. Based on NCHRP Report 684 methodology, a weekday AM peak hour internal capture of 16% and a weekday PM peak hour internal capture rate of 30% was applied to the total trips. The internal capture reductions are expected to account for approximately 90 (43 entering and 47 exiting) trips during the weekday AM peak hour and 207 trips (111 entering and 94 exiting) during the weekday PM peak hour.

Pass-by trips were also taken into consideration in this study. Pass-by trips are made by the traffic already using the adjacent roadway, entering the site as an intermediate stop on their way to another destination. Pass-by percentages are applied to site trips after adjustments for internal capture. Pass-by trips are expected to account for approximately 178 trips (89 entering and 89 exiting) during the weekday AM peak hour and approximately 202 trips (101 entering and 101 exiting) during the weekday PM peak hour. It should be noted that the pass-by trips were balanced, as it is likely that these trips would enter and exit in the same hour.

The total primary site trips are the calculated site trips after the reduction for internal capture and pass-by trips. Primary site trips are expected to generate approximately 295 trips (130 entering and 165 exiting) during the weekday AM peak hour and 273 trips (159 entering and 116 exiting) 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 residential site trips will be regionally distributed as follows:

- 35% to/from the east via NC 24
- 35% to/from the west via NC 24
- 15% to/from the south via Queens Creek Road
- 10% to/from the north via Belgrade-Swansboro Road
- 5% to/from the south via Hammocks Beach Road

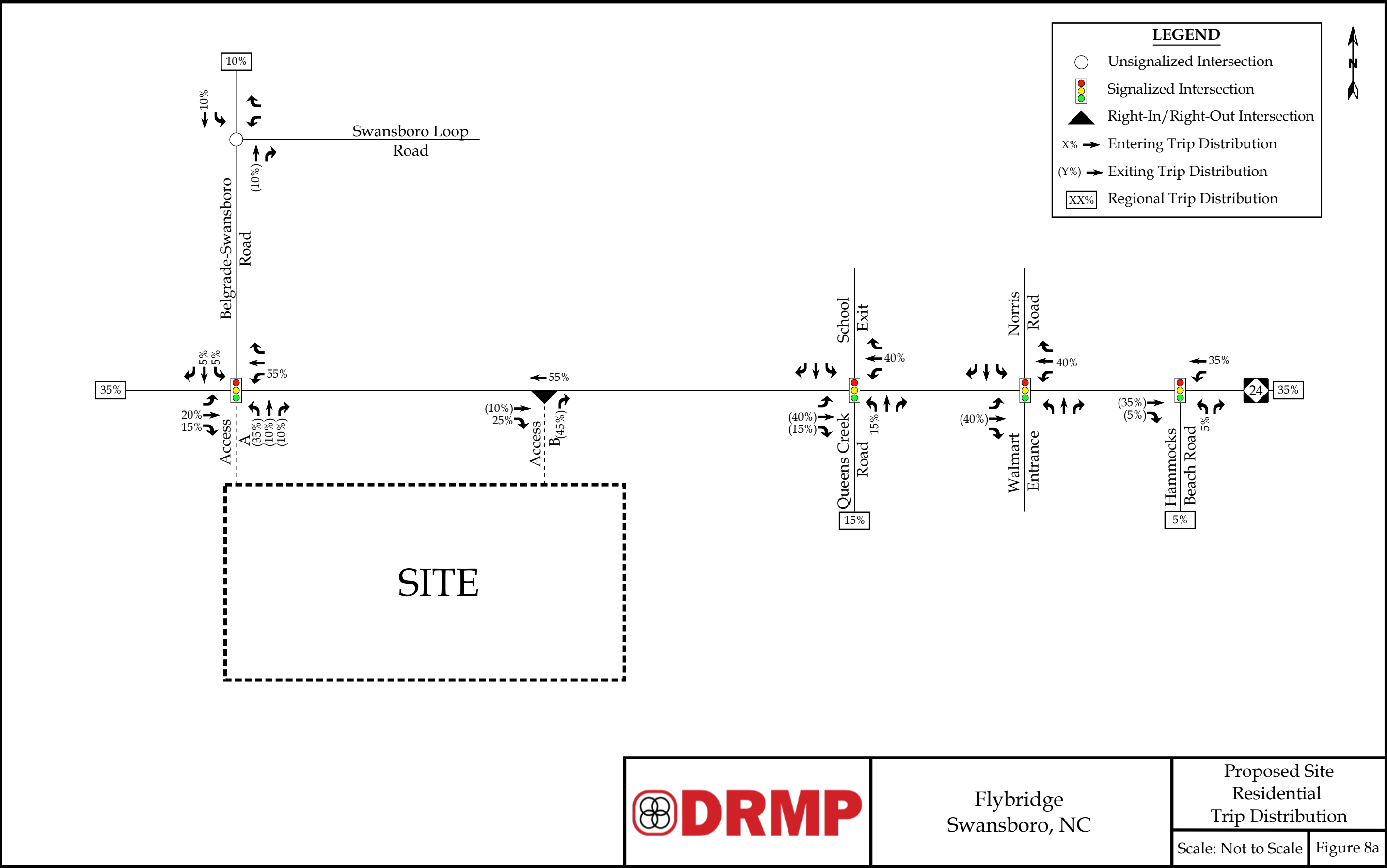
It is estimated that the retail site trips will be regionally distributed as follows:

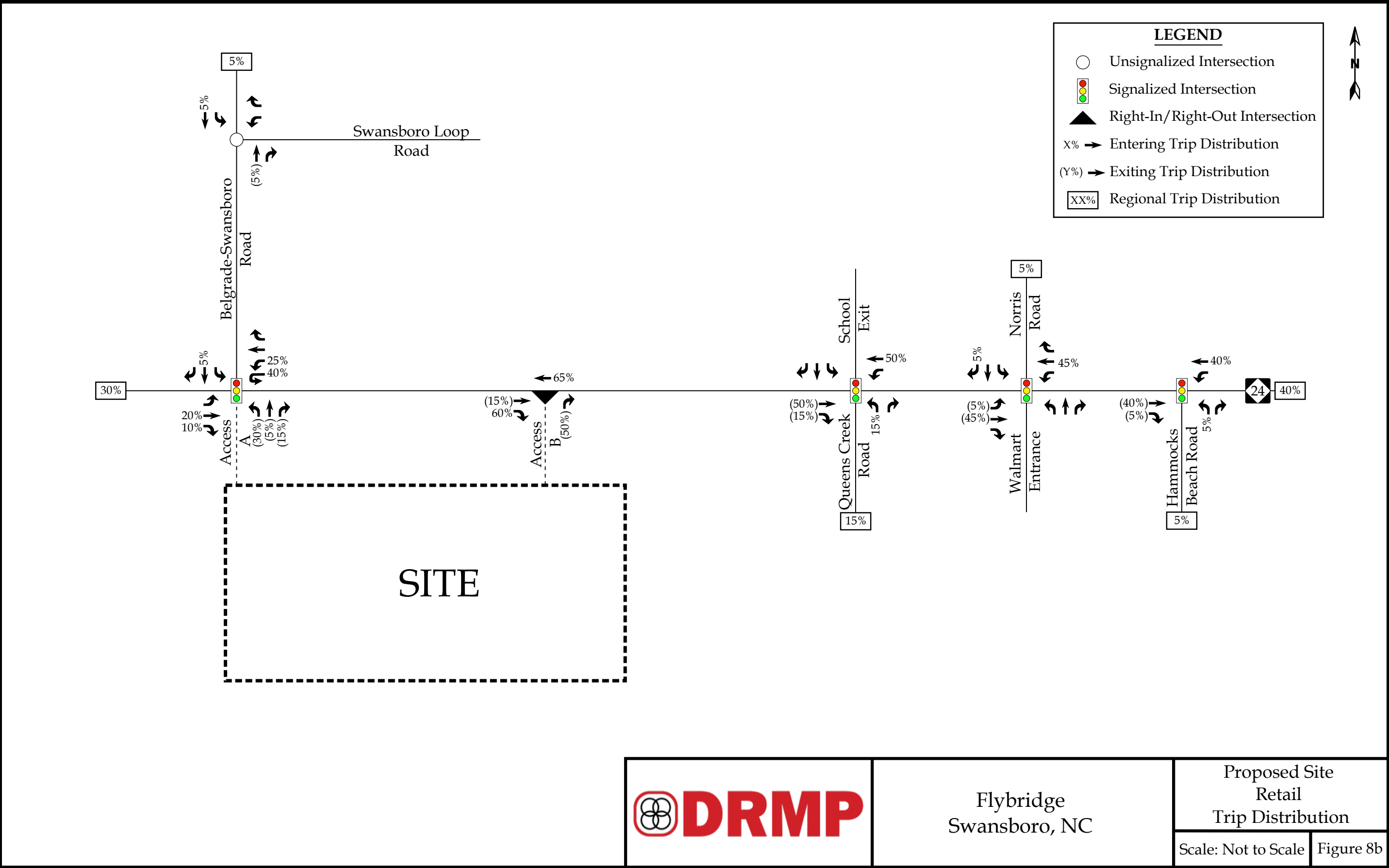
- 40% to/from the east via NC 24
- 30% to/from the west via NC 24
- 15% to/from the south via Queens Creek Road
- 5% to/from the north via Belgrade-Swansboro Road
- 5% to/from the north via Norris Road
- 5% to/from the south via Hammocks Beach Road

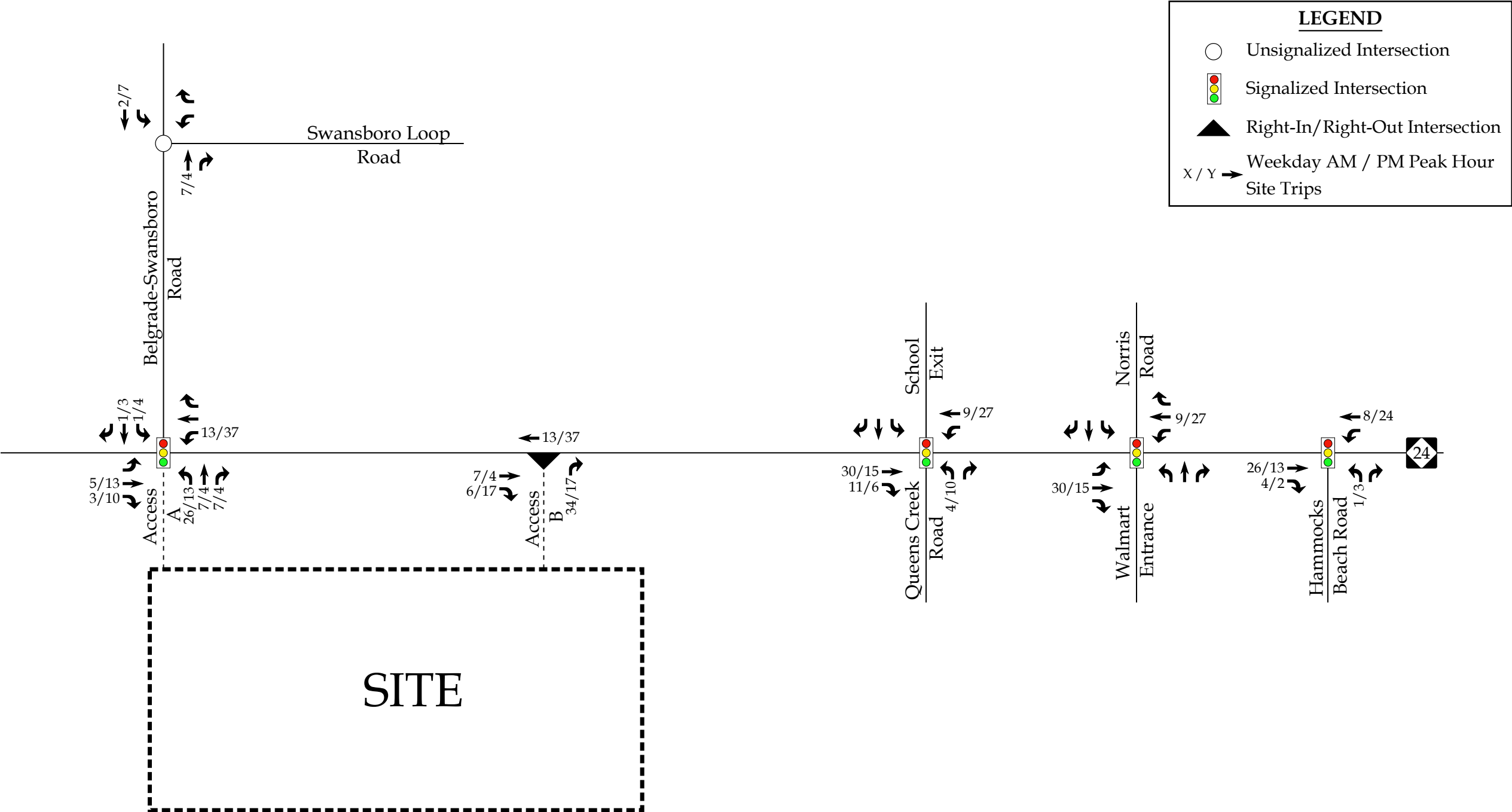
The residential site trip distribution is shown in Figure 8a, and the retail site trip distribution is shown in Figure 8b. Refer to Figure 9a for the residential site trip assignment and Figure 9b for the retail site trip assignment.

The pass-by site trips were distributed based on existing traffic patterns with consideration given to the proposed driveway access and site layout. Refer to Figure 10 for the pass-by site trip distributions. Pass-by site trips are shown in Figure 11.

The total site trips were determined by adding the primary site trips and the pass-by site trips. Refer to Figure 12 for the total peak hour site trips at the study intersections.



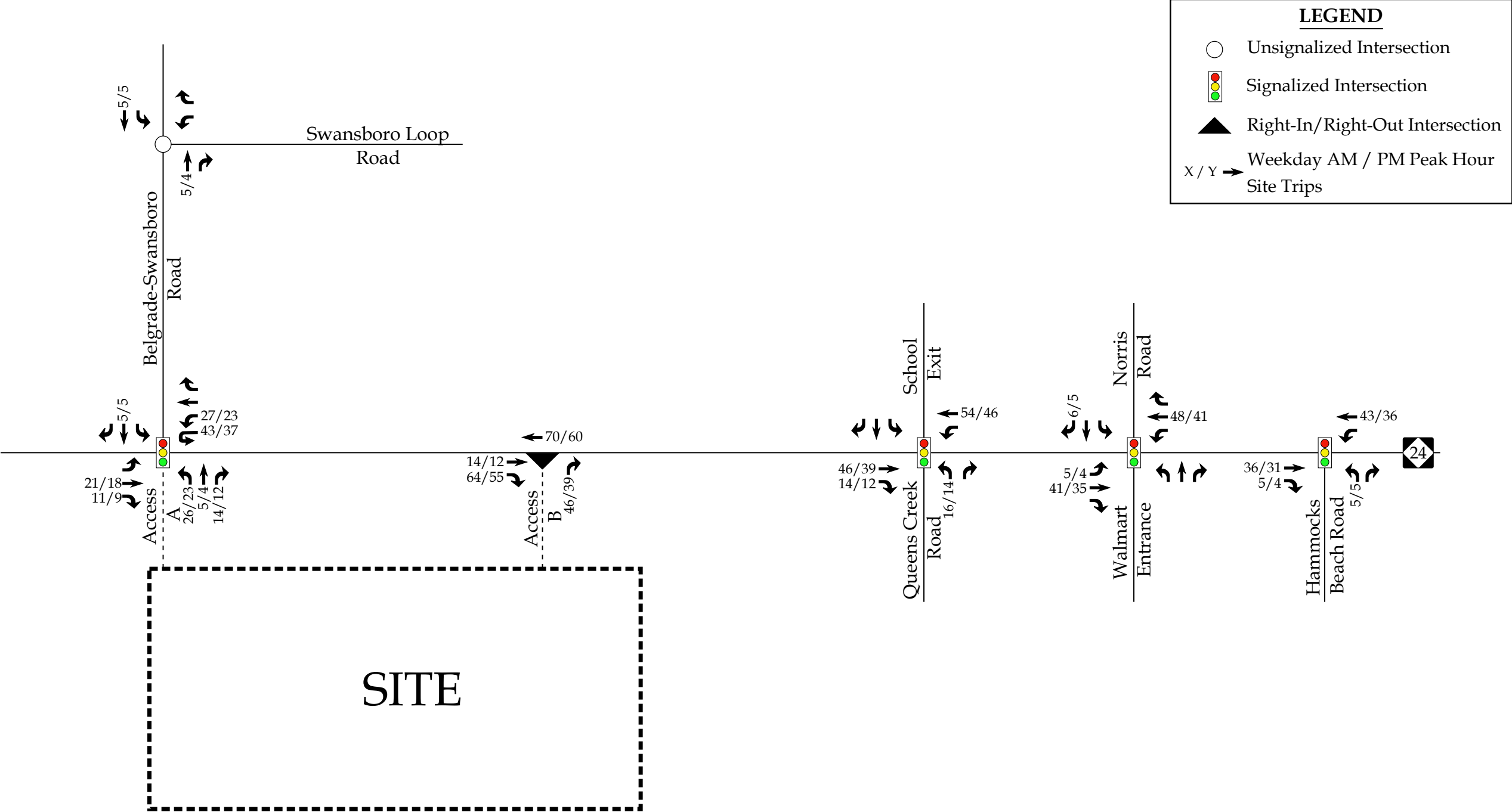




Flybridge
Swansboro, NC

Residential
Site Trip Assignment

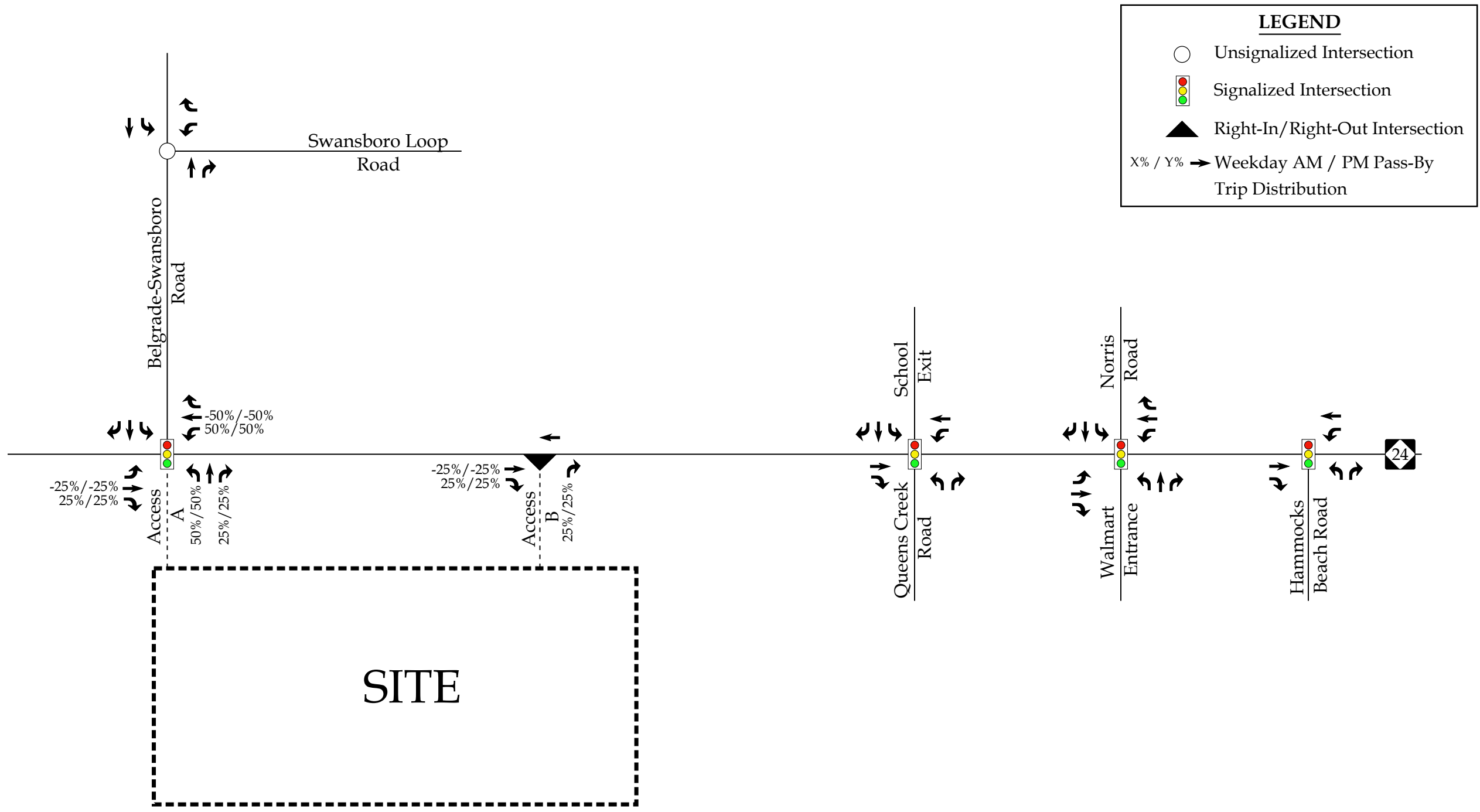
Scale: Not to Scale Figure 9a



Flybridge
Swansboro, NC

Retail Site Trip
Assignment

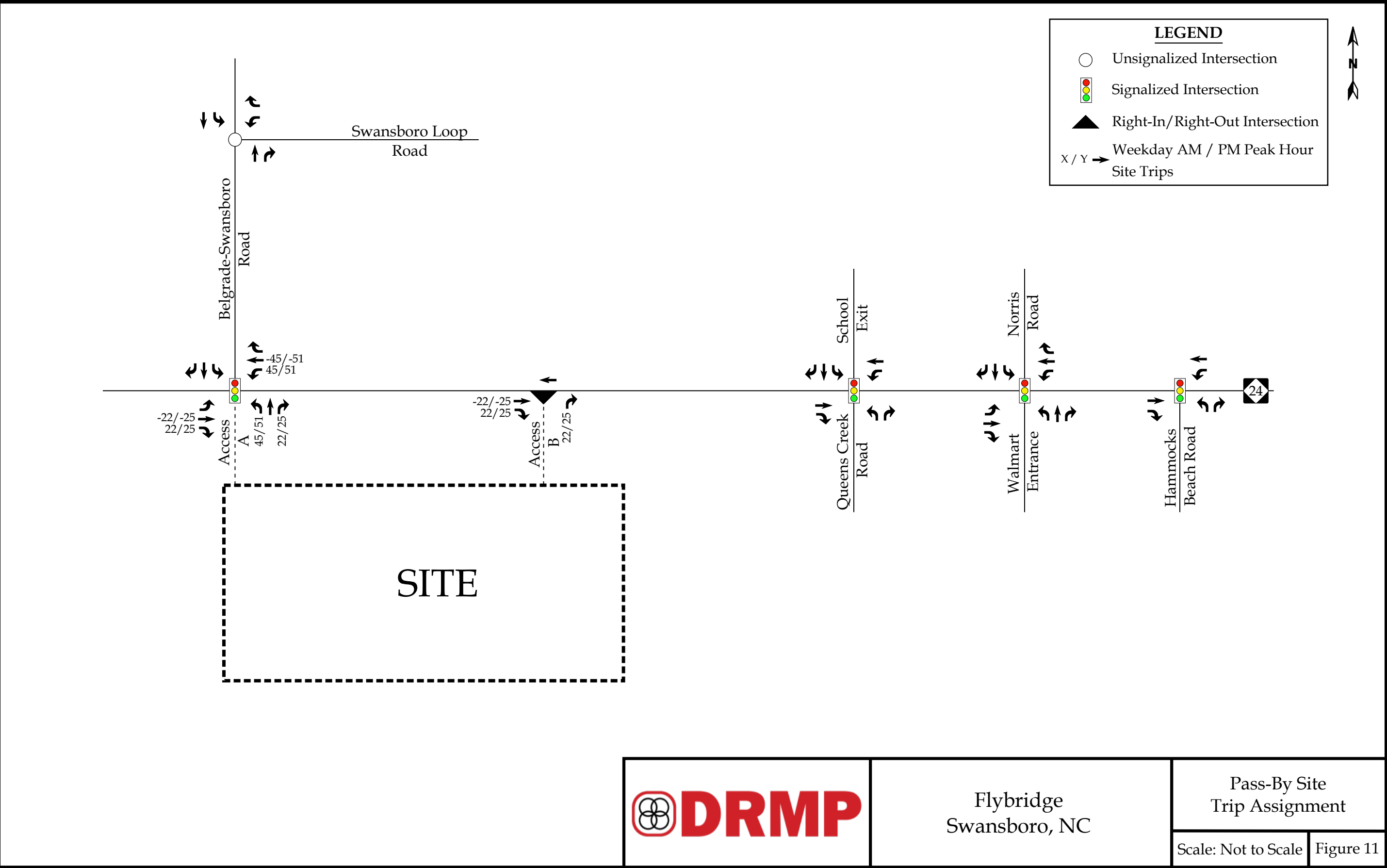
Scale: Not to Scale Figure 9b

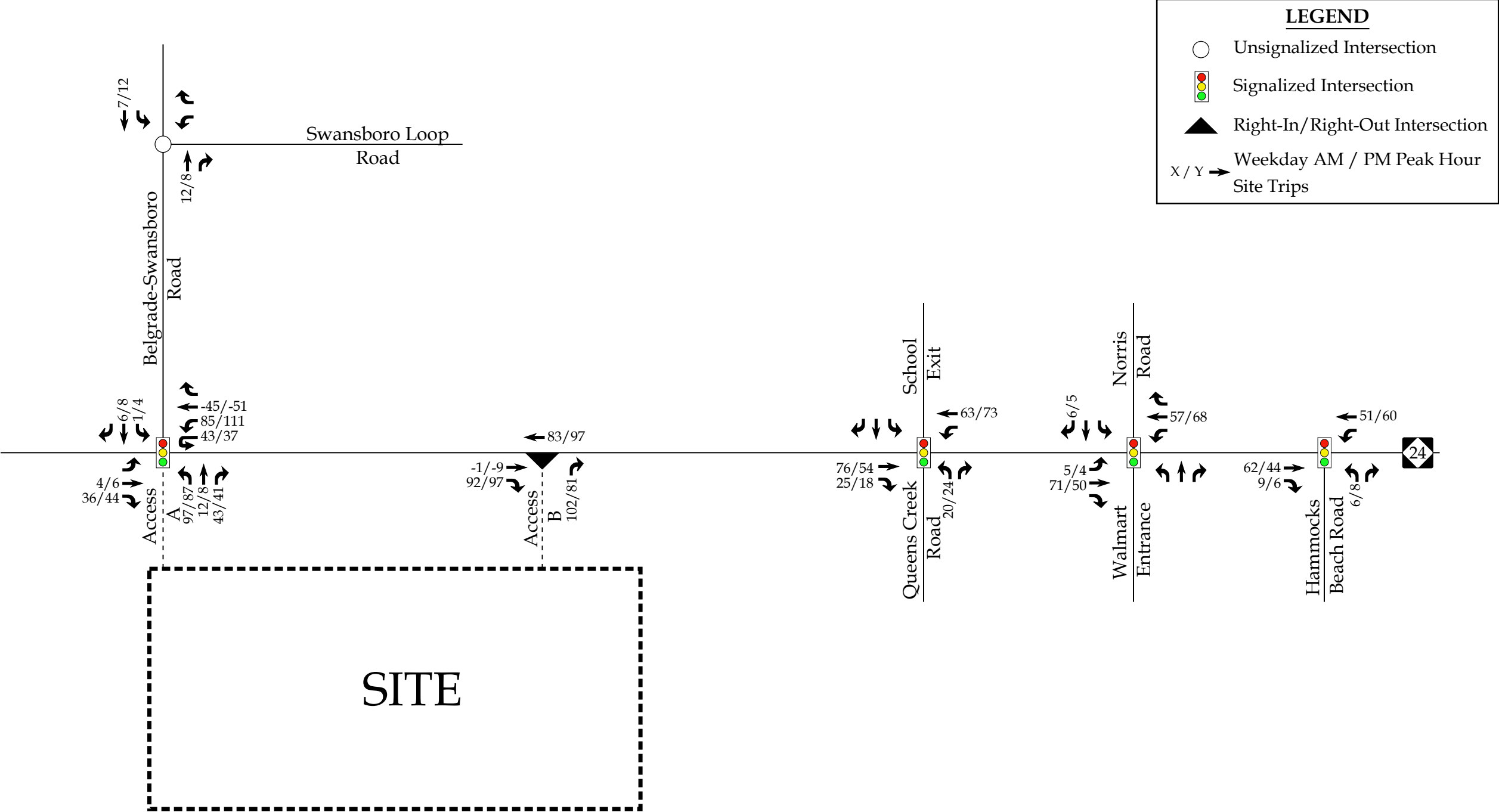


Flybridge
Swansboro, NC

Pass-By Site
Trip Distribution

Scale: Not to Scale Figure 10





Flybridge
Swansboro, NC

Total Site Trip
Assignment

Scale: Not to Scale Figure 12

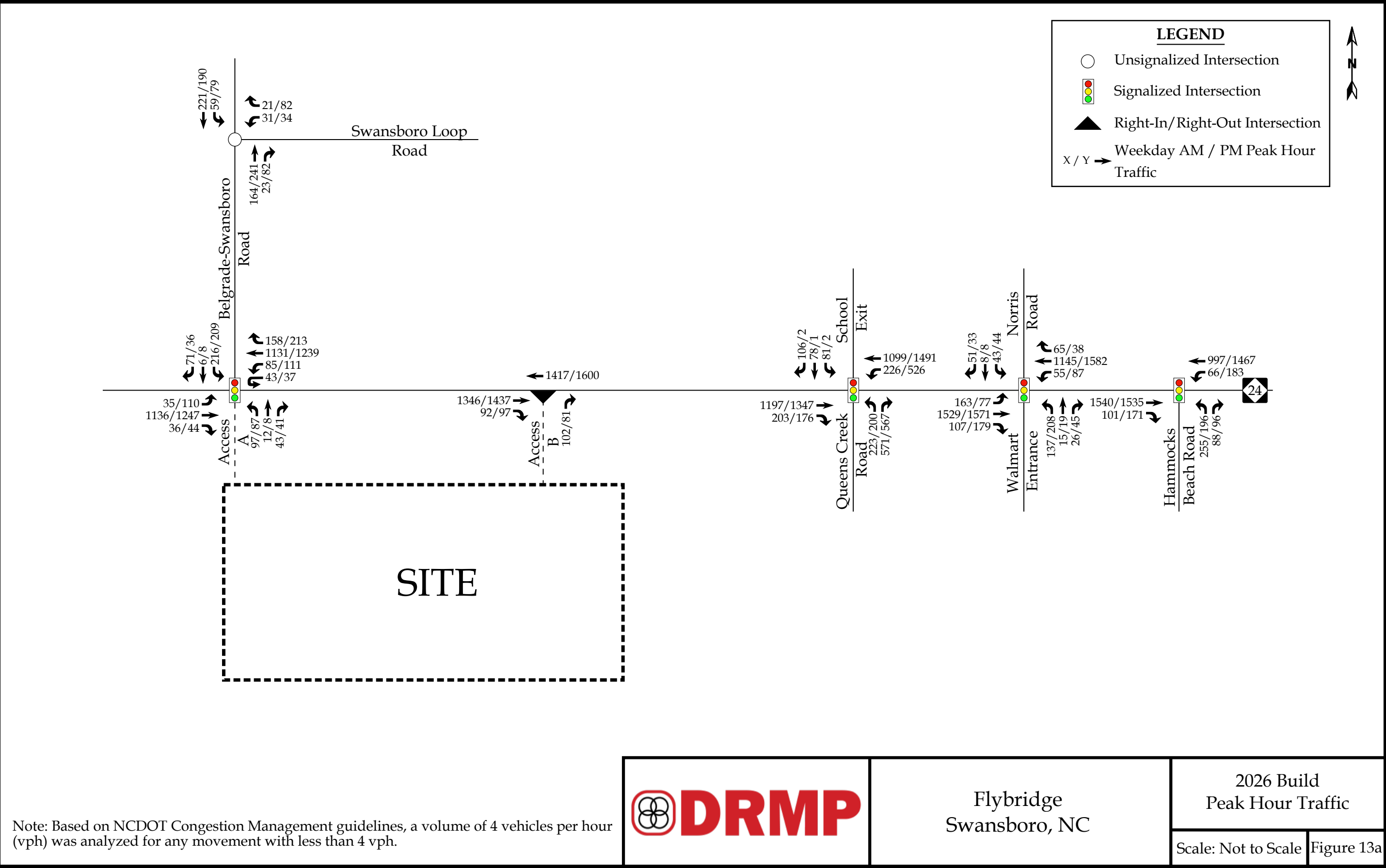
5. 2026 and 2027 BUILD TRAFFIC CONDITIONS

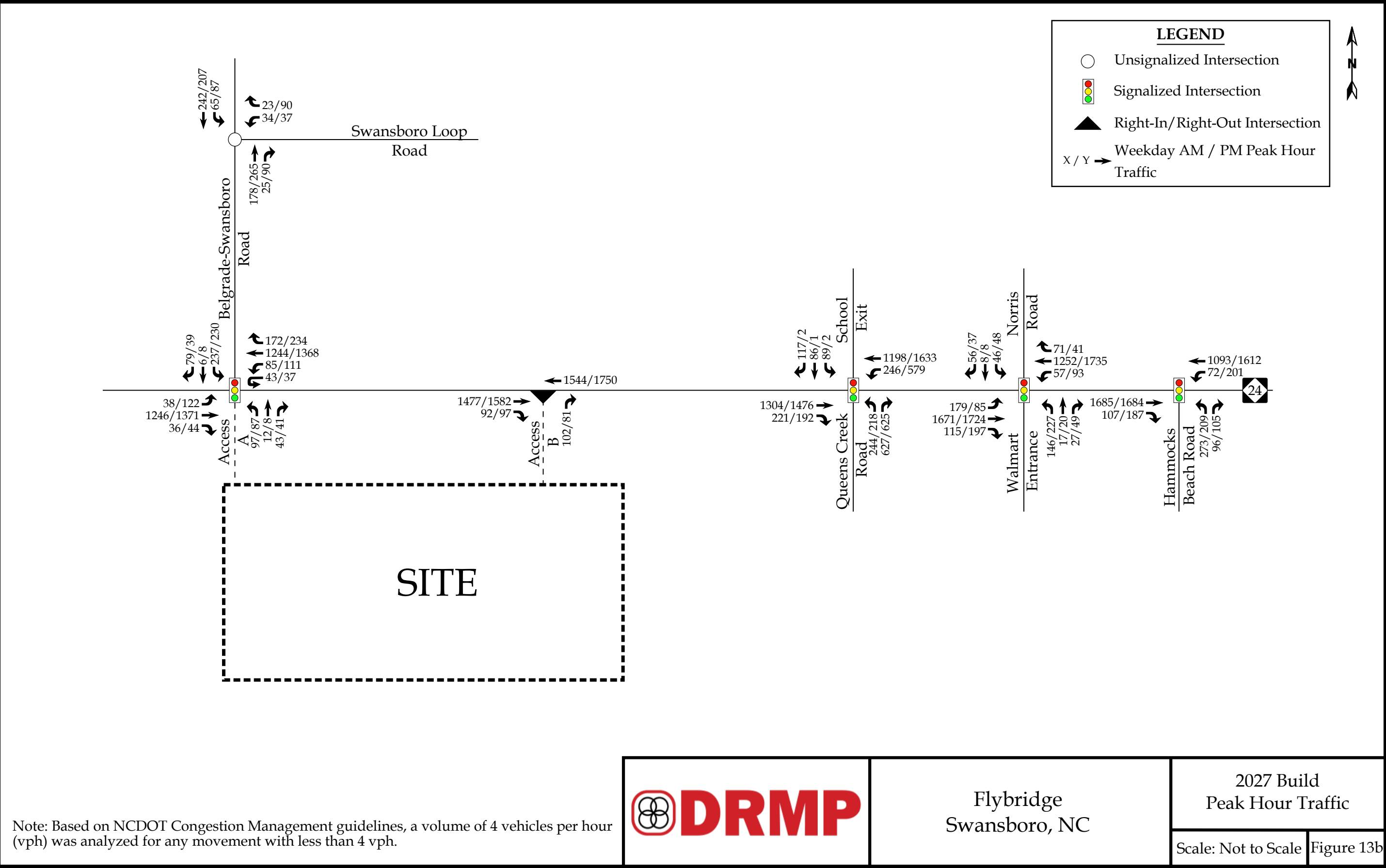
5.1. 2026 and 2027 Build Peak Hour Traffic Volumes

To estimate traffic conditions with the site fully built-out, the total site trips were added to the 2026 and 2027 no-build traffic volumes to determine the 2026 and 2027 build traffic volumes. Refer to Figure 13a for an illustration of the 2026 build peak hour traffic volumes with the proposed site fully developed. Refer to Figure 13b for an illustration of the 2027 build peak hour traffic volumes with the proposed site fully developed.

5.2. Analysis of 2026 and 2027 Build Peak Hour Traffic Conditions

Study intersections were analyzed with the 2026 and 2027 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.





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.



Flybridge
Swansboro, NC

2027 Build
Peak Hour Traffic

Scale: Not to Scale Figure 13b

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 4 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 4: 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 and Town UDO.

7. CAPACITY ANALYSIS

The following study intersections were analyzed under 2023 existing, 2026 and 2027 no-build, and 2026 and 2027 build traffic conditions:

- NC 24 & Belgrade-Swansboro Road/Access A
- NC 24 & Queens Creek Road/School Exit
- NC 24 & Norris Road/Walmart Entrance
- NC 24 & Hammocks Beach Road
- Belgrade-Swansboro Road & Swansboro Loop Road
- NC 24 & Access B

All proposed site driveways were analyzed under 2026 and 2027 build traffic conditions. Refer to Tables 5-10 for a summary of capacity analysis results. Refer to Appendices E-K for the Synchro capacity analysis reports and SimTraffic queueing reports.

7.1. NC 24 & Belgrade-Swansboro Road/Access A

Refer to the table below for a summary of the capacity analysis of the subject intersection during the analysis scenarios.

Table 5: Analysis Summary of NC 24 & Belgrade-Swansboro Road/Access A

ANALYSIS SCENARIO	LANE GROUP	Existing Storage (ft)	Weekday AM Peak Hour						Weekday PM Peak Hour					
			Queue (ft)		Lane LOS	Delay (sec)	Approach LOS (sec)	Overall LOS (sec)	Queue (ft)		Lane LOS	Delay (sec)	Approach LOS (sec)	Overall LOS (sec)
2023 Existing Conditions	EBL	150	19	65	A	9	A (9)	B (10)	85	183	B	12	A (7)	B (11)
	EBT (2)	--	154	140	A	9			271	241	A	7		
	WBU	100	4	24	A	6	A (9)		1	34	A	3	A (4)	
	WBT (2)	--	164	182	A	9			201	293	A	5		
	WBR	150	45	107	A	7			48	192	A	3		
	SBL	0	113	264	C	21	C (20)		254	342	E	73	E (69)	
	SBR	50	47	148	B	17			61	150	D	50		
2026 No-Build Conditions	EBL	150	24	65	B	13	B (11)	B (12)	145	218	C	21	A (9)	B (14)
	EBT (2)	--	190	162	B	11			339	260	A	8		
	WBU	100	4	29	A	6	B (11)		2	29	A	7	A (9)	
	WBT (2)	--	202	172	B	11			546	327	A	9		
	WBR	150	51	77	A	7			122	250	A	6		
	SBL	0	133	266	C	22	C (21)		279	340	E	72	E (69)	
	SBR	50	51	150	B	18			64	150	D	49		
2026 Build Conditions	EBL	150	68	180	D	54	C (32)	C (30)	209	250	F	81	C (35)	C (34)
	EBT (2)	--	543	364	C	32			675	1885	C	31		
	EBR	100	40	200	B	19			49	200	B	20		
	WBUL	100	181	197	D	54	C (23)		224	200	E	77	C (25)	
	WBT (2)	--	482	368	C	20			634	406	C	21		
	WBR	150	124	219	B	15			162	250	B	14		
	NBTL	100	144	131	D	44	D (40)		150	171	E	63	E (56)	
	NBR	--	58	82	C	30			65	87	D	40		
	SBTL	0	273	267	D	53	D (48)		324	400	E	80	E (74)	
	SBR	50	87	150	C	31			59	150	D	40		
2026 Build Conditions with Improvements	EBL	150	70	171	E	56	C (32)	C (30)	177	250	E	76	D (37)	D (35)
	EBT (2)	--	548	383	C	32			675	1888	C	31		
	EBR	100	41	200	B	19			49	200	C	20		
	WBUL	500	193	190	E	56	C (23)		219	221	E	75	C (31)	
	WBT (2)	--	487	338	C	20			772	419	C	25		
	WBR	150	124	236	B	15			210	250	B	17		
	NBTL	--	151	165	D	45	D (41)		150	176	E	63	E (59)	
	NBR	100	61	116	C	32			65	75	D	40		
	SBTL	0	289	299	D	54	D (49)		324	378	E	80	E (77)	
	SBR	50	91	150	C	33			59	150	D	40		

ANALYSIS SCENARIO	LANE GROUP	Existing Storage (ft)	Weekday AM Peak Hour						Weekday PM Peak Hour					
			Queue (ft)		Lane LOS	Delay (sec)	Approach LOS (sec)	Overall LOS (sec)	Queue (ft)		Lane LOS	Delay (sec)	Approach LOS (sec)	Overall LOS (sec)
			95th	Max					95th	Max				
2027 No-Build Conditions	EBL	150	28	76	B	15	B (11)	B (12)	244	241	D	49	B (12)	B (16)
	EBT (2)	--	215	184	B	11			397	436	A	9		
	WBU	100	4	27	A	6	B (11)		2	30	A	9	B (11)	
	WBT (2)	--	230	203	B	12			699	329	B	12		
	WBR	150	54	105	A	7			154	250	A	7		
	SBL	0	162	433	C	25	C (24)		307	371	E	74	E (70)	
	SBR	50	62	150	B	19			67	150	D	48		
2027 Build Conditions	EBL	150	53	118	D	36	C (21)	C (31)	229	250	F	87	D (39)	D (38)
	EBT (2)	--	352	281	C	21			754	1888	C	35		
	EBR	100	24	106	A	10			47	200	B	19		
	WBUL	100	171	192	D	52	B (18)		210	200	E	78	C (29)	
	WBT (2)	--	352	377	B	15			837	436	C	26		
	WBR	150	86	176	B	10			201	250	B	16		
	NBTL	100	183	185	F	110	F (87)		156	172	E	64	E (57)	
	NBR	--	54	134	C	29			66	103	D	40		
	SBTL	0	340	894	F	133	F (108)		384	393	F	84	E (78)	
	SBR	50	86	150	C	31			62	150	D	40		
2027 Build Conditions with Improvements	EBL	150	74	249	E	60	C (34)	C (32)	229	250	F	87	D (39)	D (38)
	EBT (2)	--	612	453	C	34			754	1882	C	35		
	EBR	100	39	200	B	18			47	200	B	20		
	WBUL	500	220	196	E	65	C (25)		210	212	E	88	C (29)	
	WBT (2)	--	564	416	C	23			837	395	C	26		
	WBR	150	135	250	B	16			201	250	B	16		
	NBTL	--	155	157	D	49	D (44)		156	181	E	69	E (57)	
	NBR	100	61	129	C	33			66	130	D	40		
	SBTL	0	345	344	E	61	D (54)		384	421	F	89	E (78)	
	SBR	50	99	150	C	34			62	150	D	40		

Improvements to lane configuration are shown in bold.

Capacity analysis indicates that the intersection is expected to operate at an overall LOS D or better under all analysis scenarios during the weekday AM and PM peak hours. When comparing the no-build and build traffic conditions the overall LOS is expected to decrease from LOS B to LOS C in the AM peak hour and LOS D in the PM peak hour. It should be noted that with the addition of the northbound Site Access during the build traffic condition the overall intersection is expected to have an increase in delay to account for the additional movements. The minor street approaches are expected to operate at LOS F or better during the weekday AM and PM peak hours under the build traffic conditions. It is not uncommon for the minor street approach to experience higher delays, especially at signalized intersections where the priority is placed on the mainline approach movements to maximize progression.

During the build with improvements scenarios a westbound left-turn lane extension and signal timing modifications were considered to improve the overall traffic flow at the intersection. Under the build with improvements traffic conditions the overall intersection is expected to operate at an overall LOS C during the weekday AM peak hour and LOS D during the weekday PM peak hour. Based on SimTraffic queuing reports, the northbound right-turn and eastbound right-turn lane queues exceed the storage lengths provided; however, this is due to the turning movements not being able to reach the turn lane.

7.2. NC 24 & Queens Creek Road/School Exit

Refer to the table below for a summary of the capacity analysis of the subject intersection during the analysis scenarios.

Table 6: Analysis Summary of NC 24 & Queens Creek Road/School Exit

ANALYSIS SCENARIO	LANE GROUP	Existing Storage (ft)	Weekday AM Peak Hour						Weekday PM Peak Hour					
			Queue (ft)		Lane LOS	Delay (sec)	Approach LOS (sec)	Overall LOS (sec)	Queue (ft)		Lane LOS	Delay (sec)	Approach LOS (sec)	Overall LOS (sec)
2023 Existing Conditions	EBT (2)	--	381	436	D	36	C (32)	E (55)	638	508	C	25	C (23)	D (49)
	EBR	800	81	128	B	10			67	104	A	9		
	WBL	125	187	224	D	52	C (23)		580	225	D	41	B (13)	
	WBT (2)	--	246	332	B	16			103	695	A	3		
	NBL	200	248	300	D	54	F (146)		388	300	F	341	F (192)	
	NBR	--	707	1048	F	180			711	1048	F	146		
	SBL	--	95	130	D	39	D (48)		17	35	E	64	E (64)	
	SBTR	--	222	218	D	52			26	42	E	65		
2026 No-Build Conditions	EBT (2)	--	467	574	D	36	C (32)	F (89)	885	880	D	44	D (40)	D (43)
	EBR	800	86	151	A	10			90	426	B	11		
	WBL	125	421	225	F	254	E (59)		851	225	F	131	D (39)	
	WBT (2)	--	300	511	B	16			173	1343	A	5		
	NBL	200	317	300	E	72	F (245)		321	300	F	81	E (57)	
	NBR	--	911	1050	F	307			626	951	D	50		
	SBL	--	111	138	D	45	E (60)		17	31	E	63	E (64)	
	SBTR	--	286	288	E	67			26	54	E	65		
2026 Build Conditions	EBT (2)	--	512	893	D	36	D (32)	F (94)	925	330	E	56	D (51)	D (45)
	EBR	800	98	210	A	9			84	140	B	10		
	WBL	125	442	225	F	278	E (61)		848	225	F	130	D (38)	
	WBT (2)	--	324	776	B	16			225	1335	A	6		
	NBL	200	377	300	F	96	F (268)		376	300	E	73	D (50)	
	NBR	--	959	1051	F	335			626	1011	D	42		
	SBL	--	116	151	D	47	E (65)		17	33	E	63	E (64)	
	SBTR	--	304	340	E	73			26	52	E	65		
2026 Build Conditions with Improvements	EBT (2)	--	782	943	E	65	E (58)	E (60)	1007	349	D	42	D (38)	D (48)
	EBR	800	125	612	B	13			102	116	B	11		
	WBL	125	358	225	E	74	C (28)		885	225	F	172	D (51)	
	WBT (2)	--	420	546	B	18			361	1339	A	9		
	NBL	200	288	300	E	69	F (105)		279	300	E	74	E (56)	
	NBR	--	823	1042	F	119			588	1034	D	49		
	SBL	--	129	197	E	59	F (102)		17	28	E	64	E (64)	
	SBTR	--	348	590	F	121			26	42	E	65		

ANALYSIS SCENARIO	LANE GROUP	Existing Storage (ft)	Weekday AM Peak Hour						Weekday PM Peak Hour					
			Queue (ft)		Lane LOS	Delay (sec)	Approach LOS (sec)	Overall LOS (sec)	Queue (ft)		Lane LOS	Delay (sec)	Approach LOS (sec)	Overall LOS (sec)
			95th	Max					95th	Max				
2027 No-Build Conditions	EBT (2)	--	529	666	D	36	C (32)	F (116)	1030	2048	E	76	E (69)	E (60)
	EBR	800	93	192	A	9			96	900	B	11		
	WBL	125	496	225	F	342	E (74)		905	225	F	178	D (53)	
	WBT (2)	--	338	998	B	16			278	1351	A	6		
	NBL	200	391	300	F	102	F (337)		365	300	E	75	E (61)	
	NBR	--	1096	1050	F	421			753	1041	E	57		
	SBL	--	129	249	D	49	E (78)		17	31	E	63	E (64)	
	SBTR	--	355	462	F	91			26	52	E	65		
2027 Build Conditions	EBT (2)	--	580	723	D	36	C (32)	F (123)	1068	368	F	113	F (101)	E (70)
	EBR	800	105	315	A	9			91	129	B	12		
	WBL	125	521	225	F	374	E (77)		865	225	F	177	D (52)	
	WBT (2)	--	365	1145	B	16			297	1336	A	8		
	NBL	200	458	300	F	141	F (369)		422	300	E	70	D (53)	
	NBR	--	1157	1043	F	458			753	1045	D	47		
	SBL	--	135	293	D	53	F (88)		17	28	E	63	E (64)	
	SBTR	--	376	745	F	103			26	41	E	65		
2027 Build Conditions with Improvements	EBT (2)	--	893	2196	F	97	F (85)	F (79)	1068	349	F	113	F (112)	E (70)
	EBR	800	138	900	B	13			91	110	B	12		
	WBL	125	405	225	F	88	C (32)		865	225	F	177	D (52)	
	WBT (2)	--	481	537	C	21			297	1344	A	8		
	NBL	200	316	300	E	71	F (133)		422	300	E	70	D (53)	
	NBR	--	940	1046	F	157			753	1012	D	47		
	SBL	--	140	394	E	61	F (121)		17	36	E	63	E (64)	
	SBTR	--	388	653	F	147			26	48	E	65		

Capacity analysis indicates that the overall intersection is expected to operate at an overall LOS F or better during the weekday AM peak hour and an overall LOS E or better during the weekday PM peak hour under all analysis scenarios. It is not unusual for the minor street approaches to have higher delays at signalized intersections, especially when the signal is coordinated where the precedence is given to the mainline approaches to maximize progression. Queueing is not expected to increase significantly along the approaches. It is important to note that the southbound approach is a school driveway, therefore it is expected to have higher traffic volumes exiting the facility during the AM peak hour during the school year due to parent drop-offs. Immediately south of the intersection there are also two additional schools that also contribute to the higher volumes along the northbound approach during the school year. The proposed development is only expected to account for less than 4% of the total traffic at the intersection.

During the build with improvements scenarios, signal timing modifications were considered to better improve the delay at the intersection. With this improvement under the 2026 build with improvement traffic condition, the intersection is expected to operate at LOS E during the weekday AM peak hour and LOS D during the weekday PM peak hour. Under the 2027 build with improvements traffic condition the intersection is expected to operate at LOS F during the weekday AM peak hour and LOS E during the weekday PM peak hour. It is important to note that per Congestion Management guidelines right-turn on-red (RTOR) was not considered; however, RTOR is expected to further improve queuing lengths and overall delays at this intersection. Improvements for this intersection may need to be evaluated from a corridor perspective and should not fall on the responsibility of a single developer given that existing and no-build conditions are unsatisfactory.

It is important to note that the intersection LOS does not meet the Town's UDO requirements; however, based on coordination with the Town and NCDOT it is understood that there are a limited number of improvements that can feasibly be made at the intersection at this time.

7.3. NC 24 & Norris Road/Walmart Entrance

Refer to the table on the following page for a summary of the capacity analysis of the subject intersection during the analysis scenarios.

Table 7: Analysis Summary of NC 24 & Norris Road/Walmart Entrance

ANALYSIS SCENARIO	LANE GROUP	Existing Storage (ft)	Weekday AM Peak Hour						Weekday PM Peak Hour					
			Queue (ft)		Lane LOS	Delay (sec)	Approach LOS (sec)	Overall LOS (sec)	Queue (ft)		Lane LOS	Delay (sec)	Approach LOS (sec)	Overall LOS (sec)
			95th	Max					95th	Max				
2023 Existing Conditions	EBL	400	59	149	B	18	A (10)	B (14)	10	106	A	9	B (11)	B (18)
	EBT (2)	--	374	251	A	9			198	179	B	12		
	EBR	150	41	64	A	6			41	75	A	8		
	WBL	150	8	85	A	4	B (16)		24	159	B	11	B (15)	
	WBTTTR	--	337	306	B	16			620	281	B	15		
	NBL	0	91	145	C	31	C (30)		254	300	E	79	E (72)	
	NBTR	--	33	54	C	27			84	116	D	49		
	SBLTR	--	89	118	C	30	C (30)		111	130	D	52	D (52)	
2026 No-Build Conditions	EBL	400	250	226	D	62	C (24)	C (26)	80	182	E	62	B (12)	C (24)
	EBT (2)	--	653	462	C	19			227	254	B	10		
	EBR	150	72	250	B	11			35	185	A	7		
	WBL	150	78	250	D	62	C (25)		182	250	F	99	C (25)	
	WBTTTR	--	407	422	C	23			750	761	C	21		
	NBL	0	146	174	D	76	D (39)		376	371	F	101	F (89)	
	NBTR	--	52	71	C	47			102	128	D	50		
	SBLTR	--	103	139	C	54	C (35)		126	177	D	53	D (53)	
2026 Build Conditions	EBUL	400	260	268	D	48	C (25)	C (27)	81	120	E	59	B (11)	C (24)
	EBT (2)	--	709	553	C	24			205	243	A	9		
	EBR	150	72	250	B	12			32	196	A	7		
	WBL	150	78	190	D	46	C (27)		181	250	F	98	C (26)	
	WBTTTR	--	438	443	C	26			809	775	C	22		
	NBL	0	147	193	D	44	C (41)		380	323	F	103	F (90)	
	NBTR	--	52	61	C	31			102	117	D	50		
	SBLTR	--	109	139	D	36	D (36)		132	170	D	53	D (53)	
2027 No-Build Conditions	EBL	400	278	482	D	53	C (28)	C (29)	79	168	E	57	B (12)	C (27)
	EBT (2)	--	765	591	C	26			225	245	B	10		
	EBR	150	77	250	B	12			35	143	A	7		
	WBL	150	80	249	D	47	C (28)		195	250	F	101	C (29)	
	WBTTTR	--	472	443	C	28			891	772	C	25		
	NBL	0	156	182	D	46	D (43)		425	423	F	121	F (105)	
	NBTR	--	54	94	C	31			108	109	D	50		
	SBLTR	--	111	142	D	36	D (36)		137	171	D	53	D (53)	
2027 Build Conditions	EBUL	400	288	436	D	53	C (30)	C (32)	79	128	E	56	B (12)	C (28)
	EBT (2)	--	821	620	C	29			206	246	B	10		
	EBR	150	77	250	B	12			32	194	A	7		
	WBL	150	80	250	D	47	C (31)		182	250	F	100	C (31)	
	WBTTTR	--	508	633	C	31			961	773	C	27		
	NBL	0	157	199	D	48	D (44)		429	477	F	126	F (108)	
	NBTR	--	54	86	C	31			108	144	D	50		
	SBLTR	--	116	158	D	37	D (37)		143	190	D	54	D (54)	

Capacity analysis indicates that the overall intersection is expected to operate at LOS C or better under all analysis scenarios during the weekday AM and PM peak hours. When

comparing the no-build and build traffic conditions queueing is not expected to increase significantly. Under all analysis scenarios the minor street approaches are expected to operate at a LOS F or better during the weekday AM and PM peak hours. It should be noted that it is not uncommon for the minor street approaches to have higher delays at signalized intersections, especially when the signal is coordinated where the precedence is given to the mainline approaches to maximize the progression. Due to the overall acceptable levels of service no improvements by the developer are recommended.

7.4. NC 24 & Hammocks Beach Road

Refer to the table below for a summary of the capacity analysis of the subject intersection during the analysis scenarios.

Table 8: Analysis Summary of NC 24 & Hammocks Beach Road

ANALYSIS SCENARIO	LANE GROUP	Existing Storage (ft)	Weekday AM Peak Hour						Weekday PM Peak Hour					
			Queue (ft)		Lane LOS	Delay (sec)	Approach LOS (sec)	Overall LOS (sec)	Queue (ft)		Lane LOS	Delay (sec)	Approach LOS (sec)	Overall LOS (sec)
2023 Existing Conditions	EBU	325	5	28	A	8	B (13)	B (12)	1	34	A	4	A (5)	A (10)
	EBT (2)	--	358	289	B	14			102	198	A	5		
	EBR	550	11	34	A	2			16	101	A	1		
	WBL	200	17	74	A	7	A (5)		83	214	C	22	A (7)	
	WBT (2)	--	117	157	A	5			243	253	A	5		
	NBL	150	98	152	C	30			143	218	E	69		
	NBLR	--	--	184	--	--	--		270	--	--			
2026 No-Build Conditions	EBU	325	6	23	A	9	B (18)	B (18)	1	42	A	5	A (5)	B (17)
	EBT (2)	--	507	444	B	19			138	263	A	6		
	EBR	550	24	129	A	3			22	105	A	2		
	WBL	200	96	118	D	46	A (8)		358	300	F	127	B (20)	
	WBT (2)	--	130	176	A	6			290	1099	A	6		
	NBL	150	212	198	D	42			194	237	E	70		
	NBLR	--	--	231	--	--	--		758	--	--			
2026 Build Conditions	EBU	325	6	29	A	9	B (19)	B (18)	1	29	A	6	A (6)	B (17)
	EBT (2)	--	550	547	B	20			160	168	A	6		
	EBR	550	26	176	A	3			27	61	A	2		
	WBL	200	101	115	D	49	A (8)		358	300	F	127	B (20)	
	WBT (2)	--	137	176	A	6			312	1345	A	6		
	NBL	150	236	205	D	44			200	250	E	71		
	NBLR	--	--	253	--	--	--		1039	--	--			
2027 No-Build Conditions	EBU	325	5	107	A	8	B (20)	B (19)	1	33	A	7	A (7)	B (20)
	EBT (2)	--	620	585	C	21			220	269	A	8		
	EBR	550	27	170	A	3			38	92	A	2		
	WBL	200	115	139	D	53	A (9)		401	300	F	151	C (24)	
	WBT (2)	--	144	197	A	6			347	1417	A	7		
	NBL	150	289	245	D	50			209	250	E	72		
	NBLR	--	--	280	--	--	--		960	--	--			
2027 Build Conditions	EBU	325	5	114	A	8	C (20)	B (20)	1	27	A	8	A (8)	C (20)
	EBT (2)	--	667	561	C	21			247	166	A	9		
	EBR	550	29	176	A	2			43	91	A	3		
	WBL	200	116	192	E	55	A (9)		401	300	F	151	C (24)	
	WBT (2)	--	155	556	A	6			375	1421	A	8		
	NBL	150	300	250	D	53			214	250	E	73		
	NBLR	--	--	488	--	--	--		1135	--	--			

Capacity analysis indicates that the overall intersection is expected to operate at LOS C or better under all analysis scenarios during the weekday AM and PM peak hours. The northbound approach is expected to operate at a LOS E or better during the weekday AM and PM peak hours under all scenarios analyzed. As previously stated, it is not uncommon for the minor street approach to experience higher delays at signalized intersections where the priority is given to the mainline movements, especially in coordinated systems. It is important to note that the development is only expected to account for 6% of the total traffic volume at the intersection. Due to the overall acceptable level of service, no improvements by the developer are recommended.

7.5. Belgrade-Swansboro Road & Swansboro Loop Road

Refer to the table below for a summary of the capacity analysis of the subject intersection during the analysis scenarios.

Table 9: Analysis Summary of Belgrade-Swansboro Road & Swansboro Loop Road

ANALYSIS SCENARIO	LANE GROUP	Existing Storage (ft)	Weekday AM Peak Hour					Overall LOS (sec)	Weekday PM Peak Hour					Overall LOS (sec)
			Queue (ft)		Lane LOS	Delay (sec)	Approach LOS (sec)		Queue (ft)		Lane LOS	Delay (sec)	Approach LOS (sec)	
			95th	Max					95th	Max				
2023 Existing Conditions	WBLR	--	8	52	B ²	11	B (11) ²	N/A	18	65	B ²	12	B (12) ²	N/A
	NBTR	--	--	--	--	--	--		4	--	--	--		
	SBLT	--	3	34	A ¹	8	A (8) ¹		5	58	A ¹	8	A (8) ¹	
2026 No-Build Conditions	WBLR	--	8	50	B ²	12	B (12) ²	N/A	20	92	B ²	13	B (13) ²	N/A
	NBTR	--	--	--	--	--	--		4	--	--	--		
	SBLT	--	3	48	A ¹	8	A (8) ¹		5	72	A ¹	8	A (8) ¹	
2026 Build Conditions	WBLR	--	8	51	B ²	12	B (12) ²	N/A	23	74	B ²	13	B (13) ²	N/A
	NBTR	--	--	--	--	--	--		--	--	--	--		
	SBLT	--	5	53	A ¹	8	A (8) ¹		5	87	A ¹	8	A (8) ¹	
2027 No-Build Conditions	WBLR	--	10	53	B ²	13	B (13) ²	N/A	25	85	B ²	14	B (14) ²	N/A
	NBTR	--	--	--	--	--	--		13	--	--	--		
	SBLT	--	5	56	A ¹	8	A (8) ¹		8	82	A ¹	8	A (8) ¹	
2027 Build Conditions	WBLR	--	10	63	B ²	13	B (13) ²	N/A	28	88	B ²	14	B (14) ²	N/A
	NBTR	--	--	--	--	--	--		4	--	--	--		
	SBLT	--	5	48	A ¹	8	A (8) ¹		8	70	A ¹	8	A (8) ¹	

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

Capacity analysis indicates that the major-street left-turn movement is expected to operate at a LOS A under all analysis scenarios during the weekday AM and PM peak hours. The minor-street approach is expected to operate at an overall LOS B under all analysis scenarios during the weekday AM and PM peak hours. When comparing the no-build and build traffic conditions queueing is not expected to increase significantly. Due to the acceptable levels of service, no improvements by the developer are recommended.

7.6. NC 24 & Access B

Refer to the table below for a summary of the capacity analysis of the subject intersection during the analysis scenarios.

Table 10: Analysis Summary of NC 24 & Access B

ANALYSIS SCENARIO	LANE GROUP	Existing Storage (ft)	Weekday AM Peak Hour					Weekday PM Peak Hour						
			Queue (ft)		Lane LOS	Delay (sec)	Approach LOS (sec)	Overall LOS (sec)	Queue (ft)		Lane LOS	Delay (sec)	Approach LOS (sec)	Overall LOS (sec)
			95th	Max					95th	Max				
2026 Build Conditions	EBT (2)	--	--	--	--	--	--	N/A	--	--	--	--	--	N/A
	EBR	100	--	--	--	--	--		--	--	--	--		
	WBT (2)	--	--	--	--	--	--		--	--	--	--		
	NBR	--	33	96	C ¹	20	C (20) ¹		28	73	C ¹	20	C (20) ¹	
2027 Build Conditions	EBT (2)	--	--	--	--	--	--	N/A	--	122	--	--	--	N/A
	EBR	100	--	97	--	--	--		--	--	--	--	--	
	WBT (2)	--	--	102	--	--	--		--	--	--	--	--	
	NBR	--	40	168	C ¹	23	C (23) ¹		33	71	C ¹	23	C (23) ¹	

Improvements by developer are shown in bold.

1. Level of service for minor-street approach.

Capacity analysis indicates that the minor-street approach is expected to operate at a LOS C under the 2026 build traffic condition, and LOS D under the 2027 build traffic condition during the weekday AM and PM peak hours. It should be noted that due to the proximity of the signalized intersection of NC 24 and Belgrade Swansboro Road/Access A, there will be gaps in the flow traffic along the eastbound approach which will allow for the side-street traffic to enter the mainline flow, which in turn reduces queueing and delay.

An eastbound right-turn lane was considered based on the NCDOT *Policy on Street and Driveway Access to North Carolina Highways* and was found to be warranted.

8. CONCLUSIONS

This Traffic Impact Analysis was conducted to determine the potential traffic impacts of the proposed development, south of NC 24 and east of Queens Creek Road in Swansboro, North Carolina. The proposed development is expected to be a mixed-use development and be built out in 2026. Site access is proposed via one full movement driveway creating a fourth leg to the intersection of NC 24 and Belgrade Swansboro Road and one right-in/right-out driveway along NC 24.

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
- 2026 Build Traffic Conditions with Improvements
- 2027 No-Build Traffic Conditions
- 2027 Build Traffic Conditions
- 2027 Build Traffic Conditions with Improvements

Trip Generation

It is estimated that the proposed development will generate approximately 295 primary trips (130 entering and 165 exiting) during the weekday AM peak hour and 273 primary trips (159 entering and 116 exiting) 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.

Intersection Capacity Analysis Summary

All the study area intersections (including the proposed site driveways) are expected to operate at acceptable levels-of-service under existing and future year conditions with the exception of the intersections described in Section 7. A summary of the study area intersections that are expected to need improvements can be found in Section 7.

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 14 for an illustration of the recommended lane configuration for the proposed development.

Recommended Improvements by Developer

NC 24 & Belgrade-Swansboro Road/Access A

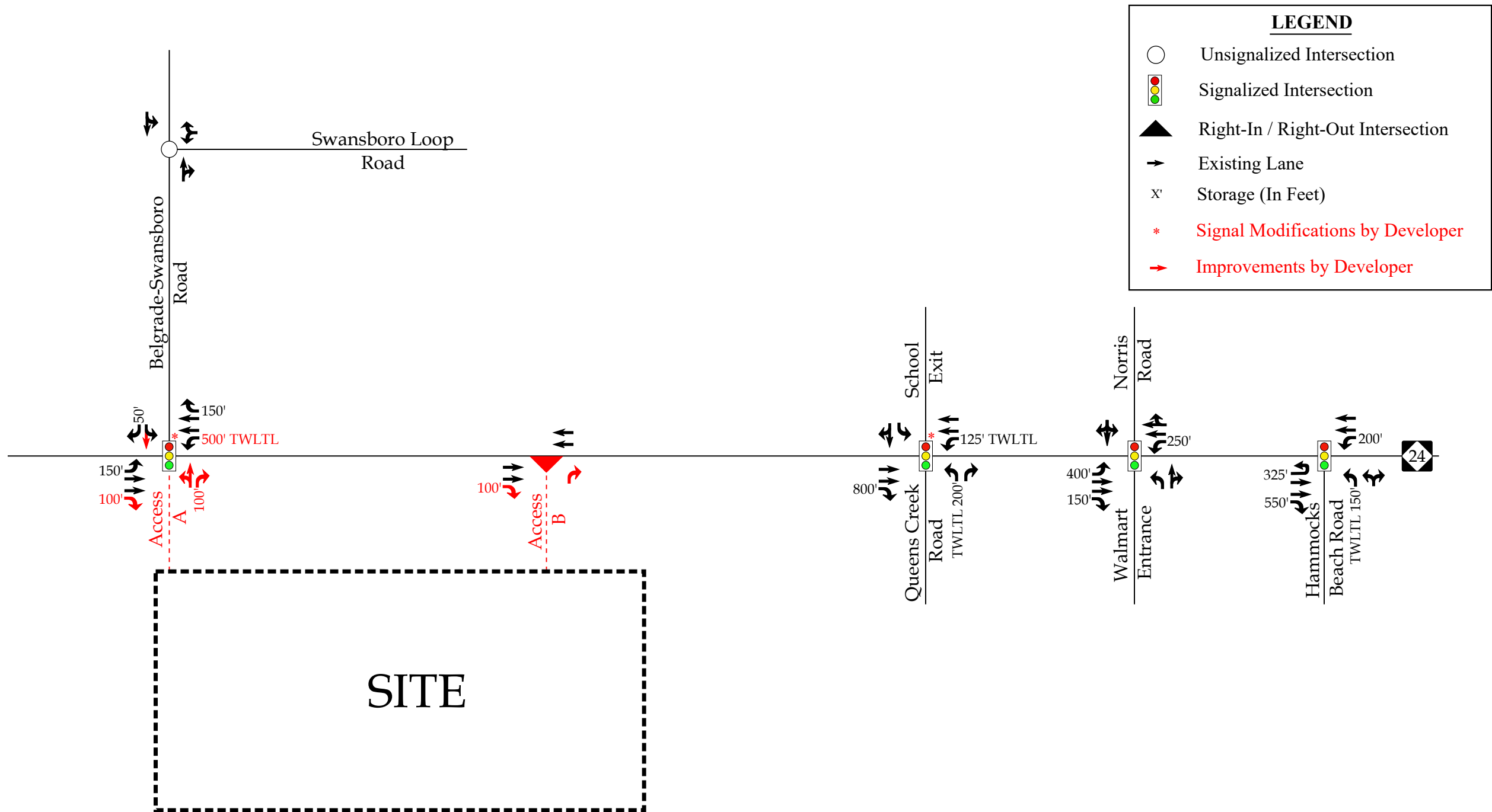
- Restripe the existing southbound left-turn lane to a shared left-through lane.
- Extend the westbound left-turn lane to 500 feet of storage and appropriate taper length.
- Construct the northbound approach with one ingress lane and two egress lanes striped as a shared left-through lane and a right-turn lane.
- Construct an eastbound right-turn lane with 100 feet of storage and appropriate taper length.
- Signal timing modifications.

NC 24 & Queens Creek Road/School Exit

- Signal timing modifications.

NC 24 & Access B

- Construct the northbound approach with one ingress lane and one egress lane striped as a right-turn lane.
- Provide stop control for the northbound approach.
- Construct an eastbound right-turn lane with 100 feet of storage and appropriate taper length.



Flybridge
Swansboro, NC

Recommended Lane
Configurations

Scale: Not to Scale Figure 14