TRAFFIC IMPACT ANALYSIS

FOR

FLYBRIDGE

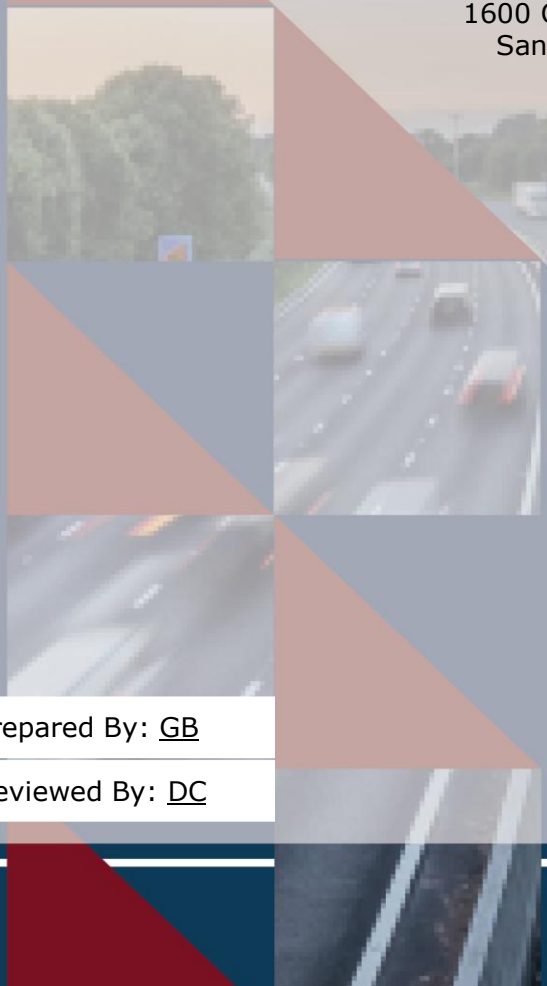
LOCATED

IN

SWANSBORO, NC

Prepared For:

Carolina Commercial Contractors
1600 Colon Road
Sanford, NC



MAY 2024

DRMP Project No. 23103

Prepared By: GB

Reviewed By: DC

DRMP

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FLYBRIDGE

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5/21/24

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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 Olive Ridge 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 306 apartments, 35,000 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 two right-in/right-out driveways 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.

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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)	306 Units	2,038	28	90	96	56
Strip Retail Plaza (822)	35,000 s.f.	1,708	40	26	95	94
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		**9,080**	**270**	**309**	**391**	**334**
*Internal Capture (14% AM & 10% PM) **			*-27*	*-35*	*-34*	*-28*
Total External Trips			**243**	**274**	**357**	**306**
Pass-By Trips: Shopping Center (29% PM)			*-0*	*-0*	*-24*	*-24*
Pass-By Trips: High-Turnover Restaurant (43% PM)			*-0*	*-0*	*-12*	*-12*
Pass-By Trips: Fast-Food Restaurant with Drive-Through (49% AM, 50% PM)			*-33*	*-33*	*-27*	*-27*
Pass-By Trips: C-Store with Gas Station (76% AM, 75% PM)			*-63*	*-63*	*-75*	*-75*
Total Primary Trips			**147**	**178**	**219**	**168**

*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

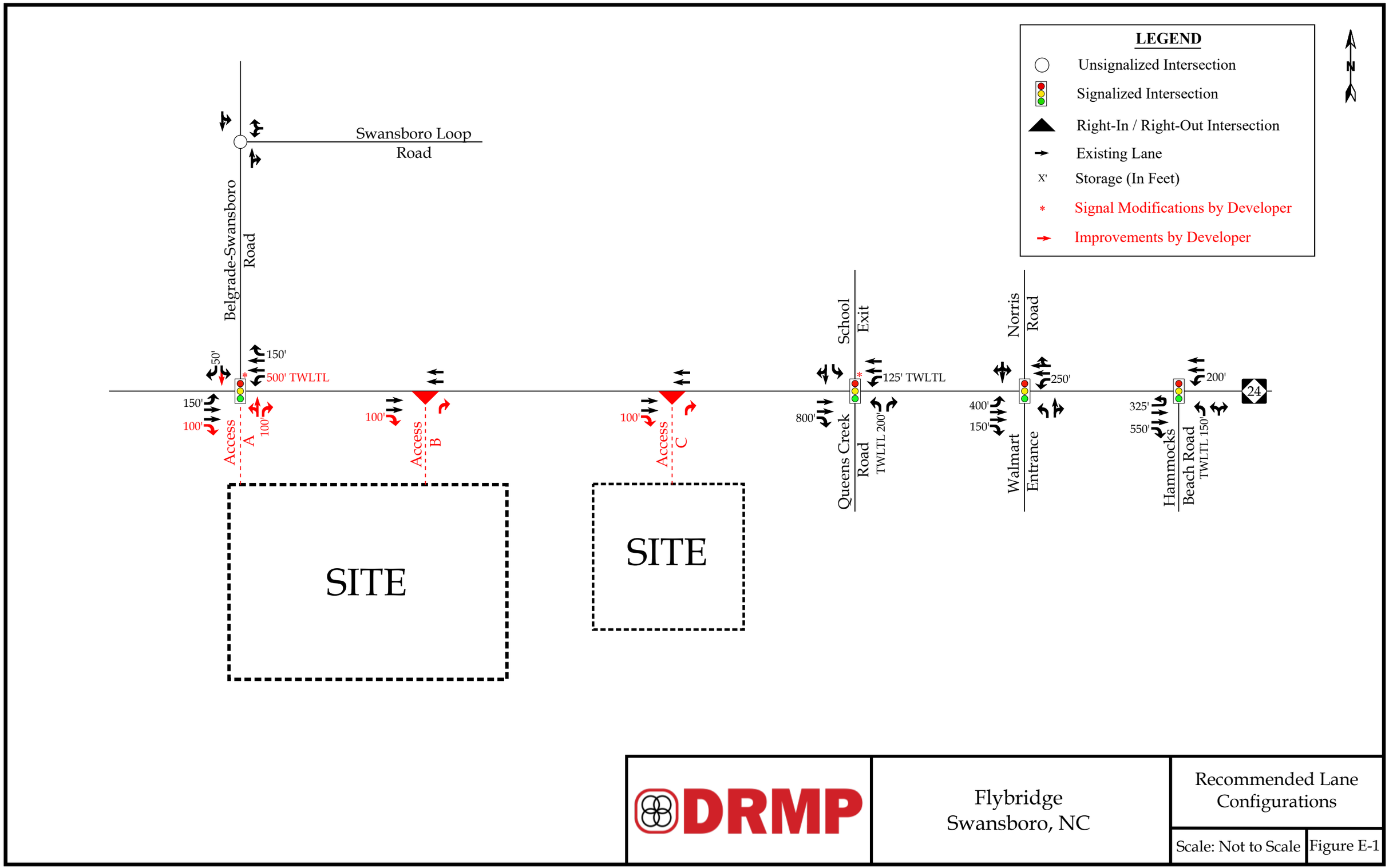
- Signal timing modifications.

NC 24 & Access B

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

NC 24 & Access C

- 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.



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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 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:

- 306 apartment units
- 35,000 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:

- 306 apartment units
- 35,000 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 two right-in/right-out 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.

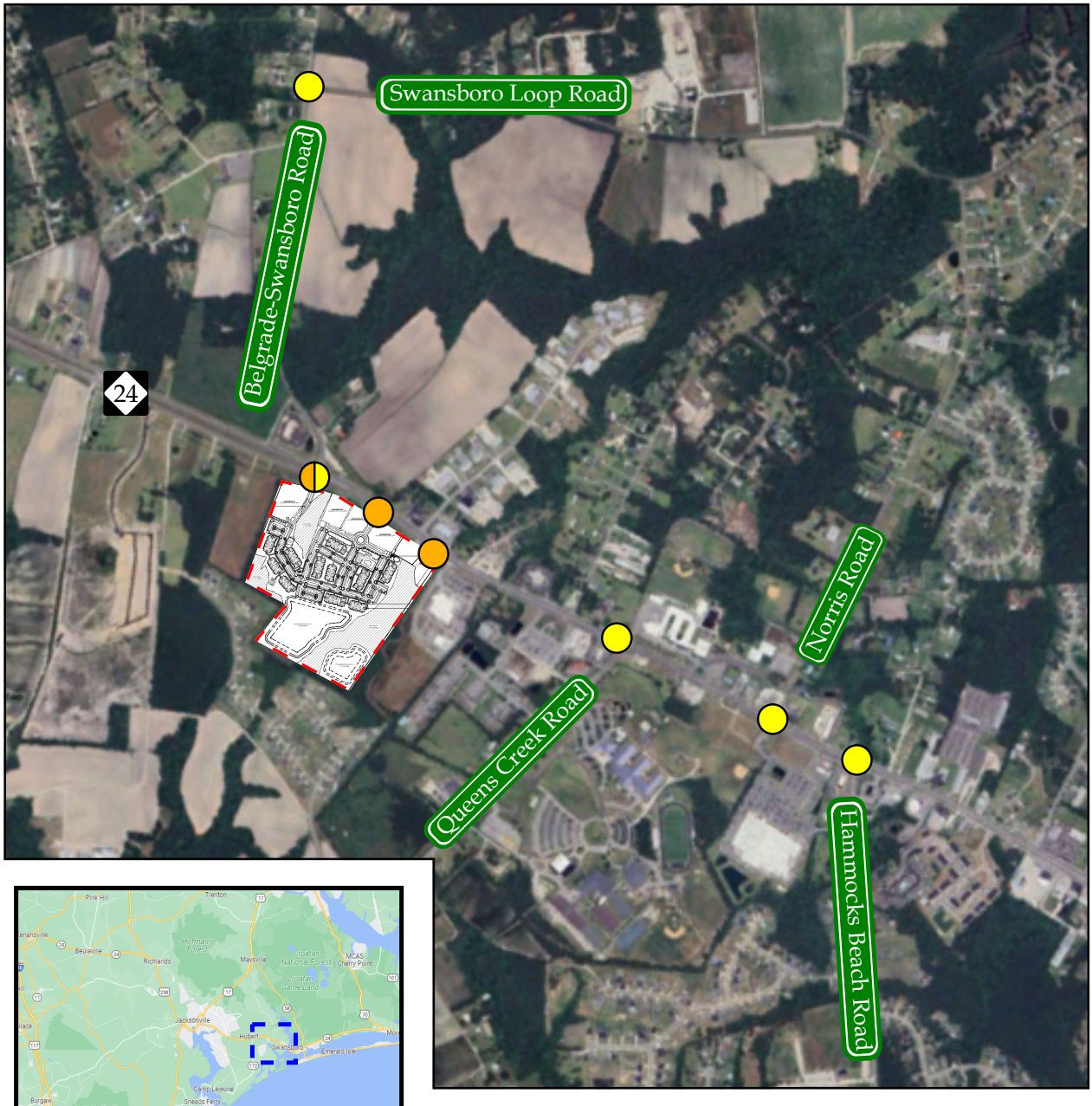
1.4. Existing Roadways

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 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.



N

LEGEND

- Study Intersection
- Proposed Site Access
- Study Area

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Site Location Map

Scale: Not to Scale | Figure 1

SITE DATA

ADDRESS:	1481 W CORBETT AVE
PID:	019494 027733
SITE ACREAGE:	±38.92 AC
CURRENT ZONING:	RA (RESIDENTIAL/AGRICULTURAL)
PROPOSED USE:	APARTMENTS COMMERCIAL OUTPARCELS

DEVELOPMENT DATA

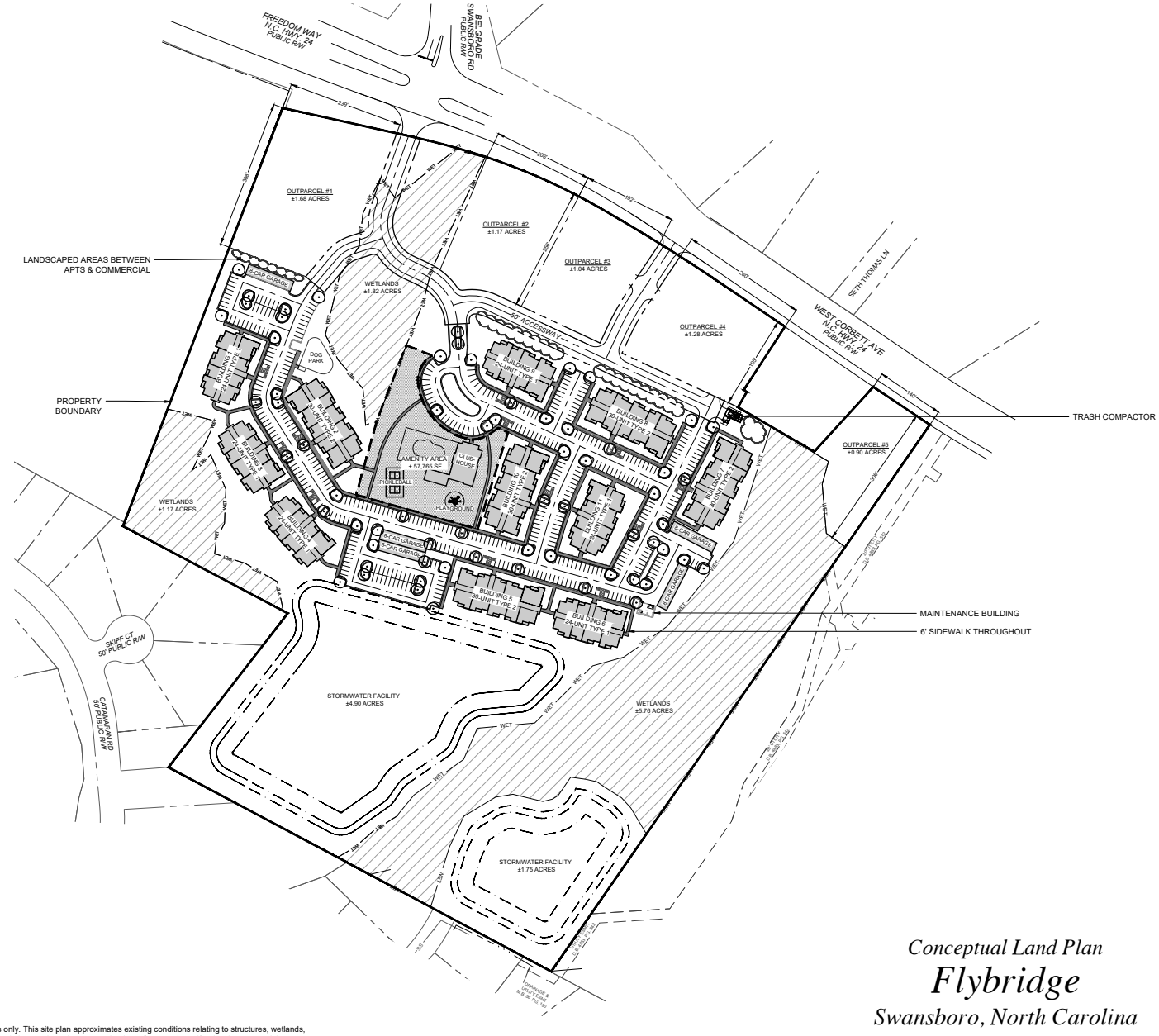
COMMERCIAL ACREAGE	
OUTPARCEL 1:	±1.68 AC
OUTPARCEL 2:	±1.17 AC
OUTPARCEL 3:	±1.04 AC
OUTPARCEL 4:	±1.28 AC
OUTPARCEL 5:	±0.90 AC
TOTAL:	±6.07 AC
APARTMENT ACREAGE:	±30.48 AC
PROPOSED UNITS:	300 UNITS IN 11 BUILDINGS
DENSITY:	9.6 DU/AC
REQUIRED AREA (R6 DISTRICT):	20.7 AC*

**9,000 SF PLUS 3,000 SF PER EACH UNIT OVER 2*

APT. PARKING REQUIRED:	600 SPACES (2 PER UNIT)
APT. PARKING PROVIDED:	513 TOTAL SPACES (1.71 PER UNIT) 40 GARAGE SPACES 473 SURFACE SPACES

APARTMENT DIMENSIONAL STANDARDS (R6 DISTRICT)

SETBACKS	
FRONT:	25'
SIDE, INTERIOR:	13'
SIDE, CORNER:	18'
REAR:	25'
MAX. HEIGHT:	35'
MAX. GROSS BLDG. AREA:	40,000 SF



Prepared by:

PARAMOUNTE ENGINEERING, INC.

Date: 26 June 2023

NORTH

SCALE: 1"=100' at 24"x36"

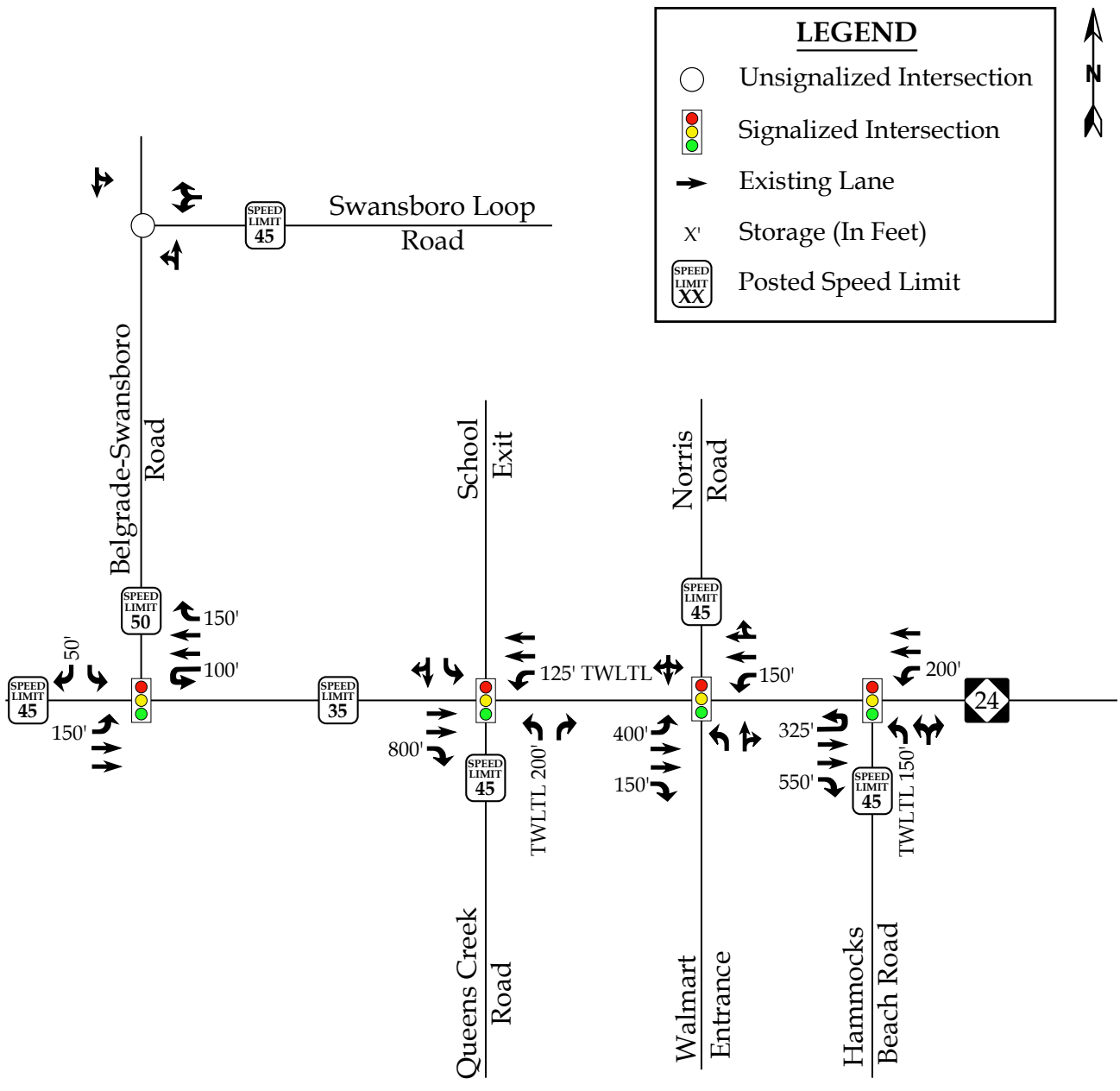
0 50' 100' 200'

Preliminary; Not For Construction. This site plan is a graphic representation and should be utilized for discussion purposes only. This site plan approximates existing conditions relating to structures, wetlands, roads, parking, vegetation and property boundaries. Plan componentsmay change based upon regulatory and municipal regulations and requirementsat the time of approvals and/or development activity.

Conceptual Land Plan

Flybridge

Swansboro, North Carolina



DRMP	Flybridge Swansboro, 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

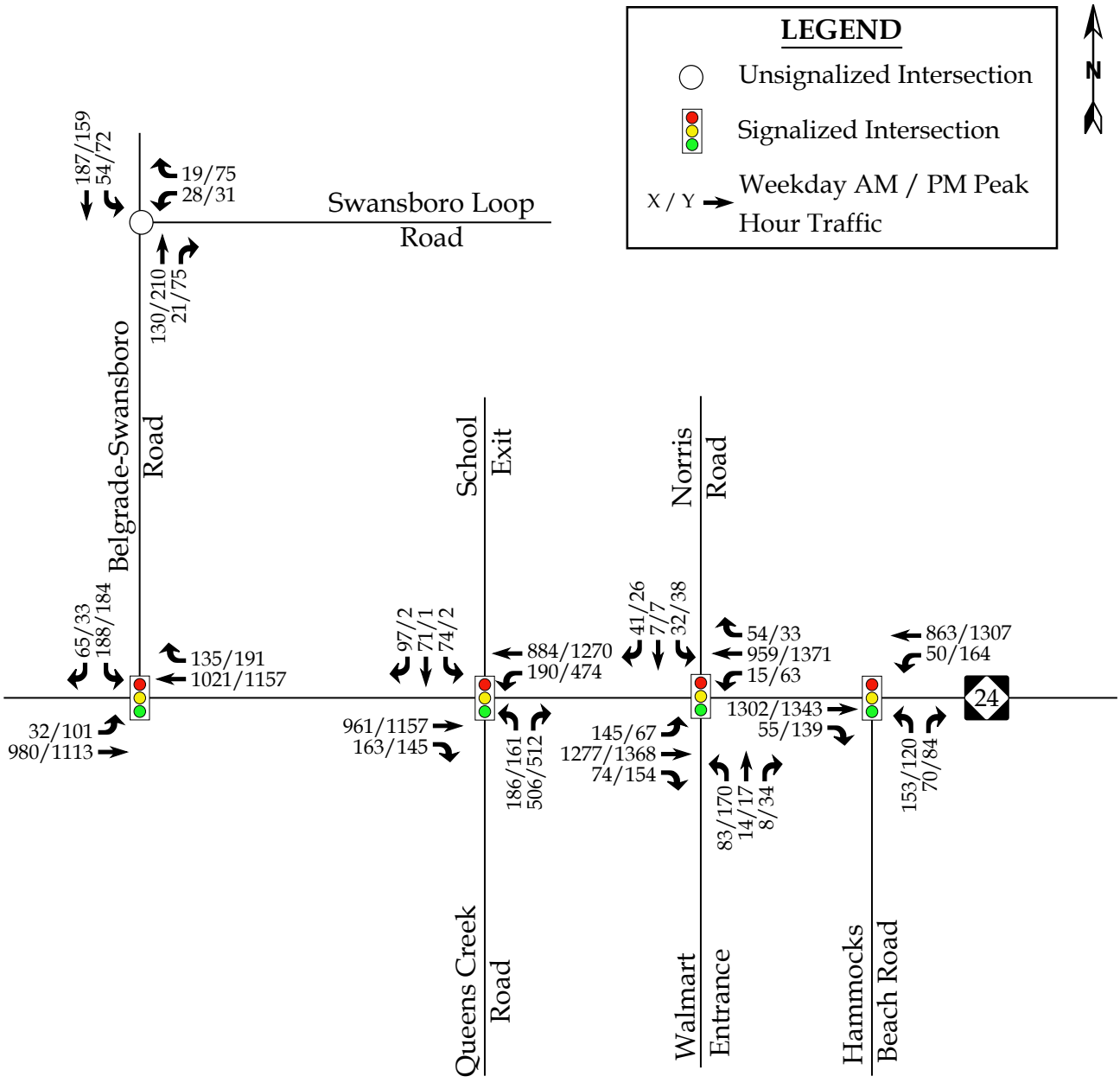
Existing peak hour traffic volumes were determined based on traffic counts conducted at the study intersections listed below, in May of 2023 during a typical weekday AM (7:00 AM – 9:00 AM) and PM (4:00 PM – 6:00 PM) peak periods:

- 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.

DRMP	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

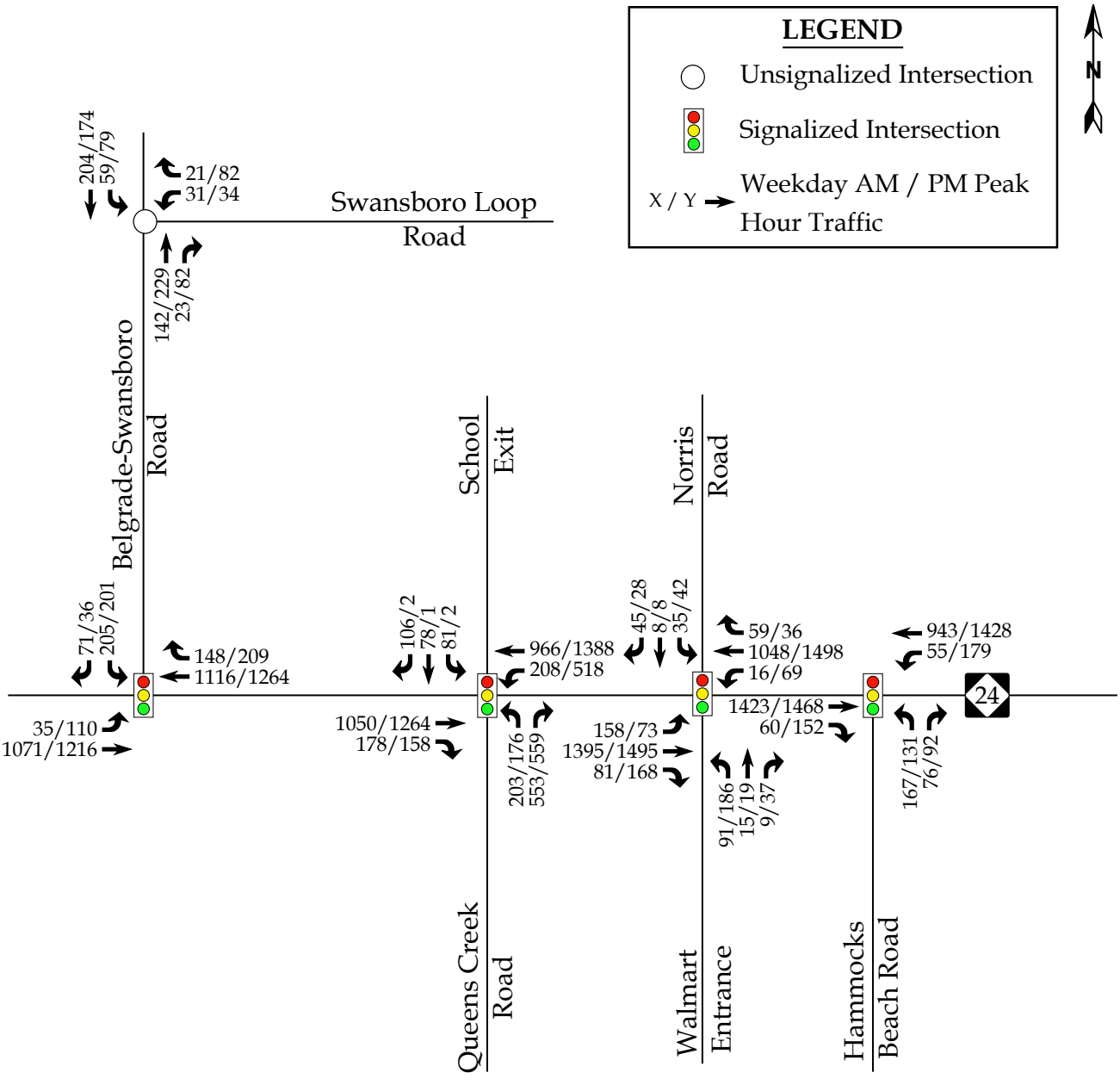
Based on coordination with the NCDOT and the Town, it was determined there were no future roadway improvements to consider with this study.

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

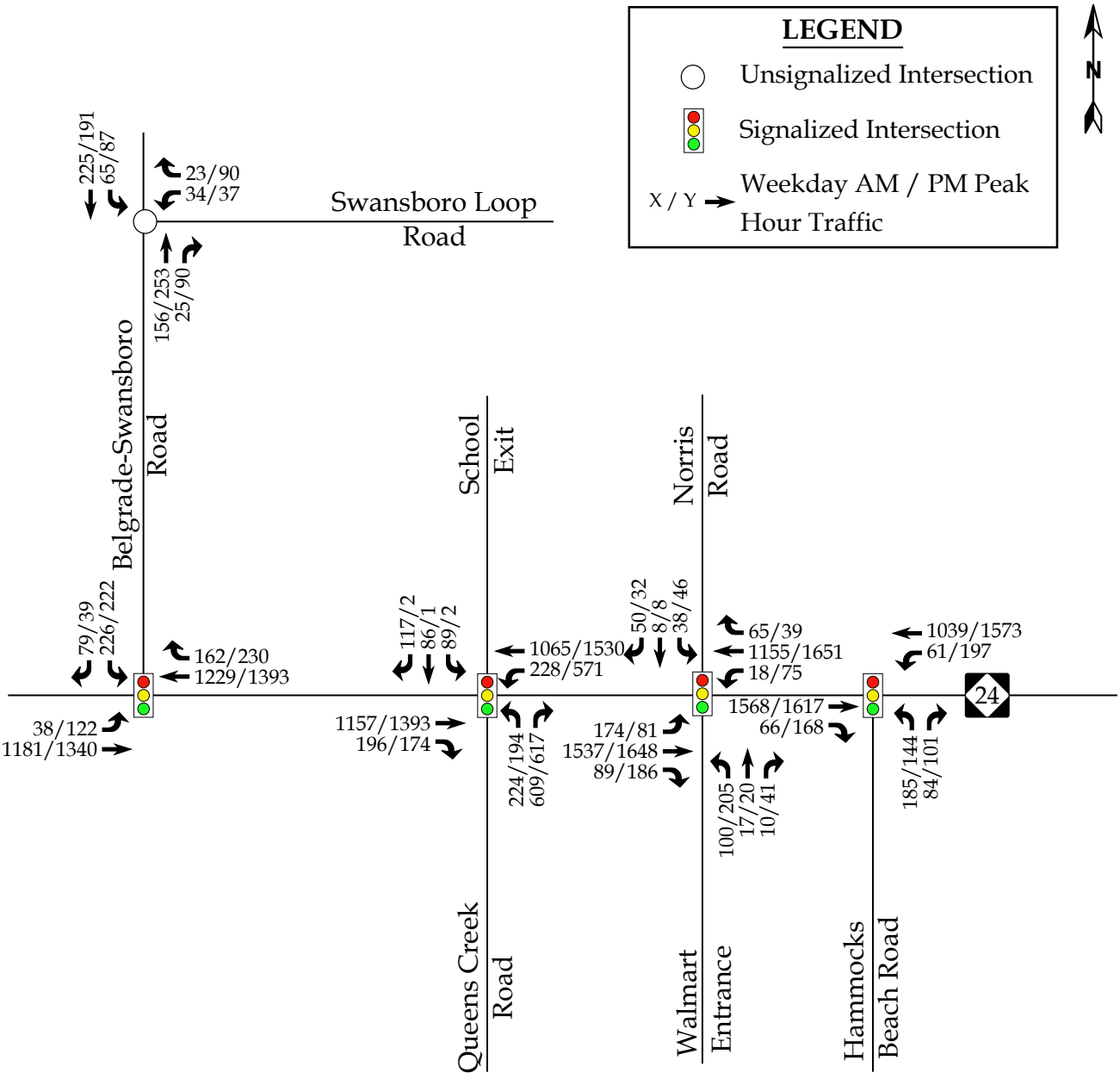
The 2026 and 2027 no-build traffic volumes were determined by projecting the 2023 existing peak hour traffic to the years 2026 and 2027 and adding the adjacent development trips. Refer to Figure 7a for an illustration of the 2026 no-build peak hour traffic volumes at the study intersections. Refer to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

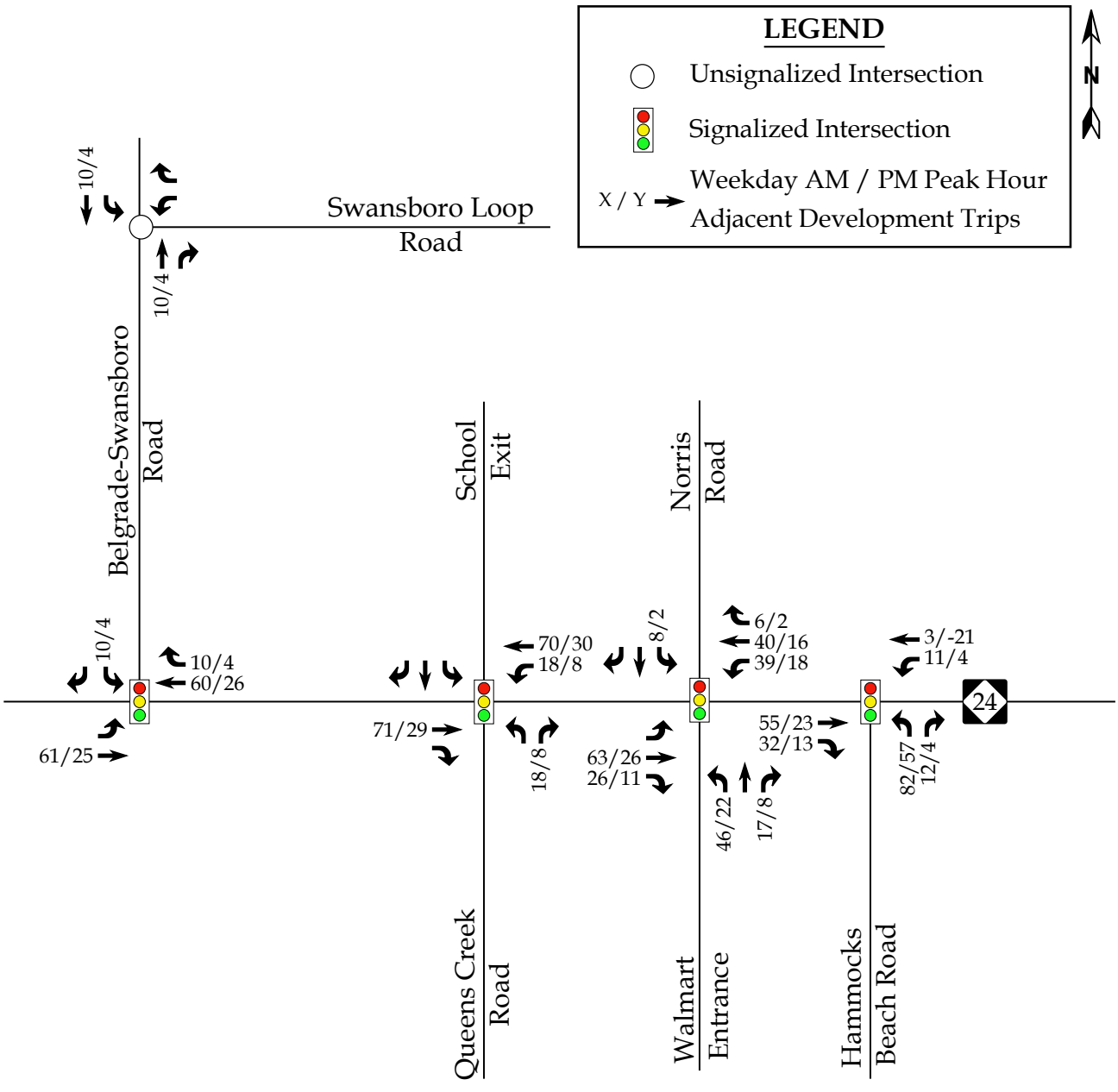
The 2026 and 2027 no-build AM and PM peak hour traffic volumes at the study intersections were analyzed with future geometric roadway conditions and traffic control. The analysis results are presented in Section 7 of this report.



DRMP	Flybridge Swansboro, NC	2026 Projected Peak Hour Traffic
		Scale: Not to Scale / Figure 5a



DRMP	Flybridge Swansboro, NC	2027 Projected Peak Hour Traffic
		Scale: Not to Scale / Figure 5b



DRMP	Flybridge Swansboro, NC	Peak Hour Adjacent Development Trips
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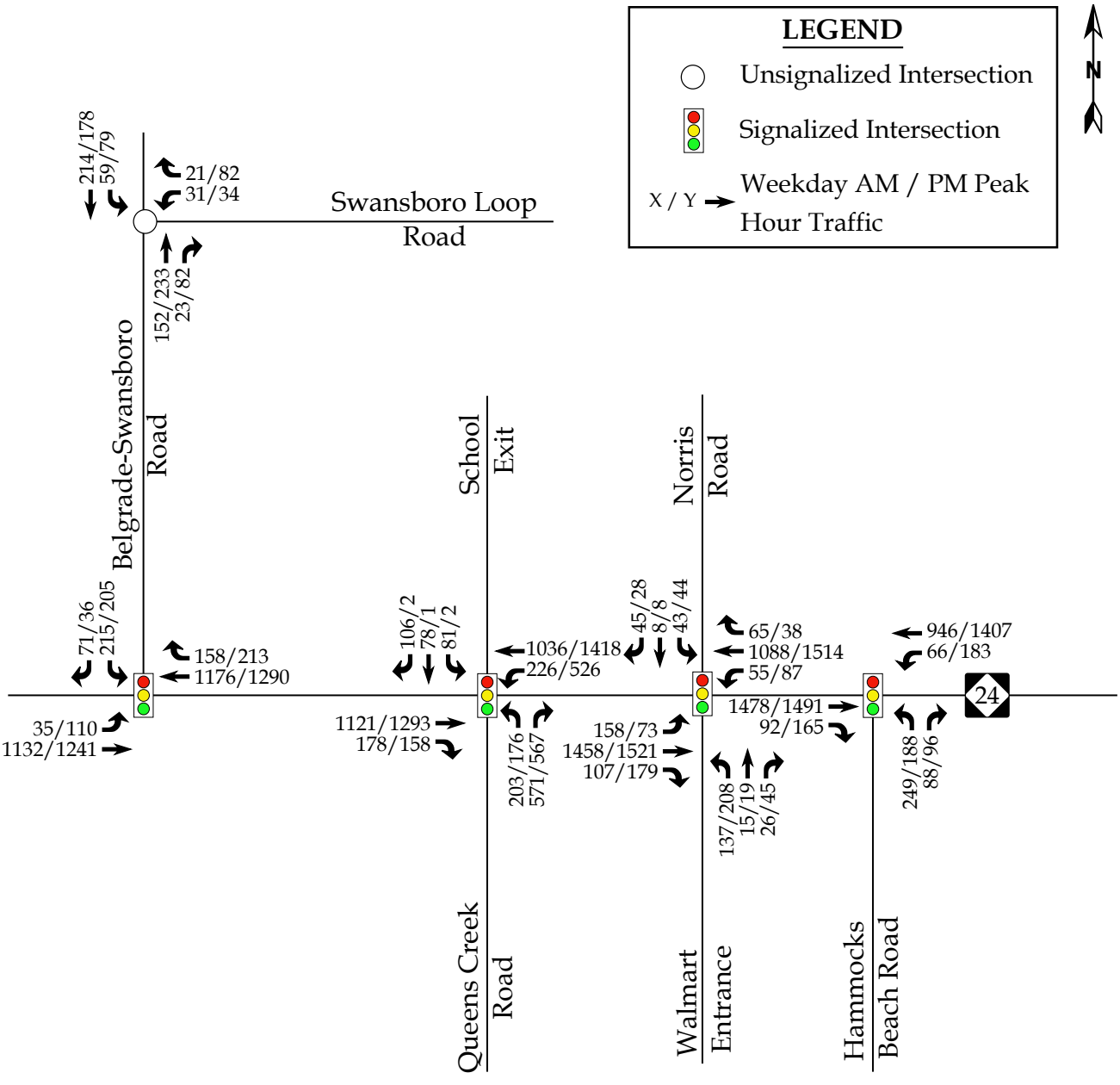
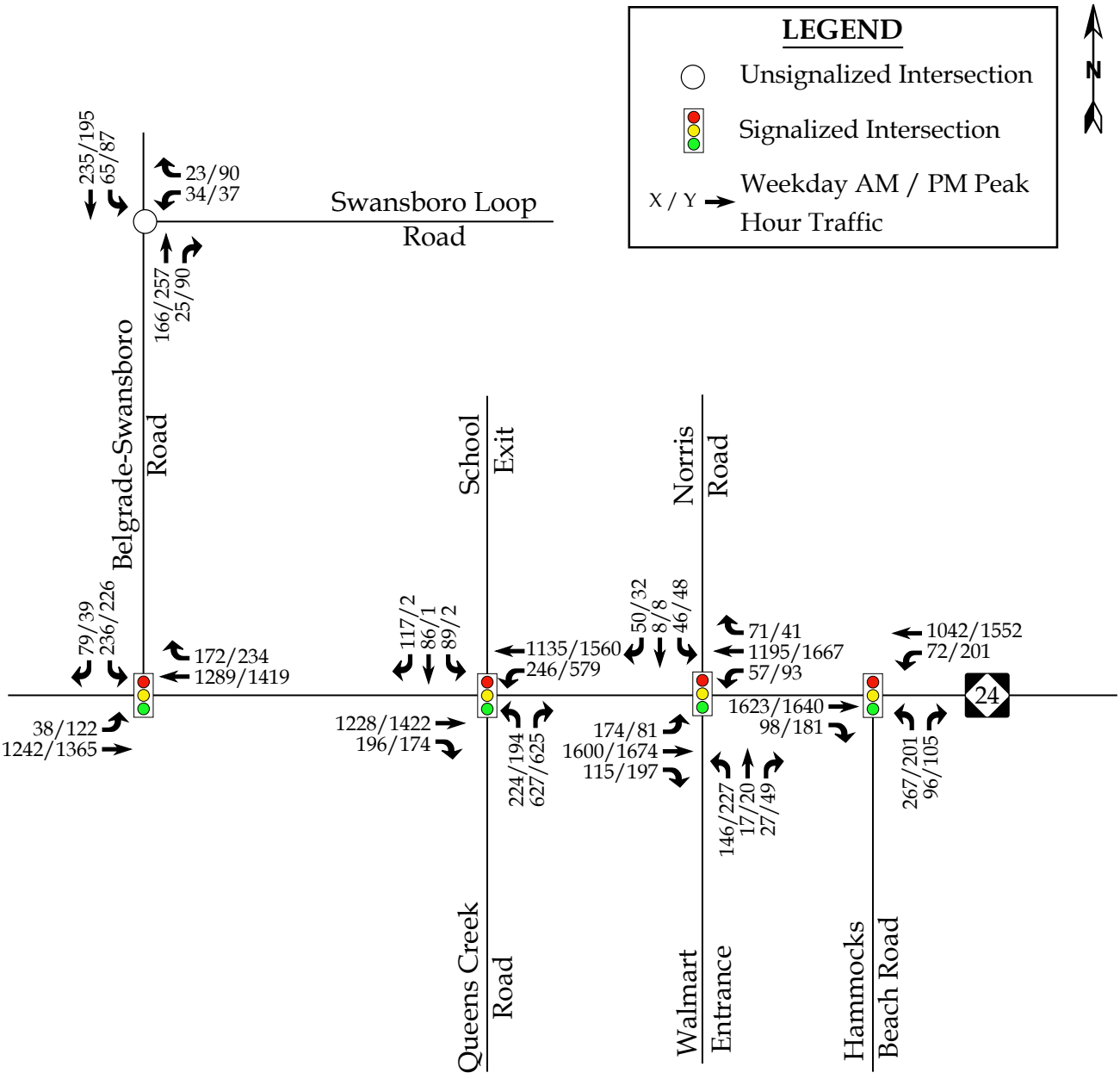


Note: Based on NCDOT Congestion Management guidelines, a volume of 4 vehicles per hour (vph) was analyzed for any movement with less than 4 vph.

DRMP	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.

DRMP	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)	306 Units	2,038	28	90	96	56
Strip Retail Plaza (822)	35,000 s.f.	1,708	40	26	95	94
High-Turnover Restaurant (932)	7,000 s.f.	750	37	30	38	25
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C-Store with Gas Station (945)	12 VFP	3,182	97	97	111	111
Total Trips		**9,080**	**270**	**309**	**391**	**334**
*Internal Capture (14% AM & 10% PM) **			*-27*	*-35*	*-34*	*-28*
Total External Trips			**243**	**274**	**357**	**306**
Pass-By Trips: Shopping Center (29% PM)			*-0*	*-0*	*-24*	*-24*
Pass-By Trips: High-Turnover Restaurant (43% PM)			*-0*	*-0*	*-12*	*-12*
Pass-By Trips: Fast-Food Restaurant with Drive-Through (49% AM, 50% PM)			*-33*	*-33*	*-27*	*-27*
Pass-By Trips: C-Store with Gas Station (76% AM, 75% PM)			*-63*	*-63*	*-75*	*-75*
Total Primary Trips			**147**	**178**	**219**	**168**

*Utilizing methodology contained in the NCHRP Report 684.

It is estimated that the proposed development will generate approximately 9,080 total site trips on the roadway network during a typical 24-hour weekday period. Of the daily traffic volume, it is anticipated that 579 trips (270 entering and 309 exiting) will occur

during the weekday AM peak hour and 725 trips (391 entering and 334 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 14% and a weekday PM peak hour internal capture rate of 10% was applied to the total trips. The internal capture reductions are expected to account for approximately 62 (27 entering and 35 exiting) trips during the weekday AM peak hour and 62 trips (34 entering and 28 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 192 trips (96 entering and 96 exiting) during the weekday AM peak hour and approximately 276 trips (138 entering and 138 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 325 trips (147 entering and 178 exiting) during the weekday AM peak hour and 387 trips (219 entering and 168 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

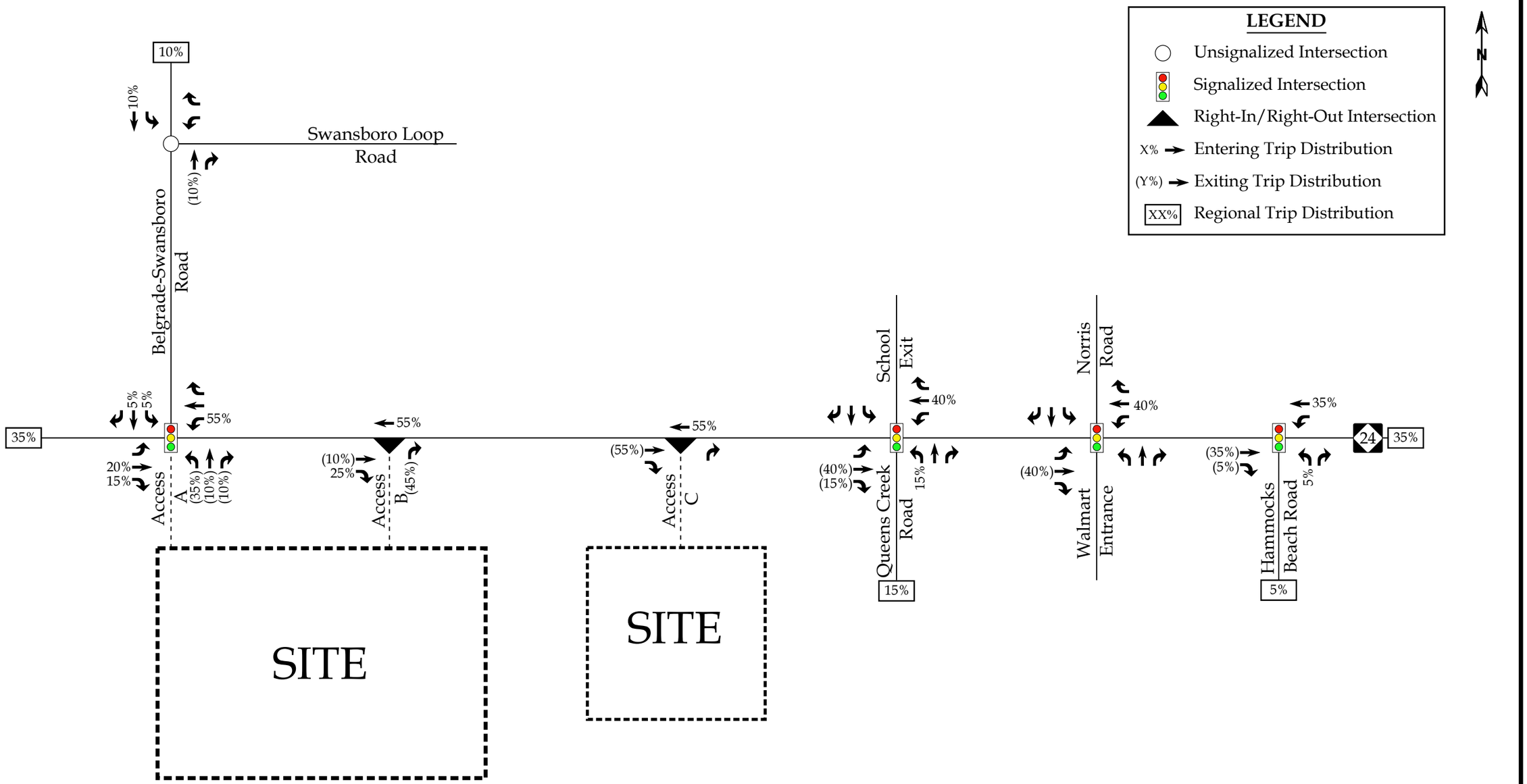
It is estimated that the retail site trips will be regionally distributed as follows:

- 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 Figures 8b and 8c. Refer to Figure 9a for the residential site trip assignment and Figures 9b and 9c 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 Figures 10a and 10b for the pass-by site trip distributions. Pass-by site trips are shown in Figures 11a and 11b.

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.



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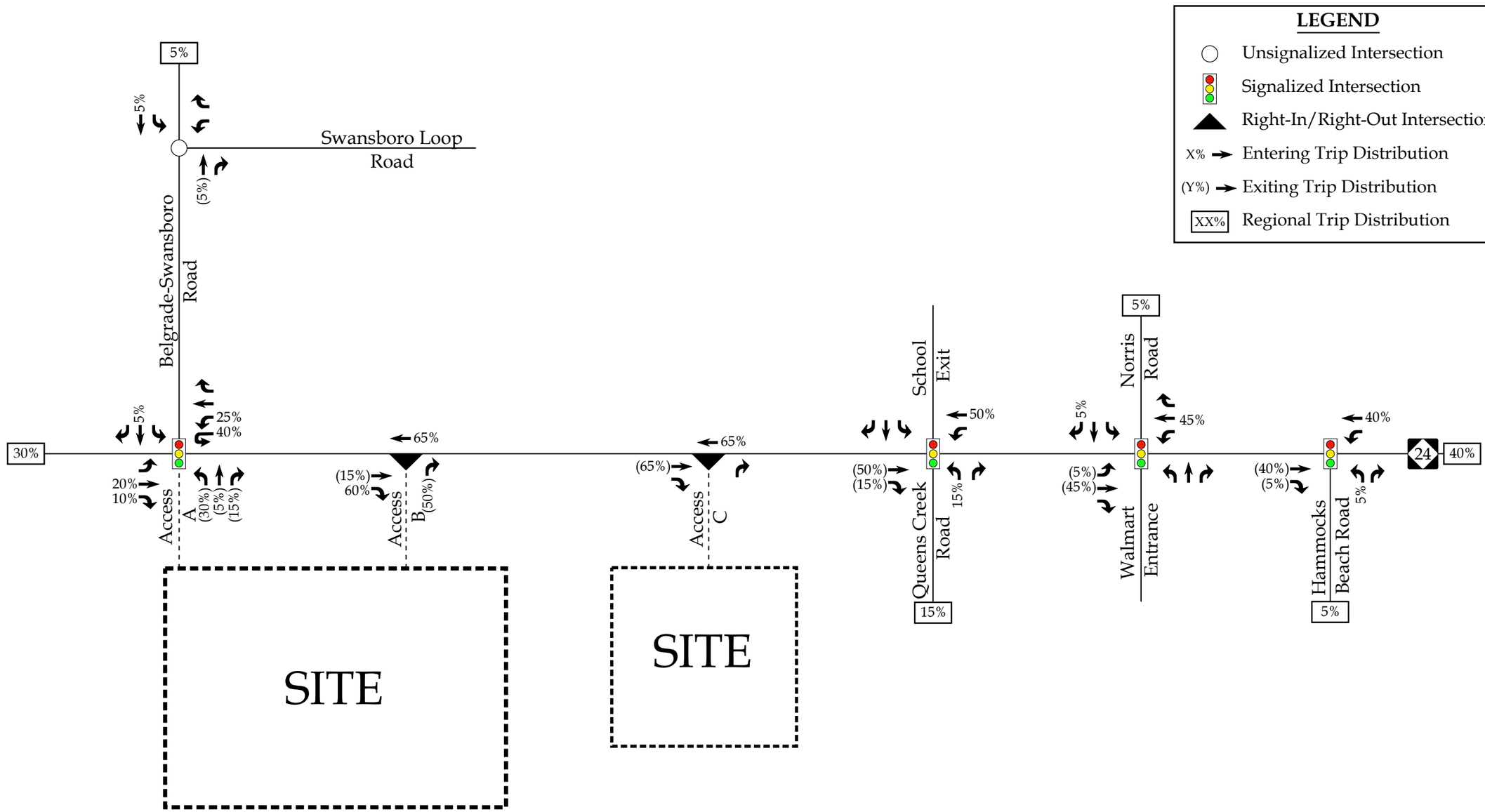
Flybridge
Swansboro, NC

Proposed Site
Residential
Trip Distribution

Scale: Not to Scale | Figure 8a



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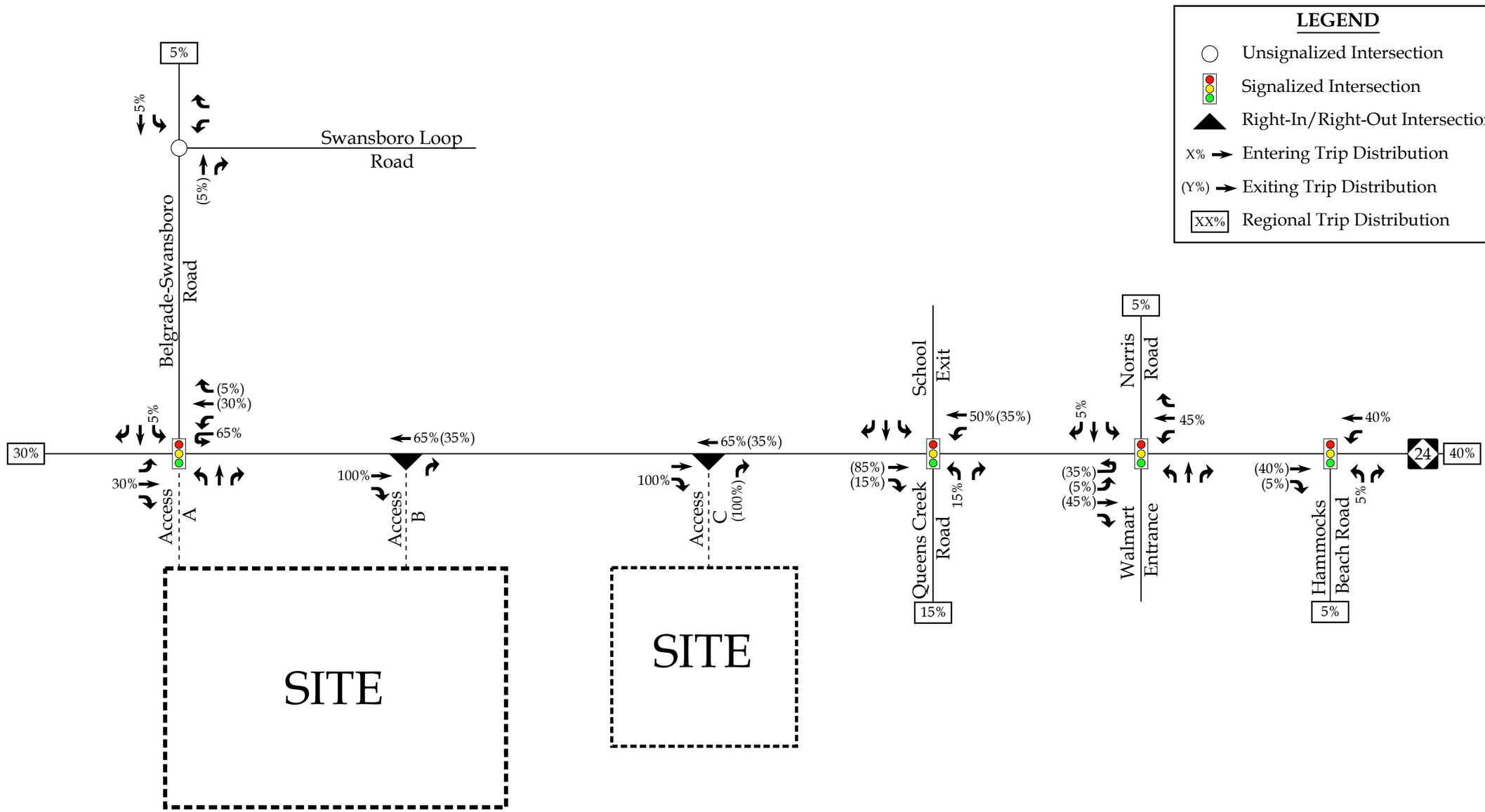
Flybridge
Swansboro, NC

Proposed Site
Retail
Trip Distribution

Scale: Not to Scale | Figure 8b

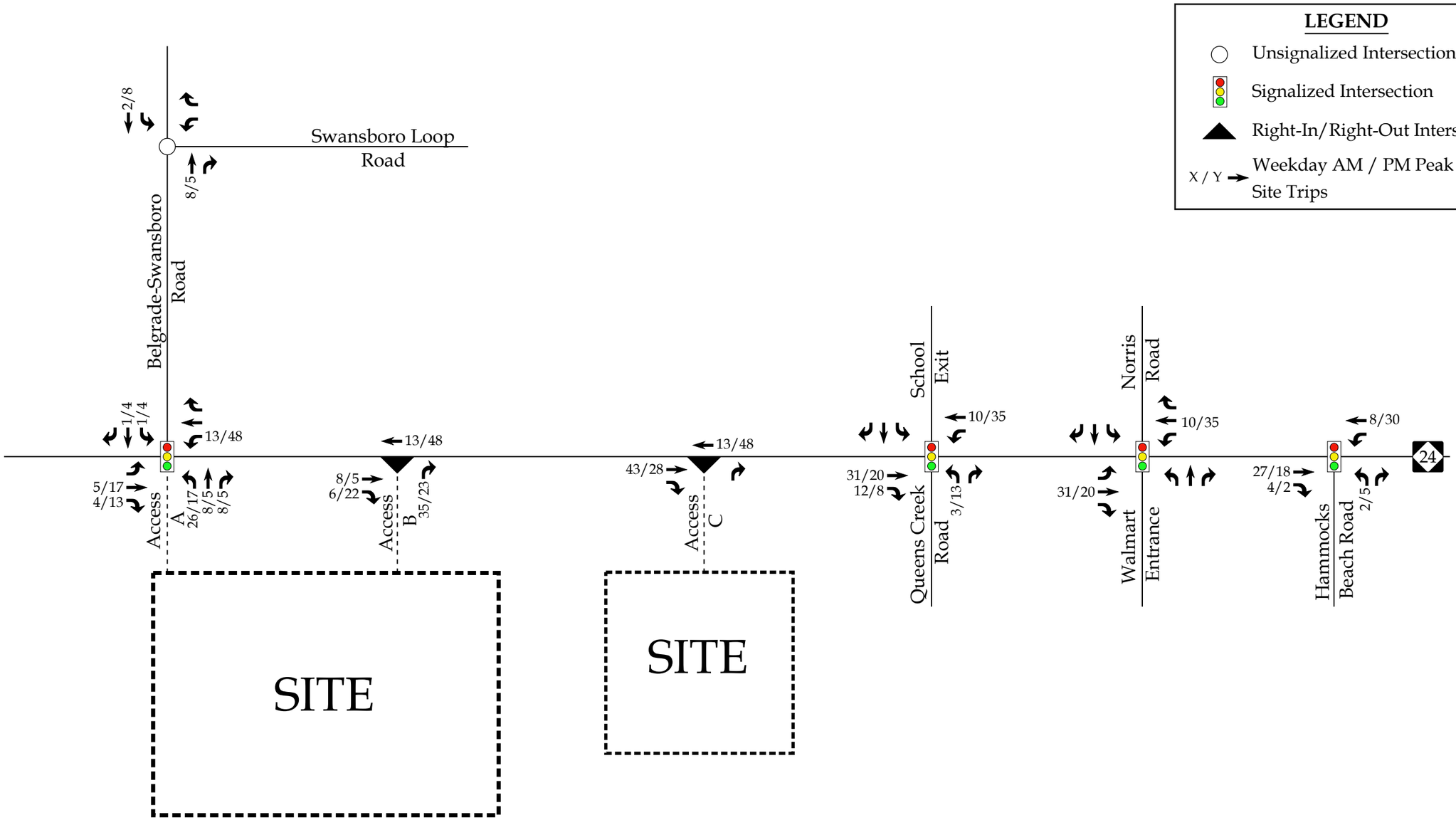


DRMP

Flybridge
Swansboro, NC

Proposed Site
Access C
Trip Distribution

Scale: Not to Scale | Figure 8c

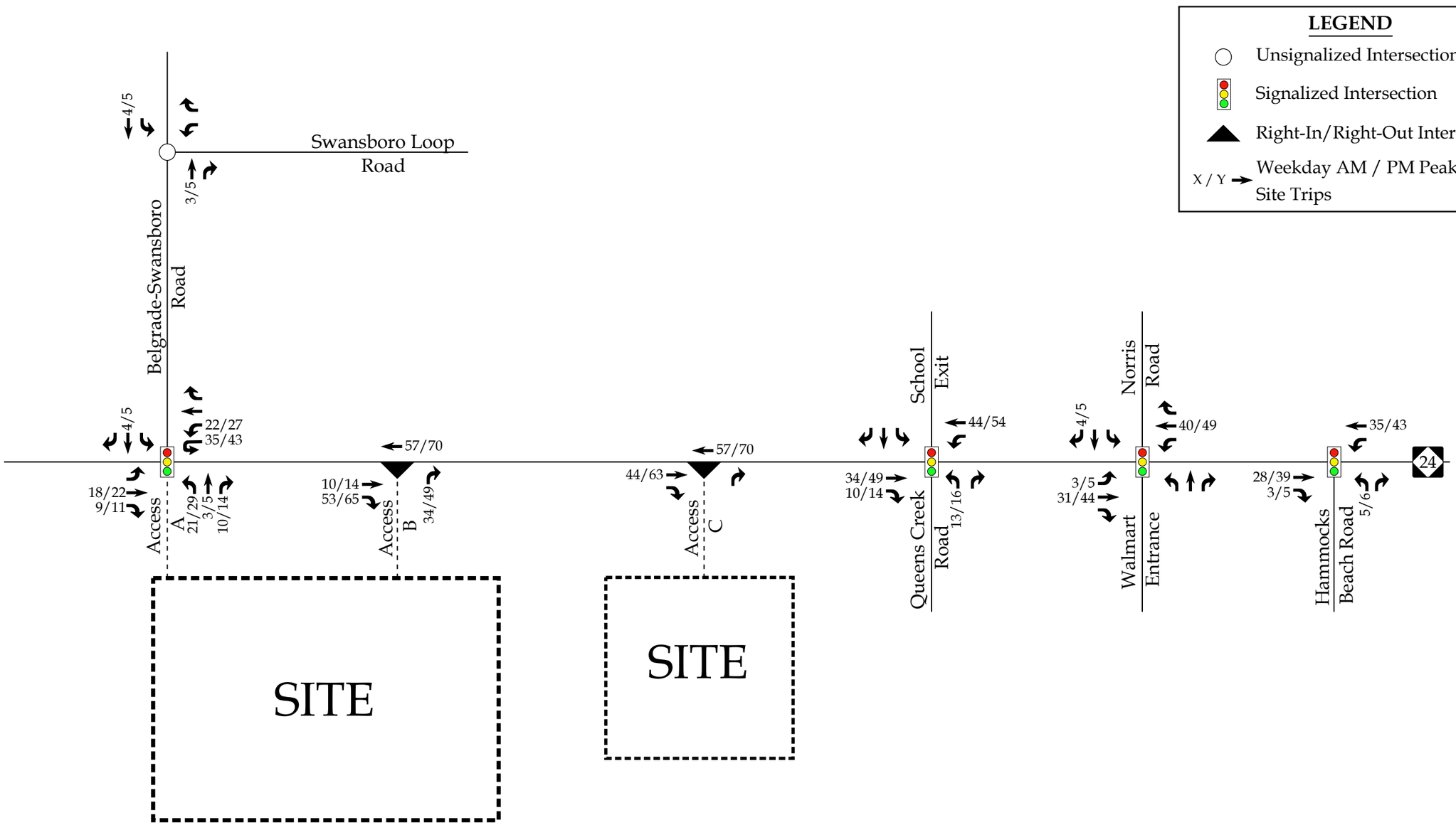


DRMP

Flybridge
Swansboro, NC

Residential
Site Trip Assignment

Scale: Not to Scale | Figure 9a

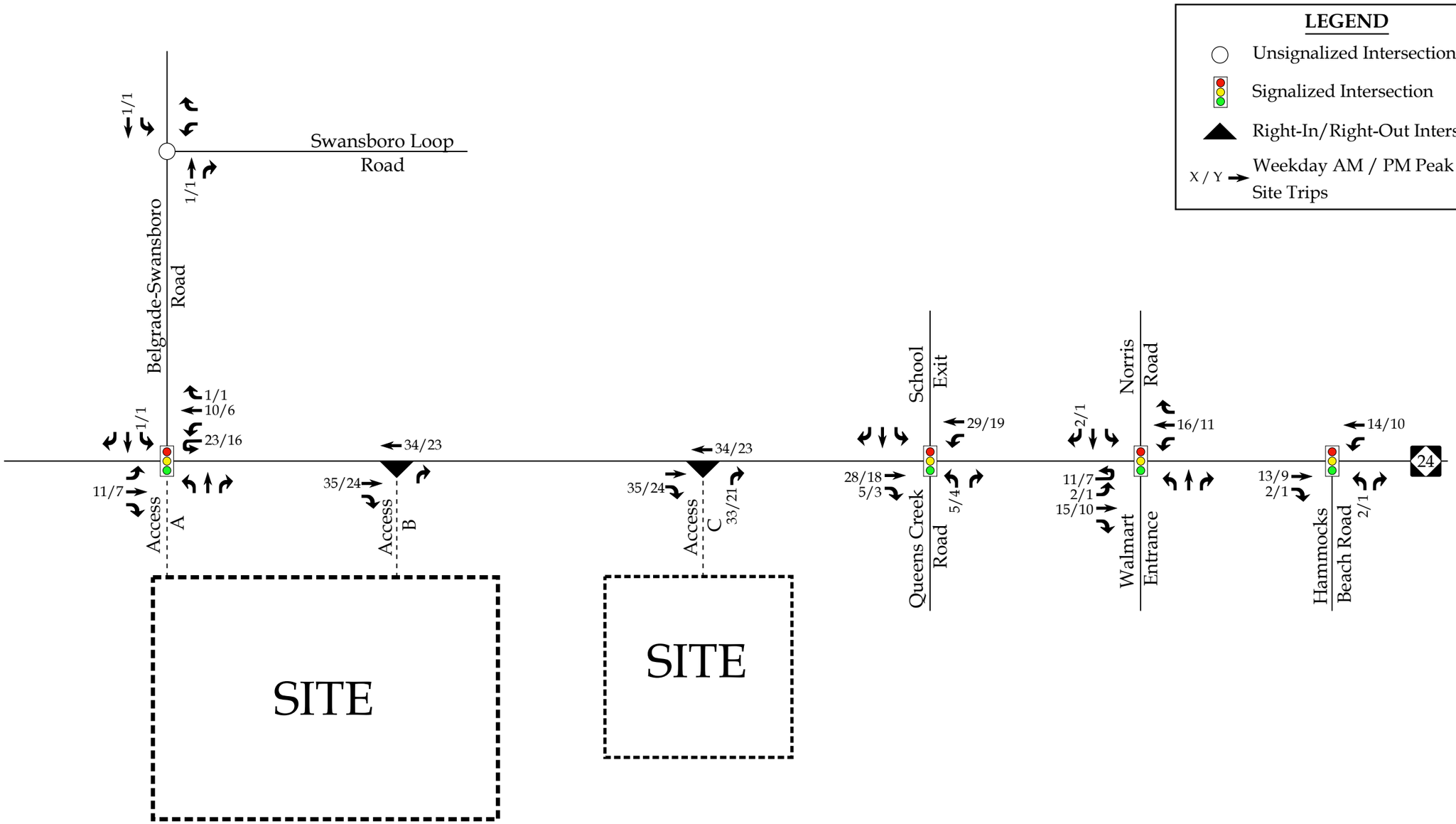


DRMP

Flybridge
Swansboro, NC

Retail Site Trip Assignment

Scale: Not to Scale | Figure 9b

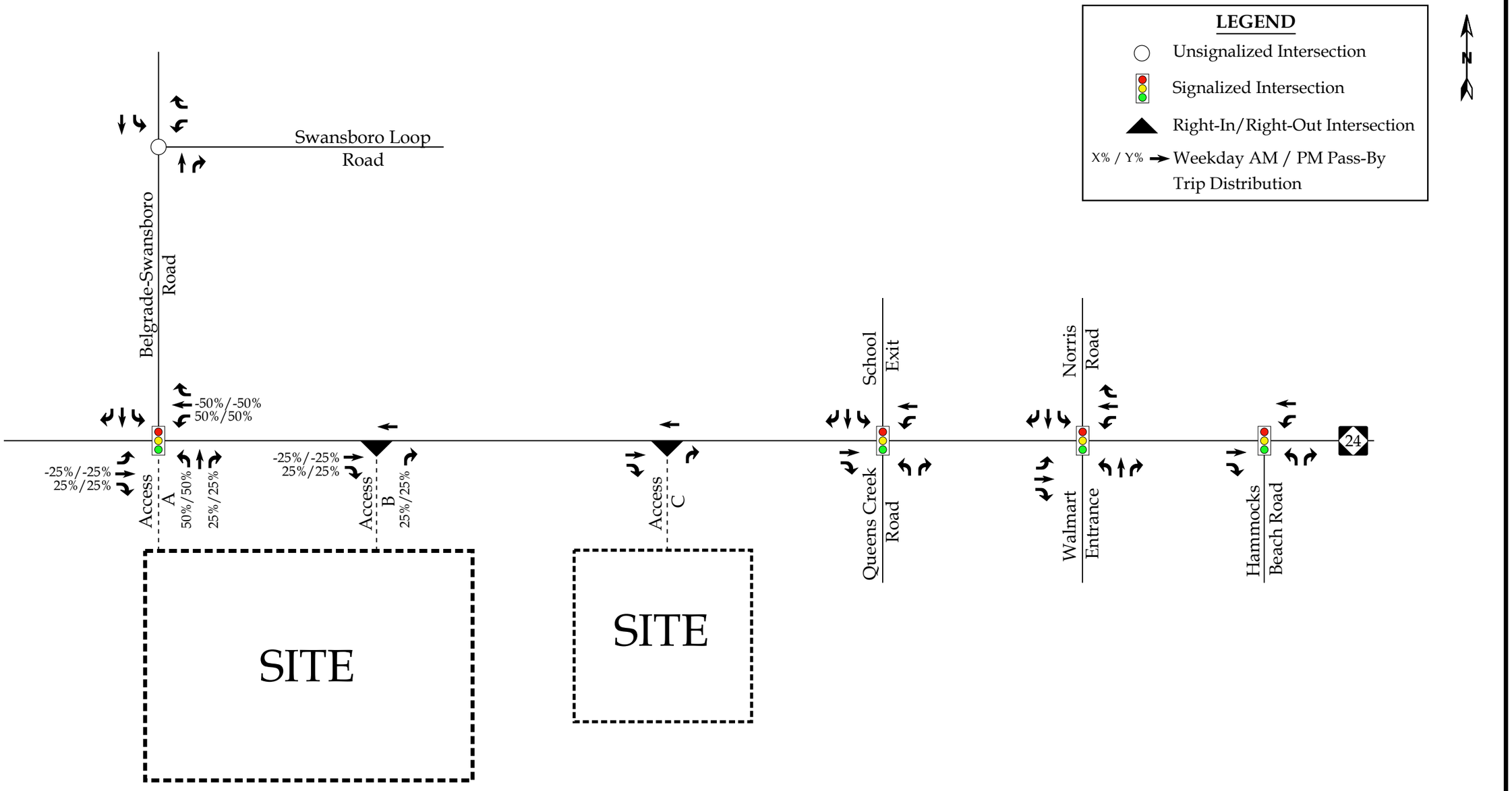


DRMP

Flybridge
Swansboro, NC

Access C
Site Trip Assignment

Scale: Not to Scale | Figure 9c

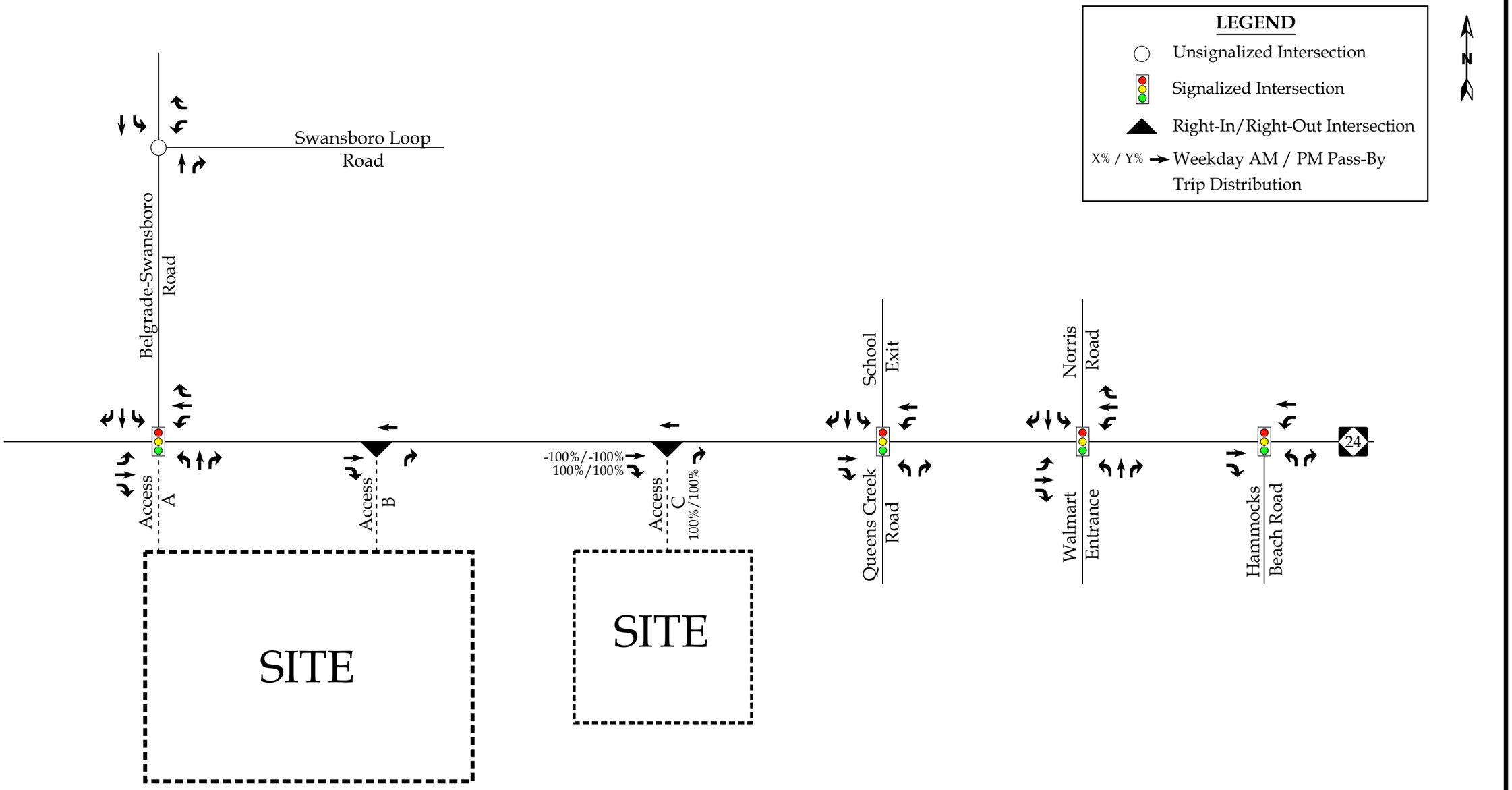


DRMP

Flybridge
Swansboro, NC

Retail
Pass-By Site
Trip Distribution

Scale: Not to Scale | Figure 10a



DRMP

Flybridge
Swansboro, NC

Access C
Pass-By Site
Trip Distribution

Scale: Not to Scale | Figure 10b

LEGEND

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

N

Swansboro Loop Road

Belgrade-Swansboro Road

-31/-55
31/55

-16/-28
16/28

Access A
31/55
16/28

-16/-28
16/28

Access B
16/28

Access C

School Exit

Queens Creek Road

Norris Road

Walmart Entrance

Hammocks Beach Road

24

SITE

SITE

DRMP

Flybridge
Swansboro, NC

Retail
Pass-By Site
Trip Assignment

Scale: Not to Scale | Figure 11a

LEGEND

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

N

Swansboro Loop Road

Belgrade-Swansboro Road

Access A

Access B

-33/-27 → 33/27

Access C

33/27 →

School Exit

Queens Creek Road

Norris Road

Walmart Entrance

Hammocks Beach Road

24

SITE

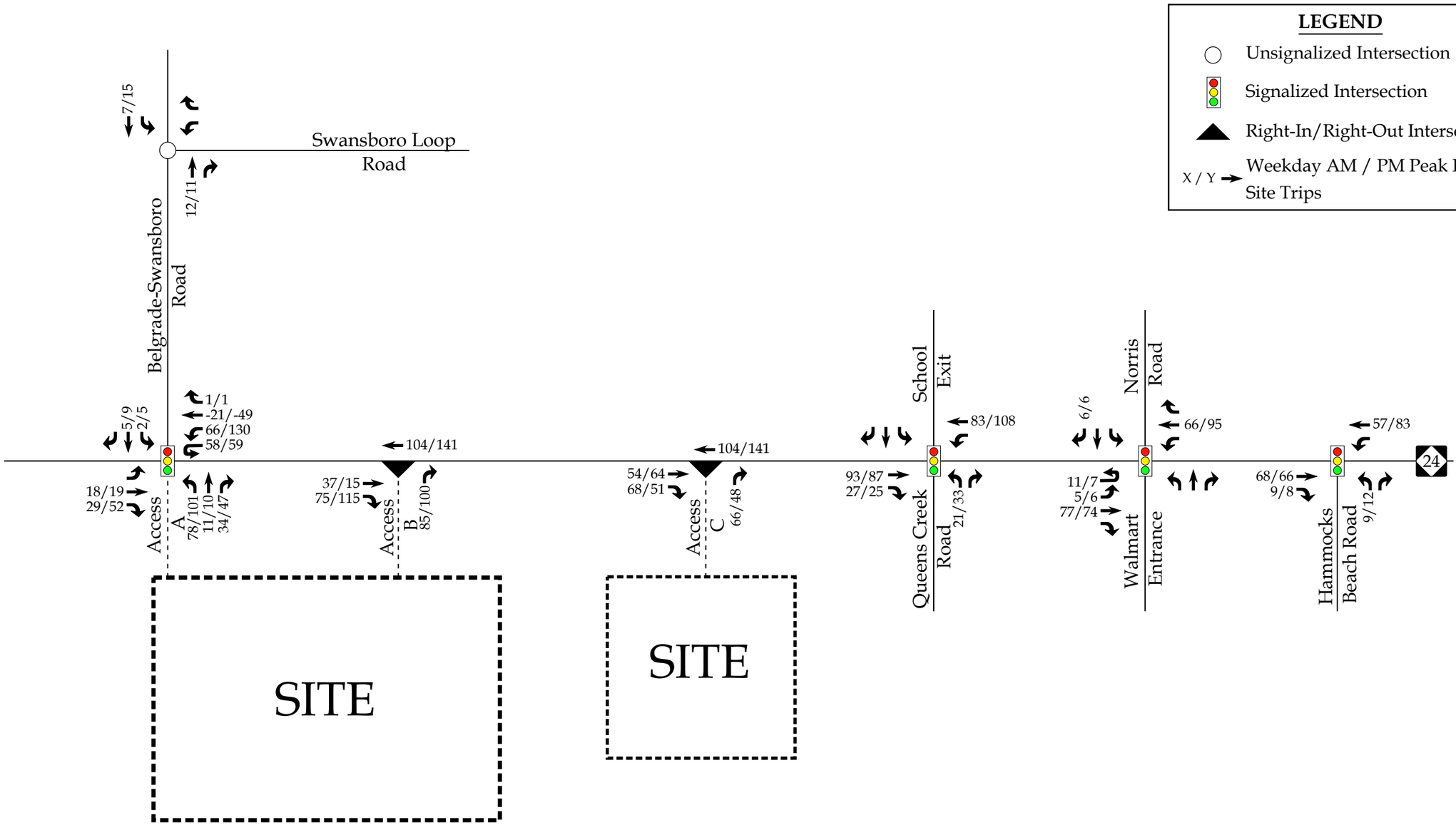
SITE

DRMP

Flybridge
Swansboro, NC

Access C
Pass-By Site
Trip Assignment

Scale: Not to Scale | Figure 11b



DRMP

Flybridge
Swansboro, NC

Total Site Trip Assignment

Scale: Not to Scale | Figure 12

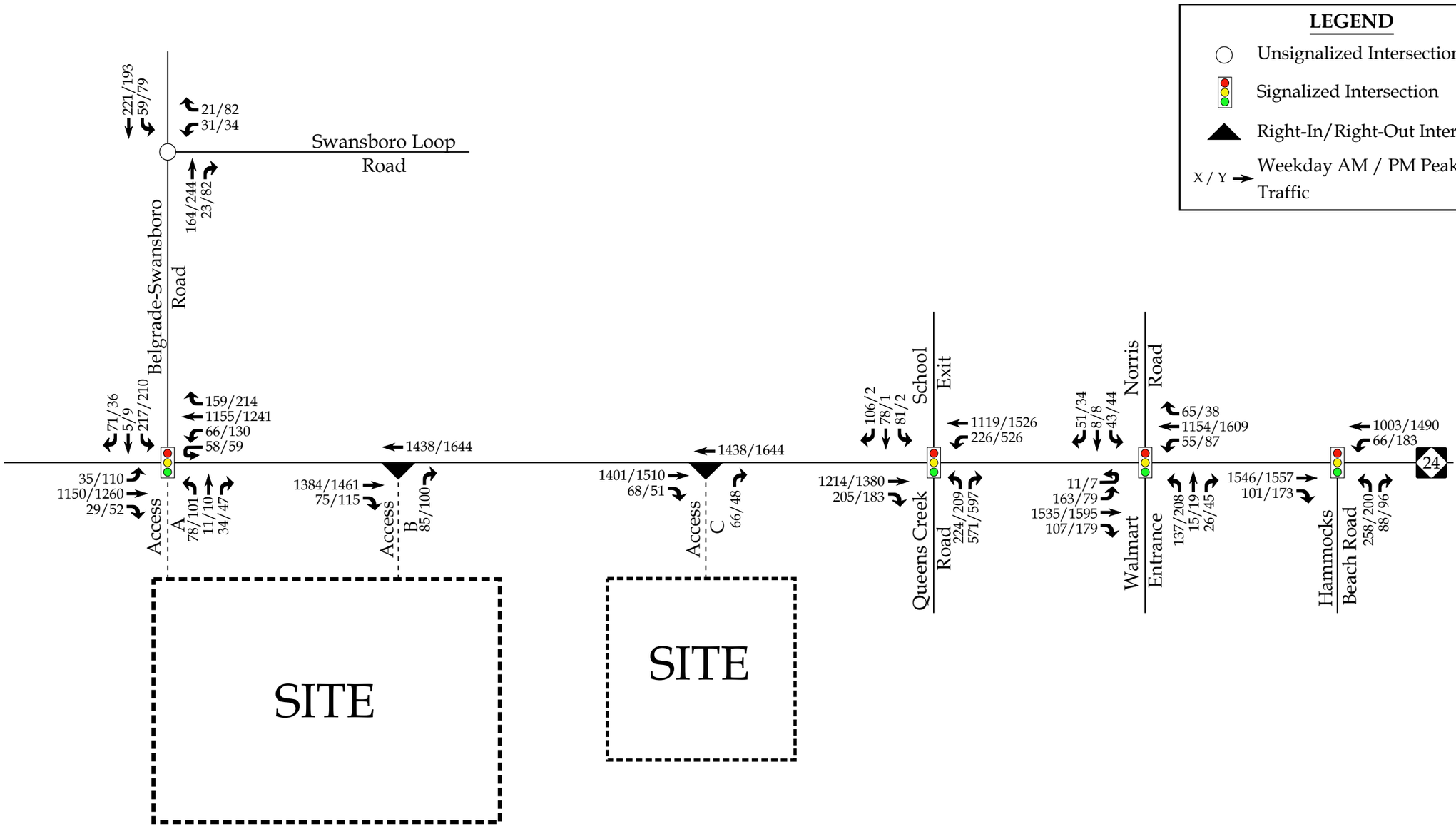
5. 2026 and 2027 BUILD TRAFFIC CONDITIONS

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.



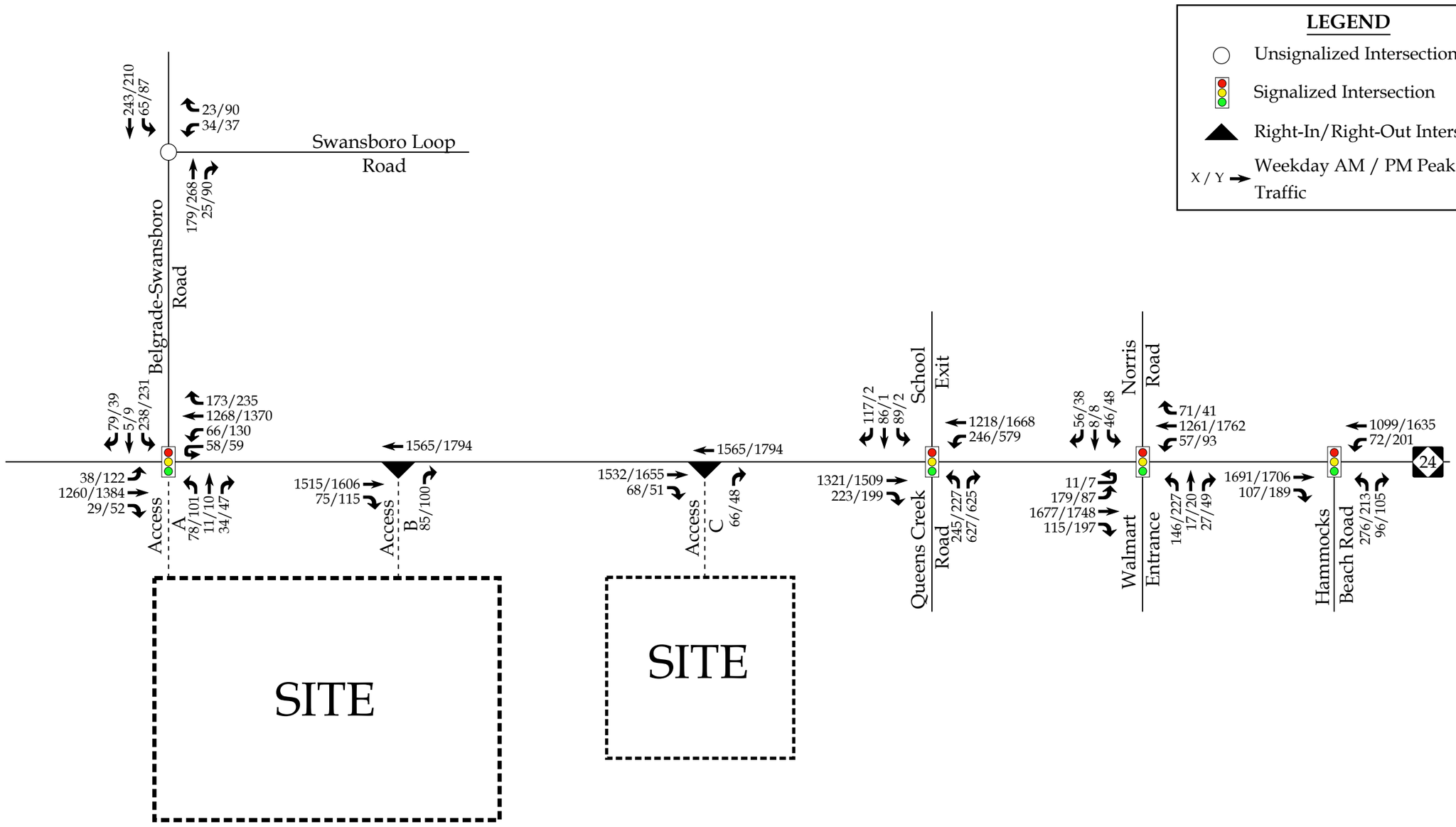
Note: Based on NCDOT Congestion Management guidelines, a volume of 4 vehicles per hour (vph) was analyzed for any movement with less than 4 vph.

DRMP

Flybridge
Swansboro, NC

2026 Build
Peak Hour Traffic

Scale: Not to Scale | Figure 13a



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

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
- NC 24 & Access C

All proposed site driveways were analyzed under 2026 and 2027 build traffic conditions. Refer to Tables 5-11 for a summary of capacity analysis results. Refer to Appendices E-L 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)
			95th	Max					95th	Max				
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	47	120	C	33	C (21)	C (25)	209	250	F	83	D (38)	D (37)
	EBT (2)	--	314	262	C	20			685	533	C	34		
	EBR	100	21	62	B	10			57	200	C	21		
	WBUL	100	151	195	D	46	B (18)		310	200	F	82	C (27)	
	WBT (2)	--	317	288	B	15			642	466	C	21		
	WBR	150	82	221	B	11			167	250	B	14		
	NBTL	100	125	116	D	48	D (42)		174	190	E	67	E (59)	
	NBR	--	42	86	C	27			71	110	D	40		
	SBTL	0	283	404	F	84	E (70)		344	350	F	83	E (77)	
	SBR	50	73	150	C	28			59	150	D	39		
2026 Build Conditions with Improvements	EBL	150	70	249	D	55	C (32)	C (29)	177	250	E	78	D (37)	D (38)
	EBT (2)	--	558	375	C	31			685	554	C	34		
	EBR	100	34	200	B	18			57	200	C	21		
	WBUL	500	183	202	D	55	C (22)		314	252	F	81	C (31)	
	WBT (2)	--	502	389	B	20			773	406	C	26		
	WBR	150	125	250	B	15			213	250	B	17		
	NBTL	--	124	131	D	41	D (39)		174	200	E	67	E (59)	
	NBR	100	51	78	C	31			71	126	D	40		
	SBTL	0	284	323	D	53	D (48)		344	360	F	83	E (77)	
	SBR	50	91	150	C	33			59	150	D	39		

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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	84	D	36	C (21)	C (29)	229	250	F	89	D (41)	D (40)
	EBT (2)	--	357	265	C	21			767	1444	D	38		
	EBR	100	20	134	A	10			54	200	B	20		
	WBUL	100	167	187	D	51	B (18)		307	200	F	88	D (31)	
	WBT (2)	--	362	395	B	16			840	468	C	26		
	WBR	150	86	219	B	10			199	250	B	16		
	NBTL	100	152	144	E	79	E (65)		192	209	E	69	E (60)	
	NBR	--	46	78	C	30			72	162	D	40		
	SBTL	0	343	1067	F	129	F (105)		401	496	F	89	F (82)	
	SBR	50	87	150	C	32			62	150	D	39		
2027 Build Conditions with Improvements	EBL	150	74	249	E	59	C (34)	C (32)	229	250	F	89	D (41)	D (40)
	EBT (2)	--	624	478	C	33			767	1359	D	38		
	EBR	100	33	200	B	18			54	200	B	20		
	WBUL	500	208	180	E	63	C (25)		307	291	F	88	C (31)	
	WBT (2)	--	582	424	C	22			840	467	C	26		
	WBR	150	135	250	B	16			199	250	B	16		
	NBTL	--	126	114	D	44	D (41)		192	179	E	69	E (60)	
	NBR	100	51	84	C	32			72	132	D	40		
	SBTL	0	321	347	E	58	D (52)		401	478	F	89	F (82)	
	SBR	50	99	150	C	34			62	150	D	39		

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. Queueing along the minor-street approaches is expected to decrease significantly. 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)
			95th	Max					95th	Max				
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)	--	522	672	D	36	C (32)	F (95)	973	1491	F	88	E (79)	D (55)
	EBR	800	98	167	A	9			139	900	B	14		
	WBL	125	448	225	F	282	E (61)		830	225	F	130	D (38)	
	WBT (2)	--	333	768	B	16			247	1335	A	6		
	NBL	200	384	300	F	100	F (273)		399	300	E	71	D (48)	
	NBR	--	970	1048	F	342			626	985	D	40		
	SBL	--	118	166	D	48	E (67)		17	30	E	63	E (64)	
	SBTR	--	309	396	E	75			26	38	E	65		
2026 Build Conditions with Improvements	EBT (2)	--	800	1325	E	69	E (61)	E (61)	1070	1200	D	53	D (47)	D (50)
	EBR	800	127	756	B	13			41	757	A	5		
	WBL	125	358	225	E	74	C (28)		866	225	F	172	D (51)	
	WBT (2)	--	432	596	B	19			383	1346	A	9		
	NBL	200	289	300	E	69	F (105)		292	300	E	75	D (55)	
	NBR	--	823	1046	F	119			588	992	D	48		
	SBL	--	129	146	E	59	F (102)		17	23	E	64	E (64)	
	SBTR	--	348	484	F	121			26	43	E	65		

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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)	--	592	604	D	36	C (32)	F (124)	1115	1639	F	138	F (123)	E (77)
	EBR	800	105	251	A	9			151	900	B	14		
	WBL	125	526	225	F	381	E (77)		848	225	F	177	D (52)	
	WBT (2)	--	374	1136	B	16			305	1349	A	8		
	NBL	200	465	300	F	146	F (376)		442	300	E	71	D (53)	
	NBR	--	1168	1048	F	465			753	1037	D	46		
	SBL	--	167	378	D	53	F (90)		17	33	E	63	E (64)	
	SBTR	--	380	698	F	106			26	61	E	65		
2027 Build Conditions with Improvements	EBT (2)	--	910	1644	F	103	F (90)	F (81)	1134	1644	F	130	F (116)	E (75)
	EBR	800	139	900	B	13			74	900	A	6		
	WBL	125	405	225	F	89	C (32)		848	225	F	177	D (52)	
	WBT (2)	--	493	547	C	21			305	1338	A	8		
	NBL	200	318	300	E	71	F (133)		442	300	E	71	D (53)	
	NBR	--	940	1048	F	157			753	1046	D	46		
	SBL	--	140	271	E	61	F (121)		17	23	E	63	E (64)	
	SBTR	--	388	737	F	147			26	56	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 7% of the total traffic at the intersection.

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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 responsibly of a single developer given that existing and no-build conditions are unsatisfactory.

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)	
	WBTTR	--	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)	
	WBTTR	--	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	278	246	D	50	C (26)	C (27)	88	149	E	56	B (11)	C (24)
	EBT (2)	--	714	512	C	24			193	242	A	9		
	EBR	150	72	250	B	12			31	136	A	7		
	WBL	150	78	249	D	46	C (27)		180	250	F	97	C (27)	
	WBTTR	--	443	429	C	26			833	770	C	23		
	NBL	0	147	194	D	44	D (41)		380	392	F	103	F (91)	
	NBTR	--	52	78	C	31			102	121	D	50		
	SBLTR	--	109	146	D	36	D (36)		134	160	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)	
	WBTTR	--	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	308	433	E	56	C (31)	C (32)	87	183	E	57	B (12)	C (28)
	EBT (2)	--	825	617	C	29			200	254	B	10		
	EBR	150	77	250	B	12			31	164	A	7		
	WBL	150	80	250	D	47	C (31)		178	250	F	99	C (32)	
	WBTTR	--	514	598	C	31			987	774	C	29		
	NBL	0	157	183	D	48	D (44)		430	397	F	127	F (109)	
	NBTR	--	54	90	C	31			108	116	D	50		
	SBLTR	--	116	156	D	37	D (37)		144	172	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

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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)
			95th	Max					95th	Max				
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	C (30)		143	218	E	69	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	D (42)		194	237	E	70	E (70)	
	NBLR	--	--	231	--	--			--	758	--	--		
2026 Build Conditions	EBU	325	6	23	A	9	B (19)	B (18)	1	46	A	6	A (6)	B (18)
	EBT (2)	--	554	578	C	20			172	235	A	7		
	EBR	550	26	130	A	3			29	100	A	2		
	WBL	200	101	113	D	49	A (8)		358	300	F	127	B (20)	
	WBT (2)	--	138	195	A	6			322	1415	A	7		
	NBL	150	242	240	D	44	D (44)		202	250	E	71	E (71)	
	NBLR	--	--	277	--	--			--	1138	--	--		
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	D (50)		209	250	E	72	E (72)	
	NBLR	--	--	280	--	--			--	960	--	--		
2027 Build Conditions	EBU	325	6	0	A	8	C (20)	B (20)	1	33	A	8	A (9)	C (20)
	EBT (2)	--	673	575	C	21			257	242	A	9		
	EBR	550	29	66	A	2			45	116	A	3		
	WBL	200	116	181	E	56	A (9)		401	300	F	151	C (24)	
	WBT (2)	--	156	271	A	6			386	1421	A	8		
	NBL	150	304	248	D	54	D (54)		217	250	E	73	E (73)	
	NBLR	--	--	328	--	--			--	1140	--	--		

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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						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	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	60	B[2]	12	B (12)[2]	N/A	23	78	B[2]	13	B (13)[2]	N/A
	NBTR	--	--	--	--	--	--		--	13	--	--		
	SBLT	--	5	48	A[1]	8	A (8)[1]		5	78	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	54	B[2]	13	B (13)[2]	N/A	28	84	B[2]	14	B (14)[2]	N/A
	NBTR	--	--	--	--	--	--		--	4	--	--		
	SBLT	--	5	70	A[1]	8	A (8)[1]		8	87	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	--	15	--	--	--	N/A
	EBR	100	--	--	--	--	--		--	--	--	--	--	
	WBT (2)	--	--	--	--	--	--		--	127	--	--	--	
	NBR	--	28	94	C[1]	19	C (19)[1]		38	149	C[1]	22	C (22)[1]	
2027 Build Conditions	EBT (2)	--	--	--	--	--	--	N/A	--	520	--	--	--	N/A
	EBR	100	--	--	--	--	--		--	200	--	--	--	
	WBT (2)	--	--	124	--	--	--		--	15	--	--	--	
	NBR	--	33	112	C[1]	22	C (22)[1]		45	560	D[1]	26	D (26)[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.

7.7. NC 24 & Access C

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

Table 11: Analysis Summary of NC 24 & Access C

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	--	183	--	--	--	N/A
	EBR	100	--	--	--	--	--		--	40	--	--	--	
	WBT (2)	--	--	--	--	--	--		--	--	--	--	--	
	NBR	--	20	65	C[1]	19	C (19)[1]		15	88	C[1]	19	C (19)[1]	
2027 Build Conditions	EBT (2)	--	--	--	--	--	--	N/A	--	580	--	--	--	N/A
	EBR	100	--	--	--	--	--		--	200	--	--	--	
	WBT (2)	--	--	--	--	--	--		--	--	--	--	--	
	NBR	--	23	105	C[1]	21	C (21)[1]		18	366	C[1]	21	C (21)[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 build traffic conditions 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 two 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 325 primary trips (147 entering and 178 exiting) during the weekday AM peak hour and 387 primary trips (219 entering and 168 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

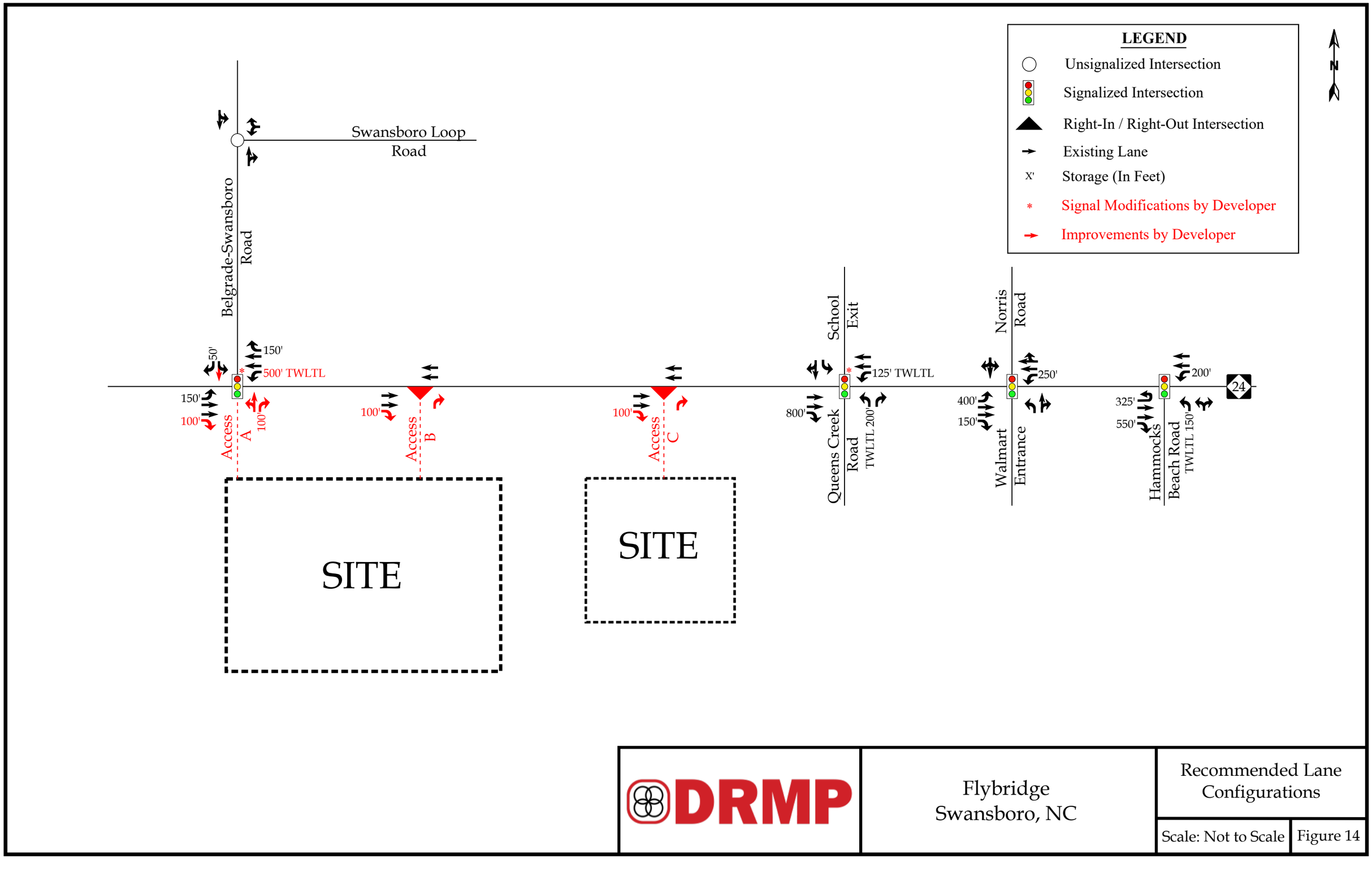
- Signal timing modifications.

NC 24 & Access B

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

NC 24 & Access C

- 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.



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Swansboro, NC

Recommended Lane Configurations

Scale: Not to Scale | Figure 14