

TRANSPORTATION IMPACT ANALYSIS

7630 Knightdale Boulevard Development

Knightsdale, NC

*Prepared for
Brown Investment Properties*





Transportation Impact Analysis

7630 Knightdale Boulevard Development Knightdale, NC

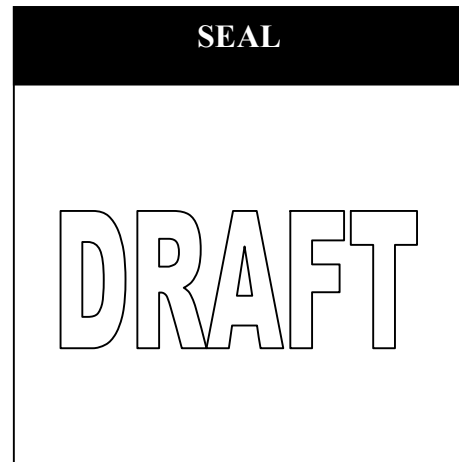
Prepared for Brown Investment Properties
June 18, 2020

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7630 Knightdale Boulevard Development – Transportation Impact Analysis
Knightdale, NC
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**7630 Knightdale Boulevard Development – Transportation Impact Analysis
Knightdale, NC
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1.0 Introduction

The 7630 Knightdale Boulevard Development is to be located off US 64 BUS (Knightdale Boulevard) in Knightdale, North Carolina. As currently planned, this site development will consist of 195 dwelling units of multi-family housing and 12,400 square feet of the general office building. The full build-out year is assumed as 2023. This development utilizes three (3) site accesses. One(1) right-in right-out (RIRO) access and one (1) right out (RO) only access off US 64 BUS and one (1) full movement access off Knightdale Station Run. The site plan is shown in Figure 1. Figure 2A and Figure 2B show the site location map and vicinity map, respectively.

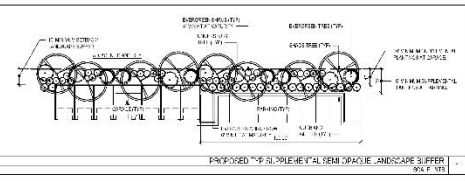
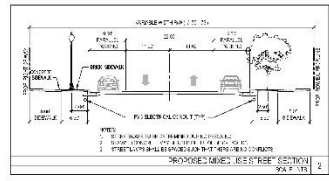
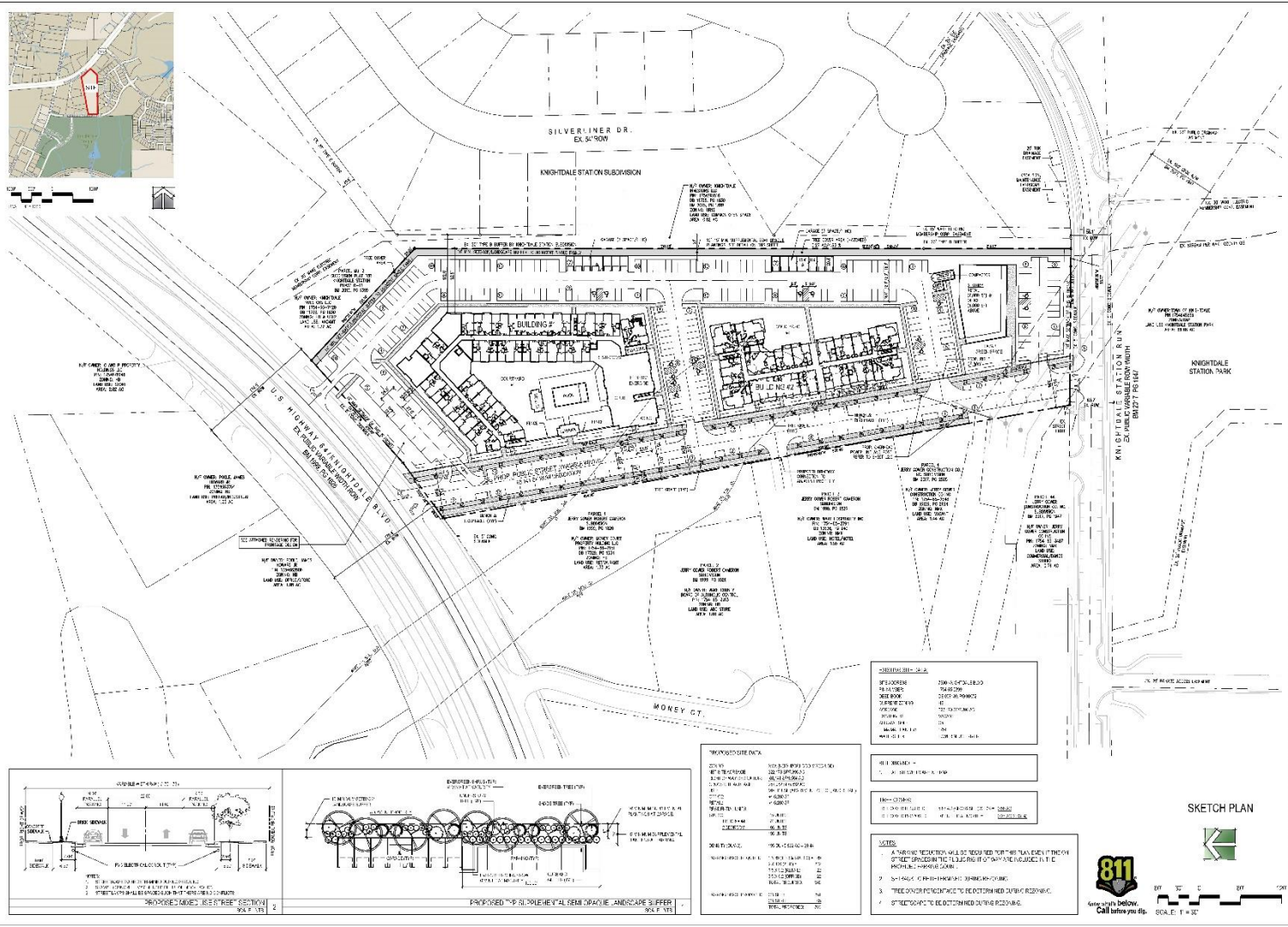
DAVENPORT was retained to determine the potential traffic impacts of this development and to identify transportation improvements that may be required to accommodate the impacts of both background traffic and new development traffic. The following intersections were included in the study:

- US 64 BUS (Knightdale Boulevard) at SR 2049 (Old Knight Road/North 1st Ave)
- US 64 BUS (Knightdale Boulevard) at Carolinian Avenue
- SR 2049 (North 1st Avenue) at Knightdale Station Run
- Carolinian Avenue at Knightdale Station Run
- US 64 BUS (Knightdale Boulevard) at Site Access 1 (RIRO)
- US 64 BUS (Knightdale Boulevard) at Site Access 2 (RO)
- Knightdale Station Run at Site Access 3

The study intersections were analyzed during the AM (7 am – 9 am) and PM (4 pm – 6 pm) peaks for the following conditions. The Town of Knightdale standards requires a horizon year analysis (build-out + 10 years).

- 2020 Existing Conditions
- 2023 Future No-build Conditions
- 2023 Future Build Conditions
- 2023 Future Build with Improvements
- 2033 Future No-build Conditions
- 2033 Future Build Conditions

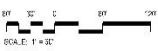
The North Carolina Department of Transportation (NCDOT) and Town of Knightdale were contacted to obtain background information and to ascertain the elements to be covered in this Transportation Impact Analysis (TIA). The approved scope for this TIA is included in the appendix. Information regarding the property was provided by Brown Investment Properties and JDAVIS Architects.



REVISIONS

NO.	DATE	DESCRIPTION
1	08/11/10	ISSUED FOR PERMIT
2	08/11/10	REVISED PER COMMENTS
3	08/11/10	REVISED PER COMMENTS
4	08/11/10	REVISED PER COMMENTS
5	08/11/10	REVISED PER COMMENTS
6	08/11/10	REVISED PER COMMENTS
7	08/11/10	REVISED PER COMMENTS
8	08/11/10	REVISED PER COMMENTS
9	08/11/10	REVISED PER COMMENTS
10	08/11/10	REVISED PER COMMENTS

- NOTES:**
1. ALL DIMENSIONS ARE IN FEET AND INCHES.
 2. ALL DIMENSIONS ARE TO FACE UNLESS NOTED OTHERWISE.
 3. ALL DIMENSIONS ARE TO CENTERLINE UNLESS NOTED OTHERWISE.
 4. ALL DIMENSIONS ARE TO CENTERLINE UNLESS NOTED OTHERWISE.
 5. ALL DIMENSIONS ARE TO CENTERLINE UNLESS NOTED OTHERWISE.
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 10. ALL DIMENSIONS ARE TO CENTERLINE UNLESS NOTED OTHERWISE.



Brown Investment Properties
7630 Knightdale Boulevard
 Knightdale, North Carolina 27545

SKETCH PLAN

FOR REVIEW ONLY
 NOT FOR CONSTRUCTION

SKETCH PLAN

PROJECT	NO.	DATE
7630 Knightdale Blvd	1	08/11/10
7630 Knightdale Blvd	2	08/11/10
7630 Knightdale Blvd	3	08/11/10
7630 Knightdale Blvd	4	08/11/10
7630 Knightdale Blvd	5	08/11/10
7630 Knightdale Blvd	6	08/11/10
7630 Knightdale Blvd	7	08/11/10
7630 Knightdale Blvd	8	08/11/10
7630 Knightdale Blvd	9	08/11/10
7630 Knightdale Blvd	10	08/11/10

L1.0



FIGURE 1
 SITE PLAN

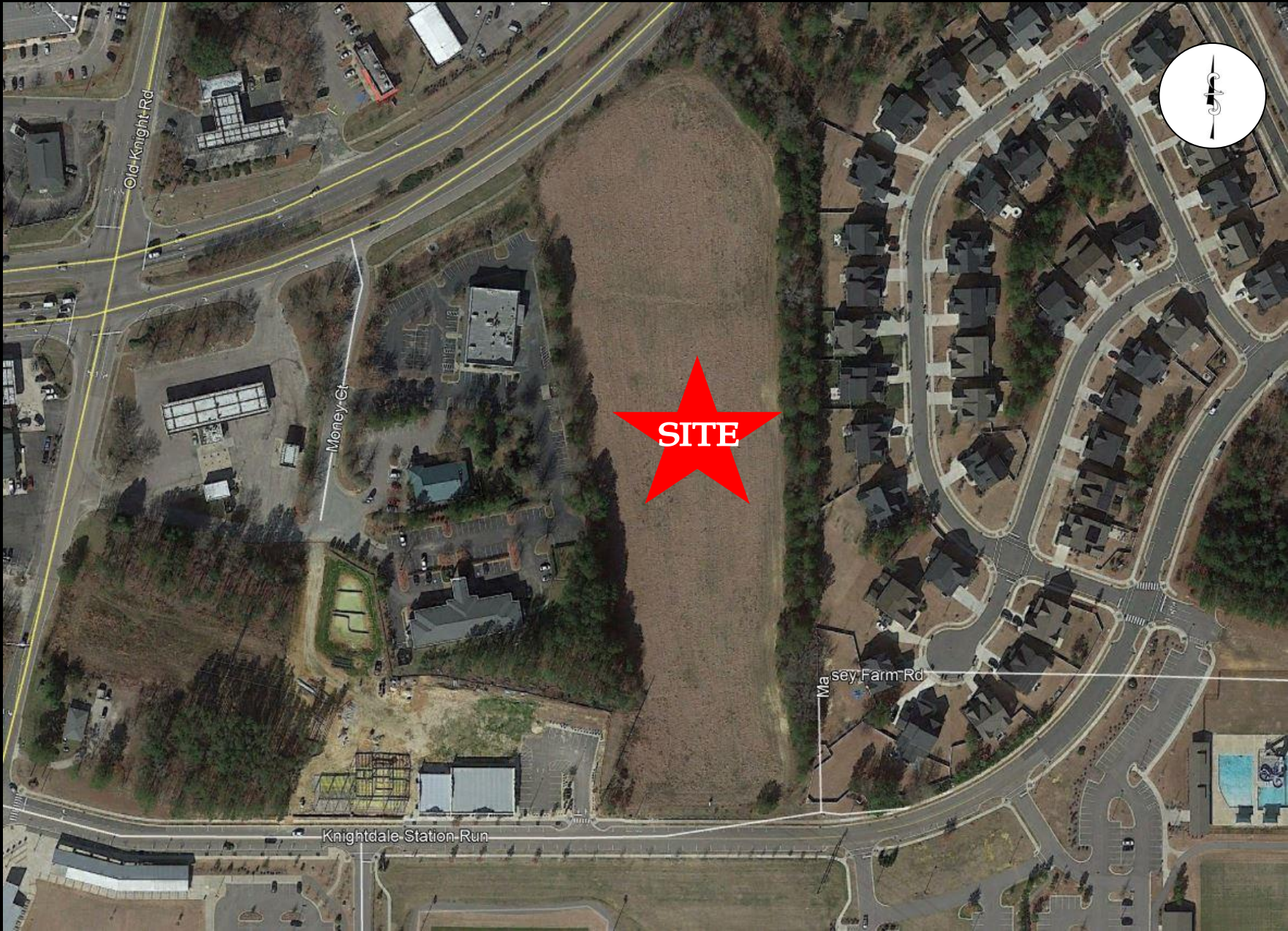


FIGURE 2A
SITE LOCATION MAP

SITE INDICATOR





2.0 Existing Conditions

2.1 Inventory

A field investigation was conducted by DAVENPORT staff to determine the existing roadway conditions in the study area. Table 2.1 contains the results of this effort. Figure 3 illustrates the existing lane geometry.

Table 2.1 - Street Inventory					
Facility Name	Route #	Typical Cross Section	Pavement Width	Speed Limit	Maintained By
Knightdale Boulevard	US 64 BUS	4-Lane Divided	Varies from ~100' to ~120'	45 MPH	NCDOT
Old Knight Road	SR 2049	2-Lane Undivided	Varies from ~38' to ~56'	45 MPH	NCDOT
North 1 st Ave	SR 2049	2-Lane Undivided	Varies from ~38' to ~56'	25 MPH	NCDOT
Carolinian Avenue	NA	2-Lane Divided	Varies from ~42' to ~60'	25 MPH	TOWN
Knightdale Station Run	NA	2-Lane Undivided	Approx. 36'	25 MPH	TOWN

2.2 Existing Traffic Volumes

Existing traffic volumes for this project were collected by Quality Counts staff. Table 2.2 contains the dates these counts were conducted. Schools were not in session at the time of traffic counts. A system peak hour was used for traffic analysis. The peak hour occurred at approximately 7:30 to 8:30 AM, and 5:00 to 6:00 PM. More information can be found in the Traffic Volume Data section of the appendix.

Table 2.2 - Traffic Volume Data		
<u>Count Location:</u>	<u>Date Taken:</u>	<u>By:</u>
Knightdale Boulevard at Old Knight Road/ North 1 st Avenue	06/02/2020	Quality Counts
Knightdale Boulevard at Carolinian Ave	06/02/2020	Quality Counts
Carolinian Ave at Knightdale Station Run	06/02/2020	Quality Counts
North 1 st Ave at Knightdale Station Run	06/02/2020	Quality Counts

2.3 2020 Base Traffic Volumes

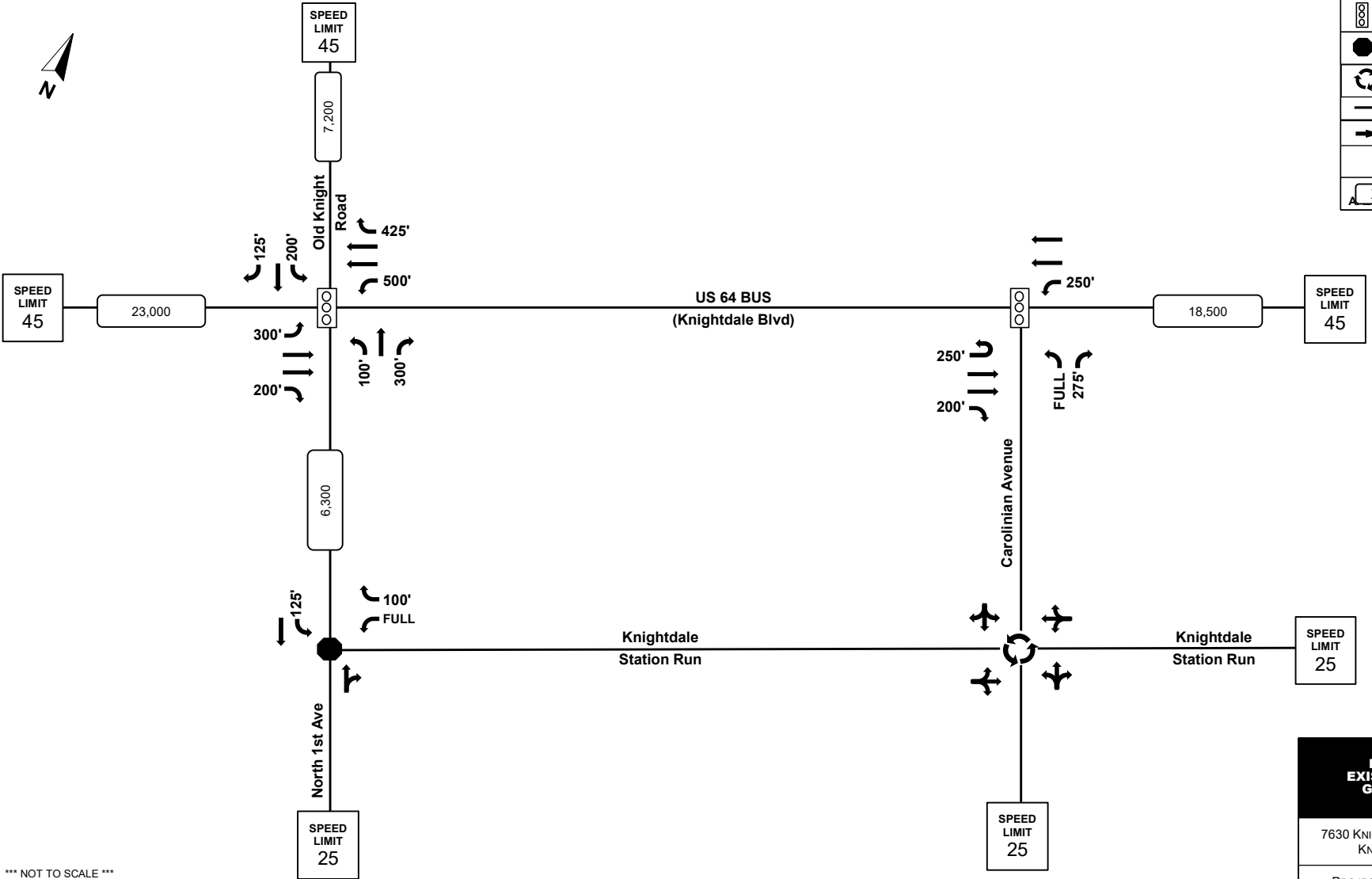
The 2020 Base Traffic volumes were obtained using the following methodology:

- The annual growth rate was found based on the NCDOT AADT from 2009- 2018 to be 2.234%
- Applied the growth rate of 2.234% to the 2010 existing counts obtained from Knightdale Station Development TIA to Project 2020 Volumes for the intersection of US 64 Bus at Old Knight Road/N 1st Ave intersection
- Compared Projected 2020 volumes to the raw data of 2020 TMC, to establish the multiplication factor (MF) for all the approaches
- Applied the multiplication factor to the raw data 2020 turning movements for the intersection of US 64 Bus at Old Knight Road/North 1st Ave and balanced the volumes at other intersections

Figure 4 shows the 2020 Base Traffic Volumes.



LEGEND	
	SIGNALIZED INTERSECTION
	UNSIGNALIZED INTERSECTION
	ROUNDABOUT
	ROADWAY
	TRAFFIC MOVEMENT
	BLACK = EXISTING
	XXXX 2018



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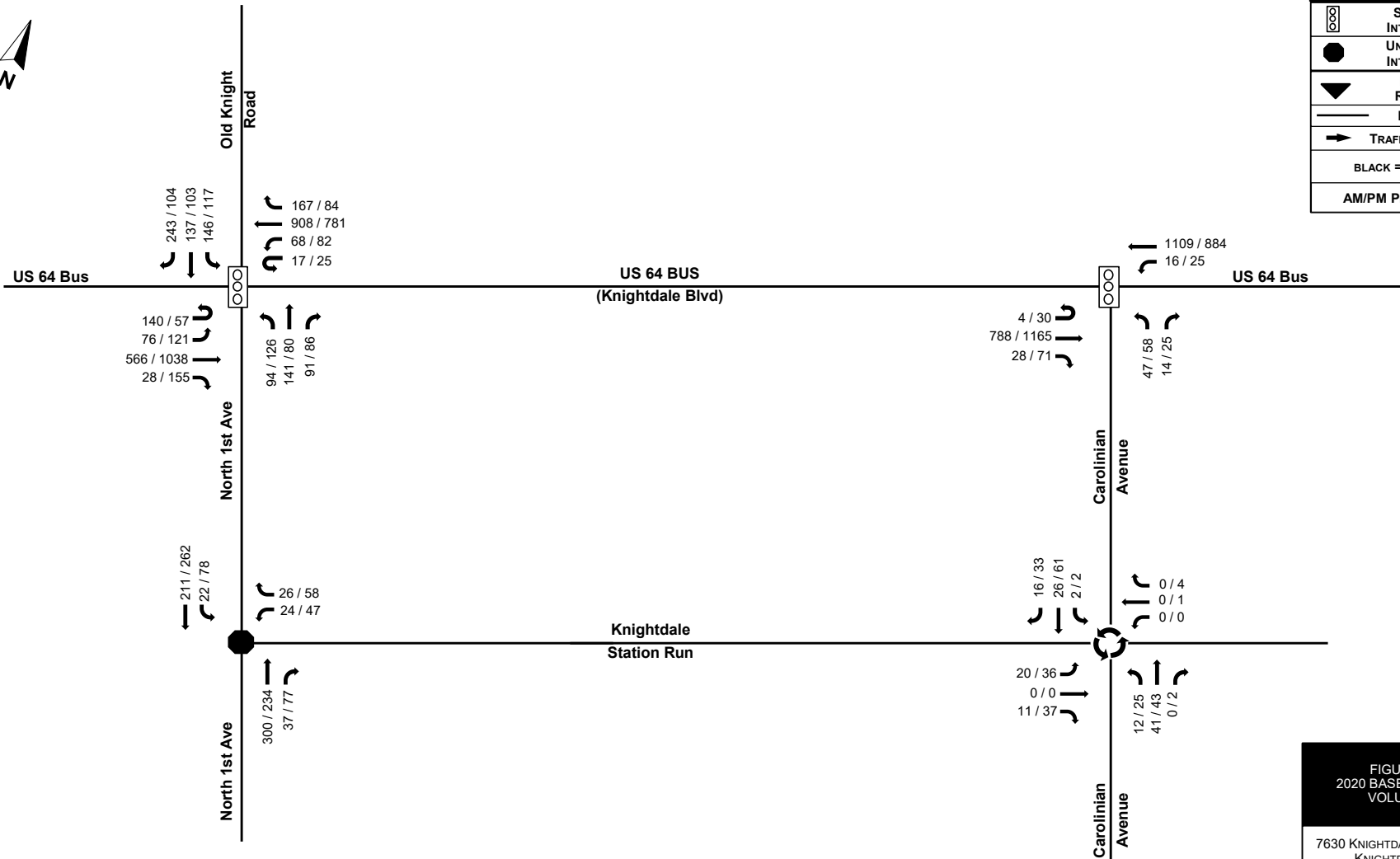
**FIGURE 3
EXISTING LANE
GEOMETRY**

7630 KNIGHTDALE BOULEVARD
KNIGHTDALE, NC

PROJECT NUMBER 190430



LEGEND	
	SIGNALIZED INTERSECTION
	UNSIGNALIZED INTERSECTION
	RIGHT IN/ RIGHT OUT
	ROADWAY
	TRAFFIC MOVEMENT
	BLACK = EXISTING
	AM/PM PEAK HOURS



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FIGURE 4
2020 BASE TRAFFIC
VOLUMES

7630 KNIGHTDALE BOULEVARD
KNIGHTDALE, NC

PROJECT NUMBER 190430

3.0 Approved Developments and Committed Improvements

3.1 Approved Developments

Approved developments are developments that have been recently approved in the area, but not yet constructed. Per NCDOT and the Town of Knightdale staff, an approved development (Knightdale Station) is to be considered in this analysis.

The site trips from phase 4 of Knightdale Station development are included as approved development trips. The proposed phase 4 of Knightdale Station development is to be located along the Carolinian Avenue. The development is planned to consist of 150 single-family homes and 50,000 square feet of commercial. The trip generation and associated site trips can be found in the approved development section of the appendix and Figure A.

3.2 Committed Improvements

Committed Improvements are improvements that are planned by NCDOT, the Town, or a developer in the area, but not yet constructed. Per the scoping with the Town NCDOT, there is no committed improvement planned near the proposed development.

4.0 Methodology

4.1 Base Assumptions and Standards

In general, the analysis for this project was conducted utilizing commonly accepted NCDOT standards. The following table contains a summary of the base assumptions:

Table 4.1 - Assumptions	
Peak Hour Factor	0.90
Background Traffic Annual Growth Rate	3.0% per year for all roadways till 2023 1.0% per year for all roadways from 2023 to 2033
Analysis Software	Synchro/SimTraffic Version 10.0 SIDRA Intersection 9.0
Base Signal Timing/Phasing	NCDOT
Lane widths	12-feet
Truck percentages	2%

4.2 Trip Generation

7630 Knightdale Boulevard is proposed to have 195 dwelling units of multi-family housing and 12,400 square feet of the general office building. The trip generation potential of 7630 Knightdale Boulevard was computed based on the 10th edition of the ITE Trip Generation Manual. This trip generation rate was approved by the Town of Knightdale and NCDOT and Table 4.2 shows the results.

Table 4.2 ITE Trip Generation									
7630 Knightdale Boulevard Development									
Average Weekday Driveway Volumes					24 Hour Two-Way	AM Peak Hour		PM Peak Hour	
<u>Land Use</u>	<u>ITE Land Code</u>	<u>Size</u>		<u>Method/Type</u>	<u>Volume</u>	<u>Enter</u>	<u>Exit</u>	<u>Enter</u>	<u>Exit</u>
Multi-Family Housing	221	195	Dwelling Units	Adjacent/Equation	1,061	17	49	51	33
General Office Building*	710	12.4	1000 GFA	Adjacent/Equation	140	33	5	3	13
Total Unadjusted Trips					1,201	50	54	54	46
Residential Internal Capture						0	-1	0	-1
Office Internal Capture						-1	0	-1	0
Total Internal Trips Reduction					-	-1	-1	-1	-1
Total Adjusted (Primary) Trips					-	49	53	53	45
*Based on NCDOT Congestion Management for LUC 710, it is suggested to use "generator/equation" but based on the suggestion from the Town "adjacent/equation" was used									

4.3 Trip Distribution

Site trips for this proposed development were distributed based on the existing traffic patterns and engineering judgment. The trip distribution diagram for residential and office trips are shown in Figure 5A and Figure 5B, respectively.

The directional distributions for residential site trips are as follows:

- 45% to and from the west on US 64 BUS
- 35% to and from the east on US 64 BUS
- 10% to and from the south on North 1st Avenue
- 5% to and from the north on Old Knight Road
- 5% to and from the east on Knightdale Station Run

The directional distributions for office site trips are as follows:

- 65% to and from the west on US 64 BUS
- 20% to and from the east on US 64 BUS
- 10% to and from the south on North 1st Avenue
- 5% to and from the north on Old Knight Road

4.4 2023 Future No Build Traffic

The 2023 future no-build traffic volumes were computed by applying a 3.0% compounded annual growth rate to the 2020 base traffic volumes and adding the approved development trips. Figure 6 shows the 2023 future no-build traffic volumes for AM and PM peaks. Approved development trips are shown in Figure A.

4.5 2023 Future Build Total Traffic

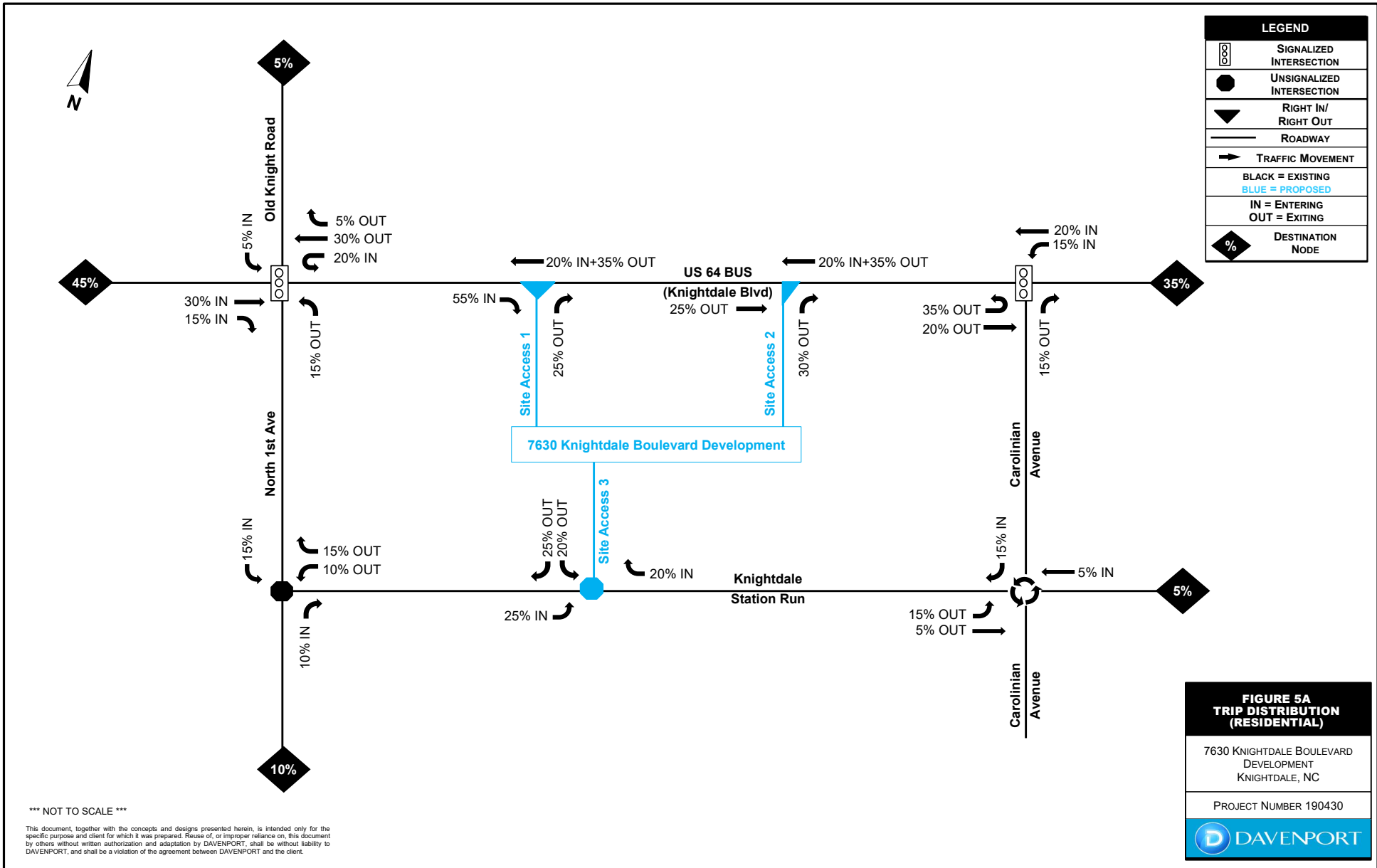
The 2023 build-out traffic volumes were obtained by summing the 2023 future no-build volumes, residential site trips, and office site trips due to the proposed development. Residential site trips and office site trips are shown in Figure 7A and Figure 7B, respectively. The 2023 future build volumes are shown for AM and PM peaks in Figure 8.

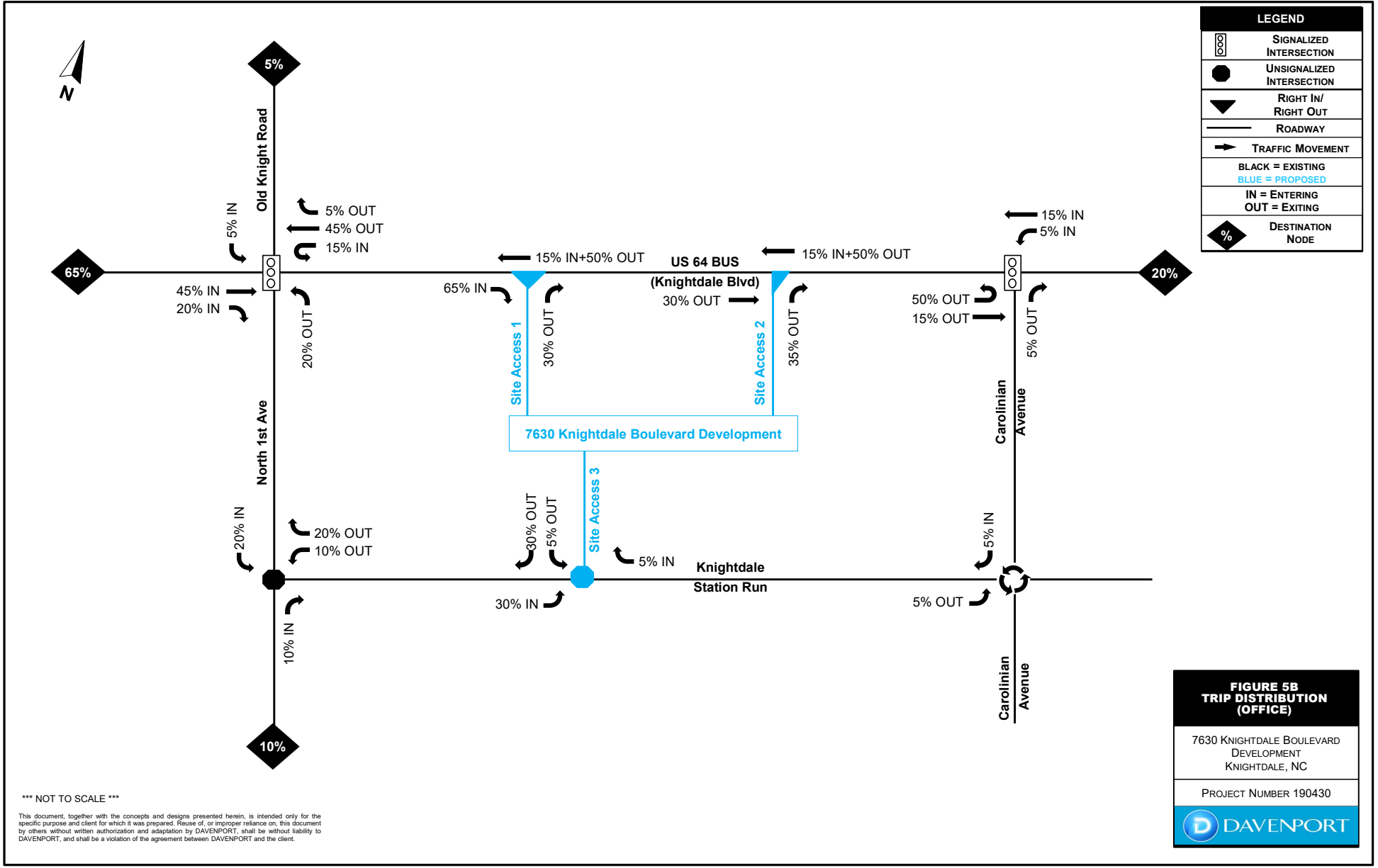
4.6 2033 Future No Build Traffic

The 2033 future no-build traffic volumes were computed by applying a 1.0% compounded annual growth rate to the 2023 projected traffic volumes and adding the approved development trips. Figure 9 shows the 2033 future no-build traffic volumes for AM and PM peaks. Approved development trips are shown in Figure A.

4.7 2033 Future Build Total Traffic

The 2033 build-out traffic volumes were obtained by summing the 2033 future no-build volumes, residential site trips, and office site trips due to the proposed development. The 2033 future build volumes are shown for AM and PM peaks in Figure 10.



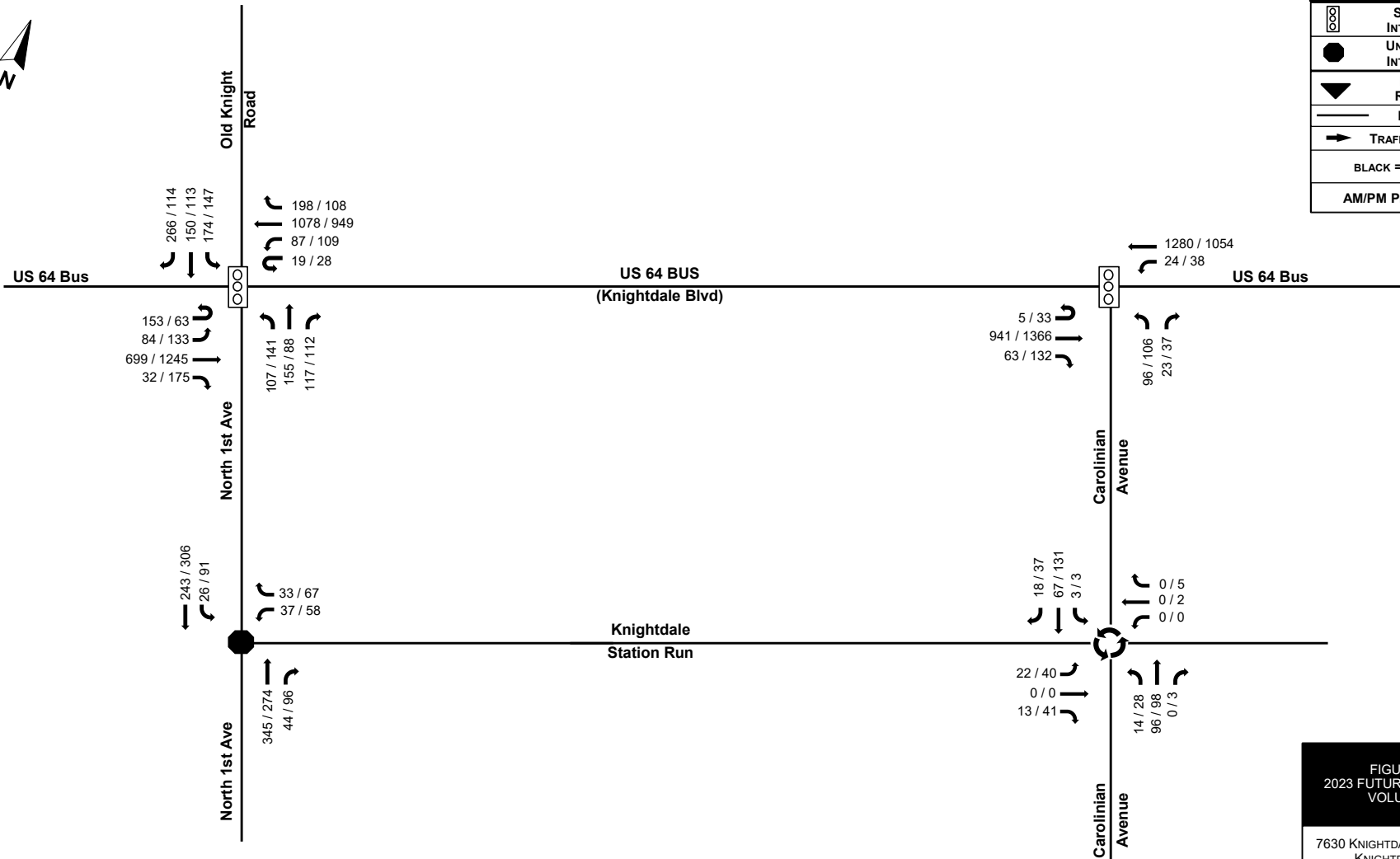


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LEGEND	
	SIGNALIZED INTERSECTION
	UNSIGNALIZED INTERSECTION
	RIGHT IN/ RIGHT OUT
	ROADWAY
	TRAFFIC MOVEMENT
	BLACK = EXISTING
	AM/PM PEAK HOURS



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FIGURE 6
2023 FUTURE NO BUILD
VOLUMES

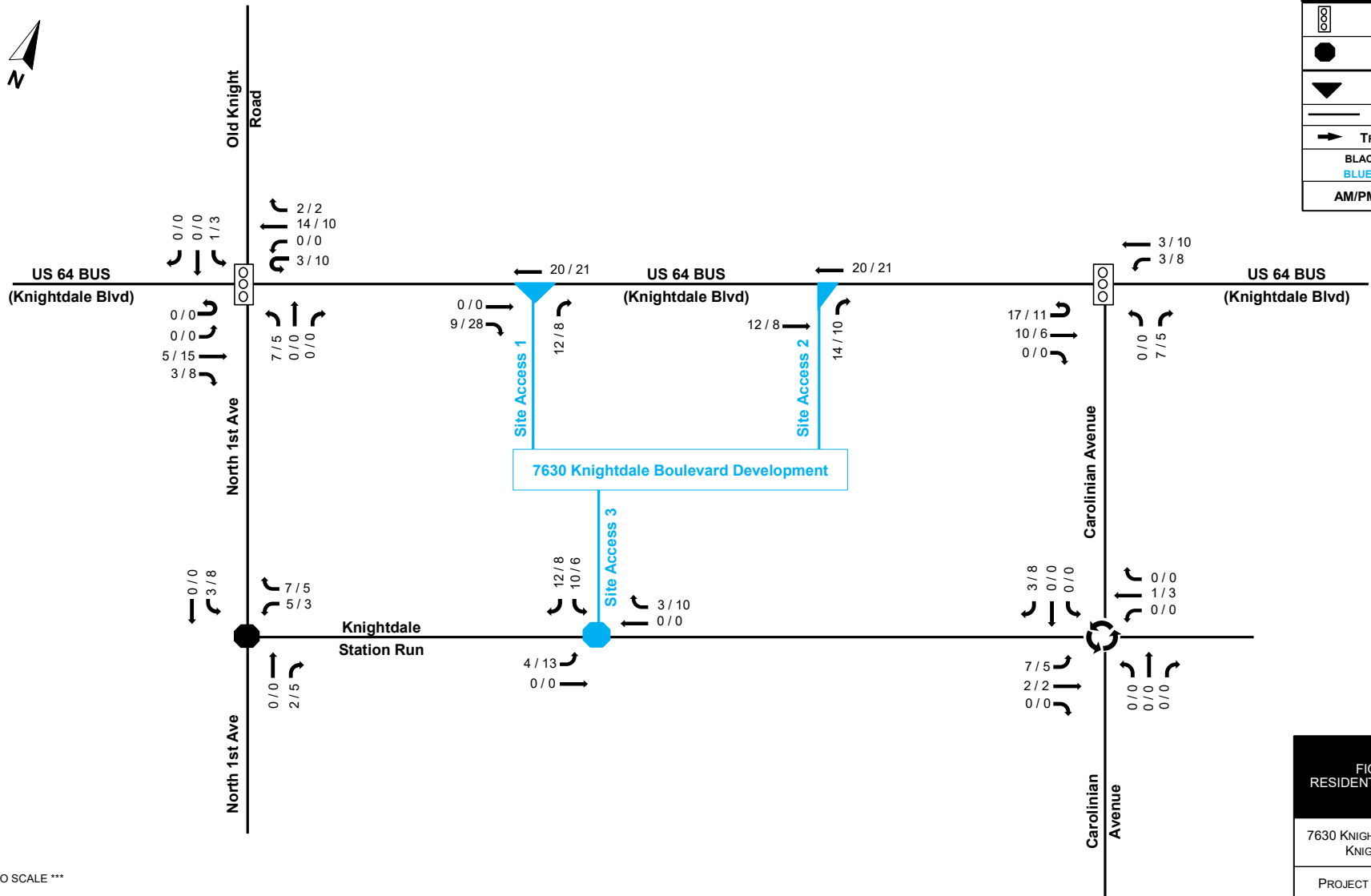
7630 KNIGHTDALE BOULEVARD
KNIGHTDALE, NC

PROJECT NUMBER 190430





LEGEND	
	SIGNALIZED INTERSECTION
	UNSIGNALIZED INTERSECTION
	RIGHT IN/ RIGHT OUT
	ROADWAY
	TRAFFIC MOVEMENT
	BLACK = EXISTING
	BLUE = PROPOSED
AM/PM PEAK HOURS	



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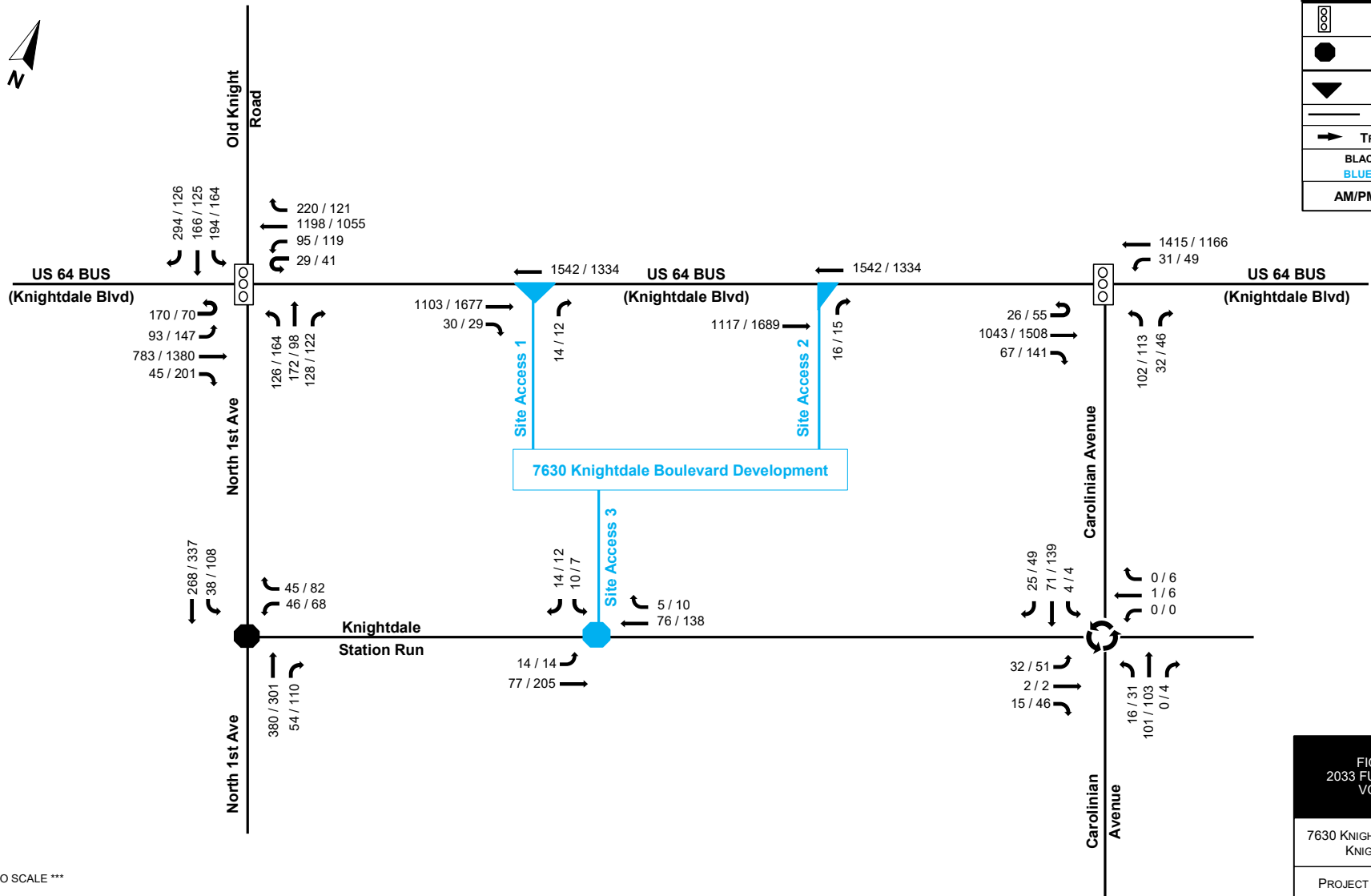
FIGURE 7A
RESIDENTIAL SITE TRIPS

7630 KNIGHTDALE BOULEVARD
KNIGHTDALE, NC

PROJECT NUMBER 190430



LEGEND	
	SIGNALIZED INTERSECTION
	UNSIGNALIZED INTERSECTION
	RIGHT IN/ RIGHT OUT
	ROADWAY
	TRAFFIC MOVEMENT
	BLACK = EXISTING
	BLUE = PROPOSED
AM/PM PEAK HOURS	



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FIGURE 10
2033 FUTURE BUILD
VOLUMES

7630 KNIGHTDALE BOULEVARD
KNIGHTDALE, NC

PROJECT NUMBER 190430

5.0 Capacity Analysis

5.1 Level of Service Evaluation Criteria

The Transportation Research Board’s Highway Capacity Manual (HCM) utilizes a term “level of service” to measure how traffic operates in intersections and on roadway segments. There are currently six levels of service ranging from A to F. Level of service “A” represents low-volume traffic operations and Level of Service “F” represents high-volume, oversaturated traffic operations. Synchro Traffic Modeling software was used to determine the level of service for studied intersections. Note for unsignalized intersection analysis, the level of service noted is for the worst approach of the intersection. This is typically the left turn movement for the side street approach, due to the number of opposing movements. All worksheet reports from the analyses can be found in the Appendix.

Table 5.1 – Highway Capacity Manual

Levels of Service and Control Delay Criteria			
Signalized Intersection		Unsignalized Intersection	
Level of Service	Control Delay Per vehicle (sec)	Level of Service	Delay Range (sec)
A	≤ 10	A	≤ 10
B	> 10 and ≤ 20	B	> 10 and ≤ 15
C	> 20 and ≤ 35	C	> 15 and ≤ 25
D	> 35 and ≤ 55	D	> 25 and ≤ 35
E	> 55 and ≤ 80	E	> 35 and ≤ 50
F	> 80	F	> 50

5.2 Existing Conditions - Level of Service Results

The results of the level of service analysis are discussed by intersection below.

US 64 BUS (Knightdale Boulevard) at Old Knight Road/North 1st Avenue

This signalized intersection currently operates at LOS F in the AM peak and LOS D in the PM peak.

US 64 BUS (Knightdale Boulevard) at Carolinian Avenue

This signalized intersection currently operates at LOS A in the AM and PM peak hours.

North 1st Avenue at Knightdale Station Run

This unsignalized intersection currently operates at LOS B in the AM and PM peak hours.

Carolinian Avenue at Knightdale Station Run

This roundabout currently operates at LOS A in the AM and PM peak hours.

Table 5.2 - Level of Service Summary (Existing Conditions)		
Intersection	AM Peak	PM Peak
NC 64 BUS at Old Knight Road/ N 1st Ave	F (98.7)	D (46.8)
NC 64 BUS at Carolinian Avenue	A (5.0)	A (6.4)
N 1st Ave at Knightdale Station Run	B (12.1) WB Approach	B (13.5) WB Approach
Carolinian Ave at Knightdale Station Run	A (3.1) NB Approach	A (3.4) SB Approach

LOS (delay in seconds)
Note for unsignalized conditions, LOS and delay indicates only minor street approach with longest delay

5.3 2023 Future Conditions - Level of Service Results

The results of the level of service analysis are discussed by intersection below and recommended improvements are shown in Figure 11.

US 64 BUS (Knightdale Boulevard) at Old Knight Road/North 1st Avenue

In 2023 future no-build conditions, this intersection is expected to operate at LOS D in the AM and PM peak hours. In 2023 future build conditions, the LOS is expected to remain unchanged. The delay increase is within the 25% increase permitted by the congestion management guidelines. The routine optimization of the traffic signal timing by NCDOT will be adequate to handle future traffic.

US 64 BUS (Knightdale Boulevard) at Carolinian Avenue

In 2023 future no-build conditions, this intersection is expected to operate at LOS A in the AM peak and LOS B in the PM peak. In 2023 future build conditions, the LOS is expected to remain unchanged. The routine optimization of the traffic signal timing by NCDOT will be adequate to handle future traffic.

North 1st Avenue at Knightdale Station Run

In 2023 future no-build conditions, this intersection is expected to operate at LOS B in the AM peak and LOS C in the PM peak. In 2023 future build conditions, the LOS is expected to remain unchanged. Therefore, no improvements are recommended.

Carolinian Avenue at Knightdale Station Run

In 2023 future no-build conditions, this roundabout is expected to operate at LOS A in the AM and PM peak hours. In 2023 future build conditions, the LOS is expected to remain unchanged. Therefore, no improvements are recommended.

US 64 BUS (Knightdale Boulevard) at Site Access 1 (RIRO)

This site access is proposed to have a Right-In Right-Out (RIRO) configuration. In 2023 future build conditions, this intersection is expected to operate at LOS B in the AM peak and LOS C in the PM peak. Based on the NCDOT turn lane warrants chart, an eastbound right turn lane is warranted.

The following improvements are recommended at this intersection:

1. Design site access according to NCDOT standards
2. Provide an eastbound right turn lane with 50 feet of storage, 50 feet of full-width deceleration, and 100 feet taper

US 64 BUS (Knightdale Boulevard) at Site Access 2 (RO)

This site access is proposed to have a Right-Out (RO) only configuration. In 2023 future build conditions, this intersection is expected to operate at LOS B in the AM peak and LOS C in the PM peak. No improvements are recommended

Knightdale Station Run at Site Access 3

This site access is proposed to have a full movement configuration. In 2023 future build conditions, this intersection is expected to operate at LOS A in the AM and PM peak hours. Based on the NCDOT turn lane warrants chart, no turn lanes are warranted. Therefore, no improvements are recommended.

Table 5.3 - Level of Service Summary (Future Conditions)

AM Peak	2023 Future No-build	2023 Future Build	2023 Future Build with Improvements
NC 64 BUS at Old Knight Road/ N 1st Ave	D (47.3)	D (47.7)	
NC 64 BUS at Carolinian Ave	A (8.7)	A (8.0)	
N 1st Ave at Knightdale Station Run	B (13.4) WB Approach	B (13.8) WB Approach	
Carolinian Ave at Knightdale Station Run	A (3.5) NB Approach	A (3.5) NB Approach	
NC 64 BUS at Site Access 1		B (13.1) NB Approach	B (12.9) NB Approach
NC 64 BUS at Site Access 2		B (13.0) NB Approach	
Knightdale Station Run at Site Access 3		A (9.2) SB Approach	
PM Peak	2023 Future No-build	2023 Future Build	2023 Future Build with Improvements
NC 64 BUS at Old Knight Road/ N 1st Ave	D (39.5)	D (40.1)	
NC 64 BUS at Carolinian Ave	B (10.5)	B (11.3)	
N 1st Ave at Knightdale Station Run	C (15.8) WB Approach	C (16.3) WB Approach	
Carolinian Ave at Knightdale Station Run	A (3.9) SB Approach	A (4.0) SB Approach	
NC 64 BUS at Site Access 1		C (17.7) NB Approach	C (17.4) NB Approach
NC 64 BUS at Site Access 2		C (17.7) NB Approach	
Knightdale Station Run at Site Access 3		A (9.8) SB Approach	

LOS (delay in seconds)
Note for unsignalized conditions, LOS and delay indicates only minor street approach with longest delay

5.4 2033 Horizon Year Conditions - Level of Service Results

The results of the level of service analysis are discussed by intersection below.

US 64 BUS (Knightdale Boulevard) at Old Knight Road/North 1st Avenue

In 2033 future no-build conditions, this intersection is expected to operate at LOS D in the AM and PM peak hours. In 2033 future build conditions, the LOS is expected to remain unchanged. The delay increase is within the 25% increase permitted by the congestion management guidelines. The routine optimization of the traffic signal timing by NCDOT will be adequate to handle future traffic.

US 64 BUS (Knightdale Boulevard) at Carolinian Avenue

In 2033 future no-build conditions, this intersection is expected to operate at LOS A in the AM peak and LOS B in the PM peak. In 2033 future build conditions, the LOS is expected to remain unchanged. The routine optimization of the traffic signal timing by NCDOT will be adequate to handle future traffic.

North 1st Avenue at Knightdale Station Run

In 2033 future no-build conditions, this intersection is expected to operate at LOS B in the AM peak and LOS C in the PM peak. In 2033 future build conditions, the LOS is expected to remain unchanged. Therefore, no improvements are recommended.

Carolinian Avenue at Knightdale Station Run

In 2033 future no-build conditions, this roundabout is expected to operate at LOS A in the AM and PM peak hours. In 2033 future build conditions, the LOS is expected to remain unchanged. Therefore, no improvements are recommended.

US 64 BUS (Knightdale Boulevard) at Site Access 1 (RIRO)

This site access is proposed to have a Right-In Right-Out (RIRO) configuration. In 2033 future build conditions, this intersection is expected to operate at LOS B in the AM peak and LOS C in the PM peak. No additional improvements are recommended

US 64 BUS (Knightdale Boulevard) at Site Access 2 (RO)

This site access is proposed to have a Right-Out (RO) only configuration. In 2033 future build conditions, this intersection is expected to operate at LOS B in the AM peak and LOS C in the PM peak. No improvements are recommended

Knightdale Station Run at Site Access 3

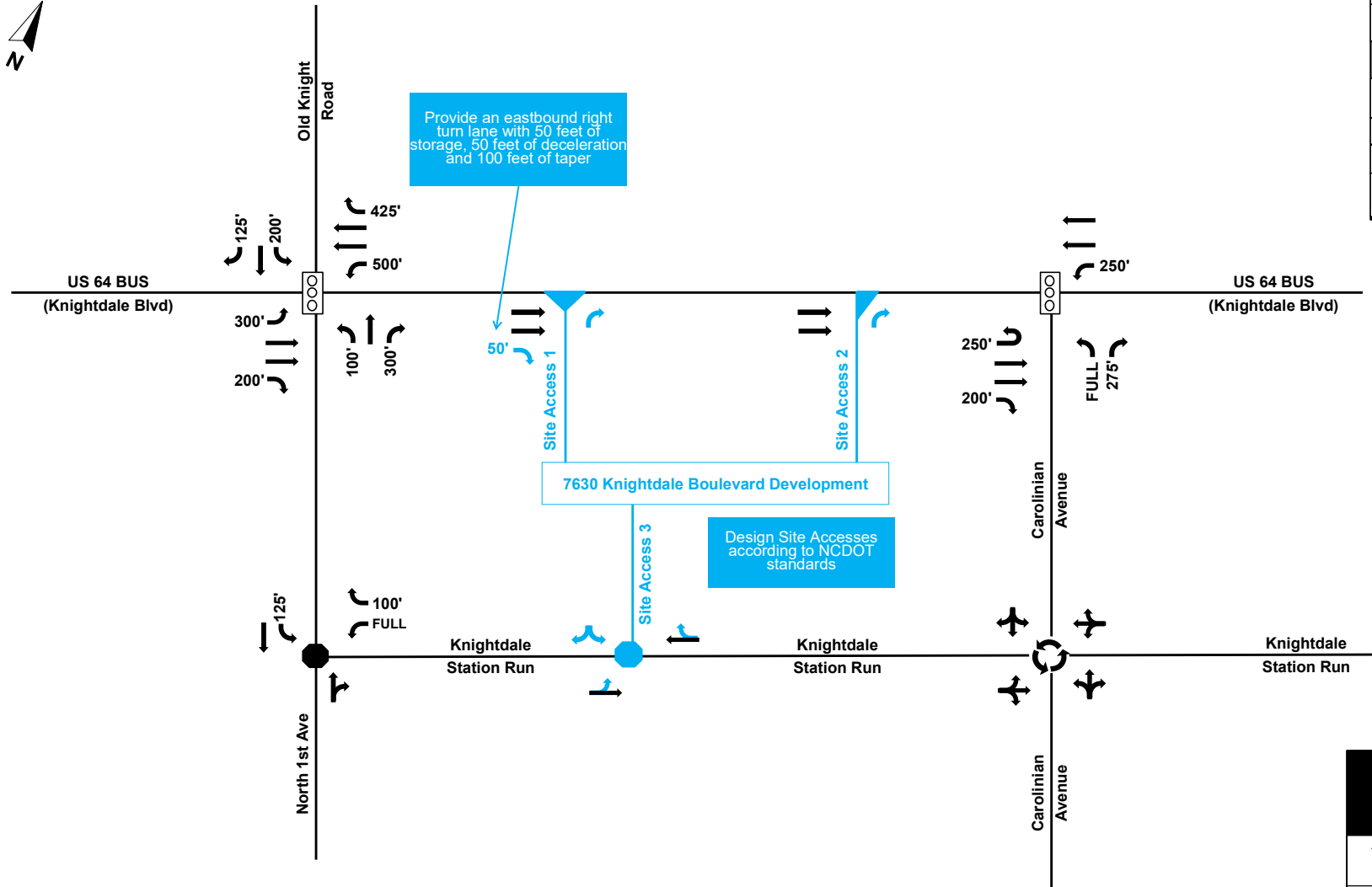
This site access is proposed to have a full movement configuration. In 2033 future build conditions, this intersection is expected to operate at LOS A in the AM and PM peak hours. No improvements are recommended.

Table 5.4 - Level of Service Summary (Horizon Year Conditions)			
AM Peak	2033 Future No-build	2033 Future Build	2033 Future Build with Improvements
NC 64 BUS at Old Knight Road/ N 1st Ave	D (50.4)	D (50.6)	
NC 64 BUS at Carolinian Ave	A (8.9)	A (9.2)	
N 1st Ave at Knightdale Station Run	B (14.4) WB Approach	B (14.8) WB Approach	
Carolinian Ave at Knightdale Station Run	A (3.5) NB Approach	A (3.6) NB Approach	
NC 64 BUS at Site Access 1		B (13.8) NB Approach	B (13.6) NB Approach
NC 64 BUS at Site Access 2		B (13.7) NB Approach	
Knightdale Station Run at Site Access 3		A (9.2) SB Approach	
PM Peak	2033 Future No-build	2033 Future Build	2033 Future Build with Improvements
NC 64 BUS at Old Knight Road/ N 1st Ave	D (42.4)	D (43.3)	
NC 64 BUS at Carolinian Ave	B (10.9)	B (11.7)	
N 1st Ave at Knightdale Station Run	C (17.8) WB Approach	C (18.5) WB Approach	
Carolinian Ave at Knightdale Station Run	A (4.0) SB Approach	A (4.1) SB Approach	
NC 64 BUS at Site Access 1		C (19.5) NB Approach	C (19.1) NB Approach
NC 64 BUS at Site Access 2		C (19.5) NB Approach	
Knightdale Station Run at Site Access 3		B (10.0) SB Approach	

LOS (delay in seconds)
Note for unsignalized conditions, LOS and delay indicates only minor street approach with longest delay



LEGEND	
	SIGNALIZED INTERSECTION
	UNSIGNALIZED INTERSECTION
	ROUNDABOUT
	RIGHT IN/ RIGHT OUT
	ROADWAY
	TRAFFIC MOVEMENT
BLACK = EXISTING BLUE = PROPOSED	



*** NOT TO SCALE ***

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**FIGURE 11
RECOMMENDED
IMPROVEMENTS**

7630 KNIGHTDALE BOULEVARD
KNIGHTDALE, NC

PROJECT NUMBER 190430

6.0 Summary and Conclusion

Site Overview

The 7630 Knightdale Boulevard Development is to be located off US 64 BUS (Knightdale Boulevard) in Knightdale, North Carolina. As currently planned, this site development will consist of 195 dwelling units of multi-family housing and 12,400 square feet of the general office building. The full build-out year is assumed as 2023. This development utilizes three (3) site accesses. One(1) right-in right-out (RIRO) access and one (1) right out (RO) only access off US 64 BUS and one (1) full movement access off Knightdale Station Run.

Trip Generation

Based on the rates and equations in the ITE Trip Generation Manual (10th Edition) this development has a trip generation potential of 102 net trips in the AM peak and 98 net trips in the PM peak.

Conclusion

Based on the analysis, a routine optimization of the traffic signal timing is recommended at the intersections of NC 64 BUS at Old Knight Road/North 1st Ave and NC 64 BUS at Carolinian Ave. Based on NCDOT turn lane warrants, it is recommended to provide an eastbound right turn lane at the intersection of NC 64 BUS at Site Access 1.

In conclusion, this study has reviewed the impacts of both background traffic and this development traffic. Please note that all site accesses should be designed according to the NCDOT Standards.

The recommended improvements at the study intersections for 2023 full build are summarized in Table 6.1.

Table 6.1 – Recommended Improvements Summary

Intersection	Full Build
US 64 BUS at Old Knight Road/North 1 st Avenue	<ul style="list-style-type: none"> The routine optimization of the traffic signal timing by NCDOT will be adequate to handle future traffic.
US 64 BUS at Carolinian Avenue	<ul style="list-style-type: none"> The routine optimization of the traffic signal timing by NCDOT will be adequate to handle future traffic.
North 1 st Avenue at Knightdale Station Run	<ul style="list-style-type: none"> No Improvements are recommended
Carolinian Avenue at Knightdale Station Run	<ul style="list-style-type: none"> No Improvements are recommended
NC 64 BUS at Site Access 1	<ul style="list-style-type: none"> Provide an eastbound right turn lane with 50 feet of storage, 50 feet of deceleration and 100 feet of taper length Design site access according to NCDOT standards
NC 64 BUS at Site Access 2	<ul style="list-style-type: none"> Design site access according to NCDOT standards
Knightdale Station Run at Site Access 3	<ul style="list-style-type: none"> Design site access according to NCDOT standards