

Traffic Impact Analysis

Legacy Oaks

Knightdale, NC

Prepared for:
Shenandoah Homes

Kimley»Horn

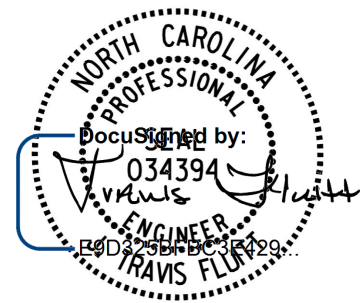
© Kimley-Horn and Associates, Inc. 2020

Traffic Impact Analysis for
Legacy Oaks
Knightdale, North Carolina

Prepared for:
Shenandoah Homes
Raleigh, North Carolina

Prepared by:
Kimley-Horn and Associates, Inc.
NC License #F-0102
421 Fayetteville Street, Suite 600
Raleigh, NC 27601
(919) 677-2000

June 2020
013538000



6/3/2020

This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

Executive Summary

Kimley-Horn and Associates, Inc. has performed an updated Traffic Impact Analysis for the Legacy Oaks development, which is located on Hodge Road north of US 64 Business in Knightdale, NC. This TIA is an update to the *Watson Tract TIA* (Kimley-Horn, November 2006). The site is currently occupied by a 4,069 square foot (SF) Sam’s Xpress Car Wash with 10 fuel pumps, a 40,560 SF urgent care facility, and 544 apartments. As currently envisioned the development will consist of approximately 217 single-family homes, 93 townhomes, 72 multifamily apartments, a 130-room hotel, and 16,000 SF of retail space in addition to the existing uses. The single-family detached and townhome portion of the development is proposed to be located north of the existing residential development on Hodge Road. The apartments, hotel, and retail uses are proposed to be located on the east side of Hodge Road along Legacy Oaks Drive and accessed via driveways on both of these roadways. Build-out of the development is anticipated in 2023, so the study year 2024 and horizon year 2033 were analyzed per Town of Knightdale requirements.

This report presents trip generation, distribution, traffic analyses, and recommendations for transportation improvements required to meet anticipated traffic demands in conjunction with the development. The traffic conditions studied include the existing (2020) traffic condition, the projected (2024) background and build-out +1 traffic conditions, and the projected (2033) background and build-out +10 traffic conditions. The weekday AM and PM peak hours were studied.

As shown in Table ES-1, the proposed development has the potential to generate 4,766 new daily trips, 366 new trips during the AM peak hour, and 407 new trips during the PM peak hour on a typical weekday. For reference, uses analyzed on the “West Tract” in the original *Watson Tract TIA* were projected to generate 12,850 daily trips, 1,062 trips during the AM peak hour, and 1,404 trips during the PM peak hour. These projected trip totals exceed the trip generation of the combined existing and proposed uses on this site.

Table ES-1 ITE Traffic Generation (Vehicles)									
Land Use Code	Land Use	Intensity		Daily		AM Peak Hour		PM Peak Hour	
				In	Out	In	Out	In	Out
210	Single Family Detached Housing	217	d.u.	1,061	1,061	40	119	135	79
220	Multifamily Housing (Low-Rise)	93	d.u.	331	331	10	35	35	20
221	Multifamily Housing (Mid-Rise)	72	d.u.	196	196	7	18	20	12
310	Hotel	130	rooms	521	521	35	25	36	35
820	Shopping Center	16,000	s.f.	865	865	54	33	67	73
Subtotal				2,974	2,974	146	230	293	219
<i>Internal Capture Reduction</i>				362	362	5	5	34	34
<i>Pass-By Capture Reduction</i>				229	229	0	0	20	17
Total Net New External Trips				2,383	2,383	141	225	239	168

Capacity analyses were performed using Synchro Version 10.3 software. Analyses were performed both with and without the Hinton Oaks Industrial development, which is proposed to be located along Hinton Oaks Boulevard, as that development is not yet approved but would have an impact on study intersection operations. Table ES-2 summarizes the operation of the study intersections for the AM and PM peak hours for each of the study traffic conditions.

Table ES-2 Level-of-Service Summary				
Condition	Background*		Build-Out*	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
US 64 Business (Knightdale Boulevard) at Hodge Road (Signalized)				
Existing (2020) Traffic	C (21.2)	C (30.3)	-	-
+1 (2024) Traffic	C (25.1)	C (32.6)	C (27.6)	D (38.8)
+10 (2033) Traffic	C (27.3)	D (40.4)	C (29.8)	D (45.8)
+1 (2024) Traffic – with Hinton Oaks	C (26.9)	C (32.5)	C (29.5)	D (38.7)
+10 (2033) Traffic – with Hinton Oaks	C (29.1)	D (40.5)	C (31.4)	D (45.9)

*Background and build-out scenarios include signal timing adjustments to intersection splits.

Table ES-2 (cont.) Level-of-Service Summary				
Condition	Background		Build-Out	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
US 64 Business (Knightdale Boulevard) at I-540 EB Ramps (Signalized)				
Existing (2020) Traffic	A (1.5)	A (3.7)	-	-
+1 (2024) Traffic	A (2.7)	A (5.1)	A (2.9)	A (6.4)
+10 (2033) Traffic	A (3.8)	A (6.4)	A (4.1)	A (8.3)
+1 (2024) Traffic – with Hinton Oaks	A (4.1)	A (7.8)	A (4.4)	A (9.8)
+10 (2033) Traffic – with Hinton Oaks	A (5.4)	A (8.9)	A (5.6)	B (11.4)
US 64 Business (Knightdale Boulevard) at I-540 WB Ramps (Signalized)				
Existing (2020) Traffic	B (11.4)	B (15.8)	-	-
+1 (2024) Traffic	B (14.4)	B (17.8)	B (17.3)	B (17.9)
+10 (2033) Traffic	B (17.1)	C (20.5)	C (20.8)	C (21.0)
+1 (2024) Traffic – with Hinton Oaks	B (17.8)	B (18.7)	C (20.5)	B (18.8)
+10 (2033) Traffic – with Hinton Oaks	C (21.3)	C (22.1)	C (24.8)	C (22.4)
US 64 Business (Knightdale Boulevard) at Hinton Oaks Boulevard (Signalized)				
Existing (2020) Traffic	B (19.5)	B (19.5)	-	-
+1 (2024) Traffic	C (20.2)	C (22.3)	C (20.5)	C (22.6)
+10 (2033) Traffic	C (24.1)	C (26.0)	C (24.6)	C (26.3)
+1 (2024) Traffic – with Hinton Oaks	C (25.9)	C (24.4)	C (26.5)	C (25.3)
+10 (2033) Traffic – with Hinton Oaks	C (28.9)	C (28.8)	C (29.9)	C (29.6)

Table ES-2 (cont.) Level-of-Service Summary				
Condition	Background		Build-Out	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Hodge Road at Legacy Oaks Drive South/Sam’s Xpress Driveway (Unsignalized)				
Existing (2020) Traffic	EB – B (11.4) WB – B (11.2) NBL – A (9.4) SBL – A (7.5)	EB – B (11.1) WB – B (13.5) NBL – A (9.0) SBL – A (7.6)	-	-
+1 (2024) Traffic	EB – B (11.4) WB – C (11.2) NBL – A (9.4) SBL – A (7.5)	EB – B (11.1) WB – B (13.5) NBL – A (9.0) SBL – A (7.6)	EB – B (13.8) WB – C (18.9) NBL – B (10.2) SBL – A (7.9)	EB – B (13.1) WB – D (27.8) NBL – A (9.4) SBL – A (8.3)
+10 (2033) Traffic	EB – B (11.4) WB – B (11.2) NBL – A (9.4) SBL – A (7.5)	EB – B (11.1) WB – B (13.5) NBL – A (9.0) SBL – A (7.6)	EB – B (13.8) WB – C (18.9) NBL – B (10.2) SBL – A (7.9)	EB – B (13.1) WB – D (27.8) NBL – A (9.4) SBL – A (8.3)
+1 (2024) Traffic – with Hinton Oaks	EB – B (11.4) WB – B (11.2) NBL – A (9.4) SBL – A (7.5)	EB – B (11.1) WB – B (13.5) NBL – A (9.0) SBL – A (7.6)	EB – B (13.8) WB – C (18.9) NBL – B (10.2) SBL – A (7.9)	EB – A (13.1) WB – D (27.8) NBL – A (9.4) SBL – A (8.3)
+10 (2033) Traffic – with Hinton Oaks	EB – B (11.4) WB – B (11.2) NBL – A (9.4) SBL – A (7.5)	EB – B (11.1) WB – B (13.5) NBL – A (9.0) SBL – A (7.6)	EB – B (13.8) WB – C (18.9) NBL – B (10.2) SBL – A (7.9)	EB – B (13.1) WB – D (27.8) NBL – A (9.4) SBL – A (8.3)
Hodge Road at Legacy Oaks Drive North (Unsignalized)				
Existing (2020) Traffic	A (8.4)	A (8.3)	-	-
+1 (2024) Traffic	A (8.4)	A (8.3)	B (10.1)	A (10.0)
+10 (2033) Traffic	A (8.4)	A (8.3)	B (10.1)	A (10.0)
+1 (2024) Traffic – with Hinton Oaks	A (8.4)	A (8.3)	B (10.1)	A (10.0)
+10 (2033) Traffic – with Hinton Oaks	A (8.4)	A (8.3)	B (10.1)	A (10.0)
Hodge Road at South RI/RO Site Driveway (Unsignalized)				
+1 (2024) Traffic	-	-	WB – A (8.8)	WB – A (9.5)
+10 (2033) Traffic	-	-	WB – A (8.8)	WB – A (9.5)
+1 (2024) Traffic – with Hinton Oaks	-	-	WB – A (8.8)	WB – A (9.5)
+10 (2033) Traffic – with Hinton Oaks	-	-	WB – A (8.8)	WB – A (9.5)

Table ES-2 (cont.) Level-of-Service Summary				
Condition	Background		Build-Out	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Hodge Road at North RI/RO Site Driveway (Unsignalized)				
+1 (2024) Traffic	-	-	WB – A (8.7)	WB – A (9.4)
+10 (2033) Traffic	-	-	WB – A (8.7)	WB – A (9.4)
+1 (2024) Traffic – with Hinton Oaks	-	-	WB – A (8.7)	WB – A (9.4)
+10 (2033) Traffic – with Hinton Oaks	-	-	WB – A (8.7)	WB – A (9.4)

The following roadway improvement was recommended to be performed as part of the Hinton Oaks Industrial project and was included in each of the future traffic conditions that included that project:

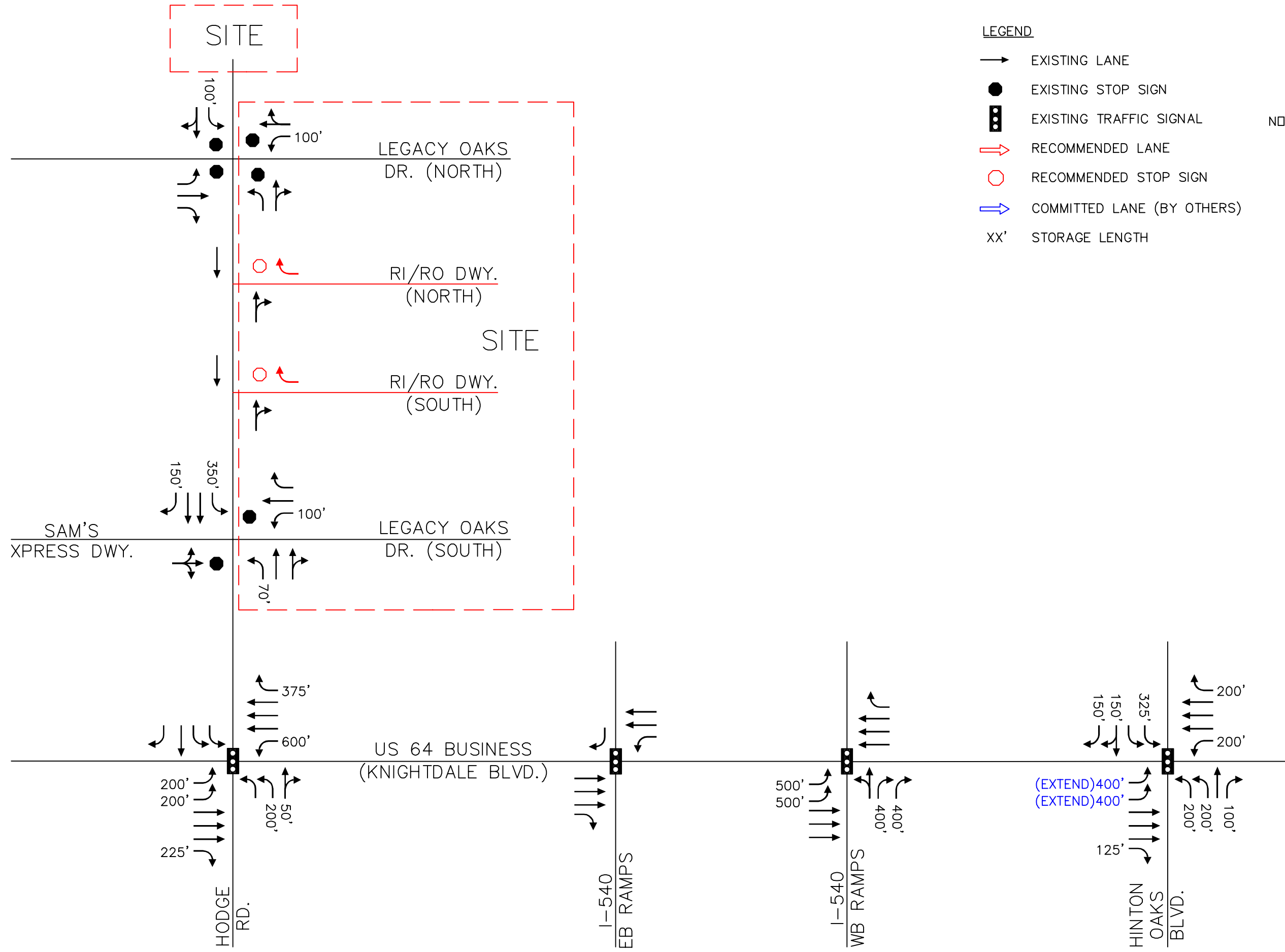
US 64 Business (Knightdale Boulevard) at Hinton Oaks Boulevard:

- Extend the dual eastbound left-turn lanes to provide 400 feet of storage each

Analyses indicate the potential for long delays and queues for the northbound approach of Hodge Road at Knightdale Boulevard in the AM peak hour and the westbound left-turn movement on Knightdale Boulevard at Hodge Road in the PM peak hour in the existing and all future traffic conditions. It is recommended that the Town and NCDOT continue to monitor this intersection to determine when signal timing modifications are necessary. For the purposes of this analysis, signal timings at this intersection were adjusted in all future traffic conditions to provide more green time to the northbound approach in the AM peak hour and more green time to the westbound left-turn movement in both peak hours.

Analyses indicate that all study intersections are anticipated to operate at an acceptable LOS for both the build-out +1 and build-out +10 traffic conditions with or without the Hinton Oaks Industrial development in place. Although the possibility of long delays and queues is noted on several movements, no site trips are anticipated to be added to the majority of these movements, and queues and delays are anticipated to increase minimally above background levels at the majority of these movements. Therefore, no roadway improvements are recommended to be performed as part of the Legacy Oaks development to accommodate projected traffic volumes.

The committed and recommended roadway laneage is shown on **Figure ES-1**.



LEGEND

- EXISTING LANE
- EXISTING STOP SIGN
- Ⓜ EXISTING TRAFFIC SIGNAL
- ➔ RECOMMENDED LANE
- RECOMMENDED STOP SIGN
- ➔ COMMITTED LANE (BY OTHERS)
- XX' STORAGE LENGTH

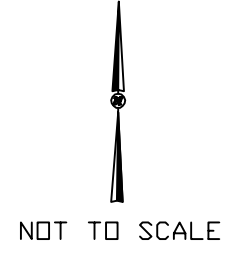


FIGURE
ES-1

COMMITTED AND
RECOMMENDED ROADWAY LANEAGE

LEGACY OAKS
KNIGHTDALE, NC
TRAFFIC IMPACT ANALYSIS



TABLE OF CONTENTS

	<u>Page No.</u>
1.0 INTRODUCTION.....	1
2.0 INVENTORY	2
2.1 <i>STUDY AREA</i>	<i>2</i>
2.2 <i>EXISTING CONDITIONS</i>	<i>2</i>
3.0 TRAFFIC GENERATION.....	8
4.0 SITE TRAFFIC DISTRIBUTION.....	9
5.0 PROJECTED TRAFFIC VOLUMES	11
5.1 <i>EXISTING TRAFFIC</i>	<i>11</i>
5.2 <i>HISTORIC GROWTH TRAFFIC.....</i>	<i>11</i>
5.3 <i>APPROVED DEVELOPMENT TRAFFIC</i>	<i>11</i>
5.4 <i>SITE TRAFFIC.....</i>	<i>12</i>
5.5 <i>BUILD-OUT TRAFFIC.....</i>	<i>13</i>
6.0 CAPACITY ANALYSIS	30
6.1 <i>US 64 BUSINESS (KNIGHTDALE BOULEVARD) AT HODGE ROAD</i>	<i>32</i>
6.2 <i>US 64 BUSINESS (KNIGHTDALE BOULEVARD) AT I-540 EB RAMPS</i>	<i>33</i>
6.3 <i>US 64 BUSINESS (KNIGHTDALE BOULEVARD) AT I-540 WB RAMPS.....</i>	<i>34</i>
6.4 <i>US 64 BUSINESS (KNIGHTDALE BOULEVARD) AT HINTON OAKS BOULEVARD.....</i>	<i>35</i>
6.5 <i>HODGE ROAD AT LEGACY OAKS DRIVE SOUTH/SAM’S XPRESS DRIVEWAY</i>	<i>36</i>
6.6 <i>HODGE ROAD AT LEGACY OAKS DRIVE NORTH.....</i>	<i>37</i>
6.7 <i>HODGE ROAD AT SOUTH RI/RO DRIVEWAY</i>	<i>38</i>
6.8 <i>HODGE ROAD AT NORTH RI/RO DRIVEWAY.....</i>	<i>39</i>
7.0 RECOMMENDATIONS.....	40

Appendices

- A. *MEMORANDUM OF UNDERSTANDING*
- B. *TRIP GENERATION*
- C. *TRAFFIC COUNT DATA*
- D. *APPROVED DEVELOPMENT DATA*
- E. *INTERSECTION SPREADSHEETS*
- F. *SYNCHRO OUTPUT: EXISTING (2020)*
- G. *SYNCHRO OUTPUT: BACKGROUND +1 (2024)*
- H. *SYNCHRO OUTPUT: BACKGROUND +10 (2033)*
- I. *SYNCHRO OUTPUT: BACKGROUND +1 (2024) W/ HINTON OAKS*
- J. *SYNCHRO OUTPUT: BACKGROUND +10 (2033) W/ HINTON OAKS*
- K. *SYNCHRO OUTPUT: BUILD-OUT +1 (2024)*
- L. *SYNCHRO OUTPUT: BUILD-OUT +10 (2033)*
- M. *SYNCHRO OUTPUT: BUILD-OUT +1 (2024) W/ HINTON OAKS*
- N. *SYNCHRO OUTPUT: BUILD-OUT +10 (2033) W/ HINTON OAKS*
- O. *SIMTRAFFIC REPORTS*
- P. *SIGNAL PLANS AND TIMINGS*

LIST OF TABLES

<u>Table No.</u>	<u>Title</u>	<u>Page No.</u>
Table 3.0	ITE Traffic Generation (Vehicles).....	8
Table 6.0	Level-of-Service Control Delay Thresholds.....	30
Table 6.1	Level-of-Service: US 64 Business (Knightdale Blvd) at Hodge Road	32
Table 6.2	Level-of-Service: US 64 Business (Knightdale Blvd) at I-540 Eastbound Ramps	33
Table 6.3	Level-of-Service: US 64 Business (Knightdale Blvd) at I-540 Westbound Ramps	34
Table 6.4	Level-of-Service: US 64 Business (Knightdale Blvd) at Hinton Oaks Boulevard	35
Table 6.5	Level-of-Service: Hodge Road at Legacy Oaks Drive South.....	36
Table 6.6	Level-of-Service: Hodge Road at Legacy Oaks Drive North.....	37
Table 6.7	Level-of-Service: Hodge Road at South RI/RO Driveway	38
Table 6.8	Level-of-Service: Hodge Road at North RI/RO Driveway	39

LIST OF FIGURES

<u>Figure No.</u>	Title	<u>Page No.</u>
Figure 2.1	Site Location.....	4
Figure 2.2	Conceptual Site Plan (North Parcel)	5
Figure 2.3	Conceptual Site Plan (South Parcel)	6
Figure 2.4	Existing Roadway Laneage	7
Figure 4.1	Site Traffic Distribution and Percent Assignment	10
Figure 5.1	Existing and Background (2024) AM Peak Hour Traffic Volumes.....	14
Figure 5.2	Existing and Background (2024) PM Peak Hour Traffic Volumes	15
Figure 5.3	Existing and Background (2024) AM Peak Hour Traffic Volumes with Hinton Oaks.....	16
Figure 5.4	Existing and Background (2024) PM Peak Hour Traffic Volumes with Hinton Oaks.....	17
Figure 5.5	Background (2033) AM Peak Hour Traffic Volumes.....	18
Figure 5.6	Background (2033) PM Peak Hour Traffic Volumes	19
Figure 5.7	Background (2033) AM Peak Hour Traffic Volumes with Hinton Oaks.....	20
Figure 5.8	Background (2033) PM Peak Hour Traffic Volumes with Hinton Oaks	21
Figure 5.9	Projected (2024) Build-out +1 AM Peak Hour Traffic Volumes	22
Figure 5.10	Projected (2024) Build-out +1 PM Peak Hour Traffic Volumes	23
Figure 5.11	Projected (2024) Build-out +1 AM Peak Hour Traffic Volumes with Hinton Oaks	24
Figure 5.12	Projected (2024) Build-out +1 PM Peak Hour Traffic Volumes with Hinton Oaks.....	25
Figure 5.13	Projected (2033) Build-out +10 AM Peak Hour Traffic Volumes	26
Figure 5.14	Projected (2033) Build-out +10 PM Peak Hour Traffic Volumes	27
Figure 5.15	Projected (2033) Build-out +10 AM Peak Hour Traffic Volumes with Hinton Oaks.....	28
Figure 5.16	Projected (2033) Build-out +10 PM Peak Hour Traffic Volumes with Hinton Oaks.....	29
Figure 7.1	Recommended Roadway Laneage.....	41

1.0 Introduction

Kimley-Horn and Associates, Inc. has performed an updated Traffic Impact Analysis for the Legacy Oaks development, which is located on Hodge Road north of US 64 Business in Knightdale, NC. This TIA is an update to the *Watson Tract TIA* (Kimley-Horn, November 2006). The site is currently occupied by a 4,069 square foot (SF) Sam's Xpress Car Wash with 10 fuel pumps, a 40,560 SF urgent care facility, and 544 apartments. As currently envisioned the development will consist of approximately 217 single-family homes, 93 townhomes, 72 multifamily apartments, a 130-room hotel, and 16,000 SF of retail space in addition to the existing uses. The single family detached and townhome portion of the development is proposed to be located north of the existing residential development on Hodge Road. The apartments, hotel, and retail uses are proposed to be located on the east side of Hodge Road along Legacy Oaks Drive and accessed via driveways on both of these roadways. Build-out of the development is anticipated in 2023, so the study year 2024 and horizon year 2033 were analyzed per Town of Knightdale requirements.

This report presents trip generation, distribution, traffic analyses, and recommendations for transportation improvements required to meet anticipated traffic demands in conjunction with the development. The traffic conditions studied include the existing (2020) traffic condition, the projected (2024) background and build-out +1 traffic conditions, and the projected (2033) background and build-out +10 traffic conditions. The weekday AM and PM peak hours were studied.

North Carolina Department of Transportation (NCDOT) and Town of Knightdale transportation staff provided background data and were consulted regarding the elements to be covered in this analysis. The approved Memorandum of Understanding is included in the Appendix of this report.

2.0 Inventory

2.1 Study Area

The study area for this development includes the following intersections:

- US 64 Business (Knightdale Boulevard) at Hodge Road
- US 64 Business (Knightdale Boulevard) at I-540 Eastbound Ramps
- US 64 Business (Knightdale Boulevard) at I-540 Westbound Ramps
- US 64 Business (Knightdale Boulevard) at Hinton Oaks Boulevard
- Hodge Road at Legacy Oaks Drive South
- Hodge Road at Legacy Oaks Drive North
- Hodge Road at South RI/RO Driveway
- Hodge Road at North RI/RO Driveway

Figure 2.1 shows the site location. The conceptual site plans are shown on **Figures 2.2 and 2.3**.

2.2 Existing Conditions

The proposed Legacy Oaks development will be located on Hodge Road north of US 64 Business in Knightdale, NC. Roadways in the study area include I-540, US 64 Business, Hodge Road, Hinton Oaks Boulevard, and Legacy Oaks Drive. The existing roadway laneage is shown in **Figure 2.4**.

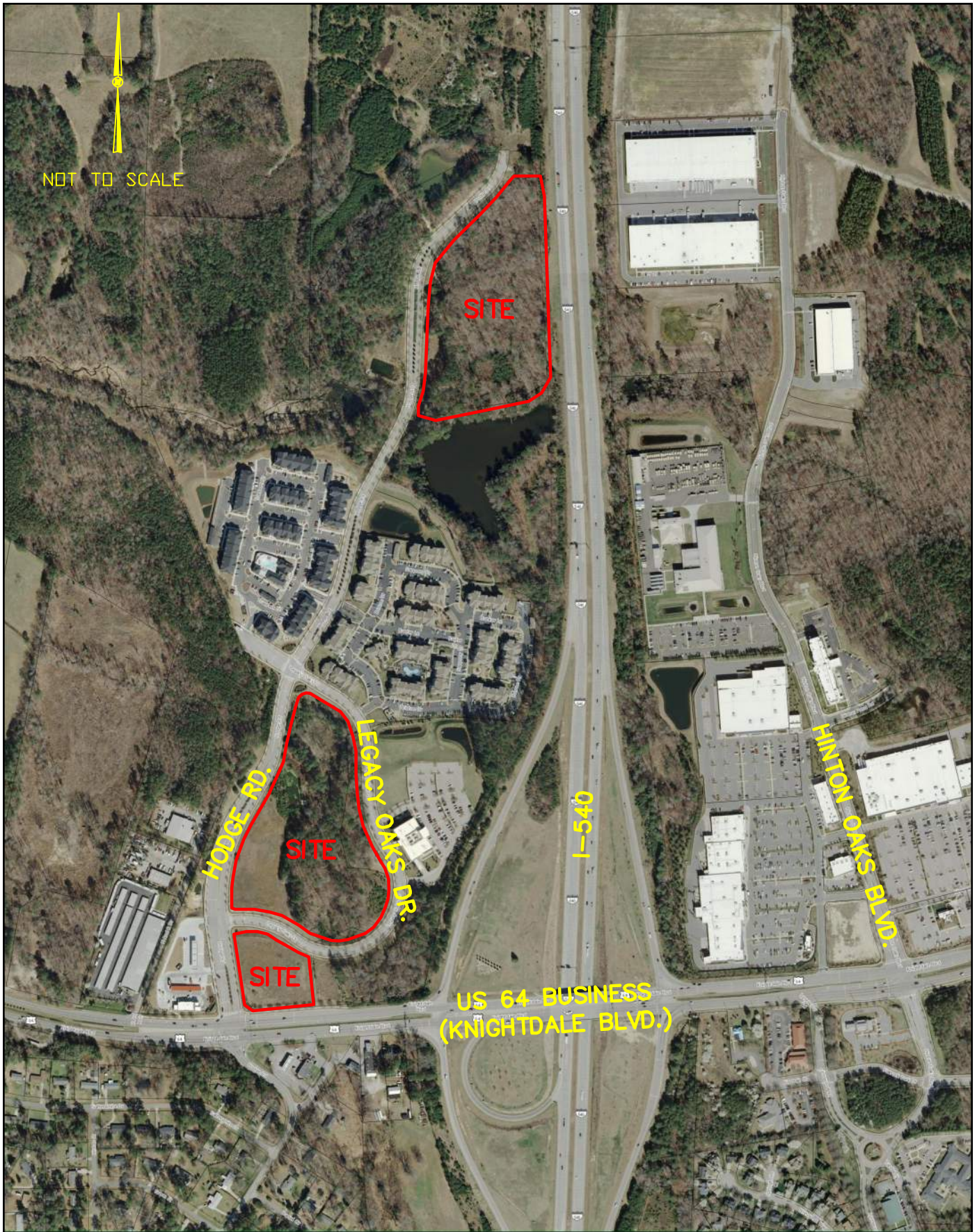
I-540 is a six-lane divided freeway with a posted speed limit of 70 mph. Per the Town of Knightdale 2035 Comprehensive Plan, this roadway is classified as a limited access facility. The reported 2018 AADT volume was approximately 67,500 vpd north of US 64 Business (Knightdale Boulevard) and 59,500 vpd south of US 64 Business (Knightdale Boulevard).

US 64 Business (Knightdale Boulevard) is a six-lane divided roadway with a posted speed limit of 45 miles per hour (mph). Per the Town of Knightdale 2035 Comprehensive Plan, this roadway is classified as a state-maintained arterial. The reported 2018 AADT volume was approximately 37,500 vehicles per day (vpd).

Hodge Road transitions from a 4-lane divided section, to a 3-lane section, to a 2-lane section going north from Knightdale Boulevard. It has a posted speed limit of 25 through the site and is classified as a town-maintained arterial. The estimated 2019 ADT volume is approximately 4,700 vpd north of US 64 Business.

Hinton Oaks Boulevard is a three-lane undivided roadway in the vicinity of the site with a two-way left-turn lane (TWLTL) and a posted speed limit of 25 mph. The Town of Knightdale 2035 Comprehensive Plan classifies this roadway as a town-maintained arterial north of US 64 Business (Knightdale Boulevard) and a collector road south of US 64 Business (Knightdale Boulevard). The estimated ADT on Hinton Oaks Boulevard is approximately 4,700 vpd.

Legacy Oaks Drive is a three-lane undivided roadway with a posted speed limit of 25 mph. The estimated 2019 ADT volume is less than 1,000 vpd.

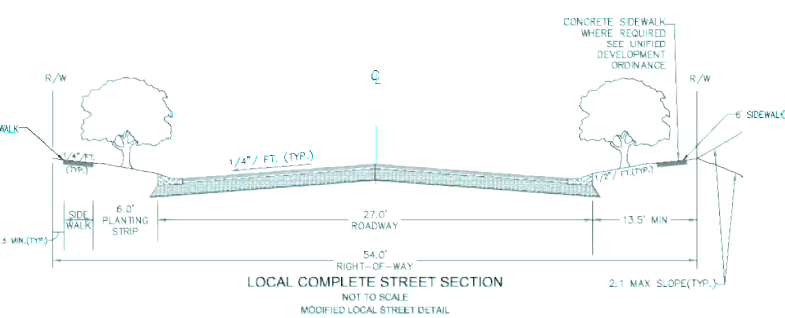
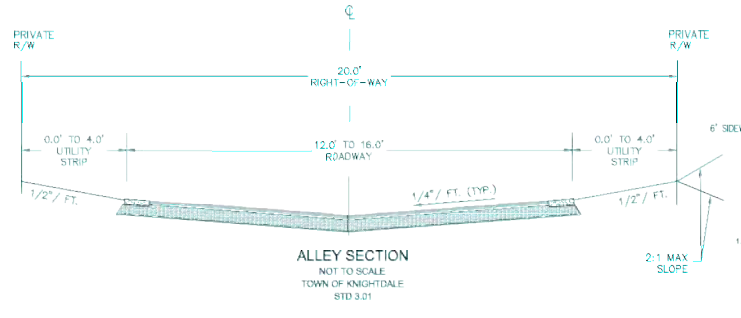
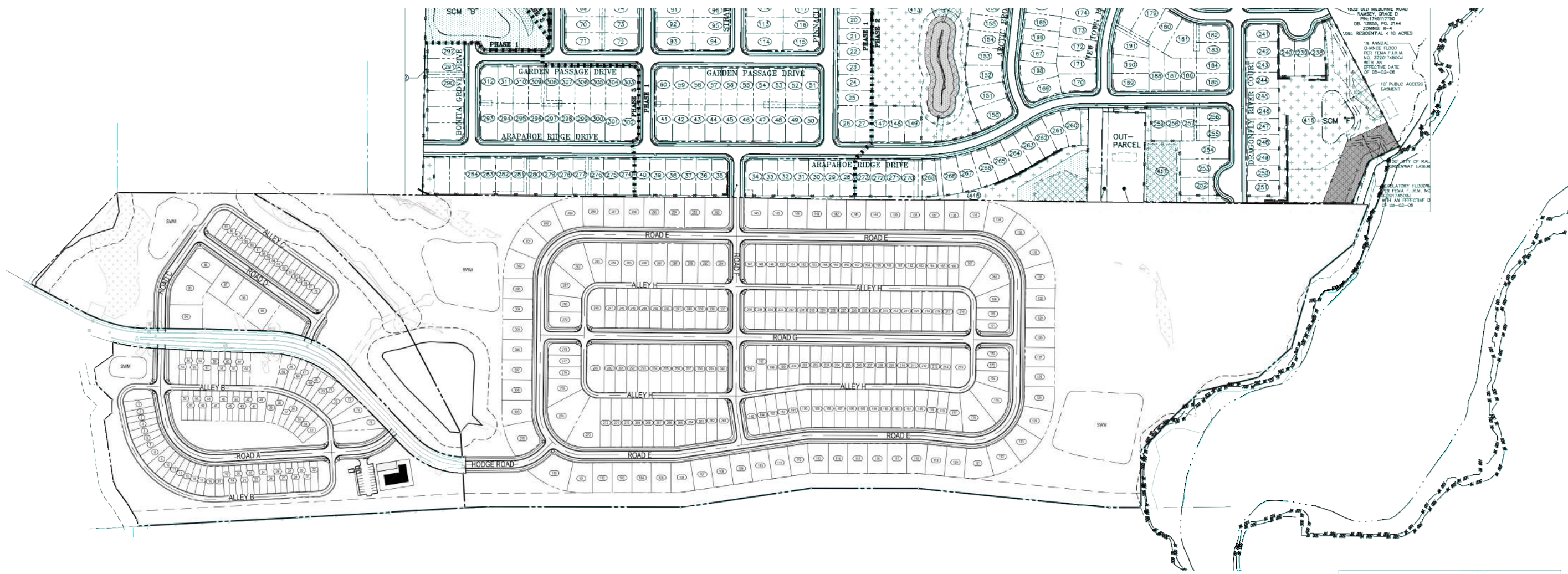


LEGACY OAKS
KNIGHTDALE, NC
TRAFFIC IMPACT ANALYSIS

SITE LOCATION

FIGURE
2.1

THIS DOCUMENT, TOGETHER WITH THE CONCEPTS AND DESIGNS PRESENTED HEREIN, AS AN INSTRUMENT OF SERVICE, IS INTENDED ONLY FOR THE SPECIFIC PURPOSE AND CLIENT FOR WHICH IT WAS PREPARED. REUSE OF AND IMPROPER RELIANCE ON THIS DOCUMENT WITHOUT WRITTEN AUTHORIZATION AND ADAPTATION BY KIMLEY-HORN AND ASSOCIATES, INC. SHALL BE WITHOUT LIABILITY TO KIMLEY-HORN AND ASSOCIATES, INC.



LOT COUNT

SINGLE FAMILY LOTS 46' WIDTH	72
SINGLE FAMILY LOTS 48' WIDTH	16
TOWNHOMES	6

TOTAL AREA DISTURBED AREA	PROPOSED
BUILDING/STRUCTURE SETBACKS	±80.44 AC
SINGLE FAMILY DETACHED	
FROM PRIMARY STREET	10'
FROM SIDE STREET	10'
FROM SIDE LOT LINE	20% LOT WIDTH
FROM REAR LOT LINE	25'
FROM REAR LOT LINE FROM REAR ALLEY	20' FROM CENTERLINE
TOWNHOMES	
FROM PRIMARY STREET	0'
FROM SIDE LOT LINE	10' BETWEEN BUILDINGS
FROM REAR LOT LINE	N/A
FROM REAR LOT LINE FROM REAR ALLEY	15' FROM CENTERLINE

SUBDIVISION NOTES

- SETBACKS ARE SHOWN IN ACCORDANCE WITH THE APPROVED TOWN OF KNIGHTDALE STANDARDS. REFER TO TOWN OF KNIGHTDALE UNIFIED DEVELOPMENT ORDINANCE FOR PORCHES, DECKS, GARAGES, ETC.
- ALL CURB AND GUTTER SHALL BE VALLEY CURB UNLESS OTHERWISE NOTED, AND CONSTRUCTED ACCORDING TO STANDARD DETAILS OF THE TOWN OF KNIGHTDALE STREET AND STORM DRAINAGE STANDARDS & SPECIFICATIONS MANUAL.
- CONTRACTOR SHALL HAVE NORTH CAROLINA ONE CALL (1-800-524-6449) LOCATE ALL EXISTING UTILITIES PRIOR TO BEGINNING CONSTRUCTION. CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF ALL EXISTING UTILITIES AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES OR CONFLICTS PRIOR TO BEGINNING CONSTRUCTION.
- CONTRACTOR IS RESPONSIBLE FOR REMOVING OR RELOCATING ALL UTILITIES IN CONFLICT WITH NEW CONSTRUCTION. CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANIES PRIOR TO DISTURBANCE.
- WHEELCHAIR RAMP LOCATIONS ARE APPROXIMATE ONLY. WHEELCHAIR RAMP SHOULD BE LOCATED AND CONSTRUCTED IN ACCORDANCE WITH THE TOWN OF KNIGHTDALE AND NCDOT STANDARDS AFTER THE LOCATIONS OF THE PROPOSED STOP BARS AND/OR PEDESTRIAN CROSSWALKS HAVE BEEN STAKED OUT.
- LOTS NOT SERVED BY ALLEYS SHALL HAVE A WIDTH (MEASURED ALONG THE FRONTING STREET'S RIGHT-OF-WAY) OF NO LESS THAN 65 FEET.

PAVEMENT MARKING & SIGNAGE NOTES

- ALL PAVEMENT MARKINGS AND STREET SIGNAGE SHALL BE IN ACCORDANCE WITH THE MUTCD.
- PAVEMENT MARKINGS SHALL BE THERMOPLASTIC AND SHALL COMPLY WITH NCDOT STANDARDS AND SPECIFICATIONS.
- SIGNS MUST USE PRISMATIC SHEETINGS AND MEET THE MINIMUM RETROREFLECTIVITY LEVELS SHOWN IN THE LATEST EDITION OF THE MUTCD. SIGNS PROVIDED FOR PEDESTRIAN CROSSINGS SHALL USE THE STRONG YELLOW-GREEN COLORING.
- ALL STREET NAME SIGNS SHALL ADHERE TO THE 2003 MUTCD REQUIREMENTS RELATED TO COLOR, LETTER CASE AND LETTER HEIGHTS. SIGN DESIGNS SHALL BE SUBMITTED TO TOWN STAFF APPROVAL PRIOR TO ACCEPTANCE OF STREETS FOR MAINTENANCE.

GRADING NOTE

- PROJECT AND ALL LOTS WILL BE MASS GRADED.

GRAPHIC LEGEND

EXISTING NOTE	TYPICAL NOTE TEXT	PROPOSED NOTE
---	PROPERTY/LEASE LINE	---
---	ADJACENT LOT LINE	---
---	BUILDING OR PARKING SETBACK	---
---	CURB & GUTTER	---
---	FLUSH CURB PAVEMENT STRIPING - 4" SSYL	---
---	STOP SIGN	+
---	ADA ACCESSIBLE PARKING SIGN	+
---	PAINTED STOP BAR	---

LAND USE AND ZONING INFORMATION AND NOTES:

- REFER TO GENERAL NOTES SHEET C-102
- SURVEYOR: BOHLER ENGINEERING NC, PLLC 4130 PARKLAKE AVE. SUITE 130 RALEIGH, NC 27601
- APPLICANT: SHENANDOAH HOMES 2840 PLAZA DRIVE, SUITE 200 RALEIGH, NC 27612
- OWNER: CAPITAL PROPERTIES OF RALEIGH VII LLC PO BOX 19001 RALEIGH, NC 27619
- PARCEL: 1745-20-805; 1744-24-382; 1744-36-3153 0 HODGE ROAD KNIGHTDALE, NC 27619
- ZONED: GR8UR12
- ALL DIMENSIONS ARE SHOWN FROM BACK OF CURB TO BACK OF CURB UNLESS OTHERWISE NOTED.

LEGACY OAKS
KNIGHTDALE, NC
TRAFFIC IMPACT ANALYSIS

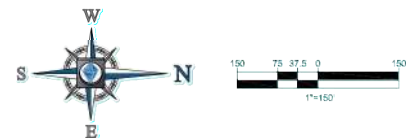
FIGURE
2.2

CONCEPTUAL SITE PLAN
(NORTH PARCEL)



**LEGACY OAKS RESIDENTIAL
CONCEPT**

KNIGHTDALE, NC



\\kimley-horn.com\SE_DUR\RAL_TPT0\Traffic\013538000 Legacy Oaks TIA Update\75 - Report-Submittals\TIA Figures\Legacy Oaks TIA figures.dwg

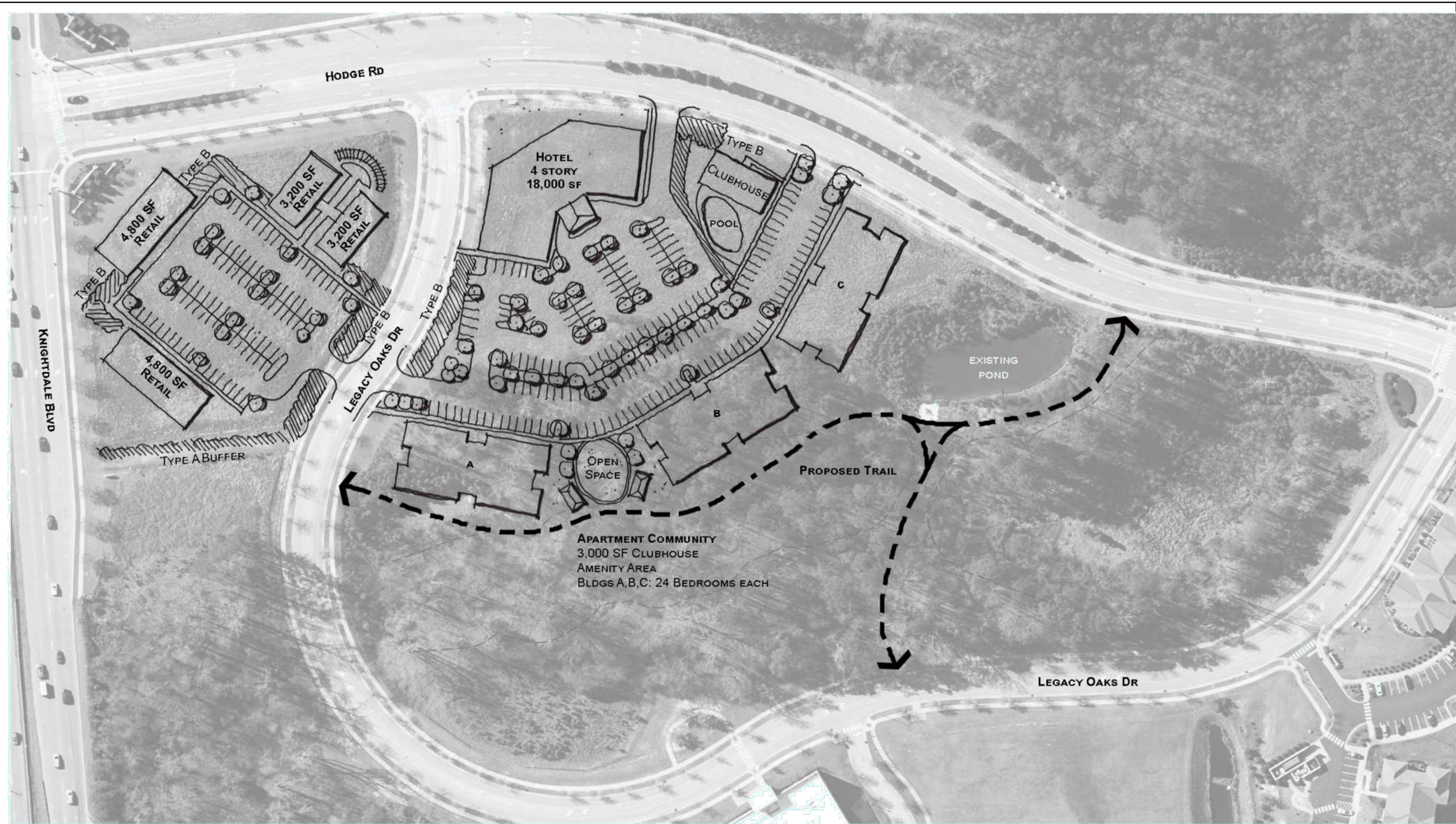


FIGURE 2.3

CONCEPTUAL SITE PLAN (SOUTH PARCEL)

LEGACY OAKS KNIGHTDALE, NC TRAFFIC IMPACT ANALYSIS



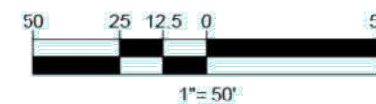
THIS DOCUMENT, TOGETHER WITH THE CONCEPTS AND DESIGNS PRESENTED HEREIN, AS AN INSTRUMENT OF SERVICE, IS INTENDED ONLY FOR THE PURPOSE AND CLIENT FOR WHICH IT WAS PREPARED. REUSE OF AND IMPROPER RELIANCE ON THIS DOCUMENT WITHOUT WRITTEN AUTHORIZATION AND ADAPTATION BY KIMLEY-HORN AND ASSOCIATES, INC. SHALL BE WITHOUT LIABILITY TO KIMLEY-HORN AND ASSOCIATES, INC.



THE INFORMATION, DESIGN AND CONTENT OF THIS PLAN ARE PROPRIETARY AND SHALL NOT BE COPIED OR USED FOR ANY PURPOSE WITHOUT PRIOR WRITTEN AUTHORIZATION FROM BOHLER ENGINEERING. ONLY APPROVED, SIGNED AND SEALED PLANS SHALL BE UTILIZED FOR CONSTRUCTION PURPOSES. © BOHLER ENGINEERING, 2018

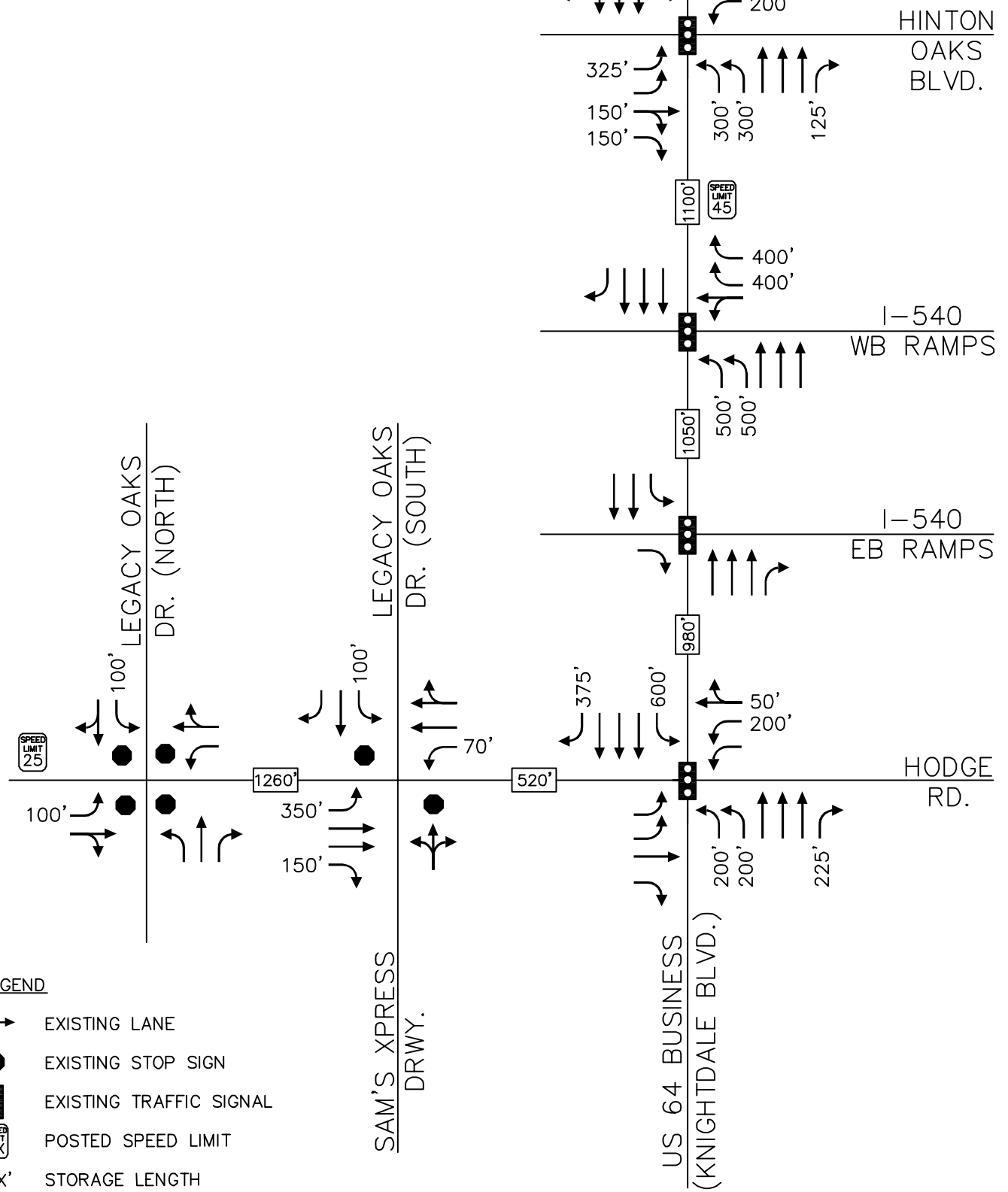
LEGACY OAKS CONCEPT A

LOT 2: RETAIL / LOT 4: HOTEL & APARTMENTS
KNIGHTDALE, NC



SEPT 2019

NOT TO SCALE



LEGEND

- EXISTING LANE
- EXISTING STOP SIGN
- ⬢ EXISTING TRAFFIC SIGNAL
- ⬢ (with XX) POSTED SPEED LIMIT
- XX' STORAGE LENGTH



LEGACY OAKS
KNIGHTDALE, NC
TRAFFIC IMPACT ANALYSIS

EXISTING (2020)
ROADWAY LANEAGE

FIGURE
2.4

THIS DOCUMENT, TOGETHER WITH THE CONCEPTS AND DESIGNS PRESENTED HEREIN, AS AN INSTRUMENT OF SERVICE, IS INTENDED ONLY FOR THE SPECIFIC PURPOSE AND CLIENT FOR WHICH IT WAS PREPARED. REUSE OF AND IMPROPER RELIANCE ON THIS DOCUMENT WITHOUT WRITTEN AUTHORIZATION AND ADAPTATION BY KIMLEY-HORN AND ASSOCIATES, INC. SHALL BE WITHOUT LIABILITY TO KIMLEY-HORN AND ASSOCIATES, INC.

3.0 Traffic Generation

The traffic generation potential of the proposed development was determined using the traffic generation rates published in *Trip Generation* (Institute of Transportation Engineers, Tenth Edition, 2017). As currently envisioned the development will consist of approximately 217 single-family homes, 93 townhomes, 72 multifamily apartments, a 130-room hotel, and 16,000 SF of retail space in addition to the existing land uses. The trip generation for the site is summarized in Table 3.0.

Land Use Code	Land Use	Intensity		Daily		AM Peak Hour		PM Peak Hour	
				In	Out	In	Out	In	Out
210	Single Family Detached Housing	217	d.u.	1,061	1,061	40	119	135	79
220	Multifamily Housing (Low-Rise)	93	d.u.	331	331	10	35	35	20
221	Multifamily Housing (Mid-Rise)	72	d.u.	196	196	7	18	20	12
310	Hotel	130	rooms	521	521	35	25	36	35
820	Shopping Center	16,000	s.f.	865	865	54	33	67	73
Subtotal				2,974	2,974	146	230	293	219
<i>Internal Capture Reduction</i>				362	362	5	5	34	34
<i>Pass-By Capture Reduction</i>				229	229	0	0	20	17
Total Net New External Trips				2,383	2,383	141	225	239	168

As shown in Table 3.0, the proposed development has the potential to generate 4,766 daily trips, 366 trips during the AM peak hour, and 407 trips during the PM peak hour on a typical weekday. For reference, uses analyzed on the “West Tract” in the original *Watson Tract TIA* were projected to generate 12,850 daily trips, 1,062 trips during the AM peak hour, and 1,404 trips during the PM peak hour, which far exceed the trip generation of the combined existing and proposed uses on this site.

Internally captured trips are trips that begin and end on the project site and do not access the external roadway network. Internal capture was applied using ITE methodology. It should be noted that to be conservative, no internal capture was applied between the proposed and existing uses even though such capture will certainly occur.

Pass-by trips are trips already on the roadway network that will make a trip to the site as they pass by on the adjacent street. Pass-by capture was calculated using ITE rates, and pass-by trips were assigned based on existing traffic patterns. Detailed trip generation calculations are included in the Appendix of this report.

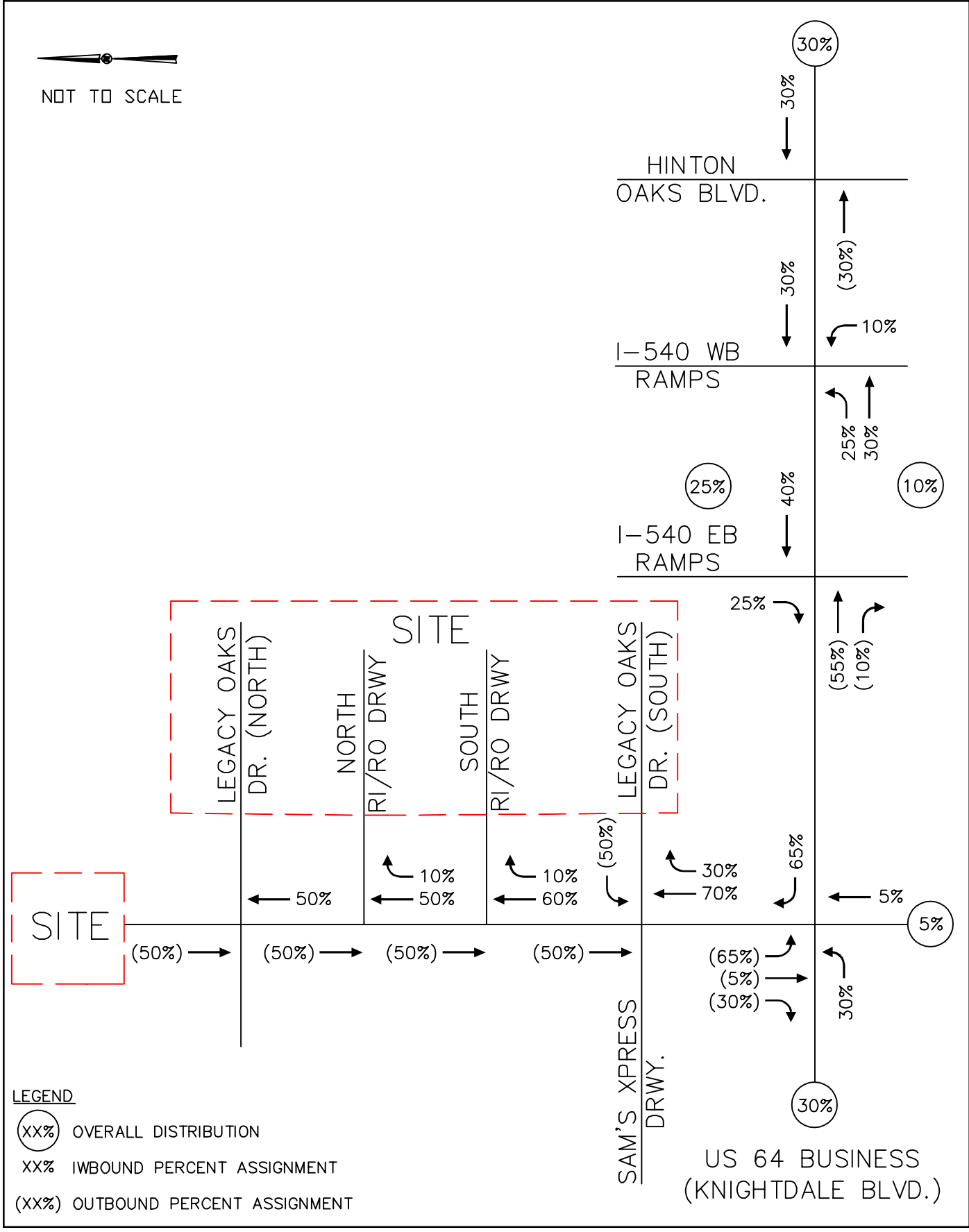
4.0 Site Traffic Distribution

The proposed generated trips for the build-out scenario was assigned to the surrounding roadway network. The directional distribution and assignment are based on existing travel patterns and are consistent with the distribution from the previous TIA.

- 30% to/from the west on US 64 Business (Knightdale Boulevard)
- 30 to/from the east on US 64 Business (Knightdale Boulevard)
- 25% to/from the north on I-540
- 10% to/from the south on I-540
- 5% to/from the south on Hodge Road

The site traffic distribution and percent assignment for the net new site trips are shown on **Figure 4.1**.

NOT TO SCALE



LEGACY OAKS
KNIGHTDALE, NC
TRAFFIC IMPACT ANALYSIS

SITE TRAFFIC DISTRIBUTION
AND PERCENT ASSIGNMENT

FIGURE
4.1

THIS DOCUMENT, TOGETHER WITH THE CONCEPTS AND DESIGNS PRESENTED HEREIN, AS AN INSTRUMENT OF SERVICE, IS INTENDED ONLY FOR THE SPECIFIC PURPOSE AND CLIENT FOR WHICH IT WAS PREPARED. REUSE OF AND IMPROPER RELIANCE ON THIS DOCUMENT WITHOUT WRITTEN AUTHORIZATION AND ADAPTATION BY KIMLEY-HORN AND ASSOCIATES, INC. SHALL BE WITHOUT LIABILITY TO KIMLEY-HORN AND ASSOCIATES, INC.

5.0 Projected Traffic Volumes

5.1 Existing Traffic

AM peak hour (7:00 to 9:00 AM) and PM peak hour (4:00 to 6:00 PM) turning movement counts were performed or obtained from other studies in the area at the following intersections:

- US 64 Business (Knightdale Boulevard) at Hodge Road December 5, 2019
- US 64 Business (Knightdale Boulevard) at I-540 Eastbound Ramps January 30, 2020
- US 64 Business (Knightdale Boulevard) at I-540 Westbound Ramps January 30, 2020
- US 64 Business (Knightdale Boulevard) at Hinton Oaks Boulevard January 30, 2020
- Hodge Road at Legacy Oaks Drive South December 5, 2019
- Hodge Road at Legacy Oaks Drive North December 5, 2019

Peak hour volumes onto/off of Hodge Road were obtained from the turning movement count performed on December 5, 2019, while through movement volumes on US 64 Business at Hodge Road were balanced with volumes at the I-540 Eastbound Ramps collected on January 30, 2020 to be consistent with the Hinton Oaks Industrial project. The existing AM and PM peak hour traffic volumes are shown on **Figures 5.1 and 5.2**, and the traffic count data are included in the Appendix.

5.2 Historic Growth Traffic

Historic growth traffic is the increase in traffic due to usage increases and non-specific growth throughout the area. Based on discussions with NCDOT and Town of Knightdale staff and a review of historic growth rates in the area and discussions with the City of Raleigh, a 3% annual growth rate was applied to existing traffic volumes up to the proposed build-out +1 study year (2024), and a 1% annual growth rate was applied from the 2024 study year to the proposed build-out +10 horizon year (2033).

5.3 Approved Development Traffic

Approved development traffic is generated by approved but not yet constructed projects in the vicinity of the proposed project. Based on discussions with NCDOT and Town of Knightdale staff there is one approved development identified for inclusion in the analysis: *540 West Subdivision* (VHB, August 2018).

- 540 West Subdivision
 - Location: East side of Old Milburnie Road immediately west of the site)
 - Proposed: 410 single-family homes
 - Anticipated build-out in 2022. Therefore, 100% of the site traffic from this development was included in the 2024 and 2033 study year scenarios of this analysis.

- Cross-access: The 540 West development will have cross-access through the Legacy Oaks development. Based on the layouts of both sites, it is anticipated that as much traffic would go through Legacy Oaks to get to Knightdale Boulevard as Legacy Oaks traffic would go through 540 West to get to Old Milburnie Road. Therefore, no site traffic was assigned between these developments.
- Assignment: It was assumed that the 15% of site traffic to/from the east on US 64 Business (Knightdale Boulevard) from the 540 West development would be split evenly:
 - 5% to/from the north on I-540
 - 5% to/from the south on I-540
 - 5% to/from the east on US 64 Business (Knightdale Blvd)

While not yet approved, analyses were performed with and without traffic from the proposed Hinton Oaks Industrial development.

- Hinton Oaks Industrial (Hinton Oaks Boulevard north of Knightdale Boulevard)
 - Proposed: 127,200 square feet of Industrial Park space, 84,800 square feet of General Office space, and 88,000 square feet of Business Park
 - Recommended extending the storage of the existing dual left-turn lanes at Hinton Oaks Boulevard to 400 feet
 - Anticipated build-out in 2022, Therefore, 100% of the site traffic from this development was included in the 2024 and 2033 study year scenarios.

Background traffic volumes consisting of existing, historic growth, and approved development traffic for the analysis year 2024 are shown on **Figures 5.1 and 5.2** for the AM and PM peak hours, respectively. Background traffic volumes with the Hinton Oaks Industrial development included for the 2024 analysis year are shown on **Figures 5.3 and 5.4** for the AM and PM peak hours, respectively.

Background traffic volumes consisting of projected (2024) background volumes and historic growth for the analysis year 2033 are shown on **Figures 5.5 and 5.6** for the AM and PM peak hours, respectively. Background traffic volumes with the Hinton Oaks Industrial development included for the 2033 analysis year are shown on **Figures 5.7 and 5.8** for the AM and PM peak hours, respectively.

5.4 Site Traffic

The proposed site traffic was generated and assigned to the adjacent roadway network according to the distribution discussed previously in Section 4.0. The site traffic volumes for the AM and PM peak hours are shown on **Figures 5.9 and 5.10**, respectively, for the year 2024. The site traffic volumes for the AM and PM peak hours with the Hinton Oaks Industrial development are shown on **Figures 5.11 and 5.12**, respectively.

The site traffic volumes for the AM and PM peak hours are shown on **Figures 5.13 and 5.14** for the year 2033, respectively. The 2033 site traffic volumes for the AM and PM peak hours with the Hinton Oaks Industrial development are shown on **Figures 5.15 and 5.16**, respectively.

5.5 *Build-Out Traffic*

To obtain the projected (2024) build-out +1 traffic volumes, the projected site traffic volumes were added to the projected (2024) background traffic. To obtain the projected (2033) build-out +10 traffic volumes, the projected site traffic volumes were added the projected (2033) background traffic. Traffic volume calculations are detailed in intersection spreadsheets in the Appendix of this report.

Figures 5.9 and 5.10 show the projected (2024) build-out +1 AM and PM peak hour traffic volumes, respectively. **Figures 5.11 and 5.12** show the projected (2024) build-out +1 AM and PM peak hour traffic volumes, respectively, with the Hinton Oaks Industrial development. **Figures 5.13 and 5.14** show the projected (2033) build-out +10 AM and PM peak hour traffic volumes, respectively. **Figures 5.15 and 5.16** show the projected (2033) build-out +10 AM and PM peak hour traffic volumes, respectively, with the Hinton Oaks Industrial development.

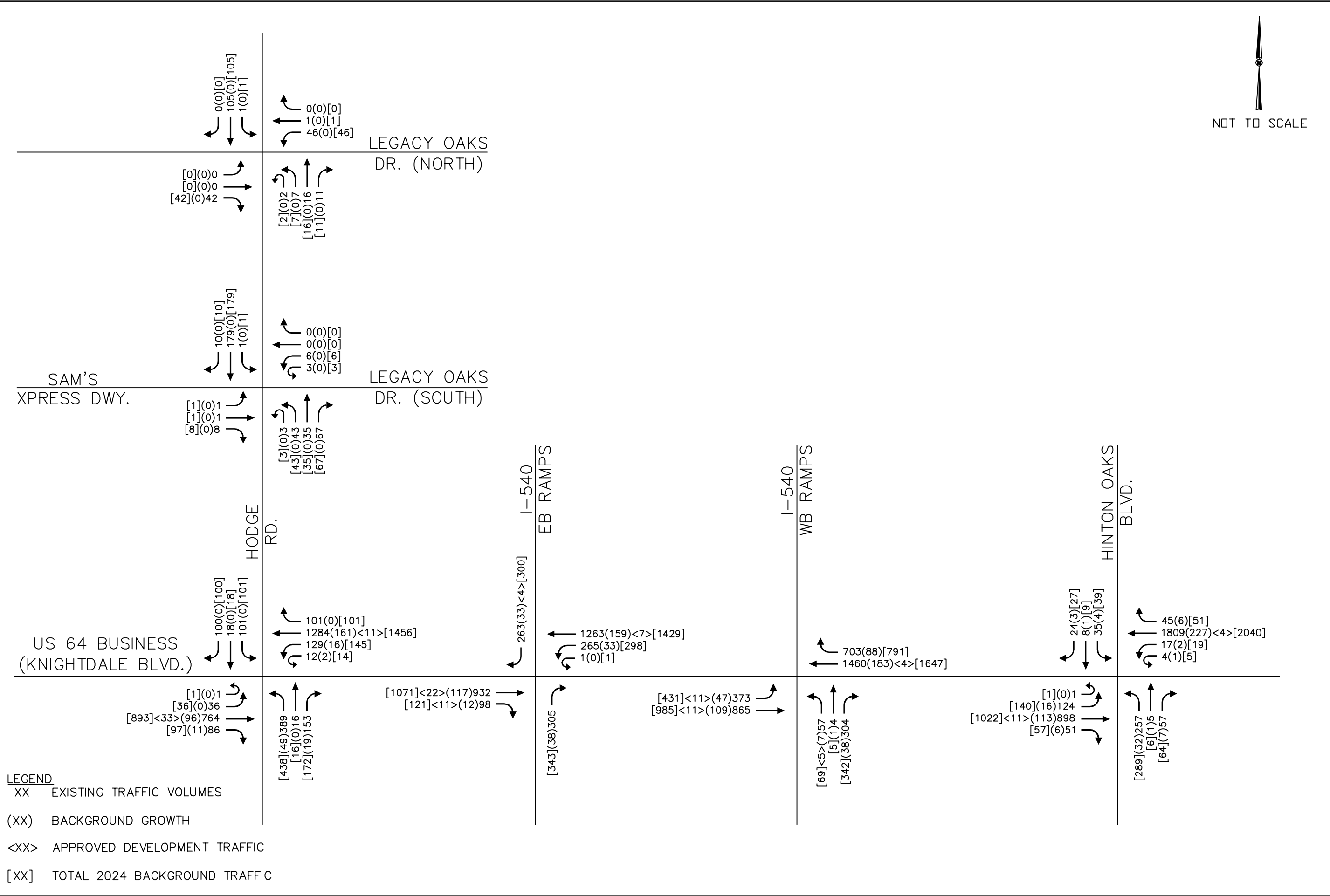


FIGURE 5.1

EXISTING (2020) AND BACKGROUND (2024) AM PEAK HOUR TRAFFIC VOLUMES

LEGACY OAKS KNIGHTDALE, NC TRAFFIC IMPACT ANALYSIS



THIS DOCUMENT, TOGETHER WITH THE CONCEPTS AND DESIGNS PRESENTED HEREIN, AS AN INSTRUMENT OF SERVICE, IS INTENDED ONLY FOR THE PURPOSE AND CLIENT FOR WHICH IT WAS PREPARED. REUSE OF AND IMPROPER RELIANCE ON THIS DOCUMENT WITHOUT WRITTEN AUTHORIZATION AND ADAPTATION BY KIMLEY-HORN AND ASSOCIATES, INC. SHALL BE WITHOUT LIABILITY TO KIMLEY-HORN AND ASSOCIATES, INC.

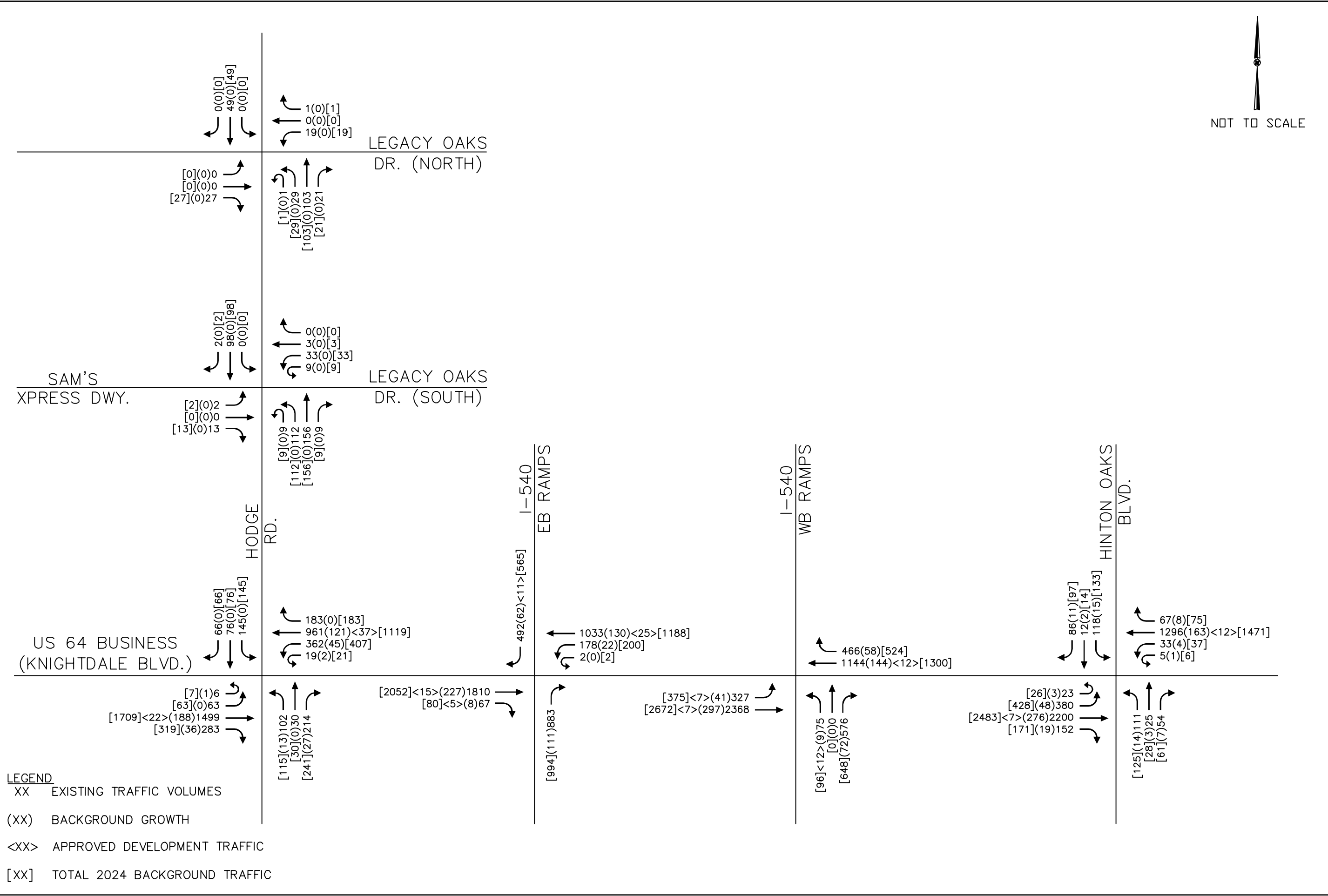


FIGURE 5.2

EXISTING (2020) AND BACKGROUND (2024) PM PEAK HOUR TRAFFIC VOLUMES

LEGACY OAKS KNIGHTDALE, NC TRAFFIC IMPACT ANALYSIS



THIS DOCUMENT, TOGETHER WITH THE CONCEPTS AND DESIGNS PRESENTED HEREIN, AS AN INSTRUMENT OF SERVICE, IS INTENDED ONLY FOR THE PURPOSE AND CLIENT FOR WHICH IT WAS PREPARED. REUSE OF AND IMPROPER RELIANCE ON THIS DOCUMENT WITHOUT WRITTEN AUTHORIZATION AND ADAPTATION BY KIMLEY-HORN AND ASSOCIATES, INC. SHALL BE WITHOUT LIABILITY TO KIMLEY-HORN AND ASSOCIATES, INC.

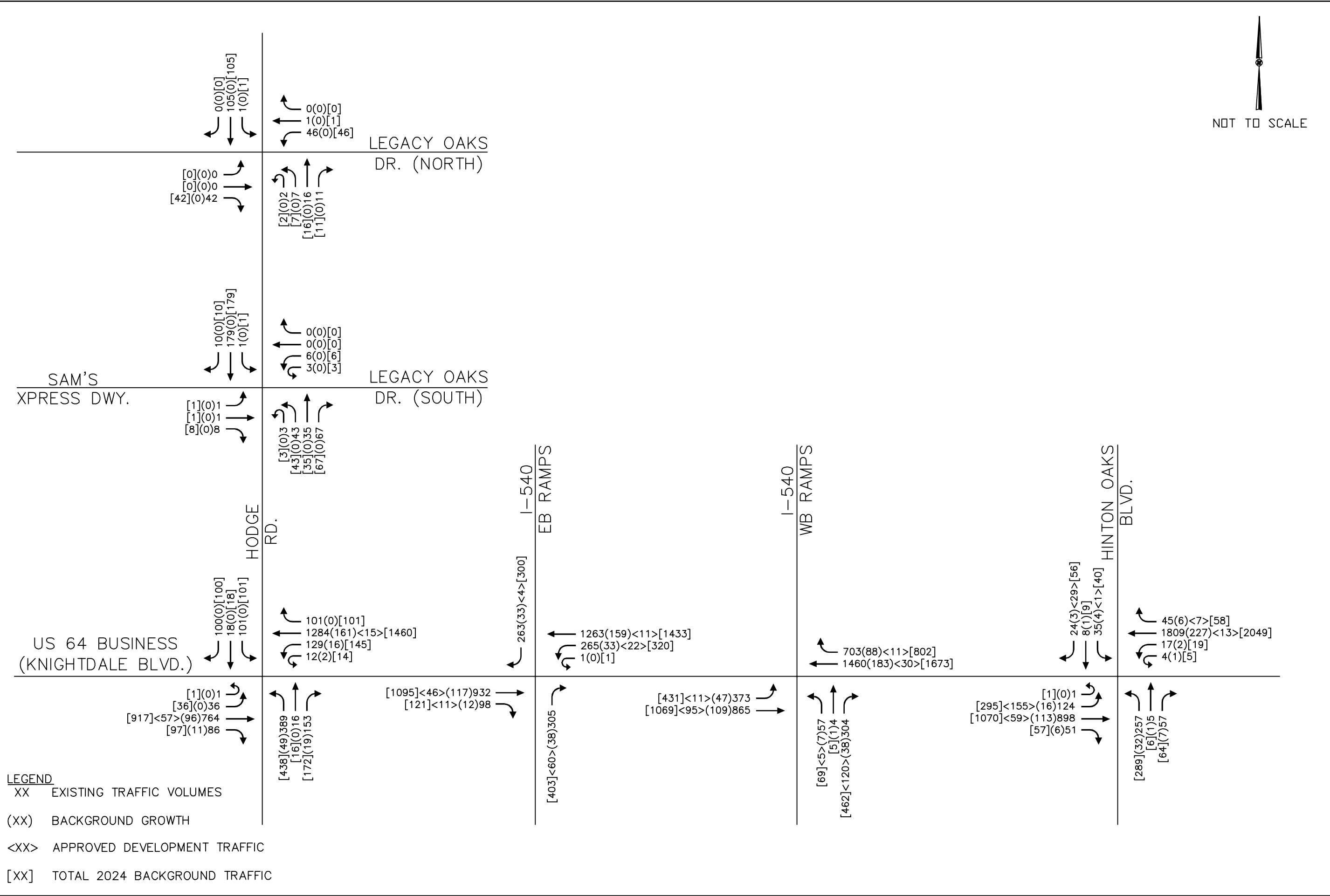


FIGURE 5.3

EXISTING (2020) AND BACKGROUND (2024) AM PEAK HOUR TRAFFIC VOLUMES WITH HINTON OAKS INDUSTRIAL

LEGACY OAKS KNIGHTDALE, NC TRAFFIC IMPACT ANALYSIS



THIS DOCUMENT, TOGETHER WITH THE CONCEPTS AND DESIGNS PRESENTED HEREIN, AS AN INSTRUMENT OF SERVICE, IS INTENDED ONLY FOR THE PURPOSE AND CLIENT FOR WHICH IT WAS PREPARED. REUSE OF AND IMPROPER RELIANCE ON THIS DOCUMENT WITHOUT WRITTEN AUTHORIZATION AND ADAPTATION BY KIMLEY-HORN AND ASSOCIATES, INC. SHALL BE WITHOUT LIABILITY TO KIMLEY-HORN AND ASSOCIATES, INC.

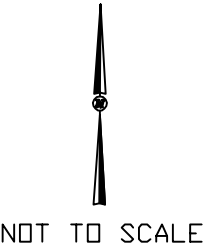
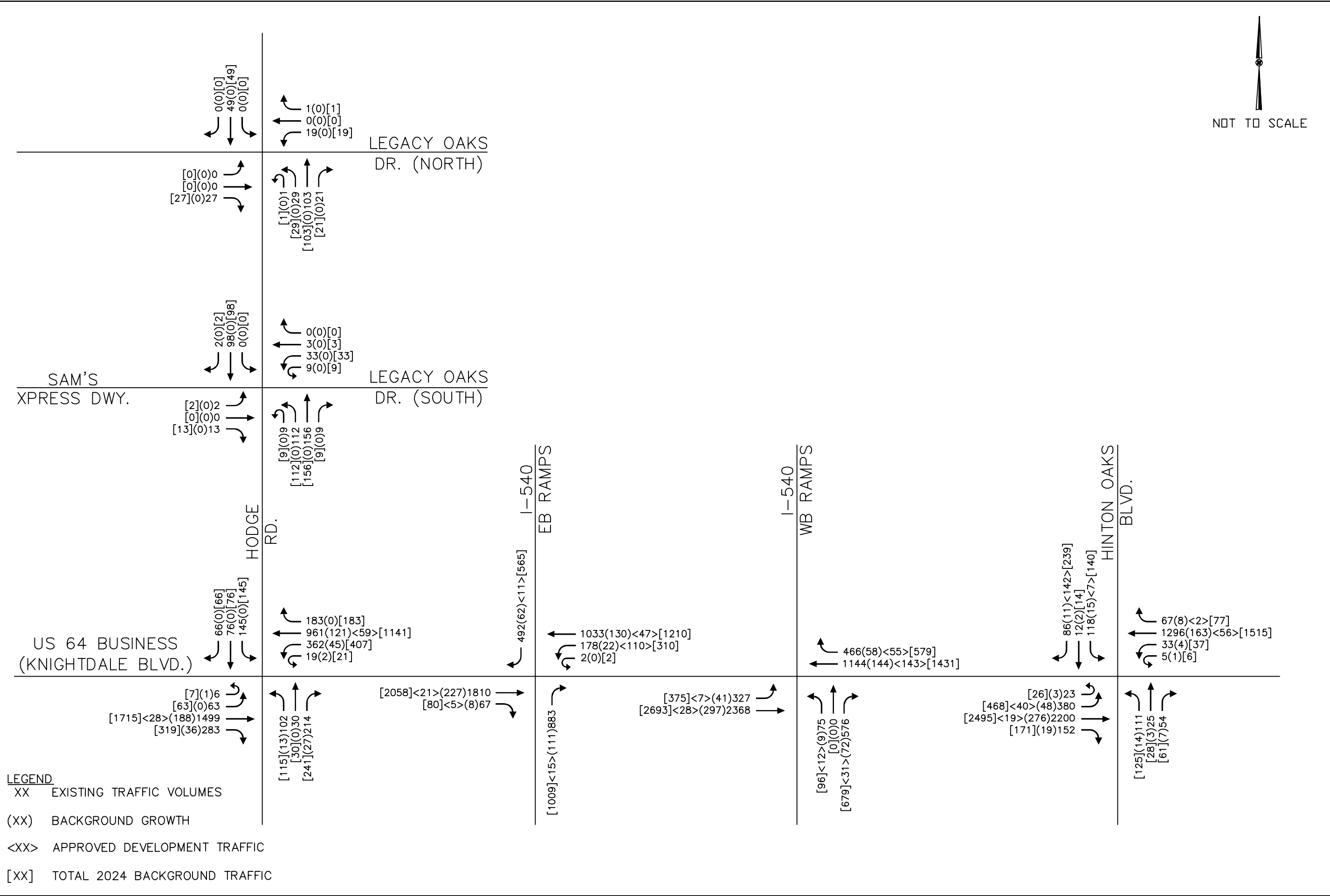


FIGURE 5.4

EXISTING (2020) AND BACKGROUND (2024) PM PEAK HOUR TRAFFIC VOLUMES WITH HINTON OAKS INDUSTRIAL

LEGACY OAKS KNIGHTDALE, NC TRAFFIC IMPACT ANALYSIS



THIS DOCUMENT, TOGETHER WITH THE CONCEPTS AND DESIGNS PRESENTED HEREIN, AS AN INSTRUMENT OF SERVICE, IS INTENDED ONLY FOR THE PURPOSE AND CLIENT FOR WHICH IT WAS PREPARED. REUSE OF AND IMPROPER RELIANCE ON THIS DOCUMENT WITHOUT WRITTEN AUTHORIZATION AND ADAPTATION BY KIMLEY-HORN AND ASSOCIATES, INC. SHALL BE WITHOUT LIABILITY TO KIMLEY-HORN AND ASSOCIATES, INC.

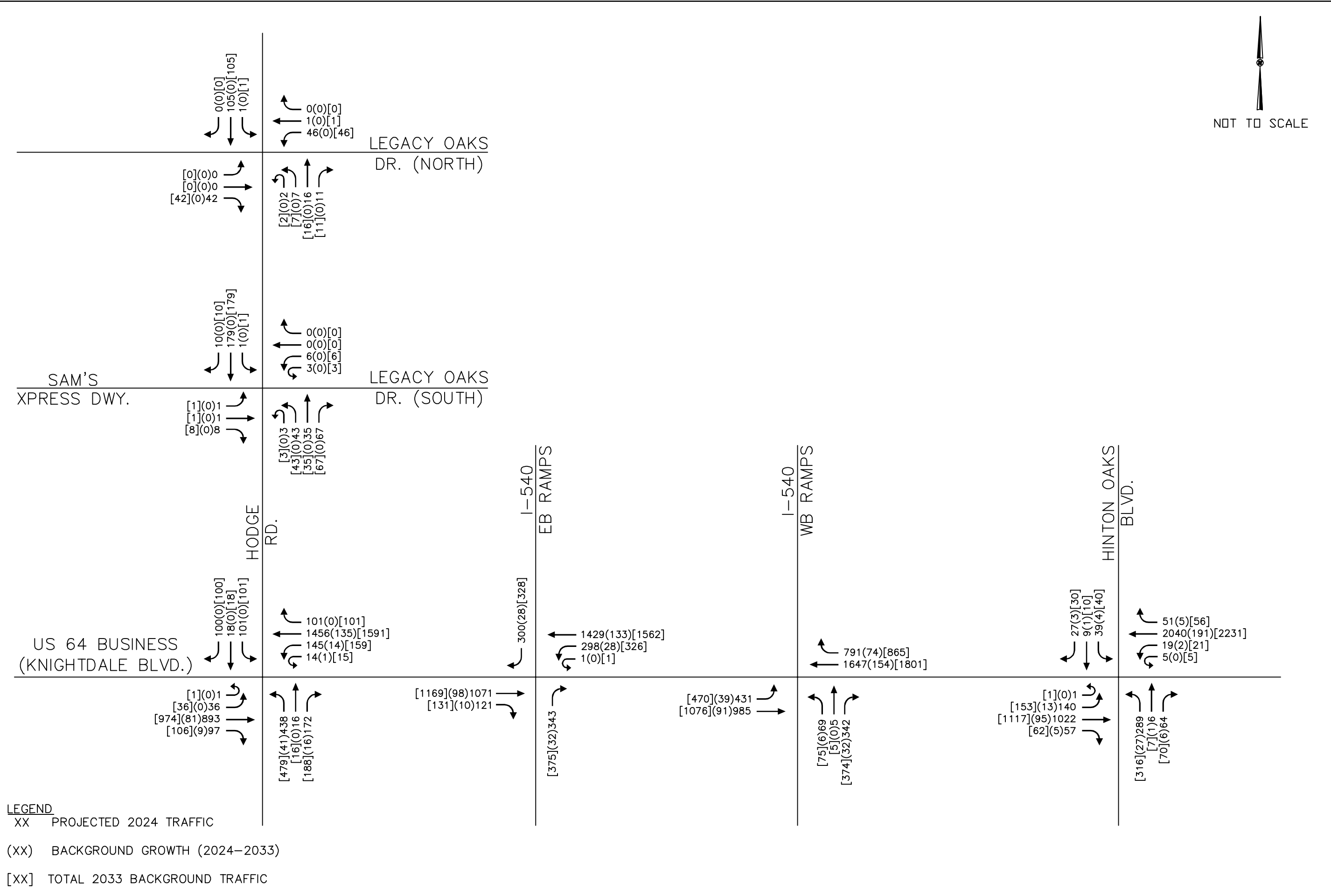


FIGURE 5.5

BACKGROUND (2033) AM PEAK HOUR TRAFFIC VOLUMES

LEGACY OAKS KNIGHTDALE, NC TRAFFIC IMPACT ANALYSIS



THIS DOCUMENT, TOGETHER WITH THE CONCEPTS AND DESIGNS PRESENTED HEREIN, AS AN INSTRUMENT OF SERVICE, IS INTENDED ONLY FOR THE PURPOSE AND CLIENT FOR WHICH IT WAS PREPARED. REUSE OF AND IMPROPER RELIANCE ON THIS DOCUMENT WITHOUT WRITTEN AUTHORIZATION AND ADAPTATION BY KIMLEY-HORN AND ASSOCIATES, INC. SHALL BE WITHOUT LIABILITY TO KIMLEY-HORN AND ASSOCIATES, INC.

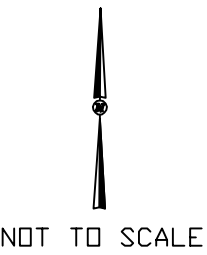
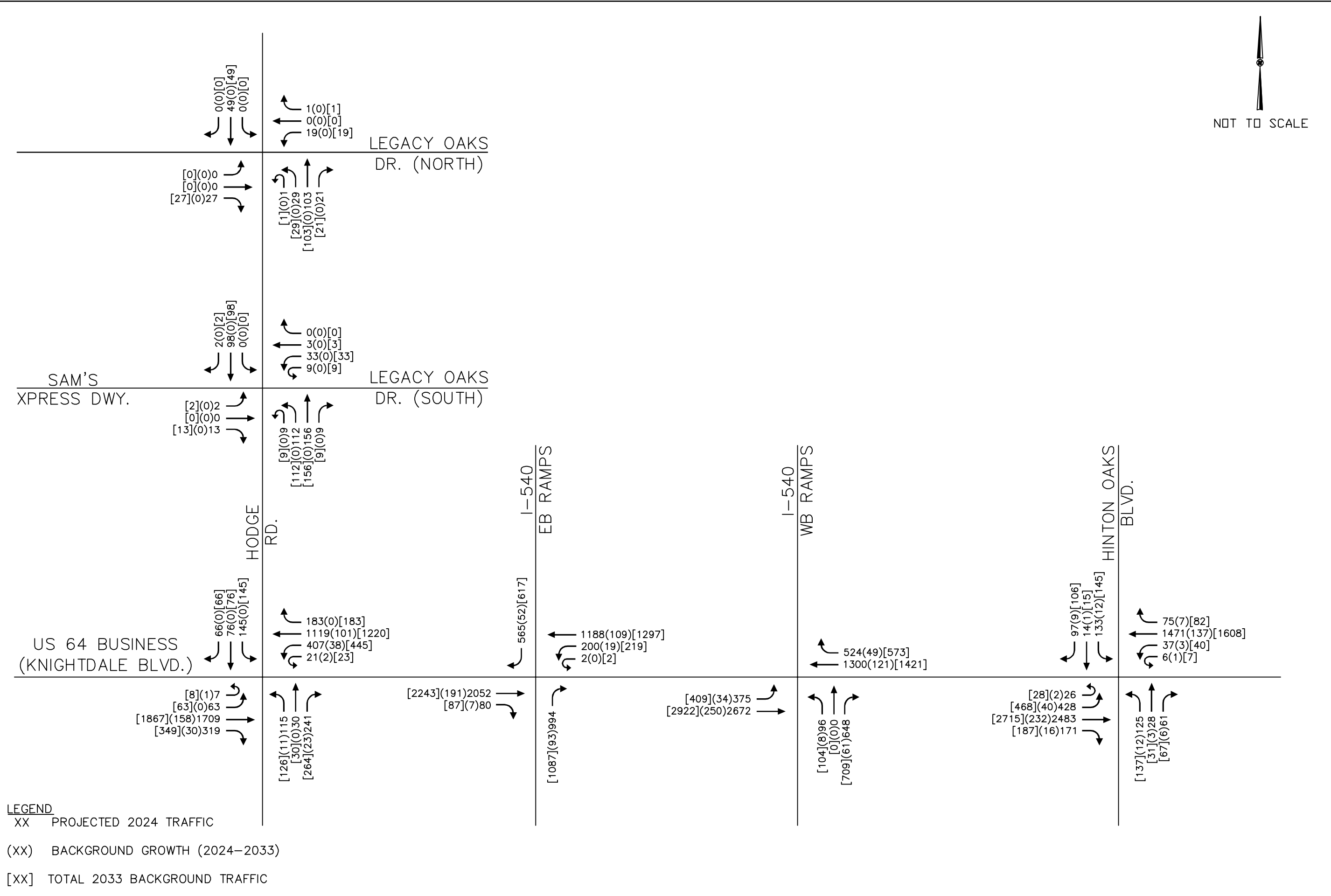


FIGURE 5.6

BACKGROUND (2033) PM PEAK HOUR TRAFFIC VOLUMES

LEGACY OAKS KNIGHTDALE, NC TRAFFIC IMPACT ANALYSIS



THIS DOCUMENT, TOGETHER WITH THE CONCEPTS AND DESIGNS PRESENTED HEREIN, AS AN INSTRUMENT OF SERVICE, IS INTENDED ONLY FOR THE PURPOSE AND CLIENT FOR WHICH IT WAS PREPARED. REUSE OF AND IMPROPER RELIANCE ON THIS DOCUMENT WITHOUT WRITTEN AUTHORIZATION AND ADAPTATION BY KIMLEY-HORN AND ASSOCIATES, INC. SHALL BE WITHOUT LIABILITY TO KIMLEY-HORN AND ASSOCIATES, INC.

SAM'S
XPRESS DWY.

[1](0)1
[1](0)1
[8](0)8

← 10(0)[10]
← 179(0)[179]
← 1(0)[1]

00
00
[42](0)42

← 0(0)[0]
← 105(0)[105]
← 1(0)[1]

LEGACY OAKS
DR. (SOUTH)

[3](0)3
[43](0)43
[35](0)35
[67](0)67

← 0(0)[0]
← 0(0)[0]
← 6(0)[6]
← 3(0)[3]

[2](0)2
[7](0)7
[16](0)16
[11](0)11

← 0(0)[0]
← 1(0)[1]
← 46(0)[46]

LEGACY OAKS
DR. (NORTH)

US 64 BUSINESS
(KNIGHTDALE BLVD.)

[1](0)1
[36](0)36
[998](81)917
[106](9)97

← 100(0)[100]
← 18(0)[18]
← 101(0)[101]

← 101(0)[101]
← 1460(135)[1595]
← 145(14)[159]
← 14(1)[15]

[479](41)438
[16](0)16
[188](16)172

[1193](98)1095
[131](10)121

← 300(28)[328]

I-540
EB RAMP

[435](32)403

← 1433(133)[1566]
← 320(28)[348]
← 1(0)[1]

[470](39)431
[1160](91)1069

I-540
WB RAMP

[75](6)69
[5](0)5
[494](32)462

← 802(74)[876]
← 1673(154)[1827]

[1](0)1
[308](13)295
[1165](95)1070
[62](5)57

← 56(3)[59]
← 9(1)[10]
← 40(4)[44]

HINTON OAKS
BLVD.

[316](27)289
[7](1)6
[70](6)64

← 58(5)[63]
← 2049(191)[2240]
← 19(2)[21]
← 5(0)[5]

NOT TO SCALE



LEGEND

- XX PROJECTED 2024 TRAFFIC
- (XX) BACKGROUND GROWTH (2024-2033)
- [XX] TOTAL 2033 BACKGROUND TRAFFIC



LEGACY OAKS
KNIGHTDALE, NC
TRAFFIC IMPACT ANALYSIS

BACKGROUND (2033)
AM PEAK HOUR TRAFFIC VOLUMES -
WITH HINTON OAKS INDUSTRIAL

FIGURE
5.7

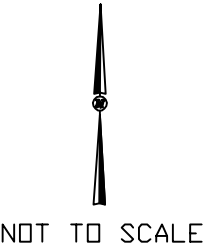
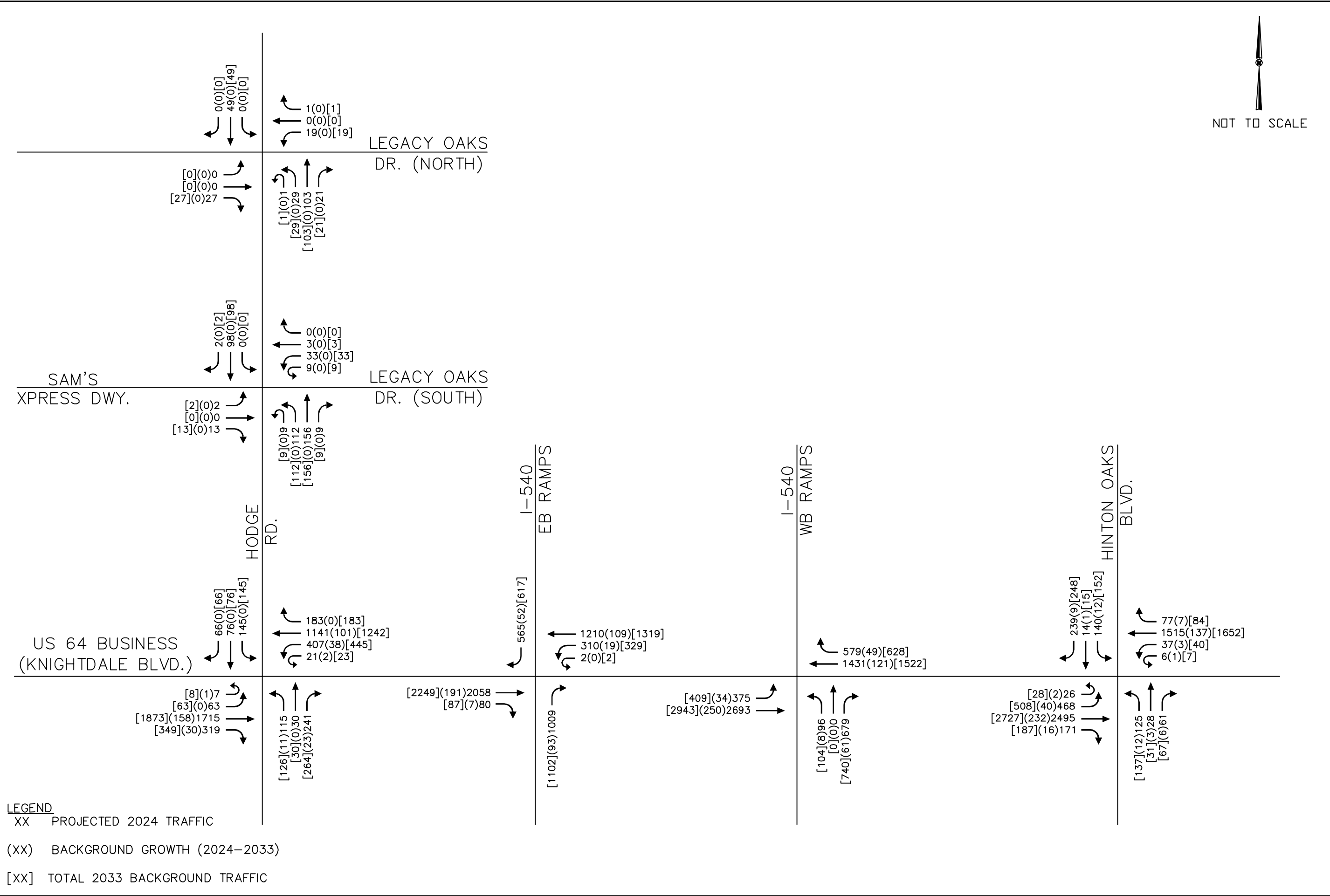


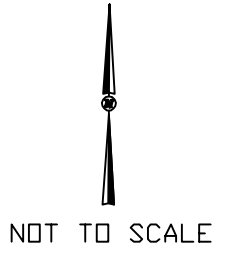
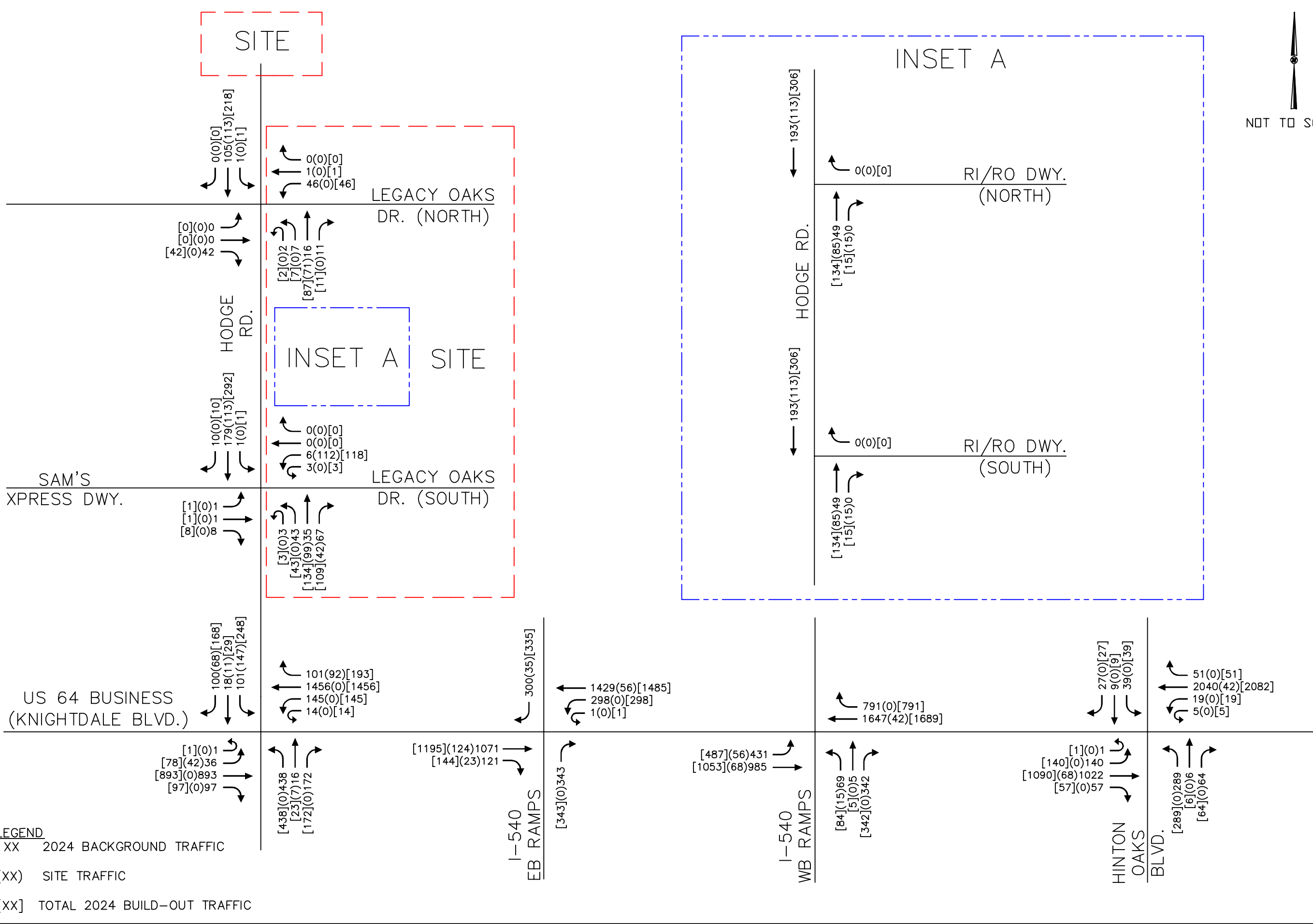
FIGURE 5.8

BACKGROUND (2033) PM PEAK HOUR TRAFFIC VOLUMES WITH HINTON OAKS INDUSTRIAL

LEGACY OAKS KNIGHTDALE, NC TRAFFIC IMPACT ANALYSIS



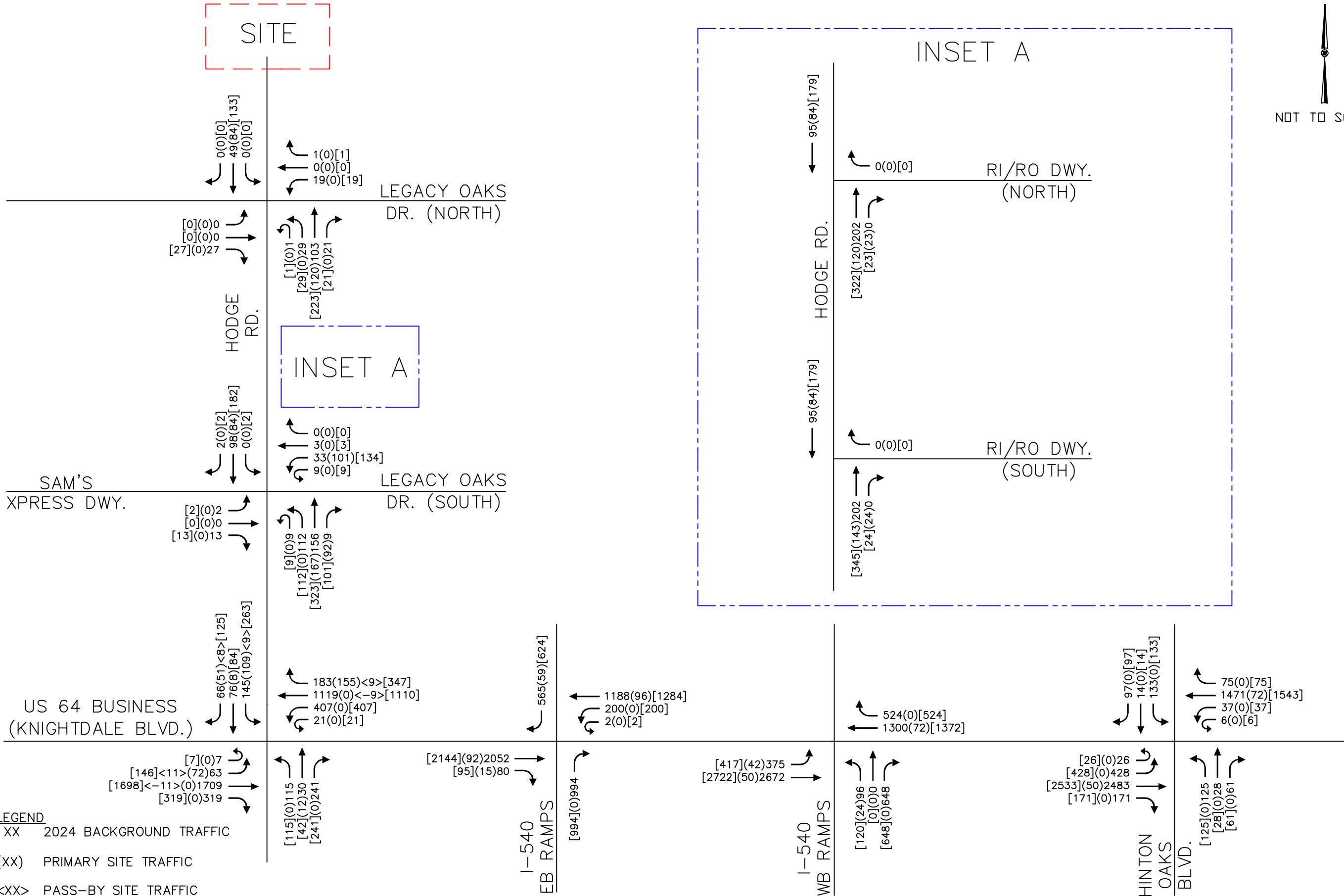
THIS DOCUMENT, TOGETHER WITH THE CONCEPTS AND DESIGNS PRESENTED HEREIN, AS AN INSTRUMENT OF SERVICE, IS INTENDED ONLY FOR THE PURPOSE AND CLIENT FOR WHICH IT WAS PREPARED. REUSE OF AND IMPROPER RELIANCE ON THIS DOCUMENT WITHOUT WRITTEN AUTHORIZATION AND ADAPTATION BY KIMLEY-HORN AND ASSOCIATES, INC. SHALL BE WITHOUT LIABILITY TO KIMLEY-HORN AND ASSOCIATES, INC.



LEGACY OAKS
KNIGHTDALE, NC
TRAFFIC IMPACT ANALYSIS

PROJECTED BUILD-OUT+1 (2024)
AM PEAK HOUR TRAFFIC VOLUMES

FIGURE
5.9



LEGEND

XX 2024 BACKGROUND TRAFFIC

(XX) PRIMARY SITE TRAFFIC

<XX> PASS-BY SITE TRAFFIC

[XX] TOTAL 2024 BUILD-OUT TRAFFIC

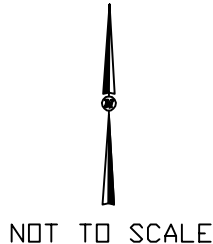


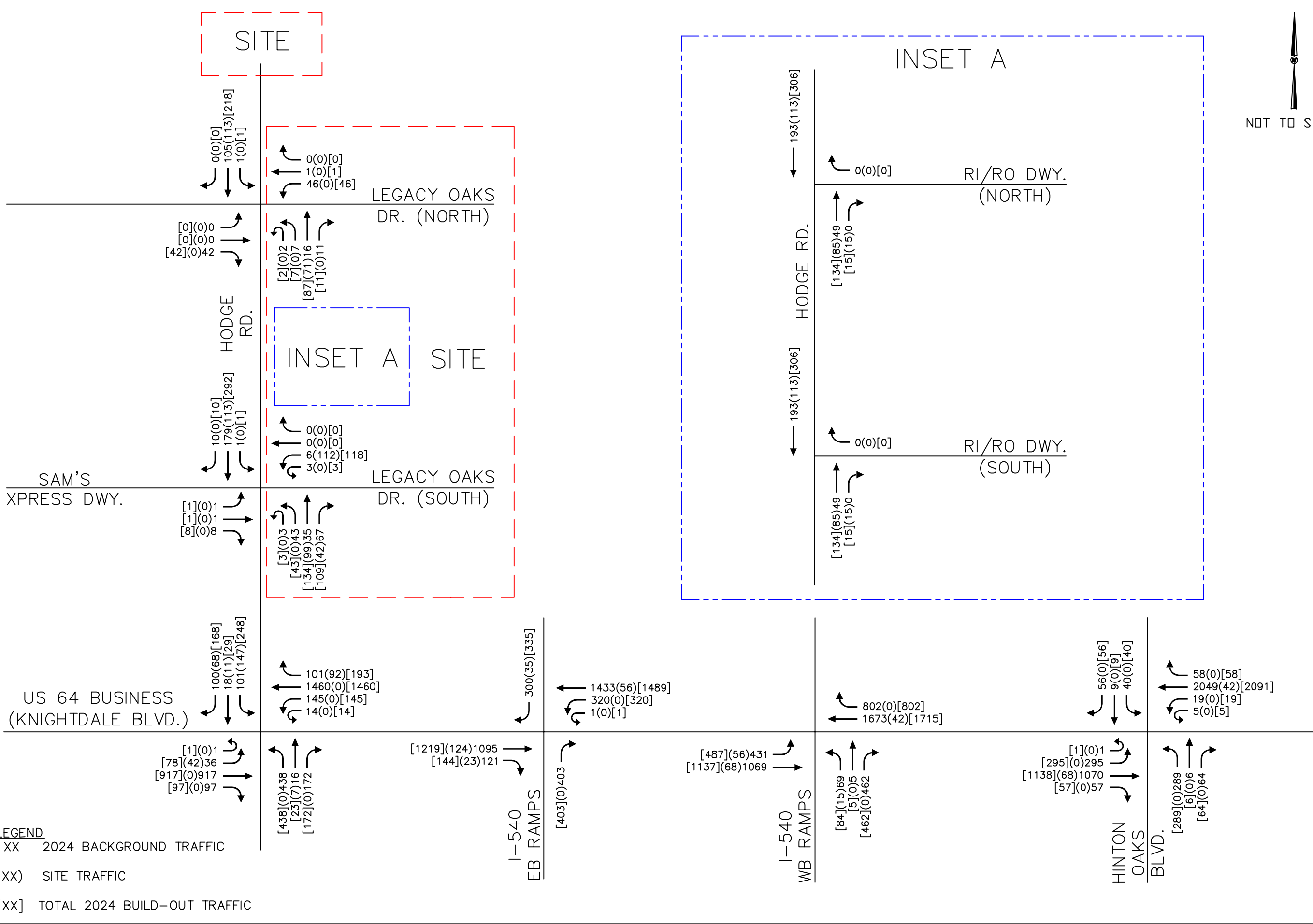
FIGURE 5.10

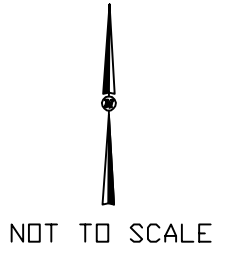
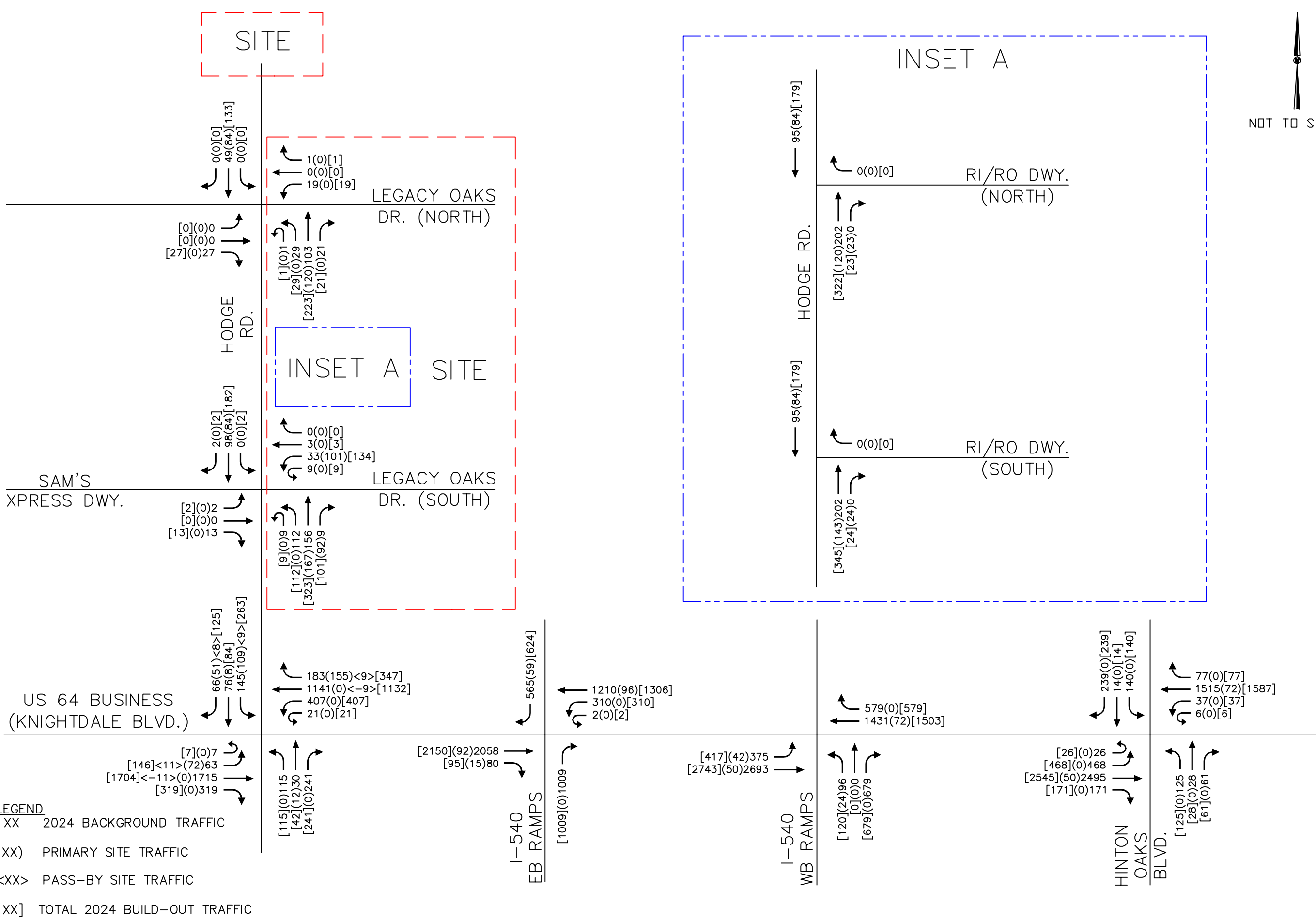
PROJECTED BUILD-OUT+1 (2024) PM PEAK HOUR TRAFFIC VOLUMES

LEGACY OAKS KNIGHTDALE, NC TRAFFIC IMPACT ANALYSIS



THIS DOCUMENT, TOGETHER WITH THE CONCEPTS AND DESIGNS PRESENTED HEREIN, AS AN INSTRUMENT OF SERVICE, IS INTENDED ONLY FOR THE PURPOSE AND CLIENT FOR WHICH IT WAS PREPARED. REUSE OF AND IMPROPER RELIANCE ON THIS DOCUMENT WITHOUT WRITTEN AUTHORIZATION AND ADAPTATION BY KIMLEY-HORN AND ASSOCIATES, INC. SHALL BE WITHOUT LIABILITY TO KIMLEY-HORN AND ASSOCIATES, INC.





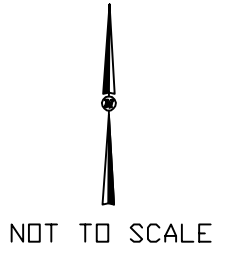
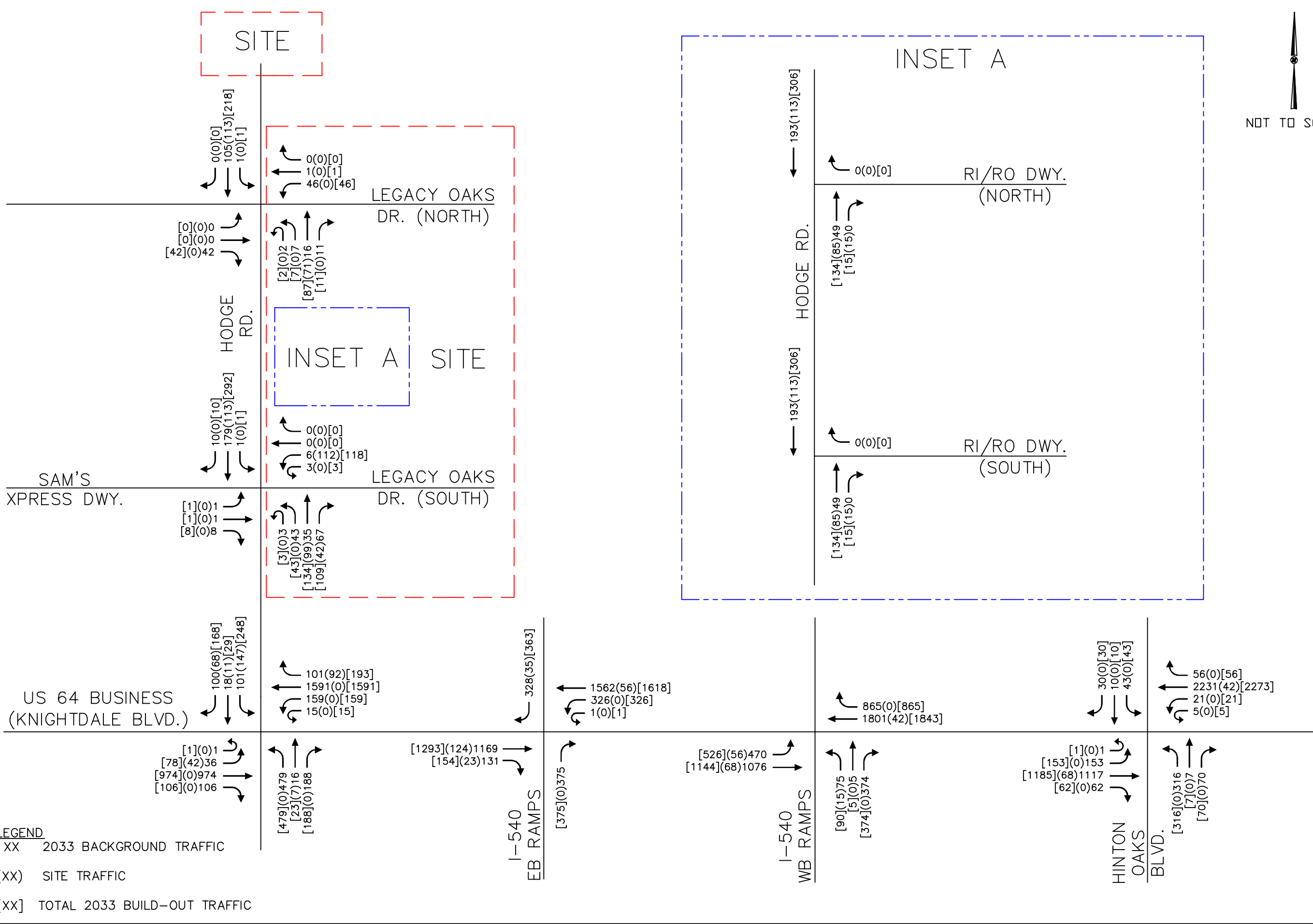


FIGURE 5.13

PROJECTED BUILD-OUT+10 (2033) AM PEAK HOUR TRAFFIC VOLUMES

LEGACY OAKS KNIGHTDALE, NC TRAFFIC IMPACT ANALYSIS



THIS DOCUMENT, TOGETHER WITH THE CONCEPTS AND DESIGNS PRESENTED HEREIN, AS AN INSTRUMENT OF SERVICE, IS INTENDED ONLY FOR THE PURPOSE AND CLIENT FOR WHICH IT WAS PREPARED. REUSE OF AND IMPROPER RELIANCE ON THIS DOCUMENT WITHOUT WRITTEN AUTHORIZATION AND ADAPTATION BY KIMLEY-HORN AND ASSOCIATES, INC. SHALL BE WITHOUT LIABILITY TO KIMLEY-HORN AND ASSOCIATES, INC.

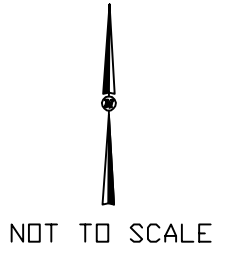
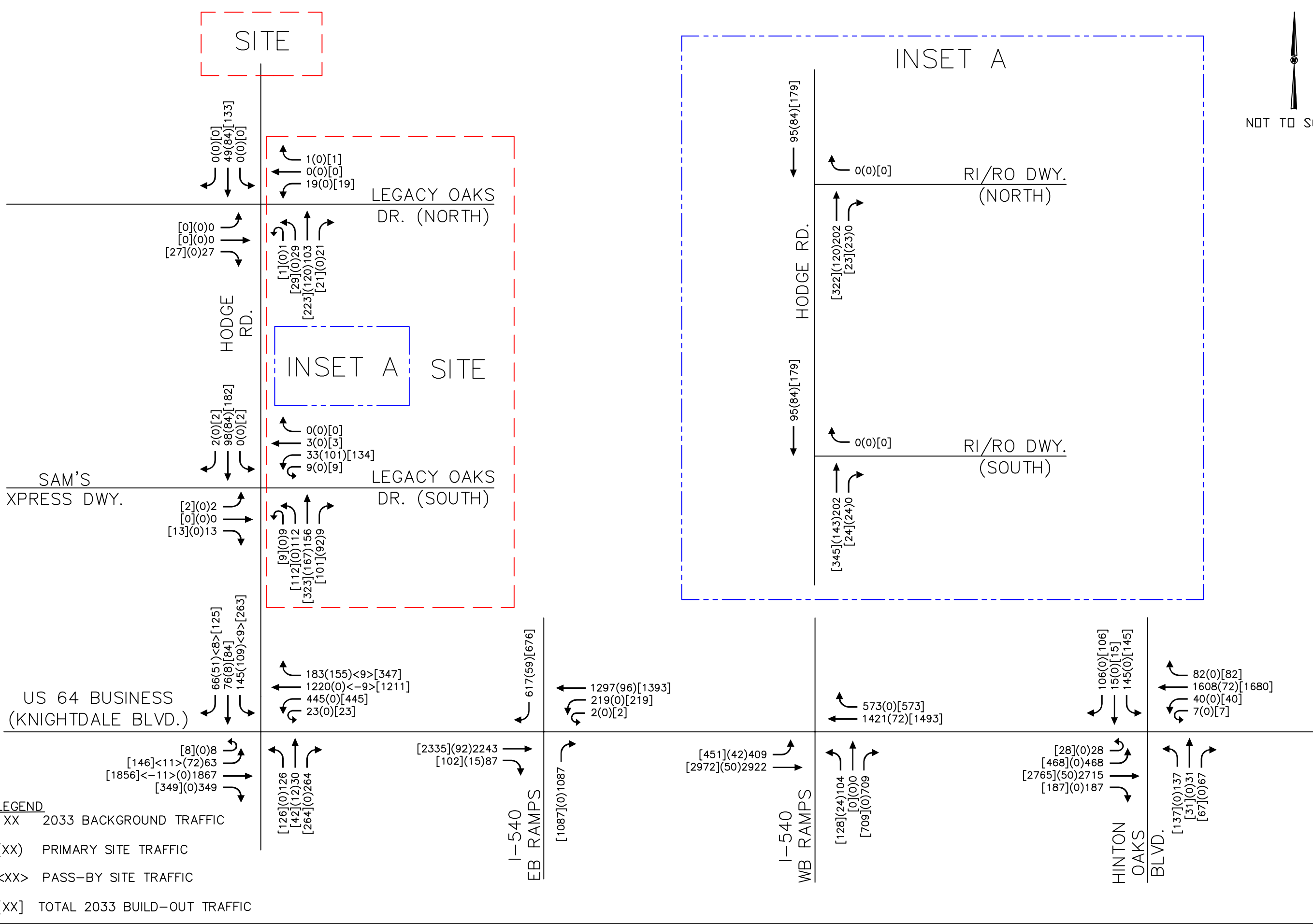


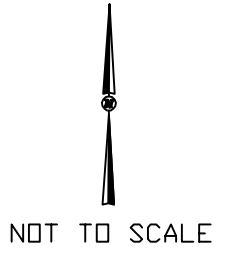
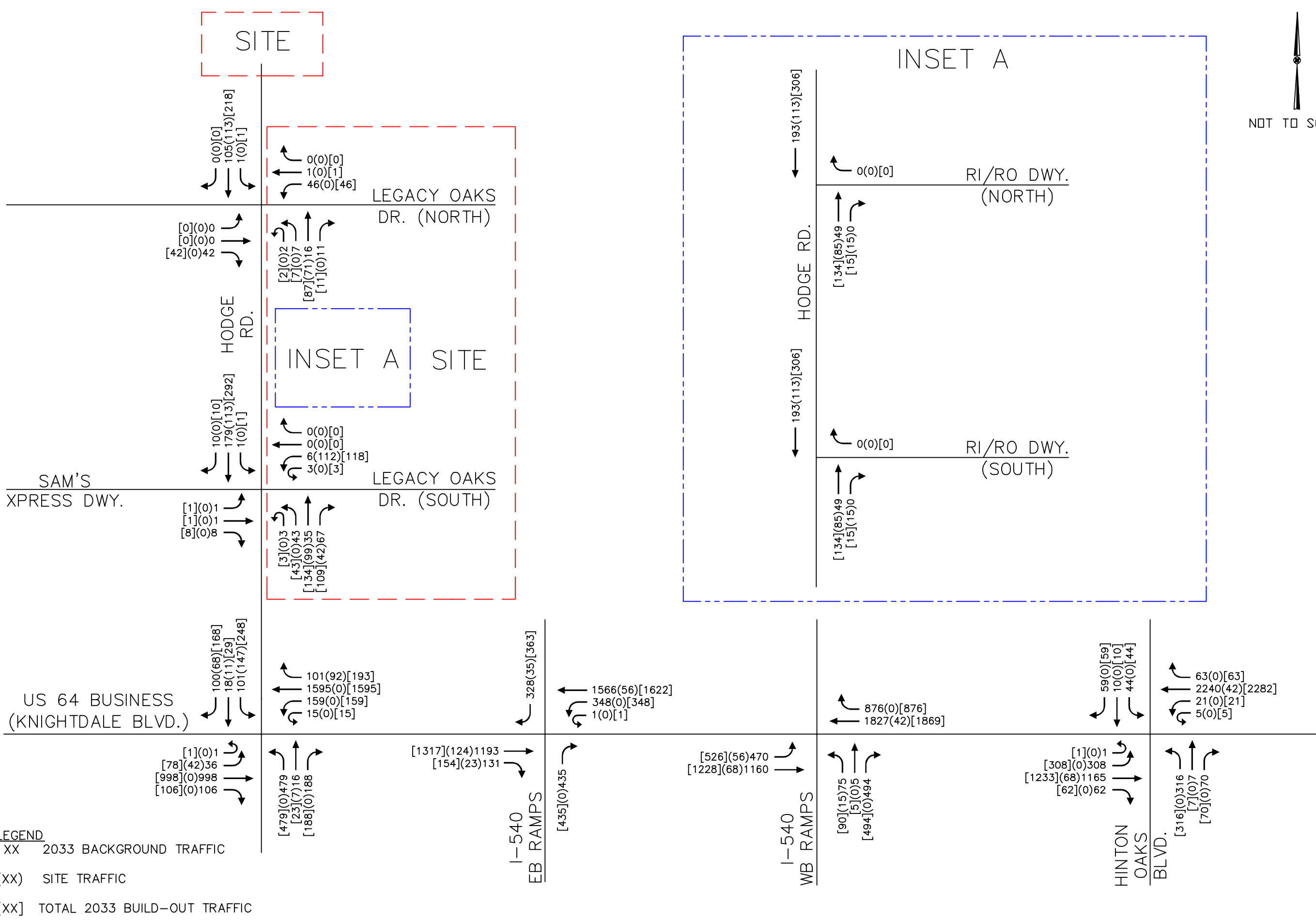
FIGURE 5.14

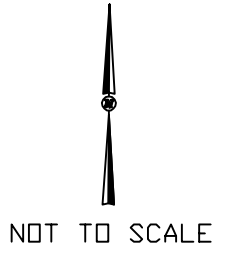
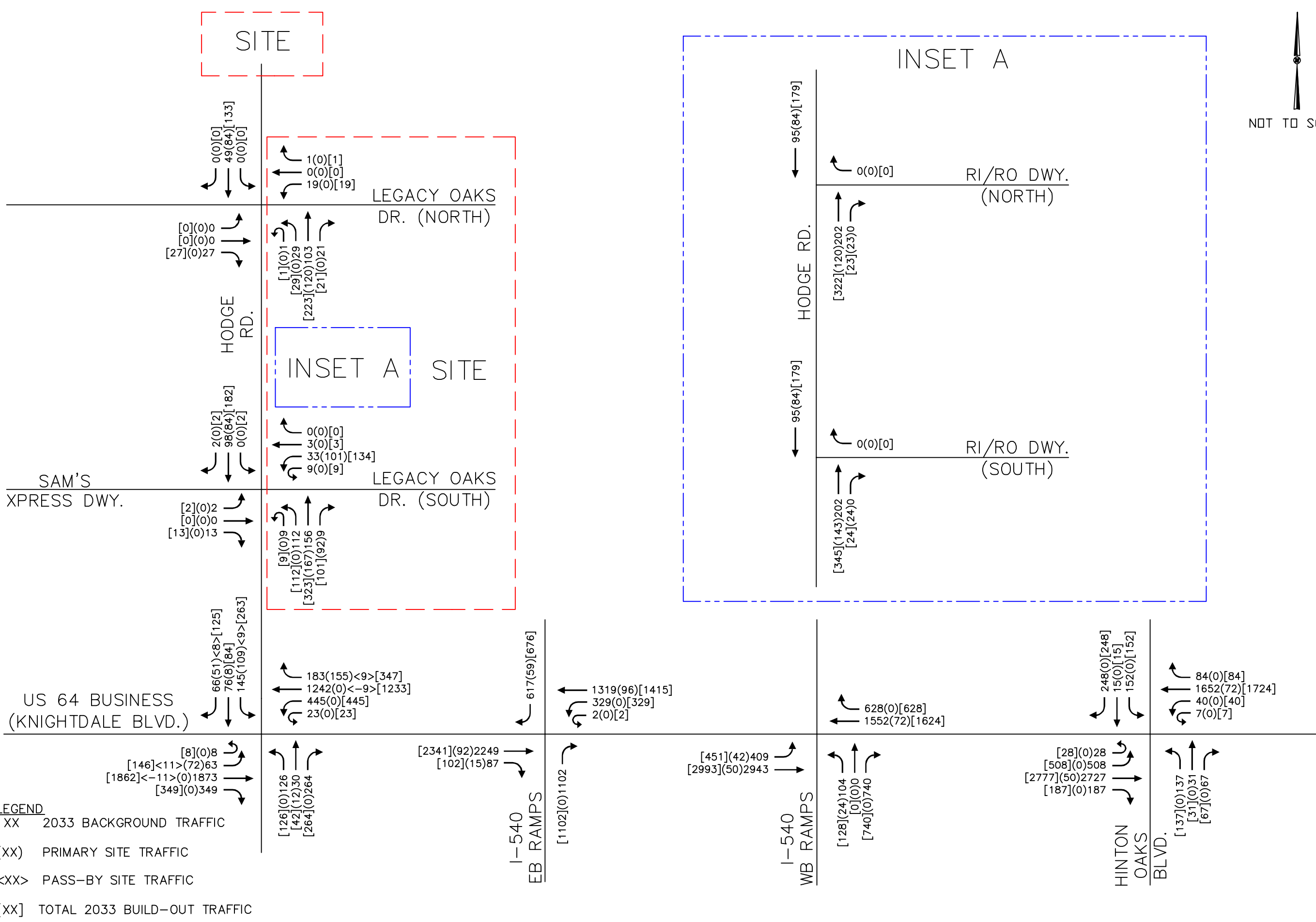
PROJECTED BUILD-OUT+10 (2033)
PM PEAK HOUR TRAFFIC VOLUMES

LEGACY OAKS
KNIGHTDALE, NC
TRAFFIC IMPACT ANALYSIS



THIS DOCUMENT, TOGETHER WITH THE CONCEPTS AND DESIGNS PRESENTED HEREIN, AS AN INSTRUMENT OF SERVICE, IS INTENDED ONLY FOR THE PURPOSE AND CLIENT FOR WHICH IT WAS PREPARED. REUSE OF AND IMPROPER RELIANCE ON THIS DOCUMENT WITHOUT WRITTEN AUTHORIZATION AND ADAPTATION BY KIMLEY-HORN AND ASSOCIATES, INC. SHALL BE WITHOUT LIABILITY TO KIMLEY-HORN AND ASSOCIATES, INC.





LEGACY OAKS
KNIGHTDALE, NC
TRAFFIC IMPACT ANALYSIS

PROJECTED BUILD-OUT+10 (2033)
PM PEAK HOUR TRAFFIC VOLUMES
- WITH HINTON OAKS INDUSTRIAL

FIGURE
5.16

6.0 Capacity Analysis

Highway Capacity Manual LOS Thresholds

Capacity analyses (see Appendix) were performed for the AM and PM peak hours for the existing (2020) traffic condition, the projected (2024) background and build-out +1 traffic conditions, and the projected (2033) background and build-out +10 traffic conditions using Synchro/SimTraffic Version 10 software to determine the operating characteristics of the adjacent road network and the impacts of the proposed project.

Capacity is defined as the maximum number of vehicles that can pass over a particular road segment or through a particular intersection within a set time duration. Capacity is combined with Level-of-Service (LOS) to describe the operating characteristics of a road segment or intersection. LOS is a qualitative measure that describes operational conditions and motorist perceptions within a traffic stream. The *Highway Capacity Manual* defines six levels of service, LOS A through LOS F, with A representing the shortest average delays and F representing the longest average delays. LOS D is the typically accepted standard for signalized intersections in urbanized areas. For signalized intersections, LOS is defined for the overall intersection operation.

For unsignalized intersections, only the movements that must yield right-of-way experience control delay. Therefore, LOS criteria for the overall intersection is not reported by Synchro/SimTraffic Version 10 or computable using methodology published in the *Highway Capacity Manual*. It is typical for stop sign controlled side streets and driveways intersecting major streets to experience long delays during peak hours, while the majority of the traffic moving through the intersection on the major street experiences little or no delay. Table 6.0 lists the LOS control delay thresholds published in the *Highway Capacity Manual* for signalized and unsignalized intersections.

Level-of-Service	Signalized Intersections – Control Delay Per Vehicle [sec/veh]	Unsignalized Intersections – Average Control Delay [sec/veh] & Qualitative Operational Description	
A	≤ 10	≤ 10	Short Delays
B	> 10 – 20	> 10 – 15	
C	> 20 – 35	> 15 – 25	
D	> 35 – 55	> 25 – 35	Moderate Delays
E	> 55 – 80	> 35 – 50	
F	> 80	> 50	Long Delays

Existing signal timings were obtained from the NCDOT and were not adjusted unless otherwise noted. Existing peak hour factors (PHF) were used for existing intersections. Right-turns on red (RTOR) were permitted in the analysis where currently allowed.

Deviations from Typical Congestion Management Guidelines

A minimum volume of 4 vehicles was used for the movements in the Synchro analysis to be conservative, though volume figures and volume development spreadsheets reflect actual volumes for all movements. Actual peak hour factors (PHF) were used at existing intersections while a PHF of 0.90 was used at new intersections.

Analysis Results

Capacity analyses were performed for the existing (2020) traffic condition, the projected (2024) background and build-out +1 traffic conditions, and the projected (2033) background and build-out +10 traffic conditions for the following intersections:

- US 64 Business (Knightdale Boulevard) at Hodge Road
- US 64 Business (Knightdale Boulevard) at I-540 Eastbound Ramps
- US 64 Business (Knightdale Boulevard) at I-540 Westbound Ramps
- US 64 Business (Knightdale Boulevard) at Hinton Oaks Boulevard
- Hodge Road at Legacy Oaks Drive South
- Hodge Road at Legacy Oaks Drive North
- Hodge Road at South RI/RO Driveway
- Hodge Road at North RI/RO Driveway

Note that the 2033 horizon year was analyzed as part of the Town's UDO requirements to determine what improvements would be required to achieve acceptable levels of service. These improvements are to assist the Town in determining future roadway priorities and are not considered to be improvements recommended or required for the proposed Legacy Oaks development.

6.1 US 64 Business (Knightdale Boulevard) at Hodge Road

Analyses indicate that the intersection of US 64 Business (Knightdale Boulevard) at Hodge Road currently operates at LOS C in both peak hours. Analyses indicate the potential for long delays and queues for the northbound approach of Hodge Road in the AM peak hour and the westbound left-turn movement on Knightdale Boulevard in the PM peak hour in the existing and all future traffic conditions. It is recommended that the Town and NCDOT continue to monitor this intersection to determine when signal timing modifications are necessary. For the purposes of this analysis, signal timings at this intersection were adjusted in all future traffic conditions to provide more green time to these movements.

Analyses indicate the intersection is generally expected to operate at LOS C or D in the peak hours with or without the proposed project in place in both 2024 and 2033 with relatively minor increases in overall intersection delay associated with the addition of site traffic. Analyses indicate the possibility of long delays on the southbound left-turn movement, but the movement is currently served by continuous dual left-turn lanes which are expected to provide sufficient storage for peak hour queues at project build-out. Given the relatively minor impact of site traffic, and since the intersection operates at an acceptable LOS at project build-out, no roadway improvements are recommended to be performed at this intersection as part of the Legacy Oaks development.

Table 6.1 summarizes the operation of the intersection of US 64 Business (Knightdale Boulevard) at Hodge Road for the existing (2020) traffic condition, the projected (2024) background and build-out +1 traffic conditions, and the projected (2033) background and build-out +10 traffic conditions.

Table 6.1 Level-of-Service US 64 Business (Knightdale Boulevard) at Hodge Road (Signalized)				
Condition	Background*		Build-Out*	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Existing (2020) Traffic	C (21.2)	C (30.3)	-	-
+1 (2024) Traffic	C (25.1)	C (32.6)	C (27.6)	D (38.8)
+10 (2033) Traffic	C (27.3)	D (40.4)	C (29.8)	D (45.8)
+1 (2024) Traffic – with Hinton Oaks	C (26.9)	C (32.5)	C (29.5)	D (38.7)
+10 (2033) Traffic – with Hinton Oaks	C (29.1)	D (40.5)	C (31.4)	D (45.9)

*Background and build-out scenarios include signal timing adjustments to intersection splits.

6.2 US 64 Business (Knightdale Boulevard) at I-540 EB Ramps

Analyses indicate that the intersection of US 64 Business (Knightdale Boulevard) at I-540 Eastbound Ramps currently operates at LOS A in both the AM and PM peak hours. The intersection is expected to operate at LOS A or B in both peak hours in both 2024 and 2033 with or without the proposed project in place and with or without the Hinton Oaks Industrial development in place. No queueing issues are expected at this intersection, and no roadway improvements are recommended to be performed at this intersection as part of the Legacy Oaks development.

Table 6.2 summarizes the operation of the intersection of US 64 Business (Knightdale Boulevard) at I-540 EB Ramps for the existing (2020) traffic condition, the projected (2024) background and build-out +1 traffic conditions, and the projected (2033) background and build-out +10 traffic conditions.

Table 6.2 Level-of-Service US 64 Business (Knightdale Boulevard) at I-540 EB Ramps (Signalized)				
Condition	Background		Build-Out	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Existing (2020) Traffic	A (1.5)	A (3.7)	-	-
+1 (2024) Traffic	A (2.7)	A (5.1)	A (2.9)	A (6.4)
+10 (2033) Traffic	A (3.8)	A (6.4)	A (4.1)	A (8.3)
+1 (2024) Traffic – with Hinton Oaks	A (4.1)	A (7.8)	A (4.4)	A (9.8)
+10 (2033) Traffic – with Hinton Oaks	A (5.4)	A (8.9)	A (5.6)	B (11.4)

6.3 US 64 Business (Knightdale Boulevard) at I-540 WB Ramps

Analyses indicate that the intersection of US 64 Business (Knightdale Boulevard) at I-540 Westbound Ramps currently operates at LOS B in both peak hours. In the study years 2024 and 2033, analyses indicate the intersection is expected to operate at LOS B or C in both peak hours in both the background and build-out conditions and with or without the Hinton Oaks Industrial development in place.

Analyses indicate the possibility of long delays and queues on the northbound right-turn movement in the PM peak hour. This development is projected to add zero site trips to this movement and is expected to account for 4.1% or less of total traffic at this intersection in both peak hours. PM peak hour delays and queues on this movement are not anticipated to increase above background levels.

Analyses also indicate the possibility of long delays on the eastbound left-turn movement in the AM peak hour, but the movement is currently served by dual left-turn lanes which are expected to provide sufficient storage for peak hour queues at project build-out.

Given the minor impact of site traffic, and since the intersection operates at an acceptable LOS at project build-out, no roadway improvements are recommended to be performed at this intersection as part of the Legacy Oaks development to accommodate projected traffic volumes.

Table 6.3 summarizes the operation of the intersection of US 64 Business (Knightdale Boulevard) at I-540 WB Ramps for the existing (2020) traffic condition, the projected (2024) background and build-out +1 traffic conditions, and the projected (2033) background and build-out +10 traffic conditions.

Table 6.3 Level-of-Service US 64 Business (Knightdale Boulevard) at I-540 WB Ramps (Signalized)				
Condition	Background		Build-Out	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Existing (2020) Traffic	B (11.4)	B (15.8)	-	-
+1 (2024) Traffic	B (14.4)	B (17.8)	B (17.3)	B (17.9)
+10 (2033) Traffic	B (17.1)	C (20.5)	C (20.8)	C (21.0)
+1 (2024) Traffic – with Hinton Oaks	B (17.8)	B (18.7)	C (20.5)	B (18.8)
+10 (2033) Traffic – with Hinton Oaks	C (21.3)	C (22.1)	C (24.8)	C (22.4)

6.4 US 64 Business (Knightdale Boulevard) at Hinton Oaks Boulevard

Analyses indicate that the intersection of US 64 Business (Knightdale Boulevard) at Hinton Oaks Boulevard currently operates at LOS B in both peak hours. In the study years 2024 and 2033, analyses indicate the intersection is expected to operate at LOS C in both peak hours in both the background and build-out conditions and with or without the Hinton Oaks Industrial development in place.

Analyses indicate the possibility of long delays on the eastbound, westbound, and northbound left-turn movements, but this development is projected to add zero site trips to these movements and, relative to study year 2024 background levels, projected (2024) build-out delays on these movements are anticipated to increase by five seconds or less and queues on these movements are anticipated to increase by less than 5 feet. Site traffic is expected to account for less than 3% of overall intersection peak hour traffic in both peak hours.

Analyses also indicate the possibility of long delays on the eastbound left-turn movement in the AM peak hour, but the Hinton Oaks Industrial project recommended extending the storage of those lanes as part of that project in order to provide sufficient storage for peak hour queues.

Given the minor impact of site traffic, and since the intersection operates at an acceptable LOS at project build-out, no roadway improvements are recommended to be performed at this intersection as part of the Legacy Oaks development to accommodate projected traffic volumes.

Table 6.4 summarizes the operation of the intersection of US 64 Business (Knightdale Boulevard) at Hinton Oaks Boulevard for the existing (2020) traffic condition, the projected (2024) background and build-out +1 traffic conditions, and the projected (2033) background and build-out +10 traffic conditions.

Table 6.4 Level-of-Service US 64 Business (Knightdale Boulevard) at Hinton Oaks Boulevard (Signalized)				
Condition	Background		Build-Out	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Existing (2020) Traffic	B (19.5)	B (19.5)	-	-
+1 (2024) Traffic	C (20.2)	C (22.3)	C (20.5)	C (22.6)
+10 (2033) Traffic	C (24.1)	C (26.0)	C (24.6)	C (26.3)
+1 (2024) Traffic – with Hinton Oaks	C (25.9)	C (24.4)	C (26.5)	C (25.3)
+10 (2033) Traffic – with Hinton Oaks	C (28.9)	C (28.8)	C (29.9)	C (29.6)

6.5 Hodge Road at Legacy Oaks Drive South/Sam’s Xpress Driveway

Analyses indicate that the unsignalized intersection of Hodge Road at Legacy Oaks Drive South/Sam’s Xpress Driveway currently operates with short delays on the minor street approaches (Legacy Oaks Drive South and Sam’s Xpress Driveway) in both the AM and PM peak hours. The intersection’s minor street approaches are expected to continue to operate with short delays in both peak hours in the study year 2024 with or without the proposed project in place. No queueing issues are expected at this intersection. No roadway improvements are recommended to be performed at this intersection as part of the Legacy Oaks development.

As part of the Town’s UDO requirements, the 2033 horizon year was analyzed to determine what improvements would be required to achieve acceptable levels of service. Analyses indicate that the intersection’s minor street approaches will continue to operate with short delays in both the projected (2033) background and build-out traffic conditions. As such, no improvements are necessary to achieve an acceptable LOS per the Town’s UDO requirements.

Table 6.5 summarizes the operation of the intersection of Hodge Road at Legacy Oaks Drive South/Sam’s Xpress Driveway for the existing (2020) traffic condition, the projected (2024) background and build-out +1 traffic conditions, and the projected (2033) background and build-out +10 traffic conditions.

Table 6.5 Level-of-Service Hodge Road at Legacy Oaks Drive South/Sam’s Xpress Driveway (Unsignalized)				
Condition	Background		Build-Out	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Existing (2020) Traffic	EB – B (11.4) WB – B (11.2) NBL – A (9.4) SBL – A (7.5)	EB – B (11.1) WB – B (13.5) NBL – A (9.0) SBL – A (7.6)	-	-
+1 (2024) Traffic	EB – B (11.4) WB – C (11.2) NBL – A (9.4) SBL – A (7.5)	EB – B (11.1) WB – B (13.5) NBL – A (9.0) SBL – A (7.6)	EB – B (13.8) WB – C (18.9) NBL – B (10.2) SBL – A (7.9)	EB – B (13.1) WB – D (27.8) NBL – A (9.4) SBL – A (8.3)
+10 (2033) Traffic	EB – B (11.4) WB – B (11.2) NBL – A (9.4) SBL – A (7.5)	EB – B (11.1) WB – B (13.5) NBL – A (9.0) SBL – A (7.6)	EB – B (13.8) WB – C (18.9) NBL – B (10.2) SBL – A (7.9)	EB – B (13.1) WB – D (27.8) NBL – A (9.4) SBL – A (8.3)
+1 (2024) Traffic – with Hinton Oaks	EB – B (11.4) WB – B (11.2) NBL – A (9.4) SBL – A (7.5)	EB – B (11.1) WB – B (13.5) NBL – A (9.0) SBL – A (7.6)	EB – B (13.8) WB – C (18.9) NBL – B (10.2) SBL – A (7.9)	EB – A (13.1) WB – D (27.8) NBL – A (9.4) SBL – A (8.3)
+10 (2033) Traffic – with Hinton Oaks	EB – B (11.4) WB – B (11.2) NBL – A (9.4) SBL – A (7.5)	EB – B (11.1) WB – B (13.5) NBL – A (9.0) SBL – A (7.6)	EB – B (13.8) WB – C (18.9) NBL – B (10.2) SBL – A (7.9)	EB – B (13.1) WB – D (27.8) NBL – A (9.4) SBL – A (8.3)

6.6 Hodge Road at Legacy Oaks Drive North

Analyses indicate that the four-way stop-controlled unsignalized intersection of Hodge Road at Legacy Oaks Drive North currently operates with short delays in both the AM and PM peak hours. The intersection is expected to operate with short delays in both peak hours in both the projected (2024) background and build-out traffic conditions. No queueing issues are expected at this intersection. No roadway improvements are recommended to be performed at this intersection as part of the Legacy Oaks development.

As part of the Town’s UDO requirements, the 2033 horizon year was analyzed to determine what improvements would be required to achieve acceptable levels of service. Analyses indicate that the intersection will continue to operate with short delays in both peak hours in both the projected (2033) background and build-out traffic conditions. As such, no improvements are necessary to achieve an acceptable LOS per the Town’s UDO requirements.

Table 6.6 summarizes the operation of the intersection of Hodge Road at Legacy Oaks Drive North for the existing (2020) traffic condition, the projected (2024) background and build-out +1 traffic conditions, and the projected (2033) background and build-out +10 traffic conditions.

Table 6.6 Level-of-Service Hodge Road at Legacy Oaks Drive North (Unsignalized)				
Condition	Background		Build-Out	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Existing (2020) Traffic	A (8.4)	A (8.3)	-	-
+1 (2024) Traffic	A (8.4)	A (8.3)	B (10.1)	A (10.0)
+10 (2033) Traffic	A (8.4)	A (8.3)	B (10.1)	A (10.0)
+1 (2024) Traffic – with Hinton Oaks	A (8.4)	A (8.3)	B (10.1)	A (10.0)
+10 (2033) Traffic – with Hinton Oaks	A (8.4)	A (8.3)	B (10.1)	A (10.0)

6.7 Hodge Road at South RI/RO Driveway

A right-in/right-out site driveway is proposed to be constructed on Hodge Road approximately 265 feet north of Legacy Oaks Drive South. Analyses indicate that the intersection is expected to operate with short delays on the minor street approach (South RI/RO Driveway) in the projected (2024) build-out traffic condition. No queueing issues are expected at this intersection, and no roadway improvements are recommended to be performed to accommodate projected traffic volumes at this intersection as part of the Legacy Oaks development.

As part of the Town’s UDO requirements, the 2033 horizon year was analyzed to determine what improvements would be required to achieve acceptable levels of service. Analysis indicates that the intersection will continue to operate with short delays in the projected (2033) build-out traffic condition. As such, no improvements are necessary to achieve an acceptable LOS per the Town’s UDO requirements.

Table 6.7 summarizes the operation of the intersection of Hodge Road at South RI/RO Driveway for the projected (2024) build-out +1 traffic condition and the projected (2033) build-out +10 traffic condition.

Table 6.7 Level-of-Service Hodge Road at South RI/RO Driveway (Unsignalized)				
Condition	Background		Build-Out	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
+1 (2024) Traffic	-	-	WB – A (8.8)	WB – A (9.5)
+10 (2033) Traffic	-	-	WB – A (8.8)	WB – A (9.5)
+1 (2024) Traffic – with Hinton Oaks	-	-	WB – A (8.8)	WB – A (9.5)
+10 (2033) Traffic – with Hinton Oaks	-	-	WB – A (8.8)	WB – A (9.5)

6.8 Hodge Road at North RI/RO Driveway

A right-in/right-out site driveway is proposed to be constructed on Hodge Road approximately 465 feet north of Legacy Oaks Drive South. Analyses indicate that the intersection is expected to operate with short delays on the minor street approach (North RI/RO Driveway) in the projected (2024) build-out traffic condition. No queueing issues are expected at this intersection, and no roadway improvements are recommended to be performed to accommodate projected traffic volumes at this intersection as part of the Legacy Oaks development.

As part of the Town’s UDO requirements, the 2033 horizon year was analyzed to determine what improvements would be required to achieve acceptable levels of service. Analysis indicates that the intersection will continue to operate with short delays in the projected (2033) build-out traffic condition. As such, no improvements are necessary to achieve an acceptable LOS per the Town’s UDO requirements.

Table 6.8 summarizes the operation of the intersection of Hodge Road at North RI/RO Driveway for the projected (2024) build-out +1 traffic condition and the projected (2033) build-out +10 traffic condition.

Table 6.8 Level-of-Service Hodge Road at North RI/RO Driveway (Unsignalized)				
Condition	Background		Build-Out	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
US 64 Business (Knightdale Boulevard) at Hinton Oaks Boulevard (Signalized)				
+1 (2024) Traffic	-	-	WB – A (8.7)	WB – A (9.4)
+10 (2033) Traffic	-	-	WB – A (8.7)	WB – A (9.4)
+1 (2024) Traffic – with Hinton Oaks	-	-	WB – A (8.7)	WB – A (9.4)
+10 (2033) Traffic – with Hinton Oaks	-	-	WB – A (8.7)	WB – A (9.4)

7.0 Recommendations

The following roadway improvement was recommended to be performed as part of the Hinton Oaks Industrial project and was included in each of the future traffic conditions that included that project:

US 64 Business (Knightdale Boulevard) at Hinton Oaks Boulevard:

- Extend the dual eastbound left-turn lanes to provide 400 feet of storage each

Analyses indicate the potential for long delays and queues for the northbound approach of Hodge Road at Knightdale Boulevard in the AM peak hour and the westbound left-turn movement on Knightdale Boulevard at Hodge Road in the PM peak hour in the existing and all future traffic conditions. It is recommended that the Town and NCDOT continue to monitor this intersection to determine when signal timing modifications are necessary. For the purposes of this analysis, signal timings at this intersection were adjusted in all future traffic conditions to provide more green time to the northbound approach in the AM peak hour and more green time to the westbound left-turn movement in both peak hours.

Analyses indicate that all study intersections are anticipated to operate at an acceptable LOS for both the build-out +1 and build-out +10 traffic conditions with or without the Hinton Oaks Industrial development in place. Although the possibility of long delays and queues is noted on several movements, no site trips are anticipated to be added to the majority of these movements, and queues and delays are anticipated to increase minimally above background levels at the majority of these movements. Therefore, no roadway improvements are recommended to be performed as part of the Legacy Oaks development to accommodate projected traffic volumes.

The committed and recommended roadway laneage is shown on **Figure 7.1**.

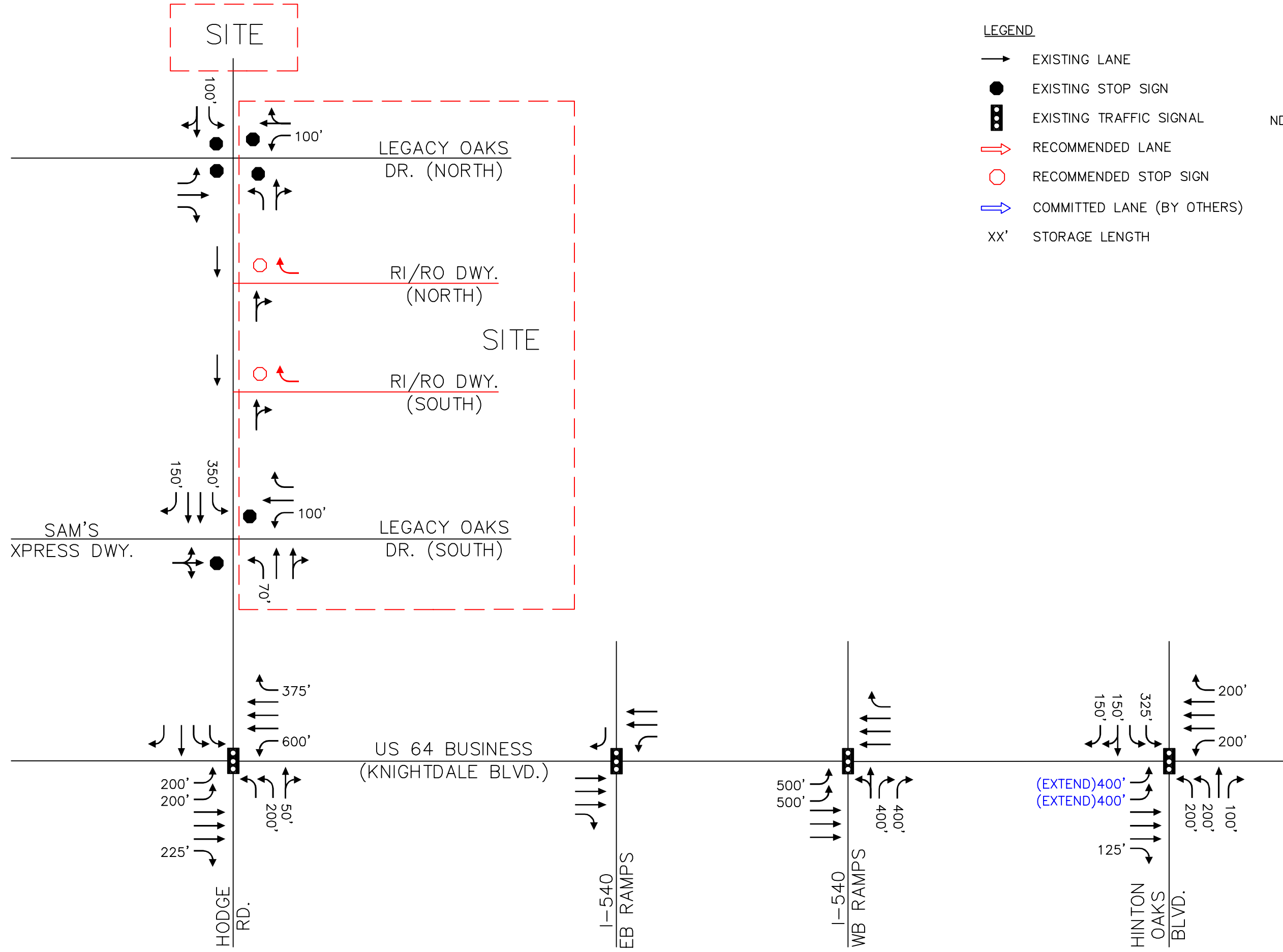


FIGURE 7.1

COMMITTED AND RECOMMENDED ROADWAY LANEAAGE

LEGACY OAKS KNIGHTDALE, NC TRAFFIC IMPACT ANALYSIS



THIS DOCUMENT, TOGETHER WITH THE CONCEPTS AND DESIGNS PRESENTED HEREIN, AS AN INSTRUMENT OF SERVICE, IS INTENDED ONLY FOR THE PURPOSE AND CLIENT FOR WHICH IT WAS PREPARED. REUSE OF AND IMPROPER RELIANCE ON THIS DOCUMENT WITHOUT WRITTEN AUTHORIZATION AND ADAPTATION BY KIMLEY-HORN AND ASSOCIATES, INC. SHALL BE WITHOUT LIABILITY TO KIMLEY-HORN AND ASSOCIATES, INC.

Appendix

Appendix A:
Memorandum of Understanding

Preliminary Assumptions Legacy Oaks TIA Update - Traffic Impact Analysis Knightdale, North Carolina

KHA will perform a traffic impact analysis (TIA) for the Legacy Oaks development, located on Hodge Road north of US 64 Business in Knightdale, North Carolina. This TIA will be an update to the *Watson Tract TIA* (Kimley-Horn, November 2006). The following assumptions will be used in the analysis (based on a scoping meeting on November 25, 2019):

Study Scenarios:

The anticipated build-out year is 2023. Therefore, per the Town of Knightdale's UDO, the study scenarios will consist of:

- Existing (2019)
- Background +1 (2023 + 1 = 2024)
- Build-out +1 (2023 + 1 = 2024)
- Background +10 (2023 + 10 = 2033)
- Build-out +10 (2023 + 10 = 2033)

For this analysis, the weekday AM (7:00 – 9:00 AM) and PM (4:00 – 6:00 PM) peak hours will be analyzed.

Study Intersections:

The study area will consist of the following intersections:

- Knightdale Boulevard (US 64 Business) at Hodge Road
- Knightdale Boulevard (US 64 Business) at I-540 Northbound Ramps
- Knightdale Boulevard (US 64 Business) at I-540 Southbound Ramps
- Knightdale Boulevard (US 64 Business) at Hinton Oaks Boulevard
- Hodge Road at Legacy Oaks Drive South
- Hodge Road at Legacy Oaks Drive North

Traffic Counts:

AM and PM peak hour turning movement counts will be collected in 15-minute intervals for the AM peak hour (7:00 to 9:00 AM) and PM peak hour (4:00 to 6:00 PM) at each of the existing study intersections when Wake County Public Schools are in session.

Approved Developments:

Based on discussions with the Town and NCDOT, the following developments in the study area were identified for inclusion as background traffic:

- 540 West
 - Currently vacant (assuming no vacancy)
 - Proposed: 410 single family units

- Hinton Oaks Industrial
 - Has not been approved yet, therefore analysis will be performed with and without this development
 - Proposed: 127,000 square feet Industrial Park space, 150,000 square feet of General Office space, and 88,000 square feet of Business Park space

Background Growth:

Based on discussions with the Town, a 3% annual growth rate will be applied from the existing year (2019) to the proposed build-out + 1 analysis scenario (2023 + 1 = 2024) and a 1% annual growth rate will be applied from the existing year to the proposed build-out + 10 analysis scenario (2023 + 10 = 2033).

Site Traffic Distribution:

The following distribution will be used for the net new site trips (see attached distribution figure):

- 30% to/from the west on US 64 Business (Knightdale Boulevard)
- 30 to/from the east on US 64 Business (Knightdale Boulevard)
- 25% to/from the north on I-540
- 10% to/from the south on I-540
- 5% to/from the south on Hodge Road

This is consistent with the distribution from the previous TIA.

Proposed Uses and Trip Generation:

The development currently includes a 4,069 square foot Sam's Xpress with 10 fuel pumps, 544 mid-rise apartments, and a 40,560 square foot urgent care. The following additional land uses are proposed: approximately 217 single family dwelling units, 165 multifamily dwelling units (93 townhomes and 72 mid-rise apartments), a 130-room hotel and 16,000 square feet of retail space. Trip generation calculations are attached.

Site Access:

This site is proposed to be accessed by two full-movement driveways onto Legacy Oaks Drive and two right-in/right-out driveways onto Hodge Road.

Other Study Assumptions:

Existing peak hour factors (PHF's) will be used at existing intersections, and a PHF of 0.90 will be used at new intersections. Right-turns on red (RTOR) and permitted + protected phasing will be permitted in the analysis where currently allowed.

Appendix B: Trip Generation

Legacy Oaks

Table 1 - Trip Generation

Land Use	Intensity		Daily			AM Peak Hour			PM Peak Hour		
			Total	In	Out	Total	In	Out	Total	In	Out
210 Single Family Detached Housing	217	d.u.	2,122	1,061	1,061	159	40	119	214	135	79
220 Multifamily Housing (Low-Rise)	93	d.u.	662	331	331	45	10	35	55	35	20
221 Multifamily Housing (Mid-Rise)	72	d.u.	392	196	196	25	7	18	32	20	12
310 Hotel	130	rooms	1,042	521	521	60	35	25	71	36	35
820 Shopping Center	16,000	s.f.	1,730	865	865	160	99	61	140	67	73
Subtotal			5,948	2,974	2,974	449	191	258	512	293	219
<i>Internal Capture</i>											
210 Single Family Detached Housing			211	116	95	3	1	2	20	13	7
220 Multifamily Housing (Low-Rise)			65	36	29	0	0	0	6	4	2
221 Multifamily Housing (Mid-Rise)			38	21	17	0	0	0	3	2	1
310 Hotel			72	46	26	4	0	4	8	7	1
820 Shopping Center			338	143	195	7	6	1	31	8	23
Internal Capture Total			724	362	362	14	7	7	68	34	34
Total External Trips			5,224	2,612	2,612	435	184	251	444	259	185
<i>Pass-By Capture</i>											
820 Shopping Center	AM	PM	457	229	228	0	0	0	37	20	17
	0%	34%									
Total New New External Trips			4,767	2,383	2,384	435	184	251	407	239	168

**Appendix C:
Traffic Count Data**

Project ID: 19-09774-001
 Location: CR 2516/Hodge Rd & US 64 Bus/Knightdale Blvd
 City: Knightdale

Day: Thursday
 Date: 12/05/2019

Groups Printed - Cars, PU, Vans - Heavy Trucks

Start Time	CR 2516/Hodge Rd Northbound						CR 2516/Hodge Rd Southbound						US 64 Bus/Knightdale Blvd Eastbound						US 64 Bus/Knightdale Blvd Westbound						Int. Total
	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	
7:00 AM	62	6	51	0	0	119	35	3	21	0	0	59	5	160	6	0	0	171	21	377	18	2	0	418	767
7:15 AM	54	7	56	0	0	117	40	5	25	0	0	70	4	158	25	0	0	187	14	337	23	4	0	378	752
7:30 AM	79	4	34	0	0	117	33	3	38	0	0	74	10	192	17	0	0	219	28	390	36	2	0	456	866
7:45 AM	89	5	33	0	0	127	16	5	20	0	0	41	6	166	22	1	0	195	32	379	23	4	0	438	801
Total	284	22	174	0	0	480	124	16	104	0	0	244	25	676	70	1	0	772	95	1483	100	12	0	1690	3186
8:00 AM	103	4	45	0	0	152	26	7	18	0	0	51	12	271	22	0	0	305	34	404	23	2	0	463	971
8:15 AM	118	3	41	0	0	162	26	3	24	0	0	53	8	159	25	0	0	192	35	343	19	4	0	401	808
8:30 AM	93	6	21	0	0	120	22	3	19	0	0	44	7	140	17	1	0	165	34	430	29	2	0	495	824
8:45 AM	113	3	24	0	0	140	30	3	23	0	0	56	11	170	22	1	0	204	30	382	19	4	0	435	835
Total	427	16	131	0	0	574	104	16	84	0	0	204	38	740	86	2	0	866	133	1559	90	12	0	1794	3438
BREAK																									
4:00 PM	23	10	38	0	0	71	30	12	10	0	0	52	23	263	49	1	0	336	72	244	39	9	1	364	823
4:15 PM	13	9	56	0	0	78	31	15	23	0	0	69	25	317	43	0	0	385	83	227	29	6	0	345	877
4:30 PM	22	8	57	0	0	87	29	18	14	0	0	61	14	340	50	0	0	404	91	277	46	8	0	422	974
4:45 PM	24	4	55	0	0	83	36	14	13	0	0	63	11	382	53	1	0	447	82	239	48	4	0	373	966
Total	82	31	206	0	0	319	126	59	60	0	0	245	73	1302	195	2	0	1572	328	987	162	27	1	1504	3640
5:00 PM	26	7	52	0	0	85	35	11	22	0	0	68	19	393	60	1	0	473	88	273	47	3	0	411	1037
5:15 PM	26	11	44	0	0	81	38	23	18	1	0	80	13	368	68	2	0	451	93	271	51	6	0	421	1033
5:30 PM	19	8	65	0	0	92	40	20	11	0	0	71	15	404	88	1	0	508	82	291	32	7	0	412	1083
5:45 PM	31	4	53	0	0	88	32	22	15	0	0	69	16	375	67	2	0	460	99	261	53	3	0	416	1033
Total	102	30	214	0	0	346	145	76	66	1	0	288	63	1540	283	6	0	1892	362	1096	183	19	0	1660	4186
Grand Total	895	99	725	0	0	1719	499	167	314	1	0	981	199	4258	634	11	0	5102	918	5125	535	70	1	6648	14450
Apprch %	52.1	5.8	42.2	0.0	0.0	50.9	17.0	32.0	0.1	0.0	0.0	3.9	83.5	12.4	0.2	0.0	0.0	13.8	77.1	8.0	1.1	0.0	0.0	0.0	0.0
Total %	6.2	0.7	5.0	0.0	0.0	11.9	3.5	1.2	2.2	0.0	0.0	6.8	1.4	29.5	4.4	0.1	0.0	35.3	6.4	35.5	3.7	0.5	0.0	46.0	46.0
Cars, PU, Vans	879	97	711	0	0	1687	493	163	309	1	0	966	198	4142	622	9	0	4971	891	4967	524	70	0	6452	14076
% Cars, PU, Vans	98.2	98.0	98.1	0.0	0.0	98.1	98.8	97.6	98.4	100.0	0.0	98.5	99.5	97.3	98.1	81.8	0.0	97.4	97.1	96.9	97.9	100.0	96.4	97.1	97.4
Heavy Trucks	16	2	14	0	0	32	6	4	5	0	0	15	1	116	12	2	0	131	27	158	11	0	0	196	374
%Heavy Trucks	1.8	2.0	1.9	0.0	0.0	1.9	1.2	2.4	1.6	0.0	0.0	1.5	0.5	2.7	1.9	18.2	0.0	2.9	3.1	2.1	0.0	0.0	0.0	2.9	2.6

Project ID: 19-09774-001
 Location: CR 2516/Hodge Rd & US 64 Bus/Knightdale Blvd
 City: Knightdale

PEAK HOURS

Day: Thursday
 Date: 12/05/2019

AM

Start Time	CR 2516/Hodge Rd Northbound						CR 2516/Hodge Rd Southbound						US 64 Bus/Knightdale Blvd Eastbound						US 64 Bus/Knightdale Blvd Westbound						Int. Total
	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total					
Peak Hour Analysis from 07:00 AM to 09:00 AM																									
Peak Hour for Entire Intersection Begins at 07:30 AM																									
7:30 AM	79	4	34	0	117	33	3	38	0	74	10	192	17	0	219	28	390	36	2	456					866
7:45 AM	89	5	33	0	127	16	5	20	0	41	6	166	22	1	195	32	379	23	4	438					801
8:00 AM	103	4	45	0	152	26	7	18	0	51	12	271	22	0	305	34	404	23	2	463					971
8:15 AM	118	3	41	0	162	26	3	24	0	53	8	159	25	0	192	35	343	19	4	401					808
Total Volume	389	16	153	0	558	101	18	100	0	219	36	788	86	1	911	129	1516	101	12	1758					3446
% App. Total	69.7	2.9	27.4	0.0	100	46.1	8.2	45.7	0.0	100	4.0	86.5	9.4	0.1	100	7.3	86.2	5.7	0.7	100					100
PHF	0.861						0.740						0.747						0.949						0.887
Cars, PU, Vans	381	15	149	0	545	100	17	100	0	217	36	750	83	0	869	121	1462	100	12	1695					3326
% Cars, PU, Vans	97.9	93.8	97.4	0.0	97.7	99.0	94.4	100.0	0.0	99.1	100.0	95.2	96.5	0.0	95.4	93.8	96.4	99.0	100.0	96.4					96.5
Heavy Trucks	8	1	4	0	13	1	1	0	0	2	0	38	3	1	42	8	54	1	0	63					120
%Heavy Trucks	2.1	6.3	2.6	0.0	2.3	1.0	5.6	0.0	0.0	0.9	0.0	4.8	3.5	100.0	4.6	6.2	3.6	1.0	0.0	3.6					3.5

PM

Start Time	CR 2516/Hodge Rd Northbound						CR 2516/Hodge Rd Southbound						US 64 Bus/Knightdale Blvd Eastbound						US 64 Bus/Knightdale Blvd Westbound						Int. Total
	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total					
Peak Hour Analysis from 04:00 PM to 06:00 PM																									
Peak Hour for Entire Intersection Begins at 05:00 PM																									
5:00 PM	26	7	52	0	85	35	11	22	0	68	19	393	60	1	473	88	273	47	3	411					1037
5:15 PM	26	11	44	0	81	38	23	18	1	80	13	368	68	2	451	93	271	51	6	421					1033
5:30 PM	19	8	65	0	92	40	20	11	0	71	15	404	88	1	508	82	291	32	7	412					1083
5:45 PM	31	4	53	0	88	32	22	15	0	69	16	375	67	2	460	99	261	53	3	416					1033
Total Volume	102	30	214	0	346	145	76	66	1	288	63	1540	283	6	1892	362	1096	183	19	1660					4186
% App. Total	29.5	8.7	61.8	0.0	100	50.3	26.4	22.9	0.3	100	3.3	81.4	15.0	0.3	100	21.8	66.0	11.0	1.1	100					100
PHF	0.940						0.900						0.931						0.986						0.966
Cars, PU, Vans	100	30	214	0	344	144	73	66	1	284	63	1517	277	5	1862	357	1078	180	19	1634					4124
% Cars, PU, Vans	98.0	100.0	100.0	0.0	99.4	99.3	96.1	100.0	100.0	98.6	100.0	98.5	97.9	83.3	98.4	98.6	98.4	98.4	100.0	98.4					98.5
Heavy Trucks	2	0	0	0	2	1	3	0	0	4	0	23	6	1	30	5	18	3	0	26					62
%Heavy Trucks	2.0	0.0	0.0	0.0	0.6	0.7	3.9	0.0	0.0	1.4	0.0	1.5	2.1	16.7	1.6	1.4	1.6	1.6	0.0	1.6					1.5

Project ID: 20-09026-001
 Location: I-540 & Northern Wake Expy SB Ramps & US 64 & Knightdale Blvd
 City: Knightdale

Day: Thursday
 Date: 01/30/2020

Groups Printed - Cars, PU, Vans - Heavy Trucks

Start Time	I-540 & Northern Wake Expy SB Ramps Northbound						I-540 & Northern Wake Expy SB Ramps Southbound						US 64 & Knightdale Blvd Eastbound						US 64 & Knightdale Blvd Westbound						Int. Total
	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	
7:00 AM	0	0	0	0	0	0	0	0	62	0	62	0	257	19	0	276	55	308	0	0	0	363	701		
7:15 AM	0	0	0	0	0	0	0	0	48	0	48	0	217	29	0	246	64	321	0	0	0	385	679		
7:30 AM	0	0	0	0	0	0	0	0	62	0	62	0	237	30	0	267	73	349	0	0	0	422	751		
7:45 AM	0	0	0	0	0	0	0	0	91	0	91	0	221	20	0	241	73	285	0	1	0	359	691		
Total	0	0	0	0	0	0	0	0	263	0	263	0	932	98	0	1030	265	1263	0	1	0	1529	2822		
8:00 AM	0	0	0	0	0	0	0	0	73	0	73	0	222	26	0	248	56	278	0	1	0	335	656		
8:15 AM	0	0	0	0	0	0	0	0	102	0	102	0	203	17	0	220	58	261	0	3	0	322	644		
8:30 AM	0	0	0	0	0	0	0	0	62	0	62	0	213	26	0	239	47	220	0	2	0	269	570		
8:45 AM	0	0	0	0	0	0	0	0	57	0	57	0	205	14	0	219	49	205	0	1	0	255	531		
Total	0	0	0	0	0	0	0	0	294	0	294	0	843	83	0	926	210	964	0	7	0	1181	2401		
BREAK																									
4:00 PM	0	0	0	0	0	0	0	0	102	0	102	0	334	33	0	367	54	210	0	1	0	265	734		
4:15 PM	0	0	0	0	0	0	0	0	116	0	116	0	377	21	0	398	67	206	0	1	0	274	788		
4:30 PM	0	0	0	0	0	0	0	0	106	0	106	0	399	22	0	421	67	242	0	1	0	310	837		
4:45 PM	0	0	0	0	0	0	0	0	103	0	103	0	426	21	0	447	41	228	0	0	0	269	819		
Total	0	0	0	0	0	0	0	0	427	0	427	0	1536	97	0	1633	229	886	0	3	0	1118	3178		
5:00 PM	0	0	0	0	0	0	0	0	117	0	117	0	478	18	0	496	44	256	0	1	0	301	914		
5:15 PM	0	0	0	0	0	0	0	0	135	0	135	0	450	12	0	462	51	240	0	1	0	292	889		
5:30 PM	0	0	0	0	0	0	0	0	126	0	126	0	457	18	0	475	41	271	0	0	0	312	913		
5:45 PM	0	0	0	0	0	0	0	0	114	0	114	0	425	19	0	444	42	266	0	0	0	308	866		
Total	0	0	0	0	0	0	0	0	492	0	492	0	1810	67	0	1877	178	1033	0	2	0	1213	3582		
Grand Total	0	0	0	0	0	0	0	0	1476	0	1476	0	5121	345	0	5466	882	4146	0	13	0	5041	11983		
Apprch %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	100.0	0.0	93.7	6.3	0.0	93.7	17.5	82.2	0.0	0.3	0.0				
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.3	0.0	12.3	0.0	42.7	2.9	0.0	45.6	7.4	34.6	0.0	0.1	0.0	42.1			
Cars, PU, Vans	0	0	0	0	0	0	0	0	1423	0	1423	0	4981	336	0	5317	848	4034	0	13	0	4895	11635		
% Cars, PU, Vans	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	96.4	0.0	96.4	0.0	97.3	97.4	0.0	97.3	96.1	97.3	0.0	100.0	0.0	97.1	97.1		
Heavy Trucks	0	0	0	0	0	0	0	0	53	0	53	0	140	9	0	149	34	112	0	0	0	146	348		
%Heavy Trucks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	0.0	3.6	0.0	2.7	2.6	0.0	2.7	3.9	2.7	0.0	0.0	0.0	2.9	2.9		

Project ID: 20-09026-001
 Location: I-540 & Northern Wake Expy SB Ramps & US 64 & Knightdale
 City: Knightdale

PEAK HOURS

Day: Thursday
 Date: 01/30/2020

Start Time	I-540 & Northern Wake Expy SB Ramps Northbound						I-540 & Northern Wake Expy SB Ramps Southbound						US 64 & Knightdale Blvd Eastbound						US 64 & Knightdale Blvd Westbound						Int. Total	
	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total		
Peak Hour Analysis from 07:00 AM to 09:00 AM																										
Peak Hour for Entire Intersection Begins at 07:00 AM																										
7:00 AM	0	0	0	0	0	0	0	0	62	0	62	0	257	19	0	276	55	308	0	0	0	363	701			
7:15 AM	0	0	0	0	0	0	0	0	48	0	48	0	217	29	0	246	64	321	0	0	0	385	679			
7:30 AM	0	0	0	0	0	0	0	0	62	0	62	0	237	30	0	267	73	349	0	0	0	422	751			
7:45 AM	0	0	0	0	0	0	0	0	91	0	91	0	221	20	0	241	73	285	0	1	0	359	691			
Total Volume	0	0	0	0	0	0	0	0	263	0	263	0	932	98	0	1030	265	1263	0	1	0	1529	2822			
% App. Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	100.0	0.0	90.5	9.5	0.0	100	17.3	82.6	0.0	0.1	0.0	100				
PHF	0.723											0.933											0.906			0.939
Cars, PU, Vans	0	0	0	0	0	0	0	0	255	0	255	0	902	95	0	997	250	1222	0	1	0	1473	2725			
% Cars, PU, Vans	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	97.0	0.0	97.0	0.0	96.8	96.9	0.0	96.8	94.3	96.8	0.0	100.0	0.0	96.3	96.6			
Heavy Trucks	0	0	0	0	0	0	0	0	8	0	8	0	30	3	0	33	15	41	0	0	0	56	97			
%Heavy Trucks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	3.0	0.0	3.2	3.1	0.0	3.2	5.7	3.2	0.0	0.0	0.0	3.7	3.4			
BREAK																										
Peak Hour Analysis from 04:00 PM to 06:00 PM																										
Peak Hour for Entire Intersection Begins at 05:00 PM																										
5:00 PM	0	0	0	0	0	0	0	0	117	0	117	0	478	18	0	496	44	256	0	1	0	301	914			
5:15 PM	0	0	0	0	0	0	0	0	135	0	135	0	450	12	0	462	51	240	0	1	0	292	889			
5:30 PM	0	0	0	0	0	0	0	0	126	0	126	0	457	18	0	475	41	271	0	0	0	312	913			
5:45 PM	0	0	0	0	0	0	0	0	114	0	114	0	425	19	0	444	42	266	0	0	0	308	866			
Total Volume	0	0	0	0	0	0	0	0	492	0	492	0	1810	67	0	1877	178	1033	0	2	0	1213	3582			
% App. Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	100.0	0.0	96.4	3.6	0.0	100	14.7	85.2	0.0	0.2	0.0	100				
PHF	0.911											0.946											0.972			0.980
Cars, PU, Vans	0	0	0	0	0	0	0	0	476	0	476	0	1781	67	0	1848	177	1022	0	2	0	1201	3525			
% Cars, PU, Vans	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	96.7	0.0	96.7	0.0	98.4	100.0	0.0	98.5	99.4	98.9	0.0	100.0	0.0	99.0	98.4			
Heavy Trucks	0	0	0	0	0	0	0	0	16	0	16	0	29	0	0	29	1	11	0	0	0	12	57			
%Heavy Trucks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.3	0.0	3.3	0.0	1.6	0.0	0.0	1.5	0.6	1.1	0.0	0.0	1.0	1.6				

Project ID: 20-09026-002

Location: I-540 & Northern Wake Expy NB Ramps & US 64 & Knightdale Blvd
 City: Knightdale

Day: Thursday
 Date: 01/30/2020

Groups Printed - Cars, PU, Vans - Heavy Trucks

Start Time	I-540 & Northern Wake Expy NB Ramps Northbound						I-540 & Northern Wake Expy NB Ramps Southbound						US 64 & Knightdale Blvd Eastbound						US 64 & Knightdale Blvd Westbound						Int. Total
	Left	Thru	Rgt	Uturm	Peds	App. Total	Left	Thru	Rgt	Uturm	Peds	App. Total	Left	Thru	Rgt	Uturm	Peds	App. Total	Left	Thru	Rgt	Uturm	Peds	App. Total	
7:00 AM	13	0	54	0	0	67	0	0	0	0	0	0	80	189	0	0	0	269	0	350	174	0	0	524	860
7:15 AM	9	0	60	0	0	69	0	0	0	0	0	0	99	203	0	1	0	303	0	362	183	0	0	545	917
7:30 AM	20	2	97	0	0	119	0	0	0	0	0	0	104	216	0	0	0	320	0	412	179	0	0	591	1030
7:45 AM	15	2	93	0	0	110	0	0	0	0	0	0	89	257	0	0	0	346	0	336	167	0	0	503	959
Total	57	4	304	0	0	365	0	0	0	0	0	0	372	865	0	1	0	1238	0	1460	703	0	0	2163	3766
8:00 AM	17	0	72	0	0	89	0	0	0	0	0	0	67	226	0	1	0	294	0	339	138	0	0	477	860
8:15 AM	12	0	98	0	0	110	0	0	0	0	0	0	90	210	0	1	0	301	0	298	119	0	0	417	828
8:30 AM	14	0	78	0	0	92	0	0	0	0	0	0	68	228	0	0	0	296	0	268	141	0	0	409	797
8:45 AM	17	0	79	0	0	96	0	0	0	0	0	0	83	208	0	0	0	291	0	221	122	0	0	343	730
Total	60	0	327	0	0	387	0	0	0	0	0	0	308	872	0	2	0	1182	0	1126	520	0	0	1646	3215
BREAK																									
4:00 PM	12	0	133	0	0	145	0	0	0	0	1	0	51	441	0	2	0	494	0	256	116	0	0	372	1011
4:15 PM	18	1	151	0	0	170	0	0	0	0	0	0	73	479	0	1	0	553	0	250	109	0	0	359	1082
4:30 PM	25	1	137	0	0	163	0	0	0	0	0	0	82	488	0	0	0	570	0	273	107	0	0	380	1113
4:45 PM	13	0	135	0	0	148	0	0	0	0	0	0	77	534	0	1	0	612	0	269	114	0	0	383	1143
Total	68	2	556	0	0	626	0	0	0	0	1	0	283	1942	0	4	0	2229	0	1048	446	0	0	1494	4349
5:00 PM	18	0	156	0	0	174	0	0	0	0	0	0	103	572	0	0	0	675	0	265	112	0	0	377	1226
5:15 PM	11	0	137	0	0	148	0	0	0	0	0	0	87	612	0	0	0	699	0	306	138	0	0	444	1291
5:30 PM	30	0	143	0	0	173	0	0	0	0	0	0	66	621	0	0	0	687	0	273	117	0	0	390	1250
5:45 PM	16	0	140	0	0	156	0	0	0	0	0	0	71	563	0	0	0	634	0	300	99	0	0	399	1189
Total	75	0	576	0	0	651	0	0	0	0	0	0	327	2368	0	0	0	2695	0	1144	466	0	0	1610	4956
Grand Total	260	6	1763	0	0	2029	0	0	0	0	1	0	1290	6047	0	7	0	7344	0	4778	2135	0	0	6913	16286
Approch %	12.8	0.3	86.9	0.0	0.0		0.0	0.0	0.0	0.0	0.0		17.6	82.3	0.0	0.1	0.0		0.0	69.1	30.9	0.0	0.0		
Total %	1.6	0.0	10.8	0.0	0.0	12.5	0.0	0.0	0.0	0.0	0.0	0.0	7.9	37.1	0.0	0.0	0.0	45.1	0.0	29.3	13.1	0.0	0.0	42.4	
Cars, PU, Vans	254	5	1710	0	0	1969	0	0	0	0	0	0	1254	5855	0	6	0	7115	0	4639	2045	0	0	6684	15768
% Cars, PU, Vans	97.7	83.3	97.0	0.0	0.0	97.0	0.0	0.0	0.0	0.0	0.0	0.0	97.2	96.8	0.0	85.7	0.0	96.9	0.0	97.1	95.8	0.0	0.0	96.7	96.8
Heavy Trucks	6	1	53	0	0	60	0	0	0	0	0	0	36	192	0	1	0	229	0	139	90	0	0	229	518
%Heavy Trucks	2.3	16.7	3.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	3.2	0.0	14.3	3.1	3.1	0.0	2.9	4.2	0.0	0.0	3.3	3.2

Project ID: 20-09026-002

Location: I-540 & Northern Wake Expy NB Ramps & US 64 & Knightdale Blvd
 City: Knightdale

PEAK HOURS

Day: Thursday
 Date: 01/30/2020

AM

Start Time	I-540 & Northern Wake Expy NB Ramps Northbound						I-540 & Northern Wake Expy NB Ramps Southbound						US 64 & Knightdale Blvd Eastbound						US 64 & Knightdale Blvd Westbound						Int. Total						
	Left	Thru	Rgt	Uturm	Peds	App. Total	Left	Thru	Rgt	Uturm	Peds	App. Total	Left	Thru	Rgt	Uturm	Peds	App. Total	Left	Thru	Rgt	Uturm	Peds	App. Total							
Peak Hour Analysis from 07:00 AM to 09:00 AM																															
Peak Hour for Entire Intersection Begins at 07:00 AM																															
7:00 AM	13	0	54	0	0	67	0	0	0	0	0	0	80	189	0	0	0	269	0	350	174	0	0	524	860						
7:15 AM	9	0	60	0	0	69	0	0	0	0	0	0	99	203	0	1	0	303	0	362	183	0	0	545	917						
7:30 AM	20	2	97	0	0	119	0	0	0	0	0	0	104	216	0	0	0	320	0	412	179	0	0	591	1030						
7:45 AM	15	2	93	0	0	110	0	0	0	0	0	0	89	257	0	0	0	346	0	336	167	0	0	503	959						
Total Volume	57	4	304	0	0	365	0	0	0	0	0	0	372	865	0	1	0	1238	0	1460	703	0	0	2163	3766						
% App. Total	15.6	1.1	83.3	0.0	0.0	100	0.0	0.0	0.0	0.0	0.0	0.0	30.0	69.9	0.0	0.1	100	0.0	67.5	32.5	0.0	0.0	100								
PHF	0.767						0.895						0.915						0.914												
Cars, PU, Vans	56	3	285	0	0	344	0	0	0	0	0	0	360	830	0	1	0	1191	0	1405	671	0	0	2076	3611						
% Cars, PU, Vans	98.2	75.0	93.8	0.0	0.0	94.2	0.0	0.0	0.0	0.0	0.0	0.0	96.8	96.0	0.0	100.0	96.2	0.0	96.2	95.4	0.0	0.0	96.0	95.9							
Heavy Trucks	1	1	19	0	0	21	0	0	0	0	0	0	12	35	0	0	0	47	0	55	32	0	0	87	155						
%Heavy Trucks	1.8	25.0	6.3	0.0	0.0	5.8	0.0	0.0	0.0	0.0	0.0	0.0	3.2	4.0	0.0	0.0	3.8	0.0	3.8	4.6	0.0	0.0	4.0	4.1							

PM

Start Time	I-540 & Northern Wake Expy NB Ramps Northbound						I-540 & Northern Wake Expy NB Ramps Southbound						US 64 & Knightdale Blvd Eastbound						US 64 & Knightdale Blvd Westbound						Int. Total						
	Left	Thru	Rgt	Uturm	Peds	App. Total	Left	Thru	Rgt	Uturm	Peds	App. Total	Left	Thru	Rgt	Uturm	Peds	App. Total	Left	Thru	Rgt	Uturm	Peds	App. Total							
Peak Hour Analysis from 04:00 PM to 06:00 PM																															
Peak Hour for Entire Intersection Begins at 05:00 PM																															
5:00 PM	18	0	156	0	0	174	0	0	0	0	0	0	103	572	0	0	0	675	0	265	112	0	0	377	1226						
5:15 PM	11	0	137	0	0	148	0	0	0	0	0	0	87	612	0	0	0	699	0	306	138	0	0	444	1291						
5:30 PM	30	0	143	0	0	173	0	0	0	0	0	0	66	621	0	0	0	687	0	273	117	0	0	390	1250						
5:45 PM	16	0	140	0	0	156	0	0	0	0	0	0	71	563	0	0	0	634	0	300	99	0	0	399	1189						
Total Volume	75	0	576	0	0	651	0	0	0	0	0	0	327	2368	0	0	0	2695	0	1144	466	0	0	1610	4956						
% App. Total	11.5	0.0	88.5	0.0	0.0	100	0.0	0.0	0.0	0.0	0.0	0.0	12.1	87.9	0.0	0.0	100	0.0	71.1	28.9	0.0	0.0	100								
PHF	0.935						0.964						0.907						0.960												
Cars, PU, Vans	73	0	573	0	0	646	0	0	0	0	0	0	324	2323	0	0	0	2647	0	1134	456	0	0	1590	4883						
% Cars, PU, Vans	97.3	0.0	99.5	0.0	0.0	99.2	0.0	0.0	0.0	0.0	0.0	0.0	99.1	98.1	0.0	0.0	98.2	0.0	99.1	97.9	0.0	0.0	98.8	98.5							
Heavy Trucks	2	0	3	0	0	5	0	0	0	0	0	0	3	45	0	0	0	48	0	10	10	0	0	20	73						
%Heavy Trucks	2.7	0.0	0.5	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.9	1.9	0.0	0.0	1.8	0.0	0.9	2.1	0.0	0.0	1.2	1.5							

Project ID: 20-09026-003
 Location: Hinton Oaks Blvd & US 64/Knightdale Blvd
 City: Knightdale

Day: Thursday
 Date: 01/30/2020

Groups Printed - Cars, PU, Vans - Heavy Trucks

Start Time	Hinton Oaks Blvd Northbound						Hinton Oaks Blvd Southbound						US 64/Knightdale Blvd Eastbound						US 64/Knightdale Blvd Westbound						Int. Total
	Left	Thru	Rgt	Utum	Peds	App. Total	Left	Thru	Rgt	Utum	Peds	App. Total	Left	Thru	Rgt	Utum	Peds	App. Total	Left	Thru	Rgt	Utum	Peds	App. Total	
7:00 AM	69	0	27	0	0	96	6	0	2	0	0	8	29	199	10	1	0	239	3	440	10	1	0	454	797
7:15 AM	70	0	10	0	0	80	5	2	6	0	13	26	197	10	0	0	233	2	458	9	1	0	470	796	
7:30 AM	62	3	14	0	0	79	10	3	6	0	19	31	242	12	0	0	285	9	489	7	0	0	505	888	
7:45 AM	56	2	6	0	1	64	14	3	10	0	27	38	260	19	0	0	317	3	422	19	2	0	446	854	
Total	257	5	57	0	1	319	35	8	24	0	67	124	898	51	1	0	1074	17	1809	45	4	0	1875	3335	
8:00 AM	50	3	12	0	0	65	14	1	14	0	29	38	233	12	0	0	283	1	385	12	0	0	398	775	
8:15 AM	44	3	13	0	0	60	9	1	12	0	22	47	224	7	0	0	278	4	353	19	2	0	378	738	
8:30 AM	29	1	11	0	0	41	10	2	12	0	24	33	230	12	0	0	275	5	330	11	0	0	346	686	
8:45 AM	31	5	10	0	0	46	11	0	17	0	28	54	210	11	0	0	275	8	297	11	0	0	316	665	
Total	154	12	46	0	0	212	44	4	55	0	103	172	897	42	0	0	1111	18	1365	53	2	0	1438	2864	
BREAK																									
4:00 PM	34	3	14	0	0	51	38	6	32	0	76	73	423	33	11	0	540	6	253	17	2	0	278	945	
4:15 PM	27	5	9	0	0	41	20	6	26	0	52	70	477	24	3	0	574	5	305	16	3	0	329	996	
4:30 PM	21	6	11	0	0	38	42	3	34	0	79	76	496	31	4	0	607	6	308	13	1	0	328	1052	
4:45 PM	37	3	12	0	0	52	32	7	30	0	69	76	499	26	4	0	605	7	283	7	2	0	299	1025	
Total	119	17	46	0	0	182	132	22	122	0	276	295	1895	114	22	0	2326	24	1149	53	8	0	1234	4018	
5:00 PM	31	6	14	0	0	51	28	2	25	0	55	90	562	43	5	0	700	12	306	19	2	0	339	1145	
5:15 PM	30	5	19	0	0	54	32	4	23	0	59	98	548	31	5	0	682	9	325	13	2	0	349	1144	
5:30 PM	24	9	11	0	0	44	28	2	14	1	45	98	579	43	5	0	725	4	360	16	1	0	381	1195	
5:45 PM	26	5	10	0	0	41	29	4	24	0	57	94	511	35	8	0	648	8	305	19	0	0	332	1078	
Total	111	25	54	0	0	190	117	12	86	1	216	380	2200	152	23	0	2755	33	1296	67	5	0	1401	4562	
Grand Total	641	59	203	0	1	903	328	46	287	1	662	971	5890	359	46	0	7266	92	5619	218	19	0	5948	14779	
Apprch %	71.0	6.5	22.5	0.0	0.1		49.5	6.9	43.4	0.2	0.2	13.4	81.1	4.9	0.6	0.0		1.5	94.5	3.7	0.3	0.0			
Total %	4.3	0.4	1.4	0.0	0.0	6.1	2.2	0.3	1.9	0.0	0.0	4.5	6.6	39.9	2.4	0.3	0.0	49.2	0.6	38.0	1.5	0.1	0.0	40.2	
Cars, PU, Vans	639	59	203	0	0	901	321	46	271	1	639	946	5676	358	46	0	7026	90	5410	210	19	0	5729	14295	
% Cars, PU, Vans	99.7	100.0	100.0	0.0	0.0	99.8	97.9	100.0	94.4	100.0	96.5	97.4	96.4	99.7	100.0	96.7	97.8	96.3	96.3	100.0	96.3	96.7	96.3	96.7	96.3
Heavy Trucks	2	0	0	0	0	2	7	0	16	0	23	25	214	1	0	0	240	2	209	8	0	0	219	484	
%Heavy Trucks	0.3	0.0	0.0	0.0	0.2	0.2	2.1	0.0	5.6	0.0	3.5	2.6	3.6	0.3	0.0	3.3	2.2	3.7	3.7	0.0	0.0	3.7	3.3	3.3	3.3

Project ID: 20-09026-003
 Location: Hinton Oaks Blvd & US 64/Knightdale Blvd
 City: Knightdale

PEAK HOURS

Day: Thursday
 Date: 01/30/2020

AM

Start Time	Hinton Oaks Blvd Northbound						Hinton Oaks Blvd Southbound						US 64/Knightdale Blvd Eastbound						US 64/Knightdale Blvd Westbound						Int. Total
	Left	Thru	Rgt	Utum	Peds	App. Total	Left	Thru	Rgt	Utum	Peds	App. Total	Left	Thru	Rgt	Utum	Peds	App. Total	Left	Thru	Rgt	Utum	Peds	App. Total	
7:00 AM	69	0	27	0	0	96	6	0	2	0	8	29	199	10	1	0	239	3	440	10	1	0	454	797	
7:15 AM	70	0	10	0	0	80	5	2	6	0	13	26	197	10	0	0	233	2	458	9	1	0	470	796	
7:30 AM	62	3	14	0	0	79	10	3	6	0	19	31	242	12	0	0	285	9	489	7	0	0	505	888	
7:45 AM	56	2	6	0	1	64	14	3	10	0	27	38	260	19	0	0	317	3	422	19	2	0	446	854	
Total Volume	257	5	57	0	1	319	35	8	24	0	67	124	898	51	1	0	1074	17	1809	45	4	0	1875	3335	
% App. Total	80.6	1.6	17.9	0.0	0.0	100	52.2	11.9	35.8	0.0	100	11.5	83.6	4.7	0.1	100	0.9	96.5	2.4	0.2	100				
PHF						0.831					0.620					0.847						0.928		0.939	
Cars, PU, Vans	256	5	57	0	1	318	33	8	20	0	61	120	846	51	1	1018	15	1731	44	4	1794	3191			
% Cars, PU, Vans	99.6	100.0	100.0	0.0	99.7	99.7	94.3	100.0	83.3	0.0	91.0	96.8	94.2	100.0	100.0	94.8	88.2	95.7	97.8	100.0	95.7	95.7	95.7	95.7	
Heavy Trucks	1	0	0	0	0	1	2	0	4	0	6	4	52	0	0	56	2	78	1	0	81	144			
%Heavy Trucks	0.4	0.0	0.0	0.0	0.3	0.3	5.7	0.0	16.7	0.0	9.0	3.2	5.8	0.0	0.0	5.2	11.8	4.3	2.2	0.0	4.3	4.3	4.3	4.3	

PM

Start Time	Hinton Oaks Blvd Northbound						Hinton Oaks Blvd Southbound						US 64/Knightdale Blvd Eastbound						US 64/Knightdale Blvd Westbound						Int. Total
	Left	Thru	Rgt	Utum	Peds	App. Total	Left	Thru	Rgt	Utum	Peds	App. Total	Left	Thru	Rgt	Utum	Peds	App. Total	Left	Thru	Rgt	Utum	Peds	App. Total	
5:00 PM	31	6	14	0	0	51	28	2	25	0	55	90	562	43	5	700	12	306	19	2	339	1145			
5:15 PM	30	5	19	0	0	54	32	4	23	0	59	98	548	31	5	682	9	325	13	2	349	1144			
5:30 PM	24	9	11	0	0	44	28	2	14	1	45	98	579	43	5	725	4	360	16	1	381	1195			
5:45 PM	26	5	10	0	0	41	29	4	24	0	57	94	511	35	8	648	8	305	19	0	332	1078			
Total Volume	111	25	54	0	0	190	117	12	86	1	216	380	2200	152	23	2755	33	1296	67	5	1401	4562			
% App. Total	58.4	13.2	28.4	0.0	0.0	100	54.2	5.6	39.8	0.5	100	13.8	79.9	5.5	0.8	100	2.4	92.5	4.8	0.4	100				
PHF						0.880					0.915					0.950						0.919		0.954	
Cars, PU, Vans	110	25	54	0	0	189	117	12	82	1	212	372	2162	151	23	2708	33	1278	66	5	1382	4491			
% Cars, PU, Vans	99.1	100.0	100.0	0.0	99.5	99.5	100.0	100.0	95.3	100.0	98.1	97.9	98.3	99.3	100.0	98.3	100.0	98.6	98.5	100.0	98.6	98.6	98.6	98.4	
Heavy Trucks	1	0	0	0	0	1	0	0	4	0	4	8	38	1	0	47	0	18	1	0	19	71			
%Heavy Trucks	0.9	0.0	0.0	0.0	0.5	0.5	0.0	0.0	4.7	0.0	1.9	2.1	1.7	0.7	0.0	1.7	0.0	1.4	1.5	0.0	1.4	1.6	1.6	1.6	

Project ID: 19-09774-003
 Location: CR 2516/Hodge Rd & Legacy Oaks Dr S Ent
 City: Knightdale

Day: Thursday
 Date: 12/05/2019

Groups Printed - Cars, PU, Vans - Heavy Trucks

Start Time	CR 2516/Hodge Rd Northbound						CR 2516/Hodge Rd Southbound						Legacy Oaks Dr S Ent Eastbound						Legacy Oaks Dr S Ent Westbound						Int. Total	
	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total		
7:00 AM	9	7	15	0	0	31	0	53	5	0	0	58	0	0	2	0	0	2	0	0	0	0	0	0	91	
7:15 AM	10	7	11	1	0	29	0	43	4	0	0	47	0	1	2	0	0	3	2	0	0	1	0	3	82	
7:30 AM	16	10	27	0	0	53	1	56	1	0	0	58	1	0	3	0	0	4	2	0	0	0	0	2	117	
7:45 AM	8	11	14	2	0	35	0	27	0	0	0	27	0	0	1	0	0	1	2	0	0	2	0	4	67	
Total	43	35	67	3	0	148	1	179	10	0	0	190	1	1	8	0	0	10	6	0	0	3	0	9	357	
8:00 AM	13	13	13	0	0	39	0	33	1	0	0	34	0	0	0	0	0	0	4	0	0	0	0	0	4	77
8:15 AM	11	10	8	0	0	29	0	36	2	0	0	38	0	0	3	0	0	3	2	0	0	0	0	2	72	
8:30 AM	17	13	14	0	0	44	0	30	2	0	0	32	0	0	0	0	0	0	7	1	0	0	0	8	84	
8:45 AM	9	9	9	0	0	27	0	22	2	0	0	24	0	0	0	0	0	0	9	0	0	0	0	0	9	60
Total	50	45	44	0	0	139	0	121	7	0	0	128	0	0	3	0	0	3	22	1	0	0	0	23	293	
BREAK																										
4:00 PM	18	37	11	2	0	68	0	22	1	0	0	23	1	1	2	0	3	4	12	1	0	2	0	15	110	
4:15 PM	22	27	4	1	0	54	0	22	0	0	0	22	0	0	1	0	2	1	12	0	0	1	1	13	90	
4:30 PM	21	38	7	4	0	70	0	29	0	0	0	29	0	0	2	0	0	2	8	0	0	4	0	12	113	
4:45 PM	27	35	1	2	0	65	0	15	1	0	0	16	1	2	3	0	0	6	10	0	0	2	0	12	99	
Total	88	137	23	9	0	257	0	88	2	0	0	90	2	3	8	0	5	13	42	1	0	9	1	52	412	
5:00 PM	29	39	2	2	0	72	0	24	1	0	0	25	0	0	3	0	0	3	13	1	0	2	1	16	116	
5:15 PM	24	44	0	2	0	70	0	23	1	0	0	24	1	0	5	0	0	6	11	1	0	2	0	14	114	
5:30 PM	27	30	3	3	0	63	0	25	0	0	0	25	0	0	1	0	0	1	7	0	0	3	0	10	99	
5:45 PM	32	43	4	2	0	81	0	26	0	0	0	26	1	0	4	0	0	5	2	1	0	2	0	5	117	
Total	112	156	9	9	0	286	0	98	2	0	0	100	2	0	13	0	0	15	33	3	0	9	1	45	446	
Grand Total	293	373	143	21	0	830	1	486	21	0	0	508	5	4	32	0	5	41	103	5	0	21	2	129	1508	
Apprch %	35.3	44.9	17.2	2.5	0.0		0.2	95.7	4.1	0.0	0.0		12.2	9.8	78.0	0.0	12.2		79.8	3.9	0.0	16.3	1.6			
Total %	19.4	24.7	9.5	1.4	0.0	55.0	0.1	32.2	1.4	0.0	0.0	33.7	0.3	0.3	2.1	0.0	0.3	2.7	6.8	0.3	0.0	1.4	0.1	8.6		
Cars, PU, Vans	282	373	139	21		815	1	483	21		0	505	5	4	29		0	38	102	5		0	21	128	1486	
% Cars, PU, Vans	96.2	100.0	97.2	100.0		98.2	100.0	99.4	100.0		0.0	99.4	100.0	100.0	90.6		0.0	92.7	99.0	100.0		0.0	100.0	99.2	98.5	
Heavy Trucks	11	0	4	0		15	0	3	0		0	3	0	0	3		0	3	1	0		0	0	1	22	
%Heavy Trucks	3.8	0.0	2.8	0.0		1.8	0.0	0.6	0.0		0.0	0.6	0.0	0.0	9.4		0.0	7.3	1.0	0.0		0.0	0.0	0.8	1.5	

Project ID: 19-09774-003
 Location: CR 2516/Hodge Rd & Legacy Oaks Dr S Ent
 City: Knightdale

PEAK HOURS

Day: Thursday
 Date: 12/05/2019

AM

Start Time	CR 2516/Hodge Rd Northbound						CR 2516/Hodge Rd Southbound						Legacy Oaks Dr S Ent Eastbound						Legacy Oaks Dr S Ent Westbound						Int. Total	
	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total		
Peak Hour Analysis from 07:00 AM to 09:00 AM																										
Peak Hour for Entire Intersection Begins at 07:00 AM																										
7:00 AM	9	7	15	0	0	31	0	53	5	0	0	58	0	0	2	0	0	2	0	0	0	0	0	0	0	91
7:15 AM	10	7	11	1	0	29	0	43	4	0	0	47	0	1	2	0	0	3	2	0	0	1	0	3	82	
7:30 AM	16	10	27	0	0	53	1	56	1	0	0	58	1	0	3	0	0	4	2	0	0	0	0	2	117	
7:45 AM	8	11	14	2	0	35	0	27	0	0	0	27	0	0	1	0	0	1	2	0	0	2	0	4	67	
Total Volume	43	35	67	3	0	148	1	179	10	0	0	190	1	1	8	0	0	10	6	0	0	3	0	9	357	
% App. Total	29.1	23.6	45.3	2.0	0.0	100	0.5	94.2	5.3	0.0	0.0	100	10.0	10.0	80.0	0.0	0.0	100	66.7	0.0	0.0	33.3	100			
PHF	0.698						0.819						0.625						0.563	0.763						
Cars, PU, Vans	42	35	66	3		146	1	178	10		0	189	1	1	8		0	10	6	0		0	3	9	354	
% Cars, PU, Vans	97.7	100.0	98.5	100.0		98.6	100.0	99.4	100.0		0.0	99.5	100.0	100.0	100.0		0.0	100.0	100.0	0.0		0.0	100.0	100.0	99.2	
Heavy Trucks	1	0	1	0		2	0	1	0		0	1	0	0	0		0	0	0	0		0	0	0	3	
%Heavy Trucks	2.3	0.0	1.5	0.0		1.4	0.0	0.6	0.0		0.5	0.6	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.8	

PM

Start Time	CR 2516/Hodge Rd Northbound						CR 2516/Hodge Rd Southbound						Legacy Oaks Dr S Ent Eastbound						Legacy Oaks Dr S Ent Westbound						Int. Total	
	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total		
Peak Hour Analysis from 04:00 PM to 06:00 PM																										
Peak Hour for Entire Intersection Begins at 05:00 PM																										
5:00 PM	29	39	2	2	0	72	0	24	1	0	0	25	0	0	3	0	0	3	13	1	0	2	1	16	116	
5:15 PM	24	44	0	2	0	70	0	23	1	0	0	24	1	0	5	0	0	6	11	1	0	2	14	114		
5:30 PM	27	30	3	3	0	63	0	25	0	0	0	25	0	0	1	0	0	1	7	0	0	3	10	99		
5:45 PM	32	43	4	2	0	81	0	26	0	0	0	26	1	0	4	0	0	5	2	1	0	2	5	117		
Total Volume	112	156	9	9	0	286	0	98	2	0	0	100	2	0	13	0	0	15	33	3	0	9	45	446		
% App. Total	39.2	54.5	3.1	3.1	0.0	100	0.0	98.0	2.0	0.0	0.0	100	13.3	0.0	86.7	0.0	0.0	100	73.3	6.7	0.0	20.0	100			
PHF	0.883						0.962						0.625						0.703	0.953						
Cars, PU, Vans	109	156	9	9		283	0	98	2		0	100	2	0	12		0	14	33	3		0	9	45	442	
% Cars, PU, Vans	97.3	100.0	100.0	100.0		99.0	0.0	100.0	100.0		0.0	100.0	100.0	0.0	92.3		0.0	93.3	100.0	100.0		0.0	100.0	100.0	99.1	
Heavy Trucks	3	0	0	0		3	0	0	0		0	0	0	0	1		0	1	0	0		0	0	0	4	
%Heavy Trucks	2.7	0.0	0.0	0.0		1.0	0.0	0.0	0.0		0.0	0.0	0.0													

Project ID: 19-09774-002
 Location: CR 2516/Hodge Rd & Legacy Oaks Dr N Ent
 City: Knightdale

Day: Thursday
 Date: 12/05/2019

Groups Printed - Cars, PU, Vans - Heavy Trucks

Start Time	CR 2516/Hodge Rd Northbound						CR 2516/Hodge Rd Southbound						Legacy Oaks Dr N Ent Eastbound						Legacy Oaks Dr N Ent Westbound						Int. Total	
	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total		
7:00 AM	2	3	3	0	0	8	0	30	0	0	0	30	0	0	11	0	0	11	13	0	0	0	0	13	62	
7:15 AM	1	3	1	0	1	5	0	29	0	0	0	29	0	0	14	0	0	14	11	1	0	0	2	12	60	
7:30 AM	2	4	4	2	0	12	1	34	0	0	0	35	0	0	12	0	0	12	9	0	0	0	1	9	68	
7:45 AM	2	6	3	0	0	11	0	12	0	0	0	12	0	0	5	0	0	5	13	0	0	0	1	13	41	
Total	7	16	11	2	1	36	1	105	0	0	0	106	0	0	42	0	0	42	46	1	0	0	4	47	231	
8:00 AM	1	8	3	0	0	12	1	19	0	0	0	20	0	0	5	0	0	5	5	0	0	0	0	5	42	
8:15 AM	5	4	2	0	0	11	0	18	0	0	1	18	0	0	9	0	0	9	15	0	0	0	0	15	53	
8:30 AM	1	7	4	0	0	12	0	16	0	0	4	16	0	0	7	0	0	7	7	1	0	0	0	8	43	
8:45 AM	2	8	0	0	0	10	0	6	0	0	0	6	0	0	10	0	0	10	7	0	0	0	0	7	33	
Total	9	27	9	0	0	45	1	59	0	0	5	60	0	0	31	0	0	31	34	1	0	0	0	35	171	
BREAK																										
4:00 PM	8	23	7	0	0	38	0	12	0	0	0	12	0	0	4	0	2	4	3	0	0	0	0	3	57	
4:15 PM	7	16	6	0	0	29	0	14	0	0	4	14	0	0	6	0	2	6	4	1	0	0	1	5	54	
4:30 PM	12	22	5	1	0	40	1	12	0	0	0	13	0	0	11	0	0	11	6	0	0	0	0	6	70	
4:45 PM	8	18	9	0	1	35	0	9	0	0	0	9	0	0	3	0	1	3	5	0	0	0	0	5	52	
Total	35	79	27	1	1	142	1	47	0	0	4	48	0	0	24	0	5	24	18	1	0	0	1	19	233	
5:00 PM	9	22	6	0	0	37	0	12	0	0	0	12	0	0	8	0	0	8	3	0	0	0	0	3	60	
5:15 PM	7	31	6	0	0	44	0	11	0	0	0	11	0	0	8	0	0	8	3	0	1	0	1	4	67	
5:30 PM	6	23	3	1	0	33	0	14	0	0	0	14	0	0	7	0	0	7	3	0	0	0	0	3	57	
5:45 PM	7	27	6	0	0	40	0	12	0	0	0	12	0	0	4	0	0	4	10	0	0	0	2	10	66	
Total	29	103	21	1	0	154	0	49	0	0	0	49	0	0	27	0	0	27	19	0	1	0	3	20	250	
Grand Total	80	225	68	4	2	377	3	260	0	0	9	263	0	0	124	0	5	124	117	3	1	0	8	121	885	
Apprch %	21.2	59.7	18.0	1.1	0.5		1.1	98.9	0.0	0.0	3.4		0.0	0.0	100.0	0.0	4.0		96.7	2.5	0.8	0.0	6.6			
Total %	9.0	25.4	7.7	0.5	0.2	42.6	0.3	29.4	0.0	0.0	1.0	29.7	0.0	0.0	14.0	0.0	0.6	14.0	13.2	0.3	0.1	0.0	0.9	13.7		
Cars, PU, Vans	80	225	68	4		377	3	260	0	0	9	263	0	0	121	0	5	124	117	0	1	0	8	121	879	
% Cars, PU, Vans	100.0	100.0	100.0	100.0		100.0	100.0	100.0	0.0	0.0	100.0	100.0	0.0	0.0	97.6	0.0	97.6	97.6	0.0	0.0	100.0	0.0	97.5	99.3		
Heavy Trucks	0	0	0	0		0	0	0	0	0	0	0	0	0	3	0	3	3	0	3	0	0	0	3	6	
%Heavy Trucks	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.0	2.4	0.0	100.0	0.0	0.0	0.0	2.5	0.7		

Project ID: 19-09774-002
 Location: CR 2516/Hodge Rd & Legacy Oaks Dr N Ent
 City: Knightdale

PEAK HOURS

Day: Thursday
 Date: 12/05/2019

AM																										
Start Time	CR 2516/Hodge Rd Northbound						CR 2516/Hodge Rd Southbound						Legacy Oaks Dr N Ent Eastbound						Legacy Oaks Dr N Ent Westbound						Int. Total	
	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total		
Peak Hour Analysis from 07:00 AM to 09:00 AM																										
Peak Hour for Entire Intersection Begins at 07:00 AM																										
7:00 AM	2	3	3	0	0	8	0	30	0	0	0	30	0	0	11	0	0	11	13	0	0	0	0	13	62	
7:15 AM	1	3	1	0	0	5	0	29	0	0	0	29	0	0	14	0	0	14	11	1	0	0	0	12	60	
7:30 AM	2	4	4	2	0	12	1	34	0	0	0	35	0	0	12	0	0	12	9	0	0	0	0	9	68	
7:45 AM	2	6	3	0	0	11	0	12	0	0	0	12	0	0	5	0	0	5	13	0	0	0	0	13	41	
Total Volume	7	16	11	2	0	36	1	105	0	0	0	106	0	0	42	0	0	42	46	1	0	0	0	47	231	
% App. Total	19.4	44.4	30.6	5.6		100	0.9	99.1	0.0	0.0	100	0.0	0.0	100.0	0.0	100	97.9	2.1	0.0	0.0	100	0.0	0.0	100		
PHF	0.750						0.757						0.750						0.904	0.849						
Cars, PU, Vans	7	16	11	2		36	1	105	0	0	0	106	0	0	41	0	0	41	46	0	0	0	0	46	229	
% Cars, PU, Vans	100.0	100.0	100.0	100.0		100.0	100.0	100.0	0.0	0.0	100.0	0.0	0.0	97.6	0.0	97.6	100.0	0.0	0.0	0.0	97.9	0.0	0.0	99.1	99.1	
Heavy Trucks	0	0	0	0		0	0	0	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	1	2	
%Heavy Trucks	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.0	2.4	0.0	100.0	0.0	0.0	0.0	2.1	0.9		
PM																										
Start Time	CR 2516/Hodge Rd Northbound						CR 2516/Hodge Rd Southbound						Legacy Oaks Dr N Ent Eastbound						Legacy Oaks Dr N Ent Westbound						Int. Total	
	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total		
Peak Hour Analysis from 04:00 PM to 06:00 PM																										
Peak Hour for Entire Intersection Begins at 05:00 PM																										
5:00 PM	9	22	6	0	0	37	0	12	0	0	0	12	0	0	8	0	0	8	3	0	0	0	0	3	60	
5:15 PM	7	31	6	0	0	44	0	11	0	0	0	11	0	0	8	0	0	8	3	0	1	0	0	4	67	
5:30 PM	6	23	3	1	0	33	0	14	0	0	0	14	0	0	7	0	0	7	3	0	0	0	0	3	57	
5:45 PM	7	27	6	0	0	40	0	12	0	0	0	12	0	0	4	0	0	4	10	0	0	0	0	10	66	
Total Volume	29	103	21	1	0	154	0	49	0	0	0	49	0	0	27	0	0	27	19	0	1	0	0	20	250	
% App. Total	18.8	66.9	13.6	0.6		100	0.0	100.0	0.0	0.0	100.0	0.0	0.0	100.0	0.0	100	95.0	0.0	5.0	0.0	100	0.0	0.0	100		
PHF	0.875						0.875						0.844						0.500	0.933						
Cars, PU, Vans	29	103	21	1		154	0	49	0	0	0	49	0	0	27	0	0	27	19	0	1	0	0	20	250	
% Cars, PU, Vans	100.0	100.0	100.0	100.0		100.0	0.0	100.0	0.0	0.0	100.0	0.0	0.0	100.0	0.0	100.0	100.0	0.0	100.0	0.0	100.0	0.0	0.0	100.0	100.0	
Heavy Trucks	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
%Heavy Trucks	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		

Appendix D:
Approved Development Data

540 West Subdivision

Raleigh, NC

PREPARED FOR

Pulte Homes
c/o Randy King
1225 Crescent Green Drive
Suite 250
Cary, NC 27518

PREPARED BY

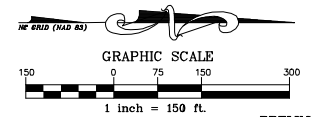
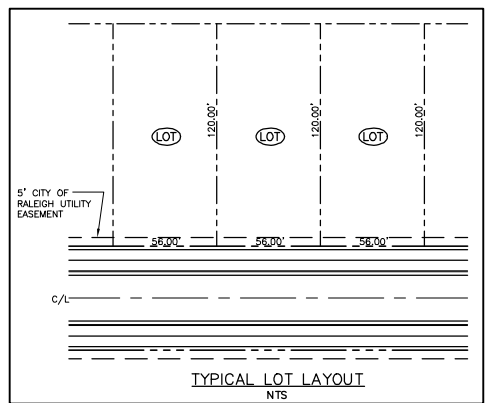
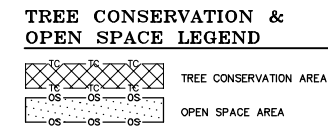
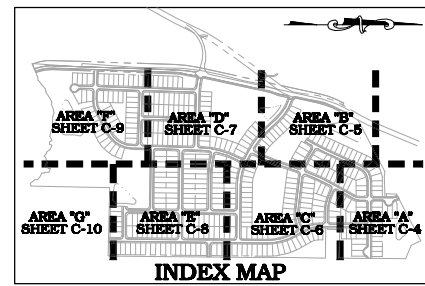
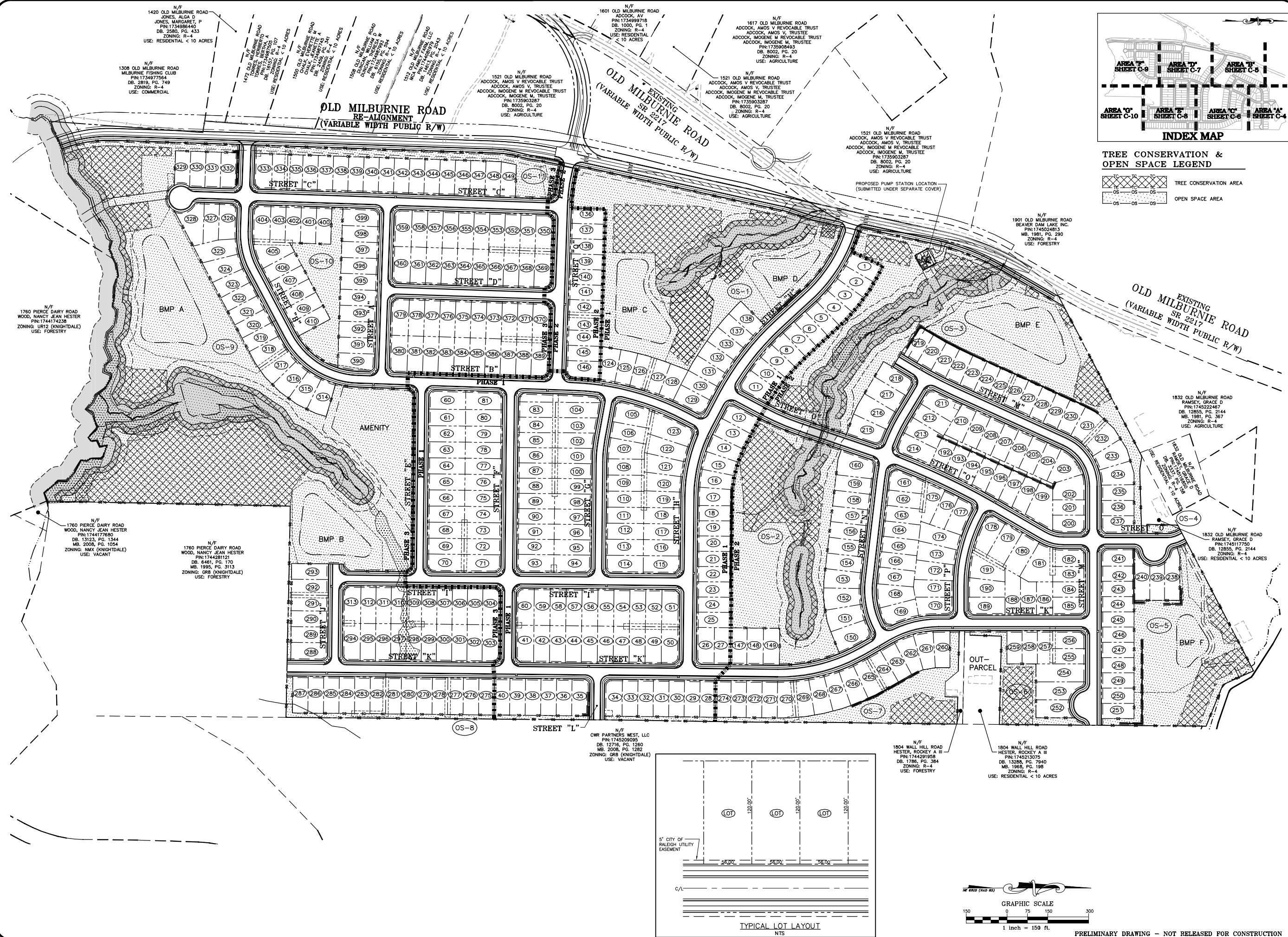


VHB Engineering NC, P.C. (C-3705)
Venture I
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
919.829.0328

August 8, 2018



X:\Projects\PLT17020-0A81\Site Plan-Construction Drawings\PLT17020-0A81.dwg, 7/6/2018, 8:43:44 AM, Hughes, Kevin



PRELIMINARY DRAWING - NOT RELEASED FOR CONSTRUCTION

THE JOHN R. MCADAMS COMPANY, INC.
2905 Meridian Parkway
Durham, North Carolina 27713
License No.: C-2028
P.O. Box 5000 • McAdams@cs.com



REVISIONS:
2018-07-06 PER CITY OF RALEIGH COMMENTS

OWNER:
PULTE GROUP
RALEIGH DIVISION
1225 CRESCENT GREEN DRIVE,
SUITE 250
CARY, NORTH CAROLINA 27518

540 WEST
PRELIMINARY SUBDIVISION PLAN
RALEIGH, NORTH CAROLINA
OVERALL SUBDIVISION PLAN

PROJECT NO. PLT-17020
FILENAME: PLT17020-0A81
CHECKED BY: BAR
DRAWN BY: KWH
SCALE: 1"=150'
DATE: 08-17-18
SHEET NO. C-3
MCADAMS

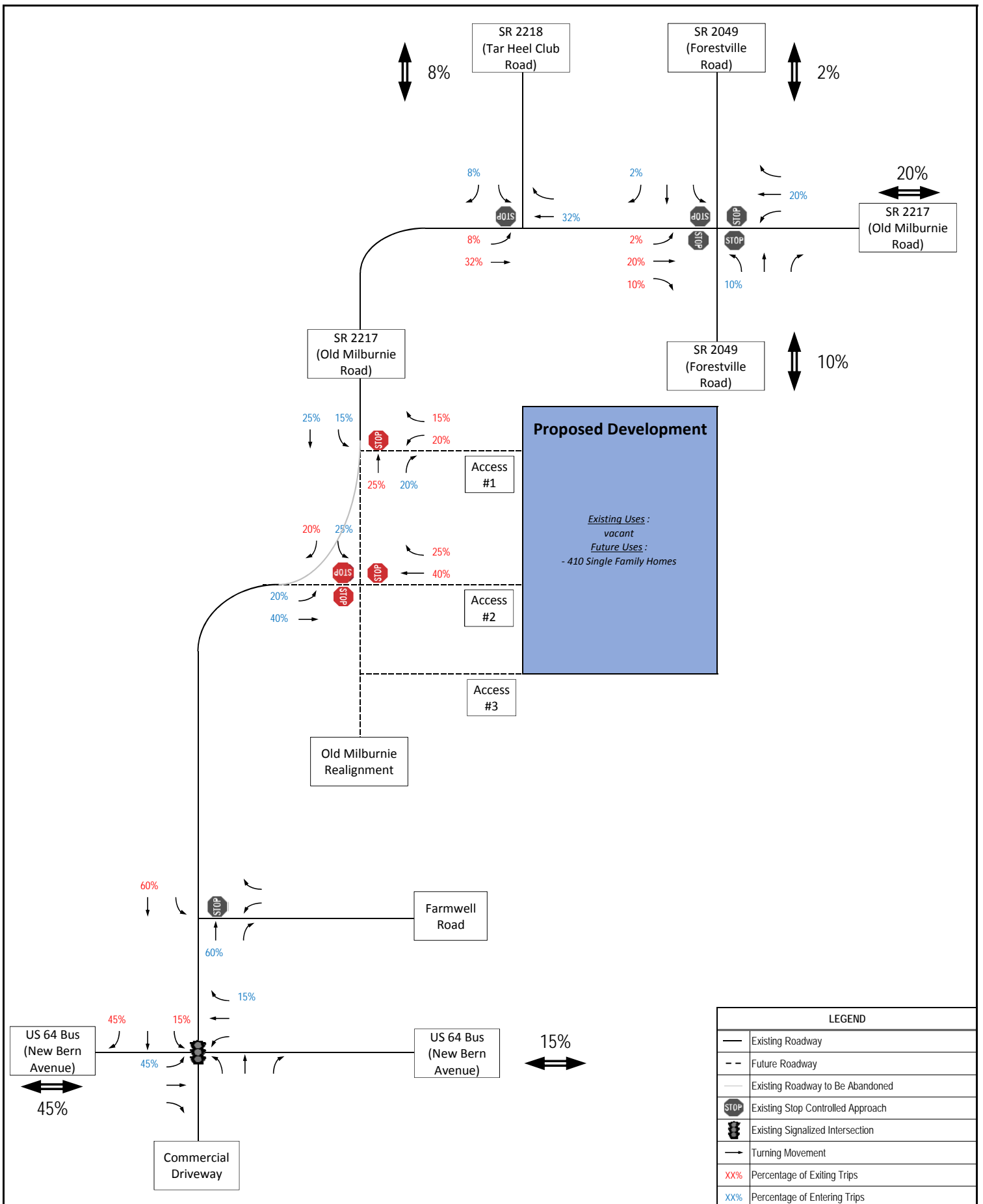


Figure 6
Peak Hour Trip Distribution Percentages

540 West Subdivision
Raleigh, NC

Appendix E:
Intersection Spreadsheets

INTERSECTION ANALYSIS SHEET

Project: Legacy Oaks
 Location: Knightdale, NC
 Count: US 64 thru mvmts from Int. #2; all others from 12/5/2019
 N/S Street: Hodge Road
 E/W Street: US 64 Business (Knightdale Blvd)

	AM In	AM Out	PM In	PM Out
Net New Trips:	141	225	239	168
Pass-By Trips:	0	0	20	17

Annual Growth Rate (Buildout +1):	3.0%	Existing Year:	2020
Growth Factor (Buildout +1):	0.125509	Buildout+1 Year:	2024
Annual Growth Rate (Buildout +10):	1.0%	Buildout+10 Year:	2033
Growth Factor (Buildout +10):	0.093685		

**AM PEAK HOUR
AM PHF = 0.89**

Description	US 64 Business (Knightdale Blvd) Eastbound				US 64 Business (Knightdale Blvd) Westbound				Hodge Road Northbound			Hodge Road Southbound		
	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	Left	Through	Right	Left	Through	Right
2020 Traffic Count	1	36	0	86	12	129	0	101	389	16	153	101	18	100
Count Balancing	0	0	764	0	0	0	1284	0	0	0	0	0	0	0
2020 Existing Traffic	1	36	764	86	12	129	1284	101	389	16	153	101	18	100
Growth Factor (3.0% per year)	0.126	0.000	0.126	0.126	0.126	0.126	0.126	0.000	0.126	0.000	0.126	0.000	0.000	0.000
2024 Background Growth	0	0	96	11	2	16	161	0	49	0	19	0	0	0
Growth Factor (1.0% per year)	0.094	0.000	0.094	0.094	0.094	0.094	0.094	0.000	0.094	0.000	0.094	0.000	0.000	0.000
2033 Background Growth	0	0	81	9	1	14	135	0	41	0	16	0	0	0
Approved Developments 540 West	0	0	33	0	0	0	11	0	0	0	0	0	0	0
Total Approved Dev. Traffic	0	0	33	0	0	0	11	0	0	0	0	0	0	0
2024 Background Traffic	1	36	893	97	14	145	1456	101	438	16	172	101	18	100
2033 Background Traffic	1	36	974	106	15	159	1591	101	479	16	188	101	18	100
Project Traffic														
Percent Assignment Inbound	0.00%	30.00%	0.00%	0.00%	0.00%	0.00%	0.00%	65.00%	0.00%	5.00%	0.00%	0.00%	0.00%	0.00%
Inbound Project Traffic	0	42	0	0	0	0	0	92	0	7	0	0	0	0
Percent Assignment Outbound	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	65.00%	5.00%	30.00%
Outbound Project Traffic	0	0	0	0	0	0	0	0	0	0	0	147	11	68
Pass-By Capture Reduction	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Capture Assignment	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Pass-By Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Project Traffic	0	42	0	0	0	0	0	92	0	7	0	147	11	68
2024 Buildout Total	1	78	893	97	14	145	1456	193	438	23	172	248	29	168
2033 Buildout Total	1	78	974	106	15	159	1591	193	479	23	188	248	29	168

**PM PEAK HOUR
PM PHF = 0.97**

Description	US 64 Business (Knightdale Blvd) Eastbound				US 64 Business (Knightdale Blvd) Westbound				Hodge Road Northbound			Hodge Road Southbound		
	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	Left	Through	Right	Left	Through	Right
2020 Traffic Count	6	63	0	283	19	362	0	183	102	30	214	145	76	66
Count Balancing	0	0	1499	0	0	0	961	0	0	0	0	0	0	0
2020 Existing Traffic	6	63	1499	283	19	362	961	183	102	30	214	145	76	66
Growth Factor (3.0% per year)	0.126	0.000	0.126	0.126	0.126	0.126	0.126	0.000	0.126	0.000	0.126	0.000	0.000	0.000
2024 Background Growth	1	0	188	36	2	45	121	0	13	0	27	0	0	0
Growth Factor (1.0% per year)	0.094	0.000	0.094	0.094	0.094	0.094	0.094	0.000	0.094	0.000	0.094	0.000	0.000	0.000
2033 Background Growth	1	0	158	30	2	38	101	0	11	0	23	0	0	0
Approved Developments 540 West	0	0	22	0	0	0	37	0	0	0	0	0	0	0
Total Approved Dev. Traffic	0	0	22	0	0	0	37	0	0	0	0	0	0	0
2024 Background Traffic	7	63	1709	319	21	407	1119	183	115	30	241	145	76	66
2033 Background Traffic	8	63	1867	349	23	445	1220	183	126	30	264	145	76	66
Project Traffic														
Percent Assignment Inbound	0.00%	30.00%	0.00%	0.00%	0.00%	0.00%	0.00%	65.00%	0.00%	5.00%	0.00%	0.00%	0.00%	0.00%
Inbound Project Traffic	0	72	0	0	0	0	0	155	0	12	0	0	0	0
Percent Assignment Outbound	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	65.00%	5.00%	30.00%
Outbound Project Traffic	0	0	0	0	0	0	0	0	0	0	0	109	8	51
Pass-By Capture Reduction	0	0	-11	0	0	0	-9	0	0	0	0	0	0	0
Pass-By Capture Assignment	0	11	0	0	0	0	0	9	0	0	0	9	0	8
Total Pass-By Traffic	0	11	-11	0	0	0	-9	9	0	0	0	9	0	8
Total Project Traffic	0	83	-11	0	0	0	-9	164	0	12	0	118	8	59
2024 Buildout Total	7	146	1698	319	21	407	1110	347	115	42	241	263	84	125
2033 Buildout Total	8	146	1856	349	23	445	1211	347	126	42	264	263	84	125

INTERSECTION ANALYSIS SHEET

Project: Legacy Oaks
Location: Knightdale, NC
Count: 1/30/2020
N/S Street: I-540 Southbound Ramps
E/W Street: US 64 Business (Knightdale Blvd)

	AM In	AM Out	PM In	PM Out
Net New Trips:	141	225	239	168
Pass-By Trips:	0	0	20	17

Annual Growth Rate (Buildout +1):	3.0%	Existing Year:	2020
Growth Factor (Buildout +1):	0.125509	Buildout+1 Year:	2024
Annual Growth Rate (Buildout +10):	1.0%	Buildout+10 Year:	2033
Growth Factor (Buildout +10):	0.093685		

AM PEAK HOUR AM PHF = 0.94

Description	US 64 Business (Knightdale Blvd) Eastbound			US 64 Business (Knightdale Blvd) Westbound				I-540 Southbound Ramps Northbound			I-540 Southbound Ramps Southbound		
	Left	Through	Right	U-Turn	Left	Through	Right	Left	Through	Right	Left	Through	Right
2020 Traffic Count	0	932	98	1	265	1263	0	0	0	0	0	0	263
Count Balancing	0	0	0	0	0	0	0	0	0	305	0	0	0
2020 Existing Traffic	0	932	98	1	265	1263	0	0	0	305	0	0	263
Growth Factor (3.0% per year)	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126
2024 Background Growth	0	117	12	0	33	159	0	0	0	38	0	0	33
Growth Factor (1.0% per year)	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094
2033 Background Growth	0	98	10	0	28	133	0	0	0	32	0	0	28
<u>Approved Developments</u>													
540 West	0	22	11	0	0	7	0	0	0	0	0	0	4
Total Approved Dev. Traffic	0	22	11	0	0	7	0	0	0	0	0	0	4
2024 Background Traffic	0	1071	121	1	298	1429	0	0	0	343	0	0	300
2033 Background Traffic	0	1169	131	1	326	1562	0	0	0	375	0	0	328
<u>Project Traffic</u>													
Percent Assignment Inbound	0.00%	0.00%	0.00%	0.00%	0.00%	40.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	25.00%
Inbound Project Traffic	0	0	0	0	0	56	0	0	0	0	0	0	35
Percent Assignment Outbound	0.00%	55.00%	10.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Outbound Project Traffic	0	124	23	0	0	0	0	0	0	0	0	0	0
Total Project Traffic	0	124	23	0	0	56	0	0	0	0	0	0	35
2024 Buildout Total	0	1195	144	1	298	1485	0	0	0	343	0	0	335
2033 Buildout Total	0	1293	154	1	326	1618	0	0	0	375	0	0	363

PM PEAK HOUR PM PHF = 0.98

Description	US 64 Business (Knightdale Blvd) Eastbound			US 64 Business (Knightdale Blvd) Westbound				I-540 Southbound Ramps Northbound			I-540 Southbound Ramps Southbound		
	Left	Through	Right	U-Turn	Left	Through	Right	Left	Through	Right	Left	Through	Right
2020 Traffic Count	0	1810	67	2	178	1033	0	0	0	0	0	0	492
Count Balancing	0	0	0	0	0	0	0	0	0	883	0	0	0
2020 Existing Traffic	0	1810	67	2	178	1033	0	0	0	883	0	0	492
Growth Factor (3.0% per year)	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126
2024 Background Growth	0	227	8	0	22	130	0	0	0	111	0	0	62
Growth Factor (1.0% per year)	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094
2033 Background Growth	0	191	7	0	19	109	0	0	0	93	0	0	52
<u>Approved Developments</u>													
540 West	0	15	5	0	0	25	0	0	0	0	0	0	11
Total Approved Dev. Traffic	0	15	5	0	0	25	0	0	0	0	0	0	11
2024 Background Traffic	0	2052	80	2	200	1188	0	0	0	994	0	0	565
2033 Background Traffic	0	2243	87	2	219	1297	0	0	0	1087	0	0	617
<u>Project Traffic</u>													
Percent Assignment Inbound	0.00%	0.00%	0.00%	0.00%	0.00%	40.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	25.00%
Inbound Project Traffic	0	0	0	0	0	96	0	0	0	0	0	0	59
Percent Assignment Outbound	0.00%	55.00%	10.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Outbound Project Traffic	0	92	15	0	0	0	0	0	0	0	0	0	0
Total Project Traffic	0	92	15	0	0	96	0	0	0	0	0	0	59
2024 Buildout Total	0	2144	95	2	200	1284	0	0	0	994	0	0	624
2033 Buildout Total	0	2335	102	2	219	1393	0	0	0	1087	0	0	676

INTERSECTION ANALYSIS SHEET

Project:	Legacy Oaks
Location:	Knightsdale, NC
Count:	1/30/2020
N/S Street:	I-540 Northbound Ramps
E/W Street:	US 64 Business (Knightsdale Blvd)

	AM In	AM Out	PM In	PM Out
Net New Trips:	141	225	239	168
Pass-By Trips:	0	0	20	17

Annual Growth Rate (Buildout +1):	3.0%	Existing Year:	2020
Growth Factor (Buildout +1):	0.125509	Buildout+1 Year:	2024
Annual Growth Rate (Buildout +10):	1.0%	Buildout+10 Year:	2033
Growth Factor (Buildout +10):	0.093685		

**AM PEAK HOUR
AM PHF = 0.91**

Description	US 64 Business (Knightsdale Blvd)			US 64 Business (Knightsdale Blvd)			I-540 Northbound Ramps			-		
	Left	Eastbound Through	Right	Left	Westbound Through	Right	Left	Northbound Through	Right	Left	Southbound Through	Right
2020 Traffic Count	373	865	0	0	1460	703	57	4	304	0	0	0
Count Balancing	0	0	0	0	0	0	0	0	0	0	0	0
2020 Existing Traffic	373	865	0	0	1460	703	57	4	304	0	0	0
Growth Factor (3.0% per year)	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126
2024 Background Growth	47	109	0	0	183	88	7	1	38	0	0	0
Growth Factor (1.0% per year)	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094
2033 Background Growth	39	91	0	0	154	74	6	0	32	0	0	0
Approved Developments												
540 West	11	11	0	0	4	0	5	0	0	0	0	0
Total Approved Dev. Traffic	11	11	0	0	4	0	5	0	0	0	0	0
2024 Background Traffic	431	985	0	0	1647	791	69	5	342	0	0	0
2033 Background Traffic	470	1076	0	0	1801	865	75	5	374	0	0	0
Project Traffic												
Percent Assignment Inbound	0.00%	0.00%	0.00%	0.00%	30.00%	0.00%	10.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Inbound Project Traffic	0	0	0	0	42	0	15	0	0	0	0	0
Percent Assignment Outbound	25.00%	30.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Outbound Project Traffic	56	68	0	0	0	0	0	0	0	0	0	0
Total Project Traffic	56	68	0	0	42	0	15	0	0	0	0	0
2024 Buildout Total	487	1053	0	0	1689	791	84	5	342	0	0	0
2033 Buildout Total	526	1144	0	0	1843	865	90	5	374	0	0	0

**PM PEAK HOUR
PM PHF = 0.96**

Description	US 64 Business (Knightsdale Blvd)			US 64 Business (Knightsdale Blvd)			I-540 Northbound Ramps			-		
	Left	Eastbound Through	Right	Left	Westbound Through	Right	Left	Northbound Through	Right	Left	Southbound Through	Right
2020 Traffic Count	327	2368	0	0	1144	466	75	0	576	0	0	0
Count Balancing	0	0	0	0	0	0	0	0	0	0	0	0
2020 Existing Traffic	327	2368	0	0	1144	466	75	0	576	0	0	0
Growth Factor (3.0% per year)	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126
2024 Background Growth	41	297	0	0	144	58	9	0	72	0	0	0
Growth Factor (1.0% per year)	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094
2033 Background Growth	34	250	0	0	121	49	8	0	61	0	0	0
Approved Developments												
540 West	7	7	0	0	12	0	12	0	0	0	0	0
Total Approved Dev. Traffic	7	7	0	0	12	0	12	0	0	0	0	0
2024 Background Traffic	375	2672	0	0	1300	524	96	0	648	0	0	0
2033 Background Traffic	409	2922	0	0	1421	573	104	0	709	0	0	0
Project Traffic												
Percent Assignment Inbound	0.00%	0.00%	0.00%	0.00%	30.00%	0.00%	10.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Inbound Project Traffic	0	0	0	0	72	0	24	0	0	0	0	0
Percent Assignment Outbound	25.00%	30.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Outbound Project Traffic	42	50	0	0	0	0	0	0	0	0	0	0
Total Project Traffic	42	50	0	0	72	0	24	0	0	0	0	0
2024 Buildout Total	417	2722	0	0	1372	524	120	0	648	0	0	0
2033 Buildout Total	451	2972	0	0	1493	573	128	0	709	0	0	0

INTERSECTION ANALYSIS SHEET

Project: Legacy Oaks
 Location: Knightdale, NC
 Count: 1/30/2020
 N/S Street: Hinton Oaks Blvd
 E/W Street: US 64 Business (Knightdale Blvd)

	AM In	AM Out	PM In	PM Out
Net New Trips:	141	225	239	168
Pass-By Trips:	0	0	20	17

Annual Growth Rate (Buildout +1):	3.0%	Existing Year:	2020
Growth Factor (Buildout +1):	0.125509	Buildout+1 Year:	2024
Annual Growth Rate (Buildout +10):	1.0%	Buildout+10 Year:	2033
Growth Factor (Buildout +10):	0.093685		

**AM PEAK HOUR
AM PHF = 0.94**

Description	US 64 Business (Knightdale Blvd)				US 64 Business (Knightdale Blvd)				Hinton Oaks Blvd			Hinton Oaks Blvd		
	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	Left	Through	Right	Left	Through	Right
2020 Traffic Count	1	124	898	51	4	17	1809	45	257	5	57	35	8	24
Count Balancing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2020 Existing Traffic	1	124	898	51	4	17	1809	45	257	5	57	35	8	24
Growth Factor (3.0% per year)	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126
2024 Background Growth	0	16	113	6	1	2	227	6	32	1	7	4	1	3
Growth Factor (1.0% per year)	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094
2033 Background Growth	0	13	95	5	0	2	191	5	27	1	6	4	1	3
Approved Developments														
540 West	0	0	11	0	0	0	4	0	0	0	0	0	0	0
Total Approved Dev. Traffic	0	0	11	0	0	0	4	0	0	0	0	0	0	0
2024 Background Traffic	1	140	1022	57	5	19	2040	51	289	6	64	39	9	27
2033 Background Traffic	1	153	1117	62	5	21	2231	56	316	7	70	43	10	30
Project Traffic														
Percent Assignment Inbound	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	30.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Inbound Project Traffic	0	0	0	0	0	0	42	0	0	0	0	0	0	0
Percent Assignment Outbound	0.00%	0.00%	30.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Outbound Project Traffic	0	0	68	0	0	0	0	0	0	0	0	0	0	0
Total Project Traffic	0	0	68	0	0	0	42	0	0	0	0	0	0	0
2024 Buildout Total	1	140	1090	57	5	19	2082	51	289	6	64	39	9	27
2033 Buildout Total	1	153	1185	62	5	21	2273	56	316	7	70	43	10	30

**PM PEAK HOUR
PM PHF = 0.95**

Description	US 64 Business (Knightdale Blvd)				US 64 Business (Knightdale Blvd)				Hinton Oaks Blvd			Hinton Oaks Blvd		
	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	Left	Through	Right	Left	Through	Right
2020 Traffic Count	23	380	2200	152	5	33	1296	67	111	25	54	118	12	86
Count Balancing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2020 Existing Traffic	23	380	2200	152	5	33	1296	67	111	25	54	118	12	86
Growth Factor (3.0% per year)	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126
2024 Background Growth	3	48	276	19	1	4	163	8	14	3	7	15	2	11
Growth Factor (1.0% per year)	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094
2033 Background Growth	2	40	232	16	1	3	137	7	12	3	6	12	1	9
Approved Developments														
540 West	0	0	7	0	0	0	12	0	0	0	0	0	0	0
Total Approved Dev. Traffic	0	0	7	0	0	0	12	0	0	0	0	0	0	0
2024 Background Traffic	26	428	2483	171	6	37	1471	75	125	28	61	133	14	97
2033 Background Traffic	28	468	2715	187	7	40	1608	82	137	31	67	145	15	106
Project Traffic														
Percent Assignment Inbound	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	30.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Inbound Project Traffic	0	0	0	0	0	0	72	0	0	0	0	0	0	0
Percent Assignment Outbound	0.00%	0.00%	30.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Outbound Project Traffic	0	0	50	0	0	0	0	0	0	0	0	0	0	0
Total Project Traffic	0	0	50	0	0	0	72	0	0	0	0	0	0	0
2024 Buildout Total	26	428	2533	171	6	37	1543	75	125	28	61	133	14	97
2033 Buildout Total	28	468	2765	187	7	40	1680	82	137	31	67	145	15	106

INTERSECTION ANALYSIS SHEET

Project: Legacy Oaks
 Location: Knightsdale, NC
 Count: 12/5/2019
 N/S Street: Hodge Road
 E/W Street: Legacy Oaks Drive South/Sam's Xpress Driveway

	AM In	AM Out	PM In	PM Out
Net New Trips:	141	225	239	168
Pass-By Trips:	0	0	20	17

Annual Growth Rate (Buildout +1):	3.0%	Existing Year:	2020
Growth Factor (Buildout +1):	0.125509	Buildout+1 Year:	2024
Annual Growth Rate (Buildout +10):	1.0%	Buildout+10 Year:	2033
Growth Factor (Buildout +10):	0.093685		

**AM PEAK HOUR
AM PHF = 0.76**

Description	Sam's Xpress Driveway Eastbound			Legacy Oaks Drive South/Sam's Xpress Driveway Westbound				Hodge Road Northbound				Hodge Road Southbound		
	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	Left	Through	Right
2020 Traffic Count	1	1	8	3	6	0	0	3	43	35	67	1	179	10
Count Balancing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2020 Existing Traffic	1	1	8	3	6	0	0	3	43	35	67	1	179	10
Growth Factor (3.0% per year)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2024 Background Growth	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Growth Factor (1.0% per year)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2033 Background Growth	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approved Developments 540 West	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Approved Dev. Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2024 Background Traffic	1	1	8	3	6	0	0	3	43	35	67	1	179	10
2033 Background Traffic	1	1	8	3	6	0	0	3	43	35	67	1	179	10
Project Traffic														
Percent Assignment Inbound	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	70.00%	30.00%	0.00%	0.00%	0.00%
Inbound Project Traffic	0	0	0	0	0	0	0	0	0	99	42	0	0	0
Percent Assignment Outbound	0.00%	0.00%	0.00%	0.00%	50.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	50.00%	0.00%
Outbound Project Traffic	0	0	0	0	112	0	0	0	0	0	0	0	113	0
Total Project Traffic	0	0	0	0	112	0	0	0	0	99	42	0	113	0
2024 Buildout Total	1	1	8	3	118	0	0	3	43	134	109	1	292	10
2033 Buildout Total	1	1	8	3	118	0	0	3	43	134	109	1	292	10

**PM PEAK HOUR
PM PHF = 0.95**

Description	Sam's Xpress Driveway Eastbound			Legacy Oaks Drive South/Sam's Xpress Driveway Westbound				Hodge Road Northbound				Hodge Road Southbound		
	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	Left	Through	Right
2020 Traffic Count	2	0	13	9	33	3	0	9	112	156	9	0	98	2
Count Balancing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2020 Existing Traffic	2	0	13	9	33	3	0	9	112	156	9	0	98	2
Growth Factor (3.0% per year)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2024 Background Growth	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Growth Factor (1.0% per year)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2033 Background Growth	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approved Developments 540 West	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Approved Dev. Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2024 Background Traffic	2	0	13	9	33	3	0	9	112	156	9	0	98	2
2033 Background Traffic	2	0	13	9	33	3	0	9	112	156	9	0	98	2
Project Traffic														
Percent Assignment Inbound	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	70.00%	30.00%	0.00%	0.00%	0.00%
Inbound Project Traffic	0	0	0	0	0	0	0	0	0	167	72	0	0	0
Percent Assignment Outbound	0.00%	0.00%	0.00%	0.00%	50.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	50.00%	0.00%
Outbound Project Traffic	0	0	0	0	84	0	0	0	0	0	0	0	84	0
Total Project Traffic	0	0	0	0	101	0	0	0	0	167	92	0	84	0
2024 Buildout Total	2	0	13	9	134	3	0	9	112	323	101	0	182	2
2033 Buildout Total	2	0	13	9	134	3	0	9	112	323	101	0	182	2

INTERSECTION ANALYSIS SHEET

Project: Legacy Oaks
 Location: Knightdale, NC
 Count: 12/5/2019
 N/S Street: Hodge Road
 E/W Street: Legacy Oaks Drive North

	AM In	AM Out	PM In	PM Out
Net New Trips:	141	225	239	168
Pass-By Trips:	0	0	20	17

Annual Growth Rate (Buildout +1):	3.0%	Existing Year:	2020
Growth Factor (Buildout +1):	0.125509	Buildout+1 Year:	2024
Annual Growth Rate (Buildout +10):	1.0%	Buildout+10 Year:	2033
Growth Factor (Buildout +10):	0.093685		

**AM PEAK HOUR
AM PHF = 0.85**

Description	Legacy Oaks Drive North Eastbound			Legacy Oaks Drive North Westbound				Hodge Road Northbound				Hodge Road Southbound		
	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	Left	Through	Right
2020 Traffic Count	0	0	42	0	46	1	0	2	7	16	11	1	105	0
Count Balancing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2020 Existing Traffic	0	0	42	0	46	1	0	2	7	16	11	1	105	0
Growth Factor (3.0% per year)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2024 Background Growth	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Growth Factor (1.0% per year)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2033 Background Growth	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approved Developments														
540 West	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Approved Dev. Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2024 Background Traffic	0	0	42	0	46	1	0	2	7	16	11	1	105	0
2033 Background Traffic	0	0	42	0	46	1	0	2	7	16	11	1	105	0
Project Traffic														
Percent Assignment Inbound	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	50.00%	0.00%	0.00%	0.00%	0.00%
Inbound Project Traffic	0	0	0	0	0	0	0	0	0	71	0	0	0	0
Percent Assignment Outbound	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	50.00%	0.00%
Outbound Project Traffic	0	0	0	0	0	0	0	0	0	0	0	0	113	0
Total Project Traffic	0	0	0	0	0	0	0	0	0	71	0	0	113	0
2024 Buildout Total	0	0	42	0	46	1	0	2	7	87	11	1	218	0
2033 Buildout Total	0	0	42	0	46	1	0	2	7	87	11	1	218	0

**PM PEAK HOUR
PM PHF = 0.93**

Description	Legacy Oaks Drive North Eastbound			Legacy Oaks Drive North Westbound				Hodge Road Northbound				Hodge Road Southbound		
	Left	Through	Right	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	Left	Through	Right
2020 Traffic Count	0	0	27	0	19	0	1	1	29	103	21	0	49	0
Count Balancing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2020 Existing Traffic	0	0	27	0	19	0	1	1	29	103	21	0	49	0
Growth Factor (3.0% per year)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2024 Background Growth	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Growth Factor (1.0% per year)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2033 Background Growth	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approved Developments														
540 West	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Approved Dev. Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2024 Background Traffic	0	0	27	0	19	0	1	1	29	103	21	0	49	0
2033 Background Traffic	0	0	27	0	19	0	1	1	29	103	21	0	49	0
Project Traffic														
Percent Assignment Inbound	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	50.00%	0.00%	0.00%	0.00%	0.00%
Inbound Project Traffic	0	0	0	0	0	0	0	0	0	120	0	0	0	0
Percent Assignment Outbound	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	50.00%	0.00%
Outbound Project Traffic	0	0	0	0	0	0	0	0	0	0	0	0	84	0
Total Project Traffic	0	0	0	0	0	0	0	0	0	120	0	0	84	0
2024 Buildout Total	0	0	27	0	19	0	1	1	29	223	21	0	133	0
2033 Buildout Total	0	0	27	0	19	0	1	1	29	223	21	0	133	0

INTERSECTION ANALYSIS SHEET

Project: Legacy Oaks
 Location: Knightdale, NC
 Count: Balanced with Hodge at Legacy Oaks Dr South
 N/S Street: Hodge Road
 E/W Street: South RIRO Driveway

	AM In	AM Out	PM In	PM Out
Net New Trips:	141	225	239	168
Pass-By Trips:	0	0	20	17

Annual Growth Rate (Buildout +1):	3.0%	Existing Year:	2020
Growth Factor (Buildout +1):	0.125509	Buildout+1 Year:	2024
Annual Growth Rate (Buildout +10):	1.0%	Buildout+10 Year:	2033
Growth Factor (Buildout +10):	0.093685		

AM PEAK HOUR
AM PHF = 0.90

Description	-			South RIRO Driveway			Hodge Road				Hodge Road		
	Eastbound			Westbound			Northbound				Southbound		
	Left	Through	Right	Left	Through	Right	U-Turn	Left	Through	Right	Left	Through	Right
2020 Traffic Count	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Balancing	0	0	0	0	0	0	0	0	49	0	0	193	0
2020 Existing Traffic	0	0	0	0	0	0	0	0	49	0	0	193	0
Growth Factor (3.0% per year)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2024 Background Growth	0	0	0	0	0	0	0	0	0	0	0	0	0
Growth Factor (1.0% per year)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2033 Background Growth	0	0	0	0	0	0	0	0	0	0	0	0	0
<u>Approved Developments</u>													
540 West	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Approved Dev. Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0
2024 Background Traffic	0	0	0	0	0	0	0	0	49	0	0	193	0
2033 Background Traffic	0	0	0	0	0	0	0	0	49	0	0	193	0
<u>Project Traffic</u>													
Percent Assignment Inbound	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	60.00%	10.00%	0.00%	0.00%	0.00%
Inbound Project Traffic	0	0	0	0	0	0	0	0	85	15	0	0	0
Percent Assignment Outbound	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	50.00%	0.00%
Outbound Project Traffic	0	0	0	0	0	0	0	0	0	0	0	113	0
Total Project Traffic	0	0	0	0	0	0	0	0	85	15	0	113	0
2024 Buildout Total	0	0	0	0	0	0	0	0	134	15	0	306	0
2033 Buildout Total	0	0	0	0	0	0	0	0	134	15	0	306	0

PM PEAK HOUR
PM PHF = 0.90

Description	-			South RIRO Driveway			Hodge Road				Hodge Road		
	Eastbound			Westbound			Northbound				Southbound		
	Left	Through	Right	Left	Through	Right	U-Turn	Left	Through	Right	Left	Through	Right
2020 Traffic Count	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Balancing	0	0	0	0	0	0	0	0	202	0	0	95	0
2020 Existing Traffic	0	0	0	0	0	0	0	0	202	0	0	95	0
Growth Factor (3.0% per year)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2024 Background Growth	0	0	0	0	0	0	0	0	0	0	0	0	0
Growth Factor (1.0% per year)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2033 Background Growth	0	0	0	0	0	0	0	0	0	0	0	0	0
<u>Approved Developments</u>													
540 West	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Approved Dev. Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0
2024 Background Traffic	0	0	0	0	0	0	0	0	202	0	0	95	0
2033 Background Traffic	0	0	0	0	0	0	0	0	202	0	0	95	0
<u>Project Traffic</u>													
Percent Assignment Inbound	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	60.00%	10.00%	0.00%	0.00%	0.00%
Inbound Project Traffic	0	0	0	0	0	0	0	0	143	24	0	0	0
Percent Assignment Outbound	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	50.00%	0.00%
Outbound Project Traffic	0	0	0	0	0	0	0	0	0	0	0	84	0
Total Project Traffic	0	0	0	0	0	0	0	0	143	24	0	84	0
2024 Buildout Total	0	0	0	0	0	0	0	0	345	24	0	179	0
2033 Buildout Total	0	0	0	0	0	0	0	0	345	24	0	179	0

INTERSECTION ANALYSIS SHEET

Project: Legacy Oaks
 Location: Knightdale, NC
 Count: Balanced with Hodge at South RI/RO Driveway
 N/S Street: Hodge Road
 E/W Street: North RI/RO Driveway

	AM In	AM Out	PM In	PM Out
Net New Trips:	141	225	239	168
Pass-By Trips:	0	0	20	17

Annual Growth Rate (Buildout +1):	3.0%	Existing Year:	2020
Growth Factor (Buildout +1):	0.125509	Buildout+1 Year:	2024
Annual Growth Rate (Buildout +10):	1.0%	Buildout+10 Year:	2033
Growth Factor (Buildout +10):	0.093685		

AM PEAK HOUR
AM PHF = 0.90

Description	- Eastbound			North RI/RO Driveway Westbound			Hodge Road Northbound				Hodge Road Southbound		
	Left	Through	Right	Left	Through	Right	U-Turn	Left	Through	Right	Left	Through	Right
2020 Traffic Count	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Balancing	0	0	0	0	0	0	0	0	49	0	0	193	0
2020 Existing Traffic	0	0	0	0	0	0	0	0	49	0	0	193	0
Growth Factor (3.0% per year)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2024 Background Growth	0	0	0	0	0	0	0	0	0	0	0	0	0
Growth Factor (1.0% per year)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2033 Background Growth	0	0	0	0	0	0	0	0	0	0	0	0	0
<u>Approved Developments</u>													
540 West	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Approved Dev. Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0
2024 Background Traffic	0	0	0	0	0	0	0	0	49	0	0	193	0
2033 Background Traffic	0	0	0	0	0	0	0	0	49	0	0	193	0
<u>Project Traffic</u>													
Percent Assignment Inbound	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	50.00%	10.00%	0.00%	0.00%	0.00%
Inbound Project Traffic	0	0	0	0	0	0	0	0	71	14	0	0	0
Percent Assignment Outbound	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	50.00%	0.00%
Outbound Project Traffic	0	0	0	0	0	0	0	0	0	0	0	113	0
Total Project Traffic	0	0	0	0	0	0	0	0	71	14	0	113	0
2024 Buildout Total	0	0	0	0	0	0	0	0	120	14	0	306	0
2033 Buildout Total	0	0	0	0	0	0	0	0	120	14	0	306	0

PM PEAK HOUR
PM PHF = 0.90

Description	- Eastbound			North RI/RO Driveway Westbound			Hodge Road Northbound				Hodge Road Southbound		
	Left	Through	Right	Left	Through	Right	U-Turn	Left	Through	Right	Left	Through	Right
2020 Traffic Count	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Balancing	0	0	0	0	0	0	0	0	202	0	0	95	0
2020 Existing Traffic	0	0	0	0	0	0	0	0	202	0	0	95	0
Growth Factor (3.0% per year)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2024 Background Growth	0	0	0	0	0	0	0	0	0	0	0	0	0
Growth Factor (1.0% per year)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2033 Background Growth	0	0	0	0	0	0	0	0	0	0	0	0	0
<u>Approved Developments</u>													
540 West	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Approved Dev. Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0
2024 Background Traffic	0	0	0	0	0	0	0	0	202	0	0	95	0
2033 Background Traffic	0	0	0	0	0	0	0	0	202	0	0	95	0
<u>Project Traffic</u>													
Percent Assignment Inbound	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	50.00%	10.00%	0.00%	0.00%	0.00%
Inbound Project Traffic	0	0	0	0	0	0	0	0	120	23	0	0	0
Percent Assignment Outbound	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	50.00%	0.00%
Outbound Project Traffic	0	0	0	0	0	0	0	0	0	0	0	84	0
Total Project Traffic	0	0	0	0	0	0	0	0	120	23	0	84	0
2024 Buildout Total	0	0	0	0	0	0	0	0	322	23	0	179	0
2033 Buildout Total	0	0	0	0	0	0	0	0	322	23	0	179	0

**Appendix F:
Intersection Spreadsheets –
With Hinton Oaks**

INTERSECTION ANALYSIS SHEET

Project: Legacy Oaks
 Location: Knightdale, NC
 Scenario: With Hinton Oaks Industrial
 Count: US 64 thru mvmts from int. #2; all others from 12/5/2019
 N/S Street: Hodge Road
 E/W Street: US 64 Business (Knightdale Blvd)

	AM In	AM Out	PM In	PM Out
Net New Trips:	141	225	239	168
Pass-By Trips:	0	0	20	17

Annual Growth Rate (Buildout +1):	3.0%	Existing Year:	2020
Growth Factor (Buildout +1):	0.125509	Buildout+1 Year:	2024
Annual Growth Rate (Buildout +10):	1.0%	Buildout+10 Year:	2033
Growth Factor (Buildout +10):	0.093685		

**AM PEAK HOUR
AM PHF = 0.89**

Description	US 64 Business (Knightdale Blvd) Eastbound				US 64 Business (Knightdale Blvd) Westbound				Hodge Road Northbound			Hodge Road Southbound		
	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	Left	Through	Right	Left	Through	Right
2020 Traffic Count	1	36	0	86	12	129	0	101	389	16	153	101	18	100
Count Balancing	0	0	764	0	0	0	1284	0	0	0	0	0	0	0
2020 Existing Traffic	1	36	764	86	12	129	1284	101	389	16	153	101	18	100
Growth Factor (3.0% per year)	0.126	0.000	0.126	0.126	0.126	0.126	0.126	0.000	0.126	0.000	0.126	0.000	0.000	0.000
2024 Background Growth	0	0	96	11	2	16	161	0	49	0	19	0	0	0
Growth Factor (1.0% per year)	0.094	0.000	0.094	0.094	0.094	0.094	0.094	0.000	0.094	0.000	0.094	0.000	0.000	0.000
2033 Background Growth	0	0	81	9	1	14	135	0	41	0	16	0	0	0
Approved Developments														
Hinton Oaks Industrial	0	0	24	0	0	0	4	0	0	0	0	0	0	0
540 West	0	0	33	0	0	0	11	0	0	0	0	0	0	0
Total Approved Dev. Traffic	0	0	57	0	0	0	15	0	0	0	0	0	0	0
2024 Background Traffic	1	36	917	97	14	145	1460	101	438	16	172	101	18	100
2033 Background Traffic	1	36	998	106	15	159	1595	101	479	16	188	101	18	100
Project Traffic														
Percent Assignment Inbound	0.00%	30.00%	0.00%	0.00%	0.00%	0.00%	0.00%	65.00%	0.00%	5.00%	0.00%	0.00%	0.00%	0.00%
Inbound Project Traffic	0	42	0	0	0	0	0	92	0	7	0	0	0	0
Percent Assignment Outbound	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	65.00%	5.00%	30.00%
Outbound Project Traffic	0	0	0	0	0	0	0	0	0	0	0	147	11	68
Pass-By Capture Reduction	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pass-By Capture Assignment	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Pass-By Traffic	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Project Traffic	0	42	0	0	0	0	0	92	0	7	0	147	11	68
2024 Buildout Total	1	78	917	97	14	145	1460	193	438	23	172	248	29	168
2033 Buildout Total	1	78	998	106	15	159	1595	193	479	23	188	248	29	168

**PM PEAK HOUR
PM PHF = 0.97**

Description	US 64 Business (Knightdale Blvd) Eastbound				US 64 Business (Knightdale Blvd) Westbound				Hodge Road Northbound			Hodge Road Southbound		
	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	Left	Through	Right	Left	Through	Right
2020 Traffic Count	6	63	0	283	19	362	0	183	102	30	214	145	76	66
Count Balancing	0	0	1499	0	0	0	961	0	0	0	0	0	0	0
2020 Existing Traffic	6	63	1499	283	19	362	961	183	102	30	214	145	76	66
Growth Factor (3.0% per year)	0.126	0.000	0.126	0.126	0.126	0.126	0.126	0.000	0.126	0.000	0.126	0.000	0.000	0.000
2024 Background Growth	1	0	188	36	2	45	121	0	13	0	27	0	0	0
Growth Factor (1.0% per year)	0.094	0.000	0.094	0.094	0.094	0.094	0.094	0.000	0.094	0.000	0.094	0.000	0.000	0.000
2033 Background Growth	1	0	158	30	2	38	101	0	11	0	23	0	0	0
Approved Developments														
Hinton Oaks Industrial	0	0	6	0	0	0	22	0	0	0	0	0	0	0
540 West	0	0	22	0	0	0	37	0	0	0	0	0	0	0
Total Approved Dev. Traffic	0	0	28	0	0	0	59	0	0	0	0	0	0	0
2024 Background Traffic	7	63	1715	319	21	407	1141	183	115	30	241	145	76	66
2033 Background Traffic	8	63	1873	349	23	445	1242	183	126	30	264	145	76	66
Project Traffic														
Percent Assignment Inbound	0.00%	30.00%	0.00%	0.00%	0.00%	0.00%	0.00%	65.00%	0.00%	5.00%	0.00%	0.00%	0.00%	0.00%
Inbound Project Traffic	0	72	0	0	0	0	0	155	0	12	0	0	0	0
Percent Assignment Outbound	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	65.00%	5.00%	30.00%
Outbound Project Traffic	0	0	0	0	0	0	0	0	0	0	0	109	8	51
Pass-By Capture Reduction	0	0	-11	0	0	0	-9	0	0	0	0	0	0	0
Pass-By Capture Assignment	0	11	0	0	0	0	0	9	0	0	0	9	0	8
Total Pass-By Traffic	0	11	-11	0	0	0	-9	9	0	0	0	9	0	8
Total Project Traffic	0	83	-11	0	0	0	-9	164	0	12	0	118	8	59
2024 Buildout Total	7	146	1704	319	21	407	1132	347	115	42	241	263	84	125
2033 Buildout Total	8	146	1862	349	23	445	1233	347	126	42	264	263	84	125

INTERSECTION ANALYSIS SHEET

Project:	Legacy Oaks
Location:	Knightdale, NC
Scenario:	With Hinton Oaks Industrial
Count:	1/30/2020
N/S Street:	I-540 Southbound Ramps
E/W Street:	US 64 Business (Knightdale Blvd)

	AM In	AM Out	PM In	PM Out
Net New Trips:	141	225	239	168
Pass-By Trips:	0	0	20	17

Annual Growth Rate (Buildout +1):	3.0%	Existing Year:	2020
Growth Factor (Buildout +1):	0.125509	Buildout+1 Year:	2024
Annual Growth Rate (Buildout +10):	1.0%	Buildout+10 Year:	2033
Growth Factor (Buildout +10):	0.093685		

**AM PEAK HOUR
AM PHF = 0.94**

Description	US 64 Business (Knightdale Blvd)			US 64 Business (Knightdale Blvd)				I-540 Southbound Ramps			I-540 Southbound Ramps		
	Eastbound			Westbound				Northbound			Southbound		
	Left	Through	Right	U-Turn	Left	Through	Right	Left	Through	Right	Left	Through	Right
2020 Traffic Count	0	932	98	1	265	1263	0	0	0	0	0	0	263
Count Balancing	0	0	0	0	0	0	0	0	0	305	0	0	0
2020 Existing Traffic	0	932	98	1	265	1263	0	0	0	305	0	0	263
Growth Factor (3.0% per year)	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126
2024 Background Growth	0	117	12	0	33	159	0	0	0	38	0	0	33
Growth Factor (1.0% per year)	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094
2033 Background Growth	0	98	10	0	28	133	0	0	0	32	0	0	28
<u>Approved Developments</u>													
Hinton Oaks Industrial	0	24	0	0	22	4	0	0	0	60	0	0	0
540 West	0	22	11	0	0	7	0	0	0	0	0	0	4
Total Approved Dev. Traffic	0	46	11	0	22	11	0	0	0	60	0	0	4
2024 Background Traffic	0	1095	121	1	320	1433	0	0	0	403	0	0	300
2033 Background Traffic	0	1193	131	1	348	1566	0	0	0	435	0	0	328
<u>Project Traffic</u>													
Percent Assignment Inbound	0.00%	0.00%	0.00%	0.00%	0.00%	40.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	25.00%
Inbound Project Traffic	0	0	0	0	0	56	0	0	0	0	0	0	35
Percent Assignment Outbound	0.00%	55.00%	10.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Outbound Project Traffic	0	124	23	0	0	0	0	0	0	0	0	0	0
Total Project Traffic	0	124	23	0	0	56	0	0	0	0	0	0	35
2024 Buildout Total	0	1219	144	1	320	1489	0	0	0	403	0	0	335
2033 Buildout Total	0	1317	154	1	348	1622	0	0	0	435	0	0	363

**PM PEAK HOUR
PM PHF = 0.98**

Description	US 64 Business (Knightdale Blvd)			US 64 Business (Knightdale Blvd)				I-540 Southbound Ramps			I-540 Southbound Ramps		
	Eastbound			Westbound				Northbound			Southbound		
	Left	Through	Right	U-Turn	Left	Through	Right	Left	Through	Right	Left	Through	Right
2020 Traffic Count	0	1810	67	2	178	1033	0	0	0	0	0	0	492
Count Balancing	0	0	0	0	0	0	0	0	0	883	0	0	0
2020 Existing Traffic	0	1810	67	2	178	1033	0	0	0	883	0	0	492
Growth Factor (3.0% per year)	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126
2024 Background Growth	0	227	8	0	22	130	0	0	0	111	0	0	62
Growth Factor (1.0% per year)	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094
2033 Background Growth	0	191	7	0	19	109	0	0	0	93	0	0	52
<u>Approved Developments</u>													
Hinton Oaks Industrial	0	6	0	0	110	22	0	0	0	15	0	0	0
540 West	0	15	5	0	0	25	0	0	0	0	0	0	11
Total Approved Dev. Traffic	0	21	5	0	110	47	0	0	0	15	0	0	11
2024 Background Traffic	0	2058	80	2	310	1210	0	0	0	1009	0	0	565
2033 Background Traffic	0	2249	87	2	329	1319	0	0	0	1102	0	0	617
<u>Project Traffic</u>													
Percent Assignment Inbound	0.00%	0.00%	0.00%	0.00%	0.00%	40.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	25.00%
Inbound Project Traffic	0	0	0	0	0	96	0	0	0	0	0	0	59
Percent Assignment Outbound	0.00%	55.00%	10.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Outbound Project Traffic	0	92	15	0	0	0	0	0	0	0	0	0	0
Total Project Traffic	0	92	15	0	0	96	0	0	0	0	0	0	59
2024 Buildout Total	0	2150	95	2	310	1306	0	0	0	1009	0	0	624
2033 Buildout Total	0	2341	102	2	329	1415	0	0	0	1102	0	0	676

INTERSECTION ANALYSIS SHEET

Project:	Legacy Oaks
Location:	Knightdale, NC
Scenario:	With Hinton Oaks Industrial
Count:	1/30/2020
N/S Street:	I-540 Northbound Ramps
E/W Street:	US 64 Business (Knightdale Blvd)

	AM In	AM Out	PM In	PM Out
Net New Trips:	141	225	239	168
Pass-By Trips:	0	0	20	17

Annual Growth Rate (Buildout +1):	3.0%
Growth Factor (Buildout +1):	0.125509
Annual Growth Rate (Buildout +10):	1.0%
Growth Factor (Buildout +10):	0.093685

Existing Year:	2020
Buildout+1 Year:	2024
Buildout+10 Year:	2033

AM PEAK HOUR AM PHF = 0.91

Description	US 64 Business (Knightdale Blvd) Eastbound			US 64 Business (Knightdale Blvd) Westbound			I-540 Northbound Ramps Northbound			- Southbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
2020 Traffic Count	373	865	0	0	1460	703	57	4	304	0	0	0
Count Balancing	0	0	0	0	0	0	0	0	0	0	0	0
2020 Existing Traffic	373	865	0	0	1460	703	57	4	304	0	0	0
Growth Factor (3.0% per year)	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126
2024 Background Growth	47	109	0	0	183	88	7	1	38	0	0	0
Growth Factor (1.0% per year)	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094
2033 Background Growth	39	91	0	0	154	74	6	0	32	0	0	0
<u>Approved Developments</u>												
Hinton Oaks Industrial	0	84	0	0	26	11	0	0	120	0	0	0
540 West	11	11	0	0	4	0	5	0	0	0	0	0
Total Approved Dev. Traffic	11	95	0	0	30	11	5	0	120	0	0	0
2024 Background Traffic	431	1069	0	0	1673	802	69	5	462	0	0	0
2033 Background Traffic	470	1160	0	0	1827	876	75	5	494	0	0	0
<u>Project Traffic</u>												
Percent Assignment Inbound	0.00%	0.00%	0.00%	0.00%	30.00%	0.00%	10.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Inbound Project Traffic	0	0	0	0	42	0	15	0	0	0	0	0
Percent Assignment Outbound	25.00%	30.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Outbound Project Traffic	56	68	0	0	0	0	0	0	0	0	0	0
Total Project Traffic	56	68	0	0	42	0	15	0	0	0	0	0
2024 Buildout Total	487	1137	0	0	1715	802	84	5	462	0	0	0
2033 Buildout Total	526	1228	0	0	1869	876	90	5	494	0	0	0

PM PEAK HOUR PM PHF = 0.96

Description	US 64 Business (Knightdale Blvd) Eastbound			US 64 Business (Knightdale Blvd) Westbound			I-540 Northbound Ramps Northbound			- Southbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
2020 Traffic Count	327	2368	0	0	1144	466	75	0	576	0	0	0
Count Balancing	0	0	0	0	0	0	0	0	0	0	0	0
2020 Existing Traffic	327	2368	0	0	1144	466	75	0	576	0	0	0
Growth Factor (3.0% per year)	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126
2024 Background Growth	41	297	0	0	144	58	9	0	72	0	0	0
Growth Factor (1.0% per year)	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094
2033 Background Growth	34	250	0	0	121	49	8	0	61	0	0	0
<u>Approved Developments</u>												
Hinton Oaks Industrial	0	21	0	0	131	55	0	0	31	0	0	0
540 West	7	7	0	0	12	0	12	0	0	0	0	0
Total Approved Dev. Traffic	7	28	0	0	143	55	12	0	31	0	0	0
2024 Background Traffic	375	2693	0	0	1431	579	96	0	679	0	0	0
2033 Background Traffic	409	2943	0	0	1552	628	104	0	740	0	0	0
<u>Project Traffic</u>												
Percent Assignment Inbound	0.00%	0.00%	0.00%	0.00%	30.00%	0.00%	10.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Inbound Project Traffic	0	0	0	0	72	0	24	0	0	0	0	0
Percent Assignment Outbound	25.00%	30.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Outbound Project Traffic	42	50	0	0	0	0	0	0	0	0	0	0
Total Project Traffic	42	50	0	0	72	0	24	0	0	0	0	0
2024 Buildout Total	417	2743	0	0	1503	579	120	0	679	0	0	0
2033 Buildout Total	451	2993	0	0	1624	628	128	0	740	0	0	0

INTERSECTION ANALYSIS SHEET

Project: Legacy Oaks
 Location: Knightdale, NC
 Scenario: With Hinton Oaks Industrial
 Count: 1/30/2020
 N/S Street: Hinton Oaks Blvd
 E/W Street: US 64 Business (Knightdale Blvd)

	AM In	AM Out	PM In	PM Out
Net New Trips:	141	225	239	168
Pass-By Trips:	0	0	20	17

Annual Growth Rate (Buildout +1):	3.0%	Existing Year:	2020
Growth Factor (Buildout +1):	0.125509	Buildout+1 Year:	2024
Annual Growth Rate (Buildout +10):	1.0%	Buildout+10 Year:	2033
Growth Factor (Buildout +10):	0.093685		

**AM PEAK HOUR
AM PHF = 0.94**

Description	US 64 Business (Knightdale Blvd) Eastbound				US 64 Business (Knightdale Blvd) Westbound				Hinton Oaks Blvd Northbound			Hinton Oaks Blvd Southbound		
	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	Left	Through	Right	Left	Through	Right
2020 Traffic Count	1	124	898	51	4	17	1809	45	257	5	57	35	8	24
Count Balancing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2020 Existing Traffic	1	124	898	51	4	17	1809	45	257	5	57	35	8	24
Growth Factor (3.0% per year)	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126
2024 Background Growth	0	16	113	6	1	2	227	6	32	1	7	4	1	3
Growth Factor (1.0% per year)	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094
2033 Background Growth	0	13	95	5	0	2	191	5	27	1	6	4	1	3
Approved Developments														
Hinton Oaks Industrial	0	155	48	0	0	0	9	7	0	0	0	1	0	29
540 West	0	0	11	0	0	0	4	0	0	0	0	0	0	0
Total Approved Dev. Traffic	0	155	59	0	0	0	13	7	0	0	0	1	0	29
2024 Background Traffic	1	295	1070	57	5	19	2049	58	289	6	64	40	9	56
2033 Background Traffic	1	308	1165	62	5	21	2240	63	316	7	70	44	10	59
Project Traffic														
Percent Assignment Inbound	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	30.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Inbound Project Traffic	0	0	0	0	0	0	42	0	0	0	0	0	0	0
Percent Assignment Outbound	0.00%	0.00%	30.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Outbound Project Traffic	0	0	68	0	0	0	0	0	0	0	0	0	0	0
Total Project Traffic	0	0	68	0	0	0	42	0	0	0	0	0	0	0
2024 Buildout Total	1	295	1138	57	5	19	2091	58	289	6	64	40	9	56
2033 Buildout Total	1	308	1233	62	5	21	2282	63	316	7	70	44	10	59

**PM PEAK HOUR
PM PHF = 0.95**

Description	US 64 Business (Knightdale Blvd) Eastbound				US 64 Business (Knightdale Blvd) Westbound				Hinton Oaks Blvd Northbound			Hinton Oaks Blvd Southbound		
	U-Turn	Left	Through	Right	U-Turn	Left	Through	Right	Left	Through	Right	Left	Through	Right
2020 Traffic Count	23	380	2200	152	5	33	1296	67	111	25	54	118	12	86
Count Balancing	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2020 Existing Traffic	23	380	2200	152	5	33	1296	67	111	25	54	118	12	86
Growth Factor (3.0% per year)	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126
2024 Background Growth	3	48	276	19	1	4	163	8	14	3	7	15	2	11
Growth Factor (1.0% per year)	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094
2033 Background Growth	2	40	232	16	1	3	137	7	12	3	6	12	1	9
Approved Developments														
Hinton Oaks Industrial	0	40	12	0	0	0	44	2	0	0	0	7	0	142
540 West	0	0	7	0	0	0	12	0	0	0	0	0	0	0
Total Approved Dev. Traffic	0	40	19	0	0	0	56	2	0	0	0	7	0	142
2024 Background Traffic	26	468	2495	171	6	37	1515	77	125	28	61	140	14	239
2033 Background Traffic	28	508	2727	187	7	40	1652	84	137	31	67	152	15	248
Project Traffic														
Percent Assignment Inbound	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	30.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Inbound Project Traffic	0	0	0	0	0	0	72	0	0	0	0	0	0	0
Percent Assignment Outbound	0.00%	0.00%	30.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Outbound Project Traffic	0	0	50	0	0	0	0	0	0	0	0	0	0	0
Total Project Traffic	0	0	50	0	0	0	72	0	0	0	0	0	0	0
2024 Buildout Total	26	468	2545	171	6	37	1587	77	125	28	61	140	14	239
2033 Buildout Total	28	508	2777	187	7	40	1724	84	137	31	67	152	15	248

**Appendix G:
Synchro Output –
Existing (2020)**

Legacy Oaks
1: Hodge Road & US 64 Bus (Knightdale Blvd.)

Existing AM (2020)
03/25/2020



Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (vph)	37	764	86	12	129	1284	101	389	16	153	101	18	100
Future Volume (vph)	37	764	86	12	129	1284	101	389	16	153	101	18	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		3%				-3%			-2%			1%	
Storage Length (ft)	200		225		600		375	200		50	0		0
Storage Lanes	3		1		1		1	1		1	2		1
Taper Length (ft)	300				150			100			100		
Satd. Flow (prot)	3382	5009	1560	0	1796	5162	1607	3368	1579	0	3350	1818	1545
Flt Permitted	0.950				0.950			0.950			0.950		
Satd. Flow (perm)	3382	5009	1560	0	1796	5162	1607	3368	1579	0	3350	1818	1545
Right Turn on Red			Yes				Yes			Yes			Yes
Satd. Flow (RTOR)			97				113		172				154
Link Speed (mph)		45				45			35			25	
Link Distance (ft)		735				962			450			524	
Travel Time (s)		11.1				14.6			8.8			14.3	
Confl. Peds. (#/hr)													
Confl. Bikes (#/hr)													
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	5%	5%	5%	4%	4%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)													
Mid-Block Traffic (%)		0%				0%			0%			0%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	42	858	97	0	158	1443	113	437	190	0	113	20	112
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	R NA	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		38				32			36			36	
Link Offset(ft)		0				0			0			0	
Crosswalk Width(ft)		16				16			16			16	
Two way Left Turn Lane													
Headway Factor	1.02	1.02	1.02	0.98	0.98	0.98	0.98	0.99	0.99	0.99	1.01	1.01	1.01
Turning Speed (mph)	15		9	9	15		9	15		9	15		9
Number of Detectors	1	1	0	1	1	1	0	1	1	1	1	1	1
Detector Template				Left									
Leading Detector (ft)	40	306	0	20	40	306	0	50	40		40	40	40
Trailing Detector (ft)	0	300	0	0	0	300	0	-10	0		0	0	0
Turn Type	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2	3	1	1	6	7	3	8		7	4	5
Permitted Phases			2			6							4
Detector Phase	5	2	3	1	1	6	7	3	8		7	4	5
Switch Phase													
Minimum Initial (s)	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	15.0	19.0	15.0	15.0	15.0	20.0	15.0	15.0	16.0		15.0	15.0	15.0
Total Split (s)	15.0	62.0	21.0	22.0	22.0	69.0	20.0	21.0	16.0		20.0	15.0	15.0
Total Split (%)	12.5%	51.7%	17.5%	18.3%	18.3%	57.5%	16.7%	17.5%	13.3%		16.7%	12.5%	12.5%
Yellow Time (s)	3.0	4.3	3.0	3.0	3.0	4.8	3.0	3.0	4.0		3.0	3.1	3.0
All-Red Time (s)	3.9	1.7	3.9	3.5	3.5	1.7	3.9	3.9	3.1		3.9	3.7	3.9
Lost Time Adjust (s)	-1.9	-1.0	-1.9		-1.5	-1.5	-1.9	-1.9	-2.1		-1.9	-1.8	-1.9
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None	None		None	None	None
Act Effect Green (s)	10.0	62.5	88.5		15.6	68.2	79.5	20.9	10.5		11.3	9.2	13.9
Actuated g/C Ratio	0.08	0.52	0.74		0.13	0.57	0.66	0.17	0.09		0.09	0.08	0.12
v/c Ratio	0.15	0.33	0.08		0.68	0.49	0.10	0.74	0.65		0.36	0.14	0.36
Control Delay	52.5	17.7	1.7		78.9	6.7	0.3	56.4	20.9		53.7	54.1	4.6
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	52.5	17.7	1.7		78.9	6.7	0.3	56.4	20.9		53.7	54.1	4.6
LOS	D	B	A		E	A	A	E	C		D	D	A
Approach Delay		17.6				13.0			45.6			31.3	
Approach LOS		B				B			D			C	
Queue Length 50th (ft)	15	136	0		112	80	0	159	13		42	15	0



Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)	34	180	18		173	94	2	#275	83		70	39	14
Internal Link Dist (ft)		655				882			370			444	
Turn Bay Length (ft)	200		225		600		375	200					
Base Capacity (vph)	281	2610	1175		256	2932	1148	587	307		418	151	314
Starvation Cap Reductn	0	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.15	0.33	0.08		0.62	0.49	0.10	0.74	0.62		0.27	0.13	0.36

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 60 (50%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.74
 Intersection Signal Delay: 21.2 Intersection LOS: C
 Intersection Capacity Utilization 64.2% ICU Level of Service C
 Analysis Period (min) 15
 Description: 05-0928
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Hodge Road & US 64 Bus (Knightdale Blvd.)



2: I-540 EB On-Ramp/I-540 EB Off-Ramp & US 64 Bus (Knightdale Blvd.)

03/25/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↓	↑↑							↑
Traffic Volume (vph)	0	932	98	266	1263	0	0	0	0	0	0	263
Future Volume (vph)	0	932	98	266	1263	0	0	0	0	0	0	263
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		1%			-1%			0%				2%
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	4963	1545	1744	3489	0	0	0	0	0	0	1580
Flt Permitted				0.267								
Satd. Flow (perm)	0	4963	1545	490	3489	0	0	0	0	0	0	1580
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			104									187
Link Speed (mph)		45		45				35				35
Link Distance (ft)		962			263			601				428
Travel Time (s)		14.6			4.0			11.7				8.3
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	0%	0%	0%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%				0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	991	104	283	1344	0	0	0	0	0	0	280
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			24			0				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	0.99	0.99	0.99	1.00	1.00	1.00	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		1	0	1	0							0
Detector Template												
Leading Detector (ft)		306	0	60	0							0
Trailing Detector (ft)		300	0	0	0							0
Turn Type		NA	Perm	D.P+P	NA							Free
Protected Phases		2		7	2.7							
Permitted Phases			2	2								Free
Detector Phase		2	2	7	2.7							
Switch Phase												
Minimum Initial (s)		12.0	12.0	7.0								
Minimum Split (s)		19.0	19.0	15.0								
Total Split (s)		90.0	90.0	30.0								
Total Split (%)		75.0%	75.0%	25.0%								
Yellow Time (s)		4.4	4.4	3.0								
All-Red Time (s)		1.6	1.6	3.1								
Lost Time Adjust (s)		-1.0	-1.0	-1.1								
Total Lost Time (s)		5.0	5.0	5.0								
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max	None								
Act Effect Green (s)		88.1	88.1	110.0	120.0							120.0
Actuated g/C Ratio		0.73	0.73	0.92	1.00							1.00
v/c Ratio		0.27	0.09	0.42	0.39							0.18
Control Delay		1.5	0.2	5.2	1.0							0.2
Queue Delay		0.0	0.0	0.0	0.0							0.0
Total Delay		1.5	0.2	5.2	1.0							0.2
LOS		A	A	A	A							A
Approach Delay		1.4			1.7						0.2	
Approach LOS		A			A						A	
Queue Length 50th (ft)		16	0	0	44							0

2: I-540 EB On-Ramp/I-540 EB Off-Ramp & US 64 Bus (Knightdale Blvd.)

03/25/2020

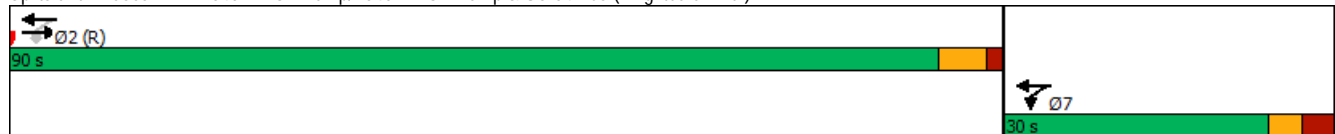


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)		36	m1	61	10							0
Internal Link Dist (ft)		882			183			521			348	
Turn Bay Length (ft)												
Base Capacity (vph)		3643	1161	719	3458							1580
Starvation Cap Reductn		0	0	0	0							0
Spillback Cap Reductn		0	0	0	0							0
Storage Cap Reductn		0	0	0	0							0
Reduced v/c Ratio		0.27	0.09	0.39	0.39							0.18

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 57 (48%), Referenced to phase 2:EBWB and 6:, Start of Green
 Natural Cycle: 40
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.42
 Intersection Signal Delay: 1.5 Intersection LOS: A
 Intersection Capacity Utilization 43.6% ICU Level of Service A
 Analysis Period (min) 15
 Description: 05-2153
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: I-540 EB On-Ramp/I-540 EB Off-Ramp & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	373	865	0	0	1460	703	57	4	304	0	0	0
Future Volume (vph)	373	865	0	0	1460	703	57	4	304	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		-1%			1%			2%			0%	
Storage Length (ft)	500		0	0		0	0		400	0		0
Storage Lanes	1		0	0		1	0		2	0		0
Taper Length (ft)	200			25			25			25		
Satd. Flow (prot)	3384	5012	0	0	4963	1545	0	1695	2655	0	0	0
Flt Permitted	0.950							0.955				
Satd. Flow (perm)	3384	5012	0	0	4963	1545	0	1695	2655	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						664			295			
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		803			1134			793			417	
Travel Time (s)		12.2			17.2			15.4			8.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	6%	6%	6%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	410	951	0	0	1604	773	0	67	334	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		36			32			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	0.99	0.99	0.99	1.01	1.01	1.01	1.01	1.01	1.01	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1			1	0	1	1	1			
Detector Template							Left					
Leading Detector (ft)	60	306			306	0	20	60	40			
Trailing Detector (ft)	0	300			300	0	0	0	0			
Turn Type	Prot	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			4				
Permitted Phases						6	4		4			
Detector Phase	5	2			6	6	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0	12.0			12.0	12.0	7.0	7.0	7.0			
Minimum Split (s)	15.0	20.0			20.0	20.0	15.0	15.0	15.0			
Total Split (s)	25.0	85.0			60.0	60.0	35.0	35.0	35.0			
Total Split (%)	20.8%	70.8%			50.0%	50.0%	29.2%	29.2%	29.2%			
Yellow Time (s)	3.3	4.6			4.4	4.4	3.7	3.7	3.7			
All-Red Time (s)	3.0	1.3			1.4	1.4	2.5	2.5	2.5			
Lost Time Adjust (s)	-1.3	-0.9			-0.8	-0.8		-1.2	-1.2			
Total Lost Time (s)	5.0	5.0			5.0	5.0		5.0	5.0			
Lead/Lag	Lag				Lead	Lead						
Lead-Lag Optimize?	Yes				Yes	Yes						
Recall Mode	None	C-Max			C-Max	C-Max	None	None	None			
Act Effect Green (s)	20.0	99.9			74.9	74.9			10.1		10.1	
Actuated g/C Ratio	0.17	0.83			0.62	0.62			0.08		0.08	
v/c Ratio	0.73	0.23			0.52	0.64			0.47		0.68	
Control Delay	46.2	2.0			7.9	5.0			63.0		16.4	
Queue Delay	0.0	0.0			0.0	0.0			0.0		0.0	
Total Delay	46.2	2.0			7.9	5.0			63.0		16.4	
LOS	D	A			A	A			E		B	
Approach Delay		15.3			7.0				24.2			
Approach LOS		B			A				C			
Queue Length 50th (ft)	158	35			241	16			51		16	

3: I-540 WB Off-Ramp/I-540 WB On-Ramp & US 64 Bus (Knightdale Blvd.)

03/25/2020

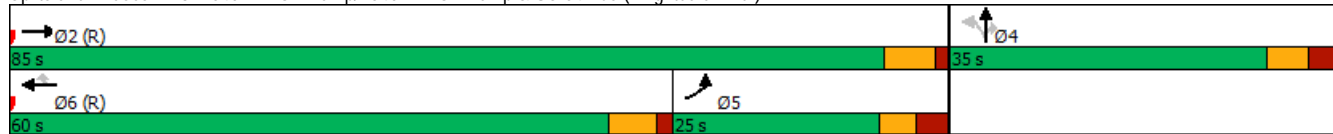


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)	188	53			78	55		96	65			
Internal Link Dist (ft)		723			1054			713			337	
Turn Bay Length (ft)	500								400			
Base Capacity (vph)	564	4173			3098	1213		423	885			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.73	0.23			0.52	0.64		0.16	0.38			

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 32 (27%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.73
 Intersection Signal Delay: 11.4 Intersection LOS: B
 Intersection Capacity Utilization 72.5% ICU Level of Service C
 Analysis Period (min) 15
 Description: 05-2152

Splits and Phases: 3: I-540 WB Off-Ramp/I-540 WB On-Ramp & US 64 Bus (Knightdale Blvd.)



Legacy Oaks
4: Hinton Oaks Boulevard & US 64 Bus (Knightdale Blvd.)

Existing AM (2020)
03/25/2020



Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (vph)	125	898	51	4	17	1809	45	257	5	57	35	8	24
Future Volume (vph)	125	898	51	4	17	1809	45	257	5	57	35	8	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		-1%				1%			3%			0%	
Storage Length (ft)	300		125		200		200	200		100	325		150
Storage Lanes	2		1		1		1	2		1	1		1
Taper Length (ft)	250				100			100			100		
Satd. Flow (prot)	3320	4918	1531	0	1710	4915	1530	3382	1835	1560	3213	1532	1408
Flt Permitted	0.950				0.950			0.950			0.950		
Satd. Flow (perm)	3320	4918	1531	0	1710	4915	1530	3382	1835	1539	3202	1532	1408
Right Turn on Red			Yes				Yes			Yes			Yes
Satd. Flow (RTOR)			94				95			153			150
Link Speed (mph)		45				45			35				35
Link Distance (ft)		1134				1230			476				550
Travel Time (s)		17.2				18.6			9.3				10.7
Confl. Peds. (#/hr)										1	1		
Confl. Bikes (#/hr)													
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	6%	6%	6%	5%	5%	5%	5%	2%	2%	2%	9%	9%	9%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)													
Mid-Block Traffic (%)		0%				0%			0%			0%	
Shared Lane Traffic (%)													35%
Lane Group Flow (vph)	133	955	54	0	22	1924	48	273	5	61	37	18	17
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	R NA	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		36				24			24			36	
Link Offset(ft)		0				0			0			0	
Crosswalk Width(ft)		16				16			16			16	
Two way Left Turn Lane													
Headway Factor	0.99	0.99	0.99	1.01	1.01	1.01	1.01	1.02	1.02	1.02	1.00	1.00	1.00
Turning Speed (mph)	15		9	9	15		9	15		9	15		9
Number of Detectors	1	1	0	1	1	1	0	1	1	1	1	1	1
Detector Template				Left									
Leading Detector (ft)	40	306	0	20	40	306	0	40	40	40	40	40	40
Trailing Detector (ft)	0	300	0	0	0	300	0	0	0	0	0	0	0
Turn Type	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2	3	1!	1	6	7	3	8	1!	7	4	5
Permitted Phases			2			6				8			4
Detector Phase	5	2	3	1	1	6	7	3	8	1	7	4	5
Switch Phase													
Minimum Initial (s)	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	15.0	20.0	15.0	15.0	15.0	20.0	16.0	15.0	15.0	15.0	16.0	15.0	15.0
Total Split (s)	17.0	68.0	20.0	17.0	17.0	68.0	16.0	20.0	19.0	17.0	16.0	15.0	17.0
Total Split (%)	14.2%	56.7%	16.7%	14.2%	14.2%	56.7%	13.3%	16.7%	15.8%	14.2%	13.3%	12.5%	14.2%
Yellow Time (s)	3.6	4.6	3.8	3.4	3.4	4.4	4.1	3.8	3.6	3.4	4.1	3.8	3.6
All-Red Time (s)	3.0	1.7	3.0	3.0	3.0	1.6	3.0	3.0	3.0	3.0	3.0	3.1	3.0
Lost Time Adjust (s)	-1.6	-1.3	-1.8		-1.4	-1.0	-2.1	-1.8	-1.6	-1.4	-2.1	-1.9	-1.6
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag	Lag	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None	None	None	None	None	None
Act Effect Green (s)	10.6	75.5	96.6		11.3	73.5	94.8	15.1	9.8	14.2	16.3	9.1	14.4
Actuated g/C Ratio	0.09	0.63	0.80		0.09	0.61	0.79	0.13	0.08	0.12	0.14	0.08	0.12
v/c Ratio	0.45	0.31	0.04		0.14	0.64	0.04	0.64	0.03	0.19	0.09	0.15	0.06
Control Delay	63.9	7.7	0.1		51.5	17.5	0.1	57.4	49.6	1.3	45.1	37.5	0.4
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.9	7.7	0.1		51.5	17.5	0.1	57.4	49.6	1.3	45.1	37.5	0.4
LOS	E	A	A		D	B	A	E	D	A	D	D	A
Approach Delay		13.9				17.5			47.2			32.6	
Approach LOS		B				B			D			C	
Queue Length 50th (ft)	54	72	1		16	293	0	103	4	0	12	7	0



Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)	74	100	0		43	470	1	151	16	0	31	31	0
Internal Link Dist (ft)		1054				1150			396			470	
Turn Bay Length (ft)	300		125		200		200	200		100	325		150
Base Capacity (vph)	332	3094	1244		171	3011	1234	437	215	327	448	135	315
Starvation Cap Reductn	0	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.31	0.04		0.13	0.64	0.04	0.62	0.02	0.19	0.08	0.13	0.05

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 2 (2%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.64
 Intersection Signal Delay: 19.5 Intersection LOS: B
 Intersection Capacity Utilization 67.3% ICU Level of Service C
 Analysis Period (min) 15
 Description: 05-2267
 ! Phase conflict between lane groups.

Splits and Phases: 4: Hinton Oaks Boulevard & US 64 Bus (Knightdale Blvd.)



5: Hodge Road & Sam's Xpress Driveway/Legacy Oaks Drive South

03/25/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔		↔	↔	
Traffic Volume (vph)	4	4	8	9	4	4	46	35	67	4	179	10
Future Volume (vph)	4	4	8	9	4	4	46	35	67	4	179	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%				1%
Storage Length (ft)	0		0	100		0	70		0	150		350
Storage Lanes	0		0	1		0	1		0	1		1
Taper Length (ft)	25			100			100			80		
Satd. Flow (prot)	0	1710	0	1770	1723	0	1770	3189	0	1761	5019	0
Flt Permitted		0.988		0.950			0.950			0.950		
Satd. Flow (perm)	0	1710	0	1770	1723	0	1770	3189	0	1761	5019	0
Link Speed (mph)		30			30			30			25	
Link Distance (ft)		171			365			524			741	
Travel Time (s)		3.9			8.3			11.9			20.2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	21	0	12	10	0	61	134	0	5	249	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Right	Right
Median Width(ft)		0			12			12			16	
Link Offset(ft)		0			0			0			12	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.01	1.01	1.01
Turning Speed (mph)		15		9	15		9	15		9	15	
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization 21.5%	ICU Level of Service A
Analysis Period (min)	15

Intersection												
Int Delay, s/veh	2.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕		↕	↕		↕	↕↕	
Traffic Vol, veh/h	4	4	8	9	4	4	46	35	67	4	179	10
Future Vol, veh/h	4	4	8	9	4	4	46	35	67	4	179	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	100	-	-	70	-	-	150	-	350
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	1	-
Peak Hour Factor	76	76	76	76	76	76	76	76	76	76	76	76
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	5	11	12	5	5	61	46	88	5	236	13

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	401	509	125	319	471	67	249	0	0	134	0	0
Stage 1	253	253	-	212	212	-	-	-	-	-	-	-
Stage 2	148	256	-	107	259	-	-	-	-	-	-	-
Critical Hdwy	6.99	6.54	7.14	6.99	6.54	6.94	5.34	-	-	4.14	-	-
Critical Hdwy Stg 1	7.34	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4.02	3.92	3.67	4.02	3.32	3.12	-	-	2.22	-	-
Pot Cap-1 Maneuver	549	466	767	619	489	983	887	-	-	1448	-	-
Stage 1	664	696	-	742	726	-	-	-	-	-	-	-
Stage 2	808	694	-	847	692	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	512	432	767	571	454	983	887	-	-	1448	-	-
Mov Cap-2 Maneuver	512	432	-	571	454	-	-	-	-	-	-	-
Stage 1	618	694	-	691	676	-	-	-	-	-	-	-
Stage 2	743	646	-	826	690	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.4	11.2	2.9	0.2
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	887	-	-	582	571	621	1448	-	-
HCM Lane V/C Ratio	0.068	-	-	0.036	0.021	0.017	0.004	-	-
HCM Control Delay (s)	9.4	-	-	11.4	11.4	10.9	7.5	-	-
HCM Lane LOS	A	-	-	B	B	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.1	0.1	0.1	0	-	-

Legacy Oaks
6: Hodge Road & Legacy Oaks Drive North

Existing AM (2020)
03/25/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	4	42	46	4	4	9	16	11	4	105	4
Future Volume (vph)	4	4	42	46	4	4	9	16	11	4	105	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%				0%				0%		1%	
Storage Length (ft)	0		0	100		0	0		0	100		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			100			25			100		
Satd. Flow (prot)	1770	1863	1583	1770	1723	0	1770	1749	0	1761	1842	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1863	1583	1770	1723	0	1770	1749	0	1761	1842	0
Link Speed (mph)		30			30			30			25	
Link Distance (ft)		258			326			504			286	
Travel Time (s)		5.9			7.4			11.5			7.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	5	49	54	10	0	11	32	0	5	129	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	23.0%
ICU Level of Service	A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	8.4
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↑	↔	↔	↔		↔	↔		↔	↔	
Traffic Vol, veh/h	4	4	42	46	4	4	9	16	11	4	105	4
Future Vol, veh/h	4	4	42	46	4	4	9	16	11	4	105	4
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	5	49	54	5	5	11	19	13	5	124	5
Number of Lanes	1	1	1	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	3	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	3	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	3
HCM Control Delay	7.6	8.7	8	8.7
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	100%	0%	100%	0%
Vol Thru, %	0%	59%	0%	100%	0%	0%	50%	0%	96%
Vol Right, %	0%	41%	0%	0%	100%	0%	50%	0%	4%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	9	27	4	4	42	46	8	4	109
LT Vol	9	0	4	0	0	46	0	4	0
Through Vol	0	16	0	4	0	0	4	0	105
RT Vol	0	11	0	0	42	0	4	0	4
Lane Flow Rate	11	32	5	5	49	54	9	5	128
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.017	0.043	0.007	0.007	0.061	0.085	0.013	0.007	0.176
Departure Headway (Hd)	5.641	4.854	5.67	5.168	4.466	5.64	4.787	5.457	4.931
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	636	738	632	693	802	636	748	657	730
Service Time	3.366	2.579	3.395	2.893	2.19	3.365	2.512	3.177	2.651
HCM Lane V/C Ratio	0.017	0.043	0.008	0.007	0.061	0.085	0.012	0.008	0.175
HCM Control Delay	8.5	7.8	8.4	7.9	7.5	8.9	7.6	8.2	8.7
HCM Lane LOS	A	A	A	A	A	A	A	A	A
HCM 95th-tile Q	0.1	0.1	0	0	0.2	0.3	0	0	0.6

Legacy Oaks
 1: Hodge Road & US 64 Bus (Knightdale Blvd.)

Existing PM (2020)
 03/25/2020



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations														
Traffic Volume (vph)	6	63	1499	283	19	362	961	183	102	30	214	145	76	66
Future Volume (vph)	6	63	1499	283	19	362	961	183	102	30	214	145	76	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)			3%				-3%			-2%				1%
Storage Length (ft)		200		225		600		375	200		50	0		0
Storage Lanes		3		1		1		1	1		1	2		1
Taper Length (ft)		300				150			100			100		
Satd. Flow (prot)	0	3382	5009	1560	0	1796	5162	1607	3467	1633	0	3416	1853	1575
Flt Permitted		0.950				0.950			0.950			0.950		
Satd. Flow (perm)	0	3382	5009	1560	0	1796	5162	1607	3467	1633	0	3416	1853	1575
Right Turn on Red				Yes				Yes			Yes			Yes
Satd. Flow (RTOR)				142				189		214				182
Link Speed (mph)			45				45			35			25	
Link Distance (ft)			734				962			450			524	
Travel Time (s)			11.1				14.6			8.8			14.3	
Confl. Peds. (#/hr)														
Confl. Bikes (#/hr)														
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)														
Mid-Block Traffic (%)			0%				0%			0%			0%	
Shared Lane Traffic (%)														
Lane Group Flow (vph)	0	71	1545	292	0	393	991	189	105	252	0	149	78	68
Turn Type	Prot	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5!	5	2	3	1	1	6	7	3	8		7	4	5!
Permitted Phases				2				6						4
Detector Phase	5	5	2	3	1	1	6	7	3	8		7	4	5
Switch Phase														
Minimum Initial (s)	7.0	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	15.0	15.0	19.0	15.0	15.0	15.0	20.0	15.0	15.0	16.0		15.0	15.0	15.0
Total Split (s)	20.0	20.0	65.0	25.0	35.0	35.0	80.0	15.0	25.0	25.0		15.0	15.0	20.0
Total Split (%)	14.3%	14.3%	46.4%	17.9%	25.0%	25.0%	57.1%	10.7%	17.9%	17.9%		10.7%	10.7%	14.3%
Yellow Time (s)	3.0	3.0	4.3	3.0	3.0	3.0	4.8	3.0	3.0	4.0		3.0	3.1	3.0
All-Red Time (s)	3.9	3.9	1.7	3.9	3.5	3.5	1.7	3.9	3.9	3.1		3.9	3.7	3.9
Lost Time Adjust (s)		-1.9	-1.0	-1.9		-1.5	-1.5	-1.9	-1.9	-2.1		-1.9	-1.8	-1.9
Total Lost Time (s)		5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lead	Lead	Lag	Lag	Lag	Lead	Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None	C-Max	None	None	None	C-Max	None	None	None		None	None	None
Act Effct Green (s)		10.4	65.0	77.5		30.0	84.6	99.6	12.5	15.0		10.0	12.5	27.9
Actuated g/C Ratio		0.07	0.46	0.55		0.21	0.60	0.71	0.09	0.11		0.07	0.09	0.20
v/c Ratio		0.28	0.66	0.32		1.02	0.32	0.16	0.34	0.69		0.61	0.47	0.15
Control Delay		63.8	31.4	5.4		91.4	6.1	0.3	62.1	21.8		74.2	70.1	0.7
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay		63.8	31.4	5.4		91.4	6.1	0.3	62.1	21.8		74.2	70.1	0.7
LOS		E	C	A		F	A	A	E	C		E	E	A
Approach Delay			28.7				26.7			33.6				56.2
Approach LOS			C				C			C				E
Queue Length 50th (ft)		31	394	39		-379	65	0	47	32		69	69	0
Queue Length 95th (ft)		57	478	71		#587	82	1	75	121		107	124	0
Internal Link Dist (ft)			654				882			370			444	
Turn Bay Length (ft)		200		225		600		375	200					
Base Capacity (vph)		362	2324	1002		384	3117	1197	495	416		244	165	505
Starvation Cap Reductn		0	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn		0	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn		0	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio		0.20	0.66	0.29		1.02	0.32	0.16	0.21	0.61		0.61	0.47	0.13

Intersection Summary

Area Type: Other

Cycle Length: 140

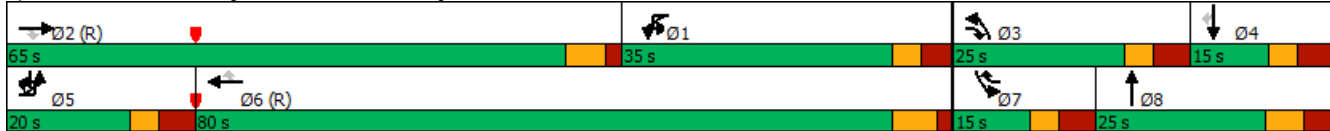
Actuated Cycle Length: 140

Legacy Oaks
 1: Hodge Road & US 64 Bus (Knightdale Blvd.)

Existing PM (2020)
 03/25/2020

Offset: 84 (60%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.02
 Intersection Signal Delay: 30.3 Intersection LOS: C
 Intersection Capacity Utilization 87.4% ICU Level of Service E
 Analysis Period (min) 15
 Description: 05-0928
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 ! Phase conflict between lane groups.

Splits and Phases: 1: Hodge Road & US 64 Bus (Knightdale Blvd.)



2: I-540 EB On-Ramp/I-540 EB Off-Ramp & US 64 Bus (Knightdale Blvd.)

03/25/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↓	↑↑							↑
Traffic Volume (vph)	0	1810	67	180	1033	0	0	0	0	0	0	492
Future Volume (vph)	0	1810	67	180	1033	0	0	0	0	0	0	492
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		1%			-1%			0%				2%
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	5060	1575	1778	3557	0	0	0	0	0	0	1564
Flt Permitted				0.099								
Satd. Flow (perm)	0	5060	1575	185	3557	0	0	0	0	0	0	1564
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			68									277
Link Speed (mph)		45		45				35				35
Link Distance (ft)		962			263			601				428
Travel Time (s)		14.6			4.0			11.7				8.3
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	4%	4%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%				0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1847	68	184	1054	0	0	0	0	0	0	502
Turn Type		NA	Perm	D.P+P	NA							Free
Protected Phases		2		7	2 7							
Permitted Phases			2	2								Free
Detector Phase		2	2	7	2 7							
Switch Phase												
Minimum Initial (s)		12.0	12.0	7.0								
Minimum Split (s)		19.0	19.0	15.0								
Total Split (s)		100.0	100.0	40.0								
Total Split (%)		71.4%	71.4%	28.6%								
Yellow Time (s)		4.4	4.4	3.0								
All-Red Time (s)		1.6	1.6	3.1								
Lost Time Adjust (s)		-1.0	-1.0	-1.1								
Total Lost Time (s)		5.0	5.0	5.0								
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max	None								
Act Effct Green (s)		110.5	110.5	130.0	140.0							140.0
Actuated g/C Ratio		0.79	0.79	0.93	1.00							1.00
v/c Ratio		0.46	0.05	0.47	0.30							0.32
Control Delay		2.3	0.5	39.6	1.5							0.5
Queue Delay		0.0	0.0	0.0	0.0							0.0
Total Delay		2.3	0.5	39.6	1.5							0.5
LOS		A	A	D	A							A
Approach Delay		2.2			7.2						0.5	
Approach LOS		A			A						A	
Queue Length 50th (ft)		69	0	91	41							0
Queue Length 95th (ft)		m100	m1	160	21							0
Internal Link Dist (ft)		882			183			521			348	
Turn Bay Length (ft)												
Base Capacity (vph)		3994	1257	576	3557							1564
Starvation Cap Reductn		0	0	0	0							0
Spillback Cap Reductn		0	0	0	0							0
Storage Cap Reductn		0	0	0	0							0
Reduced v/c Ratio		0.46	0.05	0.32	0.30							0.32

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

2: I-540 EB On-Ramp/I-540 EB Off-Ramp & US 64 Bus (Knightdale Blvd.)

03/25/2020

Offset: 72 (51%), Referenced to phase 2:EBWB and 6:, Start of Green

Natural Cycle: 40

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.47

Intersection Signal Delay: 3.7

Intersection LOS: A

Intersection Capacity Utilization 96.3%

ICU Level of Service F

Analysis Period (min) 15

Description: 05-2153

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: I-540 EB On-Ramp/I-540 EB Off-Ramp & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	327	2368	0	0	1144	466	75	4	576	0	0	0
Future Volume (vph)	327	2368	0	0	1144	466	75	4	576	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		-1%			1%			2%			0%	
Storage Length (ft)	500		0	0		0	0		400	0		0
Storage Lanes	1		0	0		1	0		2	0		0
Taper Length (ft)	200			25			25			25		
Satd. Flow (prot)	3450	5111	0	0	5060	1575	0	1761	2759	0	0	0
Flt Permitted	0.950							0.955				
Satd. Flow (perm)	3450	5111	0	0	5060	1575	0	1761	2759	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						485			71			
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		803			1134			793			417	
Travel Time (s)		12.2			17.2			15.4			8.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	341	2467	0	0	1192	485	0	82	600	0	0	0
Turn Type	Prot	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			4				
Permitted Phases					6	4		4				
Detector Phase	5	2			6	6	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0	12.0			12.0	12.0	7.0	7.0	7.0			
Minimum Split (s)	15.0	20.0			20.0	20.0	15.0	15.0	15.0			
Total Split (s)	30.0	100.0			70.0	70.0	40.0	40.0	40.0			
Total Split (%)	21.4%	71.4%			50.0%	50.0%	28.6%	28.6%	28.6%			
Yellow Time (s)	3.3	4.6			4.4	4.4	3.7	3.7	3.7			
All-Red Time (s)	3.0	1.3			1.4	1.4	2.5	2.5	2.5			
Lost Time Adjust (s)	-1.3	-0.9			-0.8	-0.8	-1.2	-1.2	-1.2			
Total Lost Time (s)	5.0	5.0			5.0	5.0	5.0	5.0	5.0			
Lead/Lag	Lag				Lead	Lead						
Lead-Lag Optimize?	Yes				Yes	Yes						
Recall Mode	None	C-Max			C-Max	C-Max	None	None	None			
Act Effct Green (s)	25.0	98.8			68.8	68.8		31.2	31.2			
Actuated g/C Ratio	0.18	0.71			0.49	0.49		0.22	0.22			
v/c Ratio	0.55	0.68			0.48	0.48		0.21	0.90			
Control Delay	45.3	4.4			10.6	2.0		44.6	63.3			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	45.3	4.4			10.6	2.0		44.6	63.3			
LOS	D	A			B	A		D	E			
Approach Delay		9.4			8.1			61.0				
Approach LOS		A			A			E				
Queue Length 50th (ft)	155	108			82	0		61	268			
Queue Length 95th (ft)	210	119			94	5		106	343			
Internal Link Dist (ft)		723			1054			713		337		
Turn Bay Length (ft)	500								400			
Base Capacity (vph)	616	3608			2488	1021		440	743			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.55	0.68			0.48	0.48		0.19	0.81			

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 68 (49%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 50

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.90

Intersection Signal Delay: 15.8

Intersection LOS: B

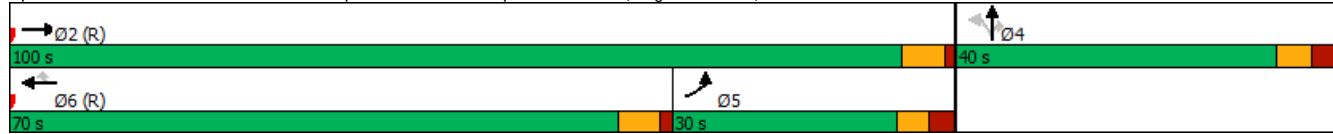
Intersection Capacity Utilization 74.2%

ICU Level of Service D

Analysis Period (min) 15

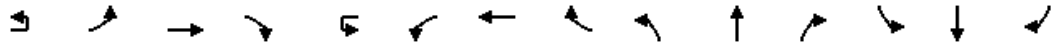
Description: 05-2152

Splits and Phases: 3: I-540 WB Off-Ramp/I-540 WB On-Ramp & US 64 Bus (Knightdale Blvd.)



Legacy Oaks
4: Hinton Oaks Boulevard & US 64 Bus (Knightdale Blvd.)

Existing PM (2020)
03/25/2020



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔	↕↕↕	↗			↕↕↕	↗	↔↔	↕	↗	↔↔	↕↕	↗
Traffic Volume (vph)	23	380	2200	152	5	33	1296	67	111	25	54	118	12	86
Future Volume (vph)	23	380	2200	152	5	33	1296	67	111	25	54	118	12	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)			-1%				1%			3%				0%
Storage Length (ft)		300		125		200		200	200		100	325		150
Storage Lanes		2		1		1		1	2		1	1		1
Taper Length (ft)		250				100			100			100		
Satd. Flow (prot)	0	3450	5111	1591	0	1761	5060	1575	3382	1835	1560	3433	1570	1504
Flt Permitted		0.950				0.950			0.950			0.950		
Satd. Flow (perm)	0	3450	5111	1591	0	1761	5060	1575	3382	1835	1560	3433	1570	1504
Right Turn on Red				Yes				Yes			Yes			Yes
Satd. Flow (RTOR)				91				81			130			126
Link Speed (mph)			45				45			35			35	
Link Distance (ft)			1134				1230			476			550	
Travel Time (s)			17.2				18.6			9.3			10.7	
Confl. Peds. (#/hr)														
Confl. Bikes (#/hr)														
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)														
Mid-Block Traffic (%)			0%				0%			0%			0%	
Shared Lane Traffic (%)														44%
Lane Group Flow (vph)	0	424	2316	160	0	40	1364	71	117	26	57	124	53	51
Turn Type	Prot	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5!	5	2	3	1!	1	6	7	3	8	1!	7	4	5!
Permitted Phases				2				6			8			4
Detector Phase	5	5	2	3	1	1	6	7	3	8	1	7	4	5
Switch Phase														
Minimum Initial (s)	7.0	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	15.0	15.0	20.0	15.0	15.0	15.0	20.0	16.0	15.0	15.0	15.0	16.0	15.0	15.0
Total Split (s)	28.0	28.0	80.0	20.0	20.0	20.0	72.0	20.0	20.0	20.0	20.0	20.0	20.0	28.0
Total Split (%)	20.0%	20.0%	57.1%	14.3%	14.3%	14.3%	51.4%	14.3%	14.3%	14.3%	14.3%	14.3%	14.3%	20.0%
Yellow Time (s)	3.6	3.6	4.6	3.8	3.4	3.4	4.4	4.1	3.8	3.6	3.4	4.1	3.8	3.6
All-Red Time (s)	3.0	3.0	1.7	3.0	3.0	3.0	1.6	3.0	3.0	3.0	3.0	3.0	3.1	3.0
Lost Time Adjust (s)		-1.6	-1.3	-1.8			-1.4	-1.0	-2.1	-1.8	-1.6	-1.4	-2.1	-1.9
Total Lost Time (s)		5.0	5.0	5.0			5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	C-Max	None	None	None	C-Max	None	None	None	None	None	None	None
Act Effct Green (s)		23.0	93.6	111.7			9.7	77.6	97.9	12.1	9.5	15.8	15.3	10.1
Actuated g/C Ratio		0.16	0.67	0.80			0.07	0.55	0.70	0.09	0.07	0.11	0.11	0.07
v/c Ratio		0.75	0.68	0.12			0.33	0.49	0.06	0.40	0.21	0.20	0.33	0.35
Control Delay		51.0	9.7	0.7			69.1	20.8	1.5	64.3	65.2	1.5	60.2	30.5
Queue Delay		0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		51.0	9.7	0.7			69.1	20.8	1.5	64.3	65.2	1.5	60.2	30.5
LOS		D	A	A			E	C	A	E	A	E	C	A
Approach Delay			15.2				21.1			46.5				39.9
Approach LOS			B				C			D				D
Queue Length 50th (ft)		193	250	5			36	278	0	53	23	0	56	11
Queue Length 95th (ft)		m240	393	m12			75	351	14	84	55	0	87	57
Internal Link Dist (ft)			1054				1150			396			470	
Turn Bay Length (ft)		300		125			200		200	200		100	325	150
Base Capacity (vph)		566	3417	1307			188	2804	1112	362	196	345	420	203
Starvation Cap Reductn		0	0	0			0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0			0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0			0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.75	0.68	0.12			0.21	0.49	0.06	0.32	0.13	0.17	0.30	0.26

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

4: Hinton Oaks Boulevard & US 64 Bus (Knightdale Blvd.)

03/25/2020

Offset: 78 (56%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 19.5

Intersection LOS: B

Intersection Capacity Utilization 76.7%

ICU Level of Service D

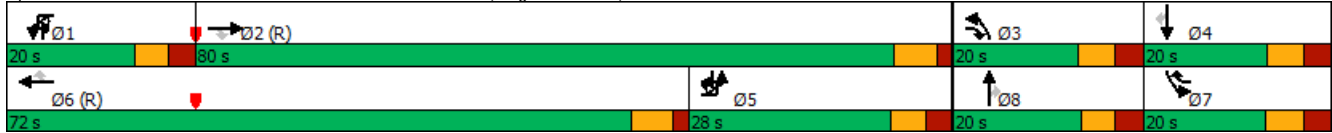
Analysis Period (min) 15

Description: 05-2267

m Volume for 95th percentile queue is metered by upstream signal.

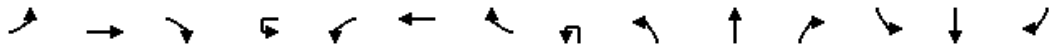
! Phase conflict between lane groups.

Splits and Phases: 4: Hinton Oaks Boulevard & US 64 Bus (Knightdale Blvd.)



5: Hodge Road & Sam's Xpress Driveway/Legacy Oaks Drive South

03/25/2020



Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕			↕	↕		↕	↕	↕
Traffic Volume (vph)	4	4	13	9	33	4	4	9	112	156	9	4	98	4
Future Volume (vph)	4	4	13	9	33	4	4	9	112	156	9	4	98	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%				0%				0%				1%
Storage Length (ft)	0		0		100		0		70		0	150		350
Storage Lanes	0		0		1		0		1		0	1		1
Taper Length (ft)	25				100				100			80		
Satd. Flow (prot)	0	1687	0	0	1770	1723	0	0	1687	3347	0	1761	5030	0
Flt Permitted		0.991			0.950				0.950			0.950		
Satd. Flow (perm)	0	1687	0	0	1770	1723	0	0	1687	3347	0	1761	5030	0
Link Speed (mph)		30				30				30			25	
Link Distance (ft)		171				365				524			741	
Travel Time (s)		3.9				8.3				11.9			20.2	
Confl. Peds. (#/hr)			1		1									
Confl. Bikes (#/hr)														
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	7%	7%	7%	7%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)														
Mid-Block Traffic (%)		0%				0%				0%			0%	
Shared Lane Traffic (%)														
Lane Group Flow (vph)	0	22	0	0	44	8	0	0	127	173	0	4	107	0
Sign Control		Stop				Stop				Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 29.0% ICU Level of Service A

Analysis Period (min) 15

Intersection														
Int Delay, s/veh	4.4													
Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔			↔	↔		↔	↔	↔
Traffic Vol, veh/h	4	4	13	9	33	4	4	9	112	156	9	4	98	4
Future Vol, veh/h	4	4	13	9	33	4	4	9	112	156	9	4	98	4
Conflicting Peds, #/hr	0	0	1	0	1	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	-	None	-	-	-	None	-	-	None
Storage Length	-	-	-	-	100	-	-	-	70	-	-	150	-	350
Veh in Median Storage, #	-	0	-	-	-	0	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	-	0	-	-	-	0	-	-	1	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	7	7	7	7	2	2	2
Mvmt Flow	4	4	14	9	35	4	4	9	118	164	9	4	103	4
Major/Minor	Minor2			Minor1			Major1			Major2				
Conflicting Flow All	451	540	55	0	475	538	87	78	107	0	0	173	0	0
Stage 1	113	113	-	0	423	423	-	-	-	-	-	-	-	-
Stage 2	338	427	-	0	52	115	-	-	-	-	-	-	-	-
Critical Hdwy	6.99	6.54	7.14	-	6.99	6.54	6.94	5.74	5.44	-	-	4.14	-	-
Critical Hdwy Stg 1	7.34	5.54	-	-	6.54	5.54	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	-	6.74	5.54	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4.02	3.92	-	3.67	4.02	3.32	2.37	3.17	-	-	2.22	-	-
Pot Cap-1 Maneuver	510	447	848	0	492	448	954	1376	1012	-	-	1401	-	-
Stage 1	825	801	-	0	560	586	-	-	-	-	-	-	-	-
Stage 2	628	584	-	0	914	799	-	-	-	-	-	-	-	-
Platoon blocked, %				-						-	-		-	-
Mov Cap-1 Maneuver	455	391	847	0	433	392	954	1031	1031	-	-	1401	-	-
Mov Cap-2 Maneuver	455	391	-	0	433	392	-	-	-	-	-	-	-	-
Stage 1	724	799	-	0	491	514	-	-	-	-	-	-	-	-
Stage 2	544	512	-	0	891	797	-	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB				
HCM Control Delay, s	11.1			13.5			3.8			0.3				
HCM LOS	B			B										
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR					
Capacity (veh/h)	1031	-	-	611	433	556	1401	-	-					
HCM Lane V/C Ratio	0.124	-	-	0.036	0.08	0.015	0.003	-	-					
HCM Control Delay (s)	9	-	-	11.1	14	11.6	7.6	-	-					
HCM Lane LOS	A	-	-	B	B	B	A	-	-					
HCM 95th %tile Q(veh)	0.4	-	-	0.1	0.3	0	0	-	-					

Legacy Oaks
6: Hodge Road & Legacy Oaks Drive North

Existing PM (2020)
03/25/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	4	27	19	4	4	30	103	21	4	49	4
Future Volume (vph)	4	4	27	19	4	4	30	103	21	4	49	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%		0%				0%		0%		1%	
Storage Length (ft)	0		0	100		0	0		0	100		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			100			25			100		
Satd. Flow (prot)	1770	1863	1583	1770	1723	0	1687	1730	0	1761	1833	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1863	1583	1770	1723	0	1687	1730	0	1761	1833	0
Link Speed (mph)		30			30			30			25	
Link Distance (ft)		258			326			504			286	
Travel Time (s)		5.9			7.4			11.5			7.8	
Confl. Peds. (#/hr)			1	1								
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	7%	7%	7%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	4	4	29	20	8	0	32	134	0	4	57	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 22.7% ICU Level of Service A

Analysis Period (min) 15

Intersection	
Intersection Delay, s/veh	8.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↑	↔	↔	↔		↔	↔		↔	↔	
Traffic Vol, veh/h	4	4	27	19	4	4	30	103	21	4	49	4
Future Vol, veh/h	4	4	27	19	4	4	30	103	21	4	49	4
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	2	2	2	2	2	2	7	7	7	2	2	2
Mvmt Flow	4	4	29	20	4	4	32	111	23	4	53	4
Number of Lanes	1	1	1	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	3	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	3	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	3
HCM Control Delay	7.6	8.4	8.6	8.1
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	100%	0%	100%	0%
Vol Thru, %	0%	83%	0%	100%	0%	0%	50%	0%	92%
Vol Right, %	0%	17%	0%	0%	100%	0%	50%	0%	8%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	30	124	4	4	27	19	8	4	53
LT Vol	30	0	4	0	0	19	0	4	0
Through Vol	0	103	0	4	0	0	4	0	49
RT Vol	0	21	0	0	27	0	4	0	4
Lane Flow Rate	32	133	4	4	29	20	9	4	57
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.049	0.178	0.007	0.006	0.036	0.033	0.012	0.007	0.079
Departure Headway (Hd)	5.428	4.809	5.726	5.224	4.521	5.744	4.889	5.551	4.997
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	662	748	626	686	793	625	734	647	719
Service Time	3.142	2.523	3.449	2.947	2.244	3.463	2.609	3.267	2.713
HCM Lane V/C Ratio	0.048	0.178	0.006	0.006	0.037	0.032	0.012	0.006	0.079
HCM Control Delay	8.4	8.6	8.5	8	7.4	8.7	7.7	8.3	8.1
HCM Lane LOS	A	A	A	A	A	A	A	A	A
HCM 95th-ile Q	0.2	0.6	0	0	0.1	0.1	0	0	0.3

**Appendix H:
Synchro Output –
Background (2024)**

Legacy Oaks
1: Hodge Road & US 64 Bus (Knightdale Blvd.)

Background + 1 AM (2024)
03/30/2020



Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (vph)	37	893	97	14	145	1456	101	438	16	172	101	18	100
Future Volume (vph)	37	893	97	14	145	1456	101	438	16	172	101	18	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		3%				-3%			-2%			1%	
Storage Length (ft)	200		225		600		375	200		50	0		0
Storage Lanes	3		1		1		1	1		1	2		1
Taper Length (ft)	300				150			100			100		
Satd. Flow (prot)	3382	5009	1560	0	1796	5162	1607	3368	1577	0	3350	1818	1545
Flt Permitted	0.950				0.950			0.950			0.950		
Satd. Flow (perm)	3382	5009	1560	0	1796	5162	1607	3368	1577	0	3350	1818	1545
Right Turn on Red			Yes				Yes			Yes			Yes
Satd. Flow (RTOR)			109				163		193				216
Link Speed (mph)		45				45			35			25	
Link Distance (ft)		735				962			450			524	
Travel Time (s)		11.1				14.6			8.8			14.3	
Confl. Peds. (#/hr)													
Confl. Bikes (#/hr)													
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	5%	5%	5%	4%	4%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)													
Mid-Block Traffic (%)		0%				0%			0%			0%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	42	1003	109	0	179	1636	113	492	211	0	113	20	112
Turn Type	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2	3	1	1	6	7	3	8		7	4	5
Permitted Phases			2			6							4
Detector Phase	5	2	3	1	1	6	7	3	8		7	4	5
Switch Phase													
Minimum Initial (s)	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	15.0	19.0	15.0	15.0	15.0	20.0	15.0	15.0	16.0		15.0	15.0	15.0
Total Split (s)	15.0	47.0	31.0	27.0	27.0	59.0	20.0	31.0	26.0		20.0	15.0	15.0
Total Split (%)	12.5%	39.2%	25.8%	22.5%	22.5%	49.2%	16.7%	25.8%	21.7%		16.7%	12.5%	12.5%
Yellow Time (s)	3.0	4.3	3.0	3.0	3.0	4.8	3.0	3.0	4.0		3.0	3.1	3.0
All-Red Time (s)	3.9	1.7	3.9	3.5	3.5	1.7	3.9	3.9	3.1		3.9	3.7	3.9
Lost Time Adjust (s)	-1.9	-1.0	-1.9		-1.5	-1.5	-1.9	-1.9	-2.1		-1.9	-1.8	-1.9
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None	None		None	None	None
Act Effct Green (s)	10.0	56.1	86.0		18.1	64.2	75.5	25.0	14.5		11.3	9.2	13.9
Actuated g/C Ratio	0.08	0.47	0.72		0.15	0.54	0.63	0.21	0.12		0.09	0.08	0.12
v/c Ratio	0.15	0.43	0.09		0.66	0.59	0.11	0.70	0.59		0.36	0.14	0.30
Control Delay	52.5	24.0	1.9		76.8	15.6	0.9	50.0	15.0		53.7	54.1	2.1
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	52.5	24.0	1.9		76.8	15.6	0.9	50.0	15.0		53.7	54.1	2.1
LOS	D	C	A		E	B	A	D	B		D	D	A
Approach Delay		23.0				20.5			39.5			30.1	
Approach LOS		C				C			D			C	
Queue Length 50th (ft)	15	169	0		141	121	0	182	13		42	15	0
Queue Length 95th (ft)	34	272	22		208	259	18	237	78		70	39	0
Internal Link Dist (ft)		655				882			370			444	
Turn Bay Length (ft)	200		225		600		375	200					
Base Capacity (vph)	281	2340	1161		329	2759	1115	729	442		418	151	369
Starvation Cap Reductn	0	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.15	0.43	0.09		0.54	0.59	0.10	0.67	0.48		0.27	0.13	0.30

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Legacy Oaks
1: Hodge Road & US 64 Bus (Knightdale Blvd.)

Background + 1 AM (2024)
03/30/2020

Offset: 60 (50%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.70

Intersection Signal Delay: 25.1

Intersection LOS: C

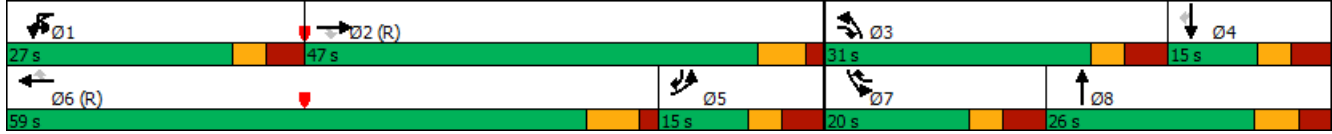
Intersection Capacity Utilization 69.0%

ICU Level of Service C

Analysis Period (min) 15

Description: 05-0928

Splits and Phases: 1: Hodge Road & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↓	↑↑							↑
Traffic Volume (vph)	0	1071	121	299	1429	0	0	0	0	0	0	300
Future Volume (vph)	0	1071	121	299	1429	0	0	0	0	0	0	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		1%			-1%			0%				2%
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	4963	1545	1744	3489	0	0	0	0	0	0	1580
Flt Permitted				0.223								
Satd. Flow (perm)	0	4963	1513	409	3489	0	0	0	0	0	0	1580
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			129									148
Link Speed (mph)		45		45				35				35
Link Distance (ft)		962			263			601				428
Travel Time (s)		14.6			4.0			11.7				8.3
Confl. Peds. (#/hr)			1	1								
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	0%	0%	0%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%				0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1139	129	318	1520	0	0	0	0	0	0	319
Turn Type		NA	Perm	D.P+P	NA							Free
Protected Phases		2		7	2 7							
Permitted Phases			2	2								Free
Detector Phase		2	2	7	2 7							
Switch Phase												
Minimum Initial (s)		12.0	12.0	7.0								
Minimum Split (s)		19.0	19.0	15.0								
Total Split (s)		90.0	90.0	30.0								
Total Split (%)		75.0%	75.0%	25.0%								
Yellow Time (s)		4.4	4.4	3.0								
All-Red Time (s)		1.6	1.6	3.1								
Lost Time Adjust (s)		-1.0	-1.0	-1.1								
Total Lost Time (s)		5.0	5.0	5.0								
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max	None								
Act Effct Green (s)		86.1	86.1	110.0	120.0							120.0
Actuated g/C Ratio		0.72	0.72	0.92	1.00							1.00
v/c Ratio		0.32	0.11	0.50	0.44							0.20
Control Delay		2.4	0.3	11.1	1.8							0.3
Queue Delay		0.0	0.0	0.0	0.0							0.0
Total Delay		2.4	0.3	11.1	1.8							0.3
LOS		A	A	B	A							A
Approach Delay		2.2			3.4						0.3	
Approach LOS		A			A						A	
Queue Length 50th (ft)		16	0	36	57							0
Queue Length 95th (ft)		29	0	138	30							0
Internal Link Dist (ft)		882			183			521			348	
Turn Bay Length (ft)												
Base Capacity (vph)		3561	1122	657	3451							1580
Starvation Cap Reductn		0	0	0	0							0
Spillback Cap Reductn		0	0	0	0							0
Storage Cap Reductn		0	0	0	0							0
Reduced v/c Ratio		0.32	0.11	0.48	0.44							0.20

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 57 (48%), Referenced to phase 2:EBWB and 6:, Start of Green

Natural Cycle: 40

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.50

Intersection Signal Delay: 2.7

Intersection LOS: A

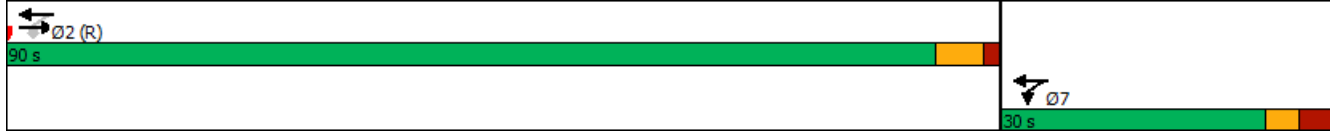
Intersection Capacity Utilization 48.6%

ICU Level of Service A

Analysis Period (min) 15

Description: 05-2153

Splits and Phases: 2: I-540 EB On-Ramp/I-540 EB Off-Ramp & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	431	985	0	0	1647	791	69	5	342	0	0	0
Future Volume (vph)	431	985	0	0	1647	791	69	5	342	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		-1%			1%			2%			0%	
Storage Length (ft)	500		0	0		0	0		400	0		0
Storage Lanes	1		0	0		1	0		2	0		0
Taper Length (ft)	200			25			25			25		
Satd. Flow (prot)	3384	5012	0	0	4963	1545	0	1695	2655	0	0	0
Flt Permitted	0.950							0.955				
Satd. Flow (perm)	3384	5012	0	0	4963	1545	0	1695	2655	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						654			225			
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		803			1134			793			417	
Travel Time (s)		12.2			17.2			15.4			8.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	6%	6%	6%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	474	1082	0	0	1810	869	0	81	376	0	0	0
Turn Type	Prot	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			4				
Permitted Phases					6	4		4				
Detector Phase	5	2			6	6	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0	12.0			12.0	12.0	7.0	7.0	7.0			
Minimum Split (s)	15.0	20.0			20.0	20.0	15.0	15.0	15.0			
Total Split (s)	25.0	85.0			60.0	60.0	35.0	35.0	35.0			
Total Split (%)	20.8%	70.8%			50.0%	50.0%	29.2%	29.2%	29.2%			
Yellow Time (s)	3.3	4.6			4.4	4.4	3.7	3.7	3.7			
All-Red Time (s)	3.0	1.3			1.4	1.4	2.5	2.5	2.5			
Lost Time Adjust (s)	-1.3	-0.9			-0.8	-0.8	-1.2	-1.2				
Total Lost Time (s)	5.0	5.0			5.0	5.0	5.0	5.0				
Lead/Lag	Lag				Lead	Lead						
Lead-Lag Optimize?	Yes				Yes	Yes						
Recall Mode	None	C-Max			C-Max	C-Max	None	None	None			
Act Effct Green (s)	20.0	97.3			72.3	72.3		12.7	12.7			
Actuated g/C Ratio	0.17	0.81			0.60	0.60		0.11	0.11			
v/c Ratio	0.84	0.27			0.61	0.73		0.46	0.78			
Control Delay	52.1	3.2			9.2	6.8		57.3	32.1			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	52.1	3.2			9.2	6.8		57.3	32.1			
LOS	D	A			A	A		E	C			
Approach Delay		18.1			8.4			36.5				
Approach LOS		B			A			D				
Queue Length 50th (ft)	187	51			301	380		60	64			
Queue Length 95th (ft)	#254	112			158	709		106	118			
Internal Link Dist (ft)		723			1054			713		337		
Turn Bay Length (ft)	500								400			
Base Capacity (vph)	564	4064			2991	1191		423	832			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.84	0.27			0.61	0.73		0.19	0.45			

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 32 (27%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 14.4

Intersection LOS: B

Intersection Capacity Utilization 79.6%

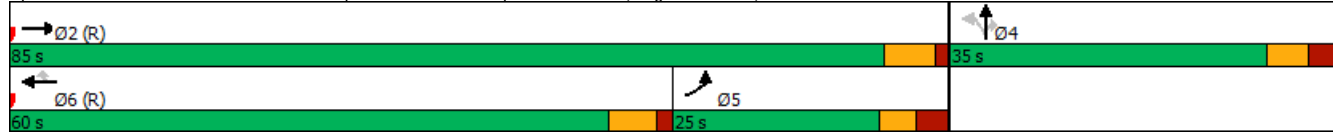
ICU Level of Service D

Analysis Period (min) 15

Description: 05-2152

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: I-540 WB Off-Ramp/I-540 WB On-Ramp & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↕↕	↔			↕↕↕	↔	↔↔	↕	↔	↔↔	↔	↔
Traffic Volume (vph)	141	1022	57	5	19	2040	51	289	6	64	39	9	27
Future Volume (vph)	141	1022	57	5	19	2040	51	289	6	64	39	9	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		-1%				1%			3%			0%	
Storage Length (ft)	300		125		200		200	200		100	325		150
Storage Lanes	2		1		1		1	2		1	1		1
Taper Length (ft)	250				100			100			100		
Satd. Flow (prot)	3320	4918	1531	0	1710	4915	1530	3382	1835	1560	3213	1532	1408
Flt Permitted	0.950				0.950			0.950			0.950		
Satd. Flow (perm)	3320	4918	1531	0	1710	4915	1530	3382	1835	1539	3202	1532	1408
Right Turn on Red			Yes				Yes			Yes			Yes
Satd. Flow (RTOR)			94				95			153		10	150
Link Speed (mph)		45				45			35				35
Link Distance (ft)		1134				1230			476			550	
Travel Time (s)		17.2				18.6			9.3			10.7	
Confl. Peds. (#/hr)										1	1		
Confl. Bikes (#/hr)													
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	6%	6%	6%	5%	5%	5%	5%	2%	2%	2%	9%	9%	9%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)													
Mid-Block Traffic (%)		0%				0%			0%			0%	
Shared Lane Traffic (%)													35%
Lane Group Flow (vph)	150	1087	61	0	25	2170	54	307	6	68	41	20	19
Turn Type	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2	3	1	1	6	7	3	8	1	7	4	5
Permitted Phases			2			6				8			4
Detector Phase	5	2	3	1	1	6	7	3	8	1	7	4	5
Switch Phase													
Minimum Initial (s)	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	15.0	20.0	15.0	15.0	15.0	20.0	16.0	15.0	15.0	15.0	16.0	15.0	15.0
Total Split (s)	17.0	68.0	20.0	17.0	17.0	68.0	16.0	20.0	19.0	17.0	16.0	15.0	17.0
Total Split (%)	14.2%	56.7%	16.7%	14.2%	14.2%	56.7%	13.3%	16.7%	15.8%	14.2%	13.3%	12.5%	14.2%
Yellow Time (s)	3.6	4.6	3.8	3.4	3.4	4.4	4.1	3.8	3.6	3.4	4.1	3.8	3.6
All-Red Time (s)	3.0	1.7	3.0	3.0	3.0	1.6	3.0	3.0	3.0	3.0	3.0	3.1	3.0
Lost Time Adjust (s)	-1.6	-1.3	-1.8		-1.4	-1.0	-2.1	-1.8	-1.6	-1.4	-2.1	-1.9	-1.6
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag	Lag	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None	None	None	None	None	None
Act Effct Green (s)	10.8	74.8	96.6		11.3	72.6	94.4	15.7	9.7	14.1	16.8	9.2	14.6
Actuated g/C Ratio	0.09	0.62	0.80		0.09	0.60	0.79	0.13	0.08	0.12	0.14	0.08	0.12
v/c Ratio	0.50	0.35	0.05		0.16	0.73	0.04	0.69	0.04	0.21	0.09	0.16	0.06
Control Delay	59.3	5.4	0.1		51.9	20.1	0.4	58.7	49.8	1.5	44.7	37.3	0.4
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.3	5.4	0.1		51.9	20.1	0.4	58.7	49.8	1.5	44.7	37.3	0.4
LOS	E	A	A		D	C	A	E	D	A	D	D	A
Approach Delay		11.4				20.0			48.4				32.3
Approach LOS		B				C			D				C
Queue Length 50th (ft)	44	47	0		18	379	0	115	4	0	14	7	0
Queue Length 95th (ft)	84	82	1		46	575	3	169	18	0	34	34	0
Internal Link Dist (ft)		1054				1150			396			470	
Turn Bay Length (ft)	300		125		200		200	200		100	325		150
Base Capacity (vph)	332	3066	1241		171	2974	1229	450	215	326	461	136	315
Starvation Cap Reductn	0	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.35	0.05		0.15	0.73	0.04	0.68	0.03	0.21	0.09	0.15	0.06

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 2 (2%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 20.2

Intersection LOS: C

Intersection Capacity Utilization 72.7%

ICU Level of Service C

Analysis Period (min) 15

Description: 05-2267

! Phase conflict between lane groups.

Splits and Phases: 4: Hinton Oaks Boulevard & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕		↕	↕		↕	↕	
Traffic Volume (vph)	4	4	8	9	4	4	46	35	67	4	179	10
Future Volume (vph)	4	4	8	9	4	4	46	35	67	4	179	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			1%	
Storage Length (ft)	0		0	100		0	70		0	150		350
Storage Lanes	0		0	1		0	1		0	1		1
Taper Length (ft)	25			100			100			80		
Satd. Flow (prot)	0	1710	0	1770	1723	0	1770	3189	0	1761	5019	0
Flt Permitted		0.988		0.950			0.950			0.950		
Satd. Flow (perm)	0	1710	0	1770	1723	0	1770	3189	0	1761	5019	0
Link Speed (mph)		30			30			30			25	
Link Distance (ft)		171			365			524			741	
Travel Time (s)		3.9			8.3			11.9			20.2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	21	0	12	10	0	61	134	0	5	249	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 21.5% ICU Level of Service A

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	2.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕		↕	↕		↕	↕↕	
Traffic Vol, veh/h	4	4	8	9	4	4	46	35	67	4	179	10
Future Vol, veh/h	4	4	8	9	4	4	46	35	67	4	179	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	100	-	-	70	-	-	150	-	350
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	1	-
Peak Hour Factor	76	76	76	76	76	76	76	76	76	76	76	76
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	5	11	12	5	5	61	46	88	5	236	13

Major/Minor	Minor2	Minor1			Major1			Major2				
Conflicting Flow All	401	509	125	319	471	67	249	0	0	134	0	0
Stage 1	253	253	-	212	212	-	-	-	-	-	-	-
Stage 2	148	256	-	107	259	-	-	-	-	-	-	-
Critical Hdwy	6.99	6.54	7.14	6.99	6.54	6.94	5.34	-	-	4.14	-	-
Critical Hdwy Stg 1	7.34	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4.02	3.92	3.67	4.02	3.32	3.12	-	-	2.22	-	-
Pot Cap-1 Maneuver	549	466	767	619	489	983	887	-	-	1448	-	-
Stage 1	664	696	-	742	726	-	-	-	-	-	-	-
Stage 2	808	694	-	847	692	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	512	432	767	571	454	983	887	-	-	1448	-	-
Mov Cap-2 Maneuver	512	432	-	571	454	-	-	-	-	-	-	-
Stage 1	618	694	-	691	676	-	-	-	-	-	-	-
Stage 2	743	646	-	826	690	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.4	11.2	2.9	0.2
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	887	-	-	582	571	621	1448	-	-
HCM Lane V/C Ratio	0.068	-	-	0.036	0.021	0.017	0.004	-	-
HCM Control Delay (s)	9.4	-	-	11.4	11.4	10.9	7.5	-	-
HCM Lane LOS	A	-	-	B	B	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.1	0.1	0.1	0	-	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	4	42	46	4	4	9	16	11	4	105	4
Future Volume (vph)	4	4	42	46	4	4	9	16	11	4	105	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%				0%				0%		1%	
Storage Length (ft)	0		0	100		0	0		0	100		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			100			25			100		
Satd. Flow (prot)	1770	1863	1583	1770	1723	0	1770	1749	0	1761	1842	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1863	1583	1770	1723	0	1770	1749	0	1761	1842	0
Link Speed (mph)		30			30			30			25	
Link Distance (ft)		258			326			504			286	
Travel Time (s)		5.9			7.4			11.5			7.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	5	49	54	10	0	11	32	0	5	129	0
Sign Control	Stop				Stop				Stop		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	23.0%
Analysis Period (min)	15
	ICU Level of Service A

Intersection	
Intersection Delay, s/veh	8.4
Intersection LOS	A

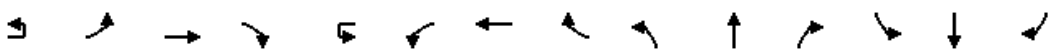
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↑	↔	↔	↔		↔	↔		↔	↔	
Traffic Vol, veh/h	4	4	42	46	4	4	9	16	11	4	105	4
Future Vol, veh/h	4	4	42	46	4	4	9	16	11	4	105	4
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	5	49	54	5	5	11	19	13	5	124	5
Number of Lanes	1	1	1	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	3	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	3	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	3
HCM Control Delay	7.6	8.7	8	8.7
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	100%	0%	100%	0%
Vol Thru, %	0%	59%	0%	100%	0%	0%	50%	0%	96%
Vol Right, %	0%	41%	0%	0%	100%	0%	50%	0%	4%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	9	27	4	4	42	46	8	4	109
LT Vol	9	0	4	0	0	46	0	4	0
Through Vol	0	16	0	4	0	0	4	0	105
RT Vol	0	11	0	0	42	0	4	0	4
Lane Flow Rate	11	32	5	5	49	54	9	5	128
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.017	0.043	0.007	0.007	0.061	0.085	0.013	0.007	0.176
Departure Headway (Hd)	5.641	4.854	5.67	5.168	4.466	5.64	4.787	5.457	4.931
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	636	738	632	693	802	636	748	657	730
Service Time	3.366	2.579	3.395	2.893	2.19	3.365	2.512	3.177	2.651
HCM Lane V/C Ratio	0.017	0.043	0.008	0.007	0.061	0.085	0.012	0.008	0.175
HCM Control Delay	8.5	7.8	8.4	7.9	7.5	8.9	7.6	8.2	8.7
HCM Lane LOS	A	A	A	A	A	A	A	A	A
HCM 95th-ile Q	0.1	0.1	0	0	0.2	0.3	0	0	0.6

Legacy Oaks
1: Hodge Road & US 64 Bus (Knightdale Blvd.)

Background + 1 PM (2024)
03/30/2020



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations														
Traffic Volume (vph)	7	63	1709	319	21	407	1119	183	115	30	241	145	76	66
Future Volume (vph)	7	63	1709	319	21	407	1119	183	115	30	241	145	76	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)			3%				-3%			-2%				1%
Storage Length (ft)		200		225		600		375	200		50	0		0
Storage Lanes		3		1		1		1	1		1	2		1
Taper Length (ft)		300				150			100			100		
Satd. Flow (prot)	0	3382	5009	1560	0	1796	5162	1607	3467	1631	0	3416	1853	1575
Flt Permitted		0.950				0.950			0.950			0.950		
Satd. Flow (perm)	0	3382	5009	1560	0	1796	5162	1607	3467	1631	0	3416	1853	1575
Right Turn on Red				Yes				Yes			Yes			Yes
Satd. Flow (RTOR)				176				189		240				182
Link Speed (mph)			45				45			35				25
Link Distance (ft)			735				962			450				524
Travel Time (s)			11.1				14.6			8.8				14.3
Confl. Peds. (#/hr)														
Confl. Bikes (#/hr)														
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)														
Mid-Block Traffic (%)			0%				0%			0%				0%
Shared Lane Traffic (%)														
Lane Group Flow (vph)	0	72	1762	329	0	442	1154	189	119	279	0	149	78	68
Turn Type	Prot	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5!	5	2	3	1	1	6	7	3	8		7	4	5!
Permitted Phases				2				6						4
Detector Phase	5	5	2	3	1	1	6	7	3	8		7	4	5
Switch Phase														
Minimum Initial (s)	7.0	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	15.0	15.0	19.0	15.0	15.0	15.0	20.0	15.0	15.0	16.0		15.0	15.0	15.0
Total Split (s)	20.0	20.0	55.0	25.0	45.0	45.0	80.0	15.0	25.0	25.0		15.0	15.0	20.0
Total Split (%)	14.3%	14.3%	39.3%	17.9%	32.1%	32.1%	57.1%	10.7%	17.9%	17.9%		10.7%	10.7%	14.3%
Yellow Time (s)	3.0	3.0	4.3	3.0	3.0	3.0	4.8	3.0	3.0	4.0		3.0	3.1	3.0
All-Red Time (s)	3.9	3.9	1.7	3.9	3.5	3.5	1.7	3.9	3.9	3.1		3.9	3.7	3.9
Lost Time Adjust (s)		-1.9	-1.0	-1.9		-1.5	-1.5	-1.9	-1.9	-2.1		-1.9	-1.8	-1.9
Total Lost Time (s)		5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lead	Lead	Lag	Lag	Lag	Lead	Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None	C-Max	None	None	None	C-Max	None	None	None		None	None	None
Act Effct Green (s)		10.4	54.2	68.4		40.0	83.8	98.8	14.2	15.8		10.0	11.6	27.1
Actuated g/C Ratio		0.07	0.39	0.49		0.29	0.60	0.71	0.10	0.11		0.07	0.08	0.19
v/c Ratio		0.29	0.91	0.39		0.86	0.37	0.16	0.34	0.70		0.61	0.51	0.15
Control Delay		63.8	48.9	7.1		47.5	6.4	0.3	60.1	20.9		74.1	73.5	0.7
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay		63.8	48.9	7.1		47.5	6.4	0.3	60.1	20.9		74.1	73.5	0.7
LOS		E	D	A		D	A	A	E	C		E	E	A
Approach Delay			43.0				15.9			32.7				57.1
Approach LOS			D				B			C				E
Queue Length 50th (ft)		32	559	52		390	79	0	53	33		69	69	0
Queue Length 95th (ft)		58	#696	98		#567	96	1	81	127		107	#133	0
Internal Link Dist (ft)			655				882			370				444
Turn Bay Length (ft)		200		225		600		375	200					
Base Capacity (vph)		362	1938	909		513	3088	1189	495	438		244	154	496
Starvation Cap Reductn		0	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn		0	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn		0	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio		0.20	0.91	0.36		0.86	0.37	0.16	0.24	0.64		0.61	0.51	0.14

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Legacy Oaks
 1: Hodge Road & US 64 Bus (Knightdale Blvd.)

Background + 1 PM (2024)
 03/30/2020

Offset: 84 (60%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.91
 Intersection Signal Delay: 32.6 Intersection LOS: C
 Intersection Capacity Utilization 95.7% ICU Level of Service F
 Analysis Period (min) 15
 Description: 05-0928
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 ! Phase conflict between lane groups.

Splits and Phases: 1: Hodge Road & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↓	↑↑							↑
Traffic Volume (vph)	0	2052	80	202	1188	0	0	0	0	0	0	565
Future Volume (vph)	0	2052	80	202	1188	0	0	0	0	0	0	565
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		1%			-1%			0%				2%
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	5060	1575	1778	3557	0	0	0	0	0	0	1564
Flt Permitted				0.068								
Satd. Flow (perm)	0	5060	1575	127	3557	0	0	0	0	0	0	1564
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			82									224
Link Speed (mph)		45		45				35				35
Link Distance (ft)		962		263				601				428
Travel Time (s)		14.6		4.0				11.7				8.3
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	4%	4%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%		0%				0%				0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2094	82	206	1212	0	0	0	0	0	0	577
Turn Type		NA	Perm	D.P+P	NA							Free
Protected Phases		2		7	2							
Permitted Phases			2	2								Free
Detector Phase		2	2	7	2							
Switch Phase												
Minimum Initial (s)		12.0	12.0	7.0								
Minimum Split (s)		19.0	19.0	15.0								
Total Split (s)		100.0	100.0	40.0								
Total Split (%)		71.4%	71.4%	28.6%								
Yellow Time (s)		4.4	4.4	3.0								
All-Red Time (s)		1.6	1.6	3.1								
Lost Time Adjust (s)		-1.0	-1.0	-1.1								
Total Lost Time (s)		5.0	5.0	5.0								
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max	None								
Act Effct Green (s)		104.9	104.9	130.0	140.0							140.0
Actuated g/C Ratio		0.75	0.75	0.93	1.00							1.00
v/c Ratio		0.55	0.07	0.50	0.34							0.37
Control Delay		3.9	0.3	50.5	2.0							0.7
Queue Delay		0.0	0.0	0.0	0.0							0.0
Total Delay		3.9	0.3	50.5	2.0							0.7
LOS		A	A	D	A							A
Approach Delay		3.7			9.0						0.7	
Approach LOS		A			A						A	
Queue Length 50th (ft)		80	0	129	66							0
Queue Length 95th (ft)		108	m1	208	24							0
Internal Link Dist (ft)		882			183			521			348	
Turn Bay Length (ft)												
Base Capacity (vph)		3792	1201	534	3552							1564
Starvation Cap Reductn		0	0	0	0							0
Spillback Cap Reductn		0	0	0	0							0
Storage Cap Reductn		0	0	0	0							0
Reduced v/c Ratio		0.55	0.07	0.39	0.34							0.37

Intersection Summary

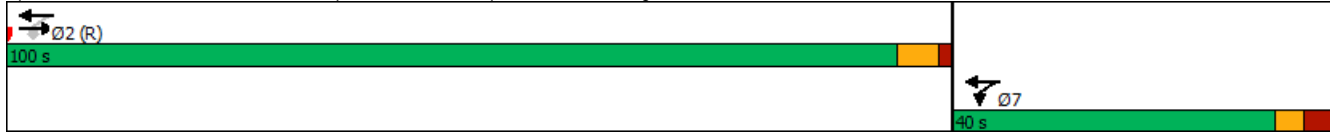
Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 72 (51%), Referenced to phase 2:EBWB and 6:, Start of Green
 Natural Cycle: 40
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.55
 Intersection Signal Delay: 5.1 Intersection LOS: A
 Intersection Capacity Utilization 107.9% ICU Level of Service G
 Analysis Period (min) 15
 Description: 05-2153
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: I-540 EB On-Ramp/I-540 EB Off-Ramp & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	375	2672	0	0	1300	524	96	4	648	0	0	0
Future Volume (vph)	375	2672	0	0	1300	524	96	4	648	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		-1%			1%			2%			0%	
Storage Length (ft)	500		0	0		0	0		400	0		0
Storage Lanes	1		0	0		1	0		2	0		0
Taper Length (ft)	200			25			25			25		
Satd. Flow (prot)	3450	5111	0	0	5060	1575	0	1759	2759	0	0	0
Flt Permitted	0.950							0.954				
Satd. Flow (perm)	3450	5111	0	0	5060	1575	0	1759	2759	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						546			71			
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		803			1134			793			417	
Travel Time (s)		12.2			17.2			15.4			8.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	391	2783	0	0	1354	546	0	104	675	0	0	0
Turn Type	Prot	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			4				
Permitted Phases					6	4		4				
Detector Phase	5	2			6	6	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0	12.0			12.0	12.0	7.0	7.0	7.0			
Minimum Split (s)	15.0	20.0			20.0	20.0	15.0	15.0	15.0			
Total Split (s)	30.0	100.0			70.0	70.0	40.0	40.0	40.0			
Total Split (%)	21.4%	71.4%			50.0%	50.0%	28.6%	28.6%	28.6%			
Yellow Time (s)	3.3	4.6			4.4	4.4	3.7	3.7	3.7			
All-Red Time (s)	3.0	1.3			1.4	1.4	2.5	2.5	2.5			
Lost Time Adjust (s)	-1.3	-0.9			-0.8	-0.8	-1.2	-1.2	-1.2			
Total Lost Time (s)	5.0	5.0			5.0	5.0	5.0	5.0	5.0			
Lead/Lag	Lag				Lead	Lead						
Lead-Lag Optimize?	Yes				Yes	Yes						
Recall Mode	None	C-Max			C-Max	C-Max	None	None	None			
Act Effct Green (s)	25.0	96.4			66.4	66.4		33.6	33.6			
Actuated g/C Ratio	0.18	0.69			0.47	0.47		0.24	0.24			
v/c Ratio	0.63	0.79			0.56	0.53		0.25	0.94			
Control Delay	45.3	6.3			12.3	2.4		44.2	68.6			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	45.3	6.3			12.3	2.4		44.2	68.6			
LOS	D	A			B	A		D	E			
Approach Delay		11.1			9.5			65.3				
Approach LOS		B			A			E				
Queue Length 50th (ft)	186	131			161	0		76	310			
Queue Length 95th (ft)	238	134			106	m5		129	#434			
Internal Link Dist (ft)		723			1054			713			337	
Turn Bay Length (ft)	500								400			
Base Capacity (vph)	616	3518			2398	1033		439	743			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.63	0.79			0.56	0.53		0.24	0.91			

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 68 (49%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 55

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.94

Intersection Signal Delay: 17.8

Intersection LOS: B

Intersection Capacity Utilization 82.6%

ICU Level of Service E

Analysis Period (min) 15

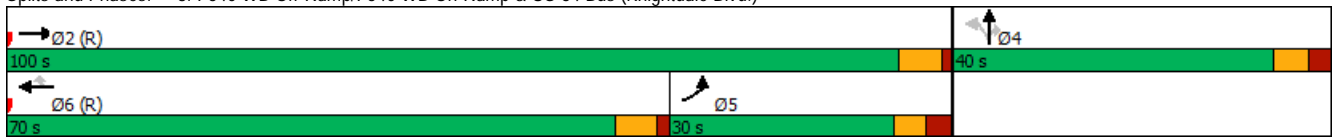
Description: 05-2152

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

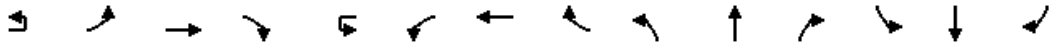
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: I-540 WB Off-Ramp/I-540 WB On-Ramp & US 64 Bus (Knightdale Blvd.)



Legacy Oaks
4: Hinton Oaks Boulevard & US 64 Bus (Knightdale Blvd.)

Background + 1 PM (2024)
03/30/2020



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔	↑↑↑	↗		↔↔	↑↑↑	↗	↔↔	↑	↗	↔↔	↖	↗
Traffic Volume (vph)	26	428	2483	171	6	37	1471	75	125	28	61	133	14	97
Future Volume (vph)	26	428	2483	171	6	37	1471	75	125	28	61	133	14	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)			-1%				1%			3%				0%
Storage Length (ft)		300		125		200		200	200		100	325		150
Storage Lanes		2		1		1		1	2		1	1		1
Taper Length (ft)		250				100			100			100		
Satd. Flow (prot)	0	3450	5111	1591	0	1761	5060	1575	3382	1835	1560	3433	1570	1504
Flt Permitted		0.950				0.950			0.950			0.950		
Satd. Flow (perm)	0	3450	5111	1591	0	1761	5060	1575	3382	1835	1560	3433	1570	1504
Right Turn on Red				Yes				Yes			Yes			Yes
Satd. Flow (RTOR)				90				81			130			126
Link Speed (mph)			45				45			35				35
Link Distance (ft)			1134				1230			476				550
Travel Time (s)			17.2				18.6			9.3				10.7
Confl. Peds. (#/hr)														
Confl. Bikes (#/hr)														
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)														
Mid-Block Traffic (%)			0%				0%			0%				0%
Shared Lane Traffic (%)														44%
Lane Group Flow (vph)	0	478	2614	180	0	45	1548	79	132	29	64	140	60	57
Turn Type	Prot	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5!	5	2	3	1!	1	6	7	3	8	1!	7	4	5!
Permitted Phases				2				6			8			4
Detector Phase	5	5	2	3	1	1	6	7	3	8	1	7	4	5
Switch Phase														
Minimum Initial (s)	7.0	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	15.0	15.0	20.0	15.0	15.0	15.0	20.0	16.0	15.0	15.0	15.0	16.0	15.0	15.0
Total Split (s)	28.0	28.0	80.0	20.0	20.0	20.0	72.0	20.0	20.0	20.0	20.0	20.0	20.0	28.0
Total Split (%)	20.0%	20.0%	57.1%	14.3%	14.3%	14.3%	51.4%	14.3%	14.3%	14.3%	14.3%	14.3%	14.3%	20.0%
Yellow Time (s)	3.6	3.6	4.6	3.8	3.4	3.4	4.4	4.1	3.8	3.6	3.4	4.1	3.8	3.6
All-Red Time (s)	3.0	3.0	1.7	3.0	3.0	3.0	1.6	3.0	3.0	3.0	3.0	3.0	3.1	3.0
Lost Time Adjust (s)		-1.6	-1.3	-1.8			-1.4	-1.0	-2.1	-1.8	-1.6	-1.4	-2.1	-1.9
Total Lost Time (s)		5.0	5.0	5.0			5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	C-Max	None	None	None	C-Max	None	None	None	None	None	None	None
Act Effct Green (s)		23.0	92.6	111.2		10.0	76.9	97.7	12.6	9.7	16.2	15.8	10.3	31.5
Actuated g/C Ratio		0.16	0.66	0.79		0.07	0.55	0.70	0.09	0.07	0.12	0.11	0.07	0.22
v/c Ratio		0.84	0.77	0.14		0.36	0.56	0.07	0.44	0.23	0.22	0.36	0.38	0.13
Control Delay		55.0	13.6	0.9		69.6	22.5	1.9	64.5	65.5	1.7	60.2	30.4	0.6
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		55.0	13.6	0.9		69.6	22.5	1.9	64.5	65.5	1.7	60.2	30.4	0.6
LOS		E	B	A		E	C	A	E	E	A	E	C	A
Approach Delay			19.0				22.8			46.8				40.0
Approach LOS			B				C			D				D
Queue Length 50th (ft)		208	294	5		40	336	0	59	26	0	63	13	0
Queue Length 95th (ft)		m#287	649	m12		81	420	18	92	59	0	96	63	0
Internal Link Dist (ft)			1054				1150			396			470	
Turn Bay Length (ft)		300		125		200		200	200		100	325		150
Base Capacity (vph)		566	3381	1297		188	2779	1107	362	196	347	424	208	436
Starvation Cap Reductn		0	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.84	0.77	0.14		0.24	0.56	0.07	0.36	0.15	0.18	0.33	0.29	0.13

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 78 (56%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 22.3

Intersection LOS: C

Intersection Capacity Utilization 82.1%

ICU Level of Service E

Analysis Period (min) 15

Description: 05-2267

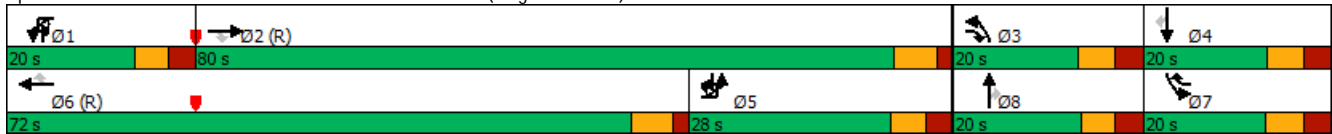
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

! Phase conflict between lane groups.

Splits and Phases: 4: Hinton Oaks Boulevard & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔			↔	↔		↔	↔↔	
Traffic Volume (vph)	4	4	13	9	33	4	4	9	112	156	9	4	98	4
Future Volume (vph)	4	4	13	9	33	4	4	9	112	156	9	4	98	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%				0%				0%				1%
Storage Length (ft)	0		0		100		0		70		0	150		350
Storage Lanes	0		0		1		0		1		0	1		1
Taper Length (ft)	25				100				100			80		
Satd. Flow (prot)	0	1687	0	0	1770	1723	0	0	1687	3347	0	1761	5030	0
Flt Permitted		0.991			0.950				0.950			0.950		
Satd. Flow (perm)	0	1687	0	0	1770	1723	0	0	1687	3347	0	1761	5030	0
Link Speed (mph)		30				30				30			25	
Link Distance (ft)		171				365				524			741	
Travel Time (s)		3.9				8.3				11.9			20.2	
Confl. Peds. (#/hr)			1		1									
Confl. Bikes (#/hr)														
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	7%	7%	7%	7%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)														
Mid-Block Traffic (%)		0%				0%				0%			0%	
Shared Lane Traffic (%)														
Lane Group Flow (vph)	0	22	0	0	44	8	0	0	127	173	0	4	107	0
Sign Control		Stop				Stop				Free			Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	29.0%
ICU Level of Service	A
Analysis Period (min)	15

Intersection														
Int Delay, s/veh	4.4													
Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔			↔	↔		↔	↔	
Traffic Vol, veh/h	4	4	13	9	33	4	4	9	112	156	9	4	98	4
Future Vol, veh/h	4	4	13	9	33	4	4	9	112	156	9	4	98	4
Conflicting Peds, #/hr	0	0	1	0	1	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	-	None	-	-	-	None	-	-	None
Storage Length	-	-	-	-	100	-	-	-	70	-	-	150	-	350
Veh in Median Storage, #	-	0	-	-	-	0	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	-	0	-	-	-	0	-	-	1	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	7	7	7	7	2	2	2
Mvmt Flow	4	4	14	9	35	4	4	9	118	164	9	4	103	4
Major/Minor	Minor2			Minor1			Major1			Major2				
Conflicting Flow All	451	540	55	0	475	538	87	78	107	0	0	173	0	0
Stage 1	113	113	-	0	423	423	-	-	-	-	-	-	-	-
Stage 2	338	427	-	0	52	115	-	-	-	-	-	-	-	-
Critical Hdwy	6.99	6.54	7.14	-	6.99	6.54	6.94	5.74	5.44	-	-	4.14	-	-
Critical Hdwy Stg 1	7.34	5.54	-	-	6.54	5.54	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	-	6.74	5.54	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4.02	3.92	-	3.67	4.02	3.32	2.37	3.17	-	-	2.22	-	-
Pot Cap-1 Maneuver	510	447	848	0	492	448	954	1376	1012	-	-	1401	-	-
Stage 1	825	801	-	0	560	586	-	-	-	-	-	-	-	-
Stage 2	628	584	-	0	914	799	-	-	-	-	-	-	-	-
Platoon blocked, %				-										
Mov Cap-1 Maneuver	455	391	847	0	433	392	954	1031	1031	-	-	1401	-	-
Mov Cap-2 Maneuver	455	391	-	0	433	392	-	-	-	-	-	-	-	-
Stage 1	724	799	-	0	491	514	-	-	-	-	-	-	-	-
Stage 2	544	512	-	0	891	797	-	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB				
HCM Control Delay, s	11.1			13.5			3.8			0.3				
HCM LOS	B			B										
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR					
Capacity (veh/h)	1031	-	-	611	433	556	1401	-	-					
HCM Lane V/C Ratio	0.124	-	-	0.036	0.08	0.015	0.003	-	-					
HCM Control Delay (s)	9	-	-	11.1	14	11.6	7.6	-	-					
HCM Lane LOS	A	-	-	B	B	B	A	-	-					
HCM 95th %tile Q(veh)	0.4	-	-	0.1	0.3	0	0	-	-					



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	4	27	19	4	4	30	103	21	4	49	4
Future Volume (vph)	4	4	27	19	4	4	30	103	21	4	49	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%				0%				0%		1%	
Storage Length (ft)	0		0	100		0	0		0	100		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			100			25			100		
Satd. Flow (prot)	1770	1863	1583	1770	1723	0	1687	1730	0	1761	1833	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1863	1583	1770	1723	0	1687	1730	0	1761	1833	0
Link Speed (mph)		30			30			30			25	
Link Distance (ft)		258			326			504			286	
Travel Time (s)		5.9			7.4			11.5			7.8	
Confl. Peds. (#/hr)			1	1								
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	7%	7%	7%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	4	4	29	20	8	0	32	134	0	4	57	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	22.7%
ICU Level of Service	A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	8.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↑	↔	↔	↔		↔	↔		↔	↔	
Traffic Vol, veh/h	4	4	27	19	4	4	30	103	21	4	49	4
Future Vol, veh/h	4	4	27	19	4	4	30	103	21	4	49	4
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	2	2	2	2	2	2	7	7	7	2	2	2
Mvmt Flow	4	4	29	20	4	4	32	111	23	4	53	4
Number of Lanes	1	1	1	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	3	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	3	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	3
HCM Control Delay	7.6	8.4	8.6	8.1
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	100%	0%	100%	0%
Vol Thru, %	0%	83%	0%	100%	0%	0%	50%	0%	92%
Vol Right, %	0%	17%	0%	0%	100%	0%	50%	0%	8%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	30	124	4	4	27	19	8	4	53
LT Vol	30	0	4	0	0	19	0	4	0
Through Vol	0	103	0	4	0	0	4	0	49
RT Vol	0	21	0	0	27	0	4	0	4
Lane Flow Rate	32	133	4	4	29	20	9	4	57
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.049	0.178	0.007	0.006	0.036	0.033	0.012	0.007	0.079
Departure Headway (Hd)	5.428	4.809	5.726	5.224	4.521	5.744	4.889	5.551	4.997
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	662	748	626	686	793	625	734	647	719
Service Time	3.142	2.523	3.449	2.947	2.244	3.463	2.609	3.267	2.713
HCM Lane V/C Ratio	0.048	0.178	0.006	0.006	0.037	0.032	0.012	0.006	0.079
HCM Control Delay	8.4	8.6	8.5	8	7.4	8.7	7.7	8.3	8.1
HCM Lane LOS	A	A	A	A	A	A	A	A	A
HCM 95th-tile Q	0.2	0.6	0	0	0.1	0.1	0	0	0.3

**Appendix I:
Synchro Output –
Build-out (2024)**



Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (vph)	79	893	97	14	145	1456	193	438	23	172	248	29	168
Future Volume (vph)	79	893	97	14	145	1456	193	438	23	172	248	29	168
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		3%				-3%			-2%			1%	
Storage Length (ft)	200		225		600		375	200		50	0		0
Storage Lanes	3		1		1		1	1		1	2		1
Taper Length (ft)	300				150			100			100		
Satd. Flow (prot)	3382	5009	1560	0	1796	5162	1607	3368	1586	0	3350	1818	1545
Flt Permitted	0.950				0.950			0.950			0.950		
Satd. Flow (perm)	3382	5009	1560	0	1796	5162	1607	3368	1586	0	3350	1818	1545
Right Turn on Red			Yes				Yes			Yes			Yes
Satd. Flow (RTOR)			109				217			193			216
Link Speed (mph)		45				45				35			25
Link Distance (ft)		735				962				450			524
Travel Time (s)		11.1				14.6				8.8			14.3
Confl. Peds. (#/hr)													
Confl. Bikes (#/hr)													
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	5%	5%	5%	4%	4%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)													
Mid-Block Traffic (%)		0%				0%			0%			0%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	89	1003	109	0	179	1636	217	492	219	0	279	33	189
Turn Type	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2	3	1	1	6	7	3	8		7	4	5
Permitted Phases			2			6							4
Detector Phase	5	2	3	1	1	6	7	3	8		7	4	5
Switch Phase													
Minimum Initial (s)	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	15.0	19.0	15.0	15.0	15.0	20.0	15.0	15.0	16.0		15.0	15.0	15.0
Total Split (s)	15.0	47.0	31.0	27.0	27.0	59.0	20.0	31.0	26.0		20.0	15.0	15.0
Total Split (%)	12.5%	39.2%	25.8%	22.5%	22.5%	49.2%	16.7%	25.8%	21.7%		16.7%	12.5%	12.5%
Yellow Time (s)	3.0	4.3	3.0	3.0	3.0	4.8	3.0	3.0	4.0		3.0	3.1	3.0
All-Red Time (s)	3.9	1.7	3.9	3.5	3.5	1.7	3.9	3.9	3.1		3.9	3.7	3.9
Lost Time Adjust (s)	-1.9	-1.0	-1.9			-1.5	-1.5	-1.9	-2.1		-1.9	-1.8	-1.9
Total Lost Time (s)	5.0	5.0	5.0			5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None	None		None	None	None
Act Effct Green (s)	10.0	51.3	83.0			18.1	59.4	74.0	26.7		14.6	9.4	15.9
Actuated g/C Ratio	0.08	0.43	0.69			0.15	0.50	0.62	0.22		0.12	0.08	0.13
v/c Ratio	0.32	0.47	0.10			0.66	0.64	0.20	0.66		0.69	0.23	0.48
Control Delay	55.1	27.1	2.0			77.4	18.2	1.4	47.4		59.8	55.9	6.3
Queue Delay	0.0	0.0	0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	55.1	27.1	2.0			77.4	18.2	1.4	47.4		59.8	55.9	6.3
LOS	E	C	A			E	B	A	D		E	E	A
Approach Delay		26.9				21.6			37.6			39.4	
Approach LOS		C				C			D			D	
Queue Length 50th (ft)	34	215	0			136	163	0	182		107	24	0
Queue Length 95th (ft)	60	272	22			214	280	37	237		153	57	26
Internal Link Dist (ft)		655				882			370			444	
Turn Bay Length (ft)	200		225		600		375	200					
Base Capacity (vph)	281	2140	1113		329	2554	1078	753	436		418	151	391
Starvation Cap Reductn	0	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.32	0.47	0.10		0.54	0.64	0.20	0.65	0.50		0.67	0.22	0.48

Intersection Summary

Area Type: Other

Cycle Length: 120

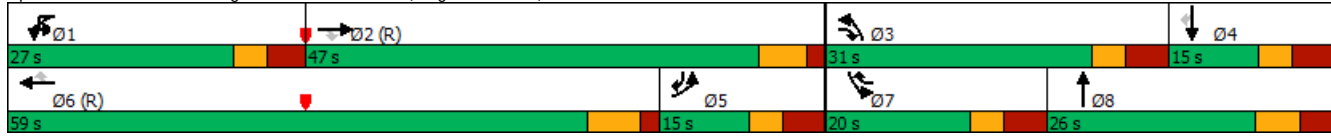
Actuated Cycle Length: 120

Legacy Oaks
 1: Hodge Road & US 64 Bus (Knightdale Blvd.)

Build-Out + 1 AM (2024)
 03/30/2020

Offset: 60 (50%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.69
 Intersection Signal Delay: 27.6 Intersection LOS: C
 Intersection Capacity Utilization 69.5% ICU Level of Service C
 Analysis Period (min) 15
 Description: 05-0928

Splits and Phases: 1: Hodge Road & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↓	↑↑							↑
Traffic Volume (vph)	0	1195	144	299	1485	0	0	0	0	0	0	335
Future Volume (vph)	0	1195	144	299	1485	0	0	0	0	0	0	335
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		1%			-1%			0%			2%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	4963	1545	1744	3489	0	0	0	0	0	0	1580
Flt Permitted				0.190								
Satd. Flow (perm)	0	4963	1545	349	3489	0	0	0	0	0	0	1580
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			153									136
Link Speed (mph)		45		45				35			35	
Link Distance (ft)		962		263				601			428	
Travel Time (s)		14.6		4.0				11.7			8.3	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	0%	0%	0%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%		0%				0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1271	153	318	1580	0	0	0	0	0	0	356
Turn Type		NA	Perm	D.P+P	NA							Free
Protected Phases		2		7	2 7							
Permitted Phases			2	2								Free
Detector Phase		2	2	7	2 7							
Switch Phase												
Minimum Initial (s)		12.0	12.0	7.0								
Minimum Split (s)		19.0	19.0	15.0								
Total Split (s)		90.0	90.0	30.0								
Total Split (%)		75.0%	75.0%	25.0%								
Yellow Time (s)		4.4	4.4	3.0								
All-Red Time (s)		1.6	1.6	3.1								
Lost Time Adjust (s)		-1.0	-1.0	-1.1								
Total Lost Time (s)		5.0	5.0	5.0								
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max	None								
Act Effct Green (s)		85.8	85.8	110.0	120.0							120.0
Actuated g/C Ratio		0.72	0.72	0.92	1.00							1.00
v/c Ratio		0.36	0.13	0.53	0.45							0.23
Control Delay		1.8	0.2	15.6	2.2							0.3
Queue Delay		0.0	0.0	0.0	0.0							0.0
Total Delay		1.8	0.2	15.6	2.2							0.3
LOS		A	A	B	A							A
Approach Delay		1.6			4.4						0.3	
Approach LOS		A			A						A	
Queue Length 50th (ft)		18	0	50	65							0
Queue Length 95th (ft)		32	m0	153	37							0
Internal Link Dist (ft)		882			183			521			348	
Turn Bay Length (ft)												
Base Capacity (vph)		3547	1148	612	3477							1580
Starvation Cap Reductn		0	0	0	0							0
Spillback Cap Reductn		0	0	0	0							0
Storage Cap Reductn		0	0	0	0							0
Reduced v/c Ratio		0.36	0.13	0.52	0.45							0.23

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 57 (48%), Referenced to phase 2:EBWB and 6:, Start of Green

Natural Cycle: 40

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.53

Intersection Signal Delay: 2.9

Intersection LOS: A

Intersection Capacity Utilization 51.0%

ICU Level of Service A

Analysis Period (min) 15

Description: 05-2153

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: I-540 EB On-Ramp/I-540 EB Off-Ramp & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↕↕			↕↕↕	↕↔		↕↔	↕↕↕			
Traffic Volume (vph)	487	1053	0	0	1689	791	84	5	342	0	0	0
Future Volume (vph)	487	1053	0	0	1689	791	84	5	342	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		-1%			1%			2%			0%	
Storage Length (ft)	500		0	0		0	0		400	0		0
Storage Lanes	1		0	0		1	0		2	0		0
Taper Length (ft)	200			25			25			25		
Satd. Flow (prot)	3384	5012	0	0	4963	1545	0	1695	2655	0	0	0
Flt Permitted	0.950							0.955				
Satd. Flow (perm)	3384	5012	0	0	4963	1545	0	1695	2655	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						650			193			
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		803			1134			793			417	
Travel Time (s)		12.2			17.2			15.4			8.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	6%	6%	6%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	535	1157	0	0	1856	869	0	97	376	0	0	0
Turn Type	Prot	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			4				
Permitted Phases					6	4		4				
Detector Phase	5	2			6	6	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0	12.0			12.0	12.0	7.0	7.0	7.0			
Minimum Split (s)	15.0	20.0			20.0	20.0	15.0	15.0	15.0			
Total Split (s)	25.0	85.0			60.0	60.0	35.0	35.0	35.0			
Total Split (%)	20.8%	70.8%			50.0%	50.0%	29.2%	29.2%	29.2%			
Yellow Time (s)	3.3	4.6			4.4	4.4	3.7	3.7	3.7			
All-Red Time (s)	3.0	1.3			1.4	1.4	2.5	2.5	2.5			
Lost Time Adjust (s)	-1.3	-0.9			-0.8	-0.8		-1.2	-1.2			
Total Lost Time (s)	5.0	5.0			5.0	5.0		5.0	5.0			
Lead/Lag	Lag				Lead	Lead						
Lead-Lag Optimize?	Yes				Yes	Yes						
Recall Mode	None	C-Max			C-Max	C-Max	None	None	None			
Act Effct Green (s)	20.0	96.1			71.1	71.1		13.9	13.9			
Actuated g/C Ratio	0.17	0.80			0.59	0.59		0.12	0.12			
v/c Ratio	0.95	0.29			0.63	0.74		0.50	0.79			
Control Delay	68.2	3.4			10.0	7.0		57.3	36.6			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	68.2	3.4			10.0	7.0		57.3	36.6			
LOS	E	A			B	A		E	D			
Approach Delay		23.9			9.1			40.8				
Approach LOS		C			A			D				
Queue Length 50th (ft)	210	52			354	385		72	78			
Queue Length 95th (ft)	#309	124			198	712		121	132			
Internal Link Dist (ft)		723			1054			713			337	
Turn Bay Length (ft)	500								400			
Base Capacity (vph)	564	4014			2941	1180		423	808			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.95	0.29			0.63	0.74		0.23	0.47			

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 32 (27%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.95

Intersection Signal Delay: 17.3

Intersection LOS: B

Intersection Capacity Utilization 81.2%

ICU Level of Service D

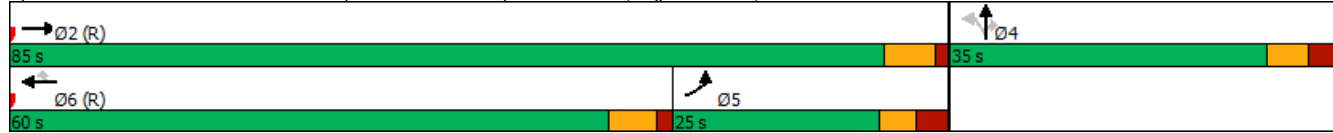
Analysis Period (min) 15

Description: 05-2152

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 3: I-540 WB Off-Ramp/I-540 WB On-Ramp & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (vph)	141	1090	57	5	19	2082	51	289	6	64	39	9	27
Future Volume (vph)	141	1090	57	5	19	2082	51	289	6	64	39	9	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		-1%				1%			3%				0%
Storage Length (ft)	300		125		200		200	200		100	325		150
Storage Lanes	2		1		1		1	2		1	1		1
Taper Length (ft)	250				100			100			100		
Satd. Flow (prot)	3320	4918	1531	0	1710	4915	1530	3382	1835	1560	3213	1532	1408
Flt Permitted	0.950				0.950			0.950			0.950		
Satd. Flow (perm)	3320	4918	1531	0	1710	4915	1530	3382	1835	1539	3202	1532	1408
Right Turn on Red			Yes				Yes			Yes			Yes
Satd. Flow (RTOR)			94				95			153			150
Link Speed (mph)		45				45			35				35
Link Distance (ft)		1134				1230			476				550
Travel Time (s)		17.2				18.6			9.3				10.7
Confl. Peds. (#/hr)										1	1		
Confl. Bikes (#/hr)													
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	6%	6%	6%	5%	5%	5%	5%	2%	2%	2%	9%	9%	9%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)													
Mid-Block Traffic (%)		0%				0%			0%				0%
Shared Lane Traffic (%)													35%
Lane Group Flow (vph)	150	1160	61	0	25	2215	54	307	6	68	41	20	19
Turn Type	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2	3	1	1	6	7	3	8	1	7	4	5
Permitted Phases			2			6				8			4
Detector Phase	5	2	3	1	1	6	7	3	8	1	7	4	5
Switch Phase													
Minimum Initial (s)	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	15.0	20.0	15.0	15.0	15.0	20.0	16.0	15.0	15.0	15.0	16.0	15.0	15.0
Total Split (s)	17.0	68.0	20.0	17.0	17.0	68.0	16.0	20.0	19.0	17.0	16.0	15.0	17.0
Total Split (%)	14.2%	56.7%	16.7%	14.2%	14.2%	56.7%	13.3%	16.7%	15.8%	14.2%	13.3%	12.5%	14.2%
Yellow Time (s)	3.6	4.6	3.8	3.4	3.4	4.4	4.1	3.8	3.6	3.4	4.1	3.8	3.6
All-Red Time (s)	3.0	1.7	3.0	3.0	3.0	1.6	3.0	3.0	3.0	3.0	3.0	3.1	3.0
Lost Time Adjust (s)	-1.6	-1.3	-1.8		-1.4	-1.0	-2.1	-1.8	-1.6	-1.4	-2.1	-1.9	-1.6
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag	Lag	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None	None	None	None	None	None
Act Effct Green (s)	10.8	74.8	96.6		11.3	72.6	94.4	15.7	9.7	14.1	16.8	9.2	14.6
Actuated g/C Ratio	0.09	0.62	0.80		0.09	0.60	0.79	0.13	0.08	0.12	0.14	0.08	0.12
v/c Ratio	0.50	0.38	0.05		0.16	0.74	0.04	0.69	0.04	0.21	0.09	0.16	0.06
Control Delay	64.3	6.1	0.4		51.9	20.6	0.4	58.7	49.8	1.5	44.7	37.3	0.4
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.3	6.1	0.4		51.9	20.6	0.4	58.7	49.8	1.5	44.7	37.3	0.4
LOS	E	A	A		D	C	A	E	D	A	D	D	A
Approach Delay		12.2				20.4			48.4				32.3
Approach LOS		B				C			D				C
Queue Length 50th (ft)	61	41	0		18	393	0	115	4	0	14	7	0
Queue Length 95th (ft)	86	122	0		46	596	3	169	18	0	34	34	0
Internal Link Dist (ft)		1054				1150			396				470
Turn Bay Length (ft)	300		125		200		200	200		100	325		150
Base Capacity (vph)	332	3066	1241		171	2974	1229	450	215	326	461	136	315
Starvation Cap Reductn	0	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.38	0.05		0.15	0.74	0.04	0.68	0.03	0.21	0.09	0.15	0.06

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Legacy Oaks
 4: Hinton Oaks Boulevard & US 64 Bus (Knightdale Blvd.)

Build-Out + 1 AM (2024)
 03/30/2020

Offset: 2 (2%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.74
 Intersection Signal Delay: 20.5 Intersection LOS: C
 Intersection Capacity Utilization 73.5% ICU Level of Service D
 Analysis Period (min) 15
 Description: 05-2267
 ! Phase conflict between lane groups.

Splits and Phases: 4: Hinton Oaks Boulevard & US 64 Bus (Knightdale Blvd.)



Legacy Oaks
5: Hodge Road & Sam's Xpress Driveway/Legacy Oaks Drive South

Build-Out + 1 AM (2024)
03/30/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕		↕	↕		↕	↕	
Traffic Volume (vph)	4	4	8	121	4	4	46	134	109	4	292	10
Future Volume (vph)	4	4	8	121	4	4	46	134	109	4	292	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			1%	
Storage Length (ft)	0		0	100		0	70		0	150		350
Storage Lanes	0		0	1		0	1		0	1		1
Taper Length (ft)	25			100			100			80		
Satd. Flow (prot)	0	1710	0	1770	1723	0	1770	3302	0	1761	5035	0
Flt Permitted		0.988		0.950			0.950			0.950		
Satd. Flow (perm)	0	1710	0	1770	1723	0	1770	3302	0	1761	5035	0
Link Speed (mph)		30			30			30			25	
Link Distance (ft)		171			365			524			266	
Travel Time (s)		3.9			8.3			11.9			7.3	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	21	0	159	10	0	61	319	0	5	397	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	33.9%
ICU Level of Service	A
Analysis Period (min)	15

Intersection												
Int Delay, s/veh	4.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕		↕	↕		↕	↕↕	
Traffic Vol, veh/h	4	4	8	121	4	4	46	134	109	4	292	10
Future Vol, veh/h	4	4	8	121	4	4	46	134	109	4	292	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	100	-	-	70	-	-	150	-	350
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	1	-
Peak Hour Factor	76	76	76	76	76	76	76	76	76	76	76	76
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	5	11	159	5	5	61	176	143	5	384	13

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	614	842	199	536	777	160	397	0	0	319	0	0
Stage 1	401	401	-	370	370	-	-	-	-	-	-	-
Stage 2	213	441	-	166	407	-	-	-	-	-	-	-
Critical Hdwy	6.99	6.54	7.14	6.99	6.54	6.94	5.34	-	-	4.14	-	-
Critical Hdwy Stg 1	7.34	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4.02	3.92	3.67	4.02	3.32	3.12	-	-	2.22	-	-
Pot Cap-1 Maneuver	401	299	688	450	327	857	757	-	-	1238	-	-
Stage 1	528	599	-	601	619	-	-	-	-	-	-	-
Stage 2	741	575	-	781	596	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	368	274	688	409	299	857	757	-	-	1238	-	-
Mov Cap-2 Maneuver	368	274	-	409	299	-	-	-	-	-	-	-
Stage 1	485	597	-	552	569	-	-	-	-	-	-	-
Stage 2	671	528	-	759	594	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.8	18.9	1.6	0.1
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	757	-	-	431	409	443	1238	-	-
HCM Lane V/C Ratio	0.08	-	-	0.049	0.389	0.024	0.004	-	-
HCM Control Delay (s)	10.2	-	-	13.8	19.3	13.3	7.9	-	-
HCM Lane LOS	B	-	-	B	C	B	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	0.2	1.8	0.1	0	-	-

Legacy Oaks
6: Hodge Road & Legacy Oaks Drive North

Build-Out + 1 AM (2024)
03/30/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	4	42	46	4	4	9	87	11	4	218	4
Future Volume (vph)	4	4	42	46	4	4	9	87	11	4	218	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%				0%		0%				1%	
Storage Length (ft)	0		0	100		0	0		0	100		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			100			25			100		
Satd. Flow (prot)	1770	1863	1583	1770	1723	0	1770	1831	0	1761	1848	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1863	1583	1770	1723	0	1770	1831	0	1761	1848	0
Link Speed (mph)		30			30			30			25	
Link Distance (ft)		258			326			504			286	
Travel Time (s)		5.9			7.4			11.5			7.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	5	49	54	10	0	11	115	0	5	261	0
Sign Control	Stop				Stop				Stop		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	28.4%
ICU Level of Service	A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	10.1
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↑	↔	↔	↔		↔	↔		↔	↔	
Traffic Vol, veh/h	4	4	42	46	4	4	9	87	11	4	218	4
Future Vol, veh/h	4	4	42	46	4	4	9	87	11	4	218	4
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	5	49	54	5	5	11	102	13	5	256	5
Number of Lanes	1	1	1	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	3	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	3	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	3
HCM Control Delay	8.4	9.5	9.3	11
HCM LOS	A	A	A	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	100%	0%	100%	0%
Vol Thru, %	0%	89%	0%	100%	0%	0%	50%	0%	98%
Vol Right, %	0%	11%	0%	0%	100%	0%	50%	0%	2%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	9	98	4	4	42	46	8	4	222
LT Vol	9	0	4	0	0	46	0	4	0
Through Vol	0	87	0	4	0	0	4	0	218
RT Vol	0	11	0	0	42	0	4	0	4
Lane Flow Rate	11	115	5	5	49	54	9	5	261
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.018	0.172	0.008	0.008	0.07	0.094	0.014	0.007	0.374
Departure Headway (Hd)	5.956	5.375	6.308	5.804	5.098	6.286	5.427	5.671	5.158
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	599	664	565	613	697	567	655	630	695
Service Time	3.712	3.131	4.078	3.574	2.868	4.057	3.198	3.418	2.904
HCM Lane V/C Ratio	0.018	0.173	0.009	0.008	0.07	0.095	0.014	0.008	0.376
HCM Control Delay	8.8	9.3	9.1	8.6	8.3	9.7	8.3	8.5	11
HCM Lane LOS	A	A	A	A	A	A	A	A	B
HCM 95th-tile Q	0.1	0.6	0	0	0.2	0.3	0	0	1.7



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↖	↕	↗	↖	↖
Traffic Volume (vph)	0	4	134	15	0	306
Future Volume (vph)	0	4	134	15	0	306
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			1%
Storage Length (ft)	0	0		0	0	
Storage Lanes	0	1		0	0	
Taper Length (ft)	25				25	
Satd. Flow (prot)	0	1611	3486	0	0	3522
Flt Permitted						
Satd. Flow (perm)	0	1611	3486	0	0	3522
Link Speed (mph)	30		30			25
Link Distance (ft)	215		266			209
Travel Time (s)	4.9		6.0			5.7
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	4	166	0	0	340
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	14.2%
ICU Level of Service	A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↑	↑↓			↑↑
Traffic Vol, veh/h	0	4	134	15	0	306
Future Vol, veh/h	0	4	134	15	0	306
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	1
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	4	149	17	0	340
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	-	83	0	0	-	
Stage 1	-	-	-	-	-	
Stage 2	-	-	-	-	-	
Critical Hdwy	-	6.94	-	-	-	
Critical Hdwy Stg 1	-	-	-	-	-	
Critical Hdwy Stg 2	-	-	-	-	-	
Follow-up Hdwy	-	3.32	-	-	-	
Pot Cap-1 Maneuver	0	960	-	-	0	
Stage 1	0	-	-	-	0	
Stage 2	0	-	-	-	0	
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	-	960	-	-	-	
Mov Cap-2 Maneuver	-	-	-	-	-	
Stage 1	-	-	-	-	-	
Stage 2	-	-	-	-	-	
Approach	WB	NB		SB		
HCM Control Delay, s	8.8	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT		
Capacity (veh/h)	-	-	960	-		
HCM Lane V/C Ratio	-	-	0.005	-		
HCM Control Delay (s)	-	-	8.8	-		
HCM Lane LOS	-	-	A	-		
HCM 95th %tile Q(veh)	-	-	0	-		



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↖	↕	↗	↖	↕
Traffic Volume (vph)	0	4	120	14	0	306
Future Volume (vph)	0	4	120	14	0	306
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			1%
Storage Length (ft)	0	0		0	0	
Storage Lanes	0	1		0	0	
Taper Length (ft)	25				25	
Satd. Flow (prot)	0	1611	3483	0	0	3522
Flt Permitted						
Satd. Flow (perm)	0	1611	3483	0	0	3522
Link Speed (mph)	30		30			25
Link Distance (ft)	193		209			272
Travel Time (s)	4.4		4.8			7.4
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	4	149	0	0	340
Sign Control	Stop		Free			Free

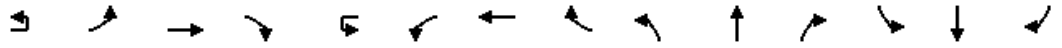
Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	13.8%
ICU Level of Service	A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↑	↑↑			↑↑
Traffic Vol, veh/h	0	4	120	14	0	306
Future Vol, veh/h	0	4	120	14	0	306
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	1
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	4	133	16	0	340
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	-	75	0	0	-	
Stage 1	-	-	-	-	-	
Stage 2	-	-	-	-	-	
Critical Hdwy	-	6.94	-	-	-	
Critical Hdwy Stg 1	-	-	-	-	-	
Critical Hdwy Stg 2	-	-	-	-	-	
Follow-up Hdwy	-	3.32	-	-	-	
Pot Cap-1 Maneuver	0	971	-	-	0	
Stage 1	0	-	-	-	0	
Stage 2	0	-	-	-	0	
Platoon blocked, %	-	-	-	-	-	
Mov Cap-1 Maneuver	-	971	-	-	-	
Mov Cap-2 Maneuver	-	-	-	-	-	
Stage 1	-	-	-	-	-	
Stage 2	-	-	-	-	-	
Approach	WB	NB		SB		
HCM Control Delay, s	8.7	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT		
Capacity (veh/h)	-	-	971	-		
HCM Lane V/C Ratio	-	-	0.005	-		
HCM Control Delay (s)	-	-	8.7	-		
HCM Lane LOS	-	-	A	-		
HCM 95th %tile Q(veh)	-	-	0	-		

Legacy Oaks
1: Hodge Road & US 64 Bus (Knightdale Blvd.)

Build-Out + 1 PM (2024)
03/30/2020



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations														
Traffic Volume (vph)	7	146	1698	319	21	407	1110	347	115	42	241	263	84	125
Future Volume (vph)	7	146	1698	319	21	407	1110	347	115	42	241	263	84	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)			3%				-3%			-2%				1%
Storage Length (ft)		200		225		600		375	200		50	0		0
Storage Lanes		3		1		1		1	1		1	2		1
Taper Length (ft)		300				150			100			100		
Satd. Flow (prot)	0	3382	5009	1560	0	1796	5162	1607	3467	1641	0	3416	1853	1575
Flt Permitted		0.950				0.950			0.950			0.950		
Satd. Flow (perm)	0	3382	5009	1560	0	1796	5162	1607	3467	1641	0	3416	1853	1575
Right Turn on Red				Yes				Yes			Yes			Yes
Satd. Flow (RTOR)				169				358		173				182
Link Speed (mph)			45				45			35				25
Link Distance (ft)			734				962			450				524
Travel Time (s)			11.1				14.6			8.8				14.3
Confl. Peds. (#/hr)														
Confl. Bikes (#/hr)														
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)														
Mid-Block Traffic (%)			0%				0%			0%				0%
Shared Lane Traffic (%)														
Lane Group Flow (vph)	0	158	1751	329	0	442	1144	358	119	291	0	271	87	129
Turn Type	Prot	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5!	5	2	3	1	1	6	7	3	8		7	4	5!
Permitted Phases				2				6						4
Detector Phase	5	5	2	3	1	1	6	7	3	8		7	4	5
Switch Phase														
Minimum Initial (s)	7.0	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	15.0	15.0	19.0	15.0	15.0	15.0	20.0	15.0	15.0	16.0		15.0	15.0	15.0
Total Split (s)	20.0	20.0	55.0	25.0	45.0	45.0	80.0	15.0	25.0	25.0		15.0	15.0	20.0
Total Split (%)	14.3%	14.3%	39.3%	17.9%	32.1%	32.1%	57.1%	10.7%	17.9%	17.9%		10.7%	10.7%	14.3%
Yellow Time (s)	3.0	3.0	4.3	3.0	3.0	3.0	4.8	3.0	3.0	4.0		3.0	3.1	3.0
All-Red Time (s)	3.9	3.9	1.7	3.9	3.5	3.5	1.7	3.9	3.9	3.1		3.9	3.7	3.9
Lost Time Adjust (s)		-1.9	-1.0	-1.9		-1.5	-1.5	-1.9	-1.9	-2.1		-1.9	-1.8	-1.9
Total Lost Time (s)		5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lead	Lead	Lag	Lag	Lag	Lead	Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None	C-Max	None	None	None	C-Max	None	None	None		None	None	None
Act Effct Green (s)		13.3	53.4	67.7		40.0	80.1	95.1	14.3	16.6		10.0	12.3	30.6
Actuated g/C Ratio		0.10	0.38	0.48		0.29	0.57	0.68	0.10	0.12		0.07	0.09	0.22
v/c Ratio		0.49	0.92	0.39		0.86	0.39	0.30	0.34	0.84		1.11	0.54	0.27
Control Delay		65.2	50.2	7.5		47.2	7.4	0.6	59.9	44.8		147.9	73.8	2.8
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay		65.2	50.2	7.5		47.2	7.4	0.6	59.9	44.8		147.9	73.8	2.8
LOS		E	D	A		D	A	A	E	D		F	E	A
Approach Delay			45.0				15.2			49.2				96.2
Approach LOS			D				B			D				F
Queue Length 50th (ft)		71	568	55		390	88	0	53	106		-145	75	0
Queue Length 95th (ft)		108	#689	101		#568	103	1	81	#231		#240	#157	15
Internal Link Dist (ft)			654				882			370				444
Turn Bay Length (ft)		200		225		600		375	200					
Base Capacity (vph)		362	1910	898		513	2952	1206	495	382		244	163	503
Starvation Cap Reductn		0	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn		0	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn		0	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio		0.44	0.92	0.37		0.86	0.39	0.30	0.24	0.76		1.11	0.53	0.26

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 84 (60%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.11

Intersection Signal Delay: 38.8 Intersection LOS: D

Intersection Capacity Utilization 97.8% ICU Level of Service F

Analysis Period (min) 15

Description: 05-0928

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

! Phase conflict between lane groups.

Splits and Phases: 1: Hodge Road & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↓	↑↑							↑
Traffic Volume (vph)	0	2144	95	202	1284	0	0	0	0	0	0	624
Future Volume (vph)	0	2144	95	202	1284	0	0	0	0	0	0	624
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		1%			-1%			0%			2%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	5060	1575	1778	3557	0	0	0	0	0	0	1564
Flt Permitted				0.059								
Satd. Flow (perm)	0	5060	1575	110	3557	0	0	0	0	0	0	1564
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			97									196
Link Speed (mph)		45		45			35				35	
Link Distance (ft)		962		263			601				428	
Travel Time (s)		14.6		4.0			11.7				8.3	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	4%	4%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%		0%			0%				0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2188	97	206	1310	0	0	0	0	0	0	637
Turn Type		NA	Perm	D.P+P	NA							Free
Protected Phases		2		7	2							
Permitted Phases			2	2								Free
Detector Phase		2	2	7	2							
Switch Phase												
Minimum Initial (s)		12.0	12.0	7.0								
Minimum Split (s)		19.0	19.0	15.0								
Total Split (s)		100.0	100.0	40.0								
Total Split (%)		71.4%	71.4%	28.6%								
Yellow Time (s)		4.4	4.4	3.0								
All-Red Time (s)		1.6	1.6	3.1								
Lost Time Adjust (s)		-1.0	-1.0	-1.1								
Total Lost Time (s)		5.0	5.0	5.0								
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max	None								
Act Effct Green (s)		103.4	103.4	130.0	140.0							140.0
Actuated g/C Ratio		0.74	0.74	0.93	1.00							1.00
v/c Ratio		0.59	0.08	0.49	0.37							0.41
Control Delay		6.5	1.0	51.6	2.4							0.8
Queue Delay		0.0	0.0	0.0	0.0							0.0
Total Delay		6.5	1.0	51.6	2.4							0.8
LOS		A	A	D	A							A
Approach Delay		6.3			9.0						0.8	
Approach LOS		A			A						A	
Queue Length 50th (ft)		142	2	135	81							0
Queue Length 95th (ft)		m236	m3	212	29							0
Internal Link Dist (ft)		882			183			521			348	
Turn Bay Length (ft)												
Base Capacity (vph)		3737	1188	522	3544							1564
Starvation Cap Reductn		0	0	0	0							0
Spillback Cap Reductn		0	0	0	0							0
Storage Cap Reductn		0	0	0	0							0
Reduced v/c Ratio		0.59	0.08	0.39	0.37							0.41

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 72 (51%), Referenced to phase 2:EBWB and 6:, Start of Green

Natural Cycle: 40

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.59

Intersection Signal Delay: 6.4

Intersection LOS: A

Intersection Capacity Utilization 109.6%

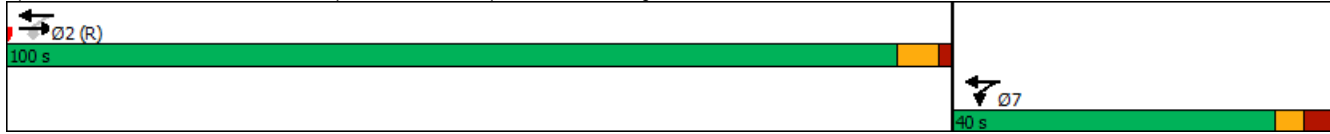
ICU Level of Service H

Analysis Period (min) 15

Description: 05-2153

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: I-540 EB On-Ramp/I-540 EB Off-Ramp & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↕↕			↕↕↕	↕↔		↕↔	↕↕↕			
Traffic Volume (vph)	417	2722	0	0	1372	524	120	4	648	0	0	0
Future Volume (vph)	417	2722	0	0	1372	524	120	4	648	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		-1%			1%			2%			0%	
Storage Length (ft)	500		0	0		0	0		400	0		0
Storage Lanes	1		0	0		1	0		2	0		0
Taper Length (ft)	200			25			25			25		
Satd. Flow (prot)	3450	5111	0	0	5060	1575	0	1759	2759	0	0	0
Flt Permitted	0.950							0.954				
Satd. Flow (perm)	3450	5111	0	0	5060	1575	0	1759	2759	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						546			71			
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		803			1134			793			417	
Travel Time (s)		12.2			17.2			15.4			8.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	434	2835	0	0	1429	546	0	129	675	0	0	0
Turn Type	Prot	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			4				
Permitted Phases					6	4		4				
Detector Phase	5	2			6	6	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0	12.0			12.0	12.0	7.0	7.0	7.0			
Minimum Split (s)	15.0	20.0			20.0	20.0	15.0	15.0	15.0			
Total Split (s)	30.0	100.0			70.0	70.0	40.0	40.0	40.0			
Total Split (%)	21.4%	71.4%			50.0%	50.0%	28.6%	28.6%	28.6%			
Yellow Time (s)	3.3	4.6			4.4	4.4	3.7	3.7	3.7			
All-Red Time (s)	3.0	1.3			1.4	1.4	2.5	2.5	2.5			
Lost Time Adjust (s)	-1.3	-0.9			-0.8	-0.8	-1.2	-1.2	-1.2			
Total Lost Time (s)	5.0	5.0			5.0	5.0	5.0	5.0	5.0			
Lead/Lag	Lag				Lead	Lead						
Lead-Lag Optimize?	Yes				Yes	Yes						
Recall Mode	None	C-Max			C-Max	C-Max	None	None	None			
Act Effct Green (s)	25.0	96.4			66.4	66.4		33.6	33.6			
Actuated g/C Ratio	0.18	0.69			0.47	0.47		0.24	0.24			
v/c Ratio	0.70	0.81			0.60	0.53		0.31	0.94			
Control Delay	47.2	5.9			12.4	2.2		45.4	68.6			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	47.2	5.9			12.4	2.2		45.4	68.6			
LOS	D	A			B	A		D	E			
Approach Delay		11.4			9.6			64.9				
Approach LOS		B			A			E				
Queue Length 50th (ft)	209	122			175	0		96	310			
Queue Length 95th (ft)	257	127			109	m4		157	#434			
Internal Link Dist (ft)		723			1054			713			337	
Turn Bay Length (ft)	500								400			
Base Capacity (vph)	616	3518			2398	1033		439	743			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.70	0.81			0.60	0.53		0.29	0.91			

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 68 (49%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.94

Intersection Signal Delay: 17.9

Intersection LOS: B

Intersection Capacity Utilization 83.6%

ICU Level of Service E

Analysis Period (min) 15

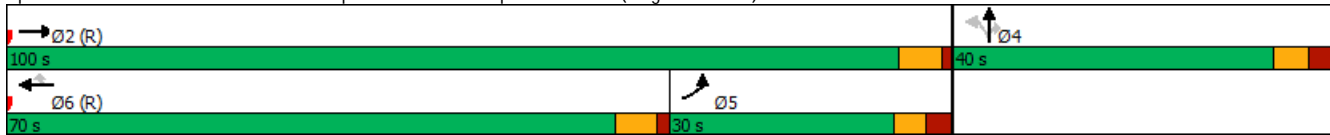
Description: 05-2152

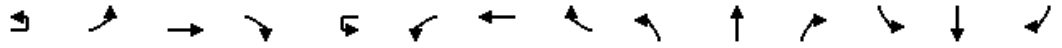
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: I-540 WB Off-Ramp/I-540 WB On-Ramp & US 64 Bus (Knightdale Blvd.)





Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations														
Traffic Volume (vph)	26	428	2533	171	6	37	1543	75	125	28	61	133	14	97
Future Volume (vph)	26	428	2533	171	6	37	1543	75	125	28	61	133	14	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)			-1%				1%			3%				0%
Storage Length (ft)		300		125		200		200	200		100	325		150
Storage Lanes		2		1		1		1	2		1	1		1
Taper Length (ft)		250				100			100			100		
Satd. Flow (prot)	0	3450	5111	1591	0	1761	5060	1575	3382	1835	1560	3433	1570	1504
Flt Permitted		0.950				0.950			0.950			0.950		
Satd. Flow (perm)	0	3450	5111	1591	0	1761	5060	1575	3382	1835	1560	3433	1570	1504
Right Turn on Red				Yes				Yes			Yes			Yes
Satd. Flow (RTOR)				88				81			130			126
Link Speed (mph)			45				45			35				35
Link Distance (ft)			1134				1230			476				550
Travel Time (s)			17.2				18.6			9.3				10.7
Confl. Peds. (#/hr)														
Confl. Bikes (#/hr)														
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)														
Mid-Block Traffic (%)			0%				0%			0%				0%
Shared Lane Traffic (%)														44%
Lane Group Flow (vph)	0	478	2666	180	0	45	1624	79	132	29	64	140	60	57
Turn Type	Prot	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5!	5	2	3	1!	1	6	7	3	8	1!	7	4	5!
Permitted Phases				2				6				8		4
Detector Phase	5	5	2	3	1	1	6	7	3	8	1	7	4	5
Switch Phase														
Minimum Initial (s)	7.0	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	15.0	15.0	20.0	15.0	15.0	15.0	20.0	16.0	15.0	15.0	15.0	16.0	15.0	15.0
Total Split (s)	28.0	28.0	80.0	20.0	20.0	20.0	72.0	20.0	20.0	20.0	20.0	20.0	20.0	28.0
Total Split (%)	20.0%	20.0%	57.1%	14.3%	14.3%	14.3%	51.4%	14.3%	14.3%	14.3%	14.3%	14.3%	14.3%	20.0%
Yellow Time (s)	3.6	3.6	4.6	3.8	3.4	3.4	4.4	4.1	3.8	3.6	3.4	4.1	3.8	3.6
All-Red Time (s)	3.0	3.0	1.7	3.0	3.0	3.0	1.6	3.0	3.0	3.0	3.0	3.0	3.1	3.0
Lost Time Adjust (s)		-1.6	-1.3	-1.8			-1.4	-1.0	-2.1	-1.8	-1.6	-1.4	-2.1	-1.9
Total Lost Time (s)		5.0	5.0	5.0			5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	C-Max	None	None	None	C-Max	None	None	None	None	None	None	None
Act Effct Green (s)		23.0	92.6	111.2		10.0	76.9	97.7	12.6	9.7	16.2	15.8	10.3	31.5
Actuated g/C Ratio		0.16	0.66	0.79		0.07	0.55	0.70	0.09	0.07	0.12	0.11	0.07	0.22
v/c Ratio		0.84	0.79	0.14		0.36	0.58	0.07	0.44	0.23	0.22	0.36	0.38	0.13
Control Delay		54.9	14.0	1.1		69.6	23.1	1.9	64.5	65.5	1.7	60.2	30.4	0.6
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		54.9	14.0	1.1		69.6	23.1	1.9	64.5	65.5	1.7	60.2	30.4	0.6
LOS		D	B	A		E	C	A	E	E	A	E	C	A
Approach Delay			19.2				23.3			46.8				40.0
Approach LOS			B				C			D				D
Queue Length 50th (ft)		209	294	5		40	360	0	59	26	0	63	13	0
Queue Length 95th (ft)		m#287	706	m15		81	449	18	92	59	0	96	63	0
Internal Link Dist (ft)			1054				1150			396			470	
Turn Bay Length (ft)		300		125		200		200	200		100	325		150
Base Capacity (vph)		566	3381	1296		188	2779	1107	362	196	347	424	208	436
Starvation Cap Reductn		0	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.84	0.79	0.14		0.24	0.58	0.07	0.36	0.15	0.18	0.33	0.29	0.13

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 78 (56%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 22.6

Intersection LOS: C

Intersection Capacity Utilization 83.1%

ICU Level of Service E

Analysis Period (min) 15

Description: 05-2267

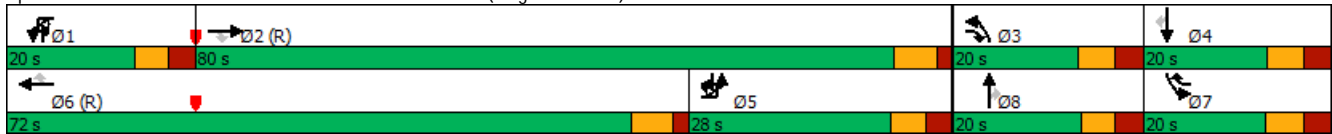
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

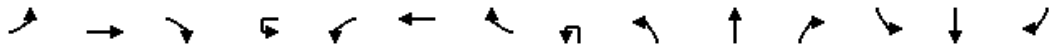
! Phase conflict between lane groups.

Splits and Phases: 4: Hinton Oaks Boulevard & US 64 Bus (Knightdale Blvd.)



Legacy Oaks
 5: Hodge Road & Sam's Xpress Driveway/Legacy Oaks Drive South

Build-Out + 1 PM (2024)
 03/30/2020



Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔			↔	↔		↔	↔↔	
Traffic Volume (vph)	4	4	13	9	134	4	4	9	112	323	101	4	182	4
Future Volume (vph)	4	4	13	9	134	4	4	9	112	323	101	4	182	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%				0%				0%				1%
Storage Length (ft)	0		0		100		0		70		0	150		350
Storage Lanes	0		0		1		0		1		0	1		1
Taper Length (ft)	25				100				100			80		
Satd. Flow (prot)	0	1687	0	0	1770	1723	0	0	1687	3252	0	1761	5045	0
Flt Permitted		0.991			0.950				0.950			0.950		
Satd. Flow (perm)	0	1687	0	0	1770	1723	0	0	1687	3252	0	1761	5045	0
Link Speed (mph)		30				30				30			25	
Link Distance (ft)		171				365				524			265	
Travel Time (s)		3.9				8.3				11.9			7.2	
Confl. Peds. (#/hr)			1		1									
Confl. Bikes (#/hr)														
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	7%	7%	7%	7%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)														
Mid-Block Traffic (%)		0%				0%				0%			0%	
Shared Lane Traffic (%)														
Lane Group Flow (vph)	0	22	0	0	150	8	0	0	127	446	0	4	196	0
Sign Control		Stop				Stop				Free			Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	40.1%
ICU Level of Service	A
Analysis Period (min)	15

Intersection														
Int Delay, s/veh	6.2													
Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔			↔	↔		↔	↔↔	
Traffic Vol, veh/h	4	4	13	9	134	4	4	9	112	323	101	4	182	4
Future Vol, veh/h	4	4	13	9	134	4	4	9	112	323	101	4	182	4
Conflicting Peds, #/hr	0	0	1	0	1	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	-	None	-	-	-	None	-	-	None
Storage Length	-	-	-	-	100	-	-	-	70	-	-	150	-	350
Veh in Median Storage, #	-	0	-	-	-	0	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	-	0	-	-	-	0	-	-	1	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	7	7	7	7	2	2	2
Mvmt Flow	4	4	14	9	141	4	4	9	118	340	106	4	192	4
Major/Minor	Minor2			Minor1			Major1			Major2				
Conflicting Flow All	628	902	99	0	735	851	223	143	196	0	0	446	0	0
Stage 1	202	202	-	0	647	647	-	-	-	-	-	-	-	-
Stage 2	426	700	-	0	88	204	-	-	-	-	-	-	-	-
Critical Hdwy	6.99	6.54	7.14	-	6.99	6.54	6.94	5.74	5.44	-	-	4.14	-	-
Critical Hdwy Stg 1	7.34	5.54	-	-	6.54	5.54	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	-	6.74	5.54	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4.02	3.92	-	3.67	4.02	3.32	2.37	3.17	-	-	2.22	-	-
Pot Cap-1 Maneuver	392	276	796	0	335	296	780	1267	920	-	-	1111	-	-
Stage 1	719	733	-	0	414	465	-	-	-	-	-	-	-	-
Stage 2	558	440	-	0	870	732	-	-	-	-	-	-	-	-
Platoon blocked, %				-						-	-		-	-
Mov Cap-1 Maneuver	344	238	795	0	290	255	780	938	938	-	-	1111	-	-
Mov Cap-2 Maneuver	344	238	-	0	290	255	-	-	-	-	-	-	-	-
Stage 1	622	730	-	0	358	402	-	-	-	-	-	-	-	-
Stage 2	475	381	-	0	846	729	-	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB				
HCM Control Delay, s	13.1			27.8			2.1			0.2				
HCM LOS	B			D										
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR					
Capacity (veh/h)	938	-	-	469	290	384	1111	-	-					
HCM Lane V/C Ratio	0.136	-	-	0.047	0.486	0.022	0.004	-	-					
HCM Control Delay (s)	9.4	-	-	13.1	28.6	14.6	8.3	-	-					
HCM Lane LOS	A	-	-	B	D	B	A	-	-					
HCM 95th %tile Q(veh)	0.5	-	-	0.1	2.5	0.1	0	-	-					

Legacy Oaks
6: Hodge Road & Legacy Oaks Drive North

Build-Out + 1 PM (2024)
03/30/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	4	27	19	4	4	30	223	21	4	133	4
Future Volume (vph)	4	4	27	19	4	4	30	223	21	4	133	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%				0%				0%		1%	
Storage Length (ft)	0		0	100		0	0		0	100		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			100			25			100		
Satd. Flow (prot)	1770	1863	1583	1770	1723	0	1687	1753	0	1761	1846	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1863	1583	1770	1723	0	1687	1753	0	1761	1846	0
Link Speed (mph)		30			30			30			25	
Link Distance (ft)		258			326			504			286	
Travel Time (s)		5.9			7.4			11.5			7.8	
Confl. Peds. (#/hr)			1	1								
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	7%	7%	7%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	4	4	29	20	8	0	32	263	0	4	147	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 34.1% ICU Level of Service A

Analysis Period (min) 15

Intersection	
Intersection Delay, s/veh	10
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↑	↔	↔	↔		↔	↔		↔	↔	
Traffic Vol, veh/h	4	4	27	19	4	4	30	223	21	4	133	4
Future Vol, veh/h	4	4	27	19	4	4	30	223	21	4	133	4
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	2	2	2	2	2	2	7	7	7	2	2	2
Mvmt Flow	4	4	29	20	4	4	32	240	23	4	143	4
Number of Lanes	1	1	1	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	3	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	3	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	3
HCM Control Delay	8.3	9.1	10.6	9.5
HCM LOS	A	A	B	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	100%	0%	100%	0%
Vol Thru, %	0%	91%	0%	100%	0%	0%	50%	0%	97%
Vol Right, %	0%	9%	0%	0%	100%	0%	50%	0%	3%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	30	244	4	4	27	19	8	4	137
LT Vol	30	0	4	0	0	19	0	4	0
Through Vol	0	223	0	4	0	0	4	0	133
RT Vol	0	21	0	0	27	0	4	0	4
Lane Flow Rate	32	262	4	4	29	20	9	4	147
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.051	0.37	0.008	0.007	0.042	0.036	0.013	0.007	0.218
Departure Headway (Hd)	5.642	5.081	6.356	5.852	5.146	6.379	5.52	5.839	5.317
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	635	708	561	609	692	559	645	612	675
Service Time	3.379	2.817	4.114	3.61	2.904	4.142	3.283	3.581	3.058
HCM Lane V/C Ratio	0.05	0.37	0.007	0.007	0.042	0.036	0.014	0.007	0.218
HCM Control Delay	8.7	10.8	9.2	8.7	8.1	9.4	8.4	8.6	9.5
HCM Lane LOS	A	B	A	A	A	A	A	A	A
HCM 95th-ile Q	0.2	1.7	0	0	0.1	0.1	0	0	0.8



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↖	↕	↗		↖
Traffic Volume (vph)	0	4	345	24	0	179
Future Volume (vph)	0	4	345	24	0	179
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			1%
Storage Length (ft)	0	0		0	0	
Storage Lanes	0	1		0	0	
Taper Length (ft)	25				25	
Satd. Flow (prot)	0	1611	3504	0	0	3522
Flt Permitted						
Satd. Flow (perm)	0	1611	3504	0	0	3522
Link Speed (mph)	30		30			25
Link Distance (ft)	215		265			219
Travel Time (s)	4.9		6.0			6.0
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	4	410	0	0	199
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	20.3%
ICU Level of Service	A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↑	↑↑			↑↑
Traffic Vol, veh/h	0	4	345	24	0	179
Future Vol, veh/h	0	4	345	24	0	179
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	1
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	4	383	27	0	199
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	-	205	0	0	-	
Stage 1	-	-	-	-	-	
Stage 2	-	-	-	-	-	
Critical Hdwy	-	6.94	-	-	-	
Critical Hdwy Stg 1	-	-	-	-	-	
Critical Hdwy Stg 2	-	-	-	-	-	
Follow-up Hdwy	-	3.32	-	-	-	
Pot Cap-1 Maneuver	0	802	-	-	0	
Stage 1	0	-	-	-	0	
Stage 2	0	-	-	-	0	
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	-	802	-	-	-	
Mov Cap-2 Maneuver	-	-	-	-	-	
Stage 1	-	-	-	-	-	
Stage 2	-	-	-	-	-	
Approach	WB	NB		SB		
HCM Control Delay, s	9.5	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT		
Capacity (veh/h)	-	-	802	-		
HCM Lane V/C Ratio	-	-	0.006	-		
HCM Control Delay (s)	-	-	9.5	-		
HCM Lane LOS	-	-	A	-		
HCM 95th %tile Q(veh)	-	-	0	-		



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↕			↕
Traffic Volume (vph)	0	4	322	23	0	179
Future Volume (vph)	0	4	322	23	0	179
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			1%
Storage Length (ft)	0	0		0	0	
Storage Lanes	0	1		0	0	
Taper Length (ft)	25				25	
Satd. Flow (prot)	0	1611	3504	0	0	3522
Flt Permitted						
Satd. Flow (perm)	0	1611	3504	0	0	3522
Link Speed (mph)	30		30			25
Link Distance (ft)	193		219			262
Travel Time (s)	4.4		5.0			7.1
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	4	384	0	0	199
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	19.6%
ICU Level of Service	A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↑	↑↑			↑↑
Traffic Vol, veh/h	0	4	322	23	0	179
Future Vol, veh/h	0	4	322	23	0	179
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	1
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	4	358	26	0	199
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	-	192	0	0	-	
Stage 1	-	-	-	-	-	
Stage 2	-	-	-	-	-	
Critical Hdwy	-	6.94	-	-	-	
Critical Hdwy Stg 1	-	-	-	-	-	
Critical Hdwy Stg 2	-	-	-	-	-	
Follow-up Hdwy	-	3.32	-	-	-	
Pot Cap-1 Maneuver	0	817	-	-	0	
Stage 1	0	-	-	-	0	
Stage 2	0	-	-	-	0	
Platoon blocked, %	-	-	-	-	-	
Mov Cap-1 Maneuver	-	817	-	-	-	
Mov Cap-2 Maneuver	-	-	-	-	-	
Stage 1	-	-	-	-	-	
Stage 2	-	-	-	-	-	
Approach	WB	NB		SB		
HCM Control Delay, s	9.4	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT		
Capacity (veh/h)	-	-	817	-		
HCM Lane V/C Ratio	-	-	0.005	-		
HCM Control Delay (s)	-	-	9.4	-		
HCM Lane LOS	-	-	A	-		
HCM 95th %tile Q(veh)	-	-	0	-		

Appendix J:
Synchro Output –
Background (2024) – with Hinton Oaks

Legacy Oaks
1: Hodge Road & US 64 Bus (Knightdale Blvd.)

Background + 1 AM (2024) - with Hinton Oaks

03/30/2020



Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (vph)	37	917	97	14	145	1460	101	438	16	172	101	18	100
Future Volume (vph)	37	917	97	14	145	1460	101	438	16	172	101	18	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		3%				-3%			-2%			1%	
Storage Length (ft)	200		225		600		375	200		50	0		0
Storage Lanes	3		1		1		1	1		1	2		1
Taper Length (ft)	300				150			100			100		
Satd. Flow (prot)	3382	5009	1560	0	1796	5162	1607	3368	1577	0	3350	1818	1545
Flt Permitted	0.950				0.950			0.950			0.950		
Satd. Flow (perm)	3382	5009	1560	0	1796	5162	1607	3368	1577	0	3350	1818	1545
Right Turn on Red			Yes				Yes			Yes			Yes
Satd. Flow (RTOR)			109				163		193				216
Link Speed (mph)		45				45			35			25	
Link Distance (ft)		735				962			450			524	
Travel Time (s)		11.1				14.6			8.8			14.3	
Confl. Peds. (#/hr)													
Confl. Bikes (#/hr)													
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	5%	5%	5%	4%	4%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)													
Mid-Block Traffic (%)		0%				0%			0%			0%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	42	1030	109	0	179	1640	113	492	211	0	113	20	112
Turn Type	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2	3	1	1	6	7	3	8		7	4	5
Permitted Phases			2			6							4
Detector Phase	5	2	3	1	1	6	7	3	8		7	4	5
Switch Phase													
Minimum Initial (s)	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	15.0	19.0	15.0	15.0	15.0	20.0	15.0	15.0	16.0		15.0	15.0	15.0
Total Split (s)	15.0	47.0	31.0	27.0	27.0	59.0	20.0	31.0	26.0		20.0	15.0	15.0
Total Split (%)	12.5%	39.2%	25.8%	22.5%	22.5%	49.2%	16.7%	25.8%	21.7%		16.7%	12.5%	12.5%
Yellow Time (s)	3.0	4.3	3.0	3.0	3.0	4.8	3.0	3.0	4.0		3.0	3.1	3.0
All-Red Time (s)	3.9	1.7	3.9	3.5	3.5	1.7	3.9	3.9	3.1		3.9	3.7	3.9
Lost Time Adjust (s)	-1.9	-1.0	-1.9		-1.5	-1.5	-1.9	-1.9	-2.1		-1.9	-1.8	-1.9
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None	None		None	None	None
Act Effct Green (s)	10.0	56.1	86.0		18.1	64.2	75.5	25.0	14.5		11.3	9.2	13.9
Actuated g/C Ratio	0.08	0.47	0.72		0.15	0.54	0.63	0.21	0.12		0.09	0.08	0.12
v/c Ratio	0.15	0.44	0.09		0.66	0.59	0.11	0.70	0.59		0.36	0.14	0.30
Control Delay	52.5	24.2	1.9		75.3	20.1	1.2	50.0	15.0		53.7	54.1	2.1
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	52.5	24.2	1.9		75.3	20.1	1.2	50.0	15.0		53.7	54.1	2.1
LOS	D	C	A		E	C	A	D	B		D	D	A
Approach Delay		23.2				24.1			39.5			30.1	
Approach LOS		C				C			D			C	
Queue Length 50th (ft)	15	175	0		142	175	2	182	13		42	15	0
Queue Length 95th (ft)	34	280	22		217	327	18	237	78		70	39	0
Internal Link Dist (ft)		655				882			370			444	
Turn Bay Length (ft)	200		225		600		375	200					
Base Capacity (vph)	281	2340	1161		329	2759	1115	729	442		418	151	369
Starvation Cap Reductn	0	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.15	0.44	0.09		0.54	0.59	0.10	0.67	0.48		0.27	0.13	0.30

Intersection Summary

Area Type: Other

Cycle Length: 120

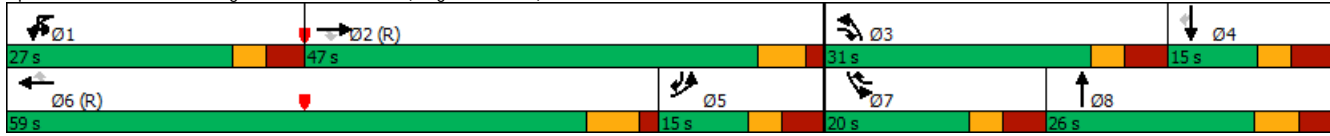
Actuated Cycle Length: 120

Legacy Oaks
 1: Hodge Road & US 64 Bus (Knightdale Blvd.)

Background + 1 AM (2024) - with Hinton Oaks
 03/30/2020

Offset: 60 (50%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.70
 Intersection Signal Delay: 26.9 Intersection LOS: C
 Intersection Capacity Utilization 69.0% ICU Level of Service C
 Analysis Period (min) 15
 Description: 05-0928

Splits and Phases: 1: Hodge Road & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↓	↑↑							↑
Traffic Volume (vph)	0	1095	121	321	1433	0	0	0	0	0	0	300
Future Volume (vph)	0	1095	121	321	1433	0	0	0	0	0	0	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		1%			-1%			0%				2%
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	4963	1545	1744	3489	0	0	0	0	0	0	1580
Flt Permitted				0.216								
Satd. Flow (perm)	0	4963	1545	397	3489	0	0	0	0	0	0	1580
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			129									147
Link Speed (mph)		45		45				35				35
Link Distance (ft)		962			263			601				428
Travel Time (s)		14.6			4.0			11.7				8.3
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	0%	0%	0%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%				0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1165	129	341	1524	0	0	0	0	0	0	319
Turn Type		NA	Perm	D.P+P	NA							Free
Protected Phases		2		7	2							
Permitted Phases			2	2								Free
Detector Phase		2	2	7	2							
Switch Phase												
Minimum Initial (s)		12.0	12.0	7.0								
Minimum Split (s)		19.0	19.0	15.0								
Total Split (s)		90.0	90.0	30.0								
Total Split (%)		75.0%	75.0%	25.0%								
Yellow Time (s)		4.4	4.4	3.0								
All-Red Time (s)		1.6	1.6	3.1								
Lost Time Adjust (s)		-1.0	-1.0	-1.1								
Total Lost Time (s)		5.0	5.0	5.0								
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max	None								
Act Effct Green (s)		86.1	86.1	110.0	120.0							120.0
Actuated g/C Ratio		0.72	0.72	0.92	1.00							1.00
v/c Ratio		0.33	0.11	0.54	0.44							0.20
Control Delay		2.4	0.3	22.0	2.5							0.3
Queue Delay		0.0	0.0	0.0	0.0							0.0
Total Delay		2.4	0.3	22.0	2.5							0.3
LOS		A	A	C	A							A
Approach Delay		2.2			6.1						0.3	
Approach LOS		A			A						A	
Queue Length 50th (ft)		16	0	92	46							0
Queue Length 95th (ft)		29	0	213	49							0
Internal Link Dist (ft)		882			183			521			348	
Turn Bay Length (ft)												
Base Capacity (vph)		3561	1145	648	3451							1580
Starvation Cap Reductn		0	0	0	0							0
Spillback Cap Reductn		0	0	0	0							0
Storage Cap Reductn		0	0	0	0							0
Reduced v/c Ratio		0.33	0.11	0.53	0.44							0.20

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 57 (48%), Referenced to phase 2:EBWB and 6:, Start of Green

Natural Cycle: 40

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.54

Intersection Signal Delay: 4.1

Intersection LOS: A

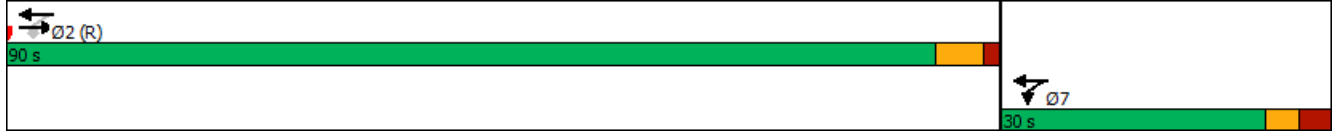
Intersection Capacity Utilization 52.8%

ICU Level of Service A

Analysis Period (min) 15

Description: 05-2153

Splits and Phases: 2: I-540 EB On-Ramp/I-540 EB Off-Ramp & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	431	1069	0	0	1673	802	69	5	462	0	0	0
Future Volume (vph)	431	1069	0	0	1673	802	69	5	462	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		-1%			1%			2%			0%	
Storage Length (ft)	500		0	0		0	0		400	0		0
Storage Lanes	1		0	0		1	0		2	0		0
Taper Length (ft)	200			25			25			25		
Satd. Flow (prot)	3384	5012	0	0	4963	1545	0	1695	2655	0	0	0
Flt Permitted	0.950							0.955				
Satd. Flow (perm)	3384	5012	0	0	4963	1545	0	1695	2655	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						654			186			
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		803			1134			793			417	
Travel Time (s)		12.2			17.2			15.4			8.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	6%	6%	6%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	474	1175	0	0	1838	881	0	81	508	0	0	0
Turn Type	Prot	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			4				
Permitted Phases					6	4		4				
Detector Phase	5	2			6	6	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0	12.0			12.0	12.0	7.0	7.0	7.0			
Minimum Split (s)	15.0	20.0			20.0	20.0	15.0	15.0	15.0			
Total Split (s)	25.0	85.0			60.0	60.0	35.0	35.0	35.0			
Total Split (%)	20.8%	70.8%			50.0%	50.0%	29.2%	29.2%	29.2%			
Yellow Time (s)	3.3	4.6			4.4	4.4	3.7	3.7	3.7			
All-Red Time (s)	3.0	1.3			1.4	1.4	2.5	2.5	2.5			
Lost Time Adjust (s)	-1.3	-0.9			-0.8	-0.8	-1.2	-1.2	-1.2			
Total Lost Time (s)	5.0	5.0			5.0	5.0	5.0	5.0	5.0			
Lead/Lag	Lag				Lead	Lead						
Lead-Lag Optimize?	Yes				Yes	Yes						
Recall Mode	None	C-Max			C-Max	C-Max	None	None	None			
Act Effct Green (s)	20.0	89.7			64.7	64.7	20.3	20.3	20.3			
Actuated g/C Ratio	0.17	0.75			0.54	0.54	0.17	0.17	0.17			
v/c Ratio	0.84	0.31			0.69	0.78	0.28	0.84	0.84			
Control Delay	52.6	5.6			12.4	9.8	44.1	43.0	43.0			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay	52.6	5.6			12.4	9.8	44.1	43.0	43.0			
LOS	D	A			B	A	D	D	D			
Approach Delay		19.1			11.5		43.1					
Approach LOS		B			B		D					
Queue Length 50th (ft)	187	90			200	24	55	141	141			
Queue Length 95th (ft)	#254	140			397	683	95	197	197			
Internal Link Dist (ft)		723			1054		713			337		
Turn Bay Length (ft)	500								400			
Base Capacity (vph)	564	3745			2675	1134	423	803	803			
Starvation Cap Reductn	0	0			0	0	0	0	0			
Spillback Cap Reductn	0	0			0	0	0	0	0			
Storage Cap Reductn	0	0			0	0	0	0	0			
Reduced v/c Ratio	0.84	0.31			0.69	0.78	0.19	0.63	0.63			

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 32 (27%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 17.8

Intersection LOS: B

Intersection Capacity Utilization 80.3%

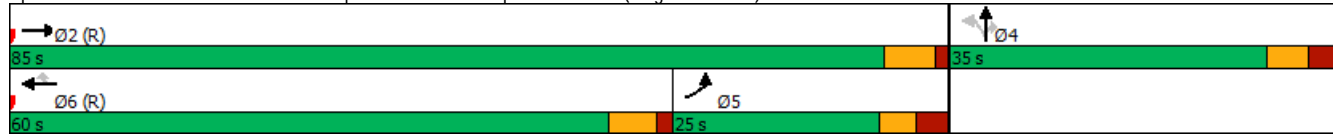
ICU Level of Service D

Analysis Period (min) 15

Description: 05-2152

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: I-540 WB Off-Ramp/I-540 WB On-Ramp & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (vph)	296	1070	57	5	19	2049	58	289	6	64	40	9	56
Future Volume (vph)	296	1070	57	5	19	2049	58	289	6	64	40	9	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		-1%				1%			3%			0%	
Storage Length (ft)	400		125		200		200	200		100	325		150
Storage Lanes	2		1		1		1	2		1	1		1
Taper Length (ft)	250				100			100			100		
Satd. Flow (prot)	3320	4918	1531	0	1710	4915	1530	3382	1835	1560	3213	1477	1408
Flt Permitted	0.950				0.950			0.950			0.950		
Satd. Flow (perm)	3320	4918	1531	0	1710	4915	1530	3382	1835	1539	3202	1477	1408
Right Turn on Red			Yes				Yes			Yes			Yes
Satd. Flow (RTOR)			94				95			153		26	150
Link Speed (mph)		45				45			35				35
Link Distance (ft)		1134				1230			476			550	
Travel Time (s)		17.2				18.6			9.3			10.7	
Confl. Peds. (#/hr)										1	1		
Confl. Bikes (#/hr)													
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	6%	6%	6%	5%	5%	5%	5%	2%	2%	2%	9%	9%	9%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)													
Mid-Block Traffic (%)		0%				0%			0%			0%	
Shared Lane Traffic (%)													43%
Lane Group Flow (vph)	315	1138	61	0	25	2180	62	307	6	68	43	36	34
Turn Type	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2	3	1	1	6	7	3	8	1	7	4	5
Permitted Phases			2			6				8			4
Detector Phase	5	2	3	1	1	6	7	3	8	1	7	4	5
Switch Phase													
Minimum Initial (s)	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	15.0	20.0	15.0	15.0	15.0	20.0	16.0	15.0	15.0	15.0	16.0	15.0	15.0
Total Split (s)	17.0	68.0	20.0	17.0	17.0	68.0	16.0	20.0	19.0	17.0	16.0	15.0	17.0
Total Split (%)	14.2%	56.7%	16.7%	14.2%	14.2%	56.7%	13.3%	16.7%	15.8%	14.2%	13.3%	12.5%	14.2%
Yellow Time (s)	3.6	4.6	3.8	3.4	3.4	4.4	4.1	3.8	3.6	3.4	4.1	3.8	3.6
All-Red Time (s)	3.0	1.7	3.0	3.0	3.0	1.6	3.0	3.0	3.0	3.0	3.0	3.1	3.0
Lost Time Adjust (s)	-1.6	-1.3	-1.8		-1.4	-1.0	-2.1	-1.8	-1.6	-1.4	-2.1	-1.9	-1.6
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag	Lag	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None	None	None	None	None	None
Act Effct Green (s)	13.8	72.4	93.7		11.3	67.3	91.5	15.3	9.7	14.1	19.2	9.2	19.4
Actuated g/C Ratio	0.12	0.60	0.78		0.09	0.56	0.76	0.13	0.08	0.12	0.16	0.08	0.16
v/c Ratio	0.83	0.38	0.05		0.16	0.79	0.05	0.71	0.04	0.21	0.08	0.26	0.10
Control Delay	70.8	10.4	1.6		51.9	24.4	0.6	60.2	49.8	1.5	42.7	29.5	0.5
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.8	10.4	1.6		51.9	24.4	0.6	60.2	49.8	1.5	42.7	29.5	0.5
LOS	E	B	A		D	C	A	E	D	A	D	C	A
Approach Delay		22.6				24.1			49.6				25.8
Approach LOS		C				C			D				C
Queue Length 50th (ft)	129	164	0		18	508	0	118	4	0	12	7	0
Queue Length 95th (ft)	#213	211	m9		46	580	6	169	18	0	35	43	0
Internal Link Dist (ft)		1054				1150			396			470	
Turn Bay Length (ft)	400		125		200		200	200		100	325		150
Base Capacity (vph)	380	2967	1207		171	2755	1193	438	215	326	525	146	353
Starvation Cap Reductn	0	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.38	0.05		0.15	0.79	0.05	0.70	0.03	0.21	0.08	0.25	0.10

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 2 (2%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 25.9

Intersection LOS: C

Intersection Capacity Utilization 75.4%

ICU Level of Service D

Analysis Period (min) 15

Description: 05-2267

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

! Phase conflict between lane groups.

Splits and Phases: 4: Hinton Oaks Boulevard & US 64 Bus (Knightdale Blvd.)



Legacy Oaks
5: Hodge Road & Sam's Xpress Driveway/Legacy Oaks Drive South

Background + 1 AM (2024) - with Hinton Oaks
03/30/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕		↕	↕		↕	↕	
Traffic Volume (vph)	4	4	8	9	4	4	46	35	67	4	179	10
Future Volume (vph)	4	4	8	9	4	4	46	35	67	4	179	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%				1%
Storage Length (ft)	0		0	100		0	70		0	150		350
Storage Lanes	0		0	1		0	1		0	1		1
Taper Length (ft)	25			100			100			80		
Satd. Flow (prot)	0	1710	0	1770	1723	0	1770	3189	0	1761	5019	0
Flt Permitted		0.988		0.950			0.950			0.950		
Satd. Flow (perm)	0	1710	0	1770	1723	0	1770	3189	0	1761	5019	0
Link Speed (mph)		30			30			30			25	
Link Distance (ft)		171			365			524			741	
Travel Time (s)		3.9			8.3			11.9			20.2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	21	0	12	10	0	61	134	0	5	249	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 21.5% ICU Level of Service A

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	2.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕		↕	↕		↕	↕↕	
Traffic Vol, veh/h	4	4	8	9	4	4	46	35	67	4	179	10
Future Vol, veh/h	4	4	8	9	4	4	46	35	67	4	179	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	100	-	-	70	-	-	150	-	350
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	1	-
Peak Hour Factor	76	76	76	76	76	76	76	76	76	76	76	76
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	5	11	12	5	5	61	46	88	5	236	13

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	401	509	125	319	471	67	249	0	0	134	0	0
Stage 1	253	253	-	212	212	-	-	-	-	-	-	-
Stage 2	148	256	-	107	259	-	-	-	-	-	-	-
Critical Hdwy	6.99	6.54	7.14	6.99	6.54	6.94	5.34	-	-	4.14	-	-
Critical Hdwy Stg 1	7.34	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4.02	3.92	3.67	4.02	3.32	3.12	-	-	2.22	-	-
Pot Cap-1 Maneuver	549	466	767	619	489	983	887	-	-	1448	-	-
Stage 1	664	696	-	742	726	-	-	-	-	-	-	-
Stage 2	808	694	-	847	692	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	512	432	767	571	454	983	887	-	-	1448	-	-
Mov Cap-2 Maneuver	512	432	-	571	454	-	-	-	-	-	-	-
Stage 1	618	694	-	691	676	-	-	-	-	-	-	-
Stage 2	743	646	-	826	690	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.4	11.2	2.9	0.2
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	887	-	-	582	571	621	1448	-	-
HCM Lane V/C Ratio	0.068	-	-	0.036	0.021	0.017	0.004	-	-
HCM Control Delay (s)	9.4	-	-	11.4	11.4	10.9	7.5	-	-
HCM Lane LOS	A	-	-	B	B	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.1	0.1	0.1	0	-	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	4	42	46	4	4	9	16	11	4	105	4
Future Volume (vph)	4	4	42	46	4	4	9	16	11	4	105	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%				0%		0%				1%	
Storage Length (ft)	0		0	100		0	0		0	100		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			100			25			100		
Satd. Flow (prot)	1770	1863	1583	1770	1723	0	1770	1749	0	1761	1842	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1863	1583	1770	1723	0	1770	1749	0	1761	1842	0
Link Speed (mph)		30			30			30			25	
Link Distance (ft)		258			326			504			286	
Travel Time (s)		5.9			7.4			11.5			7.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	5	49	54	10	0	11	32	0	5	129	0
Sign Control	Stop				Stop				Stop		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	23.0%
ICU Level of Service	A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	8.4
Intersection LOS	A

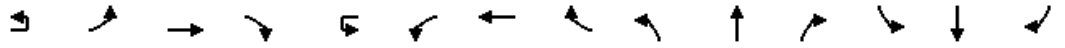
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑	↗	↘	↗		↘	↗		↘	↗	
Traffic Vol, veh/h	4	4	42	46	4	4	9	16	11	4	105	4
Future Vol, veh/h	4	4	42	46	4	4	9	16	11	4	105	4
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	5	49	54	5	5	11	19	13	5	124	5
Number of Lanes	1	1	1	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	3	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	3	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	3
HCM Control Delay	7.6	8.7	8	8.7
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	100%	0%	100%	0%
Vol Thru, %	0%	59%	0%	100%	0%	0%	50%	0%	96%
Vol Right, %	0%	41%	0%	0%	100%	0%	50%	0%	4%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	9	27	4	4	42	46	8	4	109
LT Vol	9	0	4	0	0	46	0	4	0
Through Vol	0	16	0	4	0	0	4	0	105
RT Vol	0	11	0	0	42	0	4	0	4
Lane Flow Rate	11	32	5	5	49	54	9	5	128
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.017	0.043	0.007	0.007	0.061	0.085	0.013	0.007	0.176
Departure Headway (Hd)	5.641	4.854	5.67	5.168	4.466	5.64	4.787	5.457	4.931
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	636	738	632	693	802	636	748	657	730
Service Time	3.366	2.579	3.395	2.893	2.19	3.365	2.512	3.177	2.651
HCM Lane V/C Ratio	0.017	0.043	0.008	0.007	0.061	0.085	0.012	0.008	0.175
HCM Control Delay	8.5	7.8	8.4	7.9	7.5	8.9	7.6	8.2	8.7
HCM Lane LOS	A	A	A	A	A	A	A	A	A
HCM 95th-ile Q	0.1	0.1	0	0	0.2	0.3	0	0	0.6

Legacy Oaks
1: Hodge Road & US 64 Bus (Knightdale Blvd.)

Background + 1 PM (2024) - with Hinton Oaks
03/30/2020



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations														
Traffic Volume (vph)	7	63	1715	319	21	407	1141	183	115	30	241	145	76	66
Future Volume (vph)	7	63	1715	319	21	407	1141	183	115	30	241	145	76	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)			3%				-3%			-2%				1%
Storage Length (ft)		200		225		600		375	200		50	0		0
Storage Lanes		3		1		1		1	1		1	2		1
Taper Length (ft)		300				150			100			100		
Satd. Flow (prot)	0	3382	5009	1560	0	1796	5162	1607	3467	1631	0	3416	1853	1575
Flt Permitted		0.950				0.950			0.950			0.950		
Satd. Flow (perm)	0	3382	5009	1560	0	1796	5162	1607	3467	1631	0	3416	1853	1575
Right Turn on Red				Yes				Yes			Yes			Yes
Satd. Flow (RTOR)				176				189		240				182
Link Speed (mph)			45				45			35				25
Link Distance (ft)			735				962			450				524
Travel Time (s)			11.1				14.6			8.8				14.3
Confl. Peds. (#/hr)														
Confl. Bikes (#/hr)														
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)														
Mid-Block Traffic (%)			0%				0%			0%				0%
Shared Lane Traffic (%)														
Lane Group Flow (vph)	0	72	1768	329	0	442	1176	189	119	279	0	149	78	68
Turn Type	Prot	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5!	5	2	3	1	1	6	7	3	8		7	4	5!
Permitted Phases				2				6						4
Detector Phase	5	5	2	3	1	1	6	7	3	8		7	4	5
Switch Phase														
Minimum Initial (s)	7.0	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	15.0	15.0	19.0	15.0	15.0	15.0	20.0	15.0	15.0	16.0		15.0	15.0	15.0
Total Split (s)	20.0	20.0	55.0	25.0	45.0	45.0	80.0	15.0	25.0	25.0		15.0	15.0	20.0
Total Split (%)	14.3%	14.3%	39.3%	17.9%	32.1%	32.1%	57.1%	10.7%	17.9%	17.9%		10.7%	10.7%	14.3%
Yellow Time (s)	3.0	3.0	4.3	3.0	3.0	3.0	4.8	3.0	3.0	4.0		3.0	3.1	3.0
All-Red Time (s)	3.9	3.9	1.7	3.9	3.5	3.5	1.7	3.9	3.9	3.1		3.9	3.7	3.9
Lost Time Adjust (s)		-1.9	-1.0	-1.9			-1.5	-1.5	-1.9	-2.1		-1.9	-1.8	-1.9
Total Lost Time (s)		5.0	5.0	5.0			5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lead	Lead	Lag	Lag	Lag	Lead	Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None	C-Max	None	None	None	C-Max	None	None	None		None	None	None
Act Effct Green (s)		10.4	54.2	68.4		40.0	83.8	98.8	14.2	15.8		10.0	11.6	27.1
Actuated g/C Ratio		0.07	0.39	0.49		0.29	0.60	0.71	0.10	0.11		0.07	0.08	0.19
v/c Ratio		0.29	0.91	0.39		0.86	0.38	0.16	0.34	0.70		0.61	0.51	0.15
Control Delay		63.8	49.1	7.1		46.6	6.3	0.3	60.1	20.9		74.1	73.6	0.7
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay		63.8	49.1	7.1		46.6	6.3	0.3	60.1	20.9		74.1	73.6	0.7
LOS		E	D	A		D	A	A	E	C		E	E	A
Approach Delay			43.3				15.5			32.7				57.0
Approach LOS			D				B			C				E
Queue Length 50th (ft)		32	563	52		389	78	0	53	33		69	69	0
Queue Length 95th (ft)		58	#700	98		#568	95	1	81	127		107	#133	0
Internal Link Dist (ft)			655				882			370				444
Turn Bay Length (ft)		200		225		600		375	200					
Base Capacity (vph)		362	1938	909		513	3088	1189	495	438		244	154	496
Starvation Cap Reductn		0	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn		0	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn		0	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio		0.20	0.91	0.36		0.86	0.38	0.16	0.24	0.64		0.61	0.51	0.14

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Legacy Oaks
 1: Hodge Road & US 64 Bus (Knightdale Blvd.)

Offset: 84 (60%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.91
 Intersection Signal Delay: 32.5 Intersection LOS: C
 Intersection Capacity Utilization 95.8% ICU Level of Service F
 Analysis Period (min) 15
 Description: 05-0928
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 ! Phase conflict between lane groups.

Splits and Phases: 1: Hodge Road & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↓	↑↑							↑
Traffic Volume (vph)	0	2058	80	312	1210	0	0	0	0	0	0	565
Future Volume (vph)	0	2058	80	312	1210	0	0	0	0	0	0	565
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		1%			-1%			0%				2%
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	5060	1575	1778	3557	0	0	0	0	0	0	1564
Flt Permitted				0.063								
Satd. Flow (perm)	0	5060	1575	118	3557	0	0	0	0	0	0	1564
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			82									217
Link Speed (mph)		45		45				35				35
Link Distance (ft)		962			263			601				428
Travel Time (s)		14.6			4.0			11.7				8.3
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	4%	4%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%				0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2100	82	318	1235	0	0	0	0	0	0	577
Turn Type		NA	Perm	D.P+P	NA							Free
Protected Phases		2		7	2							
Permitted Phases			2	2								Free
Detector Phase		2	2	7	2							
Switch Phase												
Minimum Initial (s)		12.0	12.0	7.0								
Minimum Split (s)		19.0	19.0	15.0								
Total Split (s)		100.0	100.0	40.0								
Total Split (%)		71.4%	71.4%	28.6%								
Yellow Time (s)		4.4	4.4	3.0								
All-Red Time (s)		1.6	1.6	3.1								
Lost Time Adjust (s)		-1.0	-1.0	-1.1								
Total Lost Time (s)		5.0	5.0	5.0								
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max	None								
Act Effct Green (s)		98.6	98.6	130.0	140.0							140.0
Actuated g/C Ratio		0.70	0.70	0.93	1.00							1.00
v/c Ratio		0.59	0.07	0.66	0.35							0.37
Control Delay		5.5	0.3	62.9	1.4							0.7
Queue Delay		0.0	0.0	0.0	0.0							0.0
Total Delay		5.5	0.3	62.9	1.4							0.7
LOS		A	A	E	A							A
Approach Delay		5.3			14.0						0.7	
Approach LOS		A			B						A	
Queue Length 50th (ft)		87	0	237	40							0
Queue Length 95th (ft)		108	m1	330	14							0
Internal Link Dist (ft)		882			183			521			348	
Turn Bay Length (ft)												
Base Capacity (vph)		3562	1133	526	3555							1564
Starvation Cap Reductn		0	0	0	0							0
Spillback Cap Reductn		0	0	0	0							0
Storage Cap Reductn		0	0	0	0							0
Reduced v/c Ratio		0.59	0.07	0.60	0.35							0.37

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 72 (51%), Referenced to phase 2:EBWB and 6:, Start of Green

Natural Cycle: 45

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.66

Intersection Signal Delay: 7.8

Intersection LOS: A

Intersection Capacity Utilization 108.9%

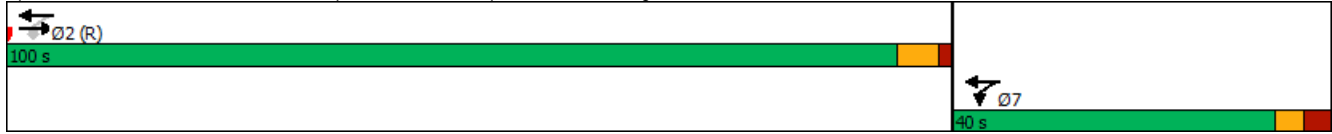
ICU Level of Service G

Analysis Period (min) 15

Description: 05-2153

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: I-540 EB On-Ramp/I-540 EB Off-Ramp & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↕↕			↕↕↕	↕↔		↕↔	↕↕↕			
Traffic Volume (vph)	375	2693	0	0	1431	579	96	4	679	0	0	0
Future Volume (vph)	375	2693	0	0	1431	579	96	4	679	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		-1%			1%			2%			0%	
Storage Length (ft)	500		0	0		0	0		400	0		0
Storage Lanes	1		0	0		1	0		2	0		0
Taper Length (ft)	200			25			25			25		
Satd. Flow (prot)	3450	5111	0	0	5060	1575	0	1759	2759	0	0	0
Flt Permitted	0.950							0.954				
Satd. Flow (perm)	3450	5111	0	0	5060	1575	0	1759	2759	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						583			71			
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		803			1134			793			417	
Travel Time (s)		12.2			17.2			15.4			8.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	391	2805	0	0	1491	603	0	104	707	0	0	0
Turn Type	Prot	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			4				
Permitted Phases					6	4		4				
Detector Phase	5	2			6	6	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0	12.0			12.0	12.0	7.0	7.0	7.0			
Minimum Split (s)	15.0	20.0			20.0	20.0	15.0	15.0	15.0			
Total Split (s)	30.0	100.0			70.0	70.0	40.0	40.0	40.0			
Total Split (%)	21.4%	71.4%			50.0%	50.0%	28.6%	28.6%	28.6%			
Yellow Time (s)	3.3	4.6			4.4	4.4	3.7	3.7	3.7			
All-Red Time (s)	3.0	1.3			1.4	1.4	2.5	2.5	2.5			
Lost Time Adjust (s)	-1.3	-0.9			-0.8	-0.8	-1.2	-1.2	-1.2			
Total Lost Time (s)	5.0	5.0			5.0	5.0	5.0	5.0	5.0			
Lead/Lag	Lag				Lead	Lead						
Lead-Lag Optimize?	Yes				Yes	Yes						
Recall Mode	None	C-Max			C-Max	C-Max	None	None	None			
Act Effct Green (s)	25.0	95.5			65.5	65.5		34.5	34.5			
Actuated g/C Ratio	0.18	0.68			0.47	0.47		0.25	0.25			
v/c Ratio	0.63	0.80			0.63	0.58		0.24	0.96			
Control Delay	44.3	6.7			13.9	2.5		43.8	72.4			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	44.3	6.7			13.9	2.5		43.8	72.4			
LOS	D	A			B	A		D	E			
Approach Delay		11.3			10.6			68.7				
Approach LOS		B			B			E				
Queue Length 50th (ft)	186	133			245	0		76	331			
Queue Length 95th (ft)	238	136			m139	m5		129	#471			
Internal Link Dist (ft)		723			1054			713			337	
Turn Bay Length (ft)	500								400			
Base Capacity (vph)	616	3488			2368	1047		439	743			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.63	0.80			0.63	0.58		0.24	0.95			

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 68 (49%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.96

Intersection Signal Delay: 18.7

Intersection LOS: B

Intersection Capacity Utilization 84.1%

ICU Level of Service E

Analysis Period (min) 15

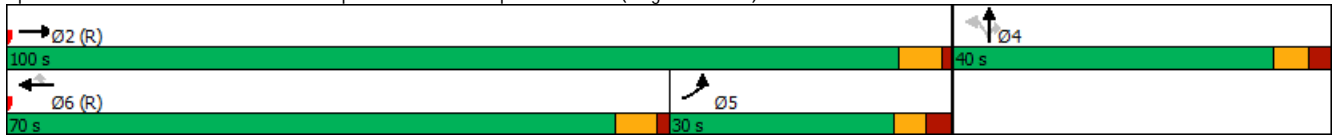
Description: 05-2152

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

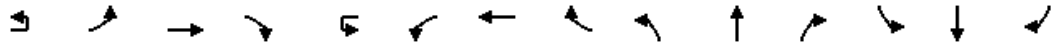
Splits and Phases: 3: I-540 WB Off-Ramp/I-540 WB On-Ramp & US 64 Bus (Knightdale Blvd.)



Legacy Oaks
4: Hinton Oaks Boulevard & US 64 Bus (Knightdale Blvd.)

Background + 1 PM (2024) - with Hinton Oaks

03/30/2020



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations														
Traffic Volume (vph)	26	468	2495	171	6	37	1515	77	125	28	61	140	14	239
Future Volume (vph)	26	468	2495	171	6	37	1515	77	125	28	61	140	14	239
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)			-1%				1%			3%				0%
Storage Length (ft)		400		125		200		200	200		100	325		150
Storage Lanes		2		1		1		1	2		1	1		1
Taper Length (ft)		250				100			100			100		
Satd. Flow (prot)	0	3450	5111	1591	0	1761	5060	1575	3382	1835	1560	3433	1534	1504
Flt Permitted		0.950				0.950			0.950			0.950		
Satd. Flow (perm)	0	3450	5111	1591	0	1761	5060	1575	3382	1835	1560	3433	1534	1504
Right Turn on Red				Yes				Yes			Yes			Yes
Satd. Flow (RTOR)				90				81			130			118
Link Speed (mph)			45				45			35				35
Link Distance (ft)			1134				1230			476				550
Travel Time (s)			17.2				18.6			9.3				10.7
Confl. Peds. (#/hr)														
Confl. Bikes (#/hr)														
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)														
Mid-Block Traffic (%)			0%				0%			0%				0%
Shared Lane Traffic (%)														47%
Lane Group Flow (vph)	0	520	2626	180	0	45	1595	81	132	29	64	147	133	134
Turn Type	Prot	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5!	5	2	3	1!	1	6	7	3	8	1!	7	4	5!
Permitted Phases				2				6			8			4
Detector Phase	5	5	2	3	1	1	6	7	3	8	1	7	4	5
Switch Phase														
Minimum Initial (s)	7.0	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	15.0	15.0	20.0	15.0	15.0	15.0	20.0	16.0	15.0	15.0	15.0	16.0	15.0	15.0
Total Split (s)	28.0	28.0	80.0	20.0	20.0	20.0	72.0	20.0	20.0	20.0	20.0	20.0	20.0	28.0
Total Split (%)	20.0%	20.0%	57.1%	14.3%	14.3%	14.3%	51.4%	14.3%	14.3%	14.3%	14.3%	14.3%	14.3%	20.0%
Yellow Time (s)	3.6	3.6	4.6	3.8	3.4	3.4	4.4	4.1	3.8	3.6	3.4	4.1	3.8	3.6
All-Red Time (s)	3.0	3.0	1.7	3.0	3.0	3.0	1.6	3.0	3.0	3.0	3.0	3.0	3.1	3.0
Lost Time Adjust (s)		-1.6	-1.3	-1.8			-1.4	-1.0	-2.1	-1.8	-1.6	-1.4	-2.1	-1.9
Total Lost Time (s)		5.0	5.0	5.0			5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	C-Max	None	None	None	C-Max	None	None	None	None	None	None	None
Act Effct Green (s)		23.0	89.3	106.8			10.0	73.6	97.7	12.5	9.7	16.2	19.1	10.9
Actuated g/C Ratio		0.16	0.64	0.76			0.07	0.53	0.70	0.09	0.07	0.12	0.14	0.08
v/c Ratio		0.92	0.81	0.15			0.36	0.60	0.07	0.44	0.23	0.22	0.31	0.58
Control Delay		61.6	15.6	1.0			69.6	24.7	2.0	64.7	65.5	1.7	57.6	24.1
Queue Delay		0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		61.6	15.6	1.0			69.6	24.7	2.0	64.7	65.5	1.7	57.6	24.1
LOS		E	B	A			E	C	A	E	A	E	C	A
Approach Delay			22.0				24.8			46.9				30.3
Approach LOS			C				C			D				C
Queue Length 50th (ft)		232	334	5			40	353	0	59	26	0	66	13
Queue Length 95th (ft)		m#325	730	m13			81	449	19	92	59	0	98	82
Internal Link Dist (ft)			1054					1150			396			470
Turn Bay Length (ft)		400		125			200		200	200		100	325	150
Base Capacity (vph)		566	3260	1262			188	2660	1116	362	196	347	477	269
Starvation Cap Reductn		0	0	0			0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0			0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0			0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.92	0.81	0.14			0.24	0.60	0.07	0.36	0.15	0.18	0.31	0.49

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 78 (56%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 24.4

Intersection LOS: C

Intersection Capacity Utilization 82.4%

ICU Level of Service E

Analysis Period (min) 15

Description: 05-2267

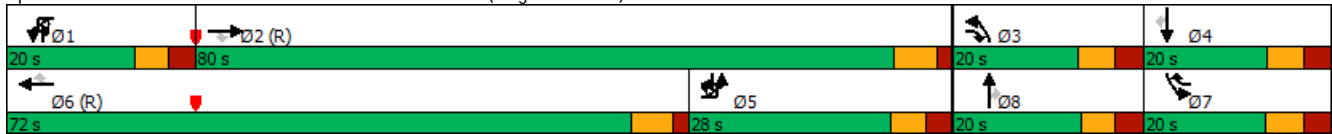
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

! Phase conflict between lane groups.

Splits and Phases: 4: Hinton Oaks Boulevard & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕			↕	↕		↕	↕	↕
Traffic Volume (vph)	4	4	13	9	33	4	4	9	112	156	9	4	98	4
Future Volume (vph)	4	4	13	9	33	4	4	9	112	156	9	4	98	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%				0%				0%				1%
Storage Length (ft)	0		0		100		0		70		0	150		350
Storage Lanes	0		0		1		0		1		0	1		1
Taper Length (ft)	25				100				100			80		
Satd. Flow (prot)	0	1687	0	0	1770	1723	0	0	1687	3347	0	1761	5030	0
Flt Permitted		0.991			0.950				0.950			0.950		
Satd. Flow (perm)	0	1687	0	0	1770	1723	0	0	1687	3347	0	1761	5030	0
Link Speed (mph)		30				30				30				25
Link Distance (ft)		171				365				524				741
Travel Time (s)		3.9				8.3				11.9				20.2
Confl. Peds. (#/hr)			1		1									
Confl. Bikes (#/hr)														
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	7%	7%	7%	7%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)														
Mid-Block Traffic (%)		0%				0%				0%				0%
Shared Lane Traffic (%)														
Lane Group Flow (vph)	0	22	0	0	44	8	0	0	127	173	0	4	107	0
Sign Control		Stop				Stop				Free				Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	29.0%
ICU Level of Service	A
Analysis Period (min)	15

Intersection														
Int Delay, s/veh	4.4													
Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔			↔	↔		↔	↔	
Traffic Vol, veh/h	4	4	13	9	33	4	4	9	112	156	9	4	98	4
Future Vol, veh/h	4	4	13	9	33	4	4	9	112	156	9	4	98	4
Conflicting Peds, #/hr	0	0	1	0	1	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	-	None	-	-	-	None	-	-	None
Storage Length	-	-	-	-	100	-	-	-	70	-	-	150	-	350
Veh in Median Storage, #	-	0	-	-	-	0	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	-	0	-	-	-	0	-	-	1	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	7	7	7	7	2	2	2
Mvmt Flow	4	4	14	9	35	4	4	9	118	164	9	4	103	4
Major/Minor	Minor2			Minor1			Major1			Major2				
Conflicting Flow All	451	540	55	0	475	538	87	78	107	0	0	173	0	0
Stage 1	113	113	-	0	423	423	-	-	-	-	-	-	-	-
Stage 2	338	427	-	0	52	115	-	-	-	-	-	-	-	-
Critical Hdwy	6.99	6.54	7.14	-	6.99	6.54	6.94	5.74	5.44	-	-	4.14	-	-
Critical Hdwy Stg 1	7.34	5.54	-	-	6.54	5.54	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	-	6.74	5.54	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4.02	3.92	-	3.67	4.02	3.32	2.37	3.17	-	-	2.22	-	-
Pot Cap-1 Maneuver	510	447	848	0	492	448	954	1376	1012	-	-	1401	-	-
Stage 1	825	801	-	0	560	586	-	-	-	-	-	-	-	-
Stage 2	628	584	-	0	914	799	-	-	-	-	-	-	-	-
Platoon blocked, %				-										
Mov Cap-1 Maneuver	455	391	847	0	433	392	954	1031	1031	-	-	1401	-	-
Mov Cap-2 Maneuver	455	391	-	0	433	392	-	-	-	-	-	-	-	-
Stage 1	724	799	-	0	491	514	-	-	-	-	-	-	-	-
Stage 2	544	512	-	0	891	797	-	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB				
HCM Control Delay, s	11.1			13.5			3.8			0.3				
HCM LOS	B			B										
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR					
Capacity (veh/h)	1031	-	-	611	433	556	1401	-	-					
HCM Lane V/C Ratio	0.124	-	-	0.036	0.08	0.015	0.003	-	-					
HCM Control Delay (s)	9	-	-	11.1	14	11.6	7.6	-	-					
HCM Lane LOS	A	-	-	B	B	B	A	-	-					
HCM 95th %tile Q(veh)	0.4	-	-	0.1	0.3	0	0	-	-					



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	4	27	19	4	4	30	103	21	4	49	4
Future Volume (vph)	4	4	27	19	4	4	30	103	21	4	49	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%				0%		0%				1%	
Storage Length (ft)	0		0	100		0	0		0	100		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			100			25			100		
Satd. Flow (prot)	1770	1863	1583	1770	1723	0	1687	1730	0	1761	1833	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1863	1583	1770	1723	0	1687	1730	0	1761	1833	0
Link Speed (mph)		30			30			30			25	
Link Distance (ft)		258			326			504			286	
Travel Time (s)		5.9			7.4			11.5			7.8	
Confl. Peds. (#/hr)			1	1								
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	7%	7%	7%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	4	4	29	20	8	0	32	134	0	4	57	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	22.7%
Analysis Period (min)	15
	ICU Level of Service A

Intersection	
Intersection Delay, s/veh	8.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↑	↔	↔	↔		↔	↔		↔	↔	
Traffic Vol, veh/h	4	4	27	19	4	4	30	103	21	4	49	4
Future Vol, veh/h	4	4	27	19	4	4	30	103	21	4	49	4
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	2	2	2	2	2	2	7	7	7	2	2	2
Mvmt Flow	4	4	29	20	4	4	32	111	23	4	53	4
Number of Lanes	1	1	1	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	3	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	3	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	3
HCM Control Delay	7.6	8.4	8.6	8.1
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	100%	0%	100%	0%
Vol Thru, %	0%	83%	0%	100%	0%	0%	50%	0%	92%
Vol Right, %	0%	17%	0%	0%	100%	0%	50%	0%	8%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	30	124	4	4	27	19	8	4	53
LT Vol	30	0	4	0	0	19	0	4	0
Through Vol	0	103	0	4	0	0	4	0	49
RT Vol	0	21	0	0	27	0	4	0	4
Lane Flow Rate	32	133	4	4	29	20	9	4	57
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.049	0.178	0.007	0.006	0.036	0.033	0.012	0.007	0.079
Departure Headway (Hd)	5.428	4.809	5.726	5.224	4.521	5.744	4.889	5.551	4.997
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	662	748	626	686	793	625	734	647	719
Service Time	3.142	2.523	3.449	2.947	2.244	3.463	2.609	3.267	2.713
HCM Lane V/C Ratio	0.048	0.178	0.006	0.006	0.037	0.032	0.012	0.006	0.079
HCM Control Delay	8.4	8.6	8.5	8	7.4	8.7	7.7	8.3	8.1
HCM Lane LOS	A	A	A	A	A	A	A	A	A
HCM 95th-tile Q	0.2	0.6	0	0	0.1	0.1	0	0	0.3

**Appendix K:
Synchro Output –
Build-out (2024) – with Hinton Oaks**

Legacy Oaks
1: Hodge Road & US 64 Bus (Knightdale Blvd.)

Build-Out + 1 AM (2024) - with Hinton Oaks

03/30/2020



Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (vph)	79	917	97	14	145	1460	193	438	23	172	248	29	168
Future Volume (vph)	79	917	97	14	145	1460	193	438	23	172	248	29	168
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		3%				-3%			-2%			1%	
Storage Length (ft)	200		225		600		375	200		50	0		0
Storage Lanes	3		1		1		1	1		1	2		1
Taper Length (ft)	300				150			100			100		
Satd. Flow (prot)	3382	5009	1560	0	1796	5162	1607	3368	1586	0	3350	1818	1545
Flt Permitted	0.950				0.950			0.950			0.950		
Satd. Flow (perm)	3382	5009	1560	0	1796	5162	1607	3368	1586	0	3350	1818	1545
Right Turn on Red			Yes				Yes			Yes			Yes
Satd. Flow (RTOR)			109				217			193			216
Link Speed (mph)		45				45				35			25
Link Distance (ft)		735				962				450			524
Travel Time (s)		11.1				14.6				8.8			14.3
Confl. Peds. (#/hr)													
Confl. Bikes (#/hr)													
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	5%	5%	5%	4%	4%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)													
Mid-Block Traffic (%)		0%				0%			0%			0%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	89	1030	109	0	179	1640	217	492	219	0	279	33	189
Turn Type	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2	3	1	1	6	7	3	8		7	4	5
Permitted Phases			2			6							4
Detector Phase	5	2	3	1	1	6	7	3	8		7	4	5
Switch Phase													
Minimum Initial (s)	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	15.0	19.0	15.0	15.0	15.0	20.0	15.0	15.0	16.0		15.0	15.0	15.0
Total Split (s)	15.0	47.0	31.0	27.0	27.0	59.0	20.0	31.0	26.0		20.0	15.0	15.0
Total Split (%)	12.5%	39.2%	25.8%	22.5%	22.5%	49.2%	16.7%	25.8%	21.7%		16.7%	12.5%	12.5%
Yellow Time (s)	3.0	4.3	3.0	3.0	3.0	4.8	3.0	3.0	4.0		3.0	3.1	3.0
All-Red Time (s)	3.9	1.7	3.9	3.5	3.5	1.7	3.9	3.9	3.1		3.9	3.7	3.9
Lost Time Adjust (s)	-1.9	-1.0	-1.9		-1.5	-1.5	-1.9	-1.9	-2.1		-1.9	-1.8	-1.9
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None	None		None	None	None
Act Effct Green (s)	10.0	51.3	83.0		18.1	59.4	74.0	26.7	16.0		14.6	9.4	15.9
Actuated g/C Ratio	0.08	0.43	0.69		0.15	0.50	0.62	0.22	0.13		0.12	0.08	0.13
v/c Ratio	0.32	0.48	0.10		0.66	0.64	0.20	0.66	0.58		0.69	0.23	0.48
Control Delay	55.1	27.3	2.0		76.2	23.4	1.9	47.4	15.4		59.8	55.9	6.3
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	55.1	27.3	2.0		76.2	23.4	1.9	47.4	15.4		59.8	55.9	6.3
LOS	E	C	A		E	C	A	D	B		E	E	A
Approach Delay		27.1				25.8			37.6			39.4	
Approach LOS		C				C			D			D	
Queue Length 50th (ft)	34	223	0		145	225	14	182	17		107	24	0
Queue Length 95th (ft)	60	280	22		219	342	37	237	87		153	57	26
Internal Link Dist (ft)		655				882			370			444	
Turn Bay Length (ft)	200		225		600		375	200					
Base Capacity (vph)	281	2140	1113		329	2554	1078	753	436		418	151	391
Starvation Cap Reductn	0	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.32	0.48	0.10		0.54	0.64	0.20	0.65	0.50		0.67	0.22	0.48

Intersection Summary

Area Type: Other

Cycle Length: 120

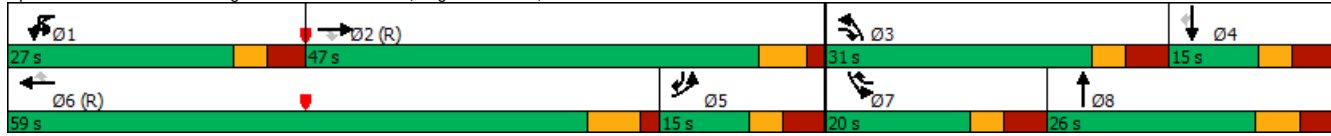
Actuated Cycle Length: 120

Legacy Oaks
 1: Hodge Road & US 64 Bus (Knightdale Blvd.)

Build-Out + 1 AM (2024) - with Hinton Oaks
 03/30/2020

Offset: 60 (50%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.69
 Intersection Signal Delay: 29.5 Intersection LOS: C
 Intersection Capacity Utilization 69.6% ICU Level of Service C
 Analysis Period (min) 15
 Description: 05-0928

Splits and Phases: 1: Hodge Road & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↓	↑↑							↑
Traffic Volume (vph)	0	1219	144	321	1489	0	0	0	0	0	0	335
Future Volume (vph)	0	1219	144	321	1489	0	0	0	0	0	0	335
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		1%			-1%			0%				2%
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	4963	1545	1744	3489	0	0	0	0	0	0	1580
Flt Permitted				0.184								
Satd. Flow (perm)	0	4963	1545	338	3489	0	0	0	0	0	0	1580
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			153									135
Link Speed (mph)		45		45				35				35
Link Distance (ft)		962			263			601				428
Travel Time (s)		14.6			4.0			11.7				8.3
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	0%	0%	0%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%				0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1297	153	341	1584	0	0	0	0	0	0	356
Turn Type		NA	Perm	D.P+P	NA							Free
Protected Phases		2		7	2 7							
Permitted Phases			2	2								Free
Detector Phase		2	2	7	2 7							
Switch Phase												
Minimum Initial (s)		12.0	12.0	7.0								
Minimum Split (s)		19.0	19.0	15.0								
Total Split (s)		90.0	90.0	30.0								
Total Split (%)		75.0%	75.0%	25.0%								
Yellow Time (s)		4.4	4.4	3.0								
All-Red Time (s)		1.6	1.6	3.1								
Lost Time Adjust (s)		-1.0	-1.0	-1.1								
Total Lost Time (s)		5.0	5.0	5.0								
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max	None								
Act Effct Green (s)		85.8	85.8	110.0	120.0							120.0
Actuated g/C Ratio		0.72	0.72	0.92	1.00							1.00
v/c Ratio		0.37	0.13	0.58	0.45							0.23
Control Delay		1.8	0.2	27.5	2.8							0.3
Queue Delay		0.0	0.0	0.0	0.0							0.0
Total Delay		1.8	0.2	27.5	2.8							0.3
LOS		A	A	C	A							A
Approach Delay		1.6			7.2						0.3	
Approach LOS		A			A						A	
Queue Length 50th (ft)		18	0	112	57							0
Queue Length 95th (ft)		32	m0	228	54							0
Internal Link Dist (ft)		882			183			521			348	
Turn Bay Length (ft)												
Base Capacity (vph)		3547	1148	604	3477							1580
Starvation Cap Reductn		0	0	0	0							0
Spillback Cap Reductn		0	0	0	0							0
Storage Cap Reductn		0	0	0	0							0
Reduced v/c Ratio		0.37	0.13	0.56	0.46							0.23

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 57 (48%), Referenced to phase 2:EBWB and 6:, Start of Green

Natural Cycle: 40

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.58

Intersection Signal Delay: 4.4

Intersection LOS: A

Intersection Capacity Utilization 55.2%

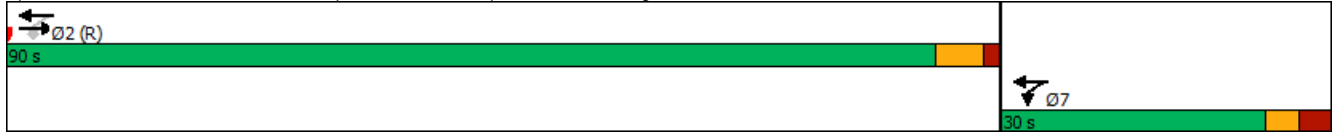
ICU Level of Service B

Analysis Period (min) 15

Description: 05-2153

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: I-540 EB On-Ramp/I-540 EB Off-Ramp & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↕↕			↕↕↕	↕↔		↕↔	↕↕↕			
Traffic Volume (vph)	487	1137	0	0	1715	802	84	4	462	0	0	0
Future Volume (vph)	487	1137	0	0	1715	802	84	4	462	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		-1%			1%			2%			0%	
Storage Length (ft)	500		0	0		0	0		400	0		0
Storage Lanes	1		0	0		1	0		2	0		0
Taper Length (ft)	200			25			25			25		
Satd. Flow (prot)	3384	5012	0	0	4963	1545	0	1693	2655	0	0	0
Flt Permitted	0.950							0.954				
Satd. Flow (perm)	3384	5012	0	0	4963	1545	0	1693	2655	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						653			159			
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		803			1134			793			417	
Travel Time (s)		12.2			17.2			15.4			8.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	6%	6%	6%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	535	1249	0	0	1885	881	0	96	508	0	0	0
Turn Type	Prot	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			4				
Permitted Phases						6	4		4			
Detector Phase	5	2			6	6	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0	12.0			12.0	12.0	7.0	7.0	7.0			
Minimum Split (s)	15.0	20.0			20.0	20.0	15.0	15.0	15.0			
Total Split (s)	25.0	85.0			60.0	60.0	35.0	35.0	35.0			
Total Split (%)	20.8%	70.8%			50.0%	50.0%	29.2%	29.2%	29.2%			
Yellow Time (s)	3.3	4.6			4.4	4.4	3.7	3.7	3.7			
All-Red Time (s)	3.0	1.3			1.4	1.4	2.5	2.5	2.5			
Lost Time Adjust (s)	-1.3	-0.9			-0.8	-0.8		-1.2	-1.2			
Total Lost Time (s)	5.0	5.0			5.0	5.0		5.0	5.0			
Lead/Lag	Lag				Lead	Lead						
Lead-Lag Optimize?	Yes				Yes	Yes						
Recall Mode	None	C-Max			C-Max	C-Max	None	None	None			
Act Effct Green (s)	20.0	88.5			63.5	63.5		21.5	21.5			
Actuated g/C Ratio	0.17	0.74			0.53	0.53		0.18	0.18			
v/c Ratio	0.95	0.34			0.72	0.78		0.32	0.84			
Control Delay	68.5	6.2			13.4	10.1		44.1	44.9			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	68.5	6.2			13.4	10.1		44.1	44.9			
LOS	E	A			B	B		D	D			
Approach Delay		24.8			12.4			44.8				
Approach LOS		C			B			D				
Queue Length 50th (ft)	207	117			241	23		65	152			
Queue Length 95th (ft)	#311	175			434	682		109	207			
Internal Link Dist (ft)		723			1054			713			337	
Turn Bay Length (ft)	500								400			
Base Capacity (vph)	564	3697			2628	1125		423	783			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.95	0.34			0.72	0.78		0.23	0.65			

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 32 (27%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.95

Intersection Signal Delay: 20.5

Intersection LOS: C

Intersection Capacity Utilization 81.9%

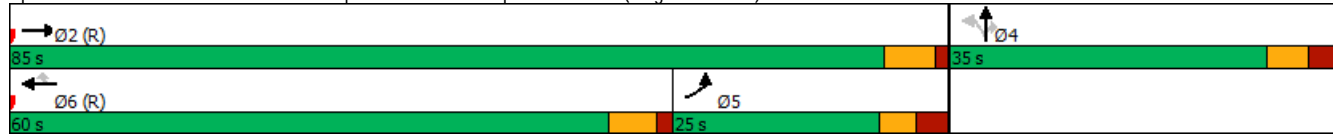
ICU Level of Service D

Analysis Period (min) 15

Description: 05-2152

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: I-540 WB Off-Ramp/I-540 WB On-Ramp & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↕↕	↔			↕↕↕	↔	↔↔	↕	↔	↔↔	↔	↔
Traffic Volume (vph)	296	1138	57	5	19	2091	58	289	6	64	40	9	56
Future Volume (vph)	296	1138	57	5	19	2091	58	289	6	64	40	9	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		-1%				1%			3%			0%	
Storage Length (ft)	400		125		200		200	200		100	325		150
Storage Lanes	2		1		1		1	2		1	1		1
Taper Length (ft)	250				100			100			100		
Satd. Flow (prot)	3320	4918	1531	0	1710	4915	1530	3382	1835	1560	3213	1477	1408
Flt Permitted	0.950				0.950			0.950			0.950		
Satd. Flow (perm)	3320	4918	1531	0	1710	4915	1530	3382	1835	1539	3202	1477	1408
Right Turn on Red			Yes				Yes			Yes			Yes
Satd. Flow (RTOR)			94				95			153		26	150
Link Speed (mph)		45				45			35				35
Link Distance (ft)		1134				1230			476			550	
Travel Time (s)		17.2				18.6			9.3			10.7	
Confl. Peds. (#/hr)										1	1		
Confl. Bikes (#/hr)													
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	6%	6%	6%	5%	5%	5%	5%	2%	2%	2%	9%	9%	9%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)													
Mid-Block Traffic (%)		0%				0%			0%			0%	
Shared Lane Traffic (%)													43%
Lane Group Flow (vph)	315	1211	61	0	25	2224	62	307	6	68	43	36	34
Turn Type	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2	3	1!	1	6	7	3	8	1!	7	4	5
Permitted Phases			2			6				8			4
Detector Phase	5	2	3	1	1	6	7	3	8	1	7	4	5
Switch Phase													
Minimum Initial (s)	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	15.0	20.0	15.0	15.0	15.0	20.0	16.0	15.0	15.0	15.0	16.0	15.0	15.0
Total Split (s)	17.0	68.0	20.0	17.0	17.0	68.0	16.0	20.0	19.0	17.0	16.0	15.0	17.0
Total Split (%)	14.2%	56.7%	16.7%	14.2%	14.2%	56.7%	13.3%	16.7%	15.8%	14.2%	13.3%	12.5%	14.2%
Yellow Time (s)	3.6	4.6	3.8	3.4	3.4	4.4	4.1	3.8	3.6	3.4	4.1	3.8	3.6
All-Red Time (s)	3.0	1.7	3.0	3.0	3.0	1.6	3.0	3.0	3.0	3.0	3.0	3.1	3.0
Lost Time Adjust (s)	-1.6	-1.3	-1.8		-1.4	-1.0	-2.1	-1.8	-1.6	-1.4	-2.1	-1.9	-1.6
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag	Lag	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None	None	None	None	None	None
Act Effct Green (s)	13.8	72.4	93.7		11.3	67.3	91.5	15.3	9.7	14.1	19.2	9.2	19.4
Actuated g/C Ratio	0.12	0.60	0.78		0.09	0.56	0.76	0.13	0.08	0.12	0.16	0.08	0.16
v/c Ratio	0.83	0.41	0.05		0.16	0.81	0.05	0.71	0.04	0.21	0.08	0.26	0.10
Control Delay	71.9	12.1	2.3		51.9	25.1	0.6	60.2	49.8	1.5	42.7	29.5	0.5
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.9	12.1	2.3		51.9	25.1	0.6	60.2	49.8	1.5	42.7	29.5	0.5
LOS	E	B	A		D	C	A	E	D	A	D	C	A
Approach Delay		23.6				24.7			49.6				25.8
Approach LOS		C				C			D				C
Queue Length 50th (ft)	116	116	0		18	527	0	118	4	0	12	7	0
Queue Length 95th (ft)	#214	263	m13		46	600	6	169	18	0	35	43	0
Internal Link Dist (ft)		1054				1150			396			470	
Turn Bay Length (ft)	400		125		200		200	200		100	325		150
Base Capacity (vph)	380	2967	1207		171	2755	1193	438	215	326	525	146	353
Starvation Cap Reductn	0	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.41	0.05		0.15	0.81	0.05	0.70	0.03	0.21	0.08	0.25	0.10

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 2 (2%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 26.5

Intersection LOS: C

Intersection Capacity Utilization 76.3%

ICU Level of Service D

Analysis Period (min) 15

Description: 05-2267

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

! Phase conflict between lane groups.

Splits and Phases: 4: Hinton Oaks Boulevard & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕		↕	↕		↕	↕	
Traffic Volume (vph)	4	4	8	121	4	4	46	134	109	4	292	10
Future Volume (vph)	4	4	8	121	4	4	46	134	109	4	292	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			1%	
Storage Length (ft)	0		0	100		0	70		0	150		350
Storage Lanes	0		0	1		0	1		0	1		1
Taper Length (ft)	25			100			100			80		
Satd. Flow (prot)	0	1710	0	1770	1723	0	1770	3302	0	1761	5035	0
Flt Permitted		0.988		0.950			0.950			0.950		
Satd. Flow (perm)	0	1710	0	1770	1723	0	1770	3302	0	1761	5035	0
Link Speed (mph)		30			30			30			25	
Link Distance (ft)		171			365			524			265	
Travel Time (s)		3.9			8.3			11.9			7.2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	21	0	159	10	0	61	319	0	5	397	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	33.9%
ICU Level of Service	A
Analysis Period (min)	15

Intersection												
Int Delay, s/veh	4.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕		↕	↕		↕	↕↕	
Traffic Vol, veh/h	4	4	8	121	4	4	46	134	109	4	292	10
Future Vol, veh/h	4	4	8	121	4	4	46	134	109	4	292	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	100	-	-	70	-	-	150	-	350
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	1	-
Peak Hour Factor	76	76	76	76	76	76	76	76	76	76	76	76
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	5	11	159	5	5	61	176	143	5	384	13
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	614	842	199	536	777	160	397	0	0	319	0	0
Stage 1	401	401	-	370	370	-	-	-	-	-	-	-
Stage 2	213	441	-	166	407	-	-	-	-	-	-	-
Critical Hdwy	6.99	6.54	7.14	6.99	6.54	6.94	5.34	-	-	4.14	-	-
Critical Hdwy Stg 1	7.34	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4.02	3.92	3.67	4.02	3.32	3.12	-	-	2.22	-	-
Pot Cap-1 Maneuver	401	299	688	450	327	857	757	-	-	1238	-	-
Stage 1	528	599	-	601	619	-	-	-	-	-	-	-
Stage 2	741	575	-	781	596	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	368	274	688	409	299	857	757	-	-	1238	-	-
Mov Cap-2 Maneuver	368	274	-	409	299	-	-	-	-	-	-	-
Stage 1	485	597	-	552	569	-	-	-	-	-	-	-
Stage 2	671	528	-	759	594	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	13.8			18.9			1.6			0.1		
HCM LOS	B			C								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR			
Capacity (veh/h)	757	-	-	431	409	443	1238	-	-			
HCM Lane V/C Ratio	0.08	-	-	0.049	0.389	0.024	0.004	-	-			
HCM Control Delay (s)	10.2	-	-	13.8	19.3	13.3	7.9	-	-			
HCM Lane LOS	B	-	-	B	C	B	A	-	-			
HCM 95th %tile Q(veh)	0.3	-	-	0.2	1.8	0.1	0	-	-			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	4	42	46	4	4	9	87	11	4	218	4
Future Volume (vph)	4	4	42	46	4	4	9	87	11	4	218	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%				0%		0%				1%	
Storage Length (ft)	0		0	100		0	0		0	100		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			100			25			100		
Satd. Flow (prot)	1770	1863	1583	1770	1723	0	1770	1831	0	1761	1848	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1863	1583	1770	1723	0	1770	1831	0	1761	1848	0
Link Speed (mph)		30			30			30			25	
Link Distance (ft)		258			326			504			286	
Travel Time (s)		5.9			7.4			11.5			7.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	5	49	54	10	0	11	115	0	5	261	0
Sign Control	Stop				Stop		Stop				Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	28.4%
ICU Level of Service	A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	10.1
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↑	↔	↔	↔		↔	↔		↔	↔	
Traffic Vol, veh/h	4	4	42	46	4	4	9	87	11	4	218	4
Future Vol, veh/h	4	4	42	46	4	4	9	87	11	4	218	4
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	5	49	54	5	5	11	102	13	5	256	5
Number of Lanes	1	1	1	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	3	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	3	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	3
HCM Control Delay	8.4	9.5	9.3	11
HCM LOS	A	A	A	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	100%	0%	100%	0%
Vol Thru, %	0%	89%	0%	100%	0%	0%	50%	0%	98%
Vol Right, %	0%	11%	0%	0%	100%	0%	50%	0%	2%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	9	98	4	4	42	46	8	4	222
LT Vol	9	0	4	0	0	46	0	4	0
Through Vol	0	87	0	4	0	0	4	0	218
RT Vol	0	11	0	0	42	0	4	0	4
Lane Flow Rate	11	115	5	5	49	54	9	5	261
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.018	0.172	0.008	0.008	0.07	0.094	0.014	0.007	0.374
Departure Headway (Hd)	5.956	5.375	6.308	5.804	5.098	6.286	5.427	5.671	5.158
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	599	664	565	613	697	567	655	630	695
Service Time	3.712	3.131	4.078	3.574	2.868	4.057	3.198	3.418	2.904
HCM Lane V/C Ratio	0.018	0.173	0.009	0.008	0.07	0.095	0.014	0.008	0.376
HCM Control Delay	8.8	9.3	9.1	8.6	8.3	9.7	8.3	8.5	11
HCM Lane LOS	A	A	A	A	A	A	A	A	B
HCM 95th-tile Q	0.1	0.6	0	0	0.2	0.3	0	0	1.7



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↕			↕
Traffic Volume (vph)	0	4	134	15	0	306
Future Volume (vph)	0	4	134	15	0	306
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			1%
Storage Length (ft)	0	0		0	0	
Storage Lanes	0	1		0	0	
Taper Length (ft)	25				25	
Satd. Flow (prot)	0	1611	3486	0	0	3522
Flt Permitted						
Satd. Flow (perm)	0	1611	3486	0	0	3522
Link Speed (mph)	30		30			25
Link Distance (ft)	215		265			210
Travel Time (s)	4.9		6.0			5.7
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	4	166	0	0	340
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	14.2%
ICU Level of Service	A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↑	↑↑			↑↑
Traffic Vol, veh/h	0	4	134	15	0	306
Future Vol, veh/h	0	4	134	15	0	306
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	1
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	4	149	17	0	340

Major/Minor	Minor1	Major1	Major2	Major2	Major2
Conflicting Flow All	-	83	0	0	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-
Pot Cap-1 Maneuver	0	960	-	0	-
Stage 1	0	-	-	0	-
Stage 2	0	-	-	0	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	960	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	960	-
HCM Lane V/C Ratio	-	-	0.005	-
HCM Control Delay (s)	-	-	8.8	-
HCM Lane LOS	-	-	A	-
HCM 95th %tile Q(veh)	-	-	0	-



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↖	↖↗			↖↗
Traffic Volume (vph)	0	4	120	14	0	306
Future Volume (vph)	0	4	120	14	0	306
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			1%
Storage Length (ft)	0	0		0	0	
Storage Lanes	0	1		0	0	
Taper Length (ft)	25				25	
Satd. Flow (prot)	0	1611	3483	0	0	3522
Flt Permitted						
Satd. Flow (perm)	0	1611	3483	0	0	3522
Link Speed (mph)	30		30			25
Link Distance (ft)	193		210			269
Travel Time (s)	4.4		4.8			7.3
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	4	149	0	0	340
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	13.8%
ICU Level of Service	A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↑	↑↓			↑↑
Traffic Vol, veh/h	0	4	120	14	0	306
Future Vol, veh/h	0	4	120	14	0	306
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	1
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	4	133	16	0	340

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	-	75	0	0	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-
Pot Cap-1 Maneuver	0	971	-	0	-
Stage 1	0	-	-	0	-
Stage 2	0	-	-	0	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	-	971	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

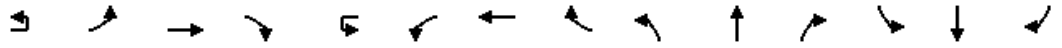
Approach	WB	NB	SB
HCM Control Delay, s	8.7	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	971	-
HCM Lane V/C Ratio	-	-	0.005	-
HCM Control Delay (s)	-	-	8.7	-
HCM Lane LOS	-	-	A	-
HCM 95th %tile Q(veh)	-	-	0	-

Legacy Oaks
1: Hodge Road & US 64 Bus (Knightdale Blvd.)

Build-Out + 1 PM (2024) - with Hinton Oaks

03/30/2020



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations														
Traffic Volume (vph)	7	146	1704	319	21	407	1132	347	115	42	241	263	84	125
Future Volume (vph)	7	146	1704	319	21	407	1132	347	115	42	241	263	84	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)			3%				-3%			-2%				1%
Storage Length (ft)		200		225		600		375	200		50	0		0
Storage Lanes		3		1		1		1	1		1	2		1
Taper Length (ft)		300				150			100			100		
Satd. Flow (prot)	0	3382	5009	1560	0	1796	5162	1607	3467	1641	0	3416	1853	1575
Flt Permitted		0.950				0.950			0.950			0.950		
Satd. Flow (perm)	0	3382	5009	1560	0	1796	5162	1607	3467	1641	0	3416	1853	1575
Right Turn on Red				Yes				Yes			Yes			Yes
Satd. Flow (RTOR)				169				358			173			182
Link Speed (mph)			45				45				35			25
Link Distance (ft)			734				962				450			524
Travel Time (s)			11.1				14.6				8.8			14.3
Confl. Peds. (#/hr)														
Confl. Bikes (#/hr)														
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)														
Mid-Block Traffic (%)			0%				0%			0%				0%
Shared Lane Traffic (%)														
Lane Group Flow (vph)	0	158	1757	329	0	442	1167	358	119	291	0	271	87	129
Turn Type	Prot	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5!	5	2	3	1	1	6	7	3	8		7	4	5!
Permitted Phases				2				6						4
Detector Phase	5	5	2	3	1	1	6	7	3	8		7	4	5
Switch Phase														
Minimum Initial (s)	7.0	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	15.0	15.0	19.0	15.0	15.0	15.0	20.0	15.0	15.0	16.0		15.0	15.0	15.0
Total Split (s)	20.0	20.0	55.0	25.0	45.0	45.0	80.0	15.0	25.0	25.0		15.0	15.0	20.0
Total Split (%)	14.3%	14.3%	39.3%	17.9%	32.1%	32.1%	57.1%	10.7%	17.9%	17.9%		10.7%	10.7%	14.3%
Yellow Time (s)	3.0	3.0	4.3	3.0	3.0	3.0	4.8	3.0	3.0	4.0		3.0	3.1	3.0
All-Red Time (s)	3.9	3.9	1.7	3.9	3.5	3.5	1.7	3.9	3.9	3.1		3.9	3.7	3.9
Lost Time Adjust (s)		-1.9	-1.0	-1.9			-1.5	-1.5	-1.9	-2.1		-1.9	-1.8	-1.9
Total Lost Time (s)		5.0	5.0	5.0			5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lead	Lead	Lag	Lag	Lag	Lead	Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None	C-Max	None	None	None	C-Max	None	None	None		None	None	None
Act Effct Green (s)		13.3	53.4	67.7		40.0	80.1	95.1	14.3	16.6		10.0	12.3	30.6
Actuated g/C Ratio		0.10	0.38	0.48		0.29	0.57	0.68	0.10	0.12		0.07	0.09	0.22
v/c Ratio		0.49	0.92	0.39		0.86	0.40	0.30	0.34	0.84		1.11	0.54	0.27
Control Delay		65.2	50.5	7.5		46.3	7.2	0.6	59.9	44.8		147.9	73.8	2.8
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay		65.2	50.5	7.5		46.3	7.2	0.6	59.9	44.8		147.9	73.8	2.8
LOS		E	D	A		D	A	A	E	D		F	E	A
Approach Delay			45.2				14.8			49.2				96.2
Approach LOS			D				B			D				F
Queue Length 50th (ft)		71	571	55		389	88	0	53	106		-145	75	0
Queue Length 95th (ft)		108	#693	101		#566	102	0	81	#231		#240	#157	15
Internal Link Dist (ft)			654				882			370				444
Turn Bay Length (ft)		200		225		600		375	200					
Base Capacity (vph)		362	1910	898		513	2952	1206	495	382		244	163	503
Starvation Cap Reductn		0	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn		0	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn		0	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio		0.44	0.92	0.37		0.86	0.40	0.30	0.24	0.76		1.11	0.53	0.26

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Legacy Oaks
 1: Hodge Road & US 64 Bus (Knightdale Blvd.)

Build-Out + 1 PM (2024) - with Hinton Oaks
 03/30/2020

Offset: 84 (60%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.11
 Intersection Signal Delay: 38.7 Intersection LOS: D
 Intersection Capacity Utilization 97.9% ICU Level of Service F
 Analysis Period (min) 15
 Description: 05-0928
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 ! Phase conflict between lane groups.

Splits and Phases: 1: Hodge Road & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↓	↑↑							↑
Traffic Volume (vph)	0	2150	95	312	1306	0	0	0	0	0	0	624
Future Volume (vph)	0	2150	95	312	1306	0	0	0	0	0	0	624
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		1%			-1%			0%			2%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	5060	1575	1778	3557	0	0	0	0	0	0	1564
Flt Permitted				0.054								
Satd. Flow (perm)	0	5060	1575	101	3557	0	0	0	0	0	0	1564
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			97									190
Link Speed (mph)		45			45			35				35
Link Distance (ft)		962			263			601				428
Travel Time (s)		14.6			4.0			11.7				8.3
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	4%	4%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%				0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2194	97	318	1333	0	0	0	0	0	0	637
Turn Type		NA	Perm	D.P+P	NA							Free
Protected Phases		2		7	2 7							
Permitted Phases			2	2								Free
Detector Phase		2	2	7	2 7							
Switch Phase												
Minimum Initial (s)		12.0	12.0	7.0								
Minimum Split (s)		19.0	19.0	15.0								
Total Split (s)		100.0	100.0	40.0								
Total Split (%)		71.4%	71.4%	28.6%								
Yellow Time (s)		4.4	4.4	3.0								
All-Red Time (s)		1.6	1.6	3.1								
Lost Time Adjust (s)		-1.0	-1.0	-1.1								
Total Lost Time (s)		5.0	5.0	5.0								
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max	None								
Act Effct Green (s)		97.8	97.8	130.0	140.0							140.0
Actuated g/C Ratio		0.70	0.70	0.93	1.00							1.00
v/c Ratio		0.62	0.09	0.66	0.37							0.41
Control Delay		9.9	1.0	63.3	1.8							0.8
Queue Delay		0.0	0.0	0.0	0.0							0.0
Total Delay		9.9	1.0	63.3	1.8							0.8
LOS		A	A	E	A							A
Approach Delay		9.5			13.6						0.8	
Approach LOS		A			B						A	
Queue Length 50th (ft)		147	2	241	52							0
Queue Length 95th (ft)		m313	m3	333	18							0
Internal Link Dist (ft)		882			183			521			348	
Turn Bay Length (ft)												
Base Capacity (vph)		3534	1128	514	3543							1564
Starvation Cap Reductn		0	0	0	0							0
Spillback Cap Reductn		0	0	0	0							0
Storage Cap Reductn		0	0	0	0							0
Reduced v/c Ratio		0.62	0.09	0.62	0.38							0.41

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 72 (51%), Referenced to phase 2:EBWB and 6:, Start of Green

Natural Cycle: 50

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.66

Intersection Signal Delay: 9.8

Intersection LOS: A

Intersection Capacity Utilization 110.7%

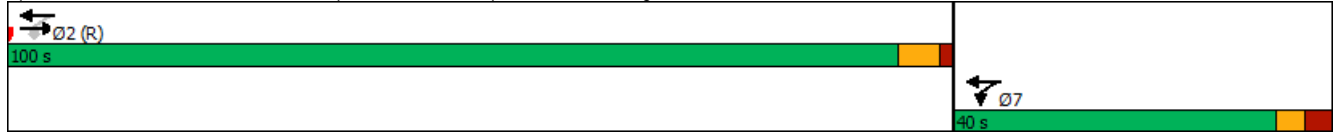
ICU Level of Service H

Analysis Period (min) 15

Description: 05-2153

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: I-540 EB On-Ramp/I-540 EB Off-Ramp & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	417	2743	0	0	1503	579	120	4	679	0	0	0
Future Volume (vph)	417	2743	0	0	1503	579	120	4	679	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		-1%			1%			2%			0%	
Storage Length (ft)	500		0	0		0	0		400	0		0
Storage Lanes	1		0	0		1	0		2	0		0
Taper Length (ft)	200			25			25			25		
Satd. Flow (prot)	3450	5111	0	0	5060	1575	0	1759	2759	0	0	0
Flt Permitted	0.950							0.954				
Satd. Flow (perm)	3450	5111	0	0	5060	1575	0	1759	2759	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						555			71			
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		803			1134			793			417	
Travel Time (s)		12.2			17.2			15.4			8.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	434	2857	0	0	1566	603	0	129	707	0	0	0
Turn Type	Prot	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			4				
Permitted Phases					6	4		4				
Detector Phase	5	2			6	6	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0	12.0			12.0	12.0	7.0	7.0	7.0			
Minimum Split (s)	15.0	20.0			20.0	20.0	15.0	15.0	15.0			
Total Split (s)	30.0	100.0			70.0	70.0	40.0	40.0	40.0			
Total Split (%)	21.4%	71.4%			50.0%	50.0%	28.6%	28.6%	28.6%			
Yellow Time (s)	3.3	4.6			4.4	4.4	3.7	3.7	3.7			
All-Red Time (s)	3.0	1.3			1.4	1.4	2.5	2.5	2.5			
Lost Time Adjust (s)	-1.3	-0.9			-0.8	-0.8	-1.2	-1.2	-1.2			
Total Lost Time (s)	5.0	5.0			5.0	5.0	5.0	5.0	5.0			
Lead/Lag	Lag				Lead	Lead						
Lead-Lag Optimize?	Yes				Yes	Yes						
Recall Mode	None	C-Max			C-Max	C-Max	None	None	None			
Act Effct Green (s)	25.0	95.5			65.5	65.5		34.5	34.5			
Actuated g/C Ratio	0.18	0.68			0.47	0.47		0.25	0.25			
v/c Ratio	0.70	0.82			0.66	0.58		0.30	0.96			
Control Delay	45.0	6.5			14.0	2.4		45.0	72.4			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	45.0	6.5			14.0	2.4		45.0	72.4			
LOS	D	A			B	A		D	E			
Approach Delay		11.6			10.8			68.2				
Approach LOS		B			B			E				
Queue Length 50th (ft)	209	124			264	0		96	331			
Queue Length 95th (ft)	256	129			142	m5		157	#471			
Internal Link Dist (ft)		723			1054			713			337	
Turn Bay Length (ft)	500								400			
Base Capacity (vph)	616	3488			2368	1032		439	743			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.70	0.82			0.66	0.58		0.29	0.95			

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 68 (49%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.96

Intersection Signal Delay: 18.8

Intersection LOS: B

Intersection Capacity Utilization 85.1%

ICU Level of Service E

Analysis Period (min) 15

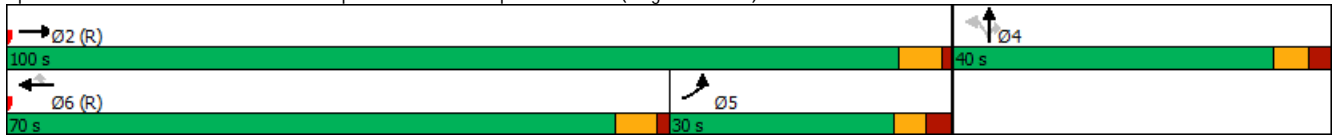
Description: 05-2152

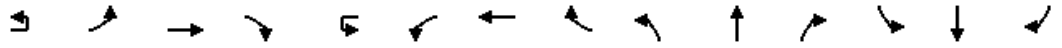
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: I-540 WB Off-Ramp/I-540 WB On-Ramp & US 64 Bus (Knightdale Blvd.)





Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations														
Traffic Volume (vph)	26	468	2545	171	6	37	1587	77	125	28	61	140	14	239
Future Volume (vph)	26	468	2545	171	6	37	1587	77	125	28	61	140	14	239
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)			-1%				1%			3%				0%
Storage Length (ft)		400		125		200		200	200		100	325		150
Storage Lanes		2		1		1		1	2		1	1		1
Taper Length (ft)		250				100			100			100		
Satd. Flow (prot)	0	3450	5111	1591	0	1761	5060	1575	3382	1835	1560	3433	1534	1504
Flt Permitted		0.950				0.950			0.950			0.950		
Satd. Flow (perm)	0	3450	5111	1591	0	1761	5060	1575	3382	1835	1560	3433	1534	1504
Right Turn on Red				Yes				Yes			Yes			Yes
Satd. Flow (RTOR)				88				81			130			118
Link Speed (mph)			45				45			35				35
Link Distance (ft)			1134				1230			476				550
Travel Time (s)			17.2				18.6			9.3				10.7
Confl. Peds. (#/hr)														
Confl. Bikes (#/hr)														
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)														
Mid-Block Traffic (%)			0%				0%			0%				0%
Shared Lane Traffic (%)														47%
Lane Group Flow (vph)	0	520	2679	180	0	45	1671	81	132	29	64	147	133	134
Turn Type	Prot	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5!	5	2	3	1!	1	6	7	3	8	1!	7	4	5!
Permitted Phases				2				6			8			4
Detector Phase	5	5	2	3	1	1	6	7	3	8	1	7	4	5
Switch Phase														
Minimum Initial (s)	7.0	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	15.0	15.0	20.0	15.0	15.0	15.0	20.0	16.0	15.0	15.0	15.0	16.0	15.0	15.0
Total Split (s)	28.0	28.0	80.0	20.0	20.0	20.0	72.0	20.0	20.0	20.0	20.0	20.0	20.0	28.0
Total Split (%)	20.0%	20.0%	57.1%	14.3%	14.3%	14.3%	51.4%	14.3%	14.3%	14.3%	14.3%	14.3%	14.3%	20.0%
Yellow Time (s)	3.6	3.6	4.6	3.8	3.4	3.4	4.4	4.1	3.8	3.6	3.4	4.1	3.8	3.6
All-Red Time (s)	3.0	3.0	1.7	3.0	3.0	3.0	1.6	3.0	3.0	3.0	3.0	3.0	3.1	3.0
Lost Time Adjust (s)		-1.6	-1.3	-1.8			-1.4	-1.0	-2.1	-1.8	-1.6	-1.4	-2.1	-1.9
Total Lost Time (s)		5.0	5.0	5.0			5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	C-Max	None	None	None	C-Max	None	None	None	None	None	None	None
Act Effct Green (s)		23.0	89.3	106.8		10.0	73.6	97.7	12.5	9.7	16.2	19.1	10.9	33.9
Actuated g/C Ratio		0.16	0.64	0.76		0.07	0.53	0.70	0.09	0.07	0.12	0.14	0.08	0.24
v/c Ratio		0.92	0.82	0.15		0.36	0.63	0.07	0.44	0.23	0.22	0.31	0.58	0.29
Control Delay		62.4	17.0	1.2		69.6	25.4	2.0	64.7	65.5	1.7	57.6	24.1	6.6
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		62.4	17.0	1.2		69.6	25.4	2.0	64.7	65.5	1.7	57.6	24.1	6.6
LOS		E	B	A		E	C	A	E	E	A	E	C	A
Approach Delay			23.1				25.5			46.9				30.3
Approach LOS			C				C			D				C
Queue Length 50th (ft)		232	403	5		40	378	0	59	26	0	66	13	4
Queue Length 95th (ft)		m#323	790	m16		81	480	19	92	59	0	98	82	45
Internal Link Dist (ft)			1054				1150			396			470	
Turn Bay Length (ft)		400		125		200		200	200		100	325		150
Base Capacity (vph)		566	3260	1261		188	2660	1116	362	196	347	477	269	459
Starvation Cap Reductn		0	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.92	0.82	0.14		0.24	0.63	0.07	0.36	0.15	0.18	0.31	0.49	0.29

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 78 (56%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 25.3

Intersection LOS: C

Intersection Capacity Utilization 83.3%

ICU Level of Service E

Analysis Period (min) 15

Description: 05-2267

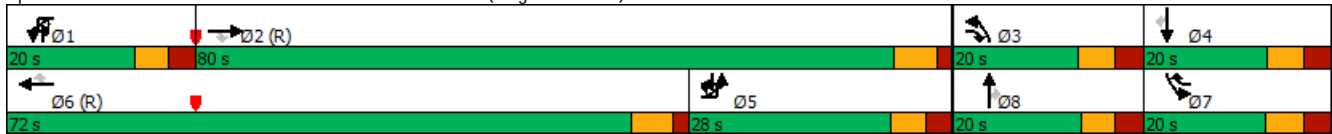
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

! Phase conflict between lane groups.

Splits and Phases: 4: Hinton Oaks Boulevard & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔			↔	↔		↔	↔↔	
Traffic Volume (vph)	4	4	13	9	134	4	4	9	112	323	101	4	182	4
Future Volume (vph)	4	4	13	9	134	4	4	9	112	323	101	4	182	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%				0%				0%				1%
Storage Length (ft)	0		0		100		0		70		0	150		350
Storage Lanes	0		0		1		0		1		0	1		1
Taper Length (ft)	25				100				100			80		
Satd. Flow (prot)	0	1687	0	0	1770	1723	0	0	1687	3252	0	1761	5045	0
Flt Permitted		0.991			0.950				0.950			0.950		
Satd. Flow (perm)	0	1687	0	0	1770	1723	0	0	1687	3252	0	1761	5045	0
Link Speed (mph)		30				30				30			25	
Link Distance (ft)		171				365				524			265	
Travel Time (s)		3.9				8.3				11.9			7.2	
Confl. Peds. (#/hr)			1		1									
Confl. Bikes (#/hr)														
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	7%	7%	7%	7%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)														
Mid-Block Traffic (%)		0%				0%				0%			0%	
Shared Lane Traffic (%)														
Lane Group Flow (vph)	0	22	0	0	150	8	0	0	127	446	0	4	196	0
Sign Control		Stop				Stop				Free			Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	40.1%
ICU Level of Service	A
Analysis Period (min)	15

Intersection														
Int Delay, s/veh	6.2													
Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔			↔	↔		↔	↔	↔
Traffic Vol, veh/h	4	4	13	9	134	4	4	9	112	323	101	4	182	4
Future Vol, veh/h	4	4	13	9	134	4	4	9	112	323	101	4	182	4
Conflicting Peds, #/hr	0	0	1	0	1	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	-	None	-	-	-	None	-	-	None
Storage Length	-	-	-	-	100	-	-	-	70	-	-	150	-	350
Veh in Median Storage, #	-	0	-	-	-	0	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	-	0	-	-	-	0	-	-	1	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	7	7	7	7	2	2	2
Mvmt Flow	4	4	14	9	141	4	4	9	118	340	106	4	192	4
Major/Minor	Minor2			Minor1			Major1			Major2				
Conflicting Flow All	628	902	99	0	735	851	223	143	196	0	0	446	0	0
Stage 1	202	202	-	0	647	647	-	-	-	-	-	-	-	-
Stage 2	426	700	-	0	88	204	-	-	-	-	-	-	-	-
Critical Hdwy	6.99	6.54	7.14	-	6.99	6.54	6.94	5.74	5.44	-	-	4.14	-	-
Critical Hdwy Stg 1	7.34	5.54	-	-	6.54	5.54	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	-	6.74	5.54	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4.02	3.92	-	3.67	4.02	3.32	2.37	3.17	-	-	2.22	-	-
Pot Cap-1 Maneuver	392	276	796	0	335	296	780	1267	920	-	-	1111	-	-
Stage 1	719	733	-	0	414	465	-	-	-	-	-	-	-	-
Stage 2	558	440	-	0	870	732	-	-	-	-	-	-	-	-
Platoon blocked, %				-						-	-		-	-
Mov Cap-1 Maneuver	344	238	795	0	290	255	780	938	938	-	-	1111	-	-
Mov Cap-2 Maneuver	344	238	-	0	290	255	-	-	-	-	-	-	-	-
Stage 1	622	730	-	0	358	402	-	-	-	-	-	-	-	-
Stage 2	475	381	-	0	846	729	-	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB				
HCM Control Delay, s	13.1			27.8			2.1			0.2				
HCM LOS	B			D										
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR					
Capacity (veh/h)	938	-	-	469	290	384	1111	-	-					
HCM Lane V/C Ratio	0.136	-	-	0.047	0.486	0.022	0.004	-	-					
HCM Control Delay (s)	9.4	-	-	13.1	28.6	14.6	8.3	-	-					
HCM Lane LOS	A	-	-	B	D	B	A	-	-					
HCM 95th %tile Q(veh)	0.5	-	-	0.1	2.5	0.1	0	-	-					



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	4	27	19	4	4	30	223	21	4	133	4
Future Volume (vph)	4	4	27	19	4	4	30	223	21	4	133	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%				0%		0%				1%	
Storage Length (ft)	0		0	100		0	0		0	100		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			100			25			100		
Satd. Flow (prot)	1770	1863	1583	1770	1723	0	1687	1753	0	1761	1846	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1863	1583	1770	1723	0	1687	1753	0	1761	1846	0
Link Speed (mph)		30			30			30			25	
Link Distance (ft)		258			326			504			286	
Travel Time (s)		5.9			7.4			11.5			7.8	
Confl. Peds. (#/hr)			1	1								
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	7%	7%	7%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	4	4	29	20	8	0	32	263	0	4	147	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	34.1%
ICU Level of Service	A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	10
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↑	↔	↔	↔		↔	↔		↔	↔	
Traffic Vol, veh/h	4	4	27	19	4	4	30	223	21	4	133	4
Future Vol, veh/h	4	4	27	19	4	4	30	223	21	4	133	4
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	2	2	2	2	2	2	7	7	7	2	2	2
Mvmt Flow	4	4	29	20	4	4	32	240	23	4	143	4
Number of Lanes	1	1	1	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	3	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	3	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	3
HCM Control Delay	8.3	9.1	10.6	9.5
HCM LOS	A	A	B	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	100%	0%	100%	0%
Vol Thru, %	0%	91%	0%	100%	0%	0%	50%	0%	97%
Vol Right, %	0%	9%	0%	0%	100%	0%	50%	0%	3%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	30	244	4	4	27	19	8	4	137
LT Vol	30	0	4	0	0	19	0	4	0
Through Vol	0	223	0	4	0	0	4	0	133
RT Vol	0	21	0	0	27	0	4	0	4
Lane Flow Rate	32	262	4	4	29	20	9	4	147
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.051	0.37	0.008	0.007	0.042	0.036	0.013	0.007	0.218
Departure Headway (Hd)	5.642	5.081	6.356	5.852	5.146	6.379	5.52	5.839	5.317
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	635	708	561	609	692	559	645	612	675
Service Time	3.379	2.817	4.114	3.61	2.904	4.142	3.283	3.581	3.058
HCM Lane V/C Ratio	0.05	0.37	0.007	0.007	0.042	0.036	0.014	0.007	0.218
HCM Control Delay	8.7	10.8	9.2	8.7	8.1	9.4	8.4	8.6	9.5
HCM Lane LOS	A	B	A	A	A	A	A	A	A
HCM 95th-ile Q	0.2	1.7	0	0	0.1	0.1	0	0	0.8



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↕			↕
Traffic Volume (vph)	0	4	345	24	0	179
Future Volume (vph)	0	4	345	24	0	179
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			1%
Storage Length (ft)	0	0		0	0	
Storage Lanes	0	1		0	0	
Taper Length (ft)	25				25	
Satd. Flow (prot)	0	1611	3504	0	0	3522
Flt Permitted						
Satd. Flow (perm)	0	1611	3504	0	0	3522
Link Speed (mph)	30		30			25
Link Distance (ft)	215		265			193
Travel Time (s)	4.9		6.0			5.3
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	4	410	0	0	199
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	20.3%
ICU Level of Service	A
Analysis Period (min)	15

Intersection

Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↑	↑↑			↑↑
Traffic Vol, veh/h	0	4	345	24	0	179
Future Vol, veh/h	0	4	345	24	0	179
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	1
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	4	383	27	0	199

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	-	205	0	0	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-
Pot Cap-1 Maneuver	0	802	-	-	0
Stage 1	0	-	-	-	0
Stage 2	0	-	-	-	0
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	-	802	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.5	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	802	-
HCM Lane V/C Ratio	-	-	0.006	-
HCM Control Delay (s)	-	-	9.5	-
HCM Lane LOS	-	-	A	-
HCM 95th %tile Q(veh)	-	-	0	-



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↖	↕	↗		↘
Traffic Volume (vph)	0	4	322	23	0	179
Future Volume (vph)	0	4	322	23	0	179
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			1%
Storage Length (ft)	0	0		0	0	
Storage Lanes	0	1		0	0	
Taper Length (ft)	25				25	
Satd. Flow (prot)	0	1611	3504	0	0	3522
Flt Permitted						
Satd. Flow (perm)	0	1611	3504	0	0	3522
Link Speed (mph)	30		30			25
Link Distance (ft)	193		193			286
Travel Time (s)	4.4		4.4			7.8
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	4	384	0	0	199
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	19.6%
ICU Level of Service	A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↑	↑↑			↑↑
Traffic Vol, veh/h	0	4	322	23	0	179
Future Vol, veh/h	0	4	322	23	0	179
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	1
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	4	358	26	0	199

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	-	192	0	0	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-
Pot Cap-1 Maneuver	0	817	-	0	-
Stage 1	0	-	-	0	-
Stage 2	0	-	-	0	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	-	817	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.4	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	817	-
HCM Lane V/C Ratio	-	-	0.005	-
HCM Control Delay (s)	-	-	9.4	-
HCM Lane LOS	-	-	A	-
HCM 95th %tile Q(veh)	-	-	0	-

**Appendix L:
Synchro Output –
Background (2033)**

Legacy Oaks
1: Hodge Road & US 64 Bus (Knightdale Blvd.)

Background + 10 AM (2033)
03/30/2020



Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (vph)	37	974	106	15	159	1591	101	479	16	188	101	18	100
Future Volume (vph)	37	974	106	15	159	1591	101	479	16	188	101	18	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		3%				-3%			-2%			1%	
Storage Length (ft)	200		225		600		375	200		50	0		0
Storage Lanes	3		1		1		1	1		1	2		1
Taper Length (ft)	300				150			100			100		
Satd. Flow (prot)	3382	5009	1560	0	1796	5162	1607	3368	1575	0	3350	1818	1545
Flt Permitted	0.950				0.950			0.950			0.950		
Satd. Flow (perm)	3382	5009	1560	0	1796	5162	1607	3368	1575	0	3350	1818	1545
Right Turn on Red			Yes				Yes			Yes			Yes
Satd. Flow (RTOR)			119				163		211				216
Link Speed (mph)		45				45			35			25	
Link Distance (ft)		736				962			450			524	
Travel Time (s)		11.2				14.6			8.8			14.3	
Confl. Peds. (#/hr)													
Confl. Bikes (#/hr)													
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	5%	5%	5%	4%	4%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)													
Mid-Block Traffic (%)		0%				0%			0%			0%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	42	1094	119	0	196	1788	113	538	229	0	113	20	112
Turn Type	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2	3	1	1	6	7	3	8		7	4	5
Permitted Phases			2			6							4
Detector Phase	5	2	3	1	1	6	7	3	8		7	4	5
Switch Phase													
Minimum Initial (s)	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	15.0	19.0	15.0	15.0	15.0	20.0	15.0	15.0	16.0		15.0	15.0	15.0
Total Split (s)	15.0	47.0	31.0	27.0	27.0	59.0	20.0	31.0	26.0		20.0	15.0	15.0
Total Split (%)	12.5%	39.2%	25.8%	22.5%	22.5%	49.2%	16.7%	25.8%	21.7%		16.7%	12.5%	12.5%
Yellow Time (s)	3.0	4.3	3.0	3.0	3.0	4.8	3.0	3.0	4.0		3.0	3.1	3.0
All-Red Time (s)	3.9	1.7	3.9	3.5	3.5	1.7	3.9	3.9	3.1		3.9	3.7	3.9
Lost Time Adjust (s)	-1.9	-1.0	-1.9			-1.5	-1.5	-1.9	-2.1		-1.9	-1.8	-1.9
Total Lost Time (s)	5.0	5.0	5.0			5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None	None		None	None	None
Act Effct Green (s)	10.0	55.1	85.2			18.9	64.1	75.4	25.1		11.3	9.2	13.9
Actuated g/C Ratio	0.08	0.46	0.71			0.16	0.53	0.63	0.21		0.09	0.08	0.12
v/c Ratio	0.15	0.48	0.10			0.69	0.65	0.11	0.77		0.36	0.14	0.30
Control Delay	52.5	25.3	1.9			77.0	19.4	1.0	52.7		53.7	54.1	2.1
Queue Delay	0.0	0.0	0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	52.5	25.3	1.9			77.0	19.4	1.0	52.7		53.7	54.1	2.1
LOS	D	C	A			E	B	A	D		D	D	A
Approach Delay		24.0				23.8			41.4			30.1	
Approach LOS		C				C			D			C	
Queue Length 50th (ft)	15	194	0			155	184	1	201		42	15	0
Queue Length 95th (ft)	34	301	22			236	334	15	260		70	39	0
Internal Link Dist (ft)		656				882			370			444	
Turn Bay Length (ft)	200		225		600		375	200					
Base Capacity (vph)	281	2300	1153		330	2755	1114	729	456		418	151	369
Starvation Cap Reductn	0	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.15	0.48	0.10		0.59	0.65	0.10	0.74	0.50		0.27	0.13	0.30

Intersection Summary

Area Type: Other

Cycle Length: 120

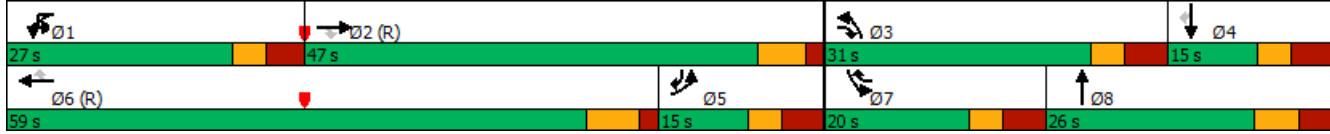
Actuated Cycle Length: 120

Legacy Oaks
 1: Hodge Road & US 64 Bus (Knightdale Blvd.)

Background + 10 AM (2033)
 03/30/2020

Offset: 60 (50%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.77
 Intersection Signal Delay: 27.3 Intersection LOS: C
 Intersection Capacity Utilization 72.7% ICU Level of Service C
 Analysis Period (min) 15
 Description: 05-0928

Splits and Phases: 1: Hodge Road & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↓	↑↑							↑
Traffic Volume (vph)	0	1169	131	327	1562	0	0	0	0	0	0	328
Future Volume (vph)	0	1169	131	327	1562	0	0	0	0	0	0	328
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		1%			-1%			0%				2%
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	4963	1545	1744	3489	0	0	0	0	0	0	1580
Flt Permitted				0.196								
Satd. Flow (perm)	0	4963	1545	360	3489	0	0	0	0	0	0	1580
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			139									121
Link Speed (mph)		45			45			35				35
Link Distance (ft)		962			263			601				428
Travel Time (s)		14.6			4.0			11.7				8.3
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	0%	0%	0%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%				0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1244	139	348	1662	0	0	0	0	0	0	349
Turn Type		NA	Perm	D.P+P	NA							Free
Protected Phases		2		7	2 7							
Permitted Phases			2	2								Free
Detector Phase		2	2	7	2 7							
Switch Phase												
Minimum Initial (s)		12.0	12.0	7.0								
Minimum Split (s)		19.0	19.0	15.0								
Total Split (s)		90.0	90.0	30.0								
Total Split (%)		75.0%	75.0%	25.0%								
Yellow Time (s)		4.4	4.4	3.0								
All-Red Time (s)		1.6	1.6	3.1								
Lost Time Adjust (s)		-1.0	-1.0	-1.1								
Total Lost Time (s)		5.0	5.0	5.0								
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max	None								
Act Effct Green (s)		85.5	85.5	110.0	120.0							120.0
Actuated g/C Ratio		0.71	0.71	0.92	1.00							1.00
v/c Ratio		0.35	0.12	0.57	0.48							0.22
Control Delay		2.5	0.3	19.9	2.4							0.3
Queue Delay		0.0	0.0	0.0	0.0							0.0
Total Delay		2.5	0.3	19.9	2.4							0.3
LOS		A	A	B	A							A
Approach Delay		2.2			5.5						0.3	
Approach LOS		A			A						A	
Queue Length 50th (ft)		17	0	74	32							0
Queue Length 95th (ft)		32	1	193	53							0
Internal Link Dist (ft)		882			183			521			348	
Turn Bay Length (ft)												
Base Capacity (vph)		3536	1140	619	3469							1580
Starvation Cap Reductn		0	0	0	0							0
Spillback Cap Reductn		0	0	0	0							0
Storage Cap Reductn		0	0	0	0							0
Reduced v/c Ratio		0.35	0.12	0.56	0.48							0.22

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 57 (48%), Referenced to phase 2:EBWB and 6:, Start of Green

Natural Cycle: 40

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.57

Intersection Signal Delay: 3.8

Intersection LOS: A

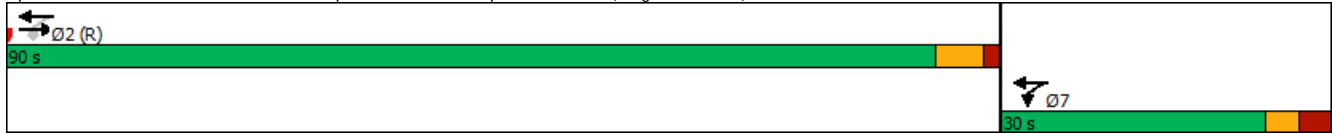
Intersection Capacity Utilization 52.5%

ICU Level of Service A

Analysis Period (min) 15

Description: 05-2153

Splits and Phases: 2: I-540 EB On-Ramp/I-540 EB Off-Ramp & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	470	1076	0	0	1801	865	75	5	374	0	0	0
Future Volume (vph)	470	1076	0	0	1801	865	75	5	374	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		-1%			1%			2%			0%	
Storage Length (ft)	500		0	0		0	0		400	0		0
Storage Lanes	1		0	0		1	0		2	0		0
Taper Length (ft)	200			25			25			25		
Satd. Flow (prot)	3384	5012	0	0	4963	1545	0	1695	2655	0	0	0
Flt Permitted	0.950							0.955				
Satd. Flow (perm)	3384	5012	0	0	4963	1545	0	1695	2655	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						651			183			
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		803			1134			793			417	
Travel Time (s)		12.2			17.2			15.4			8.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	6%	6%	6%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	516	1182	0	0	1979	951	0	87	411	0	0	0
Turn Type	Prot	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			4				
Permitted Phases					6	4		4				
Detector Phase	5	2			6	6	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0	12.0			12.0	12.0	7.0	7.0	7.0			
Minimum Split (s)	15.0	20.0			20.0	20.0	15.0	15.0	15.0			
Total Split (s)	25.0	85.0			60.0	60.0	35.0	35.0	35.0			
Total Split (%)	20.8%	70.8%			50.0%	50.0%	29.2%	29.2%	29.2%			
Yellow Time (s)	3.3	4.6			4.4	4.4	3.7	3.7	3.7			
All-Red Time (s)	3.0	1.3			1.4	1.4	2.5	2.5	2.5			
Lost Time Adjust (s)	-1.3	-0.9			-0.8	-0.8	-1.2	-1.2	-1.2			
Total Lost Time (s)	5.0	5.0			5.0	5.0	5.0	5.0	5.0			
Lead/Lag	Lag				Lead	Lead						
Lead-Lag Optimize?	Yes				Yes	Yes						
Recall Mode	None	C-Max			C-Max	C-Max	None	None	None			
Act Effct Green (s)	20.0	94.2			69.2	69.2		15.8	15.8			
Actuated g/C Ratio	0.17	0.78			0.58	0.58		0.13	0.13			
v/c Ratio	0.91	0.30			0.69	0.82		0.39	0.81			
Control Delay	61.7	4.8			10.0	9.7		51.3	40.2			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	61.7	4.8			10.0	9.7		51.3	40.2			
LOS	E	A			B	A		D	D			
Approach Delay		22.1			9.9			42.2				
Approach LOS		C			A			D				
Queue Length 50th (ft)	206	62			89	44		63	99			
Queue Length 95th (ft)	#293	142			308	763		107	153			
Internal Link Dist (ft)		723			1054			713			337	
Turn Bay Length (ft)	500								400			
Base Capacity (vph)	564	3936			2863	1166		423	801			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.91	0.30			0.69	0.82		0.21	0.51			

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 32 (27%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 17.1

Intersection LOS: B

Intersection Capacity Utilization 85.3%

ICU Level of Service E

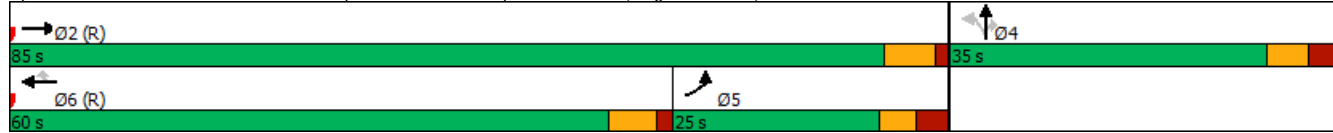
Analysis Period (min) 15

Description: 05-2152

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 3: I-540 WB Off-Ramp/I-540 WB On-Ramp & US 64 Bus (Knightdale Blvd.)



Legacy Oaks
4: Hinton Oaks Boulevard & US 64 Bus (Knightdale Blvd.)

Background + 10 AM (2033)
03/30/2020



Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↕↕	↔			↕↕↕	↔	↔↔	↕	↔	↔↔	↔↔	↔
Traffic Volume (vph)	154	1117	62	5	21	2231	56	316	7	70	43	10	30
Future Volume (vph)	154	1117	62	5	21	2231	56	316	7	70	43	10	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		-1%				1%			3%			0%	
Storage Length (ft)	300		125		200		200	200		100	325		150
Storage Lanes	2		1		1		1	2		1	1		1
Taper Length (ft)	250				100			100			100		
Satd. Flow (prot)	3320	4918	1531	0	1710	4915	1530	3382	1835	1560	3213	1532	1408
Flt Permitted	0.950				0.950			0.950			0.950		
Satd. Flow (perm)	3320	4918	1531	0	1710	4915	1530	3382	1835	1539	3202	1532	1408
Right Turn on Red			Yes				Yes			Yes			Yes
Satd. Flow (RTOR)			94				95			153		11	150
Link Speed (mph)		45			45				35			35	
Link Distance (ft)		1134				1230			476			550	
Travel Time (s)		17.2				18.6			9.3			10.7	
Confl. Peds. (#/hr)										1	1		
Confl. Bikes (#/hr)													
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	6%	6%	6%	5%	5%	5%	5%	2%	2%	2%	9%	9%	9%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)													
Mid-Block Traffic (%)		0%				0%			0%			0%	
Shared Lane Traffic (%)													35%
Lane Group Flow (vph)	164	1188	66	0	27	2373	60	336	7	74	46	22	21
Turn Type	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2	3	1!	1	6	7	3	8	1!	7	4	5
Permitted Phases			2			6				8			4
Detector Phase	5	2	3	1	1	6	7	3	8	1	7	4	5
Switch Phase													
Minimum Initial (s)	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	15.0	20.0	15.0	15.0	15.0	20.0	16.0	15.0	15.0	15.0	16.0	15.0	15.0
Total Split (s)	17.0	68.0	20.0	17.0	17.0	68.0	16.0	20.0	19.0	17.0	16.0	15.0	17.0
Total Split (%)	14.2%	56.7%	16.7%	14.2%	14.2%	56.7%	13.3%	16.7%	15.8%	14.2%	13.3%	12.5%	14.2%
Yellow Time (s)	3.6	4.6	3.8	3.4	3.4	4.4	4.1	3.8	3.6	3.4	4.1	3.8	3.6
All-Red Time (s)	3.0	1.7	3.0	3.0	3.0	1.6	3.0	3.0	3.0	3.0	3.0	3.1	3.0
Lost Time Adjust (s)	-1.6	-1.3	-1.8		-1.4	-1.0	-2.1	-1.8	-1.6	-1.4	-2.1	-1.9	-1.6
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag	Lag	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None	None	None	None	None	None
Act Effct Green (s)	11.0	72.0	93.8		11.3	69.5	94.0	15.8	9.7	14.1	19.5	9.2	16.7
Actuated g/C Ratio	0.09	0.60	0.78		0.09	0.58	0.78	0.13	0.08	0.12	0.16	0.08	0.14
v/c Ratio	0.54	0.40	0.05		0.17	0.83	0.05	0.76	0.05	0.23	0.09	0.17	0.06
Control Delay	60.9	8.3	0.8		52.2	25.5	0.5	61.9	50.1	1.7	42.5	36.9	0.4
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.9	8.3	0.8		52.2	25.5	0.5	61.9	50.1	1.7	42.5	36.9	0.4
LOS	E	A	A		D	C	A	E	D	A	D	D	A
Approach Delay		14.1				25.1			51.0			31.2	
Approach LOS		B				C			D			C	
Queue Length 50th (ft)	61	187	0		19	594	0	130	5	0	13	8	0
Queue Length 95th (ft)	91	162	1		49	677	6	#198	20	0	36	36	0
Internal Link Dist (ft)		1054				1150			396			470	
Turn Bay Length (ft)	300		125		200		200	200		100	325		150
Base Capacity (vph)	332	2948	1205		171	2847	1223	446	214	325	532	137	334
Starvation Cap Reductn	0	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.40	0.05		0.16	0.83	0.05	0.75	0.03	0.23	0.09	0.16	0.06

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 2 (2%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 24.1

Intersection LOS: C

Intersection Capacity Utilization 77.1%

ICU Level of Service D

Analysis Period (min) 15

Description: 05-2267

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

! Phase conflict between lane groups.

Splits and Phases: 4: Hinton Oaks Boulevard & US 64 Bus (Knightdale Blvd.)



Legacy Oaks
5: Hodge Road & Sam's Xpress Driveway/Legacy Oaks Drive South

Background + 10 AM (2033)
03/30/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕		↕	↕		↕	↕	↕
Traffic Volume (vph)	4	4	8	9	4	4	46	35	67	4	179	10
Future Volume (vph)	4	4	8	9	4	4	46	35	67	4	179	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%				1%
Storage Length (ft)	0		0	100		0	70		0	150		350
Storage Lanes	0		0	1		0	1		0	1		1
Taper Length (ft)	25			100			100			80		
Satd. Flow (prot)	0	1710	0	1770	1723	0	1770	3189	0	1761	5019	0
Flt Permitted		0.988		0.950			0.950			0.950		
Satd. Flow (perm)	0	1710	0	1770	1723	0	1770	3189	0	1761	5019	0
Link Speed (mph)		30			30			30			25	
Link Distance (ft)		171			365			524			741	
Travel Time (s)		3.9			8.3			11.9			20.2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	21	0	12	10	0	61	134	0	5	249	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 21.5% ICU Level of Service A

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	2.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕		↕	↕		↕	↕↕	
Traffic Vol, veh/h	4	4	8	9	4	4	46	35	67	4	179	10
Future Vol, veh/h	4	4	8	9	4	4	46	35	67	4	179	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	100	-	-	70	-	-	150	-	350
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	1	-
Peak Hour Factor	76	76	76	76	76	76	76	76	76	76	76	76
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	5	11	12	5	5	61	46	88	5	236	13

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	401	509	125	319	471	67	249	0	0	134	0	0
Stage 1	253	253	-	212	212	-	-	-	-	-	-	-
Stage 2	148	256	-	107	259	-	-	-	-	-	-	-
Critical Hdwy	6.99	6.54	7.14	6.99	6.54	6.94	5.34	-	-	4.14	-	-
Critical Hdwy Stg 1	7.34	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4.02	3.92	3.67	4.02	3.32	3.12	-	-	2.22	-	-
Pot Cap-1 Maneuver	549	466	767	619	489	983	887	-	-	1448	-	-
Stage 1	664	696	-	742	726	-	-	-	-	-	-	-
Stage 2	808	694	-	847	692	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	512	432	767	571	454	983	887	-	-	1448	-	-
Mov Cap-2 Maneuver	512	432	-	571	454	-	-	-	-	-	-	-
Stage 1	618	694	-	691	676	-	-	-	-	-	-	-
Stage 2	743	646	-	826	690	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.4	11.2	2.9	0.2
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	887	-	-	582	571	621	1448	-	-
HCM Lane V/C Ratio	0.068	-	-	0.036	0.021	0.017	0.004	-	-
HCM Control Delay (s)	9.4	-	-	11.4	11.4	10.9	7.5	-	-
HCM Lane LOS	A	-	-	B	B	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.1	0.1	0.1	0	-	-

Legacy Oaks
6: Hodge Road & Legacy Oaks Drive North

Background + 10 AM (2033)
03/30/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	4	42	46	4	4	9	16	11	4	105	4
Future Volume (vph)	4	4	42	46	4	4	9	16	11	4	105	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%				0%				0%		1%	
Storage Length (ft)	0		0	100		0	0		0	100		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			100			25			100		
Satd. Flow (prot)	1770	1863	1583	1770	1723	0	1770	1749	0	1761	1842	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1863	1583	1770	1723	0	1770	1749	0	1761	1842	0
Link Speed (mph)		30			30			30			25	
Link Distance (ft)		258			326			504			286	
Travel Time (s)		5.9			7.4			11.5			7.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	5	49	54	10	0	11	32	0	5	129	0
Sign Control	Stop				Stop				Stop		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	23.0%
Analysis Period (min)	15
	ICU Level of Service A

Intersection	
Intersection Delay, s/veh	8.4
Intersection LOS	A

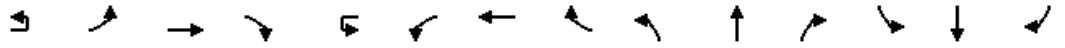
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	4	42	46	4	4	9	16	11	4	105	4
Future Vol, veh/h	4	4	42	46	4	4	9	16	11	4	105	4
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	5	49	54	5	5	11	19	13	5	124	5
Number of Lanes	1	1	1	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	3	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	3	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	3
HCM Control Delay	7.6	8.7	8	8.7
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	100%	0%	100%	0%
Vol Thru, %	0%	59%	0%	100%	0%	0%	50%	0%	96%
Vol Right, %	0%	41%	0%	0%	100%	0%	50%	0%	4%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	9	27	4	4	42	46	8	4	109
LT Vol	9	0	4	0	0	46	0	4	0
Through Vol	0	16	0	4	0	0	4	0	105
RT Vol	0	11	0	0	42	0	4	0	4
Lane Flow Rate	11	32	5	5	49	54	9	5	128
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.017	0.043	0.007	0.007	0.061	0.085	0.013	0.007	0.176
Departure Headway (Hd)	5.641	4.854	5.67	5.168	4.466	5.64	4.787	5.457	4.931
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	636	738	632	693	802	636	748	657	730
Service Time	3.366	2.579	3.395	2.893	2.19	3.365	2.512	3.177	2.651
HCM Lane V/C Ratio	0.017	0.043	0.008	0.007	0.061	0.085	0.012	0.008	0.175
HCM Control Delay	8.5	7.8	8.4	7.9	7.5	8.9	7.6	8.2	8.7
HCM Lane LOS	A	A	A	A	A	A	A	A	A
HCM 95th-ile Q	0.1	0.1	0	0	0.2	0.3	0	0	0.6

Legacy Oaks
1: Hodge Road & US 64 Bus (Knightdale Blvd.)

Background + 10 PM (2033)
03/30/2020



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations														
Traffic Volume (vph)	8	63	1867	349	23	445	1220	183	126	30	264	145	76	66
Future Volume (vph)	8	63	1867	349	23	445	1220	183	126	30	264	145	76	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)			3%				-3%			-2%				1%
Storage Length (ft)		200		225		600		375	200		50	0		0
Storage Lanes		3		1		1		1	1		1	2		1
Taper Length (ft)		300				150			100			100		
Satd. Flow (prot)	0	3382	5009	1560	0	1796	5162	1607	3467	1627	0	3416	1853	1575
Flt Permitted		0.950				0.950			0.950			0.950		
Satd. Flow (perm)	0	3382	5009	1560	0	1796	5162	1607	3467	1627	0	3416	1853	1575
Right Turn on Red				Yes				Yes			Yes			Yes
Satd. Flow (RTOR)				153				189			263			182
Link Speed (mph)			45				45				35			25
Link Distance (ft)			734				962				450			524
Travel Time (s)			11.1				14.6				8.8			14.3
Confl. Peds. (#/hr)														
Confl. Bikes (#/hr)														
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)														
Mid-Block Traffic (%)			0%				0%			0%				0%
Shared Lane Traffic (%)														
Lane Group Flow (vph)	0	73	1925	360	0	483	1258	189	130	303	0	149	78	68
Turn Type	Prot	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5!	5	2	3	1	1	6	7	3	8		7	4	5!
Permitted Phases				2				6						4
Detector Phase	5	5	2	3	1	1	6	7	3	8		7	4	5
Switch Phase														
Minimum Initial (s)	7.0	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	15.0	15.0	19.0	15.0	15.0	15.0	20.0	15.0	15.0	16.0		15.0	15.0	15.0
Total Split (s)	20.0	20.0	55.0	25.0	45.0	45.0	80.0	15.0	25.0	25.0		15.0	15.0	20.0
Total Split (%)	14.3%	14.3%	39.3%	17.9%	32.1%	32.1%	57.1%	10.7%	17.9%	17.9%		10.7%	10.7%	14.3%
Yellow Time (s)	3.0	3.0	4.3	3.0	3.0	3.0	4.8	3.0	3.0	4.0		3.0	3.1	3.0
All-Red Time (s)	3.9	3.9	1.7	3.9	3.5	3.5	1.7	3.9	3.9	3.1		3.9	3.7	3.9
Lost Time Adjust (s)		-1.9	-1.0	-1.9		-1.5	-1.5	-1.9	-1.9	-2.1		-1.9	-1.8	-1.9
Total Lost Time (s)		5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lead	Lead	Lag	Lag	Lag	Lead	Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None	C-Max	None	None	None	C-Max	None	None	None		None	None	None
Act Effct Green (s)		10.5	53.2	69.1		40.0	82.7	97.7	15.9	16.8		10.0	10.9	26.4
Actuated g/C Ratio		0.08	0.38	0.49		0.29	0.59	0.70	0.11	0.12		0.07	0.08	0.19
v/c Ratio		0.29	1.01	0.43		0.94	0.41	0.16	0.33	0.71		0.61	0.54	0.15
Control Delay		63.8	66.4	8.9		57.8	6.7	0.3	58.5	20.0		74.2	76.7	0.7
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay		63.8	66.4	8.9		57.8	6.7	0.3	58.5	20.0		74.2	76.7	0.7
LOS		E	E	A		E	A	A	E	C		E	E	A
Approach Delay			57.5				18.8			31.6				57.9
Approach LOS			E				B			C				E
Queue Length 50th (ft)		32	-704	74		437	89	0	57	33		69	69	0
Queue Length 95th (ft)		58	#808	128		#651	105	1	88	133		107	#133	0
Internal Link Dist (ft)			654				882			370				444
Turn Bay Length (ft)		200		225		600		375	200					
Base Capacity (vph)		362	1903	888		513	3049	1178	495	457		244	147	489
Starvation Cap Reductn		0	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn		0	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn		0	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio		0.20	1.01	0.41		0.94	0.41	0.16	0.26	0.66		0.61	0.53	0.14

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

1: Hodge Road & US 64 Bus (Knightdale Blvd.)

03/30/2020

Offset: 84 (60%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.01

Intersection Signal Delay: 40.4

Intersection LOS: D

Intersection Capacity Utilization 102.4%

ICU Level of Service G

Analysis Period (min) 15

Description: 05-0928

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

! Phase conflict between lane groups.

Splits and Phases: 1: Hodge Road & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↓	↑↑							↑
Traffic Volume (vph)	0	2243	87	221	1297	0	0	0	0	0	0	617
Future Volume (vph)	0	2243	87	221	1297	0	0	0	0	0	0	617
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		1%			-1%			0%				2%
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	5060	1575	1778	3557	0	0	0	0	0	0	1564
Flt Permitted				0.050								
Satd. Flow (perm)	0	5060	1575	94	3557	0	0	0	0	0	0	1564
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			89									193
Link Speed (mph)		45			45			35				35
Link Distance (ft)		962			263			601				428
Travel Time (s)		14.6			4.0			11.7				8.3
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	4%	4%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%				0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2289	89	226	1323	0	0	0	0	0	0	630
Turn Type		NA	Perm	D.P+P	NA							Free
Protected Phases		2		7	2							
Permitted Phases			2	2								Free
Detector Phase		2	2	7	2							
Switch Phase												
Minimum Initial (s)		12.0	12.0	7.0								
Minimum Split (s)		19.0	19.0	15.0								
Total Split (s)		100.0	100.0	40.0								
Total Split (%)		71.4%	71.4%	28.6%								
Yellow Time (s)		4.4	4.4	3.0								
All-Red Time (s)		1.6	1.6	3.1								
Lost Time Adjust (s)		-1.0	-1.0	-1.1								
Total Lost Time (s)		5.0	5.0	5.0								
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max	None								
Act Effct Green (s)		101.4	101.4	130.0	140.0							140.0
Actuated g/C Ratio		0.72	0.72	0.93	1.00							1.00
v/c Ratio		0.62	0.08	0.52	0.37							0.40
Control Delay		5.7	0.2	56.5	2.2							0.8
Queue Delay		0.0	0.0	0.0	0.0							0.0
Total Delay		5.7	0.2	56.5	2.2							0.8
LOS		A	A	E	A							A
Approach Delay		5.5			10.2						0.8	
Approach LOS		A			B						A	
Queue Length 50th (ft)		88	0	163	70							0
Queue Length 95th (ft)		m108	m1	244	24							0
Internal Link Dist (ft)		882			183			521			348	
Turn Bay Length (ft)												
Base Capacity (vph)		3664	1165	510	3522							1564
Starvation Cap Reductn		0	0	0	0							0
Spillback Cap Reductn		0	0	0	0							0
Storage Cap Reductn		0	0	0	0							0
Reduced v/c Ratio		0.62	0.08	0.44	0.38							0.40

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

2: I-540 EB On-Ramp/I-540 EB Off-Ramp & US 64 Bus (Knightdale Blvd.)

03/30/2020

Offset: 72 (51%), Referenced to phase 2:EBWB and 6:, Start of Green

Natural Cycle: 45

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.62

Intersection Signal Delay: 6.4

Intersection LOS: A

Intersection Capacity Utilization 117.3%

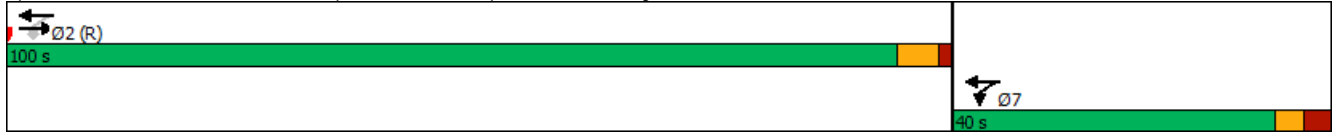
ICU Level of Service H

Analysis Period (min) 15

Description: 05-2153

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: I-540 EB On-Ramp/I-540 EB Off-Ramp & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↕↕			↕↕↕	↕↔		↕↔	↕↕↕			
Traffic Volume (vph)	409	2922	0	0	1421	573	104	4	709	0	0	0
Future Volume (vph)	409	2922	0	0	1421	573	104	4	709	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		-1%			1%			2%			0%	
Storage Length (ft)	500		0	0		0	0		400	0		0
Storage Lanes	1		0	0		1	0		2	0		0
Taper Length (ft)	200			25			25			25		
Satd. Flow (prot)	3450	5111	0	0	5060	1575	0	1759	2759	0	0	0
Flt Permitted	0.950							0.954				
Satd. Flow (perm)	3450	5111	0	0	5060	1575	0	1759	2759	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						582			71			
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		803			1134			793			417	
Travel Time (s)		12.2			17.2			15.4			8.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	426	3044	0	0	1480	597	0	112	739	0	0	0
Turn Type	Prot	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			4				
Permitted Phases					6	4		4				
Detector Phase	5	2			6	6	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0	12.0			12.0	12.0	7.0	7.0	7.0			
Minimum Split (s)	15.0	20.0			20.0	20.0	15.0	15.0	15.0			
Total Split (s)	30.0	100.0			70.0	70.0	40.0	40.0	40.0			
Total Split (%)	21.4%	71.4%			50.0%	50.0%	28.6%	28.6%	28.6%			
Yellow Time (s)	3.3	4.6			4.4	4.4	3.7	3.7	3.7			
All-Red Time (s)	3.0	1.3			1.4	1.4	2.5	2.5	2.5			
Lost Time Adjust (s)	-1.3	-0.9			-0.8	-0.8	-1.2	-1.2	-1.2			
Total Lost Time (s)	5.0	5.0			5.0	5.0	5.0	5.0	5.0			
Lead/Lag	Lag				Lead	Lead						
Lead-Lag Optimize?	Yes				Yes	Yes						
Recall Mode	None	C-Max			C-Max	C-Max	None	None	None			
Act Effct Green (s)	25.0	95.0			65.0	65.0		35.0	35.0			
Actuated g/C Ratio	0.18	0.68			0.46	0.46		0.25	0.25			
v/c Ratio	0.69	0.88			0.63	0.57		0.26	0.99			
Control Delay	44.9	9.1			13.3	2.8		44.0	78.8			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	44.9	9.1			13.3	2.8		44.0	78.8			
LOS	D	A			B	A		D	E			
Approach Delay		13.5			10.3			74.2				
Approach LOS		B			B			E				
Queue Length 50th (ft)	204	147			164	0		82	353			
Queue Length 95th (ft)	244	149			m115	m6		138	#506			
Internal Link Dist (ft)		723			1054			713			337	
Turn Bay Length (ft)	500								400			
Base Capacity (vph)	616	3468			2349	1043		439	743			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.69	0.88			0.63	0.57		0.26	0.99			

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 68 (49%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.99

Intersection Signal Delay: 20.5

Intersection LOS: C

Intersection Capacity Utilization 89.6%

ICU Level of Service E

Analysis Period (min) 15

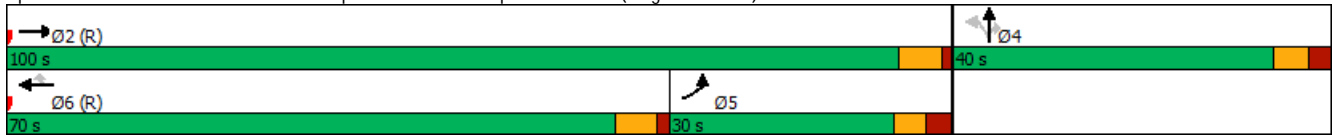
Description: 05-2152

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

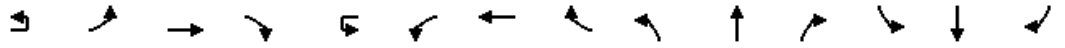
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: I-540 WB Off-Ramp/I-540 WB On-Ramp & US 64 Bus (Knightdale Blvd.)



Legacy Oaks
4: Hinton Oaks Boulevard & US 64 Bus (Knightdale Blvd.)

Background + 10 PM (2033)
03/30/2020



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↕	↔		↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	28	468	2715	187	7	40	1608	82	137	31	67	145	15	106
Future Volume (vph)	28	468	2715	187	7	40	1608	82	137	31	67	145	15	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)			-1%				1%			3%				0%
Storage Length (ft)		300		125		200		200	200		100	325		150
Storage Lanes		2		1		1		1	2		1	1		1
Taper Length (ft)		250				100			100			100		
Satd. Flow (prot)	0	3450	5111	1591	0	1761	5060	1575	3382	1835	1560	3433	1570	1504
Flt Permitted		0.950				0.950			0.950			0.950		
Satd. Flow (perm)	0	3450	5111	1591	0	1761	5060	1575	3382	1835	1560	3433	1570	1504
Right Turn on Red				Yes				Yes			Yes			Yes
Satd. Flow (RTOR)				90				85			130			49
Link Speed (mph)			45				45			35				35
Link Distance (ft)			1134				1230			476				550
Travel Time (s)			17.2				18.6			9.3				10.7
Confl. Peds. (#/hr)														
Confl. Bikes (#/hr)														
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)														
Mid-Block Traffic (%)			0%				0%			0%				0%
Shared Lane Traffic (%)														44%
Lane Group Flow (vph)	0	522	2858	197	0	49	1693	86	144	33	71	153	65	63
Turn Type	Prot	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5!	5	2	3	1!	1	6	7	3	8	1!	7	4	5!
Permitted Phases				2				6			8			4
Detector Phase	5	5	2	3	1	1	6	7	3	8	1	7	4	5
Switch Phase														
Minimum Initial (s)	7.0	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	15.0	15.0	20.0	15.0	15.0	15.0	20.0	16.0	15.0	15.0	15.0	16.0	15.0	15.0
Total Split (s)	28.0	28.0	80.0	20.0	20.0	20.0	72.0	20.0	20.0	20.0	20.0	20.0	20.0	28.0
Total Split (%)	20.0%	20.0%	57.1%	14.3%	14.3%	14.3%	51.4%	14.3%	14.3%	14.3%	14.3%	14.3%	14.3%	20.0%
Yellow Time (s)	3.6	3.6	4.6	3.8	3.4	3.4	4.4	4.1	3.8	3.6	3.4	4.1	3.8	3.6
All-Red Time (s)	3.0	3.0	1.7	3.0	3.0	3.0	1.6	3.0	3.0	3.0	3.0	3.0	3.1	3.0
Lost Time Adjust (s)		-1.6	-1.3	-1.8			-1.4	-1.0	-2.1	-1.8	-1.6	-1.4	-2.1	-1.9
Total Lost Time (s)		5.0	5.0	5.0			5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	C-Max	None	None	None	C-Max	None	None	None	None	None	None	None
Act Effct Green (s)		23.0	89.0	106.9			10.2	76.2	97.5	13.0	9.9	16.7	16.3	10.6
Actuated g/C Ratio		0.16	0.64	0.76			0.07	0.54	0.70	0.09	0.07	0.12	0.12	0.08
v/c Ratio		0.92	0.88	0.16			0.38	0.61	0.08	0.46	0.26	0.24	0.38	0.40
Control Delay		61.5	19.0	1.5			70.0	24.2	2.0	64.8	65.9	1.9	60.1	29.3
Queue Delay		0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		61.5	19.0	1.5			70.0	24.2	2.0	64.8	65.9	1.9	60.1	29.3
LOS		E	B	A			E	C	A	E	A	E	C	A
Approach Delay			24.3				24.4			46.9				39.7
Approach LOS			C				C			D				D
Queue Length 50th (ft)		236	514	6		44	389	0	64	29	0	69	14	0
Queue Length 95th (ft)		m#288	m#1058	m18		85	483	20	100	64	0	103	64	0
Internal Link Dist (ft)			1054				1150			396			470	
Turn Bay Length (ft)		300		125		200		200	200		100	325		150
Base Capacity (vph)		566	3248	1258		188	2753	1113	362	196	349	428	211	439
Starvation Cap Reductn		0	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.92	0.88	0.16		0.26	0.61	0.08	0.40	0.17	0.20	0.36	0.31	0.14

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 78 (56%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 26.0

Intersection LOS: C

Intersection Capacity Utilization 86.6%

ICU Level of Service E

Analysis Period (min) 15

Description: 05-2267

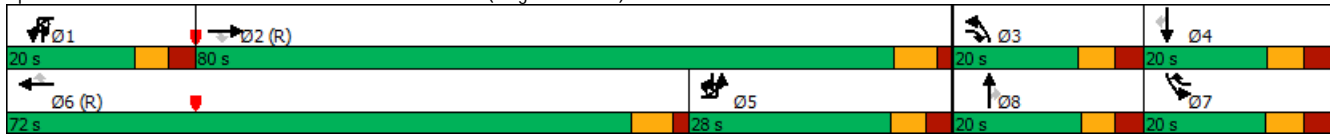
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

! Phase conflict between lane groups.

Splits and Phases: 4: Hinton Oaks Boulevard & US 64 Bus (Knightdale Blvd.)



Legacy Oaks
5: Hodge Road & Sam's Xpress Driveway/Legacy Oaks Drive South

Background + 10 PM (2033)
03/30/2020



Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕			↕	↕		↕	↕	↕
Traffic Volume (vph)	4	4	13	9	33	4	4	9	112	156	9	4	98	4
Future Volume (vph)	4	4	13	9	33	4	4	9	112	156	9	4	98	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%				0%				0%				1%
Storage Length (ft)	0		0		100		0		70		0	150		350
Storage Lanes	0		0		1		0		1		0	1		1
Taper Length (ft)	25				100				100			80		
Satd. Flow (prot)	0	1687	0	0	1770	1723	0	0	1687	3347	0	1761	5030	0
Flt Permitted		0.991			0.950				0.950			0.950		
Satd. Flow (perm)	0	1687	0	0	1770	1723	0	0	1687	3347	0	1761	5030	0
Link Speed (mph)		30				30				30			25	
Link Distance (ft)		171				365				524			741	
Travel Time (s)		3.9				8.3				11.9			20.2	
Confl. Peds. (#/hr)			1		1									
Confl. Bikes (#/hr)														
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	7%	7%	7%	7%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)														
Mid-Block Traffic (%)		0%				0%				0%			0%	
Shared Lane Traffic (%)														
Lane Group Flow (vph)	0	22	0	0	44	8	0	0	127	173	0	4	107	0
Sign Control		Stop				Stop				Free			Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	29.0%
ICU Level of Service	A
Analysis Period (min)	15

Intersection														
Int Delay, s/veh	4.4													
Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔			↔	↔		↔	↔	
Traffic Vol, veh/h	4	4	13	9	33	4	4	9	112	156	9	4	98	4
Future Vol, veh/h	4	4	13	9	33	4	4	9	112	156	9	4	98	4
Conflicting Peds, #/hr	0	0	1	0	1	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	-	None	-	-	-	None	-	-	None
Storage Length	-	-	-	-	100	-	-	-	70	-	-	150	-	350
Veh in Median Storage, #	-	0	-	-	-	0	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	-	0	-	-	-	0	-	-	1	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	7	7	7	7	2	2	2
Mvmt Flow	4	4	14	9	35	4	4	9	118	164	9	4	103	4
Major/Minor	Minor2		Minor1			Major1			Major2					
Conflicting Flow All	451	540	55	0	475	538	87	78	107	0	0	173	0	0
Stage 1	113	113	-	0	423	423	-	-	-	-	-	-	-	-
Stage 2	338	427	-	0	52	115	-	-	-	-	-	-	-	-
Critical Hdwy	6.99	6.54	7.14	-	6.99	6.54	6.94	5.74	5.44	-	-	4.14	-	-
Critical Hdwy Stg 1	7.34	5.54	-	-	6.54	5.54	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	-	6.74	5.54	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4.02	3.92	-	3.67	4.02	3.32	2.37	3.17	-	-	2.22	-	-
Pot Cap-1 Maneuver	510	447	848	0	492	448	954	1376	1012	-	-	1401	-	-
Stage 1	825	801	-	0	560	586	-	-	-	-	-	-	-	-
Stage 2	628	584	-	0	914	799	-	-	-	-	-	-	-	-
Platoon blocked, %				-										
Mov Cap-1 Maneuver	455	391	847	0	433	392	954	1031	1031	-	-	1401	-	-
Mov Cap-2 Maneuver	455	391	-	0	433	392	-	-	-	-	-	-	-	-
Stage 1	724	799	-	0	491	514	-	-	-	-	-	-	-	-
Stage 2	544	512	-	0	891	797	-	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB					
HCM Control Delay, s	11.1		13.5			3.8			0.3					
HCM LOS	B		B											
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR					
Capacity (veh/h)	1031	-	-	611	433	556	1401	-	-					
HCM Lane V/C Ratio	0.124	-	-	0.036	0.08	0.015	0.003	-	-					
HCM Control Delay (s)	9	-	-	11.1	14	11.6	7.6	-	-					
HCM Lane LOS	A	-	-	B	B	B	A	-	-					
HCM 95th %tile Q(veh)	0.4	-	-	0.1	0.3	0	0	-	-					

Legacy Oaks
6: Hodge Road & Legacy Oaks Drive North

Background + 10 PM (2033)
03/30/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	4	27	19	4	4	30	103	21	4	49	4
Future Volume (vph)	4	4	27	19	4	4	30	103	21	4	49	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%		0%				0%		0%		1%	
Storage Length (ft)	0		0	100		0	0		0	100		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			100			25			100		
Satd. Flow (prot)	1770	1863	1583	1770	1723	0	1687	1730	0	1761	1833	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1863	1583	1770	1723	0	1687	1730	0	1761	1833	0
Link Speed (mph)		30			30			30			25	
Link Distance (ft)		258			326			504			286	
Travel Time (s)		5.9			7.4			11.5			7.8	
Confl. Peds. (#/hr)			1	1								
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	7%	7%	7%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	4	4	29	20	8	0	32	134	0	4	57	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 22.7% ICU Level of Service A

Analysis Period (min) 15

Intersection	
Intersection Delay, s/veh	8.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↑	↔	↔	↔		↔	↔		↔	↔	
Traffic Vol, veh/h	4	4	27	19	4	4	30	103	21	4	49	4
Future Vol, veh/h	4	4	27	19	4	4	30	103	21	4	49	4
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	2	2	2	2	2	2	7	7	7	2	2	2
Mvmt Flow	4	4	29	20	4	4	32	111	23	4	53	4
Number of Lanes	1	1	1	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	3	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	3	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	3
HCM Control Delay	7.6	8.4	8.6	8.1
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	100%	0%	100%	0%
Vol Thru, %	0%	83%	0%	100%	0%	0%	50%	0%	92%
Vol Right, %	0%	17%	0%	0%	100%	0%	50%	0%	8%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	30	124	4	4	27	19	8	4	53
LT Vol	30	0	4	0	0	19	0	4	0
Through Vol	0	103	0	4	0	0	4	0	49
RT Vol	0	21	0	0	27	0	4	0	4
Lane Flow Rate	32	133	4	4	29	20	9	4	57
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.049	0.178	0.007	0.006	0.036	0.033	0.012	0.007	0.079
Departure Headway (Hd)	5.428	4.809	5.726	5.224	4.521	5.744	4.889	5.551	4.997
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	662	748	626	686	793	625	734	647	719
Service Time	3.142	2.523	3.449	2.947	2.244	3.463	2.609	3.267	2.713
HCM Lane V/C Ratio	0.048	0.178	0.006	0.006	0.037	0.032	0.012	0.006	0.079
HCM Control Delay	8.4	8.6	8.5	8	7.4	8.7	7.7	8.3	8.1
HCM Lane LOS	A	A	A	A	A	A	A	A	A
HCM 95th-tile Q	0.2	0.6	0	0	0.1	0.1	0	0	0.3

**Appendix M:
Synchro Output –
Build-out (2033)**

Legacy Oaks
1: Hodge Road & US 64 Bus (Knightdale Blvd.)

Build-Out + 10 AM (2033)
03/30/2020



Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (vph)	79	974	106	15	159	1591	193	479	23	188	248	29	168
Future Volume (vph)	79	974	106	15	159	1591	193	479	23	188	248	29	168
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		3%				-3%			-2%			1%	
Storage Length (ft)	200		225		600		375	200		50	0		0
Storage Lanes	3		1		1		1	1		1	2		1
Taper Length (ft)	300				150			100			100		
Satd. Flow (prot)	3382	5009	1560	0	1796	5162	1607	3368	1583	0	3350	1818	1545
Flt Permitted	0.950				0.950			0.950			0.950		
Satd. Flow (perm)	3382	5009	1560	0	1796	5162	1607	3368	1583	0	3350	1818	1545
Right Turn on Red			Yes				Yes			Yes			Yes
Satd. Flow (RTOR)			119				217		211				216
Link Speed (mph)		45				45				35			25
Link Distance (ft)		734				962			450				524
Travel Time (s)		11.1				14.6			8.8				14.3
Confl. Peds. (#/hr)													
Confl. Bikes (#/hr)													
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	5%	5%	5%	4%	4%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)													
Mid-Block Traffic (%)		0%				0%			0%			0%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	89	1094	119	0	196	1788	217	538	237	0	279	33	189
Turn Type	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2	3	1	1	6	7	3	8		7	4	5
Permitted Phases			2			6							4
Detector Phase	5	2	3	1	1	6	7	3	8		7	4	5
Switch Phase													
Minimum Initial (s)	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	15.0	19.0	15.0	15.0	15.0	20.0	15.0	15.0	16.0		15.0	15.0	15.0
Total Split (s)	15.0	47.0	31.0	27.0	27.0	59.0	20.0	31.0	26.0		20.0	15.0	15.0
Total Split (%)	12.5%	39.2%	25.8%	22.5%	22.5%	49.2%	16.7%	25.8%	21.7%		16.7%	12.5%	12.5%
Yellow Time (s)	3.0	4.3	3.0	3.0	3.0	4.8	3.0	3.0	4.0		3.0	3.1	3.0
All-Red Time (s)	3.9	1.7	3.9	3.5	3.5	1.7	3.9	3.9	3.1		3.9	3.7	3.9
Lost Time Adjust (s)	-1.9	-1.0	-1.9			-1.5	-1.5	-1.9	-2.1		-1.9	-1.8	-1.9
Total Lost Time (s)	5.0	5.0	5.0			5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None	None		None	None	None
Act Effct Green (s)	10.0	50.4	82.2			18.9	59.3	73.9	26.8		14.6	9.4	15.9
Actuated g/C Ratio	0.08	0.42	0.68			0.16	0.49	0.62	0.22		0.12	0.08	0.13
v/c Ratio	0.32	0.52	0.11			0.70	0.70	0.20	0.71		0.69	0.23	0.48
Control Delay	55.1	28.5	1.9			77.8	22.7	1.6	49.3		59.8	55.9	6.3
Queue Delay	0.0	0.0	0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	55.1	28.5	1.9			77.8	22.7	1.6	49.3		59.8	55.9	6.3
LOS	E	C	A			E	C	A	D		E	E	A
Approach Delay		27.9				25.5			38.9			39.4	
Approach LOS		C				C			D			D	
Queue Length 50th (ft)	34	246	0			153	234	12	201		107	24	0
Queue Length 95th (ft)	60	301	22			234	351	32	260		153	57	26
Internal Link Dist (ft)		654				882			370			444	
Turn Bay Length (ft)	200		225		600		375	200					
Base Capacity (vph)	281	2104	1106		329	2549	1077	753	451		418	151	391
Starvation Cap Reductn	0	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.32	0.52	0.11		0.60	0.70	0.20	0.71	0.53		0.67	0.22	0.48

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Legacy Oaks
1: Hodge Road & US 64 Bus (Knightdale Blvd.)

Build-Out + 10 AM (2033)
03/30/2020

Offset: 60 (50%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.71

Intersection Signal Delay: 29.8

Intersection LOS: C

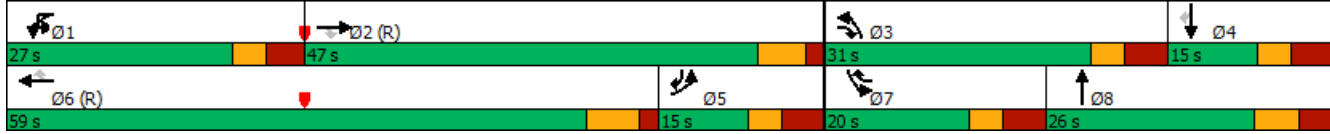
Intersection Capacity Utilization 73.1%

ICU Level of Service D

Analysis Period (min) 15

Description: 05-0928

Splits and Phases: 1: Hodge Road & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↓	↑↑							↑
Traffic Volume (vph)	0	1293	154	327	1618	0	0	0	0	0	0	363
Future Volume (vph)	0	1293	154	327	1618	0	0	0	0	0	0	363
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		1%			-1%			0%				2%
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	4963	1545	1744	3489	0	0	0	0	0	0	1580
Flt Permitted				0.167								
Satd. Flow (perm)	0	4963	1545	307	3489	0	0	0	0	0	0	1580
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			164									112
Link Speed (mph)		45		45				35				35
Link Distance (ft)		962			263			601				428
Travel Time (s)		14.6			4.0			11.7				8.3
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	0%	0%	0%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%				0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1376	164	348	1721	0	0	0	0	0	0	386
Turn Type		NA	Perm	D.P+P	NA							Free
Protected Phases		2		7	2							
Permitted Phases			2	2								Free
Detector Phase		2	2	7	2							
Switch Phase												
Minimum Initial (s)		12.0	12.0	7.0								
Minimum Split (s)		19.0	19.0	15.0								
Total Split (s)		90.0	90.0	30.0								
Total Split (%)		75.0%	75.0%	25.0%								
Yellow Time (s)		4.4	4.4	3.0								
All-Red Time (s)		1.6	1.6	3.1								
Lost Time Adjust (s)		-1.0	-1.0	-1.1								
Total Lost Time (s)		5.0	5.0	5.0								
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max	None								
Act Effct Green (s)		85.3	85.3	110.0	120.0							120.0
Actuated g/C Ratio		0.71	0.71	0.92	1.00							1.00
v/c Ratio		0.39	0.14	0.60	0.49							0.24
Control Delay		1.9	0.2	25.2	2.8							0.4
Queue Delay		0.0	0.0	0.0	0.0							0.0
Total Delay		1.9	0.2	25.2	2.8							0.4
LOS		A	A	C	A							A
Approach Delay		1.7			6.6						0.4	
Approach LOS		A			A						A	
Queue Length 50th (ft)		19	0	97	40							0
Queue Length 95th (ft)		34	m0	215	66							0
Internal Link Dist (ft)		882			183			521			348	
Turn Bay Length (ft)												
Base Capacity (vph)		3526	1145	581	3462							1580
Starvation Cap Reductn		0	0	0	0							0
Spillback Cap Reductn		0	0	0	0							0
Storage Cap Reductn		0	0	0	0							0
Reduced v/c Ratio		0.39	0.14	0.60	0.50							0.24

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 57 (48%), Referenced to phase 2:EBWB and 6:, Start of Green

Natural Cycle: 40

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 4.1

Intersection LOS: A

Intersection Capacity Utilization 54.9%

ICU Level of Service A

Analysis Period (min) 15

Description: 05-2153

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: I-540 EB On-Ramp/I-540 EB Off-Ramp & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↕↕			↕↕↕	↕↔		↕↔	↕↕↕			
Traffic Volume (vph)	526	1144	0	0	1843	865	90	5	374	0	0	0
Future Volume (vph)	526	1144	0	0	1843	865	90	5	374	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		-1%			1%			2%			0%	
Storage Length (ft)	500		0	0		0	0		400	0		0
Storage Lanes	1		0	0		1	0		2	0		0
Taper Length (ft)	200			25			25			25		
Satd. Flow (prot)	3384	5012	0	0	4963	1545	0	1695	2655	0	0	0
Flt Permitted	0.950							0.955				
Satd. Flow (perm)	3384	5012	0	0	4963	1545	0	1695	2655	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						649			157			
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		803			1134			793			417	
Travel Time (s)		12.2			17.2			15.4			8.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	6%	6%	6%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	578	1257	0	0	2025	951	0	104	411	0	0	0
Turn Type	Prot	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			4				
Permitted Phases					6	4		4				
Detector Phase	5	2			6	6	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0	12.0			12.0	12.0	7.0	7.0	7.0			
Minimum Split (s)	15.0	20.0			20.0	20.0	15.0	15.0	15.0			
Total Split (s)	25.0	85.0			60.0	60.0	35.0	35.0	35.0			
Total Split (%)	20.8%	70.8%			50.0%	50.0%	29.2%	29.2%	29.2%			
Yellow Time (s)	3.3	4.6			4.4	4.4	3.7	3.7	3.7			
All-Red Time (s)	3.0	1.3			1.4	1.4	2.5	2.5	2.5			
Lost Time Adjust (s)	-1.3	-0.9			-0.8	-0.8		-1.2	-1.2			
Total Lost Time (s)	5.0	5.0			5.0	5.0		5.0	5.0			
Lead/Lag	Lag				Lead	Lead						
Lead-Lag Optimize?	Yes				Yes	Yes						
Recall Mode	None	C-Max			C-Max	C-Max	None	None	None			
Act Effct Green (s)	20.0	93.1			68.1	68.1		16.9	16.9			
Actuated g/C Ratio	0.17	0.78			0.57	0.57		0.14	0.14			
v/c Ratio	1.02	0.32			0.72	0.82		0.44	0.81			
Control Delay	85.8	5.1			11.0	10.1		51.5	42.9			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	85.8	5.1			11.0	10.1		51.5	42.9			
LOS	F	A			B	B		D	D			
Approach Delay		30.5			10.7			44.6				
Approach LOS		C			B			D				
Queue Length 50th (ft)	-243	62			119	36		75	110			
Queue Length 95th (ft)	#350	176			362	#763		123	163			
Internal Link Dist (ft)		723			1054			713		337		
Turn Bay Length (ft)	500								400			
Base Capacity (vph)	564	3888			2816	1157		423	781			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	1.02	0.32			0.72	0.82		0.25	0.53			

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 32 (27%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.02

Intersection Signal Delay: 20.8

Intersection LOS: C

Intersection Capacity Utilization 86.9%

ICU Level of Service E

Analysis Period (min) 15

Description: 05-2152

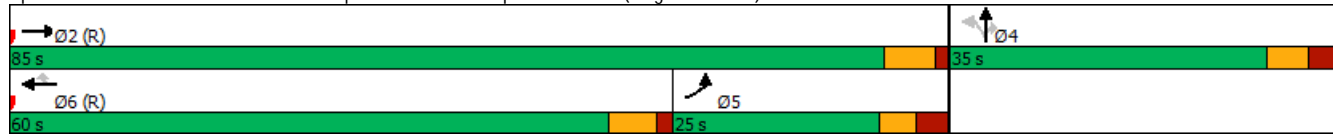
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 3: I-540 WB Off-Ramp/I-540 WB On-Ramp & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (vph)	154	1185	62	5	21	2273	56	316	7	70	43	10	30
Future Volume (vph)	154	1185	62	5	21	2273	56	316	7	70	43	10	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		-1%				1%			3%			0%	
Storage Length (ft)	300		125		200		200	200		100	325		150
Storage Lanes	2		1		1		1	2		1	1		1
Taper Length (ft)	250				100			100			100		
Satd. Flow (prot)	3320	4918	1531	0	1710	4915	1530	3382	1835	1560	3213	1532	1408
Flt Permitted	0.950				0.950			0.950			0.950		
Satd. Flow (perm)	3320	4918	1531	0	1710	4915	1530	3382	1835	1539	3202	1532	1408
Right Turn on Red			Yes				Yes			Yes			Yes
Satd. Flow (RTOR)			94				95			153		11	150
Link Speed (mph)		45				45			35				35
Link Distance (ft)		1134				1230			476			550	
Travel Time (s)		17.2				18.6			9.3			10.7	
Confl. Peds. (#/hr)										1	1		
Confl. Bikes (#/hr)													
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	6%	6%	6%	5%	5%	5%	5%	2%	2%	2%	9%	9%	9%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)													
Mid-Block Traffic (%)		0%				0%			0%			0%	
Shared Lane Traffic (%)													35%
Lane Group Flow (vph)	164	1261	66	0	27	2418	60	336	7	74	46	22	21
Turn Type	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2	3	1	1	6	7	3	8	1	7	4	5
Permitted Phases			2			6				8			4
Detector Phase	5	2	3	1	1	6	7	3	8	1	7	4	5
Switch Phase													
Minimum Initial (s)	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	15.0	20.0	15.0	15.0	15.0	20.0	16.0	15.0	15.0	15.0	16.0	15.0	15.0
Total Split (s)	17.0	68.0	20.0	17.0	17.0	68.0	16.0	20.0	19.0	17.0	16.0	15.0	17.0
Total Split (%)	14.2%	56.7%	16.7%	14.2%	14.2%	56.7%	13.3%	16.7%	15.8%	14.2%	13.3%	12.5%	14.2%
Yellow Time (s)	3.6	4.6	3.8	3.4	3.4	4.4	4.1	3.8	3.6	3.4	4.1	3.8	3.6
All-Red Time (s)	3.0	1.7	3.0	3.0	3.0	1.6	3.0	3.0	3.0	3.0	3.0	3.1	3.0
Lost Time Adjust (s)	-1.6	-1.3	-1.8		-1.4	-1.0	-2.1	-1.8	-1.6	-1.4	-2.1	-1.9	-1.6
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag	Lag	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None	None	None	None	None	None
Act Effct Green (s)	11.0	72.0	93.8		11.3	69.5	94.0	15.8	9.7	14.1	19.5	9.2	16.7
Actuated g/C Ratio	0.09	0.60	0.78		0.09	0.58	0.78	0.13	0.08	0.12	0.16	0.08	0.14
v/c Ratio	0.54	0.43	0.05		0.17	0.85	0.05	0.76	0.05	0.23	0.09	0.17	0.06
Control Delay	63.2	9.1	1.5		52.2	26.2	0.5	61.9	50.1	1.7	42.5	36.9	0.4
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.2	9.1	1.5		52.2	26.2	0.5	61.9	50.1	1.7	42.5	36.9	0.4
LOS	E	A	A		D	C	A	E	D	A	D	D	A
Approach Delay		14.7				25.9			51.0			31.2	
Approach LOS		B				C			D			C	
Queue Length 50th (ft)	55	69	0		19	616	0	130	5	0	13	8	0
Queue Length 95th (ft)	93	224	8		49	701	6	#198	20	0	36	36	0
Internal Link Dist (ft)		1054				1150			396			470	
Turn Bay Length (ft)	300		125		200		200	200		100	325		150
Base Capacity (vph)	332	2948	1205		171	2847	1223	446	214	325	532	137	334
Starvation Cap Reductn	0	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.43	0.05		0.16	0.85	0.05	0.75	0.03	0.23	0.09	0.16	0.06

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Legacy Oaks
 4: Hinton Oaks Boulevard & US 64 Bus (Knightdale Blvd.)

Build-Out + 10 AM (2033)
 03/30/2020

Offset: 2 (2%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.85
 Intersection Signal Delay: 24.6 Intersection LOS: C
 Intersection Capacity Utilization 77.9% ICU Level of Service D
 Analysis Period (min) 15
 Description: 05-2267
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 ! Phase conflict between lane groups.

Splits and Phases: 4: Hinton Oaks Boulevard & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕		↕	↕		↕	↕	
Traffic Volume (vph)	4	4	8	121	4	4	46	134	109	4	292	10
Future Volume (vph)	4	4	8	121	4	4	46	134	109	4	292	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			1%	
Storage Length (ft)	0		0	100		0	70		0	150		350
Storage Lanes	0		0	1		0	1		0	1		1
Taper Length (ft)	25			100			100			80		
Satd. Flow (prot)	0	1710	0	1770	1723	0	1770	3302	0	1761	5035	0
Flt Permitted		0.988		0.950			0.950			0.950		
Satd. Flow (perm)	0	1710	0	1770	1723	0	1770	3302	0	1761	5035	0
Link Speed (mph)		30			30			30			25	
Link Distance (ft)		171			365			524			263	
Travel Time (s)		3.9			8.3			11.9			7.2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	21	0	159	10	0	61	319	0	5	397	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	33.9%
ICU Level of Service	A
Analysis Period (min)	15

Intersection												
Int Delay, s/veh	4.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕		↕	↕		↕	↕↕	
Traffic Vol, veh/h	4	4	8	121	4	4	46	134	109	4	292	10
Future Vol, veh/h	4	4	8	121	4	4	46	134	109	4	292	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	100	-	-	70	-	-	150	-	350
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	1	-
Peak Hour Factor	76	76	76	76	76	76	76	76	76	76	76	76
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	5	11	159	5	5	61	176	143	5	384	13

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	614	842	199	536	777	160	397	0	0	319	0	0
Stage 1	401	401	-	370	370	-	-	-	-	-	-	-
Stage 2	213	441	-	166	407	-	-	-	-	-	-	-
Critical Hdwy	6.99	6.54	7.14	6.99	6.54	6.94	5.34	-	-	4.14	-	-
Critical Hdwy Stg 1	7.34	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4.02	3.92	3.67	4.02	3.32	3.12	-	-	2.22	-	-
Pot Cap-1 Maneuver	401	299	688	450	327	857	757	-	-	1238	-	-
Stage 1	528	599	-	601	619	-	-	-	-	-	-	-
Stage 2	741	575	-	781	596	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	368	274	688	409	299	857	757	-	-	1238	-	-
Mov Cap-2 Maneuver	368	274	-	409	299	-	-	-	-	-	-	-
Stage 1	485	597	-	552	569	-	-	-	-	-	-	-
Stage 2	671	528	-	759	594	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.8	18.9	1.6	0.1
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	757	-	-	431	409	443	1238	-	-
HCM Lane V/C Ratio	0.08	-	-	0.049	0.389	0.024	0.004	-	-
HCM Control Delay (s)	10.2	-	-	13.8	19.3	13.3	7.9	-	-
HCM Lane LOS	B	-	-	B	C	B	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	0.2	1.8	0.1	0	-	-

Legacy Oaks
6: Hodge Road & Legacy Oaks Drive North

Build-Out + 10 AM (2033)
03/30/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	4	42	46	4	4	9	87	11	4	218	4
Future Volume (vph)	4	4	42	46	4	4	9	87	11	4	218	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%				0%				0%		1%	
Storage Length (ft)	0		0	100		0	0		0	100		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			100			25			100		
Satd. Flow (prot)	1770	1863	1583	1770	1723	0	1770	1831	0	1761	1848	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1863	1583	1770	1723	0	1770	1831	0	1761	1848	0
Link Speed (mph)		30			30			30			25	
Link Distance (ft)		258			326			504			286	
Travel Time (s)		5.9			7.4			11.5			7.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	5	49	54	10	0	11	115	0	5	261	0
Sign Control	Stop				Stop				Stop		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	28.4%
ICU Level of Service	A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	10.1
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑	↗	↘	↗		↘	↗		↘	↗	
Traffic Vol, veh/h	4	4	42	46	4	4	9	87	11	4	218	4
Future Vol, veh/h	4	4	42	46	4	4	9	87	11	4	218	4
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	5	49	54	5	5	11	102	13	5	256	5
Number of Lanes	1	1	1	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	3	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	3	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	3
HCM Control Delay	8.4	9.5	9.3	11
HCM LOS	A	A	A	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	100%	0%	100%	0%
Vol Thru, %	0%	89%	0%	100%	0%	0%	50%	0%	98%
Vol Right, %	0%	11%	0%	0%	100%	0%	50%	0%	2%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	9	98	4	4	42	46	8	4	222
LT Vol	9	0	4	0	0	46	0	4	0
Through Vol	0	87	0	4	0	0	4	0	218
RT Vol	0	11	0	0	42	0	4	0	4
Lane Flow Rate	11	115	5	5	49	54	9	5	261
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.018	0.172	0.008	0.008	0.07	0.094	0.014	0.007	0.374
Departure Headway (Hd)	5.956	5.375	6.308	5.804	5.098	6.286	5.427	5.671	5.158
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	599	664	565	613	697	567	655	630	695
Service Time	3.712	3.131	4.078	3.574	2.868	4.057	3.198	3.418	2.904
HCM Lane V/C Ratio	0.018	0.173	0.009	0.008	0.07	0.095	0.014	0.008	0.376
HCM Control Delay	8.8	9.3	9.1	8.6	8.3	9.7	8.3	8.5	11
HCM Lane LOS	A	A	A	A	A	A	A	A	B
HCM 95th-ile Q	0.1	0.6	0	0	0.2	0.3	0	0	1.7



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↖	↕	↗	↖	↖
Traffic Volume (vph)	0	4	134	15	0	306
Future Volume (vph)	0	4	134	15	0	306
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			1%
Storage Length (ft)	0	0		0	0	
Storage Lanes	0	1		0	0	
Taper Length (ft)	25				25	
Satd. Flow (prot)	0	1611	3486	0	0	3522
Flt Permitted						
Satd. Flow (perm)	0	1611	3486	0	0	3522
Link Speed (mph)	30		30			25
Link Distance (ft)	215		263			200
Travel Time (s)	4.9		6.0			5.5
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	4	166	0	0	340
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	14.2%
ICU Level of Service	A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↑	↑↓			↑↑
Traffic Vol, veh/h	0	4	134	15	0	306
Future Vol, veh/h	0	4	134	15	0	306
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	1
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	4	149	17	0	340
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	-	83	0	0	-	
Stage 1	-	-	-	-	-	
Stage 2	-	-	-	-	-	
Critical Hdwy	-	6.94	-	-	-	
Critical Hdwy Stg 1	-	-	-	-	-	
Critical Hdwy Stg 2	-	-	-	-	-	
Follow-up Hdwy	-	3.32	-	-	-	
Pot Cap-1 Maneuver	0	960	-	-	0	
Stage 1	0	-	-	-	0	
Stage 2	0	-	-	-	0	
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	-	960	-	-	-	
Mov Cap-2 Maneuver	-	-	-	-	-	
Stage 1	-	-	-	-	-	
Stage 2	-	-	-	-	-	
Approach	WB	NB		SB		
HCM Control Delay, s	8.8	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT		
Capacity (veh/h)	-	-	960	-		
HCM Lane V/C Ratio	-	-	0.005	-		
HCM Control Delay (s)	-	-	8.8	-		
HCM Lane LOS	-	-	A	-		
HCM 95th %tile Q(veh)	-	-	0	-		



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↖	↕	↗	↖	↖
Traffic Volume (vph)	0	4	120	14	0	306
Future Volume (vph)	0	4	120	14	0	306
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			1%
Storage Length (ft)	0	0		0	0	
Storage Lanes	0	1		0	0	
Taper Length (ft)	25				25	
Satd. Flow (prot)	0	1611	3483	0	0	3522
Flt Permitted						
Satd. Flow (perm)	0	1611	3483	0	0	3522
Link Speed (mph)	30		30			25
Link Distance (ft)	193		200			284
Travel Time (s)	4.4		4.5			7.7
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	4	149	0	0	340
Sign Control	Stop		Free			Free

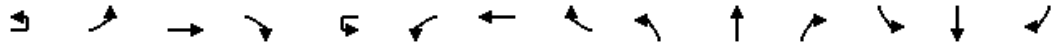
Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	13.8%
ICU Level of Service	A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↑	↑↑			↑↑
Traffic Vol, veh/h	0	4	120	14	0	306
Future Vol, veh/h	0	4	120	14	0	306
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	1
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	4	133	16	0	340
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	-	75	0	0	-	
Stage 1	-	-	-	-	-	
Stage 2	-	-	-	-	-	
Critical Hdwy	-	6.94	-	-	-	
Critical Hdwy Stg 1	-	-	-	-	-	
Critical Hdwy Stg 2	-	-	-	-	-	
Follow-up Hdwy	-	3.32	-	-	-	
Pot Cap-1 Maneuver	0	971	-	-	0	
Stage 1	0	-	-	-	0	
Stage 2	0	-	-	-	0	
Platoon blocked, %	-	-	-	-	-	
Mov Cap-1 Maneuver	-	971	-	-	-	
Mov Cap-2 Maneuver	-	-	-	-	-	
Stage 1	-	-	-	-	-	
Stage 2	-	-	-	-	-	
Approach	WB	NB		SB		
HCM Control Delay, s	8.7	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT		
Capacity (veh/h)	-	-	971	-		
HCM Lane V/C Ratio	-	-	0.005	-		
HCM Control Delay (s)	-	-	8.7	-		
HCM Lane LOS	-	-	A	-		
HCM 95th %tile Q(veh)	-	-	0	-		

Legacy Oaks
1: Hodge Road & US 64 Bus (Knightdale Blvd.)

Build-Out + 10 PM (2033)
03/30/2020



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations														
Traffic Volume (vph)	8	146	1856	349	23	445	1211	347	126	42	264	263	84	125
Future Volume (vph)	8	146	1856	349	23	445	1211	347	126	42	264	263	84	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)			3%				-3%			-2%				1%
Storage Length (ft)		200		225		600		375	200		50	0		0
Storage Lanes		3		1		1		1	1		1	2		1
Taper Length (ft)		300				150			100			100		
Satd. Flow (prot)	0	3382	5009	1560	0	1796	5162	1607	3467	1637	0	3416	1853	1575
Flt Permitted		0.950				0.950			0.950			0.950		
Satd. Flow (perm)	0	3382	5009	1560	0	1796	5162	1607	3467	1637	0	3416	1853	1575
Right Turn on Red				Yes				Yes			Yes			Yes
Satd. Flow (RTOR)				146				358		190				182
Link Speed (mph)			45				45			35				25
Link Distance (ft)			734				962			450				524
Travel Time (s)			11.1				14.6			8.8				14.3
Confl. Peds. (#/hr)														
Confl. Bikes (#/hr)														
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)														
Mid-Block Traffic (%)			0%				0%			0%				0%
Shared Lane Traffic (%)														
Lane Group Flow (vph)	0	159	1913	360	0	483	1248	358	130	315	0	271	87	129
Turn Type	Prot	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5!	5	2	3	1	1	6	7	3	8		7	4	5!
Permitted Phases				2				6						4
Detector Phase	5	5	2	3	1	1	6	7	3	8		7	4	5
Switch Phase														
Minimum Initial (s)	7.0	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	15.0	15.0	19.0	15.0	15.0	15.0	20.0	15.0	15.0	16.0		15.0	15.0	15.0
Total Split (s)	20.0	20.0	55.0	25.0	45.0	45.0	80.0	15.0	25.0	25.0		15.0	15.0	20.0
Total Split (%)	14.3%	14.3%	39.3%	17.9%	32.1%	32.1%	57.1%	10.7%	17.9%	17.9%		10.7%	10.7%	14.3%
Yellow Time (s)	3.0	3.0	4.3	3.0	3.0	3.0	4.8	3.0	3.0	4.0		3.0	3.1	3.0
All-Red Time (s)	3.9	3.9	1.7	3.9	3.5	3.5	1.7	3.9	3.9	3.1		3.9	3.7	3.9
Lost Time Adjust (s)		-1.9	-1.0	-1.9		-1.5	-1.5	-1.9	-1.9	-2.1		-1.9	-1.8	-1.9
Total Lost Time (s)		5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lead	Lead	Lag	Lag	Lag	Lead	Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None	C-Max	None	None	None	C-Max	None	None	None		None	None	None
Act Effct Green (s)		13.3	52.7	68.8		40.0	79.3	94.3	16.1	17.3		10.0	11.2	29.5
Actuated g/C Ratio		0.10	0.38	0.49		0.29	0.57	0.67	0.12	0.12		0.07	0.08	0.21
v/c Ratio		0.49	1.02	0.43		0.94	0.43	0.30	0.33	0.85		1.11	0.59	0.27
Control Delay		65.3	67.8	9.2		57.3	7.6	0.6	58.3	44.8		147.9	78.9	2.9
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay		65.3	67.8	9.2		57.3	7.6	0.6	58.3	44.8		147.9	78.9	2.9
LOS		E	E	A		E	A	A	E	D		F	E	A
Approach Delay			58.9				17.9			48.7				97.2
Approach LOS			E				B			D				F
Queue Length 50th (ft)		71	-705	77		437	98	0	56	113		-145	76	0
Queue Length 95th (ft)		109	#800	131		#647	112	0	88	#255		#240	#157	15
Internal Link Dist (ft)			654				882			370			444	
Turn Bay Length (ft)		200		225		600		375	200					
Base Capacity (vph)		362	1883	880		513	2924	1199	495	396		244	149	492
Starvation Cap Reductn		0	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn		0	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn		0	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio		0.44	1.02	0.41		0.94	0.43	0.30	0.26	0.80		1.11	0.58	0.26

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Legacy Oaks
 1: Hodge Road & US 64 Bus (Knightdale Blvd.)

Build-Out + 10 PM (2033)
 03/30/2020

Offset: 84 (60%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.11
 Intersection Signal Delay: 45.8 Intersection LOS: D
 Intersection Capacity Utilization 104.5% ICU Level of Service G
 Analysis Period (min) 15
 Description: 05-0928
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 ! Phase conflict between lane groups.

Splits and Phases: 1: Hodge Road & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↓	↑↑							↑
Traffic Volume (vph)	0	2335	102	221	1393	0	0	0	0	0	0	676
Future Volume (vph)	0	2335	102	221	1393	0	0	0	0	0	0	676
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		1%			-1%			0%			2%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	5060	1575	1778	3557	0	0	0	0	0	0	1564
Flt Permitted				0.042								
Satd. Flow (perm)	0	5060	1575	79	3557	0	0	0	0	0	0	1564
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			104									169
Link Speed (mph)		45		45			35				35	
Link Distance (ft)		962		263			601				428	
Travel Time (s)		14.6		4.0			11.7				8.3	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	4%	4%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%		0%			0%				0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2383	104	226	1421	0	0	0	0	0	0	690
Turn Type		NA	Perm	D.P+P	NA							Free
Protected Phases		2		7	2							
Permitted Phases			2	2								Free
Detector Phase		2	2	7	2							
Switch Phase												
Minimum Initial (s)		12.0	12.0	7.0								
Minimum Split (s)		19.0	19.0	15.0								
Total Split (s)		100.0	100.0	40.0								
Total Split (%)		71.4%	71.4%	28.6%								
Yellow Time (s)		4.4	4.4	3.0								
All-Red Time (s)		1.6	1.6	3.1								
Lost Time Adjust (s)		-1.0	-1.0	-1.1								
Total Lost Time (s)		5.0	5.0	5.0								
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max	None								
Act Effct Green (s)		100.5	100.5	130.0	140.0							140.0
Actuated g/C Ratio		0.72	0.72	0.93	1.00							1.00
v/c Ratio		0.66	0.09	0.52	0.40							0.44
Control Delay		8.9	0.8	57.2	2.7							0.9
Queue Delay		0.7	0.0	0.0	0.0							0.0
Total Delay		9.6	0.8	57.2	2.7							0.9
LOS		A	A	E	A							A
Approach Delay		9.2			10.1						0.9	
Approach LOS		A			B						A	
Queue Length 50th (ft)		152	2	167	118							0
Queue Length 95th (ft)		m821	m2	247	30							0
Internal Link Dist (ft)		882			183			521			348	
Turn Bay Length (ft)												
Base Capacity (vph)		3632	1160	499	3546							1564
Starvation Cap Reductn		796	0	0	0							0
Spillback Cap Reductn		0	0	0	0							0
Storage Cap Reductn		0	0	0	0							0
Reduced v/c Ratio		0.84	0.09	0.45	0.40							0.44

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 72 (51%), Referenced to phase 2:EBWB and 6:, Start of Green

Natural Cycle: 45

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.66

Intersection Signal Delay: 8.3

Intersection LOS: A

Intersection Capacity Utilization 119.1%

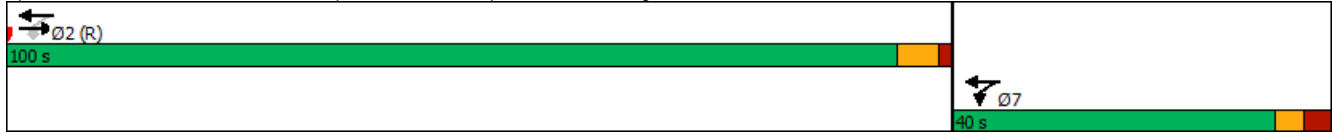
ICU Level of Service H

Analysis Period (min) 15

Description: 05-2153

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: I-540 EB On-Ramp/I-540 EB Off-Ramp & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↕↕			↕↕↕	↕↔		↕↔	↕↕↕			
Traffic Volume (vph)	451	2972	0	0	1493	573	128	4	709	0	0	0
Future Volume (vph)	451	2972	0	0	1493	573	128	4	709	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		-1%			1%			2%			0%	
Storage Length (ft)	500		0	0		0	0		400	0		0
Storage Lanes	1		0	0		1	0		2	0		0
Taper Length (ft)	200			25			25			25		
Satd. Flow (prot)	3450	5111	0	0	5060	1575	0	1759	2759	0	0	0
Flt Permitted	0.950							0.954				
Satd. Flow (perm)	3450	5111	0	0	5060	1575	0	1759	2759	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						553			71			
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		803			1134			793			417	
Travel Time (s)		12.2			17.2			15.4			8.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	470	3096	0	0	1555	597	0	137	739	0	0	0
Turn Type	Prot	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			4				
Permitted Phases					6	4		4				
Detector Phase	5	2			6	6	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0	12.0			12.0	12.0	7.0	7.0	7.0			
Minimum Split (s)	15.0	20.0			20.0	20.0	15.0	15.0	15.0			
Total Split (s)	30.0	100.0			70.0	70.0	40.0	40.0	40.0			
Total Split (%)	21.4%	71.4%			50.0%	50.0%	28.6%	28.6%	28.6%			
Yellow Time (s)	3.3	4.6			4.4	4.4	3.7	3.7	3.7			
All-Red Time (s)	3.0	1.3			1.4	1.4	2.5	2.5	2.5			
Lost Time Adjust (s)	-1.3	-0.9			-0.8	-0.8	-1.2	-1.2	-1.2			
Total Lost Time (s)	5.0	5.0			5.0	5.0	5.0	5.0	5.0			
Lead/Lag	Lag				Lead	Lead						
Lead-Lag Optimize?	Yes				Yes	Yes						
Recall Mode	None	C-Max			C-Max	C-Max	None	None	None			
Act Effct Green (s)	25.0	95.0			65.0	65.0		35.0	35.0			
Actuated g/C Ratio	0.18	0.68			0.46	0.46		0.25	0.25			
v/c Ratio	0.76	0.89			0.66	0.58		0.31	0.99			
Control Delay	47.1	9.5			13.5	2.8		45.1	78.8			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	47.1	9.5			13.5	2.8		45.1	78.8			
LOS	D	A			B	A		D	E			
Approach Delay		14.5			10.5			73.5				
Approach LOS		B			B			E				
Queue Length 50th (ft)	227	138			178	0		102	353			
Queue Length 95th (ft)	263	142			m117	m6		166	#506			
Internal Link Dist (ft)		723			1054			713			337	
Turn Bay Length (ft)	500								400			
Base Capacity (vph)	616	3468			2349	1027		439	743			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.76	0.89			0.66	0.58		0.31	0.99			

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 68 (49%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.99

Intersection Signal Delay: 21.0

Intersection LOS: C

Intersection Capacity Utilization 90.6%

ICU Level of Service E

Analysis Period (min) 15

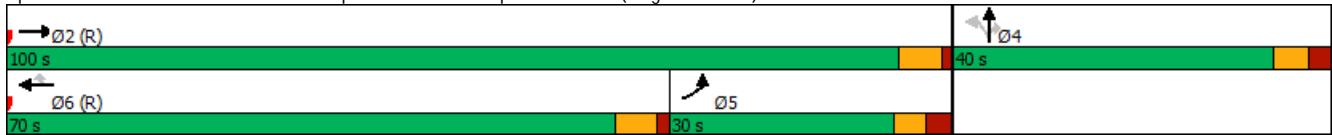
Description: 05-2152

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

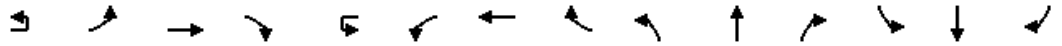
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: I-540 WB Off-Ramp/I-540 WB On-Ramp & US 64 Bus (Knightdale Blvd.)



Legacy Oaks
4: Hinton Oaks Boulevard & US 64 Bus (Knightdale Blvd.)

Build-Out + 10 PM (2033)
03/30/2020



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations														
Traffic Volume (vph)	28	468	2765	187	7	40	1680	82	137	31	67	145	15	106
Future Volume (vph)	28	468	2765	187	7	40	1680	82	137	31	67	145	15	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)			-1%				1%			3%				0%
Storage Length (ft)		300		125		200		200	200		100	325		150
Storage Lanes		2		1		1		1	2		1	1		1
Taper Length (ft)		250				100			100			100		
Satd. Flow (prot)	0	3450	5111	1591	0	1761	5060	1575	3382	1835	1560	3433	1570	1504
Flt Permitted		0.950				0.950			0.950			0.950		
Satd. Flow (perm)	0	3450	5111	1591	0	1761	5060	1575	3382	1835	1560	3433	1570	1504
Right Turn on Red				Yes				Yes			Yes			Yes
Satd. Flow (RTOR)				89				81			130			126
Link Speed (mph)			45				45			35				35
Link Distance (ft)			1134				1230			476				550
Travel Time (s)			17.2				18.6			9.3				10.7
Confl. Peds. (#/hr)														
Confl. Bikes (#/hr)														
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)														
Mid-Block Traffic (%)			0%				0%			0%				0%
Shared Lane Traffic (%)														44%
Lane Group Flow (vph)	0	522	2911	197	0	49	1768	86	144	33	71	153	65	63
Turn Type	Prot	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5!	5	2	3	1!	1	6	7	3	8	1!	7	4	5!
Permitted Phases				2				6			8			4
Detector Phase	5	5	2	3	1	1	6	7	3	8	1	7	4	5
Switch Phase														
Minimum Initial (s)	7.0	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	15.0	15.0	20.0	15.0	15.0	15.0	20.0	16.0	15.0	15.0	15.0	16.0	15.0	15.0
Total Split (s)	28.0	28.0	80.0	20.0	20.0	20.0	72.0	20.0	20.0	20.0	20.0	20.0	20.0	28.0
Total Split (%)	20.0%	20.0%	57.1%	14.3%	14.3%	14.3%	51.4%	14.3%	14.3%	14.3%	14.3%	14.3%	14.3%	20.0%
Yellow Time (s)	3.6	3.6	4.6	3.8	3.4	3.4	4.4	4.1	3.8	3.6	3.4	4.1	3.8	3.6
All-Red Time (s)	3.0	3.0	1.7	3.0	3.0	3.0	1.6	3.0	3.0	3.0	3.0	3.0	3.1	3.0
Lost Time Adjust (s)		-1.6	-1.3	-1.8			-1.4	-1.0	-2.1	-1.8	-1.6	-1.4	-2.1	-1.9
Total Lost Time (s)		5.0	5.0	5.0			5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	C-Max	None	None	None	C-Max	None	None	None	None	None	None	None
Act Effct Green (s)		23.0	89.0	106.9			10.2	76.2	97.5	13.0	9.9	16.7	16.3	10.6
Actuated g/C Ratio		0.16	0.64	0.76			0.07	0.54	0.70	0.09	0.07	0.12	0.12	0.08
v/c Ratio		0.92	0.90	0.16			0.38	0.64	0.08	0.46	0.26	0.24	0.38	0.40
Control Delay		61.0	19.6	1.6			70.0	24.9	2.3	64.8	65.9	1.9	60.1	29.3
Queue Delay		0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		61.0	19.6	1.6			70.0	24.9	2.3	64.8	65.9	1.9	60.1	29.3
LOS		E	B	A			E	C	A	E	A	E	C	A
Approach Delay			24.6				25.0			46.9				39.7
Approach LOS			C				C			D				D
Queue Length 50th (ft)		237	518	6			44	416	1	64	29	0	69	14
Queue Length 95th (ft)		m#273	m#1095	m17			85	515	21	100	64	0	103	64
Internal Link Dist (ft)			1054				1150			396			470	
Turn Bay Length (ft)		300		125			200		200	200		100	325	150
Base Capacity (vph)		566	3248	1258			188	2753	1112	362	196	349	428	211
Starvation Cap Reductn		0	0	0			0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0			0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0			0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.92	0.90	0.16			0.26	0.64	0.08	0.40	0.17	0.20	0.36	0.31

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 78 (56%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 26.3

Intersection LOS: C

Intersection Capacity Utilization 87.6%

ICU Level of Service E

Analysis Period (min) 15

Description: 05-2267

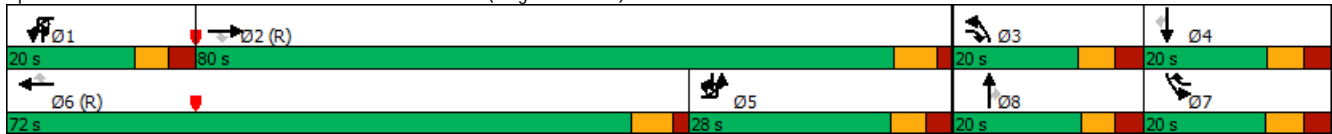
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

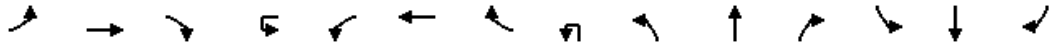
! Phase conflict between lane groups.

Splits and Phases: 4: Hinton Oaks Boulevard & US 64 Bus (Knightdale Blvd.)



Legacy Oaks
5: Hodge Road & Sam's Xpress Driveway/Legacy Oaks Drive South

Build-Out + 10 PM (2033)
03/30/2020



Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔			↔	↔		↔	↔↔	
Traffic Volume (vph)	4	4	13	9	134	4	4	9	112	323	101	4	182	4
Future Volume (vph)	4	4	13	9	134	4	4	9	112	323	101	4	182	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%				0%				0%				1%
Storage Length (ft)	0		0		100		0		70		0	150		350
Storage Lanes	0		0		1		0		1		0	1		1
Taper Length (ft)	25				100				100			80		
Satd. Flow (prot)	0	1687	0	0	1770	1723	0	0	1687	3252	0	1761	5045	0
Flt Permitted		0.991			0.950				0.950			0.950		
Satd. Flow (perm)	0	1687	0	0	1770	1723	0	0	1687	3252	0	1761	5045	0
Link Speed (mph)		30				30				30			25	
Link Distance (ft)		171				365				524			255	
Travel Time (s)		3.9				8.3				11.9			7.0	
Confl. Peds. (#/hr)			1		1									
Confl. Bikes (#/hr)														
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	7%	7%	7%	7%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)														
Mid-Block Traffic (%)		0%				0%				0%			0%	
Shared Lane Traffic (%)														
Lane Group Flow (vph)	0	22	0	0	150	8	0	0	127	446	0	4	196	0
Sign Control		Stop				Stop				Free			Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	40.1%
ICU Level of Service	A
Analysis Period (min)	15

Intersection														
Int Delay, s/veh	6.2													
Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔			↔	↔		↔	↔↔	
Traffic Vol, veh/h	4	4	13	9	134	4	4	9	112	323	101	4	182	4
Future Vol, veh/h	4	4	13	9	134	4	4	9	112	323	101	4	182	4
Conflicting Peds, #/hr	0	0	1	0	1	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	-	None	-	-	-	None	-	-	None
Storage Length	-	-	-	-	100	-	-	-	70	-	-	150	-	350
Veh in Median Storage, #	-	0	-	-	-	0	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	-	0	-	-	-	0	-	-	1	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	7	7	7	7	2	2	2
Mvmt Flow	4	4	14	9	141	4	4	9	118	340	106	4	192	4
Major/Minor	Minor2			Minor1			Major1			Major2				
Conflicting Flow All	628	902	99	0	735	851	223	143	196	0	0	446	0	0
Stage 1	202	202	-	0	647	647	-	-	-	-	-	-	-	-
Stage 2	426	700	-	0	88	204	-	-	-	-	-	-	-	-
Critical Hdwy	6.99	6.54	7.14	-	6.99	6.54	6.94	5.74	5.44	-	-	4.14	-	-
Critical Hdwy Stg 1	7.34	5.54	-	-	6.54	5.54	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	-	6.74	5.54	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4.02	3.92	-	3.67	4.02	3.32	2.37	3.17	-	-	2.22	-	-
Pot Cap-1 Maneuver	392	276	796	0	335	296	780	1267	920	-	-	1111	-	-
Stage 1	719	733	-	0	414	465	-	-	-	-	-	-	-	-
Stage 2	558	440	-	0	870	732	-	-	-	-	-	-	-	-
Platoon blocked, %				-						-	-		-	-
Mov Cap-1 Maneuver	344	238	795	0	290	255	780	938	938	-	-	1111	-	-
Mov Cap-2 Maneuver	344	238	-	0	290	255	-	-	-	-	-	-	-	-
Stage 1	622	730	-	0	358	402	-	-	-	-	-	-	-	-
Stage 2	475	381	-	0	846	729	-	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB				
HCM Control Delay, s	13.1			27.8			2.1			0.2				
HCM LOS	B			D										
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR					
Capacity (veh/h)	938	-	-	469	290	384	1111	-	-					
HCM Lane V/C Ratio	0.136	-	-	0.047	0.486	0.022	0.004	-	-					
HCM Control Delay (s)	9.4	-	-	13.1	28.6	14.6	8.3	-	-					
HCM Lane LOS	A	-	-	B	D	B	A	-	-					
HCM 95th %tile Q(veh)	0.5	-	-	0.1	2.5	0.1	0	-	-					

Legacy Oaks
6: Hodge Road & Legacy Oaks Drive North

Build-Out + 10 PM (2033)
03/30/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	4	27	19	4	4	30	223	21	4	133	4
Future Volume (vph)	4	4	27	19	4	4	30	223	21	4	133	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%				0%		0%				1%	
Storage Length (ft)	0		0	100		0	0		0	100		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			100			25			100		
Satd. Flow (prot)	1770	1863	1583	1770	1723	0	1687	1753	0	1761	1846	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1863	1583	1770	1723	0	1687	1753	0	1761	1846	0
Link Speed (mph)		30			30			30			25	
Link Distance (ft)		258			326			504			286	
Travel Time (s)		5.9			7.4			11.5			7.8	
Confl. Peds. (#/hr)			1	1								
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	7%	7%	7%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	4	4	29	20	8	0	32	263	0	4	147	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	34.1%
ICU Level of Service	A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	10
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↑	↔	↔	↔		↔	↔		↔	↔	
Traffic Vol, veh/h	4	4	27	19	4	4	30	223	21	4	133	4
Future Vol, veh/h	4	4	27	19	4	4	30	223	21	4	133	4
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	2	2	2	2	2	2	7	7	7	2	2	2
Mvmt Flow	4	4	29	20	4	4	32	240	23	4	143	4
Number of Lanes	1	1	1	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	3	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	3	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	3
HCM Control Delay	8.3	9.1	10.6	9.5
HCM LOS	A	A	B	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	100%	0%	100%	0%
Vol Thru, %	0%	91%	0%	100%	0%	0%	50%	0%	97%
Vol Right, %	0%	9%	0%	0%	100%	0%	50%	0%	3%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	30	244	4	4	27	19	8	4	137
LT Vol	30	0	4	0	0	19	0	4	0
Through Vol	0	223	0	4	0	0	4	0	133
RT Vol	0	21	0	0	27	0	4	0	4
Lane Flow Rate	32	262	4	4	29	20	9	4	147
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.051	0.37	0.008	0.007	0.042	0.036	0.013	0.007	0.218
Departure Headway (Hd)	5.642	5.081	6.356	5.852	5.146	6.379	5.52	5.839	5.317
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	635	708	561	609	692	559	645	612	675
Service Time	3.379	2.817	4.114	3.61	2.904	4.142	3.283	3.581	3.058
HCM Lane V/C Ratio	0.05	0.37	0.007	0.007	0.042	0.036	0.014	0.007	0.218
HCM Control Delay	8.7	10.8	9.2	8.7	8.1	9.4	8.4	8.6	9.5
HCM Lane LOS	A	B	A	A	A	A	A	A	A
HCM 95th-tile Q	0.2	1.7	0	0	0.1	0.1	0	0	0.8



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↖	↕	↗		↖
Traffic Volume (vph)	0	4	345	24	0	179
Future Volume (vph)	0	4	345	24	0	179
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			1%
Storage Length (ft)	0	0		0	0	
Storage Lanes	0	1		0	0	
Taper Length (ft)	25				25	
Satd. Flow (prot)	0	1611	3504	0	0	3522
Flt Permitted						
Satd. Flow (perm)	0	1611	3504	0	0	3522
Link Speed (mph)	30		30			25
Link Distance (ft)	215		255			206
Travel Time (s)	4.9		5.8			5.6
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	4	410	0	0	199
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	20.3%
	ICU Level of Service A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↑	↑↑			↑↑
Traffic Vol, veh/h	0	4	345	24	0	179
Future Vol, veh/h	0	4	345	24	0	179
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	1
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	4	383	27	0	199
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	-	205	0	0	-	
Stage 1	-	-	-	-	-	
Stage 2	-	-	-	-	-	
Critical Hdwy	-	6.94	-	-	-	
Critical Hdwy Stg 1	-	-	-	-	-	
Critical Hdwy Stg 2	-	-	-	-	-	
Follow-up Hdwy	-	3.32	-	-	-	
Pot Cap-1 Maneuver	0	802	-	-	0	
Stage 1	0	-	-	-	0	
Stage 2	0	-	-	-	0	
Platoon blocked, %	-	-	-	-	-	
Mov Cap-1 Maneuver	-	802	-	-	-	
Mov Cap-2 Maneuver	-	-	-	-	-	
Stage 1	-	-	-	-	-	
Stage 2	-	-	-	-	-	
Approach	WB	NB		SB		
HCM Control Delay, s	9.5	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT		
Capacity (veh/h)	-	-	802	-		
HCM Lane V/C Ratio	-	-	0.006	-		
HCM Control Delay (s)	-	-	9.5	-		
HCM Lane LOS	-	-	A	-		
HCM 95th %tile Q(veh)	-	-	0	-		



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↖	↕	↗		↖
Traffic Volume (vph)	0	4	322	23	0	179
Future Volume (vph)	0	4	322	23	0	179
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			1%
Storage Length (ft)	0	0		0	0	
Storage Lanes	0	1		0	0	
Taper Length (ft)	25				25	
Satd. Flow (prot)	0	1611	3504	0	0	3522
Flt Permitted						
Satd. Flow (perm)	0	1611	3504	0	0	3522
Link Speed (mph)	30		30			25
Link Distance (ft)	193		206			285
Travel Time (s)	4.4		4.7			7.8
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	4	384	0	0	199
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	19.6%
ICU Level of Service	A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↑	↑↑			↑↑
Traffic Vol, veh/h	0	4	322	23	0	179
Future Vol, veh/h	0	4	322	23	0	179
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	1
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	4	358	26	0	199

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	-	192	0	0	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-
Pot Cap-1 Maneuver	0	817	-	0	-
Stage 1	0	-	-	0	-
Stage 2	0	-	-	0	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	-	817	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.4	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	817	-
HCM Lane V/C Ratio	-	-	0.005	-
HCM Control Delay (s)	-	-	9.4	-
HCM Lane LOS	-	-	A	-
HCM 95th %tile Q(veh)	-	-	0	-

**Appendix N:
Synchro Output –
Background (2033) – with Hinton Oaks**

Legacy Oaks
1: Hodge Road & US 64 Bus (Knightdale Blvd.)

Background + 10 AM (2033) - with Hinton Oaks
03/30/2020



Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (vph)	37	998	106	15	159	1595	101	479	16	188	101	18	100
Future Volume (vph)	37	998	106	15	159	1595	101	479	16	188	101	18	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		3%				-3%			-2%			1%	
Storage Length (ft)	200		225		600		375	200		50	0		0
Storage Lanes	3		1		1		1	1		1	2		1
Taper Length (ft)	300				150			100			100		
Satd. Flow (prot)	3382	5009	1560	0	1796	5162	1607	3368	1575	0	3350	1818	1545
Flt Permitted	0.950				0.950			0.950			0.950		
Satd. Flow (perm)	3382	5009	1560	0	1796	5162	1607	3368	1575	0	3350	1818	1545
Right Turn on Red			Yes				Yes			Yes			Yes
Satd. Flow (RTOR)			119				163		211				216
Link Speed (mph)		45				45			35			25	
Link Distance (ft)		735				962			450			524	
Travel Time (s)		11.1				14.6			8.8			14.3	
Confl. Peds. (#/hr)													
Confl. Bikes (#/hr)													
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	5%	5%	5%	4%	4%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)													
Mid-Block Traffic (%)		0%				0%			0%			0%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	42	1121	119	0	196	1792	113	538	229	0	113	20	112
Turn Type	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2	3	1	1	6	7	3	8		7	4	5
Permitted Phases			2			6							4
Detector Phase	5	2	3	1	1	6	7	3	8		7	4	5
Switch Phase													
Minimum Initial (s)	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	15.0	19.0	15.0	15.0	15.0	20.0	15.0	15.0	16.0		15.0	15.0	15.0
Total Split (s)	15.0	47.0	31.0	27.0	27.0	59.0	20.0	31.0	26.0		20.0	15.0	15.0
Total Split (%)	12.5%	39.2%	25.8%	22.5%	22.5%	49.2%	16.7%	25.8%	21.7%		16.7%	12.5%	12.5%
Yellow Time (s)	3.0	4.3	3.0	3.0	3.0	4.8	3.0	3.0	4.0		3.0	3.1	3.0
All-Red Time (s)	3.9	1.7	3.9	3.5	3.5	1.7	3.9	3.9	3.1		3.9	3.7	3.9
Lost Time Adjust (s)	-1.9	-1.0	-1.9			-1.5	-1.5	-1.9	-2.1		-1.9	-1.8	-1.9
Total Lost Time (s)	5.0	5.0	5.0			5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None	None		None	None	None
Act Effct Green (s)	10.0	55.1	85.2			18.9	64.1	75.4	25.1		11.3	9.2	13.9
Actuated g/C Ratio	0.08	0.46	0.71			0.16	0.53	0.63	0.21		0.09	0.08	0.12
v/c Ratio	0.15	0.49	0.10			0.69	0.65	0.11	0.77		0.36	0.14	0.30
Control Delay	52.5	25.5	1.9			73.0	24.1	1.2	52.7		53.7	54.1	2.1
Queue Delay	0.0	0.0	0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	52.5	25.5	1.9			73.0	24.1	1.2	52.7		53.7	54.1	2.1
LOS	D	C	A			E	C	A	D		B	D	A
Approach Delay		24.2				27.5			41.4			30.1	
Approach LOS		C				C			D			C	
Queue Length 50th (ft)	15	201	0			156	255	5	201		42	15	0
Queue Length 95th (ft)	34	310	22			236	390	15	260		70	39	0
Internal Link Dist (ft)		655				882			370			444	
Turn Bay Length (ft)	200		225		600		375	200					
Base Capacity (vph)	281	2300	1153		330	2755	1114	729	456		418	151	369
Starvation Cap Reductn	0	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.15	0.49	0.10		0.59	0.65	0.10	0.74	0.50		0.27	0.13	0.30

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Legacy Oaks
 1: Hodge Road & US 64 Bus (Knightdale Blvd.)

Offset: 60 (50%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.77

Intersection Signal Delay: 29.1

Intersection LOS: C

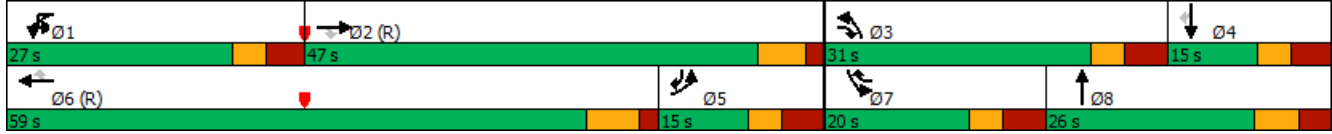
Intersection Capacity Utilization 72.8%

ICU Level of Service C

Analysis Period (min) 15

Description: 05-0928

Splits and Phases: 1: Hodge Road & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↓	↑↑							↑
Traffic Volume (vph)	0	1193	131	349	1566	0	0	0	0	0	0	328
Future Volume (vph)	0	1193	131	349	1566	0	0	0	0	0	0	328
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		1%			-1%			0%				2%
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	4963	1545	1744	3489	0	0	0	0	0	0	1580
Flt Permitted				0.190								
Satd. Flow (perm)	0	4963	1545	349	3489	0	0	0	0	0	0	1580
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			139									121
Link Speed (mph)		45		45				35				35
Link Distance (ft)		962		263				601				428
Travel Time (s)		14.6		4.0				11.7				8.3
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	0%	0%	0%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%				0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1269	139	371	1666	0	0	0	0	0	0	349
Turn Type		NA	Perm	D.P+P	NA							Free
Protected Phases		2		7	2 7							
Permitted Phases			2	2								Free
Detector Phase		2	2	7	2 7							
Switch Phase												
Minimum Initial (s)		12.0	12.0	7.0								
Minimum Split (s)		19.0	19.0	15.0								
Total Split (s)		90.0	90.0	30.0								
Total Split (%)		75.0%	75.0%	25.0%								
Yellow Time (s)		4.4	4.4	3.0								
All-Red Time (s)		1.6	1.6	3.1								
Lost Time Adjust (s)		-1.0	-1.0	-1.1								
Total Lost Time (s)		5.0	5.0	5.0								
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max	None								
Act Effct Green (s)		85.3	85.3	110.0	120.0							120.0
Actuated g/C Ratio		0.71	0.71	0.92	1.00							1.00
v/c Ratio		0.36	0.12	0.61	0.48							0.22
Control Delay		2.5	0.3	31.1	3.2							0.3
Queue Delay		0.0	0.0	0.0	0.0							0.0
Total Delay		2.5	0.3	31.1	3.2							0.3
LOS		A	A	C	A							A
Approach Delay		2.3			8.3						0.3	
Approach LOS		A			A						A	
Queue Length 50th (ft)		17	0	148	66							0
Queue Length 95th (ft)		31	1	m241	71							0
Internal Link Dist (ft)		882			183			521			348	
Turn Bay Length (ft)												
Base Capacity (vph)		3527	1138	611	3463							1580
Starvation Cap Reductn		0	0	0	0							0
Spillback Cap Reductn		0	0	0	0							0
Storage Cap Reductn		0	0	0	0							0
Reduced v/c Ratio		0.36	0.12	0.61	0.48							0.22

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 57 (48%), Referenced to phase 2:EBWB and 6:, Start of Green

Natural Cycle: 40

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.61

Intersection Signal Delay: 5.4

Intersection LOS: A

Intersection Capacity Utilization 56.7%

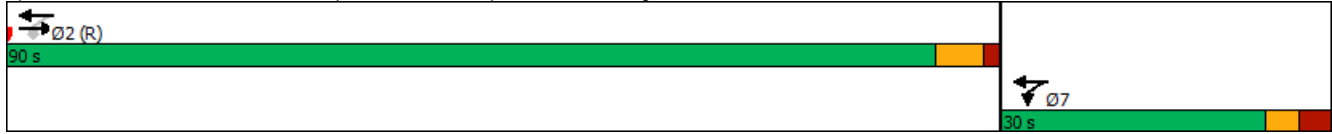
ICU Level of Service B

Analysis Period (min) 15

Description: 05-2153

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: I-540 EB On-Ramp/I-540 EB Off-Ramp & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	470	1160	0	0	1827	876	75	5	494	0	0	0
Future Volume (vph)	470	1160	0	0	1827	876	75	5	494	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		-1%			1%			2%			0%	
Storage Length (ft)	500		0	0		0	0		400	0		0
Storage Lanes	1		0	0		1	0		2	0		0
Taper Length (ft)	200			25			25			25		
Satd. Flow (prot)	3384	5012	0	0	4963	1545	0	1695	2655	0	0	0
Flt Permitted	0.950							0.955				
Satd. Flow (perm)	3384	5012	0	0	4963	1545	0	1695	2655	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						651			151			
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		803			1134			793			417	
Travel Time (s)		12.2			17.2			15.4			8.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	6%	6%	6%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	516	1275	0	0	2008	963	0	87	543	0	0	0
Turn Type	Prot	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			4				
Permitted Phases					6	4		4				
Detector Phase	5	2			6	6	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0	12.0			12.0	12.0	7.0	7.0	7.0			
Minimum Split (s)	15.0	20.0			20.0	20.0	15.0	15.0	15.0			
Total Split (s)	25.0	85.0			60.0	60.0	35.0	35.0	35.0			
Total Split (%)	20.8%	70.8%			50.0%	50.0%	29.2%	29.2%	29.2%			
Yellow Time (s)	3.3	4.6			4.4	4.4	3.7	3.7	3.7			
All-Red Time (s)	3.0	1.3			1.4	1.4	2.5	2.5	2.5			
Lost Time Adjust (s)	-1.3	-0.9			-0.8	-0.8	-1.2	-1.2	-1.2			
Total Lost Time (s)	5.0	5.0			5.0	5.0	5.0	5.0	5.0			
Lead/Lag	Lag				Lead	Lead						
Lead-Lag Optimize?	Yes				Yes	Yes						
Recall Mode	None	C-Max			C-Max	C-Max	None	None	None			
Act Effct Green (s)	20.0	86.8			61.8	61.8		23.2	23.2			
Actuated g/C Ratio	0.17	0.72			0.52	0.52		0.19	0.19			
v/c Ratio	0.91	0.35			0.79	0.87		0.27	0.86			
Control Delay	62.2	7.4			15.2	14.2		41.6	46.8			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	62.2	7.4			15.2	14.2		41.6	46.8			
LOS	E	A			B	B		D	D			
Approach Delay		23.2			14.9			46.0				
Approach LOS		C			B			D				
Queue Length 50th (ft)	206	102			320	625		58	171			
Queue Length 95th (ft)	#293	170			546	m#759		99	229			
Internal Link Dist (ft)		723			1054			713			337	
Turn Bay Length (ft)	500								400			
Base Capacity (vph)	564	3625			2555	1111		423	777			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.91	0.35			0.79	0.87		0.21	0.70			

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 32 (27%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 21.3

Intersection LOS: C

Intersection Capacity Utilization 86.0%

ICU Level of Service E

Analysis Period (min) 15

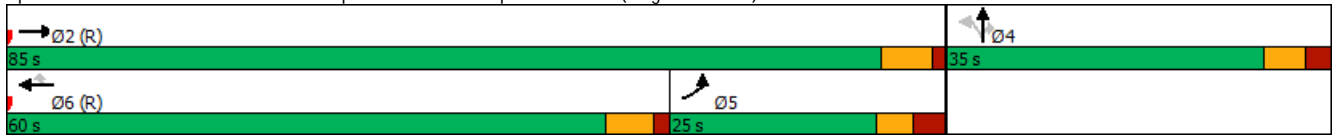
Description: 05-2152

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: I-540 WB Off-Ramp/I-540 WB On-Ramp & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (vph)	309	1165	62	5	21	2240	63	316	7	70	44	10	59
Future Volume (vph)	309	1165	62	5	21	2240	63	316	7	70	44	10	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		-1%				1%			3%			0%	
Storage Length (ft)	400		125		200		200	200		100	325		150
Storage Lanes	2		1		1		1	2		1	1		1
Taper Length (ft)	250				100			100			100		
Satd. Flow (prot)	3320	4918	1531	0	1710	4915	1530	3382	1835	1560	3213	1479	1408
Flt Permitted	0.950				0.950			0.950			0.950		
Satd. Flow (perm)	3320	4918	1531	0	1710	4915	1530	3382	1835	1539	3202	1479	1408
Right Turn on Red			Yes				Yes			Yes			Yes
Satd. Flow (RTOR)			94				95			153		27	150
Link Speed (mph)		45				45			35			35	
Link Distance (ft)		1134				1230			476			550	
Travel Time (s)		17.2				18.6			9.3			10.7	
Confl. Peds. (#/hr)										1	1		
Confl. Bikes (#/hr)													
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	6%	6%	6%	5%	5%	5%	5%	2%	2%	2%	9%	9%	9%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)													
Mid-Block Traffic (%)		0%				0%			0%			0%	
Shared Lane Traffic (%)													43%
Lane Group Flow (vph)	329	1239	66	0	27	2383	67	336	7	74	47	38	36
Turn Type	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2	3	1	1	6	7	3	8	1	7	4	5
Permitted Phases			2			6				8			4
Detector Phase	5	2	3	1	1	6	7	3	8	1	7	4	5
Switch Phase													
Minimum Initial (s)	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	15.0	20.0	15.0	15.0	15.0	20.0	16.0	15.0	15.0	15.0	16.0	15.0	15.0
Total Split (s)	17.0	68.0	20.0	17.0	17.0	68.0	16.0	20.0	19.0	17.0	16.0	15.0	17.0
Total Split (%)	14.2%	56.7%	16.7%	14.2%	14.2%	56.7%	13.3%	16.7%	15.8%	14.2%	13.3%	12.5%	14.2%
Yellow Time (s)	3.6	4.6	3.8	3.4	3.4	4.4	4.1	3.8	3.6	3.4	4.1	3.8	3.6
All-Red Time (s)	3.0	1.7	3.0	3.0	3.0	1.6	3.0	3.0	3.0	3.0	3.0	3.1	3.0
Lost Time Adjust (s)	-1.6	-1.3	-1.8		-1.4	-1.0	-2.1	-1.8	-1.6	-1.4	-2.1	-1.9	-1.6
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag	Lag	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None	None	None	None	None	None
Act Effct Green (s)	14.5	72.0	93.7		11.3	66.1	90.6	15.7	9.7	14.1	19.5	9.3	20.2
Actuated g/C Ratio	0.12	0.60	0.78		0.09	0.55	0.76	0.13	0.08	0.12	0.16	0.08	0.17
v/c Ratio	0.82	0.42	0.05		0.17	0.88	0.06	0.76	0.05	0.23	0.09	0.27	0.10
Control Delay	68.7	13.3	2.4		52.2	29.1	0.7	62.3	50.1	1.7	42.5	29.9	0.6
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.7	13.3	2.4		52.2	29.1	0.7	62.3	50.1	1.7	42.5	29.9	0.6
LOS	E	B	A		D	C	A	E	D	A	D	C	A
Approach Delay		24.0				28.6			51.4			26.1	
Approach LOS		C				C			D			C	
Queue Length 50th (ft)	135	209	0		19	600	0	130	5	0	14	8	0
Queue Length 95th (ft)	#227	260	m13		49	683	8	#198	20	0	37	46	0
Internal Link Dist (ft)		1054				1150			396			470	
Turn Bay Length (ft)	400		125		200		200	200		100	325		150
Base Capacity (vph)	400	2948	1204		171	2707	1182	444	214	325	532	148	361
Starvation Cap Reductn	0	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.42	0.05		0.16	0.88	0.06	0.76	0.03	0.23	0.09	0.26	0.10

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 2 (2%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.88

Intersection Signal Delay: 28.9

Intersection LOS: C

Intersection Capacity Utilization 80.3%

ICU Level of Service D

Analysis Period (min) 15

Description: 05-2267

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

! Phase conflict between lane groups.

Splits and Phases: 4: Hinton Oaks Boulevard & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕		↕	↕		↕	↕	
Traffic Volume (vph)	4	4	8	9	4	4	46	35	67	4	179	10
Future Volume (vph)	4	4	8	9	4	4	46	35	67	4	179	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%				0%		0%				1%	
Storage Length (ft)	0		0	100		0	70		0	150		350
Storage Lanes	0		0	1		0	1		0	1		1
Taper Length (ft)	25			100			100			80		
Satd. Flow (prot)	0	1710	0	1770	1723	0	1770	3189	0	1761	5019	0
Flt Permitted		0.988		0.950			0.950			0.950		
Satd. Flow (perm)	0	1710	0	1770	1723	0	1770	3189	0	1761	5019	0
Link Speed (mph)		30			30			30			25	
Link Distance (ft)		171			365			524			741	
Travel Time (s)		3.9			8.3			11.9			20.2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	21	0	12	10	0	61	134	0	5	249	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	21.5%
ICU Level of Service	A
Analysis Period (min)	15

Intersection												
Int Delay, s/veh	2.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕		↕	↕		↕	↕↕	
Traffic Vol, veh/h	4	4	8	9	4	4	46	35	67	4	179	10
Future Vol, veh/h	4	4	8	9	4	4	46	35	67	4	179	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	100	-	-	70	-	-	150	-	350
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	1	-
Peak Hour Factor	76	76	76	76	76	76	76	76	76	76	76	76
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	5	11	12	5	5	61	46	88	5	236	13

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	401	509	125	319	471	67	249	0	0	134	0	0
Stage 1	253	253	-	212	212	-	-	-	-	-	-	-
Stage 2	148	256	-	107	259	-	-	-	-	-	-	-
Critical Hdwy	6.99	6.54	7.14	6.99	6.54	6.94	5.34	-	-	4.14	-	-
Critical Hdwy Stg 1	7.34	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4.02	3.92	3.67	4.02	3.32	3.12	-	-	2.22	-	-
Pot Cap-1 Maneuver	549	466	767	619	489	983	887	-	-	1448	-	-
Stage 1	664	696	-	742	726	-	-	-	-	-	-	-
Stage 2	808	694	-	847	692	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	512	432	767	571	454	983	887	-	-	1448	-	-
Mov Cap-2 Maneuver	512	432	-	571	454	-	-	-	-	-	-	-
Stage 1	618	694	-	691	676	-	-	-	-	-	-	-
Stage 2	743	646	-	826	690	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.4	11.2	2.9	0.2
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	887	-	-	582	571	621	1448	-	-
HCM Lane V/C Ratio	0.068	-	-	0.036	0.021	0.017	0.004	-	-
HCM Control Delay (s)	9.4	-	-	11.4	11.4	10.9	7.5	-	-
HCM Lane LOS	A	-	-	B	B	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.1	0.1	0.1	0	-	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	4	42	46	4	4	9	16	11	4	105	4
Future Volume (vph)	4	4	42	46	4	4	9	16	11	4	105	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%				0%				0%		1%	
Storage Length (ft)	0		0	100		0	0		0	100		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			100			25			100		
Satd. Flow (prot)	1770	1863	1583	1770	1723	0	1770	1749	0	1761	1842	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1863	1583	1770	1723	0	1770	1749	0	1761	1842	0
Link Speed (mph)		30			30			30			25	
Link Distance (ft)		258			326			504			286	
Travel Time (s)		5.9			7.4			11.5			7.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	5	49	54	10	0	11	32	0	5	129	0
Sign Control	Stop				Stop				Stop		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	23.0%
ICU Level of Service	A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	8.4
Intersection LOS	A

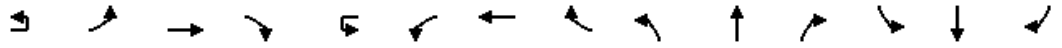
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑	↗	↘	↗		↘	↗		↘	↗	
Traffic Vol, veh/h	4	4	42	46	4	4	9	16	11	4	105	4
Future Vol, veh/h	4	4	42	46	4	4	9	16	11	4	105	4
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	5	49	54	5	5	11	19	13	5	124	5
Number of Lanes	1	1	1	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	3	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	3	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	3
HCM Control Delay	7.6	8.7	8	8.7
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	100%	0%	100%	0%
Vol Thru, %	0%	59%	0%	100%	0%	0%	50%	0%	96%
Vol Right, %	0%	41%	0%	0%	100%	0%	50%	0%	4%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	9	27	4	4	42	46	8	4	109
LT Vol	9	0	4	0	0	46	0	4	0
Through Vol	0	16	0	4	0	0	4	0	105
RT Vol	0	11	0	0	42	0	4	0	4
Lane Flow Rate	11	32	5	5	49	54	9	5	128
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.017	0.043	0.007	0.007	0.061	0.085	0.013	0.007	0.176
Departure Headway (Hd)	5.641	4.854	5.67	5.168	4.466	5.64	4.787	5.457	4.931
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	636	738	632	693	802	636	748	657	730
Service Time	3.366	2.579	3.395	2.893	2.19	3.365	2.512	3.177	2.651
HCM Lane V/C Ratio	0.017	0.043	0.008	0.007	0.061	0.085	0.012	0.008	0.175
HCM Control Delay	8.5	7.8	8.4	7.9	7.5	8.9	7.6	8.2	8.7
HCM Lane LOS	A	A	A	A	A	A	A	A	A
HCM 95th-ile Q	0.1	0.1	0	0	0.2	0.3	0	0	0.6

Legacy Oaks
1: Hodge Road & US 64 Bus (Knightdale Blvd.)

Background + 10 PM (2033) - with Hinton Oaks
03/30/2020



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations														
Traffic Volume (vph)	8	63	1873	349	23	445	1242	183	126	30	264	145	76	66
Future Volume (vph)	8	63	1873	349	23	445	1242	183	126	30	264	145	76	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)			3%				-3%			-2%			1%	
Storage Length (ft)		200		225		600		375	200		50	0		0
Storage Lanes		3		1		1		1	1		1	2		1
Taper Length (ft)		300				150			100			100		
Satd. Flow (prot)	0	3382	5009	1560	0	1796	5162	1607	3467	1627	0	3416	1853	1575
Flt Permitted		0.950				0.950			0.950			0.950		
Satd. Flow (perm)	0	3382	5009	1560	0	1796	5162	1607	3467	1627	0	3416	1853	1575
Right Turn on Red				Yes				Yes			Yes			Yes
Satd. Flow (RTOR)				153				189		263				182
Link Speed (mph)			45				45			35			25	
Link Distance (ft)			734				962			450			524	
Travel Time (s)			11.1				14.6			8.8			14.3	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)														
Lane Group Flow (vph)	0	73	1931	360	0	483	1280	189	130	303	0	149	78	68
Turn Type	Prot	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5!	5	2	3	1	1	6	7	3	8		7	4	5!
Permitted Phases				2				6						4
Detector Phase	5	5	2	3	1	1	6	7	3	8		7	4	5
Switch Phase														
Minimum Initial (s)	7.0	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	15.0	15.0	19.0	15.0	15.0	15.0	20.0	15.0	15.0	16.0		15.0	15.0	15.0
Total Split (s)	20.0	20.0	55.0	25.0	45.0	45.0	80.0	15.0	25.0	25.0		15.0	15.0	20.0
Total Split (%)	14.3%	14.3%	39.3%	17.9%	32.1%	32.1%	57.1%	10.7%	17.9%	17.9%		10.7%	10.7%	14.3%
Yellow Time (s)	3.0	3.0	4.3	3.0	3.0	3.0	4.8	3.0	3.0	4.0		3.0	3.1	3.0
All-Red Time (s)	3.9	3.9	1.7	3.9	3.5	3.5	1.7	3.9	3.9	3.1		3.9	3.7	3.9
Lost Time Adjust (s)		-1.9	-1.0	-1.9			-1.5	-1.5	-1.9	-1.9		-1.9	-1.8	-1.9
Total Lost Time (s)		5.0	5.0	5.0			5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lead	Lead	Lag	Lag	Lag	Lead	Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None	C-Max	None	None	None	C-Max	None	None	None		None	None	None
Act Effect Green (s)		10.5	53.2	69.1			40.0	82.7	97.7	15.9		16.8	10.0	10.9
Actuated g/C Ratio		0.08	0.38	0.49			0.29	0.59	0.70	0.11		0.12	0.07	0.08
v/c Ratio		0.29	1.01	0.43			0.94	0.42	0.16	0.33		0.71	0.61	0.54
Control Delay		63.8	67.2	8.9			57.2	6.6	0.3	58.5		20.0	74.3	76.7
Queue Delay		0.0	0.0	0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay		63.8	67.2	8.9			57.2	6.6	0.3	58.5		20.0	74.3	76.7
LOS		E	E	A			E	A	A	E		C	E	E
Approach Delay			58.2				18.5			31.6			58.0	
Approach LOS			E				B			C			E	
Queue Length 50th (ft)		32	~708	74			436	89	0	57		33	69	69
Queue Length 95th (ft)		58	#812	128			#652	104	1	88		133	107	#133
Internal Link Dist (ft)			654				882			370			444	
Turn Bay Length (ft)		200		225			600		375	200				
Base Capacity (vph)		362	1903	888			513	3049	1178	495		457	244	147
Starvation Cap Reductn		0	0	0			0	0	0	0		0	0	0
Spillback Cap Reductn		0	0	0			0	0	0	0		0	0	0
Storage Cap Reductn		0	0	0			0	0	0	0		0	0	0
Reduced v/c Ratio		0.20	1.01	0.41			0.94	0.42	0.16	0.26		0.66	0.61	0.53

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 84 (60%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.01
 Intersection Signal Delay: 40.5 Intersection LOS: D
 Intersection Capacity Utilization 102.5% ICU Level of Service G
 Analysis Period (min) 15
 Description: 05-0928

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- ! Phase conflict between lane groups.

Splits and Phases: 1: Hodge Road & US 64 Bus (Knightdale Blvd.)



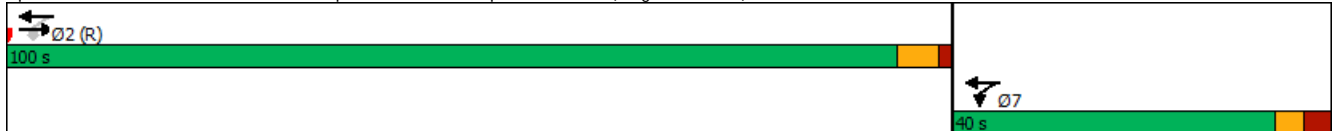


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↓	↑↑							↑
Traffic Volume (vph)	0	2249	87	331	1319	0	0	0	0	0	0	617
Future Volume (vph)	0	2249	87	331	1319	0	0	0	0	0	0	617
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		1%			-1%			0%			2%	
Satd. Flow (prot)	0	5060	1575	1778	3557	0	0	0	0	0	0	1564
Flt Permitted				0.046								
Satd. Flow (perm)	0	5060	1575	86	3557	0	0	0	0	0	0	1564
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			89									187
Link Speed (mph)		45			45			35				35
Link Distance (ft)		962			263			601				428
Travel Time (s)		14.6			4.0			11.7				8.3
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2295	89	338	1346	0	0	0	0	0	0	630
Turn Type		NA	Perm	D.P+P	NA							Free
Protected Phases		2		7	2 7							
Permitted Phases			2	2								Free
Detector Phase		2	2	7	2 7							
Switch Phase												
Minimum Initial (s)		12.0	12.0	7.0								
Minimum Split (s)		19.0	19.0	15.0								
Total Split (s)		100.0	100.0	40.0								
Total Split (%)		71.4%	71.4%	28.6%								
Yellow Time (s)		4.4	4.4	3.0								
All-Red Time (s)		1.6	1.6	3.1								
Lost Time Adjust (s)		-1.0	-1.0	-1.1								
Total Lost Time (s)		5.0	5.0	5.0								
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max	None								
Act Effct Green (s)		97.0	97.0	130.0	140.0							140.0
Actuated g/C Ratio		0.69	0.69	0.93	1.00							1.00
v/c Ratio		0.65	0.08	0.71	0.38							0.40
Control Delay		7.1	0.2	67.7	1.7							0.8
Queue Delay		0.0	0.0	0.0	0.0							0.0
Total Delay		7.1	0.2	67.7	1.7							0.8
LOS		A	A	E	A							A
Approach Delay		6.8			14.9						0.8	
Approach LOS		A			B						A	
Queue Length 50th (ft)		91	0	269	48							0
Queue Length 95th (ft)		m107	m1	364	17							0
Internal Link Dist (ft)		882			183			521			348	
Turn Bay Length (ft)												
Base Capacity (vph)		3506	1118	503	3533							1564
Starvation Cap Reductn		0	0	0	0							0
Spillback Cap Reductn		0	0	0	0							0
Storage Cap Reductn		0	0	0	0							0
Reduced v/c Ratio		0.65	0.08	0.67	0.38							0.40

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 72 (51%), Referenced to phase 2:EBWB and 6:, Start of Green
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.71
 Intersection Signal Delay: 8.9 Intersection LOS: A
 Intersection Capacity Utilization 118.4% ICU Level of Service H
 Analysis Period (min) 15
 Description: 05-2153
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: I-540 EB On-Ramp/I-540 EB Off-Ramp & US 64 Bus (Knightdale Blvd.)





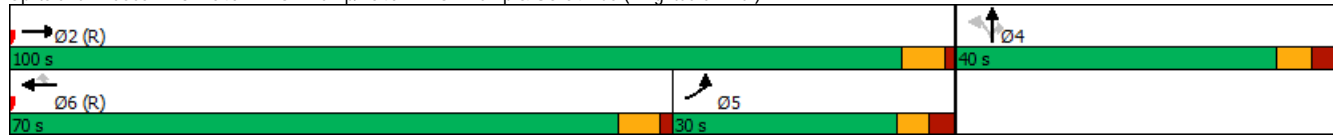
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑↑			↑↑↑	↗		↖	↗↗			
Traffic Volume (vph)	409	2943	0	0	1552	628	104	4	740	0	0	0
Future Volume (vph)	409	2943	0	0	1552	628	104	4	740	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			1%			2%			0%	
Storage Length (ft)	500		0	0		0	0		400	0	0	0
Storage Lanes	1		0	0		1	0		2	0	0	0
Taper Length (ft)	200			25			25			25		
Satd. Flow (prot)	3450	5111	0	0	5060	1575	0	1759	2759	0	0	0
Flt Permitted	0.950							0.954				
Satd. Flow (perm)	3450	5111	0	0	5060	1575	0	1759	2759	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						583			71			
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		803			1134			793			417	
Travel Time (s)		12.2			17.2			15.4			8.1	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Shared Lane Traffic (%)												
Lane Group Flow (vph)	426	3066	0	0	1617	654	0	112	771	0	0	0
Turn Type	Prot	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			4				
Permitted Phases						6	4		4			
Detector Phase	5	2			6	6	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0	12.0			12.0	12.0	7.0	7.0	7.0			
Minimum Split (s)	15.0	20.0			20.0	20.0	15.0	15.0	15.0			
Total Split (s)	30.0	100.0			70.0	70.0	40.0	40.0	40.0			
Total Split (%)	21.4%	71.4%			50.0%	50.0%	28.6%	28.6%	28.6%			
Yellow Time (s)	3.3	4.6			4.4	4.4	3.7	3.7	3.7			
All-Red Time (s)	3.0	1.3			1.4	1.4	2.5	2.5	2.5			
Lost Time Adjust (s)	-1.3	-0.9			-0.8	-0.8		-1.2	-1.2			
Total Lost Time (s)	5.0	5.0			5.0	5.0		5.0	5.0			
Lead/Lag	Lag				Lead	Lead						
Lead-Lag Optimize?	Yes				Yes	Yes						
Recall Mode	None	C-Max			C-Max	C-Max	None	None	None			
Act Effect Green (s)	25.0	95.0			65.0	65.0		35.0	35.0			
Actuated g/C Ratio	0.18	0.68			0.46	0.46		0.25	0.25			
v/c Ratio	0.69	0.88			0.69	0.63		0.26	1.04			
Control Delay	44.1	9.5			14.5	3.0		44.0	89.1			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	44.1	9.5			14.5	3.0		44.0	89.1			
LOS	D	A			B	A		D	F			
Approach Delay		13.7			11.2			83.3				
Approach LOS		B			B			F				
Queue Length 50th (ft)	201	149			256	1		82	~400			
Queue Length 95th (ft)	243	152			m148	m6		138	#543			
Internal Link Dist (ft)		723			1054			713			337	
Turn Bay Length (ft)	500								400			
Base Capacity (vph)	616	3468			2349	1043		439	743			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.69	0.88			0.69	0.63		0.26	1.04			

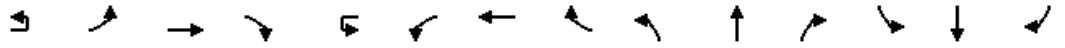
Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 68 (49%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.04
 Intersection Signal Delay: 22.1
 Intersection Capacity Utilization 91.1%
 Analysis Period (min) 15
 Description: 05-2152
 Intersection LOS: C
 ICU Level of Service F

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: I-540 WB Off-Ramp/I-540 WB On-Ramp & US 64 Bus (Knightdale Blvd.)





Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔	↕↕↕	↗		↔	↕↕↕	↗	↔↔	↕	↗	↔↔	↕↕	↗
Traffic Volume (vph)	28	508	2727	187	7	40	1652	84	137	31	67	152	15	248
Future Volume (vph)	28	508	2727	187	7	40	1652	84	137	31	67	152	15	248
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)			-1%				1%			3%			0%	
Storage Length (ft)		400		125		200		200	200		100	325		150
Storage Lanes		2		1		1		1	2		1	1		1
Taper Length (ft)		250				100			100			100		
Satd. Flow (prot)	0	3450	5111	1591	0	1761	5060	1575	3382	1835	1560	3433	1534	1504
Flt Permitted		0.950				0.950			0.950			0.950		
Satd. Flow (perm)	0	3450	5111	1591	0	1761	5060	1575	3382	1835	1560	3433	1534	1504
Right Turn on Red				Yes				Yes			Yes			Yes
Satd. Flow (RTOR)				90				84			130			123
Link Speed (mph)			45				45			35				35
Link Distance (ft)			1134				1230			476				550
Travel Time (s)			17.2				18.6			9.3				10.7
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)														47%
Lane Group Flow (vph)	0	564	2871	197	0	49	1739	88	144	33	71	160	139	138
Turn Type	Prot	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5!	5	2	3	1!	1	6	7	3	8	1!	7	4	5!
Permitted Phases				2				6			8			4
Detector Phase	5	5	2	3	1	1	6	7	3	8	1	7	4	5
Switch Phase														
Minimum Initial (s)	7.0	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	15.0	15.0	20.0	15.0	15.0	15.0	20.0	16.0	15.0	15.0	15.0	16.0	15.0	15.0
Total Split (s)	28.0	28.0	80.0	20.0	20.0	20.0	72.0	20.0	20.0	20.0	20.0	20.0	20.0	28.0
Total Split (%)	20.0%	20.0%	57.1%	14.3%	14.3%	14.3%	51.4%	14.3%	14.3%	14.3%	14.3%	14.3%	14.3%	20.0%
Yellow Time (s)	3.6	3.6	4.6	3.8	3.4	3.4	4.4	4.1	3.8	3.6	3.4	4.1	3.8	3.6
All-Red Time (s)	3.0	3.0	1.7	3.0	3.0	3.0	1.6	3.0	3.0	3.0	3.0	3.0	3.1	3.0
Lost Time Adjust (s)		-1.6	-1.3	-1.8		-1.4	-1.0	-2.1	-1.8	-1.6	-1.4	-2.1	-1.9	-1.6
Total Lost Time (s)		5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	C-Max	None	None	None	C-Max	None	None	None	None	None	None	None
Act Effect Green (s)		23.0	86.0	103.8		10.2	73.2	97.5	12.8	9.9	16.7	19.4	11.0	34.0
Actuated g/C Ratio		0.16	0.61	0.74		0.07	0.52	0.70	0.09	0.07	0.12	0.14	0.08	0.24
v/c Ratio		1.00	0.91	0.16		0.38	0.66	0.08	0.46	0.26	0.24	0.34	0.60	0.30
Control Delay		74.0	21.5	1.6		70.0	26.4	2.2	65.0	65.9	1.9	57.8	24.2	7.0
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		74.0	21.5	1.6		70.0	26.4	2.2	65.0	65.9	1.9	57.8	24.2	7.0
LOS		E	C	A		E	C	A	E	E	A	E	C	A
Approach Delay			28.6				26.4			47.0				31.1
Approach LOS			C				C			D				C
Queue Length 50th (ft)		261	545	6		44	407	1	64	29	0	72	14	7
Queue Length 95th (ft)		m#326	m#1062	m18		85	509	21	100	64	0	107	84	47
Internal Link Dist (ft)			1054				1150			396				470
Turn Bay Length (ft)		400		125		200		200	200		100	325		150
Base Capacity (vph)		566	3138	1226		188	2644	1114	362	196	349	480	274	460
Starvation Cap Reductn		0	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio		1.00	0.91	0.16		0.26	0.66	0.08	0.40	0.17	0.20	0.33	0.51	0.30

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 78 (56%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.00
 Intersection Signal Delay: 28.8 Intersection LOS: C
 Intersection Capacity Utilization 86.9% ICU Level of Service E
 Analysis Period (min) 15
 Description: 05-2267

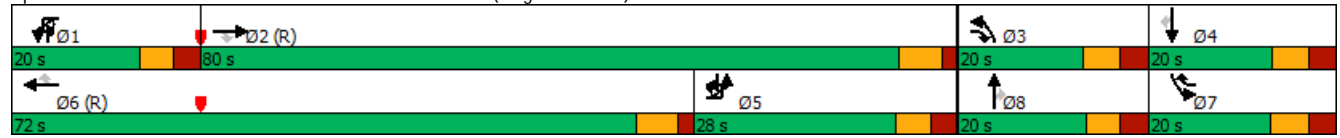
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

! Phase conflict between lane groups.

Splits and Phases: 4: Hinton Oaks Boulevard & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔			↔	↔		↔	↔↔	
Traffic Volume (vph)	4	4	13	9	33	4	4	9	112	156	9	4	98	4
Future Volume (vph)	4	4	13	9	33	4	4	9	112	156	9	4	98	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%				0%				0%				1%
Storage Length (ft)	0		0		100		0		70		0	150		350
Storage Lanes	0		0		1		0		1		0	1		1
Taper Length (ft)	25				100				100			80		
Satd. Flow (prot)	0	1687	0	0	1770	1723	0	0	1687	3347	0	1761	5030	0
Flt Permitted		0.991			0.950				0.950			0.950		
Satd. Flow (perm)	0	1687	0	0	1770	1723	0	0	1687	3347	0	1761	5030	0
Link Speed (mph)		30				30				30				25
Link Distance (ft)		171				365				524				741
Travel Time (s)		3.9				8.3				11.9				20.2
Confl. Peds. (#/hr)			1		1									
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	7%	7%	7%	7%	2%	2%	2%
Shared Lane Traffic (%)														
Lane Group Flow (vph)	0	22	0	0	44	8	0	0	127	173	0	4	107	0
Sign Control		Stop				Stop				Free			Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization 29.0%	ICU Level of Service A
Analysis Period (min)	15

Intersection														
Int Delay, s/veh	4.4													
Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔			↔	↔		↔	↔	↔
Traffic Vol, veh/h	4	4	13	9	33	4	4	9	112	156	9	4	98	4
Future Vol, veh/h	4	4	13	9	33	4	4	9	112	156	9	4	98	4
Conflicting Peds, #/hr	0	0	1	0	1	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	-	None	-	-	-	None	-	-	None
Storage Length	-	-	-	-	100	-	-	-	70	-	-	150	-	350
Veh in Median Storage, #	-	0	-	-	-	0	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	-	0	-	-	-	0	-	-	1	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	7	7	7	7	2	2	2
Mvmt Flow	4	4	14	9	35	4	4	9	118	164	9	4	103	4
Major/Minor	Minor2		Minor1			Major1			Major2					
Conflicting Flow All	451	540	55	0	475	538	87	78	107	0	0	173	0	0
Stage 1	113	113	-	0	423	423	-	-	-	-	-	-	-	-
Stage 2	338	427	-	0	52	115	-	-	-	-	-	-	-	-
Critical Hdwy	6.99	6.54	7.14	-	6.99	6.54	6.94	5.74	5.44	-	-	4.14	-	-
Critical Hdwy Stg 1	7.34	5.54	-	-	6.54	5.54	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	-	6.74	5.54	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4.02	3.92	-	3.67	4.02	3.32	2.37	3.17	-	-	2.22	-	-
Pot Cap-1 Maneuver	510	447	848	0	492	448	954	1376	1012	-	-	1401	-	-
Stage 1	825	801	-	0	560	586	-	-	-	-	-	-	-	-
Stage 2	628	584	-	0	914	799	-	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	455	391	847	0	433	392	954	1031	1031	-	-	1401	-	-
Mov Cap-2 Maneuver	455	391	-	0	433	392	-	-	-	-	-	-	-	-
Stage 1	724	799	-	0	491	514	-	-	-	-	-	-	-	-
Stage 2	544	512	-	0	891	797	-	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB					
HCM Control Delay, s	11.1		13.5			3.8			0.3					
HCM LOS	B		B											
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR					
Capacity (veh/h)	1031	-	-	611	433	556	1401	-	-					
HCM Lane V/C Ratio	0.124	-	-	0.036	0.08	0.015	0.003	-	-					
HCM Control Delay (s)	9	-	-	11.1	14	11.6	7.6	-	-					
HCM Lane LOS	A	-	-	B	B	B	A	-	-					
HCM 95th %tile Q(veh)	0.4	-	-	0.1	0.3	0	0	-	-					

Legacy Oaks
6: Hodge Road & Legacy Oaks Drive North

Background + 10 PM (2033) - with Hinton Oaks
03/30/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	4	27	19	4	4	30	103	21	4	49	4
Future Volume (vph)	4	4	27	19	4	4	30	103	21	4	49	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			0%			1%	
Storage Length (ft)	0		0	100		0	0		0	100		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			100			25			100		
Satd. Flow (prot)	1770	1863	1583	1770	1723	0	1687	1730	0	1761	1833	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1863	1583	1770	1723	0	1687	1730	0	1761	1833	0
Link Speed (mph)		30			30			30			25	
Link Distance (ft)		258			326			504			286	
Travel Time (s)		5.9			7.4			11.5			7.8	
Confl. Peds. (#/hr)			1	1								
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	7%	7%	7%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	4	4	29	20	8	0	32	134	0	4	57	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization 22.7%	ICU Level of Service A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	8.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↑	↔	↔	↔		↔	↔		↔	↔	
Traffic Vol, veh/h	4	4	27	19	4	4	30	103	21	4	49	4
Future Vol, veh/h	4	4	27	19	4	4	30	103	21	4	49	4
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	2	2	2	2	2	2	7	7	7	2	2	2
Mvmt Flow	4	4	29	20	4	4	32	111	23	4	53	4
Number of Lanes	1	1	1	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	3	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	3	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	3
HCM Control Delay	7.6	8.4	8.6	8.1
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	100%	0%	100%	0%
Vol Thru, %	0%	83%	0%	100%	0%	0%	50%	0%	92%
Vol Right, %	0%	17%	0%	0%	100%	0%	50%	0%	8%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	30	124	4	4	27	19	8	4	53
LT Vol	30	0	4	0	0	19	0	4	0
Through Vol	0	103	0	4	0	0	4	0	49
RT Vol	0	21	0	0	27	0	4	0	4
Lane Flow Rate	32	133	4	4	29	20	9	4	57
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.049	0.178	0.007	0.006	0.036	0.033	0.012	0.007	0.079
Departure Headway (Hd)	5.428	4.809	5.726	5.224	4.521	5.744	4.889	5.551	4.997
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	662	748	626	686	793	625	734	647	719
Service Time	3.142	2.523	3.449	2.947	2.244	3.463	2.609	3.267	2.713
HCM Lane V/C Ratio	0.048	0.178	0.006	0.006	0.037	0.032	0.012	0.006	0.079
HCM Control Delay	8.4	8.6	8.5	8	7.4	8.7	7.7	8.3	8.1
HCM Lane LOS	A	A	A	A	A	A	A	A	A
HCM 95th-tile Q	0.2	0.6	0	0	0.1	0.1	0	0	0.3

**Appendix O:
Synchro Output –
Build-out (2033) – with Hinton Oaks**



Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (vph)	79	998	106	15	159	1595	193	479	23	188	248	29	168
Future Volume (vph)	79	998	106	15	159	1595	193	479	23	188	248	29	168
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		3%				-3%			-2%			1%	
Storage Length (ft)	200		225		600		375	200		50	0		0
Storage Lanes	3		1		1		1	1		1	2		1
Taper Length (ft)	300				150			100			100		
Satd. Flow (prot)	3382	5009	1560	0	1796	5162	1607	3368	1583	0	3350	1818	1545
Flt Permitted	0.950				0.950			0.950			0.950		
Satd. Flow (perm)	3382	5009	1560	0	1796	5162	1607	3368	1583	0	3350	1818	1545
Right Turn on Red			Yes				Yes			Yes			Yes
Satd. Flow (RTOR)			119				217		211				216
Link Speed (mph)		45				45				35			25
Link Distance (ft)		734				962			450				524
Travel Time (s)		11.1				14.6			8.8				14.3
Confl. Peds. (#/hr)													
Confl. Bikes (#/hr)													
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	5%	5%	5%	4%	4%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)													
Mid-Block Traffic (%)		0%				0%			0%			0%	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	89	1121	119	0	196	1792	217	538	237	0	279	33	189
Turn Type	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2	3	1	1	6	7	3	8		7	4	5
Permitted Phases			2			6							4
Detector Phase	5	2	3	1	1	6	7	3	8		7	4	5
Switch Phase													
Minimum Initial (s)	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	15.0	19.0	15.0	15.0	15.0	20.0	15.0	15.0	16.0		15.0	15.0	15.0
Total Split (s)	15.0	47.0	31.0	27.0	27.0	59.0	20.0	31.0	26.0		20.0	15.0	15.0
Total Split (%)	12.5%	39.2%	25.8%	22.5%	22.5%	49.2%	16.7%	25.8%	21.7%		16.7%	12.5%	12.5%
Yellow Time (s)	3.0	4.3	3.0	3.0	3.0	4.8	3.0	3.0	4.0		3.0	3.1	3.0
All-Red Time (s)	3.9	1.7	3.9	3.5	3.5	1.7	3.9	3.9	3.1		3.9	3.7	3.9
Lost Time Adjust (s)	-1.9	-1.0	-1.9			-1.5	-1.5	-1.9	-2.1		-1.9	-1.8	-1.9
Total Lost Time (s)	5.0	5.0	5.0			5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None	None		None	None	None
Act Effct Green (s)	10.0	50.4	82.2			18.9	59.3	73.9	26.8		14.6	9.4	15.9
Actuated g/C Ratio	0.08	0.42	0.68			0.16	0.49	0.62	0.22		0.12	0.08	0.13
v/c Ratio	0.32	0.53	0.11			0.70	0.70	0.20	0.71		0.69	0.23	0.48
Control Delay	55.1	28.8	1.9			74.4	27.3	2.0	49.3		59.8	55.9	6.3
Queue Delay	0.0	0.0	0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	55.1	28.8	1.9			74.4	27.3	2.0	49.3		59.8	55.9	6.3
LOS	E	C	A			E	C	A	D		E	E	A
Approach Delay		28.1				29.0			38.9			39.4	
Approach LOS		C				C			D			D	
Queue Length 50th (ft)	34	254	0			158	294	19	201		107	24	0
Queue Length 95th (ft)	60	310	22			235	397	32	260		153	57	26
Internal Link Dist (ft)		654				882			370			444	
Turn Bay Length (ft)	200		225		600		375	200					
Base Capacity (vph)	281	2104	1106		329	2549	1077	753	451		418	151	391
Starvation Cap Reductn	0	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.32	0.53	0.11		0.60	0.70	0.20	0.71	0.53		0.67	0.22	0.48

Intersection Summary

Area Type: Other

Cycle Length: 120

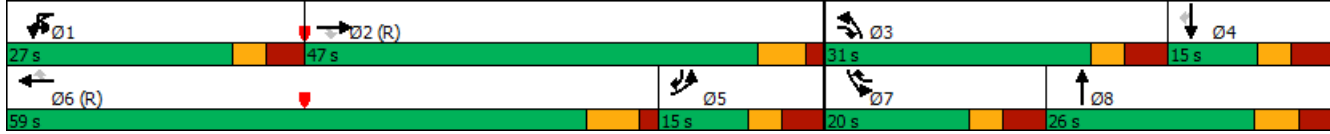
Actuated Cycle Length: 120

Legacy Oaks
 1: Hodge Road & US 64 Bus (Knightdale Blvd.)

Build-Out + 10 AM (2033) - with Hinton Oaks
 03/30/2020

Offset: 60 (50%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.71
 Intersection Signal Delay: 31.4 Intersection LOS: C
 Intersection Capacity Utilization 73.2% ICU Level of Service D
 Analysis Period (min) 15
 Description: 05-0928

Splits and Phases: 1: Hodge Road & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↓	↑↑							↑
Traffic Volume (vph)	0	1317	154	349	1622	0	0	0	0	0	0	363
Future Volume (vph)	0	1317	154	349	1622	0	0	0	0	0	0	363
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		1%			-1%			0%				2%
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	4963	1545	1744	3489	0	0	0	0	0	0	1580
Flt Permitted				0.161								
Satd. Flow (perm)	0	4963	1545	296	3489	0	0	0	0	0	0	1580
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			164									111
Link Speed (mph)		45		45				35				35
Link Distance (ft)		962			263			601				428
Travel Time (s)		14.6			4.0			11.7				8.3
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	0%	0%	0%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%				0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1401	164	371	1726	0	0	0	0	0	0	386
Turn Type		NA	Perm	D.P+P	NA							Free
Protected Phases		2		7	2							
Permitted Phases			2	2								Free
Detector Phase		2	2	7	2							
Switch Phase												
Minimum Initial (s)		12.0	12.0	7.0								
Minimum Split (s)		19.0	19.0	15.0								
Total Split (s)		90.0	90.0	30.0								
Total Split (%)		75.0%	75.0%	25.0%								
Yellow Time (s)		4.4	4.4	3.0								
All-Red Time (s)		1.6	1.6	3.1								
Lost Time Adjust (s)		-1.0	-1.0	-1.1								
Total Lost Time (s)		5.0	5.0	5.0								
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max	None								
Act Effct Green (s)		85.1	85.1	110.0	120.0							120.0
Actuated g/C Ratio		0.71	0.71	0.92	1.00							1.00
v/c Ratio		0.40	0.14	0.65	0.49							0.24
Control Delay		2.0	0.2	36.6	3.6							0.4
Queue Delay		0.0	0.0	0.0	0.0							0.0
Total Delay		2.0	0.2	36.6	3.6							0.4
LOS		A	A	D	A							A
Approach Delay		1.8			9.5						0.4	
Approach LOS		A			A						A	
Queue Length 50th (ft)		19	0	154	82							0
Queue Length 95th (ft)		34	m0	m244	89							0
Internal Link Dist (ft)		882			183			521			348	
Turn Bay Length (ft)												
Base Capacity (vph)		3517	1143	573	3456							1580
Starvation Cap Reductn		0	0	0	0							0
Spillback Cap Reductn		0	0	0	0							0
Storage Cap Reductn		0	0	0	0							0
Reduced v/c Ratio		0.40	0.14	0.65	0.50							0.24

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 57 (48%), Referenced to phase 2:EBWB and 6:, Start of Green

Natural Cycle: 40

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 5.6

Intersection LOS: A

Intersection Capacity Utilization 59.0%

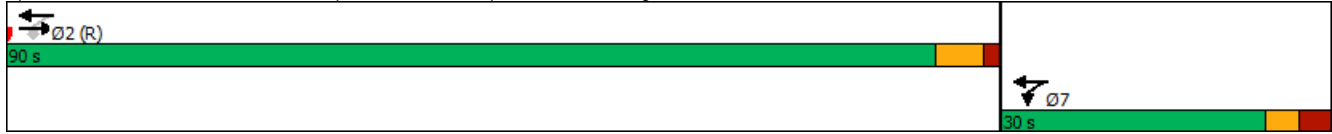
ICU Level of Service B

Analysis Period (min) 15

Description: 05-2153

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: I-540 EB On-Ramp/I-540 EB Off-Ramp & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↕↕			↕↕↕	↕↔		↕↔	↕↕↕			
Traffic Volume (vph)	526	1228	0	0	1869	876	90	5	494	0	0	0
Future Volume (vph)	526	1228	0	0	1869	876	90	5	494	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		-1%			1%			2%			0%	
Storage Length (ft)	500		0	0		0	0		400	0		0
Storage Lanes	1		0	0		1	0		2	0		0
Taper Length (ft)	200			25			25			25		
Satd. Flow (prot)	3384	5012	0	0	4963	1545	0	1695	2655	0	0	0
Flt Permitted	0.950							0.955				
Satd. Flow (perm)	3384	5012	0	0	4963	1545	0	1695	2655	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						649			129			
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		803			1134			793			417	
Travel Time (s)		12.2			17.2			15.4			8.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	6%	6%	6%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	578	1349	0	0	2054	963	0	104	543	0	0	0
Turn Type	Prot	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			4				
Permitted Phases					6	4		4				
Detector Phase	5	2			6	6	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0	12.0			12.0	12.0	7.0	7.0	7.0			
Minimum Split (s)	15.0	20.0			20.0	20.0	15.0	15.0	15.0			
Total Split (s)	25.0	85.0			60.0	60.0	35.0	35.0	35.0			
Total Split (%)	20.8%	70.8%			50.0%	50.0%	29.2%	29.2%	29.2%			
Yellow Time (s)	3.3	4.6			4.4	4.4	3.7	3.7	3.7			
All-Red Time (s)	3.0	1.3			1.4	1.4	2.5	2.5	2.5			
Lost Time Adjust (s)	-1.3	-0.9			-0.8	-0.8	-1.2	-1.2	-1.2			
Total Lost Time (s)	5.0	5.0			5.0	5.0	5.0	5.0	5.0			
Lead/Lag	Lag				Lead	Lead						
Lead-Lag Optimize?	Yes				Yes	Yes						
Recall Mode	None	C-Max			C-Max	C-Max	None	None	None			
Act Effct Green (s)	20.0	86.1			61.1	61.1	23.9	23.9	23.9			
Actuated g/C Ratio	0.17	0.72			0.51	0.51	0.20	0.20	0.20			
v/c Ratio	1.02	0.38			0.81	0.87	0.31	0.86	0.86			
Control Delay	86.2	8.0			16.2	14.5	42.0	48.8	48.8			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay	86.2	8.0			16.2	14.5	42.0	48.8	48.8			
LOS	F	A			B	B	D	D	D			
Approach Delay		31.4			15.6		47.7					
Approach LOS		C			B		D					
Queue Length 50th (ft)	-222	134			357	632	69	180				
Queue Length 95th (ft)	#350	201			584	m#737	115	240				
Internal Link Dist (ft)		723			1054		713			337		
Turn Bay Length (ft)	500								400			
Base Capacity (vph)	564	3594			2525	1104	423	760				
Starvation Cap Reductn	0	0			0	0	0	0				
Spillback Cap Reductn	0	0			0	0	0	0				
Storage Cap Reductn	0	0			0	0	0	0				
Reduced v/c Ratio	1.02	0.38			0.81	0.87	0.25	0.71				

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 32 (27%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.02

Intersection Signal Delay: 24.8

Intersection LOS: C

Intersection Capacity Utilization 87.6%

ICU Level of Service E

Analysis Period (min) 15

Description: 05-2152

~ Volume exceeds capacity, queue is theoretically infinite.

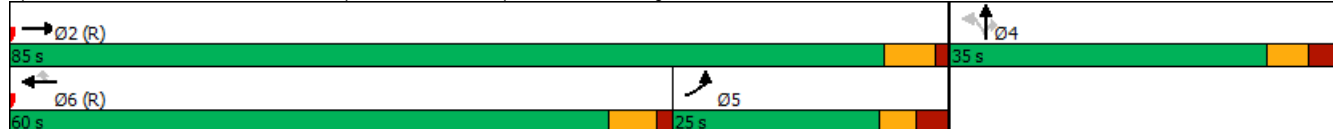
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: I-540 WB Off-Ramp/I-540 WB On-Ramp & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (vph)	309	1233	62	5	21	2282	63	316	7	70	44	10	59
Future Volume (vph)	309	1233	62	5	21	2282	63	316	7	70	44	10	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		-1%				1%			3%			0%	
Storage Length (ft)	400		125		200		200	200		100	325		150
Storage Lanes	2		1		1		1	2		1	1		1
Taper Length (ft)	250				100			100			100		
Satd. Flow (prot)	3320	4918	1531	0	1710	4915	1530	3382	1835	1560	3213	1479	1408
Flt Permitted	0.950				0.950			0.950			0.950		
Satd. Flow (perm)	3320	4918	1531	0	1710	4915	1530	3382	1835	1539	3202	1479	1408
Right Turn on Red			Yes				Yes			Yes			Yes
Satd. Flow (RTOR)			94				95			153		27	150
Link Speed (mph)		45			45				35			35	
Link Distance (ft)		1134				1230			476			550	
Travel Time (s)		17.2				18.6			9.3			10.7	
Confl. Peds. (#/hr)										1	1		
Confl. Bikes (#/hr)													
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	6%	6%	6%	5%	5%	5%	5%	2%	2%	2%	9%	9%	9%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)													
Mid-Block Traffic (%)		0%				0%			0%			0%	
Shared Lane Traffic (%)													43%
Lane Group Flow (vph)	329	1312	66	0	27	2428	67	336	7	74	47	38	36
Turn Type	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2	3	1!	1	6	7	3	8	1!	7	4	5
Permitted Phases			2			6				8			4
Detector Phase	5	2	3	1	1	6	7	3	8	1	7	4	5
Switch Phase													
Minimum Initial (s)	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	15.0	20.0	15.0	15.0	15.0	20.0	16.0	15.0	15.0	15.0	16.0	15.0	15.0
Total Split (s)	17.0	68.0	20.0	17.0	17.0	68.0	16.0	20.0	19.0	17.0	16.0	15.0	17.0
Total Split (%)	14.2%	56.7%	16.7%	14.2%	14.2%	56.7%	13.3%	16.7%	15.8%	14.2%	13.3%	12.5%	14.2%
Yellow Time (s)	3.6	4.6	3.8	3.4	3.4	4.4	4.1	3.8	3.6	3.4	4.1	3.8	3.6
All-Red Time (s)	3.0	1.7	3.0	3.0	3.0	1.6	3.0	3.0	3.0	3.0	3.0	3.1	3.0
Lost Time Adjust (s)	-1.6	-1.3	-1.8		-1.4	-1.0	-2.1	-1.8	-1.6	-1.4	-2.1	-1.9	-1.6
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag	Lag	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None	None	None	None	None	None
Act Effct Green (s)	14.5	72.0	93.7		11.3	66.1	90.6	15.7	9.7	14.1	19.5	9.3	20.2
Actuated g/C Ratio	0.12	0.60	0.78		0.09	0.55	0.76	0.13	0.08	0.12	0.16	0.08	0.17
w/c Ratio	0.82	0.45	0.05		0.17	0.90	0.06	0.76	0.05	0.23	0.09	0.27	0.10
Control Delay	70.4	14.9	3.0		52.2	30.2	0.7	62.3	50.1	1.7	42.5	29.9	0.6
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.4	14.9	3.0		52.2	30.2	0.7	62.3	50.1	1.7	42.5	29.9	0.6
LOS	E	B	A		D	C	A	E	D	A	D	C	A
Approach Delay		25.2				29.6			51.4			26.1	
Approach LOS		C				C			D			C	
Queue Length 50th (ft)	124	167	1		19	622	0	130	5	0	14	8	0
Queue Length 95th (ft)	#227	298	m15		49	#710	8	#198	20	0	37	46	0
Internal Link Dist (ft)		1054				1150			396			470	
Turn Bay Length (ft)	400		125		200		200	200		100	325		150
Base Capacity (vph)	400	2948	1204		171	2707	1182	444	214	325	532	148	361
Starvation Cap Reductn	0	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0	0	0	0	0	0
Reduced w/c Ratio	0.82	0.45	0.05		0.16	0.90	0.06	0.76	0.03	0.23	0.09	0.26	0.10

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 2 (2%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.90

Intersection Signal Delay: 29.9

Intersection LOS: C

Intersection Capacity Utilization 81.1%

ICU Level of Service D

Analysis Period (min) 15

Description: 05-2267

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

! Phase conflict between lane groups.

Splits and Phases: 4: Hinton Oaks Boulevard & US 64 Bus (Knightdale Blvd.)



Legacy Oaks
5: Hodge Road & Sam's Xpress Driveway/Legacy Oaks Drive South

Build-Out + 10 AM (2033) - with Hinton Oaks
03/30/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕		↕	↕		↕	↕	
Traffic Volume (vph)	4	4	8	121	4	4	46	134	109	4	292	10
Future Volume (vph)	4	4	8	121	4	4	46	134	109	4	292	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			1%	
Storage Length (ft)	0		0	100		0	70		0	150		350
Storage Lanes	0		0	1		0	1		0	1		1
Taper Length (ft)	25			100			100			80		
Satd. Flow (prot)	0	1710	0	1770	1723	0	1770	3302	0	1761	5035	0
Flt Permitted		0.988		0.950			0.950			0.950		
Satd. Flow (perm)	0	1710	0	1770	1723	0	1770	3302	0	1761	5035	0
Link Speed (mph)		30			30			30			25	
Link Distance (ft)		171			365			524			264	
Travel Time (s)		3.9			8.3			11.9			7.2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	21	0	159	10	0	61	319	0	5	397	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 33.9% ICU Level of Service A

Analysis Period (min) 15

Intersection												
Int Delay, s/veh	4.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕		↕	↕		↕	↕↕	
Traffic Vol, veh/h	4	4	8	121	4	4	46	134	109	4	292	10
Future Vol, veh/h	4	4	8	121	4	4	46	134	109	4	292	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	100	-	-	70	-	-	150	-	350
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	1	-
Peak Hour Factor	76	76	76	76	76	76	76	76	76	76	76	76
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	5	11	159	5	5	61	176	143	5	384	13

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	614	842	199	536	777	160	397	0	0	319	0	0
Stage 1	401	401	-	370	370	-	-	-	-	-	-	-
Stage 2	213	441	-	166	407	-	-	-	-	-	-	-
Critical Hdwy	6.99	6.54	7.14	6.99	6.54	6.94	5.34	-	-	4.14	-	-
Critical Hdwy Stg 1	7.34	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4.02	3.92	3.67	4.02	3.32	3.12	-	-	2.22	-	-
Pot Cap-1 Maneuver	401	299	688	450	327	857	757	-	-	1238	-	-
Stage 1	528	599	-	601	619	-	-	-	-	-	-	-
Stage 2	741	575	-	781	596	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	368	274	688	409	299	857	757	-	-	1238	-	-
Mov Cap-2 Maneuver	368	274	-	409	299	-	-	-	-	-	-	-
Stage 1	485	597	-	552	569	-	-	-	-	-	-	-
Stage 2	671	528	-	759	594	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.8	18.9	1.6	0.1
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	757	-	-	431	409	443	1238	-	-
HCM Lane V/C Ratio	0.08	-	-	0.049	0.389	0.024	0.004	-	-
HCM Control Delay (s)	10.2	-	-	13.8	19.3	13.3	7.9	-	-
HCM Lane LOS	B	-	-	B	C	B	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	0.2	1.8	0.1	0	-	-

Legacy Oaks
6: Hodge Road & Legacy Oaks Drive North

Build-Out + 10 AM (2033) - with Hinton Oaks

03/30/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	4	42	46	4	4	9	87	11	4	218	4
Future Volume (vph)	4	4	42	46	4	4	9	87	11	4	218	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%				0%				0%		1%	
Storage Length (ft)	0		0	100		0	0		0	100		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			100			25			100		
Satd. Flow (prot)	1770	1863	1583	1770	1723	0	1770	1831	0	1761	1848	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1863	1583	1770	1723	0	1770	1831	0	1761	1848	0
Link Speed (mph)		30			30			30			25	
Link Distance (ft)		258			326			504			286	
Travel Time (s)		5.9			7.4			11.5			7.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	5	49	54	10	0	11	115	0	5	261	0
Sign Control	Stop				Stop				Stop		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 28.4% ICU Level of Service A

Analysis Period (min) 15

Intersection	
Intersection Delay, s/veh	10.1
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↑	↔	↔	↔		↔	↔		↔	↔	
Traffic Vol, veh/h	4	4	42	46	4	4	9	87	11	4	218	4
Future Vol, veh/h	4	4	42	46	4	4	9	87	11	4	218	4
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	5	49	54	5	5	11	102	13	5	256	5
Number of Lanes	1	1	1	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	3	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	3	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	3
HCM Control Delay	8.4	9.5	9.3	11
HCM LOS	A	A	A	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	100%	0%	100%	0%
Vol Thru, %	0%	89%	0%	100%	0%	0%	50%	0%	98%
Vol Right, %	0%	11%	0%	0%	100%	0%	50%	0%	2%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	9	98	4	4	42	46	8	4	222
LT Vol	9	0	4	0	0	46	0	4	0
Through Vol	0	87	0	4	0	0	4	0	218
RT Vol	0	11	0	0	42	0	4	0	4
Lane Flow Rate	11	115	5	5	49	54	9	5	261
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.018	0.172	0.008	0.008	0.07	0.094	0.014	0.007	0.374
Departure Headway (Hd)	5.956	5.375	6.308	5.804	5.098	6.286	5.427	5.671	5.158
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	599	664	565	613	697	567	655	630	695
Service Time	3.712	3.131	4.078	3.574	2.868	4.057	3.198	3.418	2.904
HCM Lane V/C Ratio	0.018	0.173	0.009	0.008	0.07	0.095	0.014	0.008	0.376
HCM Control Delay	8.8	9.3	9.1	8.6	8.3	9.7	8.3	8.5	11
HCM Lane LOS	A	A	A	A	A	A	A	A	B
HCM 95th-tile Q	0.1	0.6	0	0	0.2	0.3	0	0	1.7



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↖	↕	↗		↖
Traffic Volume (vph)	0	4	134	15	0	306
Future Volume (vph)	0	4	134	15	0	306
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			1%
Storage Length (ft)	0	0		0	0	
Storage Lanes	0	1		0	0	
Taper Length (ft)	25				25	
Satd. Flow (prot)	0	1611	3486	0	0	3522
Flt Permitted						
Satd. Flow (perm)	0	1611	3486	0	0	3522
Link Speed (mph)	30		30			25
Link Distance (ft)	215		264			210
Travel Time (s)	4.9		6.0			5.7
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	4	166	0	0	340
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	14.2%
ICU Level of Service	A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↑	↑↑			↑↑
Traffic Vol, veh/h	0	4	134	15	0	306
Future Vol, veh/h	0	4	134	15	0	306
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	1
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	4	149	17	0	340
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	-	83	0	0	-	
Stage 1	-	-	-	-	-	
Stage 2	-	-	-	-	-	
Critical Hdwy	-	6.94	-	-	-	
Critical Hdwy Stg 1	-	-	-	-	-	
Critical Hdwy Stg 2	-	-	-	-	-	
Follow-up Hdwy	-	3.32	-	-	-	
Pot Cap-1 Maneuver	0	960	-	-	0	
Stage 1	0	-	-	-	0	
Stage 2	0	-	-	-	0	
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	-	960	-	-	-	
Mov Cap-2 Maneuver	-	-	-	-	-	
Stage 1	-	-	-	-	-	
Stage 2	-	-	-	-	-	
Approach	WB	NB		SB		
HCM Control Delay, s	8.8	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT		
Capacity (veh/h)	-	-	960	-		
HCM Lane V/C Ratio	-	-	0.005	-		
HCM Control Delay (s)	-	-	8.8	-		
HCM Lane LOS	-	-	A	-		
HCM 95th %tile Q(veh)	-	-	0	-		



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↕			↘
Traffic Volume (vph)	0	4	120	14	0	306
Future Volume (vph)	0	4	120	14	0	306
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			1%
Storage Length (ft)	0	0		0	0	
Storage Lanes	0	1		0	0	
Taper Length (ft)	25				25	
Satd. Flow (prot)	0	1611	3483	0	0	3522
Flt Permitted						
Satd. Flow (perm)	0	1611	3483	0	0	3522
Link Speed (mph)	30		30			25
Link Distance (ft)	193		210			269
Travel Time (s)	4.4		4.8			7.3
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	4	149	0	0	340
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	13.8%
ICU Level of Service	A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↑	↑↑			↑↑
Traffic Vol, veh/h	0	4	120	14	0	306
Future Vol, veh/h	0	4	120	14	0	306
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	1
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	4	133	16	0	340

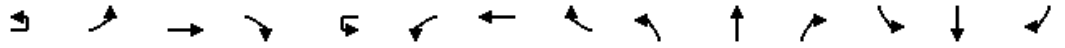
Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	-	75	0	0	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-
Pot Cap-1 Maneuver	0	971	-	0	-
Stage 1	0	-	-	0	-
Stage 2	0	-	-	0	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	-	971	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.7	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	971	-
HCM Lane V/C Ratio	-	-	0.005	-
HCM Control Delay (s)	-	-	8.7	-
HCM Lane LOS	-	-	A	-
HCM 95th %tile Q(veh)	-	-	0	-

Legacy Oaks
1: Hodge Road & US 64 Bus (Knightdale Blvd.)

Build-Out + 10 PM (2033) - with Hinton Oaks
03/30/2020



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations														
Traffic Volume (vph)	8	146	1862	349	23	445	1233	347	126	42	264	263	84	125
Future Volume (vph)	8	146	1862	349	23	445	1233	347	126	42	264	263	84	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)			3%				-3%			-2%				1%
Storage Length (ft)		200		225		600		375	200		50	0		0
Storage Lanes		3		1		1		1	1		1	2		1
Taper Length (ft)		300				150			100			100		
Satd. Flow (prot)	0	3382	5009	1560	0	1796	5162	1607	3467	1637	0	3416	1853	1575
Flt Permitted		0.950				0.950			0.950			0.950		
Satd. Flow (perm)	0	3382	5009	1560	0	1796	5162	1607	3467	1637	0	3416	1853	1575
Right Turn on Red				Yes				Yes			Yes			Yes
Satd. Flow (RTOR)				146				358		190				182
Link Speed (mph)			45				45			35				25
Link Distance (ft)			734				962			450				524
Travel Time (s)			11.1				14.6			8.8				14.3
Confl. Peds. (#/hr)														
Confl. Bikes (#/hr)														
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)														
Mid-Block Traffic (%)			0%				0%			0%				0%
Shared Lane Traffic (%)														
Lane Group Flow (vph)	0	159	1920	360	0	483	1271	358	130	315	0	271	87	129
Turn Type	Prot	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5!	5	2	3	1	1	6	7	3	8		7	4	5!
Permitted Phases				2				6						4
Detector Phase	5	5	2	3	1	1	6	7	3	8		7	4	5
Switch Phase														
Minimum Initial (s)	7.0	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	15.0	15.0	19.0	15.0	15.0	15.0	20.0	15.0	15.0	16.0		15.0	15.0	15.0
Total Split (s)	20.0	20.0	55.0	25.0	45.0	45.0	80.0	15.0	25.0	25.0		15.0	15.0	20.0
Total Split (%)	14.3%	14.3%	39.3%	17.9%	32.1%	32.1%	57.1%	10.7%	17.9%	17.9%		10.7%	10.7%	14.3%
Yellow Time (s)	3.0	3.0	4.3	3.0	3.0	3.0	4.8	3.0	3.0	4.0		3.0	3.1	3.0
All-Red Time (s)	3.9	3.9	1.7	3.9	3.5	3.5	1.7	3.9	3.9	3.1		3.9	3.7	3.9
Lost Time Adjust (s)		-1.9	-1.0	-1.9		-1.5	-1.5	-1.9	-1.9	-2.1		-1.9	-1.8	-1.9
Total Lost Time (s)		5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lead	Lead	Lag	Lag	Lag	Lead	Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None	C-Max	None	None	None	C-Max	None	None	None		None	None	None
Act Effct Green (s)		13.3	52.7	68.8		40.0	79.3	94.3	16.1	17.3		10.0	11.2	29.5
Actuated g/C Ratio		0.10	0.38	0.49		0.29	0.57	0.67	0.12	0.12		0.07	0.08	0.21
v/c Ratio		0.49	1.02	0.43		0.94	0.43	0.30	0.33	0.85		1.11	0.59	0.27
Control Delay		65.3	68.7	9.2		56.7	7.5	0.6	58.3	44.8		147.9	78.9	2.9
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay		65.3	68.7	9.2		56.7	7.5	0.6	58.3	44.8		147.9	78.9	2.9
LOS		E	E	A		E	A	A	E	D		F	E	A
Approach Delay			59.7				17.6			48.7				97.2
Approach LOS			E				B			D				F
Queue Length 50th (ft)		71	-709	77		436	97	0	56	113		-145	76	0
Queue Length 95th (ft)		109	#804	131		#640	111	0	88	#255		#240	#157	15
Internal Link Dist (ft)			654				882			370			444	
Turn Bay Length (ft)		200		225		600		375	200					
Base Capacity (vph)		362	1883	880		513	2924	1199	495	396		244	149	492
Starvation Cap Reductn		0	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn		0	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn		0	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio		0.44	1.02	0.41		0.94	0.43	0.30	0.26	0.80		1.11	0.58	0.26

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Legacy Oaks
 1: Hodge Road & US 64 Bus (Knightdale Blvd.)

Build-Out + 10 PM (2033) - with Hinton Oaks
 03/30/2020

Offset: 84 (60%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.11
 Intersection Signal Delay: 45.9 Intersection LOS: D
 Intersection Capacity Utilization 104.6% ICU Level of Service G
 Analysis Period (min) 15
 Description: 05-0928
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 ! Phase conflict between lane groups.

Splits and Phases: 1: Hodge Road & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↓	↑↑							↑
Traffic Volume (vph)	0	2341	102	331	1415	0	0	0	0	0	0	676
Future Volume (vph)	0	2341	102	331	1415	0	0	0	0	0	0	676
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		1%			-1%			0%			2%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	5060	1575	1778	3557	0	0	0	0	0	0	1564
Flt Permitted				0.041								
Satd. Flow (perm)	0	5060	1575	77	3557	0	0	0	0	0	0	1564
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			104									164
Link Speed (mph)		45		45			35				35	
Link Distance (ft)		962		263			601				428	
Travel Time (s)		14.6		4.0			11.7				8.3	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	4%	4%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%		0%			0%				0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2389	104	338	1444	0	0	0	0	0	0	690
Turn Type		NA	Perm	D.P+P	NA							Free
Protected Phases		2		7	2 7							
Permitted Phases			2	2								Free
Detector Phase		2	2	7	2 7							
Switch Phase												
Minimum Initial (s)		12.0	12.0	7.0								
Minimum Split (s)		19.0	19.0	15.0								
Total Split (s)		100.0	100.0	40.0								
Total Split (%)		71.4%	71.4%	28.6%								
Yellow Time (s)		4.4	4.4	3.0								
All-Red Time (s)		1.6	1.6	3.1								
Lost Time Adjust (s)		-1.0	-1.0	-1.1								
Total Lost Time (s)		5.0	5.0	5.0								
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Max	C-Max	None								
Act Effct Green (s)		96.6	96.6	130.0	140.0							140.0
Actuated g/C Ratio		0.69	0.69	0.93	1.00							1.00
v/c Ratio		0.68	0.09	0.71	0.41							0.44
Control Delay		11.8	0.8	67.0	2.1							0.9
Queue Delay		0.8	0.0	0.0	0.0							0.0
Total Delay		12.6	0.8	67.0	2.1							0.9
LOS		B	A	E	A							A
Approach Delay		12.1			14.4						0.9	
Approach LOS		B			B						A	
Queue Length 50th (ft)		834	2	270	61							0
Queue Length 95th (ft)		m820	m2	364	23							0
Internal Link Dist (ft)		882			183			521			348	
Turn Bay Length (ft)												
Base Capacity (vph)		3489	1118	497	3557							1564
Starvation Cap Reductn		708	0	0	0							0
Spillback Cap Reductn		0	0	0	0							0
Storage Cap Reductn		0	0	0	0							0
Reduced v/c Ratio		0.86	0.09	0.68	0.41							0.44

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 72 (51%), Referenced to phase 2:EBWB and 6:, Start of Green

Natural Cycle: 50

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.71

Intersection Signal Delay: 11.4

Intersection LOS: B

Intersection Capacity Utilization 120.1%

ICU Level of Service H

Analysis Period (min) 15

Description: 05-2153

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: I-540 EB On-Ramp/I-540 EB Off-Ramp & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↔↔↔			↔↔↔	↔		↔	↔↔			
Traffic Volume (vph)	451	2993	0	0	1624	628	128	4	740	0	0	0
Future Volume (vph)	451	2993	0	0	1624	628	128	4	740	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		-1%			1%			2%			0%	
Storage Length (ft)	500		0	0		0	0		400	0		0
Storage Lanes	1		0	0		1	0		2	0		0
Taper Length (ft)	200			25			25			25		
Satd. Flow (prot)	3450	5111	0	0	5060	1575	0	1759	2759	0	0	0
Flt Permitted	0.950							0.954				
Satd. Flow (perm)	3450	5111	0	0	5060	1575	0	1759	2759	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						557			71			
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		803			1134			793			417	
Travel Time (s)		12.2			17.2			15.4			8.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	470	3118	0	0	1692	654	0	137	771	0	0	0
Turn Type	Prot	NA			NA	Perm	Perm	NA	Perm			
Protected Phases	5	2			6			4				
Permitted Phases					6	4		4				
Detector Phase	5	2			6	6	4	4	4			
Switch Phase												
Minimum Initial (s)	7.0	12.0			12.0	12.0	7.0	7.0	7.0			
Minimum Split (s)	15.0	20.0			20.0	20.0	15.0	15.0	15.0			
Total Split (s)	30.0	100.0			70.0	70.0	40.0	40.0	40.0			
Total Split (%)	21.4%	71.4%			50.0%	50.0%	28.6%	28.6%	28.6%			
Yellow Time (s)	3.3	4.6			4.4	4.4	3.7	3.7	3.7			
All-Red Time (s)	3.0	1.3			1.4	1.4	2.5	2.5	2.5			
Lost Time Adjust (s)	-1.3	-0.9			-0.8	-0.8	-1.2	-1.2	-1.2			
Total Lost Time (s)	5.0	5.0			5.0	5.0	5.0	5.0	5.0			
Lead/Lag	Lag				Lead	Lead						
Lead-Lag Optimize?	Yes				Yes	Yes						
Recall Mode	None	C-Max			C-Max	C-Max	None	None	None			
Act Effct Green (s)	25.0	95.0			65.0	65.0		35.0	35.0			
Actuated g/C Ratio	0.18	0.68			0.46	0.46		0.25	0.25			
v/c Ratio	0.76	0.90			0.72	0.64		0.31	1.04			
Control Delay	45.3	9.7			14.7	2.8		45.1	89.1			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	45.3	9.7			14.7	2.8		45.1	89.1			
LOS	D	A			B	A		D	F			
Approach Delay		14.4			11.4			82.4				
Approach LOS		B			B			F				
Queue Length 50th (ft)	219	140			274	1		102	~400			
Queue Length 95th (ft)	263	144			m152	m6		166	#543			
Internal Link Dist (ft)		723			1054			713			337	
Turn Bay Length (ft)	500								400			
Base Capacity (vph)	616	3468			2349	1029		439	743			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.76	0.90			0.72	0.64		0.31	1.04			

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 68 (49%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.04

Intersection Signal Delay: 22.4

Intersection LOS: C

Intersection Capacity Utilization 92.0%

ICU Level of Service F

Analysis Period (min) 15

Description: 05-2152

~ Volume exceeds capacity, queue is theoretically infinite.

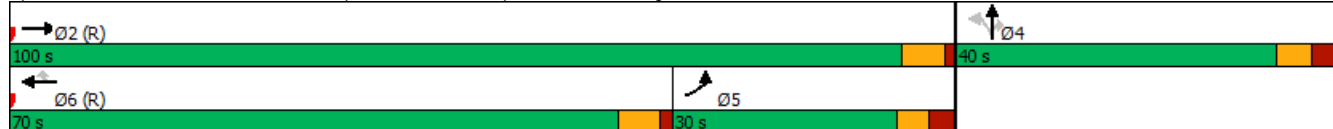
Queue shown is maximum after two cycles.

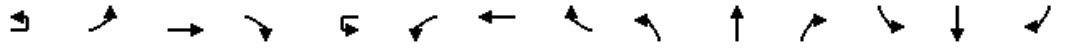
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: I-540 WB Off-Ramp/I-540 WB On-Ramp & US 64 Bus (Knightdale Blvd.)





Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔	↕↕↕	↗		↔↔	↕↕↕	↗	↔↔	↕	↗	↔↔	↕↕	↗
Traffic Volume (vph)	28	508	2777	187	7	40	1724	84	137	31	67	152	15	248
Future Volume (vph)	28	508	2777	187	7	40	1724	84	137	31	67	152	15	248
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)			-1%				1%			3%				0%
Storage Length (ft)		400		125		200		200	200		100	325		150
Storage Lanes		2		1		1		1	2		1	1		1
Taper Length (ft)		250				100			100			100		
Satd. Flow (prot)	0	3450	5111	1591	0	1761	5060	1575	3382	1835	1560	3433	1534	1504
Flt Permitted		0.950				0.950			0.950			0.950		
Satd. Flow (perm)	0	3450	5111	1591	0	1761	5060	1575	3382	1835	1560	3433	1534	1504
Right Turn on Red				Yes				Yes			Yes			Yes
Satd. Flow (RTOR)				88				81			130			123
Link Speed (mph)			45				45			35				35
Link Distance (ft)			1134				1230			476				550
Travel Time (s)			17.2				18.6			9.3				10.7
Confl. Peds. (#/hr)														
Confl. Bikes (#/hr)														
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)														
Mid-Block Traffic (%)			0%				0%			0%				0%
Shared Lane Traffic (%)														47%
Lane Group Flow (vph)	0	564	2923	197	0	49	1815	88	144	33	71	160	139	138
Turn Type	Prot	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5!	5	2	3	1!	1	6	7	3	8	1!	7	4	5!
Permitted Phases				2				6			8			4
Detector Phase	5	5	2	3	1	1	6	7	3	8	1	7	4	5
Switch Phase														
Minimum Initial (s)	7.0	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	15.0	15.0	20.0	15.0	15.0	15.0	20.0	16.0	15.0	15.0	15.0	16.0	15.0	15.0
Total Split (s)	28.0	28.0	80.0	20.0	20.0	20.0	72.0	20.0	20.0	20.0	20.0	20.0	20.0	28.0
Total Split (%)	20.0%	20.0%	57.1%	14.3%	14.3%	14.3%	51.4%	14.3%	14.3%	14.3%	14.3%	14.3%	14.3%	20.0%
Yellow Time (s)	3.6	3.6	4.6	3.8	3.4	3.4	4.4	4.1	3.8	3.6	3.4	4.1	3.8	3.6
All-Red Time (s)	3.0	3.0	1.7	3.0	3.0	3.0	1.6	3.0	3.0	3.0	3.0	3.0	3.1	3.0
Lost Time Adjust (s)		-1.6	-1.3	-1.8			-1.4	-1.0	-2.1	-1.8	-1.6	-1.4	-2.1	-1.9
Total Lost Time (s)		5.0	5.0	5.0			5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	C-Max	None	None	None	C-Max	None	None	None	None	None	None	None
Act Effct Green (s)		23.0	86.0	103.8			10.2	73.2	97.5	12.8	9.9	16.7	19.4	11.0
Actuated g/C Ratio		0.16	0.61	0.74			0.07	0.52	0.70	0.09	0.07	0.12	0.14	0.08
v/c Ratio		1.00	0.93	0.16			0.38	0.69	0.08	0.46	0.26	0.24	0.34	0.60
Control Delay		73.9	22.9	1.8			70.0	27.2	2.4	65.0	65.9	1.9	57.8	24.2
Queue Delay		0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		73.9	22.9	1.8			70.0	27.2	2.4	65.0	65.9	1.9	57.8	24.2
LOS		E	C	A			E	C	A	E	A	E	C	A
Approach Delay			29.6				27.1			47.0				31.1
Approach LOS			C				C			D				C
Queue Length 50th (ft)		261	564	8		44	435	2	64	29	0	72	14	7
Queue Length 95th (ft)		m#318	m#1099	m18		85	541	22	100	64	0	107	84	47
Internal Link Dist (ft)			1054				1150			396			470	
Turn Bay Length (ft)		400		125		200		200	200		100	325		150
Base Capacity (vph)		566	3138	1225		188	2644	1113	362	196	349	480	274	460
Starvation Cap Reductn		0	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio		1.00	0.93	0.16		0.26	0.69	0.08	0.40	0.17	0.20	0.33	0.51	0.30

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

4: Hinton Oaks Boulevard & US 64 Bus (Knightdale Blvd.)

03/30/2020

Offset: 78 (56%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.00

Intersection Signal Delay: 29.6

Intersection LOS: C

Intersection Capacity Utilization 87.8%

ICU Level of Service E

Analysis Period (min) 15

Description: 05-2267

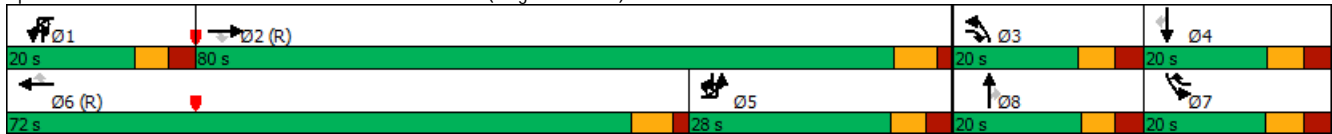
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

! Phase conflict between lane groups.

Splits and Phases: 4: Hinton Oaks Boulevard & US 64 Bus (Knightdale Blvd.)





Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔			↔	↔		↔	↔↔	
Traffic Volume (vph)	4	4	13	9	134	4	4	9	112	323	101	4	182	4
Future Volume (vph)	4	4	13	9	134	4	4	9	112	323	101	4	182	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%				0%				0%				1%
Storage Length (ft)	0		0		100		0		70		0	150		350
Storage Lanes	0		0		1		0		1		0	1		1
Taper Length (ft)	25				100				100			80		
Satd. Flow (prot)	0	1687	0	0	1770	1723	0	0	1687	3252	0	1761	5045	0
Flt Permitted		0.991			0.950				0.950			0.950		
Satd. Flow (perm)	0	1687	0	0	1770	1723	0	0	1687	3252	0	1761	5045	0
Link Speed (mph)		30				30				30				25
Link Distance (ft)		171				365				524				260
Travel Time (s)		3.9				8.3				11.9				7.1
Confl. Peds. (#/hr)			1		1									
Confl. Bikes (#/hr)														
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	7%	7%	7%	7%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)														
Mid-Block Traffic (%)		0%				0%				0%				0%
Shared Lane Traffic (%)														
Lane Group Flow (vph)	0	22	0	0	150	8	0	0	127	446	0	4	196	0
Sign Control		Stop				Stop				Free				Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	40.1%
ICU Level of Service	A
Analysis Period (min)	15

Intersection														
Int Delay, s/veh	6.2													
Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔			↔	↔		↔	↔	↔
Traffic Vol, veh/h	4	4	13	9	134	4	4	9	112	323	101	4	182	4
Future Vol, veh/h	4	4	13	9	134	4	4	9	112	323	101	4	182	4
Conflicting Peds, #/hr	0	0	1	0	1	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	-	None	-	-	-	None	-	-	None
Storage Length	-	-	-	-	100	-	-	-	70	-	-	150	-	350
Veh in Median Storage, #	-	0	-	-	-	0	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	-	0	-	-	-	0	-	-	1	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	7	7	7	7	2	2	2
Mvmt Flow	4	4	14	9	141	4	4	9	118	340	106	4	192	4
Major/Minor	Minor2			Minor1			Major1			Major2				
Conflicting Flow All	628	902	99	0	735	851	223	143	196	0	0	446	0	0
Stage 1	202	202	-	0	647	647	-	-	-	-	-	-	-	-
Stage 2	426	700	-	0	88	204	-	-	-	-	-	-	-	-
Critical Hdwy	6.99	6.54	7.14	-	6.99	6.54	6.94	5.74	5.44	-	-	4.14	-	-
Critical Hdwy Stg 1	7.34	5.54	-	-	6.54	5.54	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	-	6.74	5.54	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4.02	3.92	-	3.67	4.02	3.32	2.37	3.17	-	-	2.22	-	-
Pot Cap-1 Maneuver	392	276	796	0	335	296	780	1267	920	-	-	1111	-	-
Stage 1	719	733	-	0	414	465	-	-	-	-	-	-	-	-
Stage 2	558	440	-	0	870	732	-	-	-	-	-	-	-	-
Platoon blocked, %				-						-	-		-	-
Mov Cap-1 Maneuver	344	238	795	0	290	255	780	938	938	-	-	1111	-	-
Mov Cap-2 Maneuver	344	238	-	0	290	255	-	-	-	-	-	-	-	-
Stage 1	622	730	-	0	358	402	-	-	-	-	-	-	-	-
Stage 2	475	381	-	0	846	729	-	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB				
HCM Control Delay, s	13.1			27.8			2.1			0.2				
HCM LOS	B			D										
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR					
Capacity (veh/h)	938	-	-	469	290	384	1111	-	-					
HCM Lane V/C Ratio	0.136	-	-	0.047	0.486	0.022	0.004	-	-					
HCM Control Delay (s)	9.4	-	-	13.1	28.6	14.6	8.3	-	-					
HCM Lane LOS	A	-	-	B	D	B	A	-	-					
HCM 95th %tile Q(veh)	0.5	-	-	0.1	2.5	0.1	0	-	-					



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	4	27	19	4	4	30	223	21	4	133	4
Future Volume (vph)	4	4	27	19	4	4	30	223	21	4	133	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%				0%		0%				1%	
Storage Length (ft)	0		0	100		0	0		0	100		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			100			25			100		
Satd. Flow (prot)	1770	1863	1583	1770	1723	0	1687	1753	0	1761	1846	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1863	1583	1770	1723	0	1687	1753	0	1761	1846	0
Link Speed (mph)		30			30			30			25	
Link Distance (ft)		258			326			504			286	
Travel Time (s)		5.9			7.4			11.5			7.8	
Confl. Peds. (#/hr)			1	1								
Confl. Bikes (#/hr)												
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	7%	7%	7%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	4	4	29	20	8	0	32	263	0	4	147	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	34.1%
ICU Level of Service	A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	10
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↑	↔	↔	↔		↔	↔		↔	↔	
Traffic Vol, veh/h	4	4	27	19	4	4	30	223	21	4	133	4
Future Vol, veh/h	4	4	27	19	4	4	30	223	21	4	133	4
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	2	2	2	2	2	2	7	7	7	2	2	2
Mvmt Flow	4	4	29	20	4	4	32	240	23	4	143	4
Number of Lanes	1	1	1	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	3	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	3	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	3
HCM Control Delay	8.3	9.1	10.6	9.5
HCM LOS	A	A	B	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	100%	0%	100%	0%
Vol Thru, %	0%	91%	0%	100%	0%	0%	50%	0%	97%
Vol Right, %	0%	9%	0%	0%	100%	0%	50%	0%	3%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	30	244	4	4	27	19	8	4	137
LT Vol	30	0	4	0	0	19	0	4	0
Through Vol	0	223	0	4	0	0	4	0	133
RT Vol	0	21	0	0	27	0	4	0	4
Lane Flow Rate	32	262	4	4	29	20	9	4	147
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.051	0.37	0.008	0.007	0.042	0.036	0.013	0.007	0.218
Departure Headway (Hd)	5.642	5.081	6.356	5.852	5.146	6.379	5.52	5.839	5.317
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	635	708	561	609	692	559	645	612	675
Service Time	3.379	2.817	4.114	3.61	2.904	4.142	3.283	3.581	3.058
HCM Lane V/C Ratio	0.05	0.37	0.007	0.007	0.042	0.036	0.014	0.007	0.218
HCM Control Delay	8.7	10.8	9.2	8.7	8.1	9.4	8.4	8.6	9.5
HCM Lane LOS	A	B	A	A	A	A	A	A	A
HCM 95th-ile Q	0.2	1.7	0	0	0.1	0.1	0	0	0.8



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↕			↘
Traffic Volume (vph)	0	4	345	24	0	179
Future Volume (vph)	0	4	345	24	0	179
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			1%
Storage Length (ft)	0	0		0	0	
Storage Lanes	0	1		0	0	
Taper Length (ft)	25				25	
Satd. Flow (prot)	0	1611	3504	0	0	3522
Flt Permitted						
Satd. Flow (perm)	0	1611	3504	0	0	3522
Link Speed (mph)	30		30			25
Link Distance (ft)	215		260			200
Travel Time (s)	4.9		5.9			5.5
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	4	410	0	0	199
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	20.3%
ICU Level of Service	A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↑	↑↑			↑↑
Traffic Vol, veh/h	0	4	345	24	0	179
Future Vol, veh/h	0	4	345	24	0	179
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	1
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	4	383	27	0	199
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	-	205	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	802	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	-	802	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	9.5	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT		
Capacity (veh/h)	-	-	802	-		
HCM Lane V/C Ratio	-	-	0.006	-		
HCM Control Delay (s)	-	-	9.5	-		
HCM Lane LOS	-	-	A	-		
HCM 95th %tile Q(veh)	-	-	0	-		



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↕			↘
Traffic Volume (vph)	0	4	322	23	0	179
Future Volume (vph)	0	4	322	23	0	179
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			1%
Storage Length (ft)	0	0		0	0	
Storage Lanes	0	1		0	0	
Taper Length (ft)	25				25	
Satd. Flow (prot)	0	1611	3504	0	0	3522
Flt Permitted						
Satd. Flow (perm)	0	1611	3504	0	0	3522
Link Speed (mph)	30		30			25
Link Distance (ft)	193		200			289
Travel Time (s)	4.4		4.5			7.9
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	4	384	0	0	199
Sign Control	Stop		Free			Free

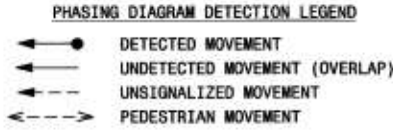
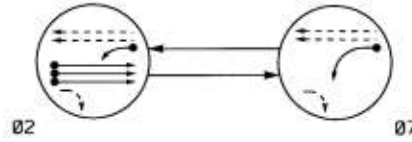
Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	19.6%
ICU Level of Service	A
Analysis Period (min)	15

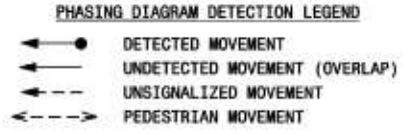
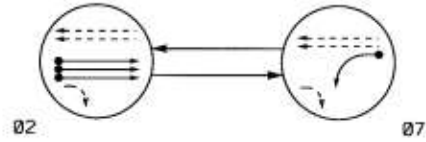
Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↑	↑↑			↑↑
Traffic Vol, veh/h	0	4	322	23	0	179
Future Vol, veh/h	0	4	322	23	0	179
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	1
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	4	358	26	0	199
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	-	192	0	0	-	
Stage 1	-	-	-	-	-	
Stage 2	-	-	-	-	-	
Critical Hdwy	-	6.94	-	-	-	
Critical Hdwy Stg 1	-	-	-	-	-	
Critical Hdwy Stg 2	-	-	-	-	-	
Follow-up Hdwy	-	3.32	-	-	-	
Pot Cap-1 Maneuver	0	817	-	-	0	
Stage 1	0	-	-	-	0	
Stage 2	0	-	-	-	0	
Platoon blocked, %	-	-	-	-	-	
Mov Cap-1 Maneuver	-	817	-	-	-	
Mov Cap-2 Maneuver	-	-	-	-	-	
Stage 1	-	-	-	-	-	
Stage 2	-	-	-	-	-	
Approach	WB	NB		SB		
HCM Control Delay, s	9.4	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT		
Capacity (veh/h)	-	-	817	-		
HCM Lane V/C Ratio	-	-	0.005	-		
HCM Control Delay (s)	-	-	9.4	-		
HCM Lane LOS	-	-	A	-		
HCM 95th %tile Q(veh)	-	-	0	-		

Appendix P:
Signal Plans and Timings

NORMAL PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



NORMAL PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE		
	NB	SB	EB
21, 22, 23	G	R	Y
71	⚡	⚡	⚡

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE		
	NB	SB	EB
21, 22, 23	G	R	Y
71	⚡	⚡	⚡

STANDARD SIGNAL FACE CLEARANCES FOR FLASHING LEFT TURN SIGNAL

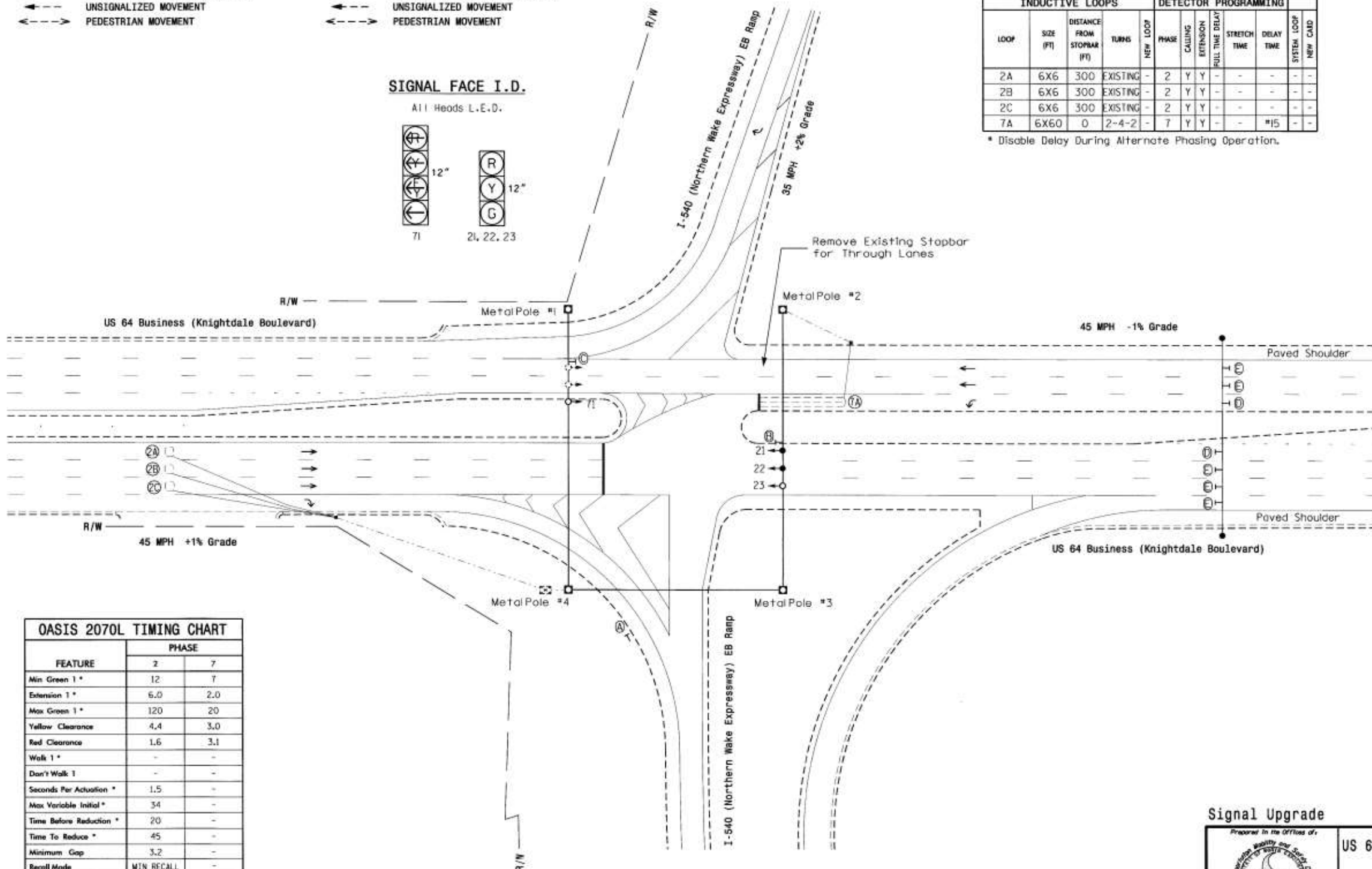
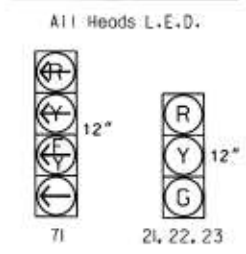
TO	FROM			
	1	2	1	2
←	←	←	←	←
→	→	→	→	→
⚡	⚡	⚡	⚡	⚡
⚡	⚡	⚡	⚡	⚡

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING							
					PHASE	CALLING	EXTENSION	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD	
2A	6X6	300	EXISTING	-	2	Y	Y	-	-	-	-	-
2B	6X6	300	EXISTING	-	2	Y	Y	-	-	-	-	-
2C	6X6	300	EXISTING	-	2	Y	Y	-	-	-	-	-
7A	6X60	0	2-4-2	-	7	Y	Y	-	-	#15	-	-

* Disable Delay During Alternate Phasing Operation.

SIGNAL FACE I.D.



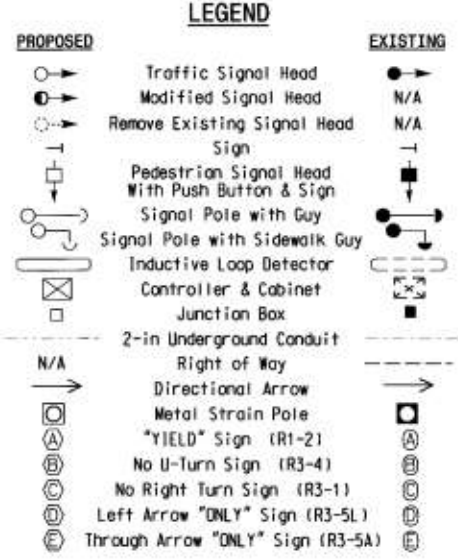
OASIS 2070L TIMING CHART

FEATURE	PHASE	
	2	7
Min Green 1 *	12	7
Extension 1 *	6.0	2.0
Max Green 1 *	120	20
Yellow Clearance	4.4	3.0
Red Clearance	1.6	3.1
Walk 1 *	-	-
Don't Walk 1	-	-
Seconds Per Actuation *	1.5	-
Max Variable Initial *	34	-
Time Before Reduction *	20	-
Time To Reduce *	45	-
Minimum Gap	3.2	-
Recall Mode	MIN RECALL	-
Vehicle Call Memory	YELLOW	-
Dual Entry	-	-
Simultaneous Gap	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

2 Phase Fully Actuated (US 64-Knightdale Closed Loop System)

- NOTES**
- Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
 - Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
 - Reposition existing signal heads numbered 21 and 22.
 - Remove existing signal heads numbered 61 and 62.
 - Set all detector units to presence mode.
 - Pavement markings are existing unless otherwise shown.
 - Program controller to operate in FYA COMPACT mode.
 - The Division Traffic Engineer will determine the hours of use for each phasing plan.
 - Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
 - Closed loop system data: Controller Asset #: 2153.



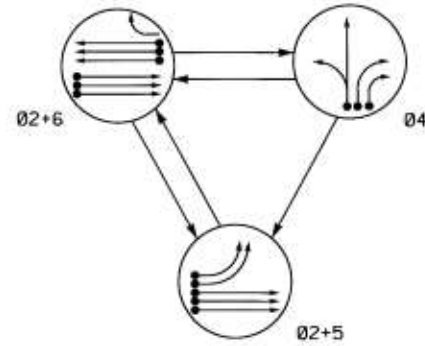
Signal Upgrade

Prepared in the Office of:

US 64 Business (Knightdale Blvd.) at I-540 Eastbound Ramp
 Division 5 Wake County Knightdale
 PLAN DATE: January 2012 REVIEWED BY:
 PREPARED BY: C.E. Carter REVIEWED BY:
 REVISIONS: INIT. DATE
 SCALE: 1"=40'
 SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 026486 ROBERT J. ZIEGLER
 DATE: 1/10/12
 SIG. INVENTORY NO. 05-2153

10-FEB-2012 09:23:11
 S:\13505415\SigFace\Signal Design\Section\Central Region\481v 540-2153\021011.dgn
 1/10/12

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

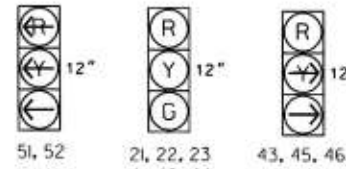
- ←●→ DETECTED MOVEMENT
- ←○→ UNDETECTED MOVEMENT (OVERLAP)
- ←---→ UNSIGNALIZED MOVEMENT
- ←- - -> PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE			
	2	4	5	6
21, 22, 23	G	G	R	Y
41, 42, 44	R	R	G	R
43, 45, 46	R	R	→	R
51, 52	←	R	←	←
61, 62, 63	R	G	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

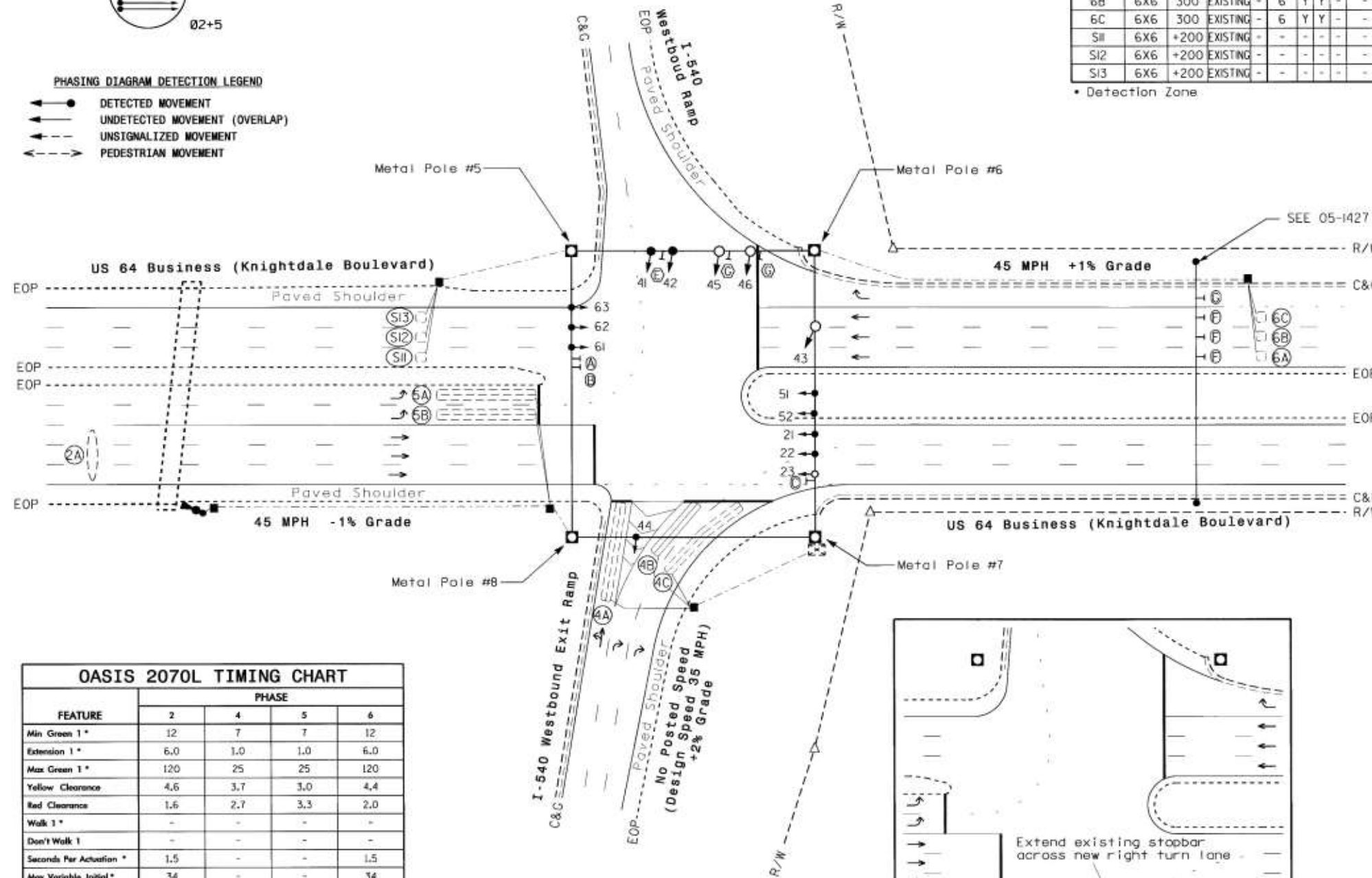
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	DETECTOR PROGRAMMING									
				PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD		
*2A	6X30	300	N/A	-	2	Y	Y	-	-	-	-	-	-
4A	6X60	0	2-4-2	-	4	Y	Y	-	-	-	-	-	-
4B	6X40	0	2-4-2	Y	4	Y	Y	-	-	-	15	-	-
4C	6X60	0	2-4-2	-	4	Y	Y	-	-	-	15	-	-
5A	6X60	0	2-4-2	-	5	Y	Y	-	-	-	-	-	-
5B	6X60	0	2-4-2	-	5	Y	Y	-	-	-	-	-	-
6A	6X6	300	EXISTING	-	6	Y	Y	-	-	-	-	-	-
6B	6X6	300	EXISTING	-	6	Y	Y	-	-	-	-	-	-
6C	6X6	300	EXISTING	-	6	Y	Y	-	-	-	-	-	-
SI1	6X6	+200	EXISTING	-	-	-	-	-	-	-	-	Y	-
SI2	6X6	+200	EXISTING	-	-	-	-	-	-	-	-	Y	-
SI3	6X6	+200	EXISTING	-	-	-	-	-	-	-	-	Y	-

* Detection Zone

3 Phase Fully Actuated (US 64-Knightdale Closed Loop System)

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Reposition existing signal heads numbered 21 and 22.
- Phase 5 may be lagged.
- Set all detector units to presence mode.
- Pavement markings are existing unless otherwise shown.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Closed loop system data: Controller Asset #: 2152.



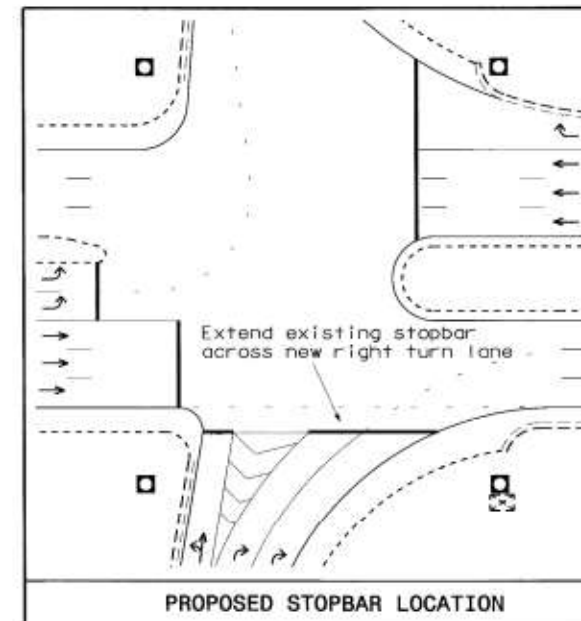
OASIS 2070L TIMING CHART

FEATURE	PHASE			
	2	4	5	6
Min Green 1*	12	7	7	12
Extension 1*	6.0	1.0	1.0	6.0
Max Green 1*	120	25	25	120
Yellow Clearance	4.6	3.7	3.0	4.4
Red Clearance	1.6	2.7	3.3	2.0
Walk 1*	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	1.5	-	-	1.5
Max Variable Initial *	34	-	-	34
Time Before Reduction *	15	-	-	15
Time To Reduce *	45	-	-	45
Minimum Gap	3.2	-	-	3.2
Recall Mode	MIN RECALL	-	-	MIN RECALL
Vehicle Call Memory	YELLOW	-	-	YELLOW
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND

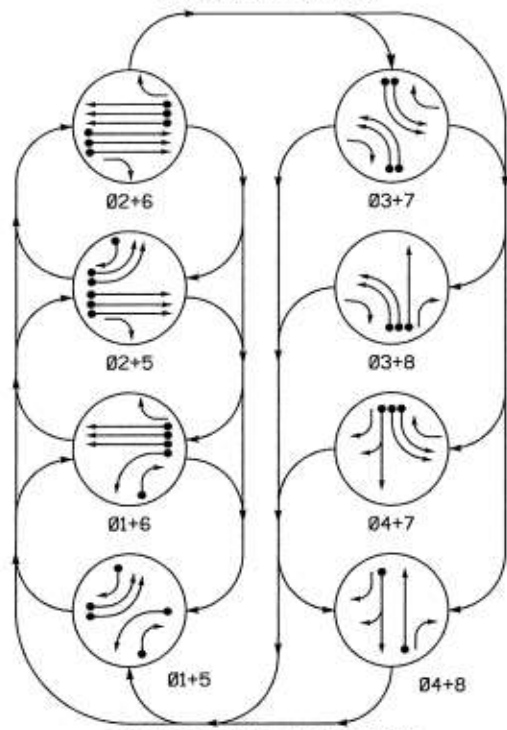
- | | | | |
|--|---|--|---|
| | Proposed Traffic Signal Head | | Existing Traffic Signal Head |
| | Proposed Modified Signal Head | | Existing Modified Signal Head |
| | Proposed Pedestrian Signal Head | | Existing Pedestrian Signal Head |
| | Proposed Signal Pole with Guy | | Existing Signal Pole with Guy |
| | Proposed Inductive Loop Detector | | Existing Inductive Loop Detector |
| | Proposed Controller & Cabinet | | Existing Controller & Cabinet |
| | Proposed Junction Box | | Existing Junction Box |
| | Proposed 2-in Underground Conduit | | Existing 2-in Underground Conduit |
| | Proposed Right of Way | | Existing Right of Way |
| | Proposed Directional Arrow | | Existing Directional Arrow |
| | Proposed Metal Strain Pole | | Existing Metal Strain Pole |
| | Proposed Out of Pavement Detector | | Existing Out of Pavement Detector |
| | Proposed Out of Pavement Detection Zone | | Existing Out of Pavement Detection Zone |
| | Proposed No U-Turn Sign (R3-4) | | Existing No U-Turn Sign (R3-4) |
| | Proposed No Left Turn Sign (R3-2) | | Existing No Left Turn Sign (R3-2) |
| | Proposed No Right Turn Sign (R3-1) | | Existing No Right Turn Sign (R3-1) |
| | Proposed Combined Through and Left Arrow Sign (R3-6L) | | Existing Combined Through and Left Arrow Sign (R3-6L) |
| | Proposed Through Arrow "ONLY" Sign (R3-5A) | | Existing Through Arrow "ONLY" Sign (R3-5A) |
| | Proposed Right Arrow "ONLY" Sign (R3-5R) | | Existing Right Arrow "ONLY" Sign (R3-5R) |



Signal Upgrade

	<p>US 64 Business (Knightdale Blvd.) at I-540 Westbound Ramps</p>		
	<p>Division 5 Wake County Knightdale</p>	<p>Prepared by: C.E. Carter</p>	
<p>Scale: 1"=40'</p>	<p>Plan Date: January 2012</p>	<p>Revisions:</p>	<p>Signature: [Signature] Date: 2/10/12</p>

PHASING DIAGRAM



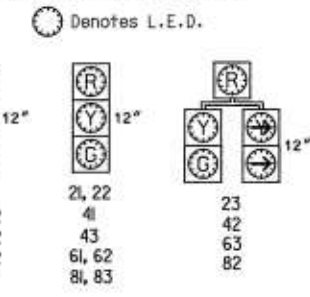
PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE							
	Ø1+5	Ø2+6	Ø3+7	Ø4+8	Ø1+5	Ø2+6	Ø3+7	Ø4+8
II	-	-	-	-	-	-	-	-
21, 22	R	R	G	G	R	R	R	Y
23	R	R	G	G	R	R	R	Y
31, 32	-	-	-	-	-	-	-	-
41, 43	R	R	R	R	R	R	G	G
42	R	R	R	R	R	R	G	G
51, 52	-	-	-	-	-	-	-	-
61, 62	R	G	R	G	R	R	R	Y
63	R	G	R	G	R	R	R	Y
71, 72	-	-	-	-	-	-	-	-
81, 83	R	R	R	R	R	G	R	G
82	R	R	R	R	G	R	G	R

SIGNAL FACE I.D.



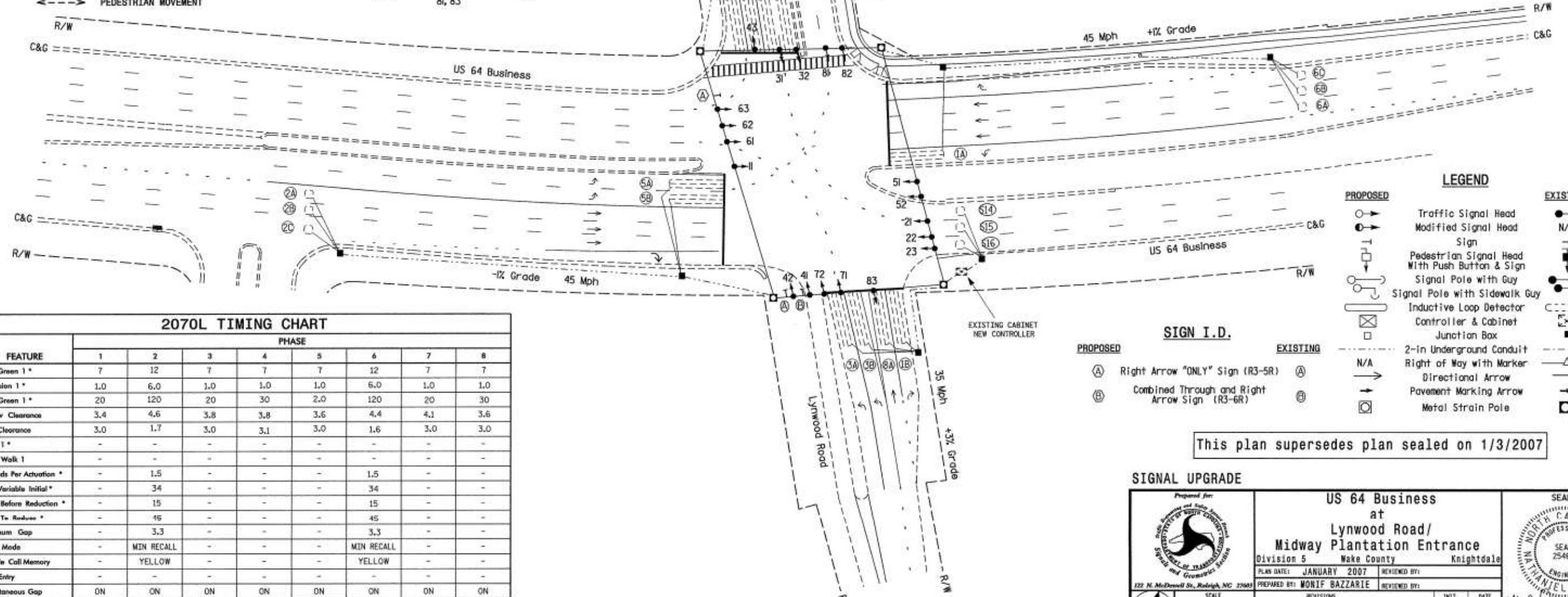
2070L LOOP & DETECTOR INSTALLATION

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING				SYSTEM LOOP	NEW CARD
					PHASE	CALLING	EXTENSION	PULL TIME DELAY		
1A	6X40	0	2-4-2	-	1	Y	Y	-	-	Y
1B	6X40	0	2-4-2	-	1	Y	Y	-	15	Y
2A	6X6	300	5	-	2	Y	Y	-	-	Y
2B	6X6	300	5	-	2	Y	Y	-	-	Y
2C	6X6	300	5	-	2	Y	Y	-	-	Y
3A	6X40	0	2-4-2	-	3	Y	Y	-	-	Y
3B	6X40	0	2-4-2	-	3	Y	Y	-	-	Y
4A	6X40	0	2-4-2	-	4	Y	Y	-	-	Y
5A	6X40	0	2-4-2	-	5	Y	Y	-	-	Y
5B	6X40	0	2-4-2	-	5	Y	Y	-	-	Y
5C	6X40	0	2-4-2	-	5	Y	Y	-	-	Y
6A	6X6	300	5	-	6	Y	Y	-	-	Y
6B	6X6	300	5	-	6	Y	Y	-	-	Y
6C	6X6	300	5	-	6	Y	Y	-	-	Y
7A	6X40	0	2-4-2	-	7	Y	Y	-	-	Y
7B	6X40	0	2-4-2	-	7	Y	Y	-	-	Y
8A	6X40	0	2-4-2	-	8	Y	Y	-	-	Y
S14	6X6	170	4	-	SYSTEM DETECTOR				Y	Y
S15	6X6	170	4	-	SYSTEM DETECTOR				Y	Y
S16	6X6	170	4	-	SYSTEM DETECTOR				Y	Y

8 Phase Fully Actuated (US 64 Business Knightdale Closed Loop Signal System)

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 or phase 5 may be lagged.
- Phase 3 or phase 7 may be lagged.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Closed loop system data: Local Comm Addr # 3, Area Assignment # 1, Area Address # 3.



2070L TIMING CHART

FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Min Green 1*	7	12	7	7	7	12	7	7
Extension 1*	1.0	6.0	1.0	1.0	1.0	6.0	1.0	1.0
Max Green 1*	20	120	20	30	2.0	120	20	30
Yellow Clearance	3.4	4.6	3.8	3.8	3.6	4.4	4.1	3.6
Red Clearance	3.0	1.7	3.0	3.1	3.0	1.6	3.0	3.0
Walk 1*	-	-	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-	-	-
Seconds Per Actuation*	-	1.5	-	-	-	1.5	-	-
Max Variable Initial*	-	34	-	-	-	34	-	-
Time Before Reduction*	-	15	-	-	-	15	-	-
Time To Reduce*	-	16	-	-	-	45	-	-
Minimum Gap	-	3.3	-	-	-	3.3	-	-
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL	-	-
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW	-	-
Dual Entry	-	-	-	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND

- | PROPOSED | EXISTING |
|--|----------|
| ○ → Traffic Signal Head | ● → N/A |
| ○ → Modified Signal Head | ○ → N/A |
| ○ → Sign | ○ → N/A |
| ○ → Pedestrian Signal Head With Push Button & Sign | ○ → N/A |
| ○ → Signal Pole with Guy | ○ → N/A |
| ○ → Signal Pole with Sidewalk Guy | ○ → N/A |
| ⊗ → Inductive Loop Detector | ⊗ → N/A |
| □ → Controller & Cabinet Junction Box | □ → N/A |
| □ → 2-in Underground Conduit | □ → N/A |
| → → Right of Way with Marker | → → N/A |
| → → Directional Arrow | → → N/A |
| → → Pavement Marking Arrow | → → N/A |
| □ → Metal Strain Pole | □ → N/A |

SIGN I.D.

- Ⓐ Right Arrow "ONLY" Sign (R3-5R)
- Ⓑ Combined Through and Right Arrow Sign (R3-6R)

This plan supersedes plan sealed on 1/3/2007

SIGNAL UPGRADE

Prepared for
Wake County
Department of Transportation
Signal and Geometric Section

US 64 Business at Lynwood Road/ Midway Plantation Entrance

Division 5 Wake County Knightdale

PLAN DATE: JANUARY 2007 REVIEWED BY:

PREPARED BY: MONIF BAZZARIE REVIEWED BY:

SEAL

THANIEL BITTINS

ENGINEER

25463

122 N. McDowell St., Raleigh, NC 27603

SCALE: 1" = 40'

REVISIONS

NO.	DESCRIPTION	INIT.	DATE

SIG. INVENTORY NO. 05-2207

02-01-2007 09:24 A:\176 signal\work\project\work\group\41-111\05-40-us-64-c1\072317_sig_dgn_20070103.dgn