

Eastgate 540

Knightsdale, NC

Prepared for Sherrie Chaffin
Trinity Capital
440 S Church Street, Suite 800
Charlotte, NC 28202

Prepared by **VHB Engineering NC, P.C. (C-3705)**
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
919.829.0328 • Fax 919.829.0329
www.vhb.com

January 25, 2021





Executive Summary

Project Background

Trinity Capital has plans to develop a parcel of land on the east side of Hodge Road, south of US 64/264/I-87, in Knightdale, NC (Figure 1). The project will effectively be an expansion of the existing Eastgate 540 Industrial Park, which is partially constructed and occupied. The project currently has two options for development. Option 1 is 204,000 square feet of industrial warehouse and Option 2 is a 160,000 square foot same day delivery warehouse facility. Both options will have access to Spectrum Drive with an estimated opening at the end of 2021.

Based on a Memorandum of Understanding email on January 13, 2021 between the project team and Town of Knightdale staff, the following intersections were included in the study area and were analyzed for existing and future conditions, where applicable:

- Hodge Road and US 64/264/I-87 WB Ramps/Old Faison Road (signalized)
- Hodge Road and US 64/264/I-87 EB Ramps (signalized)
- Hodge Road and Panther Rock Boulevard/Ellen Drive (unsignalized)
- Hodge Road and Spectrum Drive/Future Harding Hill Lane (signalized)
- Hodge Road and Poole Road (signalized)

The Town indicated that there are four developments in the area that are currently in the TIA review process. As a result, the Town required these be included in the background analysis. In addition, the Town of Knightdale requires that Build analysis be conducted for the build year and 10 years after.

As a result, the following traffic scenarios were analyzed for weekday AM and PM peak hour level of service utilizing *Synchro* and *Highway Capacity Software*:

- Existing (2021) - includes peak hour volumes based on turning movement count data collected at the study area intersections as part of recent studies in the area with a three percent (3%) annual growth between the collected year (2017) and existing year (2021).
- Background (2022) - includes Existing (2021) scenario peak hour volumes with a three percent (3%) annual growth between the existing (2021) and future year (2022), as well as projected traffic and improvements from four nearby developments in the area.



- Build (2022) – includes Background (2022) scenario peak hour volumes with projected site trips from the proposed development.
- Background (2032) – includes Background (2022) scenario peak hour volumes with a three percent (3%) annual growth between 2022 and 2032, as well as projected traffic and improvements from four nearby developments in the area.
- Build (2032) – includes Background (2032) scenario peak hour volumes and projected site trips from the proposed development.

Existing (2021) Conditions

Existing analyses were conducted based on current roadway geometrics and traffic data from previous studies at study area intersections. A traffic growth rate of three percent (3%) was applied to previous year traffic data.

As reported in the Summary Level of Service (LOS) table on page vi, all of the signalized intersections within the study area are operating at acceptable overall levels of service during the AM and PM peak hours, with the exception of the Hodge Road and Poole Road intersection, which is currently operating at LOS F during both peak hours. The stop-controlled, eastbound Panther Rock Boulevard approach along Hodge Road is also operating at LOS F during the AM and PM peak hours. The stop-controlled, westbound Ellen Drive approach along Hodge Road is also operating at LOS E during the AM and PM peak hours.

Background (2022) Conditions

For this analysis, the Town of Knightdale is requiring an annual growth rate of three percent (3%) be applied to the existing traffic to account for the normal growth between the base year (2021) and the build year (2022).

In addition to applying an annual growth rate to the existing volumes, traffic from four (4) nearby developments was also individually included. These developments are currently in the TIA review process.

Per the Timmons Summary TIA, the following improvements were included:

- Hodge Road and US 64/264/I-87 WB Ramps/Old Faison Road
 - Construct an exclusive westbound left-turn lane that provides 125 feet of storage.
 - Construct an exclusive northbound right-turn lane that provides 200 feet of storage.
- Hodge Road and US 64/264/I-87 EB Ramp
 - Construct an exclusive second eastbound right-turn lane that provides 150 feet of storage.



- Widen southbound Hodge Road from US-64 EB Ramps to Spectrum Drive
- Hodge Road and Panther Rock Boulevard/Ellen Drive
 - Construct an exclusive southbound right-turn lane that provides 200 feet of storage.
 - Widen northbound Hodge Road to north of Faison Ridge Lane
 - Widen southbound Hodge Road (included above)
 - Install a signal.
- Hodge Road and Spectrum Drive
 - Construction of exclusive northbound left-turn lane that provides 100 feet of storage.
 - Terminate southbound Hodge Road widening as right turn lane
 - Widen northbound Hodge Road to north of Faison Ridge Lane (included above)
- Hodge Road and Poole Road
 - Construct an exclusive westbound right-turn lane that provides 200 feet of storage.

Based on the Background (2022) analysis, all of the signalized intersections within the study area are expected to operate at acceptable overall levels of service during the AM and PM peak hours, with the exception of the Hodge Road and US 64/264/I-87 WB Ramp intersection, is projected to degrade to LOS F in the PM peak hour.

Trip Generation and Assignment

The project currently has two options for development. Option 1 is 204,000 square feet of industrial warehouse and Option 2 is a 160,000 square foot warehouse with an expedited delivery service that could generate additional trips. Trip generation for Option 1 was prepared using the *Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition* and NCDOT's Rate vs Equation guidance for a warehouse (Land Use Code 150). Trip generation for Option 2 was prepared based on the smaller building square footage, however some expected deliveries were added. For Option 2, there are expected to be approximately 50 drivers making deliveries every 2 hours starting towards the end of the adjacent street AM peak hour and running through the PM peak hour. In addition, approximately 7 large tractor-trailer truck deliveries are expected at the warehouse over the course of each day. The primary warehouse employee shift is expected to occur prior to the AM adjacent street peak hour, and they will leave prior to the PM adjacent peak hour. Option 2 provides the more conservative analysis since it results in more site generated trips than Option 1. The site is expected to generate 562 trips per day with 97 trips (60 entering/37 exiting) occurring in the AM peak hour and 99 trips (39 entering/60 exiting) occurring in the PM peak hour.



Build (2022) Conditions

The Build (2022) conditions account for both the Background (2022) traffic and the site traffic generated by the proposed development.

As shown on the Summary LOS table on page vi, all of the signalized intersections within the study area are operating at acceptable overall levels of service during the AM and PM peak hours, with the exception of the Hodge Road and US 64/264/I-87 WB Ramp intersection, which is projected to continue to operate to LOS F in the PM peak hour.

Roadway Improvement Recommendations

As indicated in the traffic operations analyses, the proposed development is projected to have a slight impact on the traffic operations of the surrounding roadway network and intersections. Therefore, after the build-out of the development is completed at the end of 2021, no offsite roadway improvements should be considered.

Background (2032) Conditions

The Town of Knightdale requires a Build analysis to be conducted for the build year (2022) and a period 10 years beyond (2032). For this analysis, the Town of Knightdale is requiring an annual growth rate of three percent (3%) be applied to the existing traffic to account for the normal growth between the build year (2022) and the future analysis year (2032).

In addition to applying an annual growth rate to the existing volumes, traffic from four (4) nearby developments was also individually included. These developments are currently in the TIA review process.

Based on the Background (2032) analysis, all of the signalized intersections within the study are projected to fail in at least one peak hour with the exception of the Hodge Road at Panther Rock Boulevard intersection.

Build (2032) Conditions

The Build (2032) conditions include the Background (2032) peak hour volumes with a three percent (3%) annual growth for an additional 10 years beyond the build-out of the proposed development, and projected site trips from the proposed development.



As shown on the Summary LOS table on page vi, all of the signalized intersections within the study are projected to continue to fail in at least one peak hour with the exception of the Hodge Road at Panther Rock Boulevard intersection.

Per the Town's Arterial & Collector Street Plan, Hodge Road is identified as an existing arterial that needs improvements within the study area, while the Town's Functional Class Plan identifies Hodge Road as a boulevard with 100 feet of right-of-way. In addition, the City of Raleigh's 2030 Comprehensive Plan depicts Hodge Road as a four-lane, divided avenue within the study area. Several studies in the area have already identified additional thru lanes along Hodge Road as a needed improvement in the future. There are sections along Hodge Road where developments have provided frontage widening via striped out pavement, so that Hodge Road can be improved in the future with additional thru lanes. The Town and NCDOT should continue to pursue the ultimate widening of Hodge Road as planned.

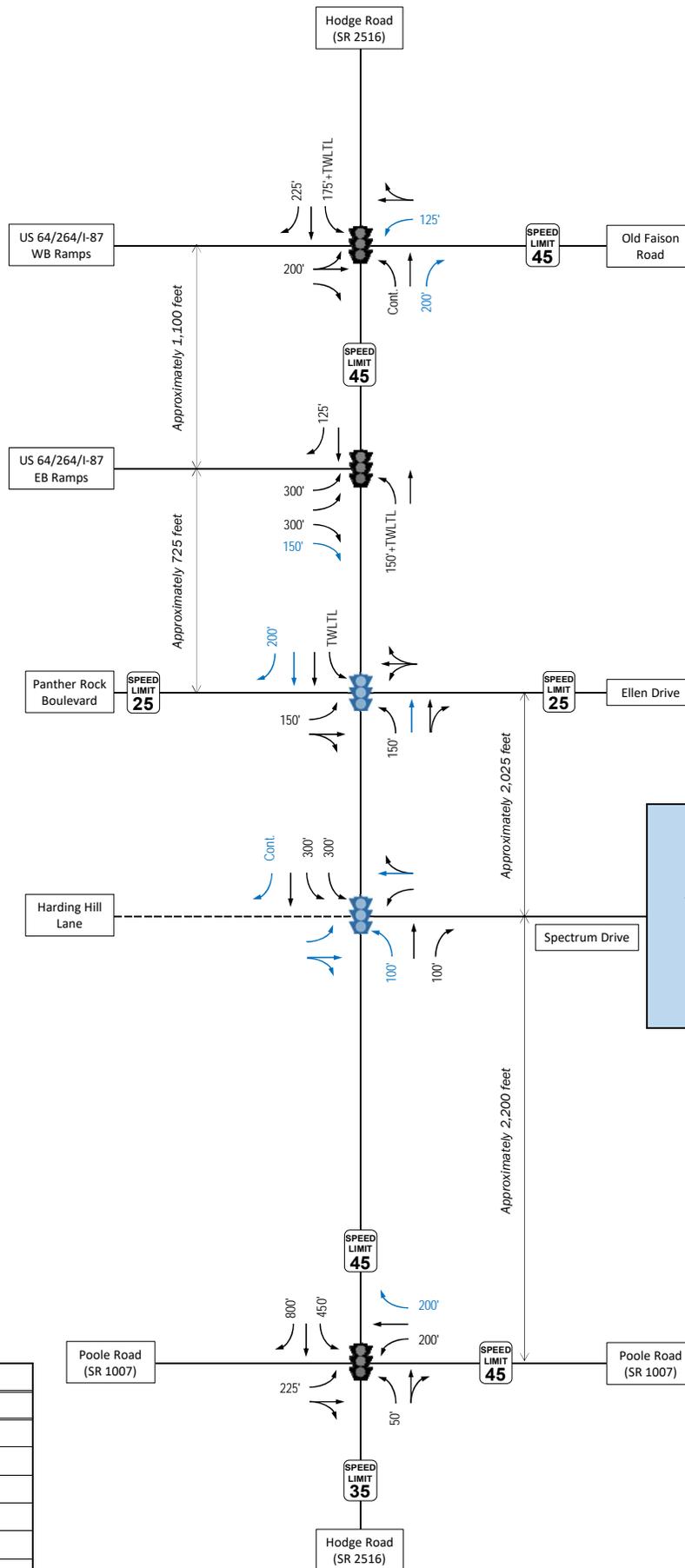
In addition, the construction of R-2829 (NC 540 - Eastern Wake Freeway) is scheduled to begin construction in 2026 which will alter traffic patterns in 2032.



Summary Level of Service Table

Intersection and Approach	Traffic Control	Existing (2021)		Background (2022)		Build (2022)		Background (2032)		Build (2032)	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Hodge Road (SR 2516) at US 64/264/I-87 WB Ramps/Old Faison Road (SR 2515)	Signalized	C (30.5)	C (28.1)	D (35.7)	C (31.0)	D (37.3)	C (31.2)	F (88.7)	D (53.6)	F (91.0)	D (53.9)
Eastbound		B-20.0	C-20.4	E-59.0	D-54.5	E-59.3	D-54.3	F-139.0	F-100.9	F-136.0	F-100.7
Westbound		E-68.9	E-73.1	C-34.2	D-47.9	C-34.4	D-48.0	E-55.5	E-65.4	E-55.6	E-65.6
Northbound		C-21.4	C-23.1	C-30.8	A-5.3	C-33.4	A-5.9	F-93.6	A-9.2	F-98.2	A-9.4
Southbound		B-16.6	C-28.3	C-25.0	D-48.6	C-26.9	D-49.4	E-65.8	F-80.5	E-69.7	F-83.3
Hodge Road (SR 2516) at US 64/264/I-87 EB Ramps	Signalized	B (11.1)	C (33.3)	C (20.2)	F (81.0)	C (22.4)	F (85.1)	D (53.3)	F (175.2)	E (57.2)	F (180.7)
Eastbound		C-32.3	C-34.4	D-36.8	F-84.1	D-36.4	F-84.1	F-84.9	F-170.7	F-81.5	F-172.9
Northbound		A-4.6	C-34.0	B-16.3	E-68.7	B-19.5	E-75.9	D-46.3	F-128.0	D-48.3	F-136.7
Southbound		B-16.0	C-31.2	C-22.4	F-87.6	C-22.8	F-94.9	E-56.7	F-220.8	E-67.4	F-229.4
Hodge Road (SR 2516) at Panther Rock Boulevard/Ellen Drive (SR 2577)	Unsignalized/ Signalized	-	-	B (18.9)	B (14.2)	B (18.6)	B (14.1)	D (42.5)	C (32.5)	D (46.2)	D (35.8)
Eastbound		F-776.7	F-577.2	E-56.3	E-62.8	E-56.4	E-62.8	F-94.4	F-89.8	F-94.5	F-89.8
Westbound		E-38.9	E-41.0	E-55.1	E-66.7	E-55.1	E-66.7	F-109.6	F-80.1	F-109.6	F-80.1
Northbound		-	-	B-12.1	A-2.7	B-12.4	A-2.4	D-37.1	A-6.1	D-42.7	A-5.6
Southbound		-	-	A-8.3	B-12.6	A-7.9	B-12.9	C-22.3	D-37.1	C-25.2	D-43.0
Hodge Road (SR 2516) at Spectrum Drive/ Harding Hill Lane	Signalized	B (17.2)	B (13.5)	C (23.1)	D (42.7)	C (34.1)	D (46.6)	F (99.6)	F (123.9)	F (113.2)	F (130.4)
Eastbound		-	-	E-58.1	E-72.8	E-59.6	F-115.0	F-123.3	F-98.0	F-143.9	F-182.8
Westbound		D-46.0	E-55.2	D-52.2	F-86.2	E-57.4	F-123.3	F-97.3	F-99.0	F-104.9	F-141.4
Northbound		C-21.1	A-7.1	C-20.7	C-24.6	C-27.3	B-12.3	F-122.7	B-16.9	F-128.1	C-21.9
Southbound		A-4.5	B-10.1	C-20.2	D-41.7	D-40.9	D-42.5	D-40.5	F-173.4	E-76.4	F-173.0
Hodge Road (SR 2516) at Poole Road (SR 1007)	Signalized	F (125.5)	F (85.0)	D (47.8)	D (47.3)	D (49.3)	D (39.2)	F (128.5)	F (115.4)	F (130.4)	F (116.9)
Eastbound		F-142.9	E-73.7	E-59.4	E-66.5	E-66.3	E-62.0	F-152.8	F-132.0	F-152.5	F-134.4
Westbound		F-124.7	F-107.5	D-50.6	D-41.4	D-50.2	D-42.4	F-143.3	E-71.9	F-148.4	E-71.5
Northbound		E-64.5	B-14.4	E-79.7	E-76.5	F-80.5	F-85.9	F-187.2	F-199.4	F-181.6	F-202.6
Southbound		F-119.8	F-86.4	B-18.9	D-38.9	B-19.7	C-25.4	D-41.1	F-117.7	D-38.4	F-119.2

LEGEND: X = Overall signalized intersection LOS;
 (XX.X sec/veh) = Overall signalized intersection control delay in seconds; X = Approach LOS



LEGEND	
	Lane Configuration
	Background Lane Improvement
	Existing Roadway
	Future Roadway
	Existing Signalized Intersection
	Background Signal Improvement
	Existing Stop Controlled Approach



Figure ES-1
Future (2022) Lane Configuration and Traffic Control



Table of Contents

Introduction	1
Existing (2021) Conditions	4
Existing Roadway Conditions	4
Existing Turning Movement Data	9
Level of Service Criteria	9
Level of Service Analysis	10
Background (2022) Conditions	12
Background Growth and Development	12
Level of Service Analysis	14
Build (2022) Conditions	18
Trip Generation	18
Traffic Distribution and Assignment	19
Level of Service Analysis	23
Background (2032) Conditions	26
Background Growth and Development	26
Level of Service Analysis	27
Background (2032) Conditions	30
Level of Service Analysis	30
Findings and Conclusions	33

Appendices

APPENDIX A: Turning Movement Counts

APPENDIX B: Traffic Signal Plans

APPENDIX C: Intersection Capacity Analysis

APPENDIX D: Background Projects



Tables

Table No.	Description	Page
Table 1:	Level of Service Description for Intersections	9
Table 2:	Existing (2021) LOS Results	10
Table 3:	Background (2022) LOS Results	15
Table 4:	Option 1 Trip Generation Rates	18
Table 5:	Option 2 Trip Generation Rates	19
Table 6:	Build (2022) LOS Results	24
Table 7:	Background (2032) LOS Results	28
Table 8:	Build (2032) LOS Results	31
Table 9:	Summary of LOS Results	34

Figures

Figure No.	Description	Page
Figure 1:	Vicinity Map	2
Figure 2:	Site Plan	3
Figure 3:	Existing (2021) Lane Configurations and Traffic Control	8
Figure 4:	Existing (2021) AM and PM Peak Hour Turning Movement Volumes	11
Figure 5:	Background (2022) AM and PM Peak Hour Turning Movement Volumes	16
Figure 6:	Background (2022) Lane Geometrics and Traffic Control	17
Figure 7:	Directional Distribution Percentages	21
Figure 8:	AM and PM Peak Hour Site Trips	22
Figure 9:	Build (2022) AM and PM Peak Hour Turning Movement Volumes	25
Figure 10:	Background (2032) AM and PM Peak Hour Turning Movement Volumes	29
Figure 11:	Build (2032) AM and PM Peak Hour Turning Movement Volumes	32
Figure 12:	Future (2022) Lane Configurations and Traffic Control	35

Introduction

Trinity Capital has plans to develop a parcel of land on the east side of Hodge Road, south of US 64/264/I-87, in Knightdale, NC (Figure 1). The project currently has two options for development. Option 1 is 204,000 square feet of industrial warehouse and Option 2 is a 160,000 square foot same day delivery facility. Both options will have access to Spectrum Drive with an estimated opening at the end of 2021.

Based on a Memorandum of Understanding email on January 13, 2021 between the project team and Town of Knightdale staff, the following intersections were included in the study area and were analyzed for existing and future conditions, where applicable:

- Hodge Road and US 64/264/I-87 WB Ramps/Old Faison Road (signalized)
- Hodge Road and US 64/264/I-87 EB Ramps (signalized)
- Hodge Road and Panther Rock Boulevard/Ellen Drive (unsignalized)
- Hodge Road and Spectrum Drive/Future Harding Hill Lane (signalized)
- Hodge Road and Poole Road (signalized)

Trinity Capital retained VHB Engineering NC, P.C. to analyze the potential traffic impacts of the proposed development and to identify any necessary roadway improvements. This Traffic Impact Analysis (TIA) summarizes trip generation, distribution, traffic assignment, and traffic analyses for the proposed development.



Figure 1: Vicinity Map



Figure 2: Site Plan

Existing (2021) Conditions

Existing Roadway Conditions

This section describes the existing roadways in the vicinity of the proposed development. Average Annual Daily Traffic (AADT) data for the surrounding network of roadway were obtained from the North Carolina Department of Transportation (NCDOT). The most recent AADT counts from the NCDOT are for 2019 on the study area roadways.

Hodge Road (SR 2516)

- The cross-section along Hodge Road varies from a three-lane cross-section north of Panther Rock Boulevard to a two-lane cross-section south of Panther Rock Boulevard. The posted speed limit along Hodge Road is 45 miles per hour (mph) north of Poole Road and 35 mph south of Poole Road.
- The land uses along Hodge Road are a mix of residential, industrial, open space, and commercial space.
- According to the NCDOT, the 2019 AADT on Hodge Road was 16,000 vehicles per day (vpd) south of US 64/264/I-87.



Looking south along Hodge Road at Spectrum Drive intersection



Looking north along Hodge Road at Spectrum Drive intersection

Poole Road (SR 1007)

- Poole Road is a two-lane roadway with a posted speed limit of 45 mph within the study area.
- The land uses along Poole Road are a mix of residential, commercial space, and open space within the study area.
- According to the NCDOT, the 2019 AADT on Poole Road was 11,000 vpd west of Hodge Road and 13,000 east of Hodge Road.



Looking east along Poole Road from the Hodge Road intersection



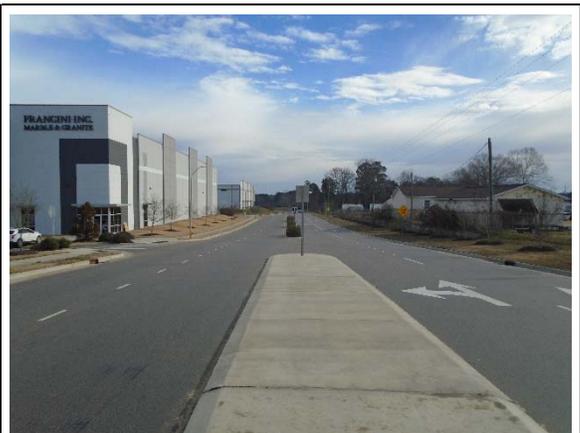
Looking west along Poole Road at the Hodge Road intersection

Spectrum Drive

- Spectrum Drive is a four-lane commercial driveway with a posted speed limit of 25 mph within the study area.
- The land use along Spectrum Drive is industrial within the study area.
- No AADT information is available from the NCDOT along Spectrum Drive within the study area.



Looking west along Spectrum Drive at Hodge Road intersection



Looking east along Spectrum Drive from Hodge Road intersection

Ellen Drive (SR 2557)

- Ellen Drive is a two-lane roadway with a posted speed limit of 25 mph.
- The land use along Ellen Drive is residential.
- No AADT information is available from the NCDOT along Ellen Drive within the study area.



Looking east along Ellen Drive from the Hodge Road intersection



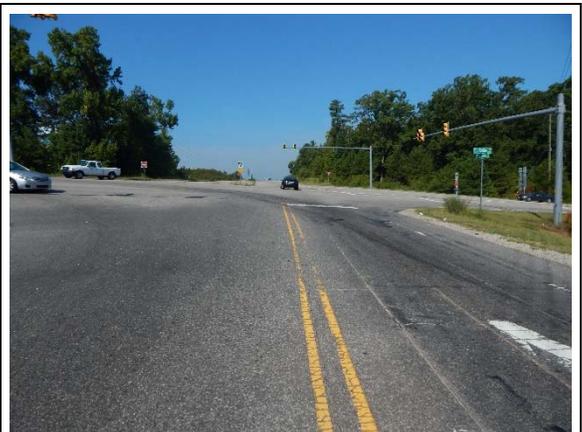
Looking west along Ellen Drive at the Hodge Road intersection

Old Faison Road (SR 2515)

- Old Faison Road is a two-lane roadway with a posted speed limit of 45 mph.
- The land uses along Old Faison Road is primarily open space and residential within the study area.
- No AADT information is available from the NCDOT along Old Faison Road within the study area.



Looking east along Old Faison Road from the Hodge Road intersection



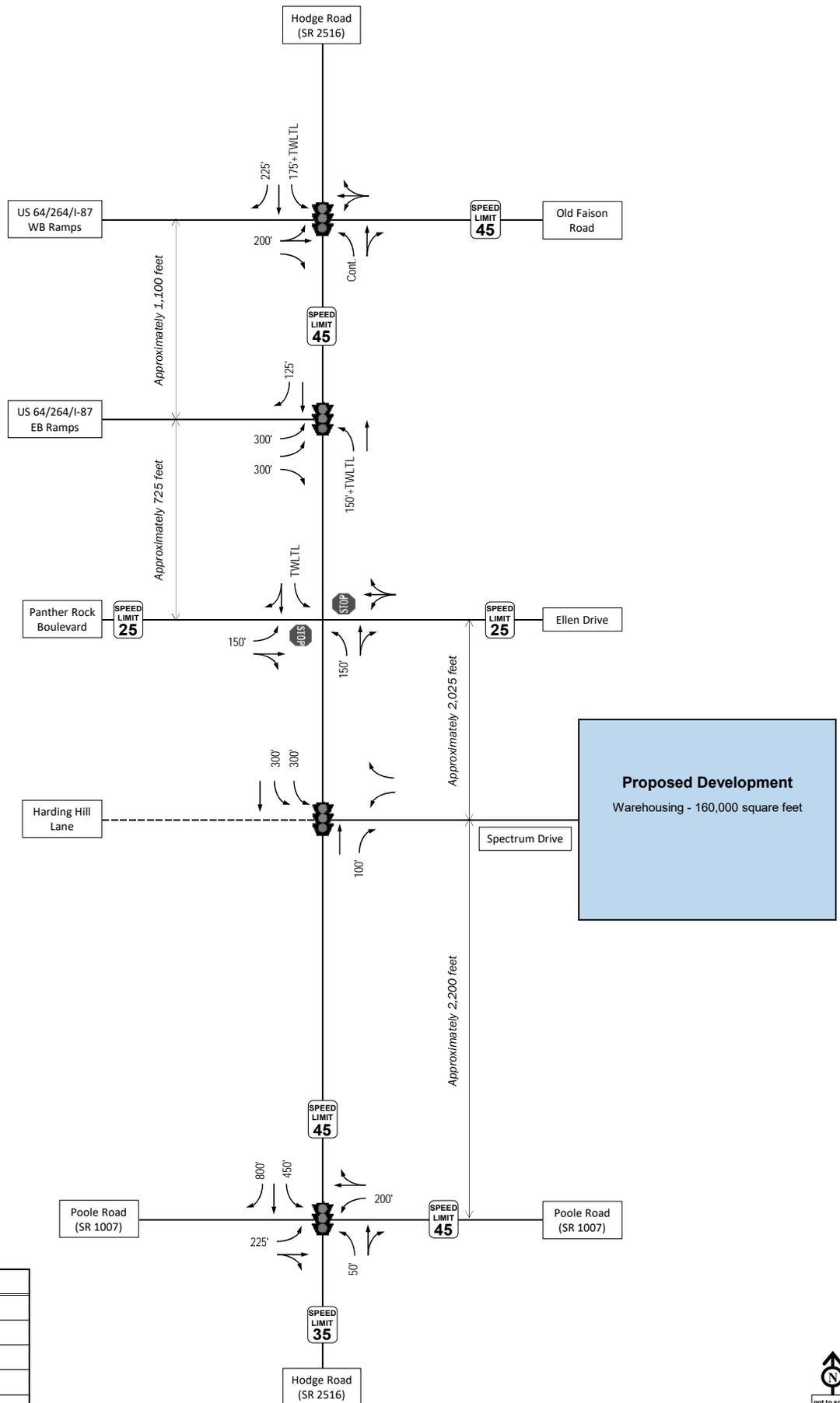
Looking west along Old Faison Road at the Hodge Road intersection

US 64/264/I-87

- US 64/264/I-87 is a six-lane divided freeway with a posted speed limit of 70 mph that serves traffic between Raleigh and Greenville/Rocky Mount.
- The intersection with Hodge Road is a grade-separated half-clover leaf.
- The Westbound Ramps form a signalized four-leg intersection with Hodge Road and Old Faison Road.
- The Eastbound Ramps form a signalized three-leg intersection with Hodge Road.
- According to the NCDOT, the 2019 AADT on US 64/264/I-87 was 88,500 vpd east of Hodge Road.



Figure 3 provides a schematic diagram of the existing roadways within the study area including the intersection geometrics and traffic control.



LEGEND	
	Lane Configuration
	Existing Roadway
	Future Roadway
	Existing Signalized Intersection
	Existing Stop Controlled Approach



Figure 3
Existing (2021) Lane Configuration and Traffic Control





Existing Turning Movement Data

Due to current COVID-19 conditions, the turning movement counts used in this TIA were obtained from historical counts within studies in the area that are currently in the TIA review process. For this analysis, the Town of Knightdale is requiring an annual growth rate of three percent (3%) be applied to the existing traffic to account for the normal growth between the data collection year (2017) and the existing year (2021). A summary of the 2017 traffic counts can be found in Appendix A.

Minor volume adjustments were made in order to ensure proper balancing along the corridor. The existing peak hour turning movement volumes are shown in Figure 4.

Level of Service Criteria

Peak hour level of service (LOS) measures the adequacy of the intersection geometrics and traffic controls of a particular intersection or approach for the given turning volumes. Levels of service range from A through F, based on the average control delay experienced by vehicles traveling through the intersection during the peak hour. Control delay represents the portion of total delay attributed to traffic control devices (e.g., signals or stop signs). The engineering professional generally accepts LOS D as an acceptable operating condition for signalized intersections in urban areas and LOS C for rural areas.

As unsignalized intersections, LOS E is generally considered acceptable only if the side street encounters the delay. Nevertheless, side streets sometimes function at LOS F during peak traffic periods; however, the traffic volume often does not warrant a traffic signal to assist side street traffic. Table 1 provides a general description of various levels of service categories and delay ranges.

Table 1: Level of Service Description for Intersections

Level of Service	Description	Signalized Intersection	Unsignalized Intersection
A	Little or no delay	<= 10 sec.	<= 10 sec.
B	Short traffic delay	10-20 sec.	10-15 sec.
C	Average traffic delay	20-35 sec.	15-25 sec.
D	Long traffic delay	35-55 sec.	25-35 sec.
E	Very long traffic delay	55-80 sec.	35-50 sec.
F	Unacceptable delay	> 80 sec.	> 50 sec.

Level of Service Analysis

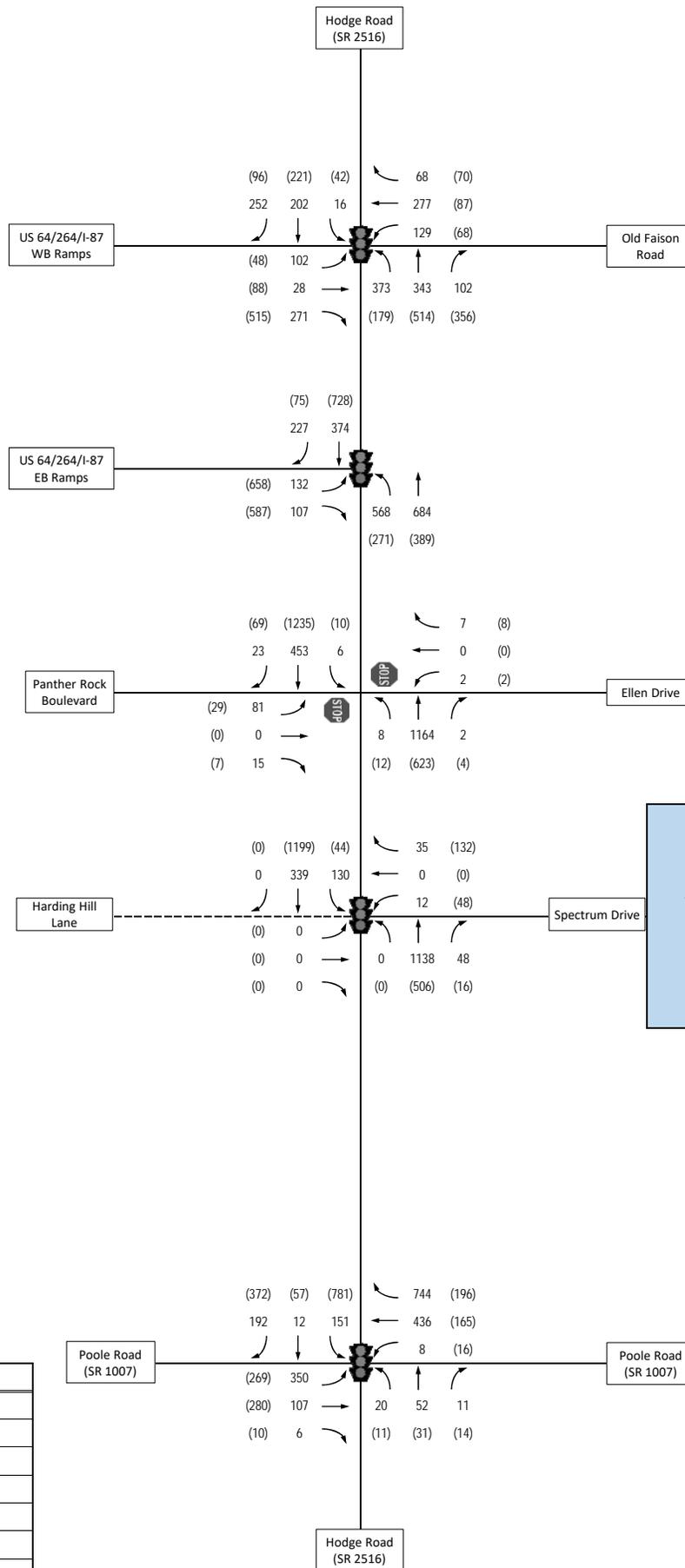
Intersection levels of service analyses were performed for the typical weekday AM and PM peak hours using *Synchro/SimTraffic Version 10*. The existing analysis utilized the existing signal plan and timings obtained from NCDOT which are included in Appendix B. A summary of the findings for the Existing (2021) scenario LOS analysis can be found in Table 2 and the full *Synchro/HCS* output can be found in Appendix C.

As reported in Table 2, all of the signalized intersections within the study area are operating at acceptable overall levels of service during the AM and PM peak hours, with the exception of the Hodge Road and Poole Road intersection, which is currently operating at LOS F during both peak hours. The stop-controlled, eastbound Panther Rock Boulevard approach along Hodge Road is also operating at LOS F during the AM and PM peak hours. The stop-controlled, westbound Ellen Drive approach along Hodge Road is also operating at LOS E during the AM and PM peak hours.

Table 2: Existing (2021) LOS Results

Intersection and Approach	Traffic Control	Existing (2021)	
		AM	PM
Hodge Road (SR 2516) at US 64/264/I-87 WB Ramps/Old Faison Road (SR 2515)	Signalized	C (30.5)	C (28.1)
Eastbound		B-20.0	C-20.4
Westbound		E-68.9	E-73.1
Northbound		C-21.4	C-23.1
Southbound		B-16.6	C-28.3
Hodge Road (SR 2516) at US 64/264/I-87 EB Ramps	Signalized	B (11.1)	C (33.3)
Eastbound		C-32.3	C-34.4
Northbound		A-4.6	C-34.0
Southbound		B-16.0	C-31.2
Hodge Road (SR 2516) at Panther Rock Boulevard/Ellen Drive (SR 2577)	Unsignalized	-	-
Eastbound		F-776.7	F-577.2
Westbound		E-38.9	E-41.0
Hodge Road (SR 2516) at Spectrum Drive/Harding Hill Lane	Signalized	B (17.2)	B (13.5)
Westbound		D-46.0	E-55.2
Northbound		C-21.1	A-7.1
Southbound		A-4.5	B-10.1
Hodge Road (SR 2516) at Poole Road (SR 1007)	Signalized	F (125.5)	F (85.0)
Eastbound		F-142.9	E-73.7
Westbound		F-124.7	F-107.5
Northbound		E-64.5	B-14.4
Southbound		F-119.8	F-86.4

LEGEND: X = Overall signalized intersection LOS;
(XX.X sec/veh) = Overall signalized intersection control delay in seconds; X = Approach LOS



Proposed Development
Warehousing - 160,000 square feet

LEGEND	
	Turning Movement
	Existing Roadway
	Future Roadway
	Existing Signalized Intersection
	Existing Stop Controlled Approach
XX	AM Peak Hour Turning Movement Volume
(XX)	PM Peak Hour Turning Movement Volume



Figure 4
Existing (2021) AM and PM Peak Hour
Turning Movement Volumes



Background (2022) Conditions

Background Growth and Development

The Background (2022) scenario includes Existing (2021) scenario peak hour volumes with annual growth of three percent (3%) applied as well as projected traffic and improvements from four (4) nearby developments. These developments are currently in construction. Committed elements associated with the developments were included in the Background (2022) analysis.

Cheswick North

Located on the west side of Hodge Road, south of the US 64/264/I-87 interchange in Knightdale, NC, this residential development is proposed to consist of 228 apartments, 352 single-family homes and 120 townhomes, with an anticipated build-out year of 2020. A traffic analysis report was prepared by Ramey Kemp and submitted to the Town of Knightdale in February 2015. As detailed in the report, the development is projected to generate 5,600 daily trips, 431 AM peak hour trips (97 entering, 334 exiting), and 539 PM peak hour trips (345 entering, 194 exiting). These trips were distributed to the study area based on the assumed distribution patterns in the report. Field visits indicate that the development is partially constructed; therefore, only 100% of Phase II (100 single family homes the traffic associated with the development was included in the Background (2022) analysis.

SilverStone

Located on the west side of Hodge Road, south of the US 64/264/I-87 interchange in Knightdale, NC, this residential development is proposed to consist of 282 single-family homes and 108 townhomes with an anticipated build-out year of 2020. A traffic analysis report was prepared by Ramey Kemp and submitted to the Town of Knightdale in October 2016. As detailed in the report, the development is projected to generate 3,320 daily trips, 260 AM peak hour trips (61 entering, 199 exiting), and 338 PM peak hour trips (216 entering, 122 exiting). These trips were distributed to the study area based on the assumed distribution patterns in the report. Field visits indicate that the development is under construction; In 2017, Timmons provided an updated summary to the SilverStone and StoneRiver Developments and projected the Silverstone development to be 87% complete by 2022. Those trips were included in the Background (2022) analysis.



StoneRiver

Located on the west side of Hodge Road, south of the US 64/264/I-87 interchange in Knightdale, NC, this residential development is proposed to consist of 286 single-family homes and 98 townhomes with an anticipated build-out year of 2020. A traffic analysis report was prepared by Ramey Kemp and submitted to the Town of Knightdale in June 2016. As detailed in the report, the development is projected to generate 3,320 daily trips, 258 AM peak hour trips (61 entering, 197 exiting), and 337 PM peak hour trips (214 entering, 123 exiting). These trips were distributed to the study area based on the assumed distribution patterns in the report. Field visits indicate that the development is under construction; In 2017, Timmons provided an updated summary to the SilverStone and Stone River Developments and projected the StoneRiver development to be 91% complete by 2022. Those trips were included in the Background (2022) analysis.

Hodge Road Industrial

Located on the east side of Hodge Road at Spectrum Drive in Knightdale, NC, this industrial development is proposed to consist of 988,000 square feet of warehouse space with an anticipated build-out year of 2020. A traffic analysis report was prepared by VHB and submitted to the Town of Knightdale in September 2015. As detailed in the report, the development is projected to generate 707 daily trips, 291 AM peak hour trips (230 entering, 61 exiting), and 258 PM peak hour trips (65 entering, 193 exiting). These trips were distributed to the study area based on the assumed distribution patterns in the report. Field visits indicate that the development is partially constructed; therefore, 75% of the traffic associated with the development was included in the Background (2022) analysis.

Per the Timmons Summary TIA, the following improvements were included:

- Hodge Road and US 64/264/I-87 WB Ramps/Old Faison Road
 - Construct an exclusive westbound left-turn lane that provides 125 feet of storage.
 - Construct an exclusive northbound right-turn lane that provides 200 feet of storage.
- Hodge Road and US 64/264/I-87 EB Ramp
 - Construct an exclusive second eastbound right-turn lane that provides 150 feet of storage.
 - Widen southbound Hodge Road from US-64 EB Ramps to Spectrum Drive
- Hodge Road and Panther Rock Boulevard/Ellen Drive
 - Construct an exclusive southbound right-turn lane that provides 200 feet of storage.
 - Widen northbound Hodge Road to north of Faison Ridge Lane
 - Widen southbound Hodge Road (included above)
 - Install a signal.



- Hodge Road and Spectrum Drive
 - Construction of exclusive northbound left-turn lane that provides 100 feet of storage.
 - Terminate southbound Hodge Road widening as right turn lane
 - Widen northbound Hodge Road to north of Faison Ridge Lane (included above)
- Hodge Road and Poole Road
 - Construct an exclusive westbound right-turn lane that provides 200 feet of storage.

All supporting documentation for the approved development trips, including the total projected site trips from the approved developments, are included in Appendix D. The Background (2022) peak hour volumes are shown in Figure 5, and the assumed lane geometrics and traffic control analyzed in the Background (2022) scenario are shown in Figure 6.

Level of Service Analysis

Intersection levels of service analyses were performed for the typical weekday AM and PM peak hours using *Synchro/SimTraffic Version 10*. The newly signalized intersections were optimized within *Synchro* as part of the future year analysis. A summary of the findings for the Background (2022) scenario LOS analysis can be found in Table 3 and the full *Synchro/HCS* output can be found in Appendix C.

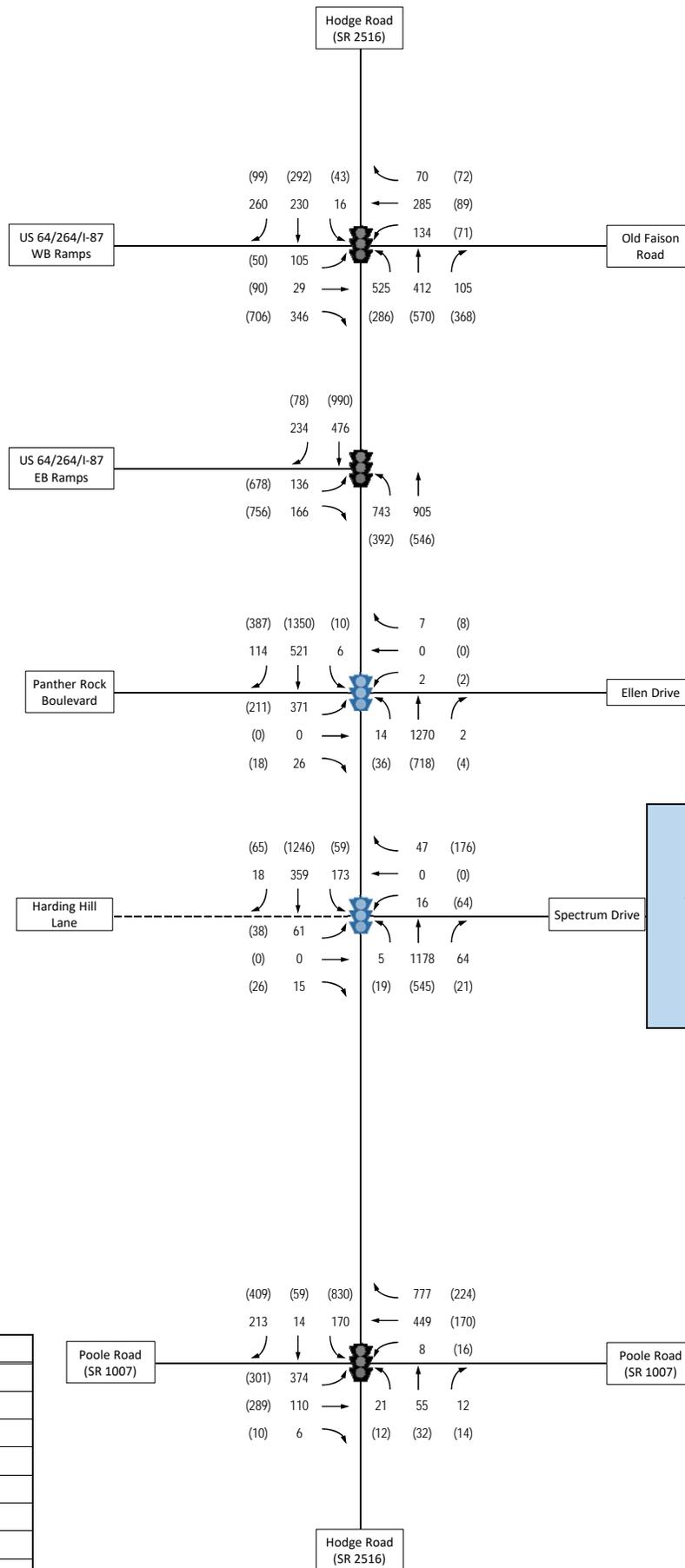
As reported in Table 3, all of the signalized intersections within the study area are expected to operate at acceptable overall levels of service during the AM and PM peak hours, with the exception of the Hodge Road and US 64/264/I-87 WB Ramp intersection, is projected to degrade to LOS F in the PM peak hour.



Table 3: Background (2022) LOS Results

Intersection and Approach	Traffic Control	Background (2022)	
		AM	PM
Hodge Road (SR 2516) at US 64/264/I-87 WB Ramps/Old Faison Road (SR 2515)	Signalized	D (35.7)	C (31.0)
Eastbound		E-59.0	D-54.5
Westbound		C-34.2	D-47.9
Northbound		C-30.8	A-5.3
Southbound		C-25.0	D-48.6
Hodge Road (SR 2516) at US 64/264/I-87 EB Ramps	Signalized	C (20.2)	F (81.0)
Eastbound		D-36.8	F-84.1
Northbound		B-16.3	E-68.7
Southbound		C-22.4	F-87.6
Hodge Road (SR 2516) at Panther Rock Boulevard/Ellen Drive (SR 2577)	Signalized	B (18.9)	B (14.2)
Eastbound		E-56.3	E-62.8
Westbound		E-55.1	E-66.7
Northbound		B-12.1	A-2.7
Southbound		A-8.3	B-12.6
Hodge Road (SR 2516) at Spectrum Drive/Harding Hill Lane	Signalized	C (23.1)	D (42.7)
Eastbound		E-58.1	E-72.8
Westbound		D-52.2	F-86.2
Northbound		C-20.7	C-24.6
Southbound		C-20.2	D-41.7
Hodge Road (SR 2516) at Poole Road (SR 1007)	Signalized	D (47.8)	D (47.3)
Eastbound		E-59.4	E-66.5
Westbound		D-50.6	D-41.4
Northbound		E-79.7	E-76.5
Southbound		B-18.9	D-38.9

LEGEND: X = Overall signalized intersection LOS;
 (XX.X sec/veh) = Overall signalized intersection control delay in seconds; X = Approach LOS



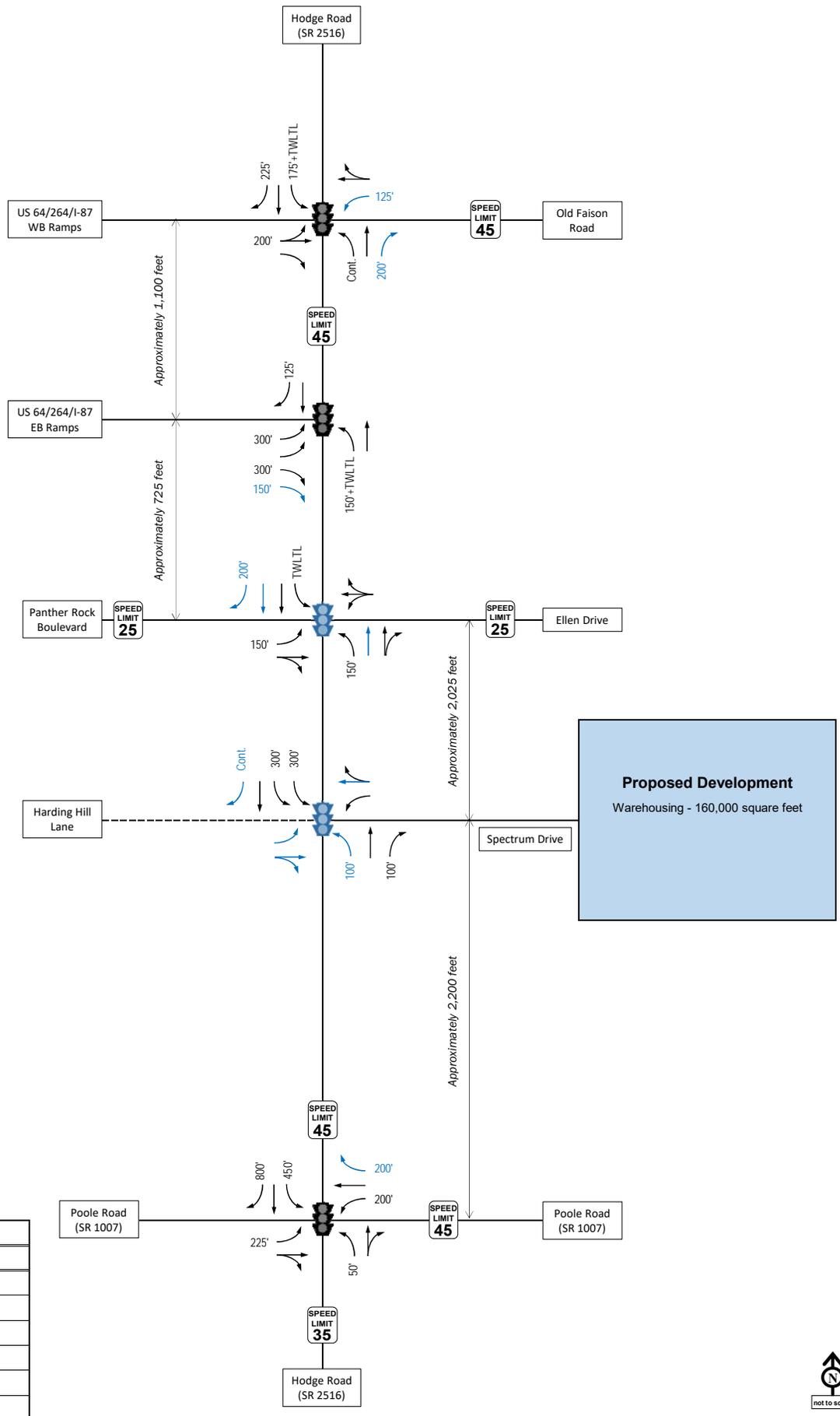
Proposed Development
Warehousing - 160,000 square feet

LEGEND	
→	Turning Movement
—	Existing Roadway
- -	Future Roadway
🚦	Existing Signalized Intersection
🚦	Background Signal Improvement
STOP	Existing Stop Controlled Approach
XX	AM Peak Hour Turning Movement Volume
(XX)	PM Peak Hour Turning Movement Volume



Figure 5
Background (2022) AM and PM Peak Hour
Turning Movement Volumes

Eastgate 540
Traffic Impact Analysis
Knightdale, NC



LEGEND	
	Lane Configuration
	Background Lane Improvement
	Existing Roadway
	Future Roadway
	Existing Signalized Intersection
	Background Signal Improvement
	Existing Stop Controlled Approach



Figure 6
No-Build (2022) Lane Configuration and Traffic Control



Build (2022) Conditions

Trinity Capital has plans to develop a parcel of land on the east side of Hodge Road, south of US 64/264/I-87, in Knightdale, NC (Figure 1). The project currently has two options for development. Option 1 is 204,000 square feet of industrial warehouse and Option 2 is a 160,000 square foot same day delivery facility. Both options will have access to Spectrum Drive with an estimated opening at the end of 2021.

Trip Generation

The project currently has two options for development. Option 1 is 204,000 square feet of industrial warehouse and Option 2 is a 160,000 square foot warehouse with an expedited delivery service that could generate additional trips.

Trip generation for Option 1 was prepared using the *Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition* and NCDOT's Rate vs Equation guidance for a warehouse (Land Use Code 150). The trip generation for Option 1 for the site for various time periods is found below in Table 4.

Table 4: Option 1 Trip Generation Rates

AM Peak Hour Total Trips						
ITE Land Use Code	Use	Units	ITE MANUAL RATES*			
			ADT	AM Enter	AM Exit	AM Total
150	Warehousing	204,000 sf	368	38	12	50

PM Peak Hour Total Trips						
ITE Land Use Code	Use	Units	ITE MANUAL RATES*			
			ADT	PM Enter	PM Exit	PM Total
150	Warehousing	204,000 sf	368	14	38	52

* ITE Trip Generation, 10th Edition

Trip generation for Option 2 was prepared based on the smaller building square footage, however with additional trips for expedited deliveries. There are expected to be approximately 50 drivers making deliveries every 2 hours starting towards the end



of the adjacent street AM peak hour and running through the PM peak hour. In addition, approximately 7 large tractor-trailer truck deliveries are expected at the warehouse over the course of each day. The primary warehouse employee shift is expected to occur prior to the AM adjacent street peak hour, and they will leave prior to the PM adjacent peak hour. The trip generation for Option 2 for the site for various time periods is found below in Table 5.

Table 5: Option 2 Trip Generation Rates

AM Peak Hour Total Trips						
ITE Land Use Code	Use	Units	ITE MANUAL RATES			
			ADT	AM Enter	AM Exit	AM Total
150*	Warehousing	160,000 sf	298	34	11	45
Local	Local Deliveries	25 deliveries/hour	250	25	25	50
Local	TTST Deliveries	7 TTSTs/day	14	1	1	2
Total			562	60	37	97

PM Peak Hour Total Trips						
ITE Land Use Code	Use	Units	ITE MANUAL RATES			
			ADT	PM Enter	PM Exit	PM Total
150*	Warehousing	160,000 sf	298	13	34	47
Local	Local Deliveries	25 deliveries/hour	250	25	25	50
Local	TTST Deliveries	7 TTSTs/day	14	1	1	2
Total			562	39	60	99

* ITE Trip Generation, 10th Edition

Option 2 provides the more conservative analysis since it results in more site generated trips than Option 1. As shown in Table 5, the site is expected to generate 562 trips per day with 97 trips (60 entering/37 exiting) occurring in the AM peak hour and 99 trips (39 entering/60 exiting) occurring in the PM peak hour.

Traffic Distribution and Assignment

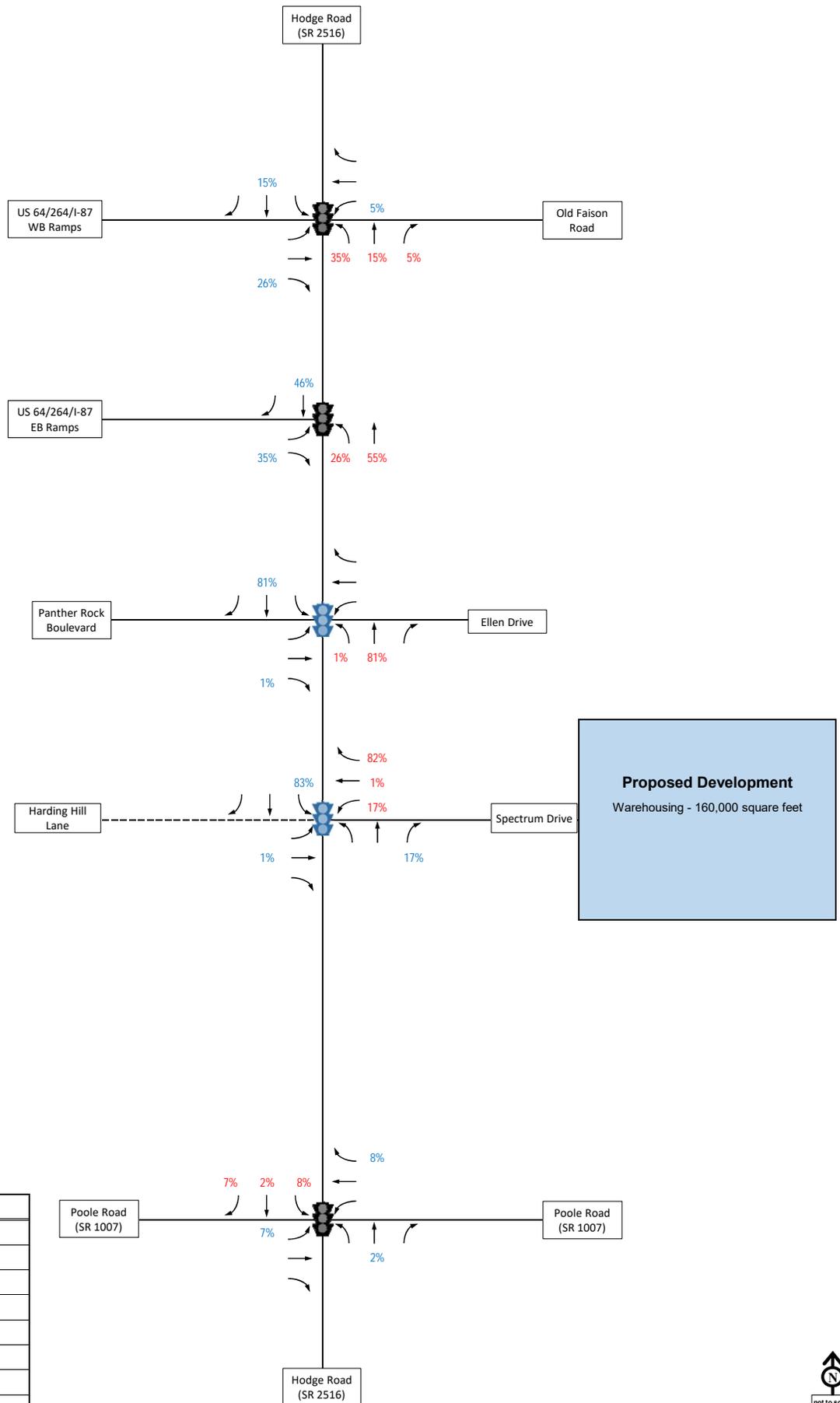
The Memorandum of Understanding listed a separate trip generation for employees and deliveries. Those percentages were combined using a weighted average to reflect a single distribution. The generated site trips were distributed in accordance with the existing traffic patterns and land uses in the vicinity of the study area as follows:

- Hodge Road to/from the north - 15%
- Hodge Road to/from the south - 2%
- US 64/264/I-87 to/from the west - 35%
- US 64/264/I-87 to/from the east - 26%
- Old Faison Road to/from the east - 5%
- Panther Rock Boulevard to/from the west - 1%
- Poole Road to/from the west - 7%
- Poole Road to/from the east - 8%



- Harding Hill Lane to/from the west - 1%

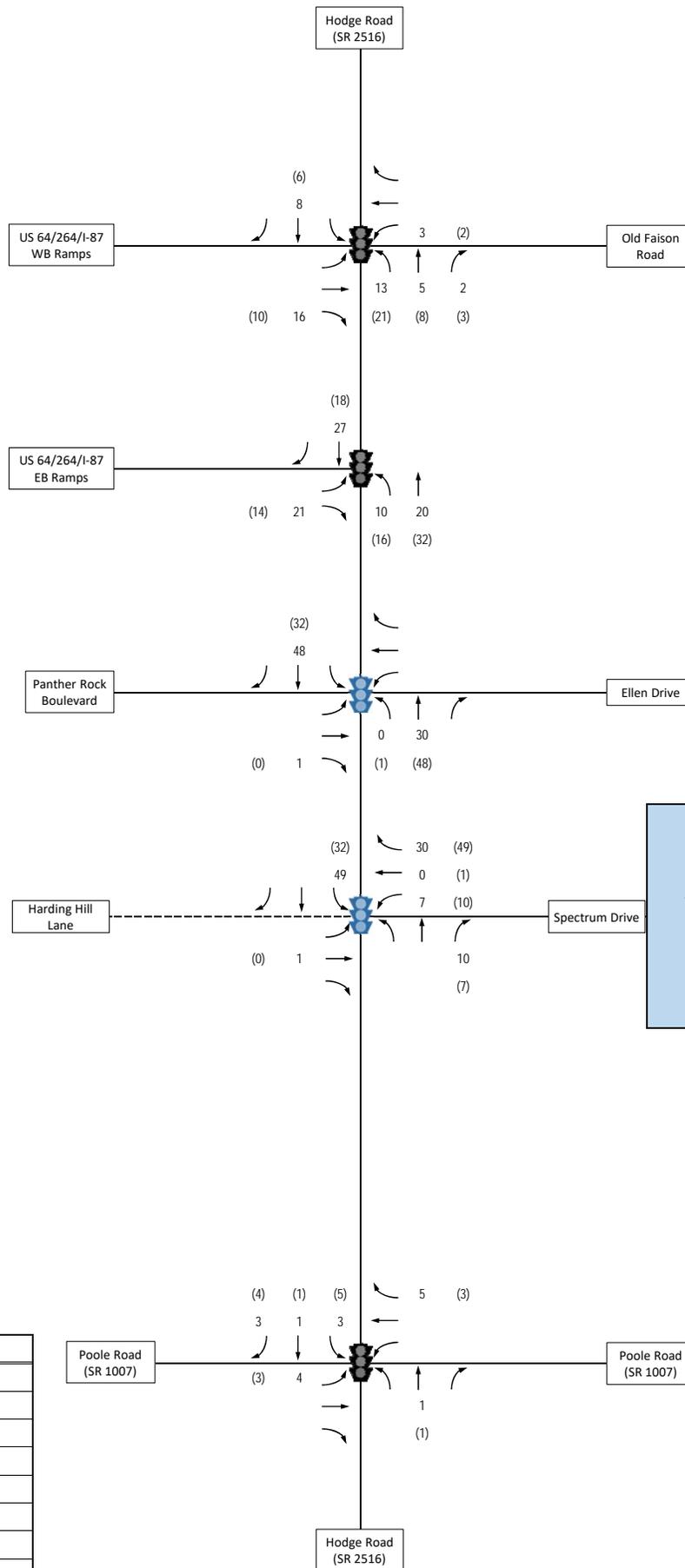
The site trip percentages are depicted in Figure 7, with the resulting site trips shown in Figure 8.



LEGEND	
	Turning Movement
	Existing Roadway
	Future Roadway
	Existing Signalized Intersection
	Background Signal Improvement
	Existing Stop Controlled Approach
XX%	Percentage of Exiting Trips
XX%	Percentage of Entering Trips

Figure 7
Directional Distribution Percentages





Proposed Development
Warehousing - 160,000 square feet

LEGEND	
	Turning Movement
	Existing Roadway
	Future Roadway
	Existing Signalized Intersection
	Background Signal Improvement
	Existing Stop Controlled Approach
XX	AM Peak Hour Turning Movement Volume
(XX)	PM Peak Hour Turning Movement Volume



Figure 8
AM and PM Peak Hour Site Trips



Level of Service Analysis

The Build (2022) analysis scenario includes the Background (2022) traffic as well as site generated trips from the proposed development, as described previously. Figure 9 depicts the turning movement volumes used in the Build (2022) scenarios. Intersection levels of service analyses were performed for the typical weekday AM and PM peak hours using *Synchro/SimTraffic Version 10* and *Highway Capacity Software*. The newly signalized intersections were optimized within *Synchro* as part of the future year analysis. Table 6 summarizes the findings of the LOS analysis, and Appendix C contains the full *Synchro/HCS* reports of the analyses.

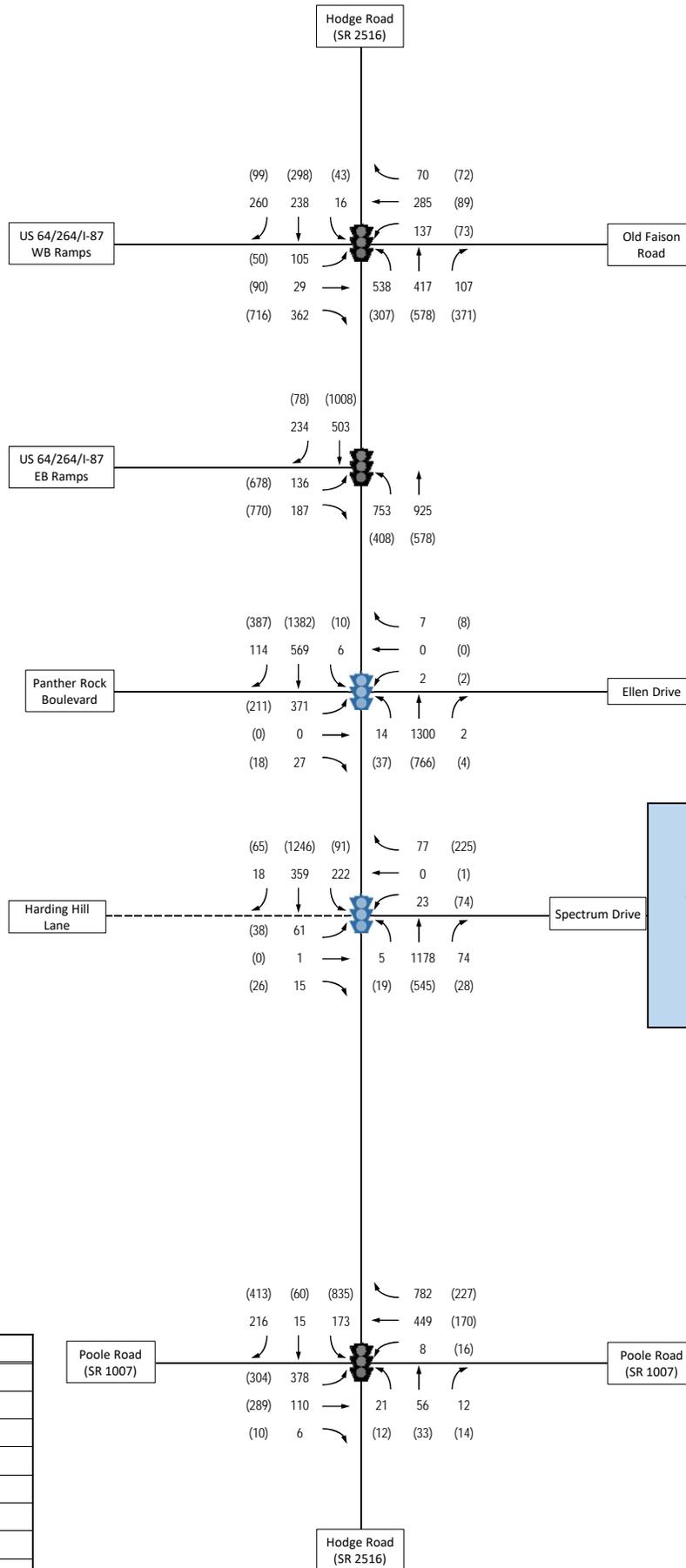
As reported in Table 6, all of the signalized intersections within the study area are operating at acceptable overall levels of service during the AM and PM peak hours, with the exception of the Hodge Road and US 64/264/I-87 WB Ramp intersection, which is projected to continue to operate to LOS F in the PM peak hour.



Table 6: Build (2022) LOS Results

Intersection and Approach	Traffic Control	Build (2022)	
		AM	PM
Hodge Road (SR 2516) at US 64/264/I-87 WB Ramps/Old Faison Road (SR 2515)	Signalized	D (37.3)	C (31.2)
Eastbound		E-59.3	D-54.3
Westbound		C-34.4	D-48.0
Northbound		C-33.4	A-5.9
Southbound		C-26.9	D-49.4
Hodge Road (SR 2516) at US 64/264/I-87 EB Ramps	Signalized	C (22.4)	F (85.1)
Eastbound		D-36.4	F-84.1
Northbound		B-19.5	E-75.9
Southbound		C-22.8	F-94.9
Hodge Road (SR 2516) at Panther Rock Boulevard/Ellen Drive (SR 2577)	Unsignalized/ Signalized	B (18.6)	B (14.1)
Eastbound		E-56.4	E-62.8
Westbound		E-55.1	E-66.7
Northbound		B-12.4	A-2.4
Southbound		A-7.9	B-12.9
Hodge Road (SR 2516) at Spectrum Drive/Harding Hill Lane	Signalized	C (34.1)	D (46.6)
Eastbound		E-59.6	F-115.0
Westbound		E-57.4	F-123.3
Northbound		C-27.3	B-12.3
Southbound		D-40.9	D-42.5
Hodge Road (SR 2516) at Poole Road (SR 1007)	Signalized	D (49.3)	D (39.2)
Eastbound		E-66.3	E-62.0
Westbound		D-50.2	D-42.4
Northbound		F-80.5	F-85.9
Southbound		B-19.7	C-25.4

LEGEND: X = Overall signalized intersection LOS;
 (XX.X sec/veh) = Overall signalized intersection control delay in seconds; X = Approach LOS



Proposed Development
Warehousing - 160,000 square feet

LEGEND	
	Turning Movement
	Existing Roadway
	Future Roadway
	Existing Signalized Intersection
	Future Signalized Intersection
	Existing Stop Controlled Approach
XX	AM Peak Hour Turning Movement Volume
(XX)	PM Peak Hour Turning Movement Volume



Figure 9
Build (2022) AM and PM Peak Hour
Turning Movement Volumes



Background (2032) Conditions

Background Growth and Development

The Town of Knightdale requires a Build analysis to be conducted for the build year (2022) and a period 10 years beyond (2032). For this analysis, the Town of Knightdale is requiring an annual growth rate of three percent (3%) be applied to the existing traffic to account for the normal growth between the background year (2022) and the build year (2032).

The Background (2032) scenario includes Existing (2021) scenario peak hour volumes with a three percent (3%) annual growth applied as well as projected traffic and improvements from four (4) nearby developments in the area. These developments are currently in construction. Committed elements associated with the developments were included in the Background (2032) analysis.

Cheswick North

100% completed in 2022

SilverStone

In 2017, Timmons provided an updated summary to the SilverStone and StoneRiver Developments and projected the SilverStone development to be 87% complete by 2022. The remaining 13% of trips were included in the Background (2032) analysis.

StoneRiver

In 2017, Timmons provided an updated summary to the SilverStone and StoneRiver Developments and projected the StoneRiver development to be 91% complete by 2022. The remaining 9% trips were included in the Background (2032) analysis.

Hodge Road Industrial

Field visits indicate that the development is partially constructed; therefore, 75% of the traffic associated with the development was included in the Background (2022) analysis. The remaining trips were included in the Background (2032) analysis.

Per the Timmons Summary TIA, the following improvements were included:



All supporting documentation for the approved development trips, including the total projected site trips from the approved developments, are included in Appendix D. The Background (2032) peak hour volumes are shown in Figure 10.

Level of Service Analysis

Intersection levels of service analyses were performed for the typical weekday AM and PM peak hours using *Synchro/SimTraffic Version 10*. The newly signalized intersections were optimized within *Synchro* as part of the future year analysis. A summary of the findings for the Background (2022) scenario LOS analysis can be found in Table 7 and the full *Synchro/HCS* output can be found in Appendix C.

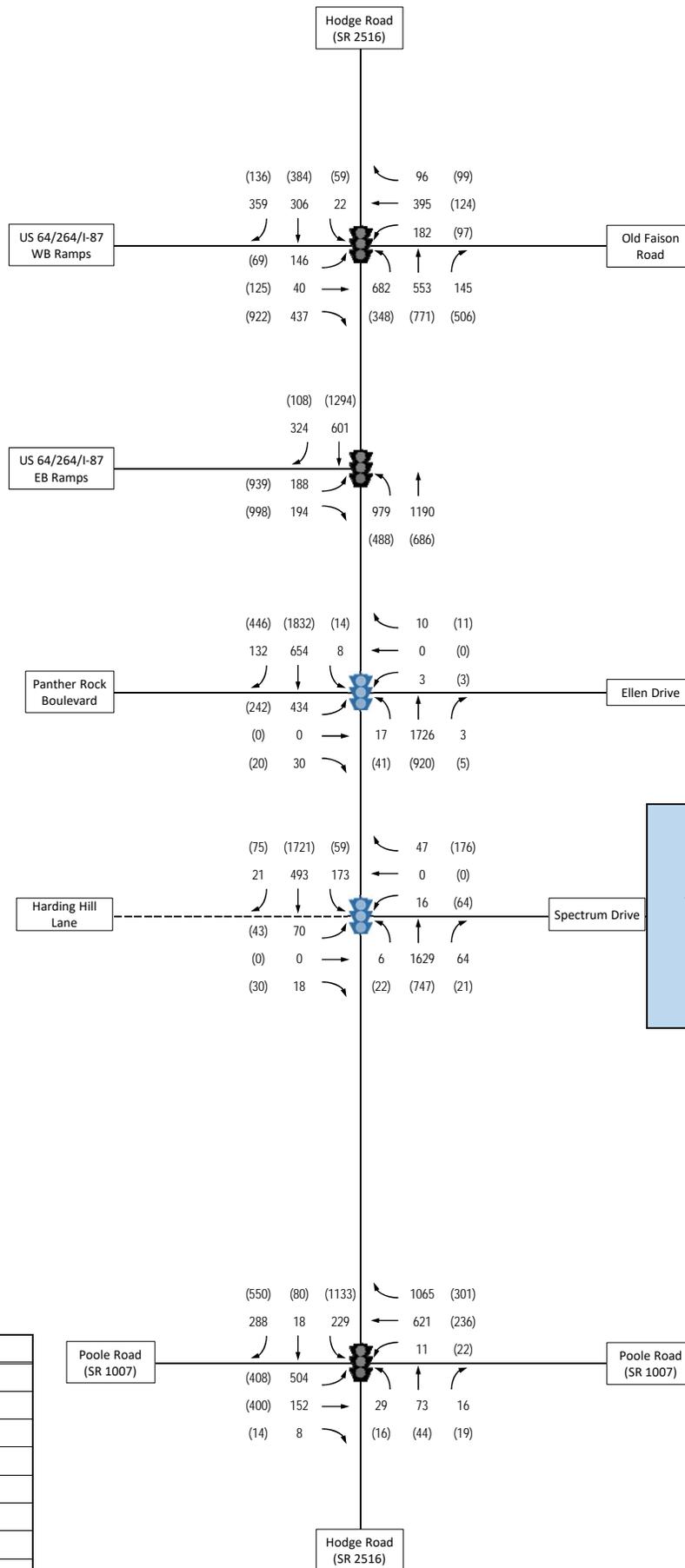
As reported in Table 7, all of the signalized intersections within the study are projected to fail in at least one peak hour with the exception of the Hodge Road at Panther Rock Boulevard intersection.



Table 7: Background (2032) LOS Results

Intersection and Approach	Traffic Control	Background (2032)	
		AM	PM
Hodge Road (SR 2516) at US 64/264/I-87 WB Ramps/Old Faison Road (SR 2515)	Signalized	F (88.7)	D (53.6)
Eastbound		F-139.0	F-100.9
Westbound		E-55.5	E-65.4
Northbound		F-93.6	A-9.2
Southbound		E-65.8	F-80.5
Hodge Road (SR 2516) at US 64/264/I-87 EB Ramps	Signalized	D (53.3)	F (175.2)
Eastbound		F-84.9	F-170.7
Northbound		D-46.3	F-128.0
Southbound		E-56.7	F-220.8
Hodge Road (SR 2516) at Panther Rock Boulevard/Ellen Drive (SR 2577)	Unsignalized/ Signalized	D (42.5)	C (32.5)
Eastbound		F-94.4	F-89.8
Westbound		F-109.6	F-80.1
Northbound		D-37.1	A-6.1
Southbound		C-22.3	D-37.1
Hodge Road (SR 2516) at Spectrum Drive/Harding Hill Lane	Signalized	F (99.6)	F (123.9)
Eastbound		F-123.3	F-98.0
Westbound		F-97.3	F-99.0
Northbound		F-122.7	B-16.9
Southbound		D-40.5	F-173.4
Hodge Road (SR 2516) at Poole Road (SR 1007)	Signalized	F (128.5)	F (115.4)
Eastbound		F-152.8	F-132.0
Westbound		F-143.3	E-71.9
Northbound		F-187.2	F-199.4
Southbound		D-41.1	F-117.7

LEGEND: X = Overall signalized intersection LOS;
 (XX.X sec/veh) = Overall signalized intersection control delay in seconds; X = Approach LOS



Proposed Development
Warehousing - 160,000 square feet

LEGEND	
→	Turning Movement
—	Existing Roadway
- -	Future Roadway
🚦	Existing Signalized Intersection
🚦	Background Signal Improvement
STOP	Existing Stop Controlled Approach
XX	AM Peak Hour Turning Movement Volume
(XX)	PM Peak Hour Turning Movement Volume



Figure 10
No-Build (2032) AM and PM Peak Hour
Turning Movement Volumes

Eastgate 540
Traffic Impact Analysis
Knightdale, NC

Background (2032) Conditions

Trinity Capital has plans to develop a parcel of land on the east side of Hodge Road, south of US 64/264/I-87, in Knightdale, NC (Figure 1). The project currently has two options for development. Option 1 is 204,000 square feet of industrial warehouse and Option 2 is a 160,000 square foot same day delivery facility. Both options will have access to Spectrum Drive with an estimated opening at the end of 2021.

Level of Service Analysis

The Build (2032) conditions include the Background (2032) peak hour volumes with a three percent (3%) annual growth rate applied for an additional 10 years beyond the build-out of the proposed development, as well as projected site trips from the proposed development. The site trips are based on the same calculations and distributions as described in Section 4. Figure 11 depicts the turning movement volumes used in the Build (2032) scenario. Intersection levels of service analyses were performed for the typical weekday AM and PM peak hours using *Synchro/SimTraffic Version 10* and *Highway Capacity Software*. The newly signalized intersections were optimized within *Synchro* as part of the future year analysis. Table 8 summarizes the findings of the LOS analysis, and Appendix C contains the full *Synchro/HCS* reports of the analyses.

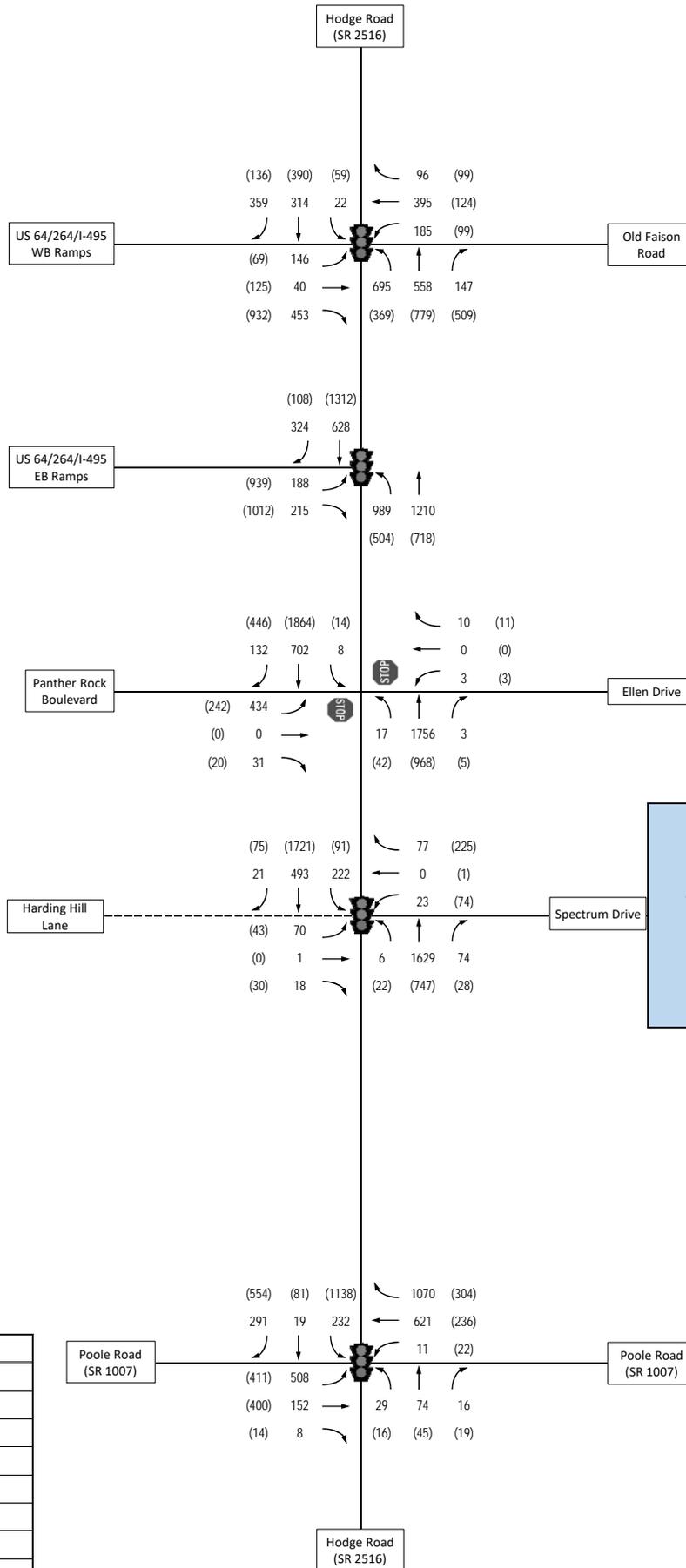
As reported in Table 8, all of the signalized intersections within the study are projected to continue to fail in at least one peak hour with the exception of the Hodge Road at Panther Rock Boulevard intersection.



Table 8: Build (2032) LOS Results

Intersection and Approach	Traffic Control	Build (2032)	
		AM	PM
Hodge Road (SR 2516) at US 64/264/I-87 WB Ramps/Old Faison Road (SR 2515)	Signalized	F (91.0)	D (53.9)
Eastbound		F-136.0	F-100.7
Westbound		E-55.6	E-65.6
Northbound		F-98.2	A-9.4
Southbound		E-69.7	F-83.3
Hodge Road (SR 2516) at US 64/264/I-87 EB Ramps	Signalized	E (57.2)	F (180.7)
Eastbound		F-81.5	F-172.9
Northbound		D-48.3	F-136.7
Southbound		E-67.4	F-229.4
Hodge Road (SR 2516) at Panther Rock Boulevard/Ellen Drive (SR 2577)	Unsignalized/ Signalized	D (46.2)	D (35.8)
Eastbound		F-94.5	F-89.8
Westbound		F-109.6	F-80.1
Northbound		D-42.7	A-5.6
Southbound		C-25.2	D-43.0
Hodge Road (SR 2516) at Spectrum Drive/Harding Hill Lane	Signalized	F (113.2)	F (130.4)
Eastbound		F-143.9	F-182.8
Westbound		F-104.9	F-141.4
Northbound		F-128.1	C-21.9
Southbound		E-76.4	F-173.0
Hodge Road (SR 2516) at Poole Road (SR 1007)	Signalized	F (130.4)	F (116.9)
Eastbound		F-152.5	F-134.4
Westbound		F-148.4	E-71.5
Northbound		F-181.6	F-202.6
Southbound		D-38.4	F-119.2

LEGEND: X = Overall signalized intersection LOS;
 (XX.X sec/veh) = Overall signalized intersection control delay in seconds; X = Approach LOS



LEGEND	
	Turning Movement
	Existing Roadway
	Future Roadway
	Existing Signalized Intersection
	Background Signal Improvement
	Existing Stop Controlled Approach
XX	AM Peak Hour Turning Movement Volume
(XX)	PM Peak Hour Turning Movement Volume



Figure 11
Build (2032) AM and PM Peak Hour
Turning Movement Volumes

Eastgate 540
Traffic Impact Analysis
Knightdale, NC



Findings and Conclusions

As indicated in the traffic operations analyses, the proposed development is projected to have a slight impact on the traffic operations of the surrounding roadway network and intersections. Therefore, after the build-out of the development is completed at the end of 2021, no offsite roadway improvements should be considered.

Per the Town's Arterial & Collector Street Plan, Hodge Road is identified as an existing arterial that needs improvements within the study area, while the Town's Functional Class Plan identifies Hodge Road as a boulevard with 100 feet of right-of-way. In addition, the City of Raleigh's 2030 Comprehensive Plan depicts Hodge Road as a four-lane, divided avenue within the study area. Several studies in the area have already identified additional thru lanes along Hodge Road as a needed improvement in the future. There are sections along Hodge Road where developments have provided frontage widening via striped out pavement, so that Hodge Road can be improved in the future with additional thru lanes. The Town and NCDOT should continue to pursue the ultimate widening of Hodge Road as planned.

In addition, the construction of R-2829 (NC 540 - Eastern Wake Freeway) is scheduled to begin construction in 2026 which will alter traffic patterns in 2032.

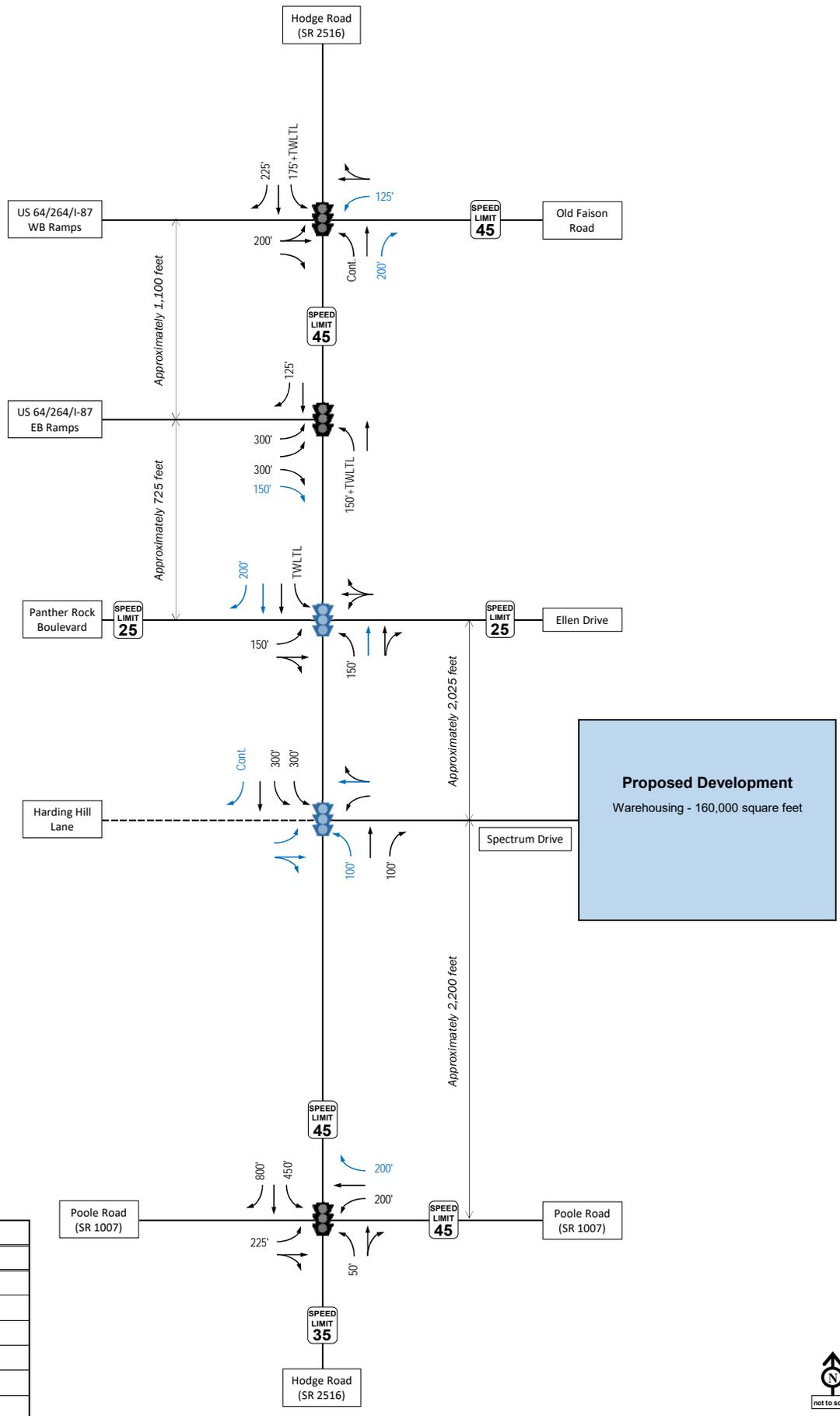
A summary of LOS results across scenarios is shown in Table 9, and the resulting future (2022) lane configurations and traffic control is shown in Figure 12.



Table 9: Summary of LOS Results

Intersection and Approach	Traffic Control	Existing (2021)		Background (2022)		Build (2022)		Background (2032)		Build (2032)	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Hodge Road (SR 2516) at US 64/264/I-87 WB Ramps/Old Faison Road (SR 2515)	Signalized	C (30.5)	C (28.1)	D (35.7)	C (31.0)	D (37.3)	C (31.2)	F (88.7)	D (53.6)	F (91.0)	D (53.9)
Eastbound		B-20.0	C-20.4	E-59.0	D-54.5	E-59.3	D-54.3	F-139.0	F-100.9	F-136.0	F-100.7
Westbound		E-68.9	E-73.1	C-34.2	D-47.9	C-34.4	D-48.0	E-55.5	E-65.4	E-55.6	E-65.6
Northbound		C-21.4	C-23.1	C-30.8	A-5.3	C-33.4	A-5.9	F-93.6	A-9.2	F-98.2	A-9.4
Southbound		B-16.6	C-28.3	C-25.0	D-48.6	C-26.9	D-49.4	E-65.8	F-80.5	E-69.7	F-83.3
Hodge Road (SR 2516) at US 64/264/I-87 EB Ramps	Signalized	B (11.1)	C (33.3)	C (20.2)	F (81.0)	C (22.4)	F (85.1)	D (53.3)	F (175.2)	E (57.2)	F (180.7)
Eastbound		C-32.3	C-34.4	D-36.8	F-84.1	D-36.4	F-84.1	F-84.9	F-170.7	F-81.5	F-172.9
Northbound		A-4.6	C-34.0	B-16.3	E-68.7	B-19.5	E-75.9	D-46.3	F-128.0	D-48.3	F-136.7
Southbound		B-16.0	C-31.2	C-22.4	F-87.6	C-22.8	F-94.9	E-56.7	F-220.8	E-67.4	F-229.4
Hodge Road (SR 2516) at Panther Rock Boulevard/Ellen Drive (SR 2577)	Unsignalized/ Signalized	-	-	B (18.9)	B (14.2)	B (18.6)	B (14.1)	D (42.5)	C (32.5)	D (46.2)	D (35.8)
Eastbound		F-776.7	F-577.2	E-56.3	E-62.8	E-56.4	E-62.8	F-94.4	F-89.8	F-94.5	F-89.8
Westbound		E-38.9	E-41.0	E-55.1	E-66.7	E-55.1	E-66.7	F-109.6	F-80.1	F-109.6	F-80.1
Northbound		-	-	B-12.1	A-2.7	B-12.4	A-2.4	D-37.1	A-6.1	D-42.7	A-5.6
Southbound		-	-	A-8.3	B-12.6	A-7.9	B-12.9	C-22.3	D-37.1	C-25.2	D-43.0
Hodge Road (SR 2516) at Spectrum Drive/ Harding Hill Lane	Signalized	B (17.2)	B (13.5)	C (23.1)	D (42.7)	C (34.1)	D (46.6)	F (99.6)	F (123.9)	F (113.2)	F (130.4)
Eastbound		-	-	E-58.1	E-72.8	E-59.6	F-115.0	F-123.3	F-98.0	F-143.9	F-182.8
Westbound		D-46.0	E-55.2	D-52.2	F-86.2	E-57.4	F-123.3	F-97.3	F-99.0	F-104.9	F-141.4
Northbound		C-21.1	A-7.1	C-20.7	C-24.6	C-27.3	B-12.3	F-122.7	B-16.9	F-128.1	C-21.9
Southbound		A-4.5	B-10.1	C-20.2	D-41.7	D-40.9	D-42.5	D-40.5	F-173.4	E-76.4	F-173.0
Hodge Road (SR 2516) at Poole Road (SR 1007)	Signalized	F (125.5)	F (85.0)	D (47.8)	D (47.3)	D (49.3)	D (39.2)	F (128.5)	F (115.4)	F (130.4)	F (116.9)
Eastbound		F-142.9	E-73.7	E-59.4	E-66.5	E-66.3	E-62.0	F-152.8	F-132.0	F-152.5	F-134.4
Westbound		F-124.7	F-107.5	D-50.6	D-41.4	D-50.2	D-42.4	F-143.3	E-71.9	F-148.4	E-71.5
Northbound		E-64.5	B-14.4	E-79.7	E-76.5	F-80.5	F-85.9	F-187.2	F-199.4	F-181.6	F-202.6
Southbound		F-119.8	F-86.4	B-18.9	D-38.9	B-19.7	C-25.4	D-41.1	F-117.7	D-38.4	F-119.2

LEGEND: X = Overall signalized intersection LOS;
 (XX.X sec/veh) = Overall signalized intersection control delay in seconds; X = Approach LOS



LEGEND	
	Lane Configuration
	Background Lane Improvement
	Existing Roadway
	Future Roadway
	Existing Signalized Intersection
	Background Signal Improvement
	Existing Stop Controlled Approach



Figure 12
Future (2022) Lane Configuration and Traffic Control

