8210 University Executive Park Drive, Ste. 220
Charlotte, North Carolina 28262

February 24, 2025

Gideon Smith
Town of Knightdale
950 Steeple Square Court
Knightdale, NC 27545

Reference: Olde Faison Place - Knightdale, North Carolina

Subject: Traffic Impact Assessment

Dear Mr. Smith,

This letter provides a summary of the traffic impact analysis prepared for the proposed Olde Faison Place development to be located on the north side of Old Faison Road between Hodge Road and Interstate 540 (I-540) in Knightdale, North Carolina. Through coordination with the Town of Knightdale (the Town), it was requested that a commercial parcel be included as a part of the development. While there is no known tenant and the land use is not yet determined, a conservative approach to this analysis was taken. For the purpose of this traffic impact analysis, a 3,500 square foot (s.f.) fast-food restaurant with drive-through was assumed to be constructed on the commercial parcel. The development is anticipated to be constructed in two (2) phases, summarized below:

Phase 1 – construction estimated to be complete by 2028

- 12 single-family homes
- 105 townhomes

Phase 2 – unknown completion (assumed 2028 for the purpose of this analysis)

- 3,500 s.f. fast food restaurant with drive through

The purpose of this study is to determine the potential impacts to the surrounding transportation system created by traffic generated by the proposed development, as well as recommend improvements to mitigate the impacts, if necessary.

Study Area and Analysis Scenarios

Based on coordination with the Town of Knightdale (Town), the proposed site accesses were the only intersections to be analyzed, and would be analyzed under the following conditions, as per the Town's Unified Development Ordinance (UDO):

- 2028 + 1 Traffic Conditions (Phase 1)
- 2028 + 10 Traffic Conditions (Phase 1)
- 2028 + 1 Traffic Conditions (Phase 2)
- 2028 + 10 Traffic Conditions (Phase 2)

Refer to Attachment A for the approved scoping documentation. Refer to Attachment B for the site location map.

Proposed Land Use and Site Access

The proposed development is expected to be constructed in two phases and consist of the land uses below:

Phase 1

- 12 single-family homes
- 105 townhomes

Phase 2

- 3,500 s.f. fast food restaurant with drive through (*yet to be confirmed*)

Completion of the proposed development is anticipated by the end of 2028. Site access is proposed via two (2) full-movement driveways along Old Faison Road. During scoping, the Town requested analysis of a potential connection to the existing Mingo Bluff Boulevard to the north. Per coordination with the Town, all intersections were analyzed under two scenarios.

- Scenario 1 - assumes that the connection to Mingo Bluff Boulevard is not constructed (access only available via Old Faison Road)
- Scenario 2 - assumes Site Access A operates as an extension of Mingo Bluff Boulevard.

Refer to Attachment B for a copy of the preliminary site plan.

Adjacent Land Uses

The proposed development is located north of I-87, in an area consisting primarily of residential development.

Existing Roadways

Speed limits, cross section, and other roadway information about Old Faison Road are shown in Table 1 below.

Table 1: Existing Roadway Inventory

Road Name	Route Number	Typical Cross Section	Speed Limit	ADT (vpd)
Old Faison Road	SR 2515	2-lane undivided	45 mph	*6,510

*ADT based on the traffic counts from 2024.

Existing Traffic Conditions

Existing peak hour traffic volumes were determined by collecting traffic count data along Old Faison Road at the approximate location of the two proposed site driveways. Weekday count data was recorded for 24-hours but only the typical AM (7:00 – 9:00) and PM (4:00 – 6:00) peak hours were considered in the capacity analysis. Refer to Attachment B for an illustration of 2024 existing traffic volumes and Attachment C for the raw traffic count data.

2029 (+1) and 2038 (+10) No-Build Traffic Conditions

As mentioned previously, the Town's UDO requires a build +1 and build +10 analysis. Existing traffic volumes were projected to the future year 2029 utilizing a 3% annual growth rate approved by the Town. For each year after 2029, a 1% growth rate was applied. Refer to Attachment B for illustrations of the 2029 and 2038 projected peak hour traffic volumes.

The following adjacent developments were identified to be included as a part of the analysis:

- Silverstone
- Stone River
- Riverview Commons
- Lyndon Oaks

Refer to Attachment D for additional adjacent development data. It should be noted that Lyndon Oaks is the only development that adds site traffic along Old Faison Road, therefore this was the only development included in the analysis.

2029 and 2038 no-build traffic volumes were determined by adding the adjacent development trips to the correlating projected peak hour traffic volumes. Refer to Attachment B for illustration of the adjacent development trips and 2029/2038 no-build peak hour traffic volumes.

Site Trip Generation

Average weekday daily, AM peak hour, and PM peak hour trips for the proposed development were estimated using methodology contained within the ITE Trip Generation Manual, 11.1 Edition. Table 2a provides a summary of the trip generation potential for the site under each phase.

Table 2a: Site Trip Generation (Phase 1)

Land Use (ITE Code)	Intensity	Daily Traffic (vpd)	Weekday AM Peak Hour Trips (vph)		Weekday PM Peak Hour Trips (vph)	
			Enter	Exit	Enter	Exit
Single-Family Detached (210)	12 DU	144	3	8	9	5
Single-Family Attached (215)	105 DU	750	12	37	35	24
Total Trips		894	15	45	44	29

Table 2b: Site Trip Generation (Full Build)

Land Use (ITE Code)	Intensity	Daily Traffic (vpd)	Weekday AM Peak Hour Trips (vph)		Weekday PM Peak Hour Trips (vph)	
			Enter	Exit	Enter	Exit
Single-Family Detached (210)	12 DU	144	3	8	9	5
Single-Family Attached (215)	105 DU	750	12	37	35	24
Fast-Food w/ Drive-Thru (934)	3.5 KSF	1,636	80	76	60	56
Total Trips		2,530	95	121	104	85
Pass-By Trips: Fast-Food Restaurant with Drive-Through (50% AM, 55% PM)			*-39*	*-39*	*-32*	*-32*
Total Primary Trips*			56	82	72	53

*No internal capture assumed; 5% of regional distributions assumed to originate from proposed development.

Trip Distribution and Assignment

The site trips were distributed based on existing traffic patterns, population centers adjacent to the study area, and engineering judgment. A summary of the residential regional distributions for Scenario 1 is shown below:

- 85% to/from the west via Old Faison Road
- 15% to/from the east via Old Faison Road

A summary of the residential regional distributions for Scenario 2 is shown below:

- 75% to/from the west via Old Faison Road
- 15% to/from the east via Old Faison Road
- 10% to/from the north via Mingo Bluff Boulevard

Primary (new) trips associated with the commercial parcel were distributed as follows under Scenario 2:

- 80% to/from the west via Old Faison Road
- 15% to/from the east via Old Faison Road
- 5% to/from within proposed Old Faison Place development OR within adjacent Mingo Bluff development (accessing via potential Mingo Bluff Boulevard connection)

Additionally, with the potential connection to Mingo Bluff Boulevard, trips from the existing Mingo Bluff development would be expected to be diverted from their current route (Mingo Bluff Boulevard-to-Hodge Road-to-Old Faison Road) to the new Mingo Bluff Boulevard connection directly to Old Faison Road (via proposed Site Access A). Traffic counts at the intersections of Hodge Road/Mingo Bluff Boulevard and Hodge Road/Old Faison Road were used to estimate the amount of Mingo Bluff Boulevard traffic that could be diverted with an extension connecting to Old Faison Road. The diverted peak hour traffic was only utilized under Scenario 2. Refer to Attachment B for illustrations of the site trip distributions and assignments, diverted trip distributions and assignments, and total trip assignments.

2029 (+1) and 2038 (+10) Build Traffic Conditions

To estimate the traffic conditions with the site built-out, the site trips were added to the no-build traffic volumes for each respective analysis year, scenario, and phase. Refer to Attachment B for an illustration of the 2029 and 2038 build peak hour traffic volumes for each scenario and phase.

Traffic Capacity Analysis

Traffic capacity analysis for the study intersections was performed using Synchro 11.1 and SIDRA, which are comprehensive software packages that allows the user to model signalized, unsignalized, and roundabout intersections to determine levels-of-service based on the thresholds specified in the Highway Capacity Manual (HCM).

Refer to Table 3 for HCM levels of service and related average control delay per vehicle for signalized intersections, unsignalized intersections, and roundabouts.

Table 3: Highway Capacity Manual – Levels-of-Service and Delay

Unsignalized Intersections and Roundabouts		Signalized Intersections	
Level of Service	**Average Control Delay per Vehicle (Seconds)**	**Level of Service**	**Average Control Delay per Vehicle (Seconds)**
A	0-10	A	0-10
B	10-15	B	10-20
C	15-25	C	20-35
D	25-35	D	35-55
E	35-50	E	55-80
F	>50	F	>80

Old Faison Road and Site Access A

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

Table 4a: Analysis Summary for Old Faison Road and Site Access A

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
2029 Build – Scenario 1 (Phase 1)	EB WB **SB**	1 **LT**-TH 1 TH-**RT** **1 LT, 1 RT**	A (8)[1] -- B (12)[2]	N/A	A (9)[1] -- C (15)[2]	N/A
2029 Build – Scenario 2a (Phase 1)	EB WB **SB**	1 **LT**, 1 TH 1 TH-**RT** **1 LT, 1 RT**	A (8)[1] -- B (14)[2]	N/A	A (9)[1] -- C (18)[2]	N/A
2029 Build – Scenario 2b* (Phase 1)	EB WB **SB**	1 **LT**-TH 1 TH-**RT** **1 LT-RT**	A (9) A (6) A (5)	A (7)	A (7) A (9) A (6)	A (8)
2029 Build – Scenario 1 (Phase 2)	EB WB **SB**	1 **LT**-TH 1 TH-**RT** **1 LT, 1 RT**	A (8)[1] -- C (17)[2]	N/A	A (9)[1] -- C (19)[2]	N/A
2029 Build – Scenario 2a (Phase 2)	EB WB **SB**	1 **LT**, 1 TH 1 TH, **1 RT** **1 LT, 1 RT**	A (8)[1] -- C (18)[2]	N/A	A (10)[1] -- C (22)[2]	N/A
2029 Build – Scenario 2b* (Phase 2)	EB WB **SB**	1 **LT**-TH 1 TH-**RT** **1 LT-RT**	A (10) A (6) A (6)	A (8)	A (8) B (10) A (7)	A (9)

Improvements/lane modifications by developer shown in bold.

*Analyzed as roundabout per Town of Knightdale UDO.

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

Table 4b: Analysis Summary for Old Faison Road and Site Access A

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
2038 Build – Scenario 1 (Phase 1)	EB WB **SB**	1 **LT**-TH 1 TH-**RT** **1 LT, 1 RT**	A (8)[1] -- B (13)[2]	N/A	A (9)[1] -- C (16)[2]	N/A
2038 Build- Scenario 2a (Phase 1)	EB WB **SB**	1 **LT**, 1 TH 1 TH-**RT** **1 LT, 1 RT**	A (8)[1] -- B (15)[2]	N/A	A (10)[1] -- C (19)[2]	N/A
2038 Build – Scenario 2b* (Phase 1)	EB WB **SB**	1 **LT**-TH 1 TH-**RT** **1 LT-RT**	A (9) A (6) A (5)	A (8)	A (8) B (10) A (7)	A (9)
2038 Build – Scenario 1 (Phase 2)	EB WB **SB**	1 **LT**-TH 1 TH-**RT** **1 LT, 1 RT**	A (8)[1] -- C (18)[2]	N/A	A (10)[1] -- C (21)[2]	N/A
2038 Build- Scenario 2a (Phase 2)	EB WB **SB**	1 **LT**, 1 TH 1 TH, **1 RT** **1 LT, 1 RT**	A (9)[1] -- C (20)[2]	N/A	A (10)[1] -- C (24)[2]	N/A
2038 Build – Scenario 2b* (Phase 2)	EB WB **SB**	1 **LT**-TH 1 TH-**RT** **1 LT-RT**	B (11) A (6) A (6)	A (9)	A (8) B (11) A (8)	A (10)

Improvements/lane modifications by developer shown in bold.

*Analyzed as roundabout per Town of Knightdale UDO.

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

Capacity analysis under all conditions indicates the major-street left-turn movement is expected to operate at LOS A. The minor-street approach of the proposed site access (and Mingo Bluff Boulevard Extension) is expected to operate at an overall LOS C or better during the AM and PM peak hours.

Turn lanes were considered based on the North Carolina Department of Transportation *Policy on Street and Driveway Access to North Carolina Highways*. An eastbound left-turn lane with 75 feet of storage is warranted and recommended by the developer under Phase 1 conditions. Under Phase 2 conditions, an eastbound left turn lane with 125 feet of storage and a westbound right turn lane with 50 feet of storage are warranted and recommended by the developer.

Per scoping with the Town of Knightdale, 8-hour, 4-hour, and peak hour warrants for signalization were analyzed at the intersection. Under phase 2 conditions with the connection to Mingo Bluff, 8-hour and 4-hour warrants for signalization are expected to be met. 50% reduction of right turns was assumed along the major and minor street; however, if ample storage is supplied along the minor-street, right-turns to be included in the signal warrant analysis could further be reduced resulting in warrants for signalization not being met. If connection to Mingo Bluff occurs, the intersection should be monitored for signalization in the future due to uncertainty of the commercial land use at this time.

Per the Town's Unified Development Ordinance (UDO) and coordination with the Town, Site Access A was also analyzed as a single-lane roundabout (Scenario 2b). When analyzed as a roundabout, the overall intersection and each approach are expected to operate at LOS B or better during the AM and PM peak hours. No significant queuing is expected at the approach under any conditions.

Due to acceptable operations (including insignificant queuing) without and with the connection to Mingo Bluff Boulevard, no roundabout appears to be necessary. Upon completion of the development, the intersection should be monitored for signalization in the future.

Old Faison Road and Site Access B

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

Table 5a: Analysis Summary of Old Faison Road and Site Access B

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
2029 Build – Scenario 1 (Phase 1)	EB WB **SB**	1 **LT**-TH 1 TH-**RT** **1 LT-RT**	A (8)[1] -- C (15)[2]	N/A	A (9)[1] -- C (18)[2]	N/A
2029 Build – Scenario 2 (Phase 1)	EB WB **SB**	1 **LT**-TH 1 TH-**RT** **1 LT-RT**	A (8)[1] -- C (15)[2]	N/A	A (9)[1] -- C (18)[2]	N/A
2029 Build – Scenario 1 (Phase 2)	EB WB **SB**	1 **LT**-TH 1 TH-**RT** **1 LT-RT**	A (8)[1] -- C (15)[2]	N/A	A (9)[1] -- C (19)[2]	N/A
2029 Build – Scenario 2 (Phase 2)	EB WB **SB**	1 **LT**-TH 1 TH-**RT** **1 LT-RT**	A (8)[1] -- C (15)[2]	N/A	A (9)[1] -- C (19)[2]	N/A

Improvements/lane modifications by developer shown in bold.

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

Table 5b: Analysis Summary of Old Faison Road and Site Access B

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
2038 Build – Scenario 1 (Phase 1)	EB WB **SB**	1 **LT**-TH 1 TH-**RT** **1 LT-RT**	A (8)[1] -- C (16)[2]	N/A	A (9)[1] -- C (20)[2]	N/A
2038 Build- Scenario 2 (Phase 1)	EB WB **SB**	1 **LT**-TH 1 TH-**RT** **1 LT-RT**	A (8)[1] -- C (16)[2]	N/A	A (9)[1] -- C (20)[2]	N/A
2038 Build – Scenario 1 (Phase 2)	EB WB **SB**	1 **LT**-TH 1 TH-**RT** **1 LT-RT**	A (8)[1] -- C (17)[2]	N/A	A (9)[1] -- C (20)[2]	N/A
2038 Build- Scenario 2 (Phase 2)	EB WB **SB**	1 **LT**-TH 1 TH-**RT** **1 LT-RT**	A (8)[1] -- C (17)[2]	N/A	A (9)[1] -- C (20)[2]	N/A

Capacity analysis under all conditions indicates the major-street left-turn movement is expected to operate at LOS A. The minor-street approach of the proposed site access is expected to operate at an overall LOS C during the AM and PM peak hours. Turn lanes were considered based on the NCDOT *Policy on Street and Driveway Access to North Carolina Highways*. No turn lanes are warranted at Site Access B.

Due to acceptable operations at the intersection, no improvements are recommended by the developer.

Findings and Summary

Capacity analysis at all study intersections was completed in accordance with the Town of Knightdale UDO and NCDOT capacity analysis guidelines. All study area intersections are expected to operate at acceptable levels-of-service. Based on the findings of this study, it was determined that the proposed development would not have a major impact on traffic operations in this corridor. See below for a description of the recommended lane configuration and traffic control at the proposed access points along Old Faison Road. Refer to Attachment B for an illustration of the recommended lane configuration and traffic control.

Phase 1

Old Faison Road and Site Access A

- Construct Site Access A as a full-movement access with one ingress lane and two egress lanes with approximately 100 feet of storage.
- Construct an exclusive eastbound left turn lane on Old Faison Road with approximately 75 feet of storage plus appropriate deceleration and taper.
- Provide stop control for Site Access A.

Old Faison Road and Site Access B

- Construct Site Access B as a full-movement access with one ingress lane and one egress lane.
- Provide stop control for Site Access B.

Phase 2

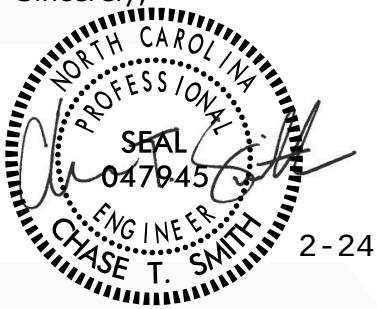
Old Faison Road and Site Access A

- Construct an exclusive westbound right turn lane with 50’ of storage plus appropriate deceleration and taper.
- Monitor for signalization upon completion of Phase 2.

As mentioned, the land use for the commercial parcel is yet to be determined. Additionally, the developer of the residential parcel is unlikely to develop the commercial parcel, instead selling it to a separate entity exclusively for development of the parcel. At such time that a tenant is known, the aforementioned improvements recommended for Phase 2 (commercial parcel) should be verified, with new analysis and traffic provided when necessary.

If you have questions regarding information contained herein, feel free to contact me at (336) 714-0112.

Sincerely,



2-24-2025

Chase Smith, PE

Traffic Analysis Project Manager

DRMP, Inc.

Attachments

- Attachment A – Approved Scoping Document
- Attachment B – Figures
- Attachment C – Traffic Count Data
- Attachment D – Adjacent Development Information
- Attachment E – Synchro, SIDRA, and SimTraffic Reports
- Attachment F – Turn Lane Warrants
- Attachment G – Signal Warrant Analysis