
TRAFFIC IMPACT ANALYSIS

Dallas Stanley Highway Residential

Dallas, North Carolina

OCTOBER 21, 2024

IMPACT DESIGNS, INC.

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TRAFFIC IMPACT ANALYSIS

Dallas Stanley Highway Residential

DALLAS, NORTH CAROLINA



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EXECUTIVE SUMMARY

A traffic impact study was conducted for the proposed Dallas Stanley Highway Residential development in accordance NCDOT guidelines. The proposed development is located on the north side of Dallas Stanley Highway, west of Kiser Dairy Road, in Dallas, North Carolina. The development is expected to consist of up to 155 single family homes to be completed in 2028. Access to the site is to be provided via a full movement connection to Dallas Stanley Highway and a full movement connection to Kiser Dairy Road.

The study was determined through coordination with NCDOT and consists of the following intersections:

- Dallas Stanley Highway (NC-275) and Kiser Dairy Road
- Dallas Stanley Highway (NC-275) and Access A
- Kiser Dairy Road and Access B

For the purpose of this analysis, the study intersections listed above were analyzed under the following scenarios:

- Existing (2024) Conditions
- No-Build (2028) Conditions
- Build (2028) Conditions

Traffic operations during the AM and PM peak hours were modeled for each scenario. The results of each scenario were compared to determine impacts from background traffic growth and the proposed development.

The capacity analysis indicates that all movements are expected to operate at LOS C or better in all scenarios. Operations of the traffic signal at Dallas Stanley Highway and Kiser Dairy Road under Build conditions are anticipated to be similar No-Build conditions. No mitigation is recommended based on the capacity analysis.

The queuing analysis indicates that the addition of site traffic in the Build scenario does not create a queuing issue that would require mitigation.

Recommendations:

- Construct an eastbound left turn lane on Dallas Stanley Highway at Access A with 50 feet of storage and appropriate taper.

1. INTRODUCTION

The purpose of this report is to summarize the traffic impact analysis that was completed for the proposed Dallas Stanley Highway Residential development in Dallas, North Carolina. The study was developed in accordance with NCDOT guidelines. The purpose of the study is to determine the potential impact to the surrounding transportation system caused by the traffic generated by the development. This report summarizes the procedures and findings of the traffic impact study.

1.1. Project Summary

The proposed development is located on the north side of Dallas Stanley Highway, west of Kiser Dairy Road, in Dallas, North Carolina. The development is expected to consist of up to 155 single family homes to be completed by 2028. This traffic impact study analyzes the effects of the additional traffic associated with the proposed development during the weekday AM (7:00 AM - 9:00 AM) and the weekday PM (4:00 PM - 6:00 PM) peak periods. The study area for the purpose of the analysis includes:

- Dallas Stanley Highway (NC-275) and Kiser Dairy Road
- Dallas Stanley Highway (NC-275) and Access A
- Kiser Dairy Road and Access B

Refer to Figures 1 and 2 for the site location and the conceptual site plan.

For the purpose of this analysis, the study intersections listed above were analyzed under the following scenarios:

- Existing (2024) Conditions
- No-Build (2028) Conditions
- Build (2028) Conditions

Refer to Appendix A for a copy of the NCDOT TIA Scoping Checklist.

1.2. Existing Roadway Conditions

The primary roadways within the study area are Dallas Stanley Highway and Kiser Dairy Road. A summary of their existing characteristics is shown in Table 1.

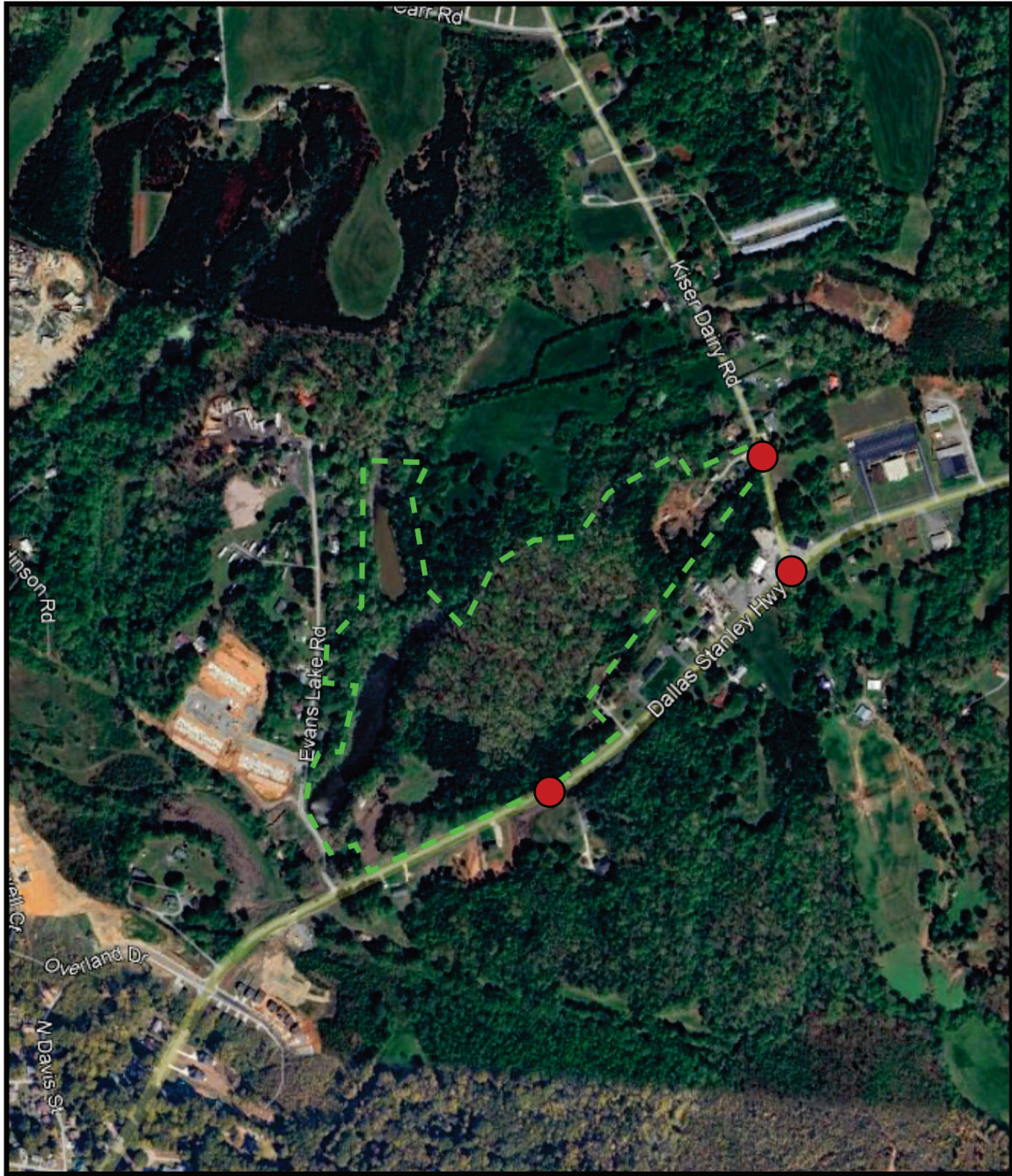
Table 1 – Study Area Summary

Facility Name	Route #	Typical Cross Section	Posted Speed Limit	Maintained By	AADT
Dallas Stanley Highway	NC-275	2-lane undivided	45 MPH	NCDOT	11,000 (2022)
Kiser Dairy Road	SR 1802	2-lane undivided	45 MPH	NCDOT	4,000 (2022)



Refer to Figure 3 for an illustration of the existing lane geometry and traffic control at the study intersections.

1.3. Driveway Location

Access to the site is to be provided via a full movement connection to Dallas Stanley Highway and a full movement connection to Kiser Dairy Road.



LEGEND

-  Proposed Site Location
-  Study Intersection

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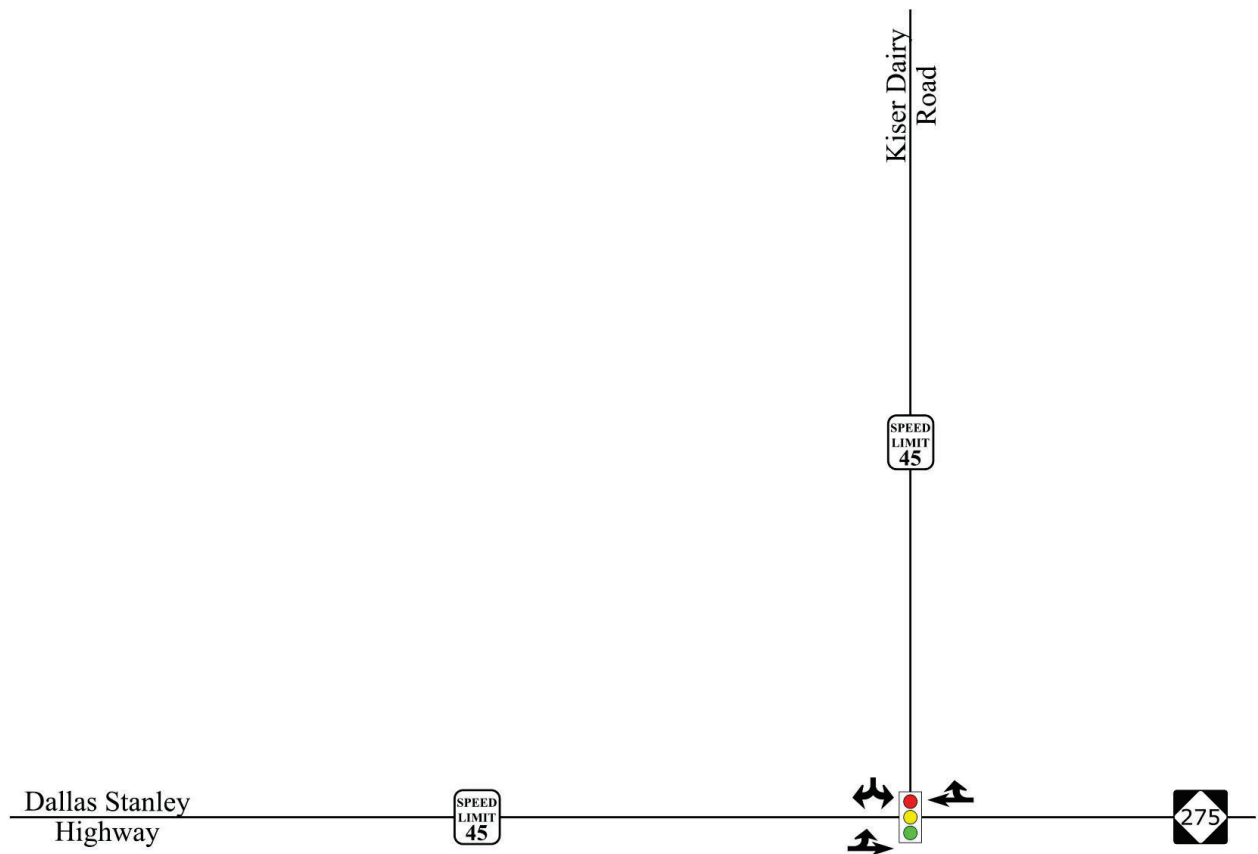
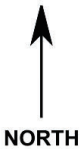
*Dallas Stanley Highway Residential
Dallas, NC*

Site Location Map

Scale: Not to Scale

Figure

1



LEGEND



Signalized Intersection



Unsignalized Intersection



Existing Lane



Posted Speed Limit

X'

Storage (In Feet)

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Dallas, NC*

Existing Lane Configurations
and Traffic Control

Scale: Not to Scale

Figure

3

2. TRAFFIC VOLUME DEVELOPMENT

2.1. Existing Traffic Volumes

Existing turning movement counts were conducted at the intersections during the weekday AM (7:00 AM to 9:00 AM) and weekday PM (4:00 PM to 6:00 PM) peak periods in May of 2024. The existing (2024) traffic volumes are illustrated in Figure 4. Refer to Appendix B for a copy of the raw traffic count data.

2.2. Projected Traffic Volumes

Based on coordination with NCDOT, a 2% annual growth was applied to the 2024 counts to project traffic volumes for the future year (2028). This growth rate was applied to account for all background growth in the area without any adjacent and/or the proposed developments. Refer to Figure 5 for an illustration of the No-Build (2028) traffic volumes.

2.3. Proposed Development Traffic Volumes

As mentioned previously, the proposed development is expected to consist of up to 155 single family homes to be completed by 2028. The trip generation potential for the development was estimated utilizing methodology contained within the ITE's *Trip Generation Manual*, 11th Edition. Utilizing ITE equations for ITE Code 210 traffic volumes were generated for the weekday daily, the weekday AM peak hour, and the weekday PM peak hour. Refer to Table 2 for a summary of the trip generation potential of the proposed development.

Table 2 – Trip Generation

ITE Land Use (Code)	Density	Independent Variable	Daily Traffic	AM Peak		PM Peak	
				Enter	Exit	Enter	Exit
Single Family Detached Housing (ITE Code 210)	155	Dwelling Units	1,510	28	83	95	55

It is estimated that the proposed development could generate a total of 1,510 trips (in and out) during a typical 24-hour weekday period with 111 trips (28 entering and 83 exiting) generated during the AM peak hour and 150 trips (95 entering and 55 exiting) generated during the PM peak hour at full build-out in 2028.

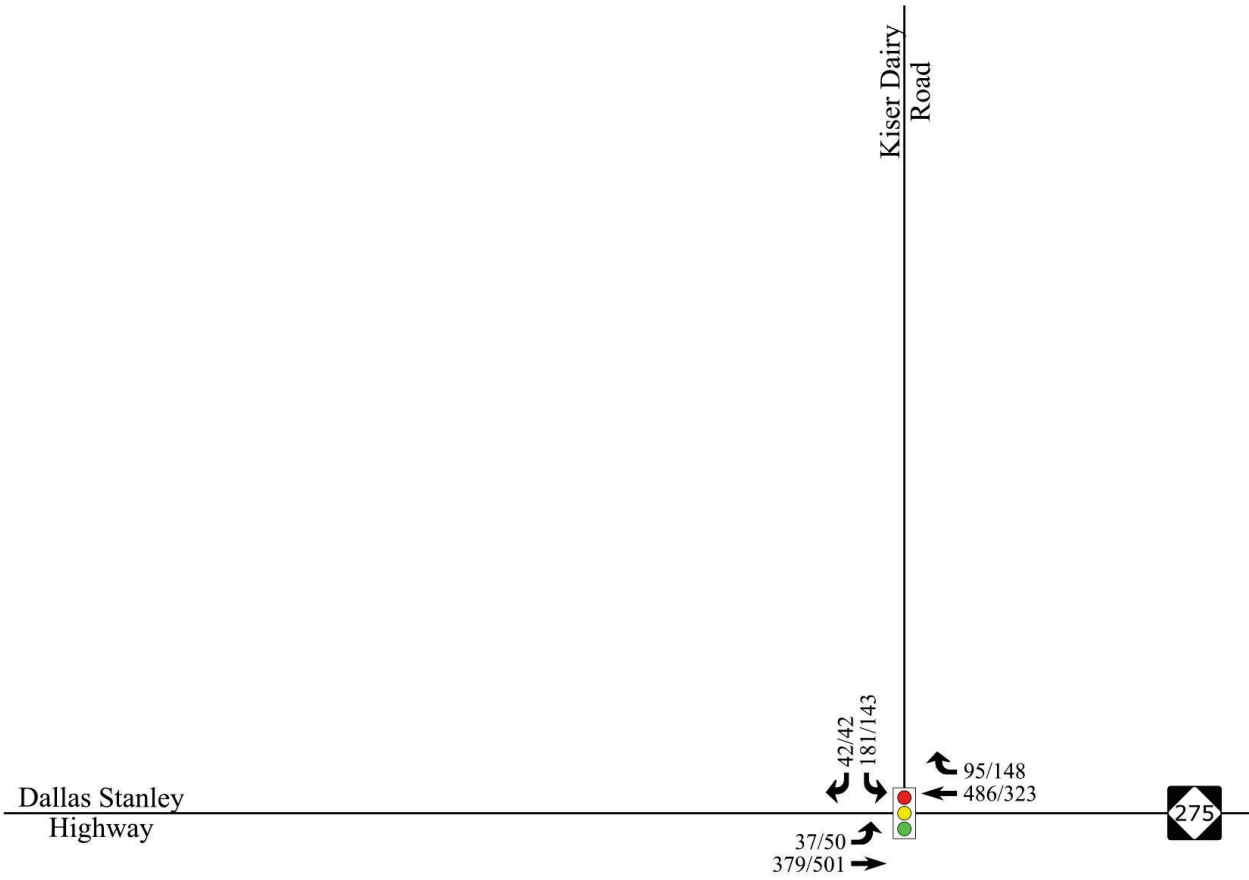
Site traffic associated with the proposed development was distributed and assigned to the roadway network based upon existing travel patterns and are summarized below:

- 50% to/from the west via Dallas Stanley Highway
- 40% to/from the east via Dallas Stanley Highway
- 10% to/from the north via Kiser Dairy Road



Refer to Figures 6 and 7 for illustrations of the site trip distributions and assignments for the proposed development.

2.4. Future Build Traffic Volumes

The site generated traffic volumes were added to the No-Build traffic volumes to determine the Build traffic volumes. The Build (2028) volumes are illustrated in Figures 8.



LEGEND

-  Signalized Intersection
-  Unsignalized Intersection
- X / Y → AM / PM Peak Hour Traffic

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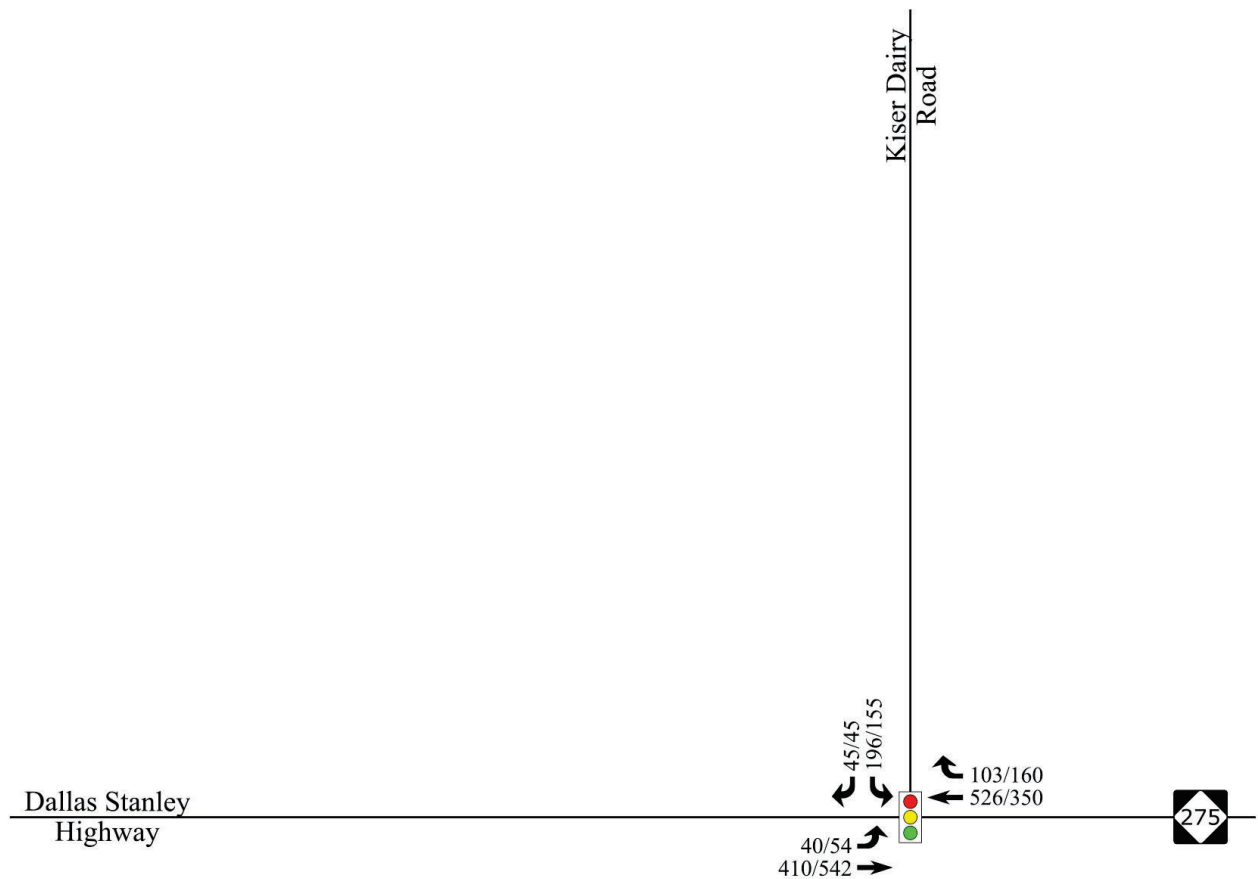
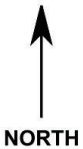
*Dallas Stanley Highway Residential
Dallas, NC*

Existing (2024)
Traffic Volumes

Scale: Not to Scale

Figure

4



LEGEND



Signalized Intersection



Unsignalized Intersection

X / Y → AM / PM Peak Hour Traffic

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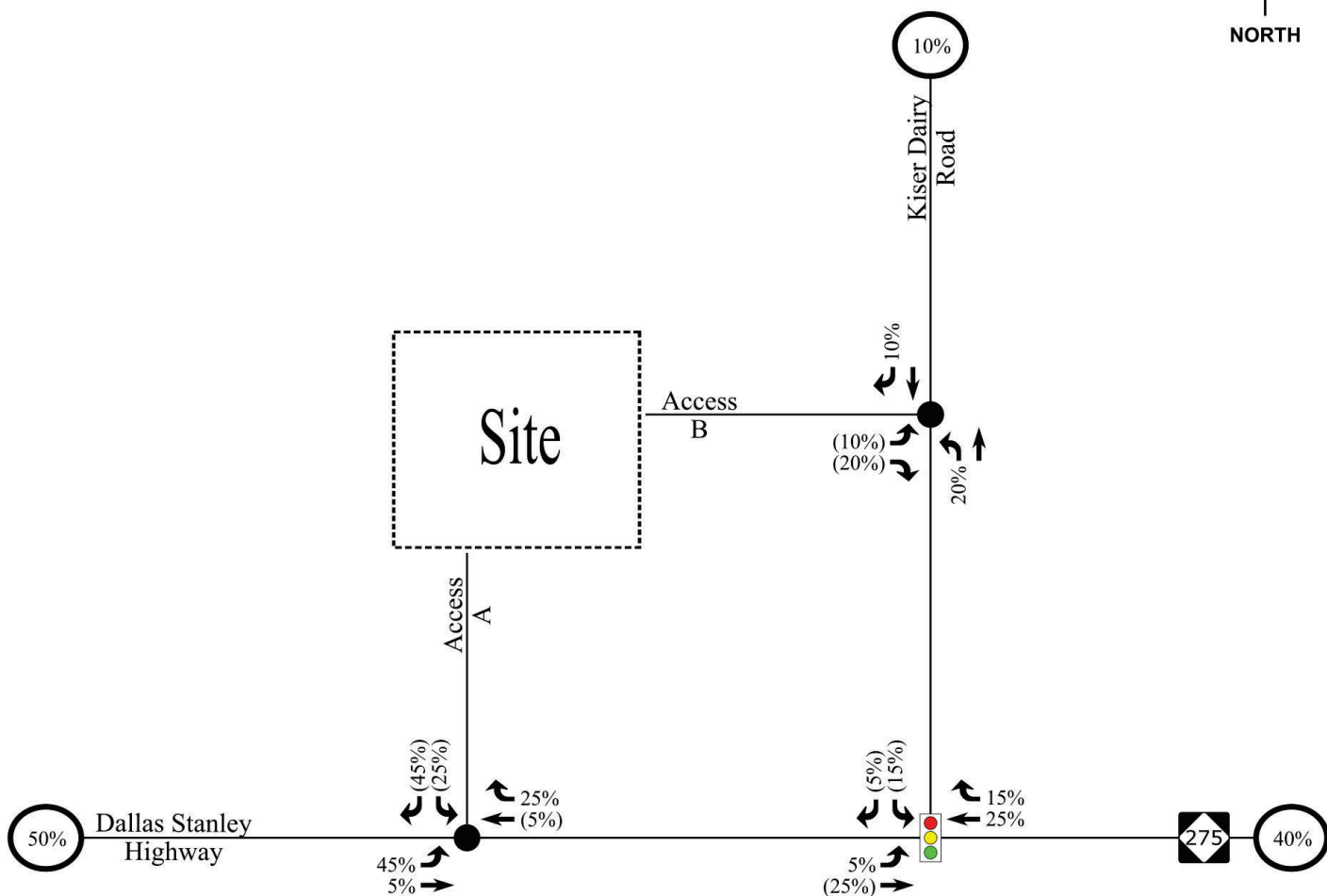
*Dallas Stanley Highway Residential
Dallas, NC*

No-Build (2028)
Traffic Volumes

Scale: Not to Scale

Figure

5



LEGEND



Signalized Intersection



Unsignalized Intersection



Regional Trip Distribution

X% →

Entering Trip Distribution

(Y%) →

Exiting Trip Distribution

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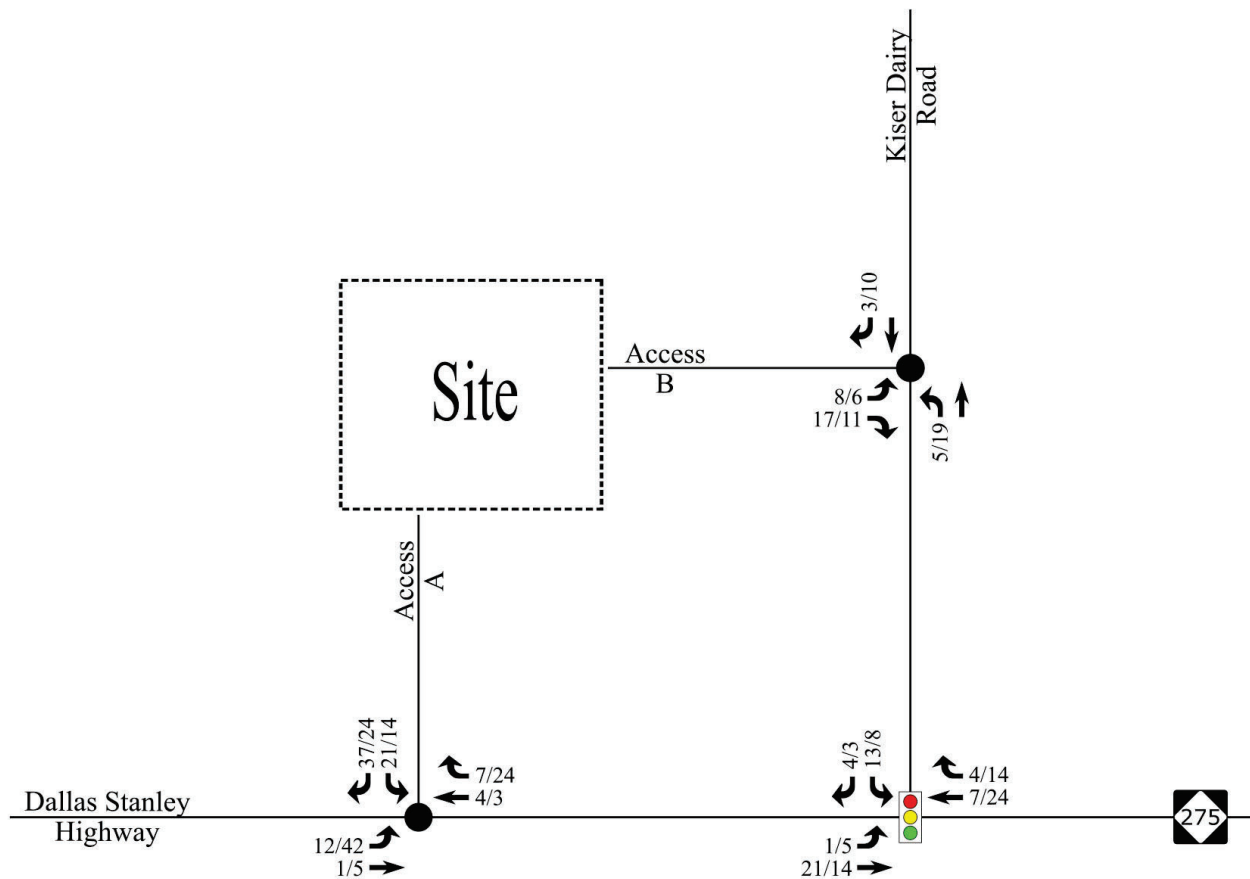
*Dallas Stanley Highway Residential
Dallas, NC*

Site Trip Distribution

Scale: Not to Scale

Figure

6



LEGEND



Signalized Intersection



Unsignalized Intersection

X / Y → AM / PM Peak Hour Traffic

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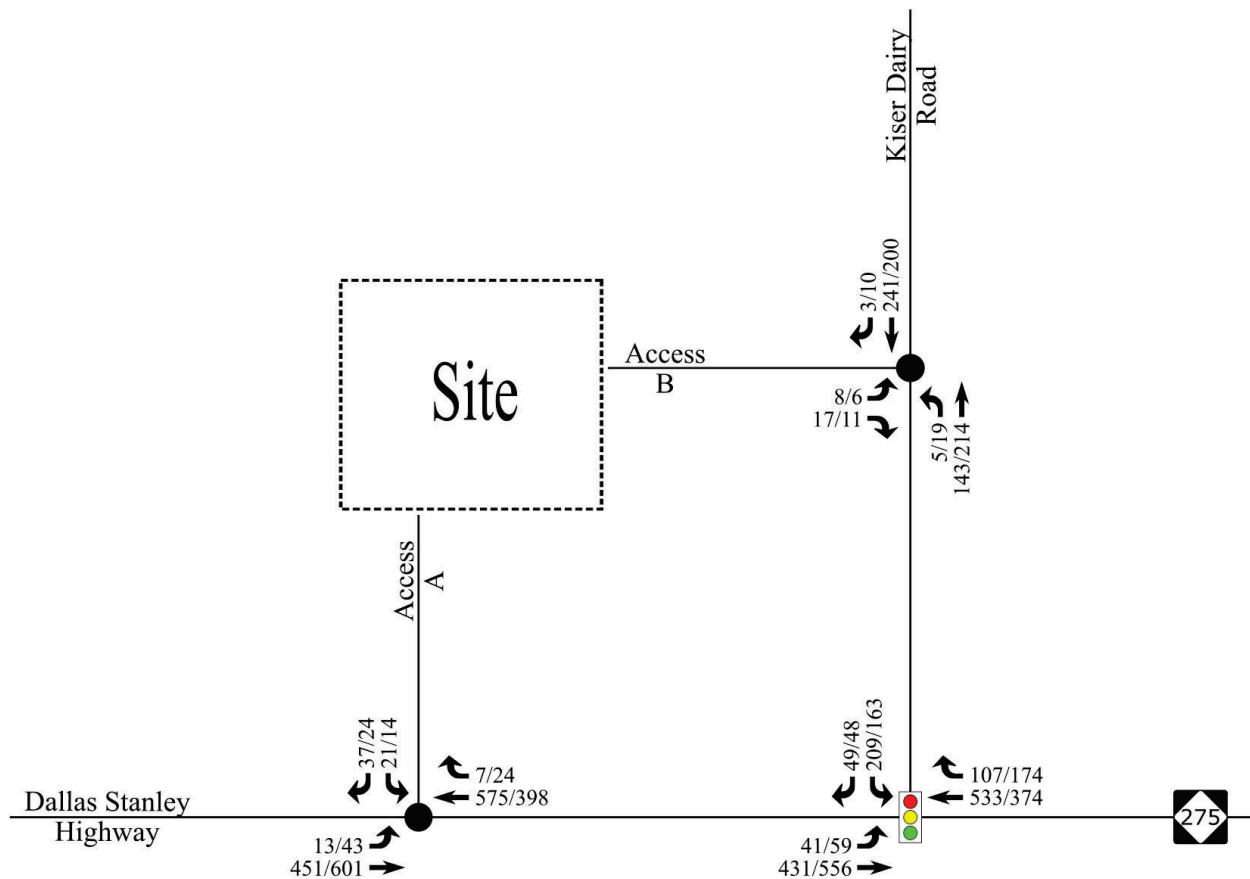
*Dallas Stanley Highway Residential
Dallas, NC*

Site Trip Assignment

Scale: Not to Scale

Figure

7



LEGEND



Signalized Intersection



Unsignalized Intersection

X / Y → AM / PM Peak Hour Traffic

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*Dallas Stanley Highway Residential
Dallas, NC*

Build (2028)
Traffic Volumes

Scale: Not to Scale

Figure

8

3. TRAFFIC IMPACT ANALYSIS

3.1. Turn Lane Analysis

A turn lane analysis was conducted for the site accesses utilizing the Build (2028) volumes. Based on build out volumes, a left turn lane is warranted on Dallas Stanley Highway at Access A. The volumes charted on the NCDOT nomograph indicate that the turn lane should be constructed with 50 feet of storage and appropriate taper. Refer to Appendix C for the turn lane warrant charts with the volumes graphed.

3.2. Intersection LOS Analysis

Using the existing, no-build, and build traffic volumes, intersection analyses were conducted for the study intersections under Existing (2024) conditions, No-Build (2028) conditions, and Build (2028) conditions. This analysis was conducted using the Transportation Research Board's *Highway Capacity Manual 6th Edition* (HCM 6th Edition) methodologies of the *Synchro*, Version 11 software.

Intersection level of service (LOS) grades range from LOS A to LOS F, which are directly related to the level of control delay at the intersection and characterize the operational conditions of the intersection traffic flow. LOS A operations typically represent ideal, free-flow conditions where vehicles experience little to no delays, and LOS F operations typically represent poor, forced-flow (bumper-to-bumper) conditions with high vehicular delays, and are generally considered undesirable. Table 3 summarizes the HCM 6th Edition control delay thresholds associated with each LOS grade for signalized and unsignalized intersections.

Table 3 – HCM 6th Edition LOS Criteria for Signalized & Unsignalized Intersections

Signalized Intersections		Unsignalized Intersections	
LOS	Control Delay per Vehicle (seconds)	LOS	Control Delay per Vehicle (seconds)
A	≤ 10	A	≤ 10
B	> 10 and ≤ 20	B	> 10 and ≤ 15
C	> 20 and ≤ 35	C	> 15 and ≤ 25
D	> 35 and ≤ 55	D	> 25 and ≤ 35
E	> 55 and ≤ 80	E	> 35 and ≤ 50
F	> 85	F	> 50

A PHF of 0.90 was applied and a heavy vehicle percentage of 2% was utilized for the purpose of this analysis. Existing signal data was obtained from NCDOT and was utilized for the purpose of this analysis. Additionally, a conservative approach was taken in which no right turns on red were permitted, although right turns on red are permitted on all intersections in the field. Additionally, all signals with protected-permitted left turn phasing were modeled as protected only in all scenarios.

3.3. Mitigation Requirements

NCDOT typically requires mitigation to be identified when developments are expected to impact the traffic operations as described below:

- Overall intersection or intersection approach delay increases by 25%.
- LOS degrades by at least one level.
- LOS is F.
- Synchro 95th or SimTraffic maximum queue results are greater than the existing turn lane storage length.

3.4. Capacity Analysis

The results of the capacity analysis for the study intersections under existing traffic control are summarized below in Table 4. Refer to Appendix D for the detailed capacity analysis reports.

Table 4 – Intersection Capacity Analysis Results

Intersections	Approach	LOS (Delay in seconds per vehicle)					
		Existing (2024)		No-Build (2028)		Build (2028)	
		AM	PM	AM	PM	AM	PM
Dallas Stanley Highway & Kiser Dairy Road	EB	B (11.2)	B (12.8)	B (12.9)	B (14.1)	B (14.8)	B (14.3)
	WB	B (14.1)	B (10.3)	B (15.5)	B (10.9)	B (16.4)	B (11.2)
	SB	C (21.9)	C (21.3)	C (24.2)	C (23.9)	C (25.0)	C (27.0)
	Overall	B (14.5)	B (13.2)	B (16.2)	B (14.4)	B (17.5)	B (15.0)
Dallas Stanley Highway & Access A	EB	<i>Analyzed under Build conditions only.</i>				A (8.9)	A (8.4)
	WB					-	-
	SB					C (18.8)	C (17.5)
Kiser Dairy Road & Access B	EB	<i>Analyzed under Build conditions only.</i>				B (10.4)	B (10.5)
	NB					A (7.8)	A (7.7)
	SB					-	-

The capacity analysis indicates that all movements are expected to operate at LOS C or better in all scenarios. Operations of the traffic signal at Dallas Stanley Highway and Kiser Dairy Road under Build conditions are anticipated to be similar No-Build conditions. No mitigation is recommended based on the capacity analysis.

3.5. Queuing Analysis

A queuing analysis was also completed for all No-Build and Build traffic. Reported in Table 5 is the maximum value between the Synchro 95th percentile queue and the SimTraffic maximum queue for each turn lane at study intersections. Additional storage is recommended where the site traffic introduced in the Build scenario extends the queue beyond the available storage. Refer to Appendix D for detailed Synchro capacity analysis reports and Appendix E for detailed SimTraffic reports.

Table 5 – Queuing Analysis

Intersections	Lane Group	Storage (feet) [Proposed]	Max Queue (feet)			
			AM Peak Hour		PM Peak Hour	
			No-Build	Build Improved	No-Build	Build Improved
Dallas Stanley Highway & Kiser Dairy Road	EB-LT	Full	410	477	578	615
	WB-TR	Full	338	365	223	256
	SB-LR	Full	186	198	166	166
Dallas Stanley Highway & Access A	EB-L	[50]	-	32	-	44
	SB-LR	Full	-	64	-	59
Kiser Dairy Road & Access B	EB-LR	Full	-	36	-	36
	NB-LT	Full	-	21	-	34

The queuing analysis indicates that the addition of site traffic in the Build scenario does not create a queuing issue that would require mitigation.

4. SUMMARY OF FINDINGS AND RECOMMENDATIONS

A traffic impact study was conducted for the proposed Dallas Stanley Highway Residential development in accordance NCDOT guidelines. The proposed development is located on the north side of Dallas Stanley Highway, west of Kiser Dairy Road, in Dallas, North Carolina. The development is expected to consist of up to 155 single family homes to be completed in 2028. Access to the site is to be provided via a full movement connection to Dallas Stanley Highway and a full movement connection to Kiser Dairy Road.

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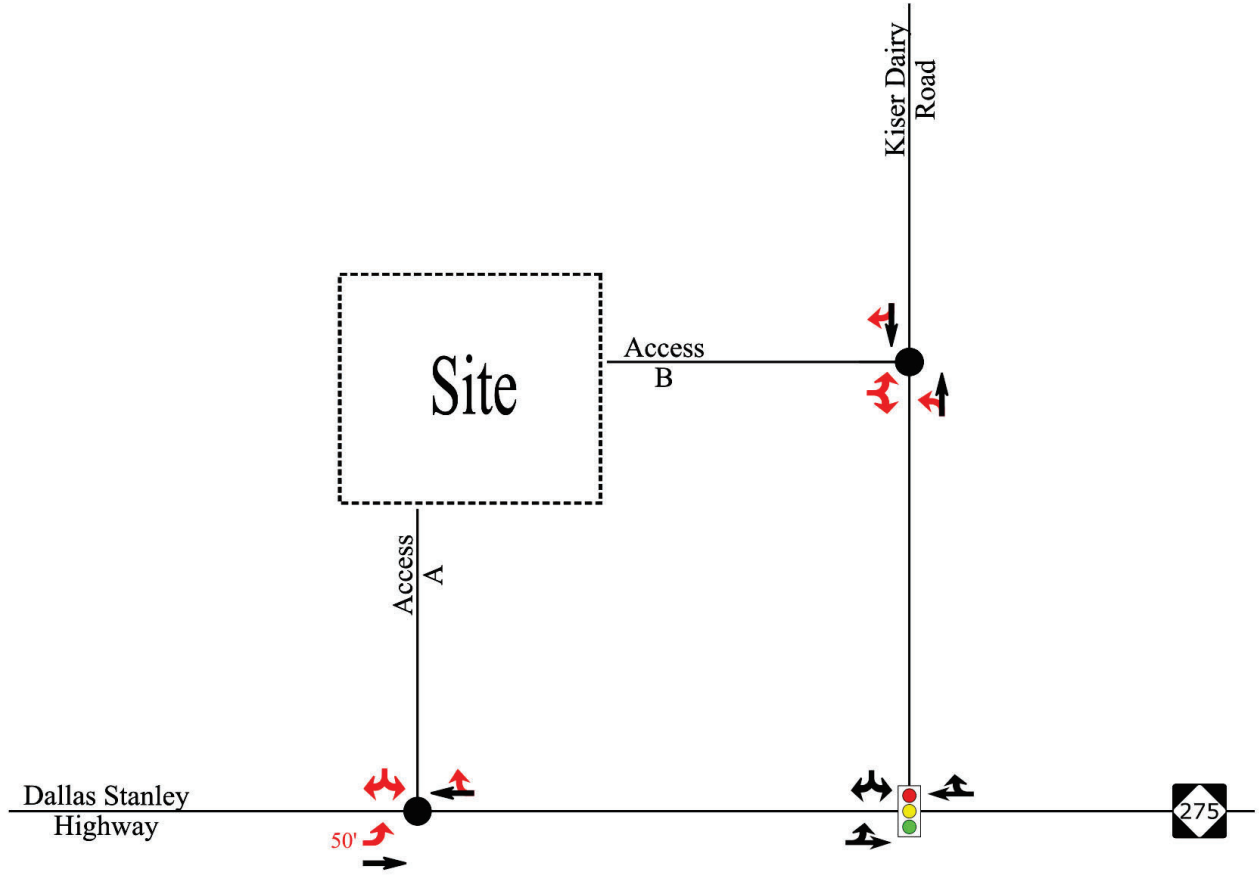
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



The queuing analysis indicates that the addition of site traffic in the Build scenario does not create a queuing issue that would require mitigation.

Recommendations:

- Construct an eastbound left turn lane on Dallas Stanley Highway at Access A with 50 feet of storage and appropriate taper.



LEGEND

-  Signalized Intersection
-  Unsignalized Intersection
-  Existing Lane (Proposed)
-  Storage (In Feet)

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Dallas, NC*

Proposed Lane Configurations
and Traffic Control

Scale: Not to Scale

Figure

9