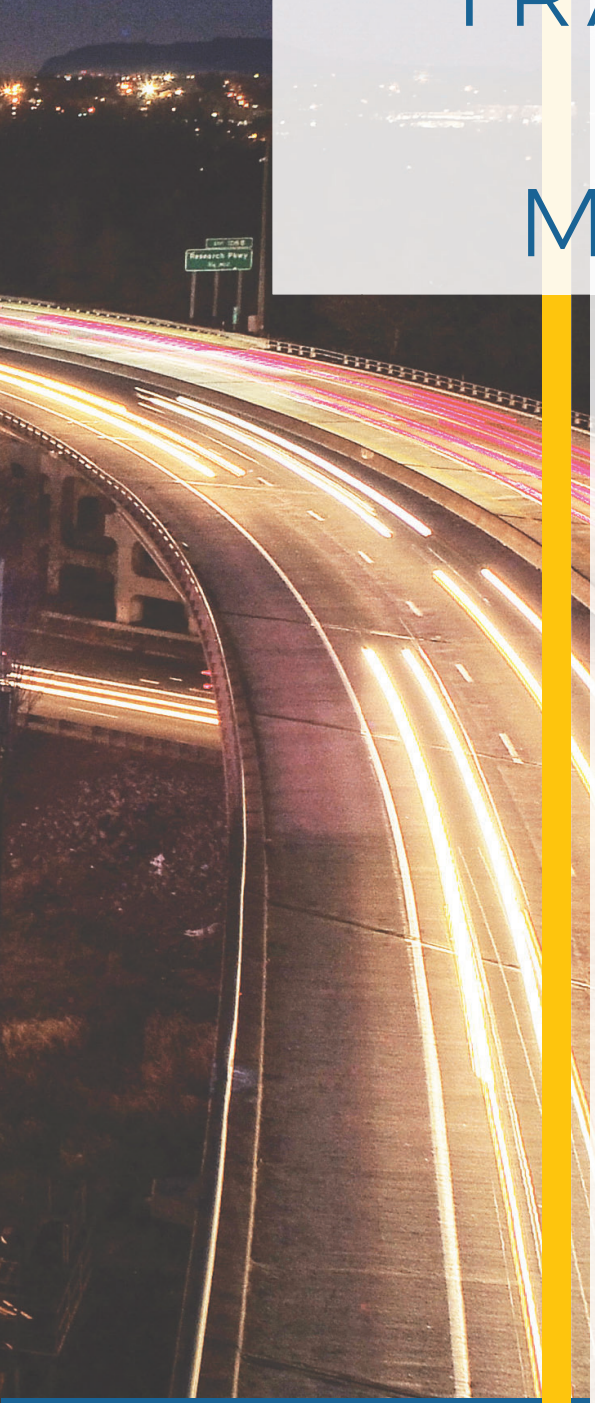
November 20, 2024

DAVENPORT

TRANSPORTATION TECHNICAL MEMORANDUM



Sheraton Park Road Trailer Parking Site

Guilford County, North Carolina

Project # 240018

Prepared For: The Carroll Companies

Transportation Technical Memorandum

Sheraton Park Road Trailer Parking Site

Guilford County, NC

Prepared for
The Carroll Companies

November 20, 2024

Prepared and Sealed by: Nick Liguori, P.E.

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1.0 Introduction

This memorandum provides a transportation-related review of the proposed Sheraton Park Road Trailer Parking site. This site is located at 209 East Sheraton Park Road, which is on the north side of Sheraton Park Road approximately 0.5 miles east of Randleman Road, and directly west of Wood Lake. The site will consist of a trailer parking facility with a capacity of 224 parking spaces in Phase 1. Phase 2 will add 363 spaces (587 cumulative) and Phase 3 will add 123 spaces (710 cumulative). Phases 2 and 3 are subject to demand, and it is uncertain whether these Phases will be built. The site plan is shown in Figure 1.

The purpose of this technical memorandum was to address the transportation-related impacts of the proposed project and to identify any necessary improvements. The following pages contain a review of trip generation, traffic volumes, intersection capacity and geometrics, safety, and pavement adequacy.

2.0 Land Use and Trip Generation

Land Use and Activity

The site will consist of a trailer parking facility, and is planned to be built in three phases as follows:

- Phase 1: 224 spaces
- Phase 2: 363 spaces
- Phase 3: 123 spaces
- Total: 710 spaces

Note that parking is limited to trailers only and does not include tractors alone or in combination with trailers. Activities will include the changing of trailers and the dropping off or picking up of trailers, and loading and unloading of containers which will be stored in a northwestern part of the site. The site plan also shows a gate house at the entrance to the facility. One to two employees will be on site at any time during business hours. Business hours are yet to be determined, but the facility will not be open 24 hours or overnight.

NOTE: LOT AREAS TO BE FENCED AND ENTRANCE AND EXIT TO BE GATED.

SHERATON PARK RD TRAILER PARKING

Site Plan Rendering - March 25, 2024

Figure 1 - Site Plan

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S:\107\Pursuits\99999-Sheraton_Park_Rd\DWG\Sheet\Exhibit\2024-03-19 Sheraton Park Rd - Site Plan Rendering\2024-03-19 Site Plan Rendering Exhibit.dwg | Plotted on 4/9/2024 3:56 PM | by Jacob Moore

Trip Generation Methodology

The ITE *Trip Generation Manual* is routinely used in the transportation engineering industry to quantify trip generation, based on rates and equations that have been developed based on years of data collection and research. However, no relevant data is available in the *Trip Generation Manual* for the proposed land use of trailer parking.

As a result, this study involved a customized trip generation. This involved identifying and collecting trip generation data for comparable sites offering trailer parking. In particular, two sites in Greer, South Carolina were identified, which are shown in Figures 2 and 3 below.

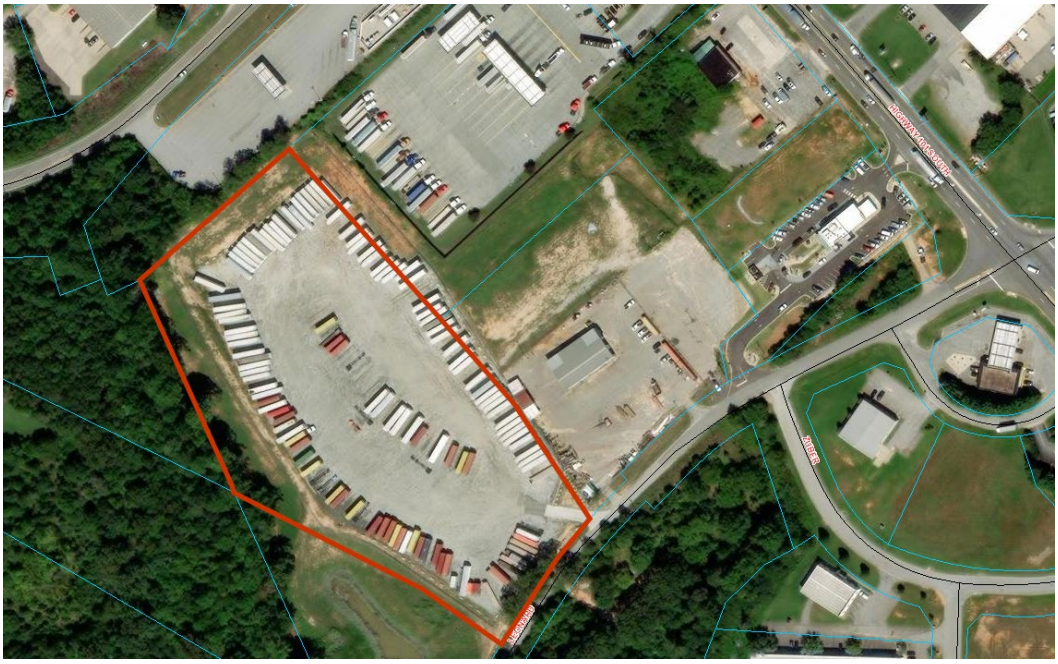

Figure 2: Data Collection Site 1: 361 Leonard Road, Greer, SC 29651

Figure 3: Data Collection Site 2: 1890 SC Highway 14, Greer, SC 29650

Driveway volumes were collected at each site for a 24-hour period from Wednesday, March 27 to Thursday, March 28, 2024. The results are summarized in Tables 1 and 2. The Tables also indicate the parking capacity of each site.

Table 1: Observed Driveway Volumes for Data Collection Site 1			
361 Leonard Road Greer, SC 29651			
Counted 12:00 pm 3/2724 to 12:00 pm 3/28/24			
Trailer parking capacity: Approximately 200 spaces			
Time Interval	**Enter**	**Exit**	**Total**
12:00 to 1:00 AM	0	0	0
1:00 to 2:00 AM	0	0	0
2:00 to 3:00 AM	1	0	1
3:00 to 4:00 AM	0	1	1
4:00 to 5:00 AM	0	0	0
5:00 to 6:00 AM	0	0	0
6:00 to 7:00 AM	0	0	0
7:00 to 8:00 AM	3	2	5
8:00 to 9:00 AM	2	3	5
9:00 to 10:00 AM	3	3	6
10:00 to 11:00 AM	1	1	2
11:00 AM to 12:00 PM	1	0	1
12:00 to 1:00 PM	0	0	0
1:00 to 2:00 PM	3	3	6
2:00 to 3:00 PM	0	0	0
3:00 to 4:00 PM	2	3	5
4:00 to 5:00 PM	1	1	2
5:00 to 6:00 PM	2	2	4
6:00 to 7:00 PM	1	1	2
7:00 to 8:00 PM	0	0	0
8:00 to 9:00 PM	0	0	0
9:00 to 10:00 PM	0	0	0
10:00 to 11:00 PM	0	0	0
11:00 PM to 12:00 AM	0	0	0
Total	**20**	**20**	**40**
AM Peak Hour (8:30-9:30 AM)	**3**	**4**	**7**
PM Peak Hour (4:30-5:30 PM)	**3**	**3**	**6**
AM Rate (trips/parking space)	**0.015**	**0.020**	**0.035**
PM Rate (trips/parking space)	**0.015**	**0.015**	**0.030**
Daily Trips Rate (trips/parking space)	**0.100**	**0.100**	**0.200**

Table 2: Observed Driveway Volumes for Data Collection Site 2			
1890 SC Highway 14 Greer, SC 29650			
Counted 11:00 am 3/2724 to 11:00 pm 3/28/24			
Trailer parking capacity: Approximately 286 spaces			
Time Interval	**Enter**	**Exit**	**Total**
12:00 to 1:00 AM	0	0	0
1:00 to 2:00 AM	0	0	0
2:00 to 3:00 AM	0	0	0
3:00 to 4:00 AM	1	0	1
4:00 to 5:00 AM	1	1	2
5:00 to 6:00 AM	0	2	2
6:00 to 7:00 AM	1	2	3
7:00 to 8:00 AM	3	1	4
8:00 to 9:00 AM	0	1	1
9:00 to 10:00 AM	1	1	2
10:00 to 11:00 AM	3	4	7
11:00 AM to 12:00 PM	2	2	4
12:00 to 1:00 PM	2	3	5
1:00 to 2:00 PM	2	2	4
2:00 to 3:00 PM	0	0	0
3:00 to 4:00 PM	2	1	3
4:00 to 5:00 PM	0	0	0
5:00 to 6:00 PM	0	0	0
6:00 to 7:00 PM	0	0	0
7:00 to 8:00 PM	2	0	2
8:00 to 9:00 PM	2	1	3
9:00 to 10:00 PM	1	2	3
10:00 to 11:00 PM	0	0	0
11:00 PM to 12:00 AM	0	0	0
Total	**23**	**23**	**46**
AM Peak Hour (10:00-11:00 AM)	**3**	**4**	**7**
PM Peak Hour (12:00-1:00 PM)	**2**	**3**	**5**
AM Rate (trips/parking space)	**0.010**	**0.014**	**0.024**
PM Rate (trips/parking space)	**0.007**	**0.010**	**0.017**
Daily Trips Rate (trips/parking space)	**0.080**	**0.080**	**0.161**

Table 3 provides the average trip generation rates based on the two data collection sites, in terms of trips per parking space.

Table 3: Average Trip Generation Rates (Trailer Parking Site)						
Trips per parking space						
24-Hour Two-Way Volume	AM Peak Hour			PM Peak Hour		
	Enter	Exit	Total	Enter	Exit	Total
0.180	0.013	0.017	0.030	0.011	0.013	0.024

Trip Generation Results

Next, the trip generation of the proposed site on Sheraton Park Road was computed using average trip rates from Table 3 above. Parking capacity (number of spaces) is used as the independent variable for trip generation purposes. Based on the proposed phasing schedule, Table 4 below summarizes the trip generation at each phase of the project.

Table 4: Trip Generation for Sheraton Park Road Trailer Parking Site											
Average Weekday Driveway Volumes					24-Hour Two-Way	AM Peak Hour			PM Peak Hour		
Land Use	ITE Land Use Code	Size		Method	Volume	Enter	Exit	Total	Enter	Exit	Total
Phase 1: 224 parking spaces											
Trailer Parking	Custom	224	Parking Spaces	Custom Rates	40	3	4	7	2	3	5
Phase 2: 587 parking spaces											
Trailer Parking	Custom	587	Parking Spaces	Custom Rates	106	8	10	18	6	8	14
Phase 3 (Full Build): 710 parking spaces											
Trailer Parking	Custom	710	Parking Spaces	Custom Rates	128	9	12	21	8	9	17

In total, the site is expected to generate less than 150 trips per day and less than 25 trips per peak hour in the full-build scenario. Note that site traffic consists primarily of truck traffic, with the exception of employee trips.

3.0 Trip Generation for Alternative Land Use Scenario

For comparative purposes only, an alternative development scenario based on the existing zoning was reviewed. The subject parcel is currently undeveloped woodland. The land is zoned AG (Agricultural), which allows residential development to a minimum lot size of 40,000 square feet (0.92 acres). Based on the parcel size of 48.76 acres, the number of lots developable was computed as 53. To allow margins for streets and other undevelopable area, it was estimated that 50 single family lots could be developed. The trip generation for 50 homes was calculated based on equations in the ITE *Trip Generation Manual* (11th Edition). The results are shown in Table 5 below.

Table 6 compares the proposed trailer parking scenario and this by-right residential scenario. The results indicate that even at full-build, the proposed trailer parking plan generates approximately 76% fewer trips than the residential by-right scenario. It should be noted that the difference is the proposed site's traffic consists primarily of trucks instead of passenger vehicles.

Table 5 - Trip Generation for By-Right Development Scenario (Comparison Purposes Only)

Average Weekday Driveway Volumes					24 Hour Two-Way	AM Peak Hour		PM Peak Hour	
Land Use	ITE Land Code	Size		Data Source	Volume	Enter	Exit	Enter	Exit
Single Family Detached	210	50	Dwelling Units	Adjacent, Equations	533	10	30	33	19

Table 6 - Comparison of Trip Generation for Proposed Scenario and By-Right Development Scenario

		24 Hour Two-Way	AM Peak Hour		PM Peak Hour	
Proposed Scenario (Trailer Parking)		128	9	12	8	9
By-Right Residential Scenario (50 homes)		533	10	30	33	19
Difference (Proposed minus By-Right)	**Trips**	**-405**	**-1**	**-18**	**-25**	**-10**
	%	**-76%**	**-10%**	**-60%**	**-76%**	**-53%**
			-35%		**-64%**	

4.0 Access and Traffic Routing

Access

The site plan proposes one (1) access point to the site on Sheraton Park Road at a location approximately 0.5 miles east of Randleman Road. Based on information from the applicant, the trucks that will patronize the site are primarily from major interstate and intrastate routes in the area including I-85, I-73, I-40, and US 421. The most direct access to the site is from I-85 via the Elm-Eugene Street interchange. This route is shown in Figure 4.

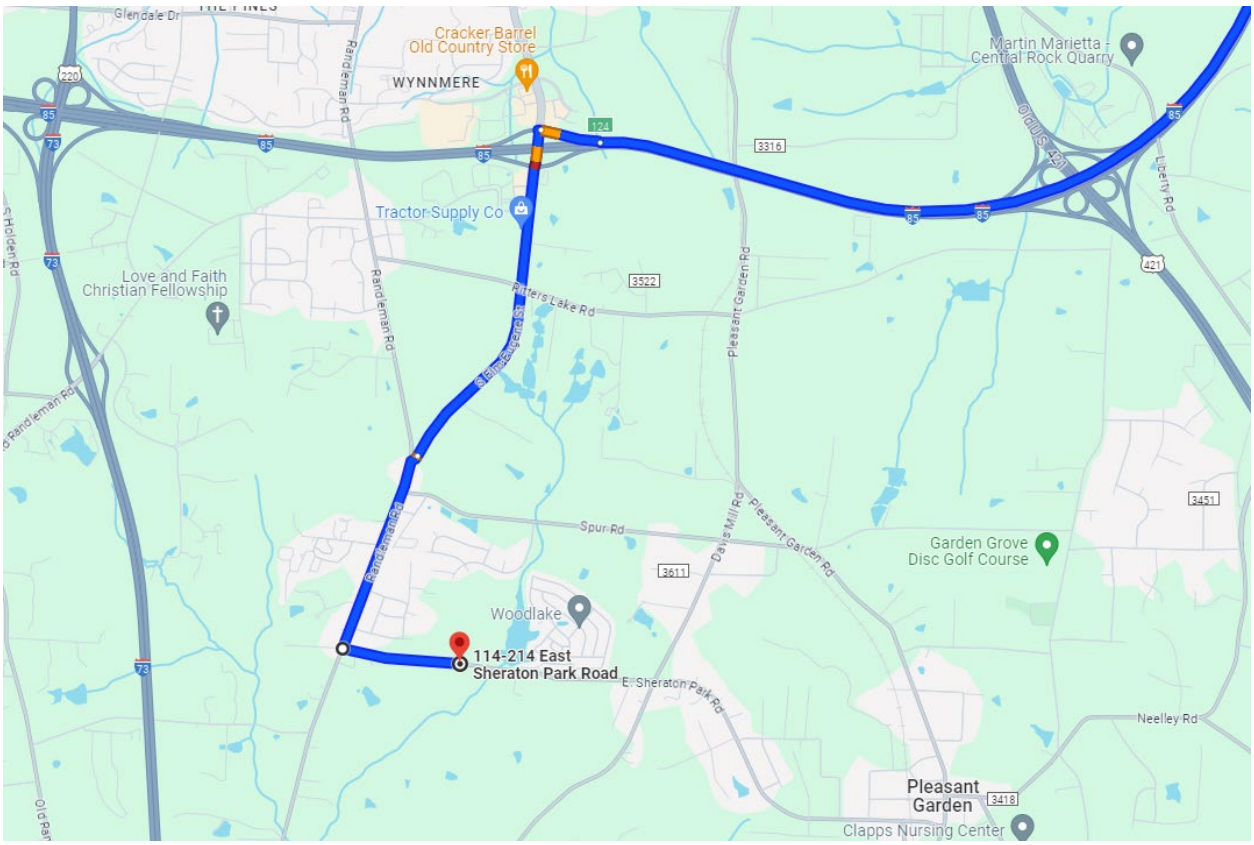

Figure 4: Anticipated Primary Route along Elm-Eugene Street and Randleman Road

Traffic Volumes

Traffic counts published by NCDOT indicate that Sheraton Park Road had an average annual daily traffic volume (AADT) of 2,000 vehicles per day in 2023. This is approximately 13% of the capacity of a two-lane route (approximately 15,000 vehicles per day), indicating there is adequate spare capacity. Randleman Road had an AADT volume of 6,800 vehicles per day to the north of Sheraton Park Road, and 3,400 vehicles per day to the south of Sheraton Park Road in 2021. This is approximately 23% to 45% of the capacity of a two-lane route (approximately 15,000 vehicles per day), indicating there is adequate spare capacity.

5.0 Intersection Adequacy

The potential need for roadway improvements was reviewed at the following two locations:

1) Randleman Road at Sheraton Park Road
2) Sheraton Park Road at Proposed Site Access

Randleman Road at Sheraton Park Road

Based on preliminary review of intersection geometry, the following improvements are expected to be needed at this intersection to safely accommodate truck traffic:

- Provide southbound left turn lane on Randleman Road with 100 feet of storage and appropriate deceleration and taper
- Provide northbound left turn lane on Randleman Road with 100 feet of storage and appropriate deceleration and taper
- Widen turning radii on east side of Randleman Road to accommodate truck turns to and from Sheraton Park Road. (Design vehicle: WB-67)

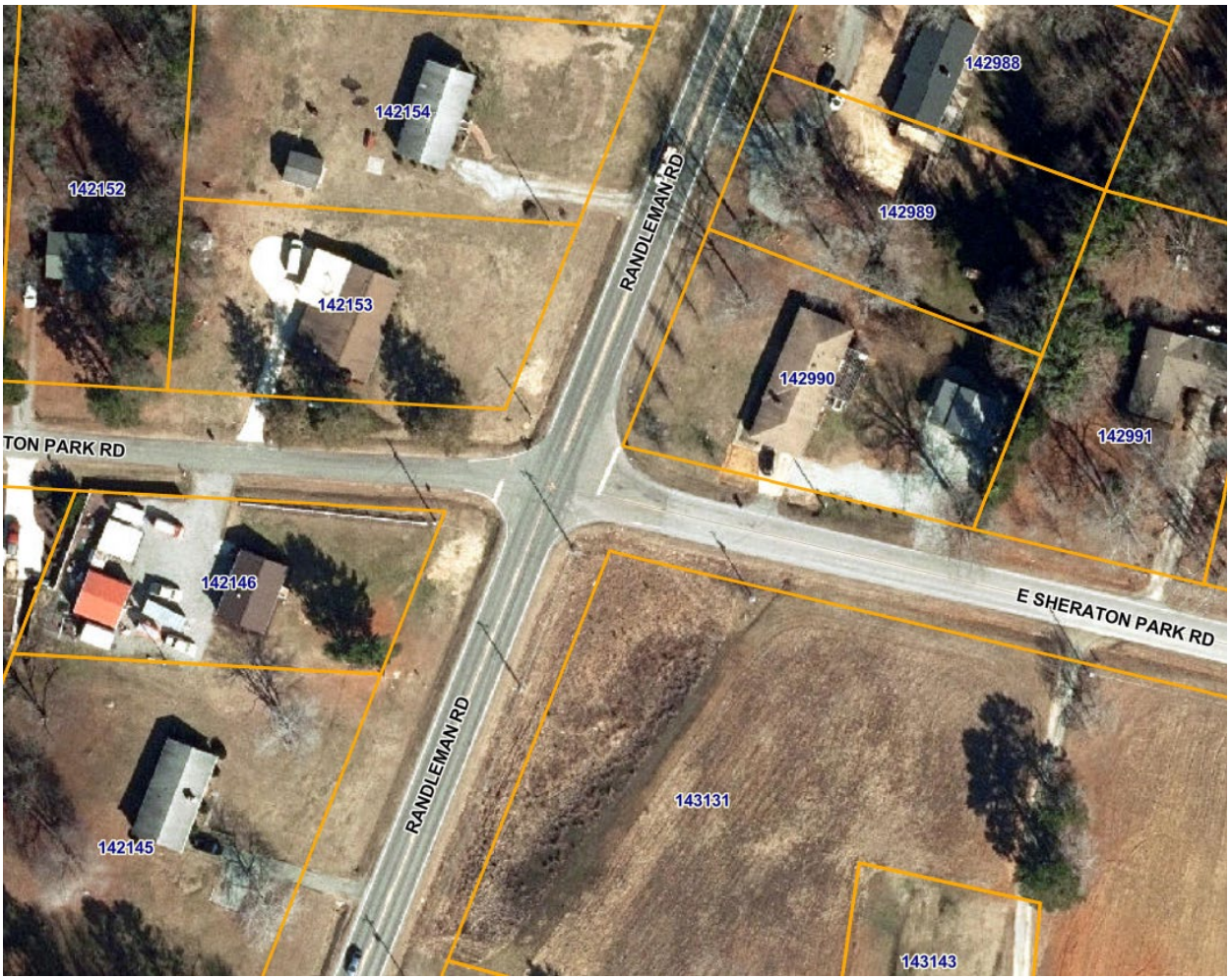

Figure 5: Aerial View of Randleman Road at Sheraton Park Road with Approximate Parcel Boundaries

Sheraton Park Road at Proposed Site Access

Based on the AADT volume (approximately 2,000 vehicles per day), Sheraton Park Road volumes will not reach the 4,000-vehicle NCDOT threshold for consideration of left or right turn lanes. Hence, left or right turn entry lanes are not recommended on Sheraton Park Road. It is recommended at this site access be designed with adequate turning radii to safely accommodate turning maneuvers by trucks (design vehicle: WB-67).

Figure 6: Screenshot from Site Plan Showing Proposed Site Access

6.0 Crash History Review

Randleman Road at Sheraton Park Road

Table 7 summarizes preliminary crash history data obtained for the intersection of Randleman Road at Sheraton Park Road. Crash history data was obtained from NCDOT maps for a 5-year period from January 1, 2019 to December 31, 2023. During this period, there were no fatal or serious (Class A) injuries recorded at this intersection.

Table 7 – Crash History Review for Randleman Road at Sheraton Park Road	
Based on NCDOT crash records from 1/1/2019 to 12/31/2023	
Total Crashes	10
Class A Injury Crashes	0
Class B Injury Crashes	0
Class C Injury Crashes	3
Property Damage Only Crashes	6
Unspecified Severity	1
Frontal Impact Crashes*	5
Rear End Crashes	0
Sideswipe Crashes	1
Pedestrian Crashes	0
Bicycle Crashes	0
Other Crashes**	4
* Frontal impact crashes include left turn, right turn, and angle crashes ** Other crashes include ran off road, fixed object, movable object, parked vehicle, backing up, animal-related, and other crashes	

As noted previously, a left turn lane is recommended on Randleman Road. This improvement is expected to improve overall intersection safety by removing conflicts between left-turning vehicles and through and right-turning vehicles. Based on the NCDOT "Crash Reduction Factor (CRF) Information" document, a left turn lane can provide approximately a 33% reduction in all intersection crashes and a 60% reduction in left turn and rear end crashes.

Sheraton Park Road

For the 0.5-mile segment of Sheraton Park Road from Randleman Road to the proposed site access, crash data were not available at the time of this study. However, one risk factor for this section of Sheraton Park Road is the relatively narrow width of pavement (21 feet), with two-foot unpaved shoulders. A potential improvement is to coordinate with NCDOT on resurfacing Sheraton Park Road and widening the lanes from Randleman Road to the proposed Site Access.

7.0 Pavement Review

Sheraton Park Road has a typical pavement width of 21 feet and a posted speed of 45 mph. Shoulder width is typically two (2) feet and unpaved. Based on information from NCDOT mapping, the pavement is in poor condition, with a condition rating of 46.50.[1] The most recent pavement overlay was performed in 2008, meaning that the pavement is 16 years old. The composition and depth of the pavement structure is not yet known.

Per NCDOT staff, Sheraton Park Road is currently scheduled for pavement rehabilitation in fiscal year 2027. It is recommended that the applicant coordinate with NCDOT on the timing of this pavement improvement project. Also, it is recommended to widen lane width and / or shoulder between Randleman Road and the proposed Site Access.

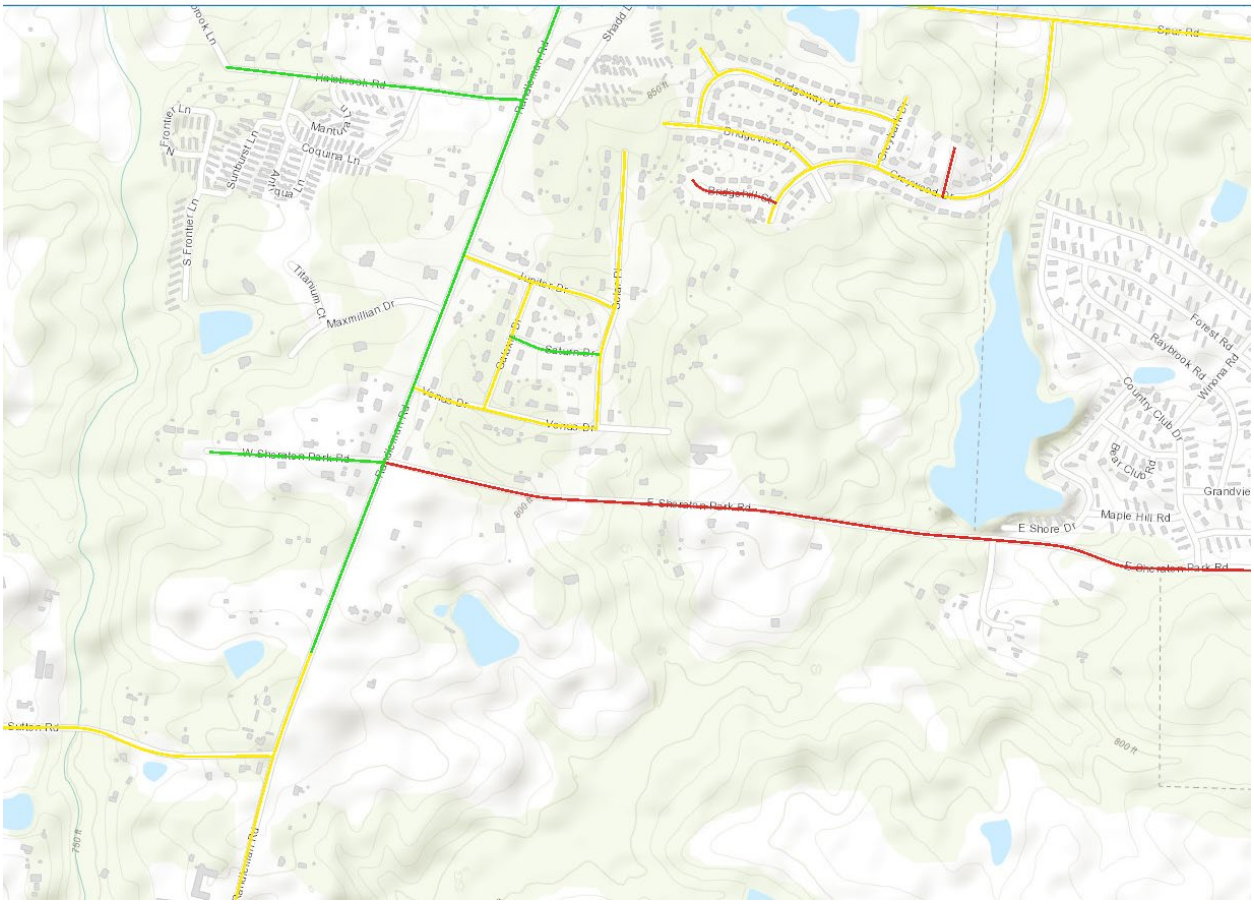

Figure 7: NCDOT Pavement Conditions Map (Green = Good, Yellow = Fair, Red = Poor)

[1] "Poor" condition is defined with a rating less than 60, "fair" with a rating between 60 and 80, and "good" with a rating above 80.

8.0 Summary / Conclusion

The purpose of this technical memorandum was to address the transportation-related impacts of the proposed project and to identify any necessary improvements. Table 8 below summarizes the recommendations of this study. With the recommended improvements in place, the anticipated impacts of the proposed site can be safely accommodated.

Table 8 – Recommended Improvements Summary

Location	Recommendations
Randleman Road at Sheraton Park Road	• Provide southbound left turn lane on Randleman Road with 100 feet of storage and appropriate deceleration and taper • Provide northbound left turn lane on Randleman Road with 100 feet of storage and appropriate deceleration and taper • Widen turning radii on east side of Randleman Road to accommodate truck turns to and from Sheraton Park Road. (Design vehicle: WB-67)
Sheraton Parl Road at Proposed Site Access	• Design Site Access with adequate turning radii to safely accommodate turning maneuvers by trucks (design vehicle: WB-67).
Sheraton Park Road between Randleman Road and Davis Mill Road	• It is recommended that the applicant coordinate with NCDOT on the timing of the pavement rehabilitation of Sheraton Park Road (currently scheduled for 2027). • It is also recommended to widen lane width and / or shoulder between Randleman Road and the proposed Site Access.