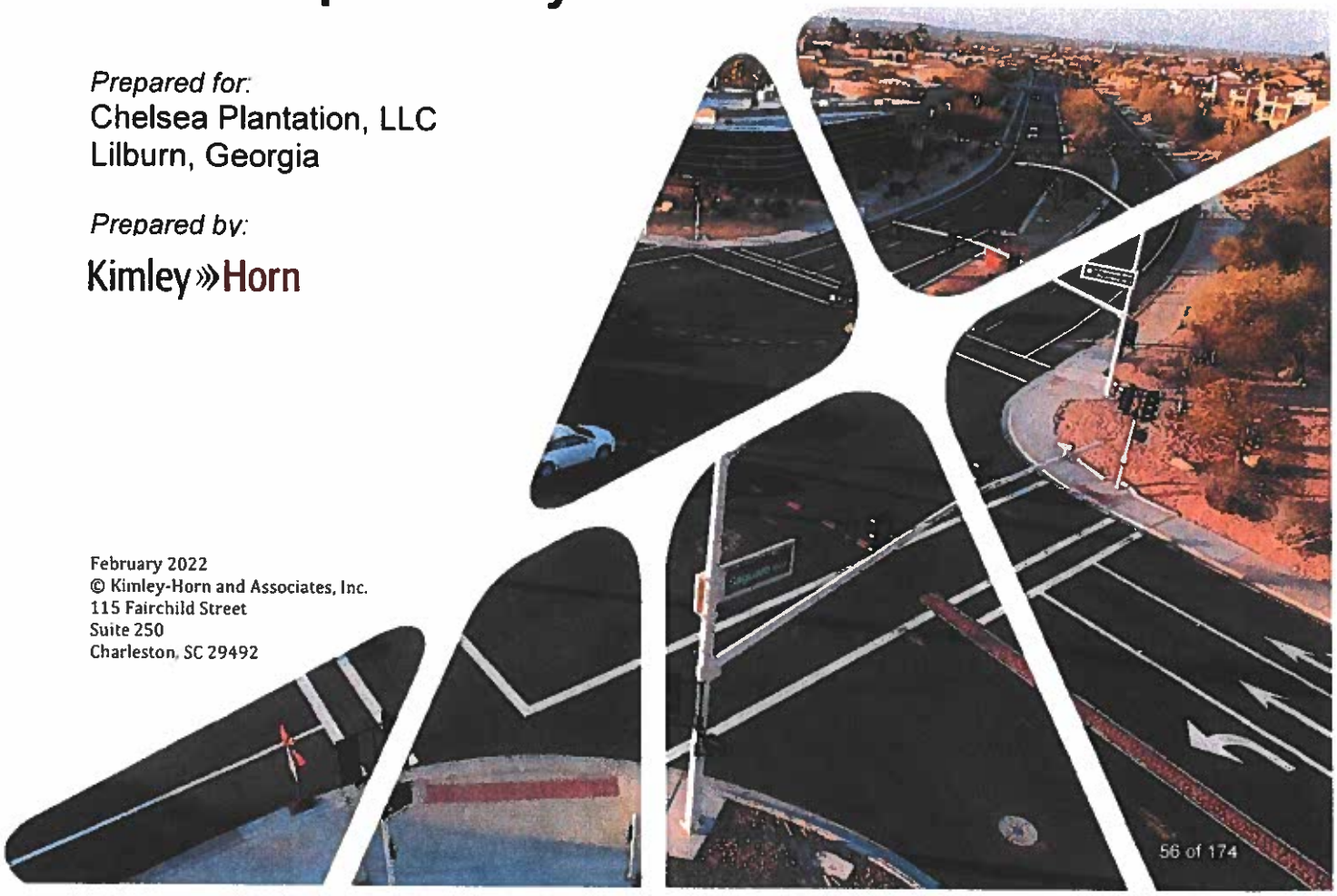
APPENDIX M – TRAFFIC STUDY

Chelsea Park Development
Okatie, Jasper County, South Carolina

Traffic Impact Analysis

Prepared for:
Chelsea Plantation, LLC
Lilburn, Georgia

Prepared by:
Kimley»Horn



February 2022

115 Fairchild Street
Suite 250
Charleston, SC 29492

Traffic Impact Analysis for
Chelsea Park Development
Okatie, Jasper County, South Carolina

Prepared for:

Chelsea Plantation, LLC
Lilburn, Georgia

Prepared by:

Kimley-Horn and Associates, Inc.
115 Fairchild Street
Suite 250
Charleston, South Carolina 29492

SOUTH CAROLINA
KIMLEY-HORN AND ASSOCIATES, INC
No. C00166
CERTIFICATE OF AUTHORIZATION

February 2022
013885000

SOUTH CAROLINA
LICENSED PROFESSIONAL ENGINEER
No. 33615
DILLON BRENT TURNER

02/25/2022

TABLE OF CONTENTS

List of Figures

List of Tables

1.0 Executive Summary

The proposed Chelsea Park Development is located adjacent to Snake Road near SC 170 in Okatie, Jasper County, SC. The proposed mixed-use development is planned to be constructed in two phases:

Phase I (2026 Build-Out)

- 438-dwelling unit single-family residential community with clubhouse/pool/fitness amenity
- 69,600 square-foot self-storage facility

Phase II (2031 Build-Out)

- 597-dwelling unit multi-family apartment complex
- 110,000 square feet of retail space

This report analyses three access scenarios:

Scenario 1, which will be referred to as Phase 1 – Option 1 considered three site access points along Snake road for the first phase of the development

This report analyses three (3) access scenarios:

- Scenario 1, which will be referred to in the report as Phase 1, considers two site access points along Snake Road for the first phase of the development. No site accesses are considered on SC 170
- Scenario 2, which will be referred to in the report as Phase 2 – Option 1, considers three site access points along Snake Road for the second phase of the development. No site accesses are considered on SC 170
- Scenario 3, which will be referred to in the report as Phase 2 – Option 2, considers three site access points along Snake Road and one access point along SC 170

Based on the site plan shown in **Figure 2.1**, primary external access to the development will occur via the following:

- Snake Road at Marion Horry Lane Site/Access #1 (proposed unsignalized, full-movement)
  - Site Access #1 is proposed to be located approximately 1,340' north of SC 170 along Snake Road across from Marion Horry Lane
- Snake Road at Site Access #2 (proposed unsignalized, full-movement)
  - Site Access #2 is proposed to be located approximately 3,460' north of SC 170 along Snake Road
- Snake Road at Site Access #3 (proposed unsignalized, full-movement)
  - Site Access #3 is proposed to be located approximately 5,830' north of SC 170 along Snake Road
  - *This site access is only part of Phase 2*
- SC 170 at Old Bailey's Road/Site Access #4
  - *The Chelsea Park Development is not proposed to connect to this site Access in Phase 1*
  - Site Access #4 is proposed to be signalized, full-movement in Phase 2
  - Site Access #4 is proposed to be located approximately 2,900' west of Snake Road along SC 170 across from Old Bailey's Road
  - Site Access #4 was only analyzed in Phase 2 Option 2

This traffic impact analysis (TIA) evaluates traffic operations under 2021 Existing, 2026 Background, 2026 Build, 2031 Background and 2031 Build conditions during the AM and PM peak hours at the following intersections:

- Snake Road at SC 170
- Snake Road at Marion Horry Lane (Site Access #1)
- Old Bailey's Road at SC 170 (Site Access #4)
- Snake Road at SC 462
- Snake Road at Site Access #2
- Snake Road at Site Access #3

The TIA scoping parameters for this TIA were approved by SCDOT via email on March 26, 2021. The TIA scoping approval is attached in the **Appendix.**

Kimley-Horn was retained to determine the potential traffic impacts of this development and identify transportation improvements that may be required to accommodate these impacts in accordance with the guidelines set forth in the South Carolina Department of Transportation (SCDOT) *Access and Roadside Management Standards* (ARMS) *Manual*. This report presents trip generation, trip distribution, capacity analyses, and recommendations for transportation improvements required to mitigate anticipated traffic demands produced by the subject development.

Based on the capacity analyses performed at each of the identified study intersections, along with review of the auxiliary turn-lane warrants contained herein, the following improvements have been identified to mitigate the impact of the proposed development on the adjacent street network under **2026 Build Phase 1 Conditions**:

SC 170 at Snake Road/Callawassie Road

- Construct a southbound right-turn lane with a minimum storage of 375
- Implement permitted + overlap phasing for the southbound and northbound right-turn movements
- Optimize the traffic signal splits

Snake Road at Marion Horry Lane/Site Access #1

- Construct a northbound left-turn lane with a minimum storage of 200
- For Phase 1, the site access should include one ingress lane and one egress lane
- Dedicate right-of-way for a future southbound right-turn lane for future development
- Dedicate right-of-way for two egress lanes for future development

Snake Road at Site Access #2

- Construct a northbound left-turn lane with a minimum storage of 200
- For Phase 1, the site access should include one ingress lane and one egress lane
- Dedicate right-of-way for a future southbound right-turn lane for future development
- Dedicate right-of-way for two egress lanes for future development

Based on the capacity analyses performed at each of the identified study intersections, along with review of the auxiliary turn lane warrants contained herein, the following improvements have been identified to mitigate the impact of the proposed development on the adjacent street network under 2031 Build Phase 2 – Option 1 Conditions - (*Italicized bullets represent a carry-over recommendation from Phase 1*):

SC 170 at Snake Road/Callawassie Road

- Construct a southbound left-turn with a minimum storage of 250' to create dual southbound left-turn lanes
- Construct an eastbound left-turn lane with a minimum storage of 225' to create dual eastbound left-turn lanes
- *Construct a southbound right-turn lane with a minimum storage of 375'*
- Implement permitted + overlap phasing for all right-turn movements at the intersection
- Implement protected + permitted phasing for the northbound left-turn movement
- Optimize the traffic signal splits

Snake Road at Marion Horry Lane/Site Access #1

- Construct a northbound left-turn lane to drop at the site access to accommodate the dual eastbound left-turn lanes from the SC 170 at Snake Road/Callawassie Drive intersection
- Construct a southbound right-turn lane with a minimum storage of 100'
- Construct an eastbound left-turn lane with a minimum storage of 150'

Snake Road at Site Access #2

- *Construct a northbound left-turn lane with a minimum storage of 200'*
- Construct a southbound right-turn lane with a minimum storage of 100'
- Construct an eastbound left-turn lane with a minimum storage of 150'

Snake Road at Site Access #3

- Construct a westbound left-turn lane with a minimum storage of 200'
- Construct a northbound left-turn lane with a minimum storage of 150'

SC 462 at Snake Road

- Construct a northbound left-turn lane with a minimum storage of 200'

Based on the capacity analyses performed at each of the identified study intersections, along with review of the auxiliary turn lane warrants contained herein, the following improvements have been identified to mitigate the impact of the proposed development on the adjacent street network under **2031 Build Phase 2 – Option 2 Conditions - (*Italicized bullets represent a carry-over recommendation from Phase 1):***

SC 170 at Old Bailey's Road/Site Access #4

- Conduct a full signal warrant analysis once Phase 2 of the Chelsea Park Development is constructed to evaluate the need for installing a traffic signal
  - A traffic signal at this intersection is warranted based on projected 2031 Phase 2 Build peak-hour traffic volumes, but SCDOT District 6 does not allow a traffic signal to be constructed based on projected volumes
- Construct a westbound right-turn lane with a minimum storage of 250'
- Restripe the existing two-way left-turn lane (TWLTL) to function as an exclusive eastbound left-turn lane with 300' of storage
- Construct a southbound left-turn lane with a minimum full-width storage of 200'
- Construct a southbound shared through/right-turn turn lane

SC 170 at Snake Road/Callawassie Road

- Construct a southbound left-turn with a minimum storage of 250' to create dual southbound left-turn lanes
- *Construct a southbound right-turn lane with a minimum storage of 375'*
- Implement permitted + overlap phasing for all right-turn movements at the intersection
- Implement protected + permitted phasing for the northbound left-turn movement
- Optimize the traffic signal splits

Snake Road at Marion Horry Lane/Site Access #1

- *Construct a northbound left-turn lane with a minimum storage of 200'*
- Construct a southbound right-turn lane with a minimum storage of 100'
- Construct an eastbound right-turn lane with a minimum storage of 150'

Snake Road at Site Access #2

- *Construct a northbound left-turn lane with a minimum storage of 200'*
- Construct a southbound right-turn lane with a minimum storage of 100'
- Construct an eastbound right-turn lane with a minimum storage of 150'

Snake Road at Site Access #3

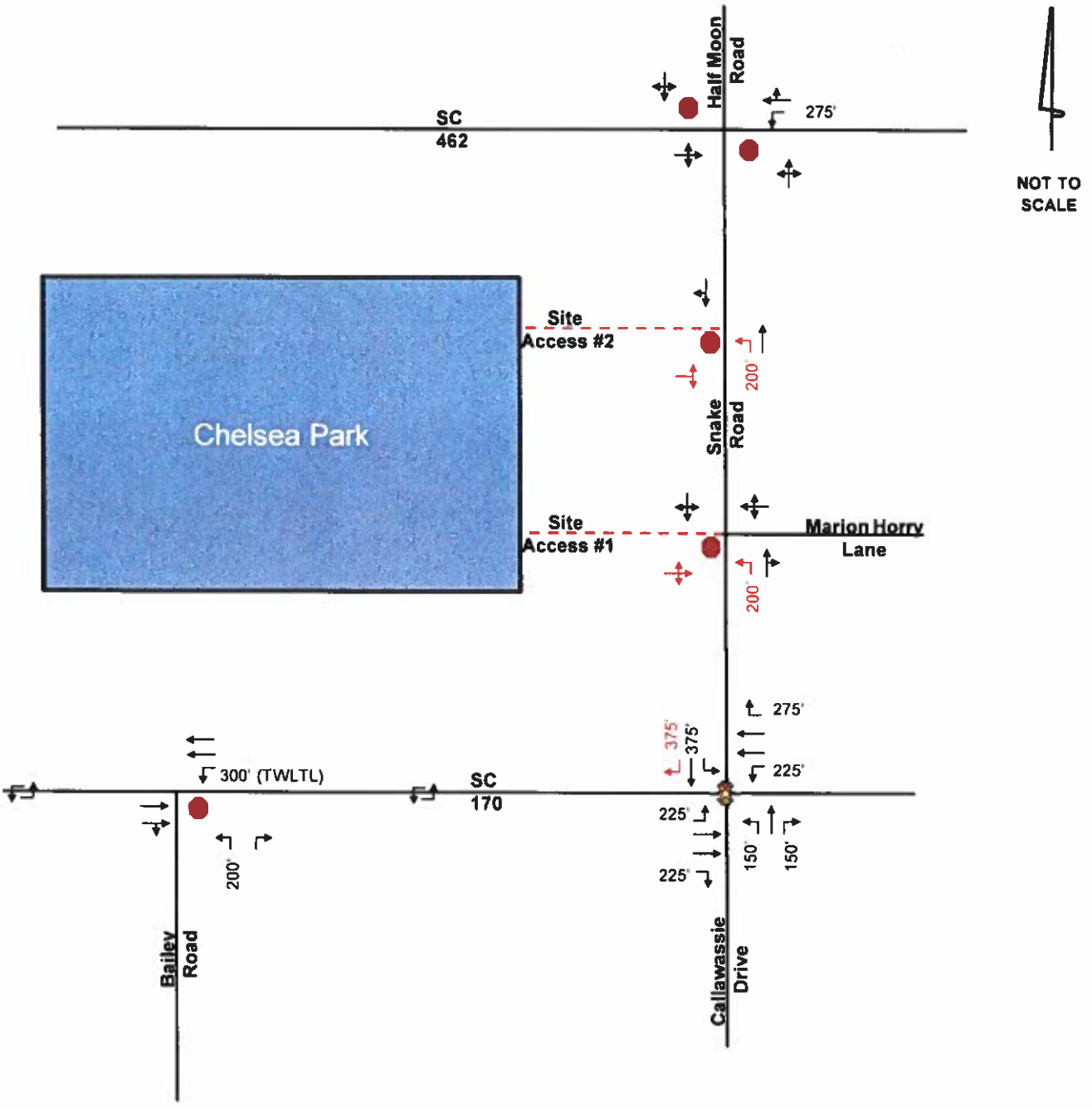
- Construct a westbound left-turn lane with a minimum storage of 200'
- Construct a northbound left-turn lane with a minimum storage of 150'

SC 462 at Snake Road

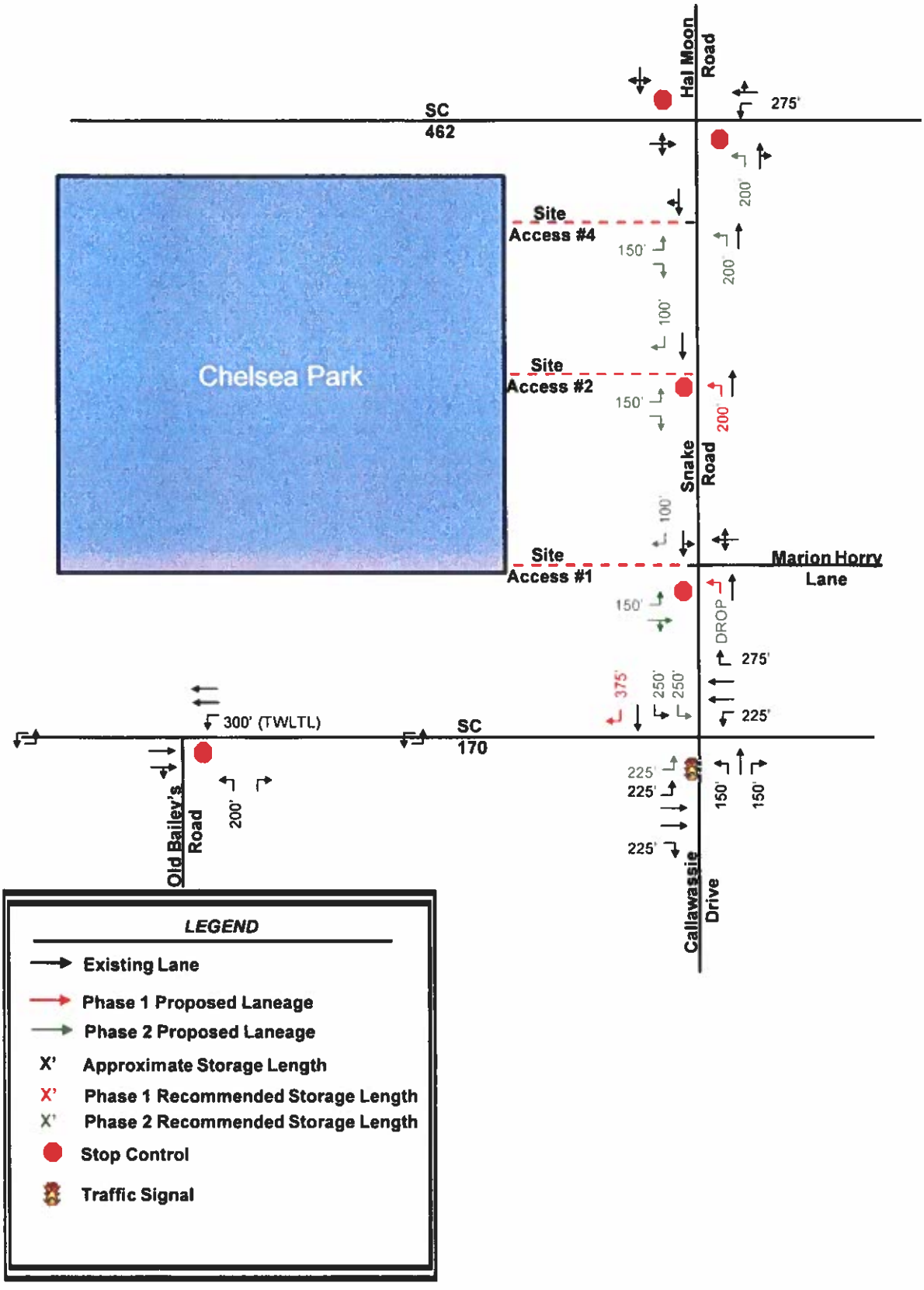
- Construct a northbound left-turn lane with a minimum storage of 200'

The recommended improvements identified within the study area are shown in **Figure ES-1, Figure ES-2,** and **Figure ES-3** for the 2026 Phase 1, 2031 Phase 2 – Option 1, and 2031 Phase 2- Option 2 conditions, respectively. The improvements shown on these figures are subject to approval by

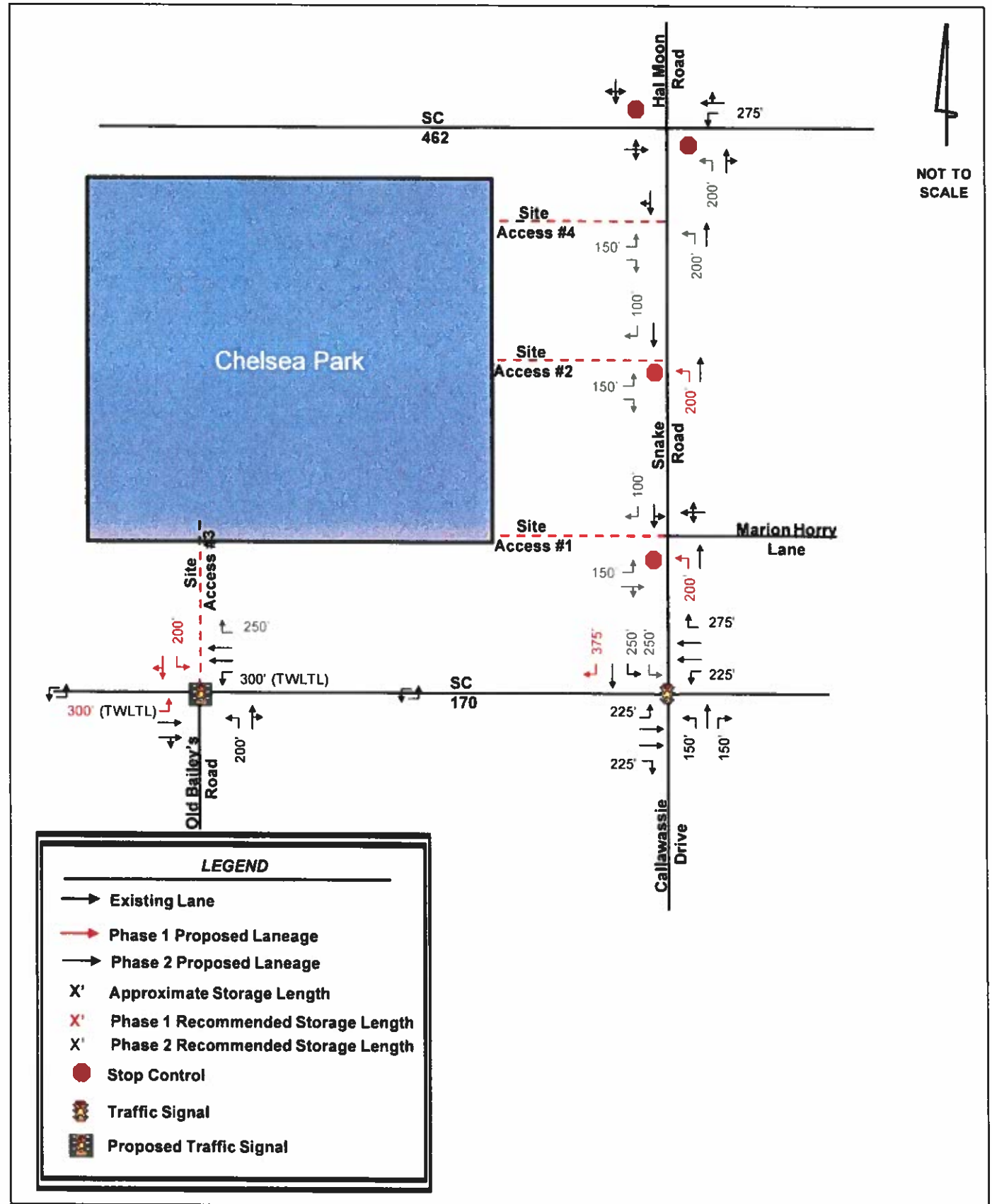
SCDOT and Jasper County. All additions and attachments to the State roadway system shall be properly permitted, designed, and constructed in conformance to standards maintained by SCDOT and Jasper County.



Kimley»Horn	Chelsea Park Development Traffic Impact Analysis	2026 Phase 1 Recommended Mitigation	Figure ES-1



Kimley»Horn	Chelsea Park Development Traffic Impact Analysis	2031 Phase 2 - Option 1 Build Recommended Mitigation	Figure ES-2



Kimley»Horn	Chelsea Park Development Traffic Impact Analysis	2031 Phase 2 - Option 2 Build Recommended Mitigation	Figure ES-3

2.0 Introduction

The proposed Chelsea Park Development is located adjacent to Snake Road near SC 170 in Okatie, Jasper County, SC. The proposed mixed-use development is planned to be constructed in two phases:

Phase I (2026 Build-Out)

- 438-dwelling unit single family residential community with clubhouse/pool/fitness amenity
- 69,600 square-foot self-storage facility

Phase II (2031 Build-Out)

- 597-dwelling unit multi-family apartment complex
- 110,000 square feet of retail space

This report analyses three access scenarios:

Scenario 1, which will be referred to as Phase 1 – Option 1 considered three site access points along Snake road for the first phase of the development

This report analyses three (3) access scenarios:

- Scenario 1, which will be referred to in the report as Phase 1, considers two site access points along Snake Road for the first phase of the development. No site accesses are considered on SC 170
- Scenario 2, which will be referred to in the report as Phase 2 – Option 1, considers three site access points along Snake Road for the second phase of the development. No site accesses are considered on SC 170
- Scenario 3, which will be referred to in the report as Phase 2 – Option 2, considers three site access points along Snake Road and one access point along SC 170

Based on the site plan shown in **Figure 2.1**, primary external access to the development will occur via the following:

- Snake Road at Marion Horry Lane Site/Access #1 (proposed unsignalized, full-movement)
  - Site Access #1 is proposed to be located approximately 1,340' north of SC 170 along Snake Road across from Marion Horry Lane
- Snake Road at Site Access #2 (proposed unsignalized, full-movement)
  - Site Access #2 is proposed to be located approximately 3,460' north of SC 170 along Snake Road
- Snake Road at Site Access #3 (proposed unsignalized, full-movement)
  - Site Access #3 is proposed to be located approximately 5,830' north of SC 170 along Snake Road
  - *This site access is only part of Phase 2*
- SC 170 at Old Bailey's Road/Site Access #4
  - *The Chelsea Park Development is not proposed to connect to this site Access in Phase 1*
  - Site Access #4 is proposed to be signalized, full-movement in Phase 2

- Site Access #4 is proposed to be located aproximately 2,900' west of Snake Road along SC 170 across from Old Bailey's Road
- Site Access #4 was only analyzed in Phase 2 Option 2

This traffic impact analysis (TIA) evaluates traffic operations under 2021 Existing, 2026 Background, 2026 Build, 2031 Background and 2031 Build conditions during the AM and PM peak hours at the following intersections:

- Snake Road at SC 170
- Snake Road at Marion Horry Lane (Site Access #1)
- Old Bailey's Road at SC 170 (Site Access #4)
- Snake Road at SC 462
- Snake Road at Site Access #2
- Snake Road at Site Access #3

The TIA scoping parameters for this TIA were approved by SCDOT via email on March 26, 2021. The TIA scoping approval is attached in the **Appendix.**

Kimley-Horn was retained to determine the potential traffic impacts of this development and identify transportation improvements that may be required to accommodate these impacts in accordance with the guidelines set forth in the South Carolina Department of Transportation (SCDOT) *Access and Roadside Management Standards* (ARMS) *Manual*. This report presents trip generation, trip distribution, capacity analyses, and recommendations for transportation improvements required to mitigate anticipated traffic demands produced by the subject development.

Kimley»Horn	Chelsea Park Development Traffic Impact Analysis	Proposed Site Plan	Figure 2.1

3.0 Existing Traffic Conditions

3.1 STUDY AREA

Based on coordination with SCDOT, the study area for this TIA includes the following intersections:

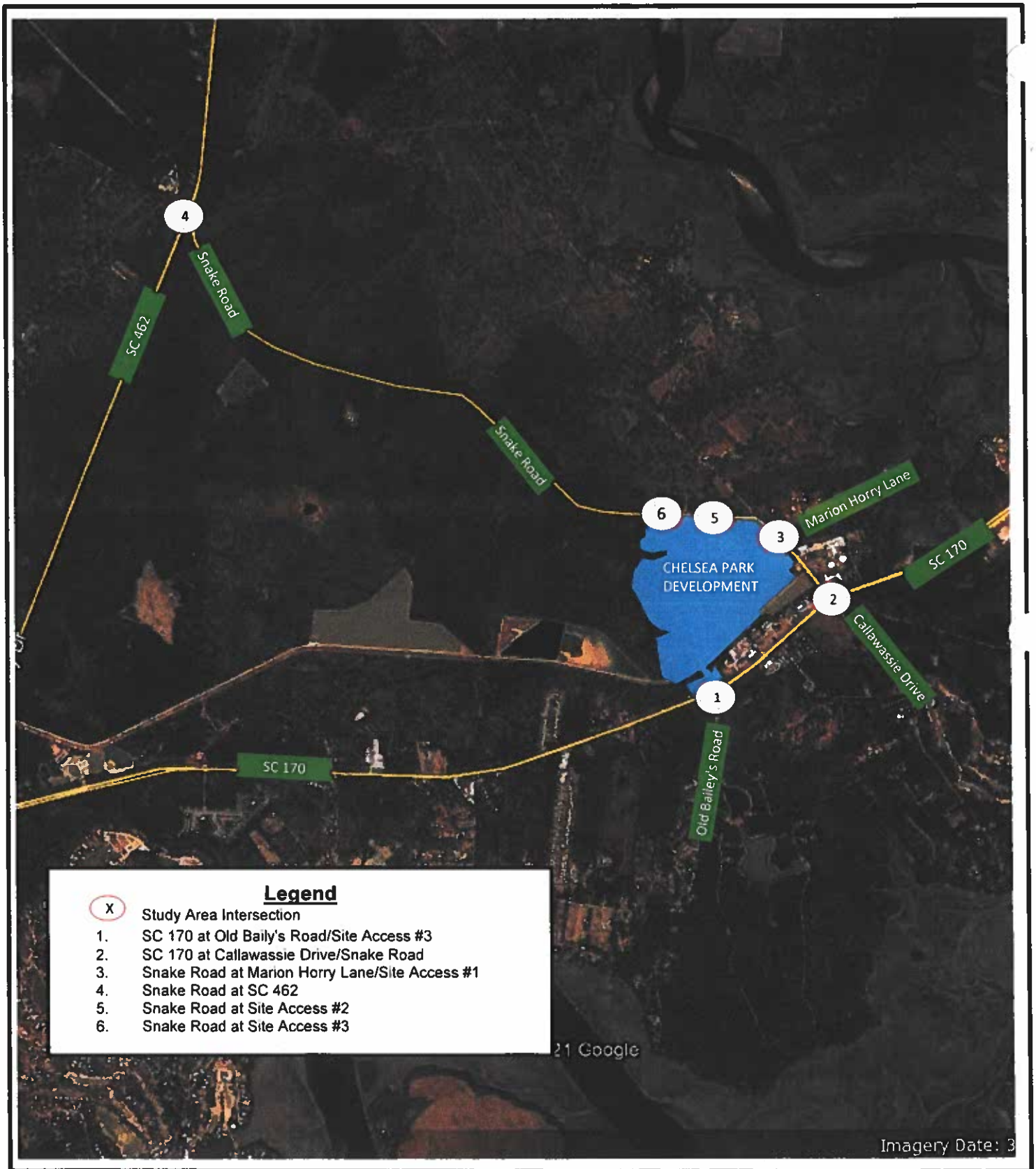
- Snake Road at SC 170
- Snake Road at Marion Horry Lane (Site Access #1)
- Old Bailey's Road at SC 170 (Site Access #4)
- Snake Road at SC 462
- Snake Road at Site Access #2
- Snake Road at Site Access #3

Figure 3.1 shows the study area intersections and the site location, and **Figure 3.2** shows the existing roadway geometry at the study intersections.

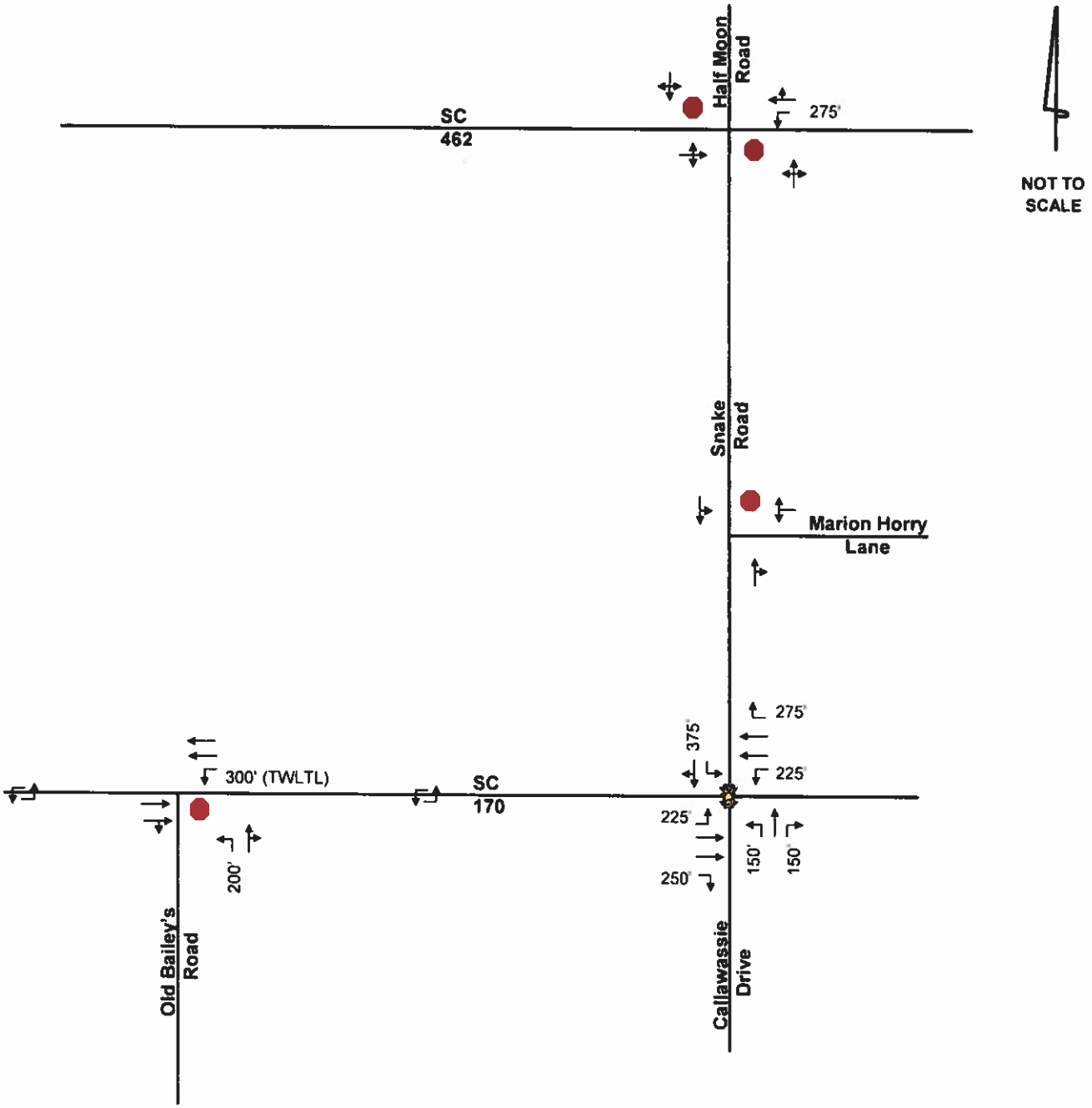
The primary roadways within the vicinity of the site are summarized in **Table 3.1** below.

Table 3.1 – Study Area Road Data

Roadway	SCDOT AADT (vehicles per day)	Cross Section	SCDOT Functional Classification	Posted Speed Limit
SC 170	27,600 (Station 184) – Jasper County	5 – Lane	Principal Arterial	55 MPH
Snake Road	3,400 (Station 291) – Jasper County	2 – Lane	Major Collector	55 MPH
Callawassie Road	No SCDOT Data Available	2 – Lane	Local Roadway	55 MPH, Recent speed study agreed to 45 MPH
Old Bailey's Road	375 (Station 171) – Beaufort County	2 – Lane	Major Collector	30 MPH
SC 462	7,700 (Station 155) – Jasper County	2– Lane	Minor Arterial	55 MPH
Marion Horry Lane	No Data Available	2 – Lane	Local Roadway	Not Posted



Kimley»Horn	Chelsea Park Development Traffic Impact Analysis	Study Area/ Site Location	Figure 3.1



Kimley»Horn	Chelsea Park Development Traffic Impact Analysis	Existing Roadway Laneage	Figure 3.2

3.2 EXISTING TRAFFIC VOLUME DEVELOPMENT

Peak hour intersection turning movement counts—including heavy vehicles and pedestrians—were performed by Marr Traffic Data Collection on Tuesday, April 20, 2021 for the AM (7:00-9:00 AM) and PM (4:00-6:00 PM) peak hours at the intersections of:

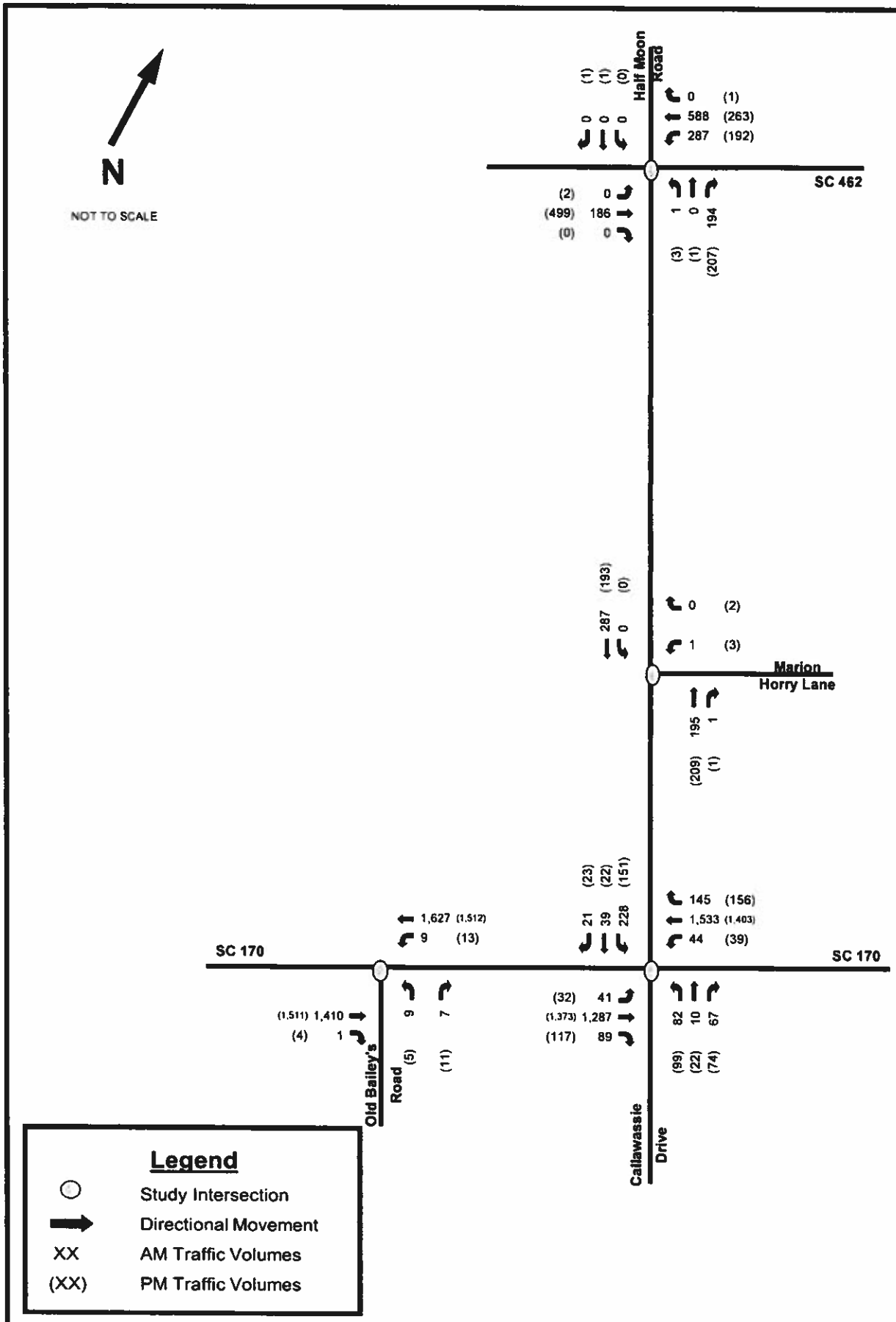
- Snake Road at SC 170
- Snake Road at Marion Horry Lane/Proposed Site Access #1
- Snake Road at SC 462

Due to the ongoing COVID pandemic, SCDOT District 6 released a memo on February 5, 2021 which outlined that traffic counts can be collected, but a seasonal factor of 1.15 for the AM peak hour and a seasonal factor of 1.02 for the PM peak hour must be used.

Additionally, a 13-hour intersection turning movement count—including heavy vehicles and pedestrians—was performed by Marr Traffic Data Collection on Tuesday, April 20, 2021 from 7:00 AM – 7:00 PM at the intersection of SC 170 at Old Bailey's Road for signal warrant purposes. *The SCDOT District 6 COVID factor was applied to the peak hour turning movement counts used for the capacity analysis, however, based on guidance from SCDOT District 6, this COVID factor was not used in the signal warrant analysis.*

Raw peak hour intersection turning movement count data is provided in the **Appendix**.

Figure 3.3 illustrates the 2021 Existing AM and PM peak hour traffic volumes.



Kimley»Horn	Chelsea Park Development Traffic Impact Analysis	2021 Existing Peak Hour Traffic Volumes	Figure 3.3

4.0 Background Traffic Volume Development

Projected background (non-project) traffic is defined as the expected growth or change in traffic volumes on the surrounding roadway network between the year the existing counts were collected (2021) and the expected Phase 1 build-out year (2026) and Phase 2 build-out year (2031) absent the construction and opening of the proposed project. This includes both historical background growth and growth in traffic volumes caused by specific approved developments near the proposed site.

4.1 HISTORICAL BACKGROUND GROWTH TRAFFIC

Historical background growth is the anticipated increase in existing traffic volumes due to generalized growth in the study area that is independent of specific approved developments. Historical background growth traffic is calculated using an annual growth rate, which is applied to the existing traffic volumes up to the future horizon year. Based on SCDOT AADT station data, an annual growth rate of 4.0% was assumed for this project and applied to the 2021 Existing peak hour traffic volumes to calculate 2026 Background and 2031 Background traffic volumes.

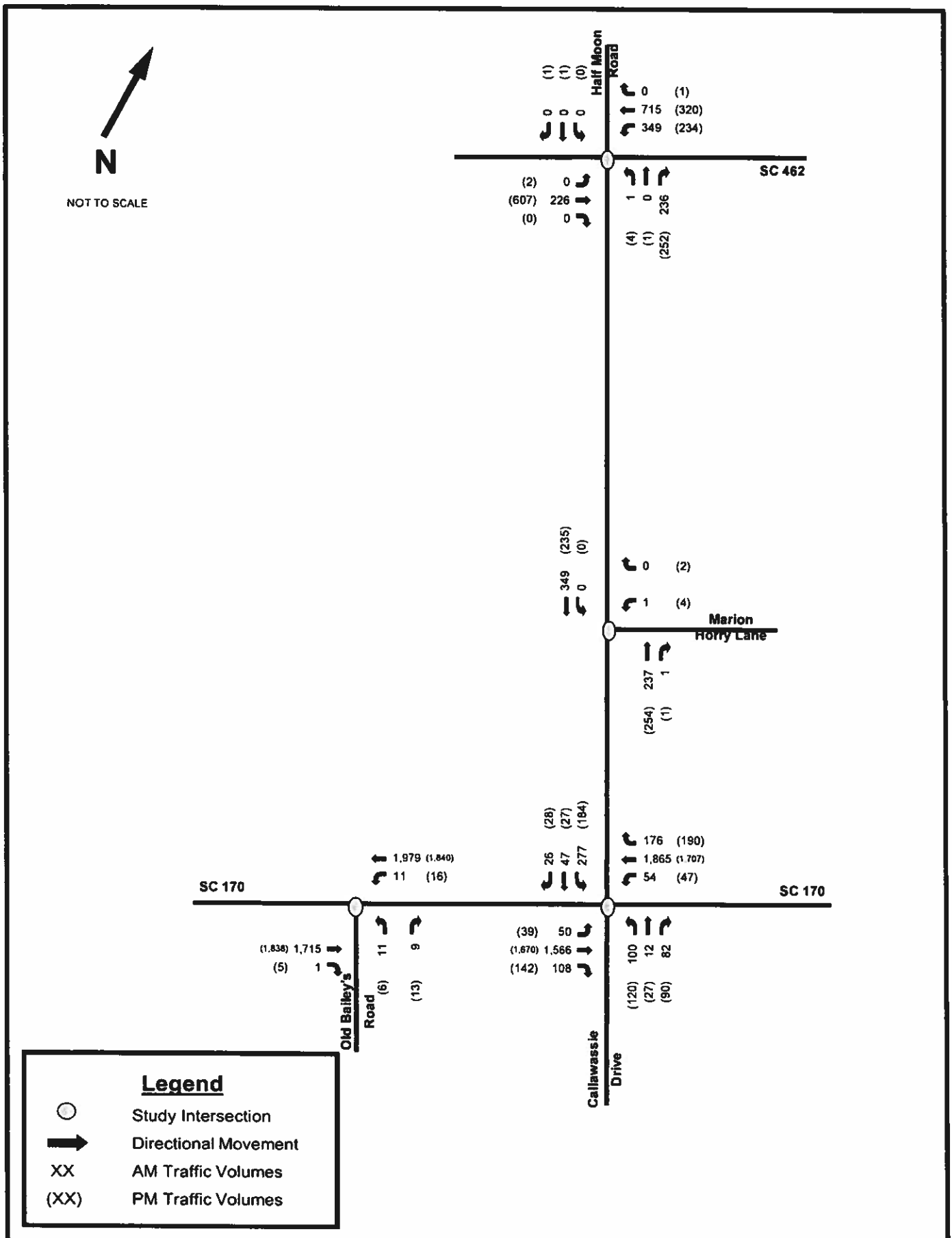
4.2 APPROVED DEVELOPMENTS

Based on coordination with SCDOT, no approved developments were considered as part of this TIA.

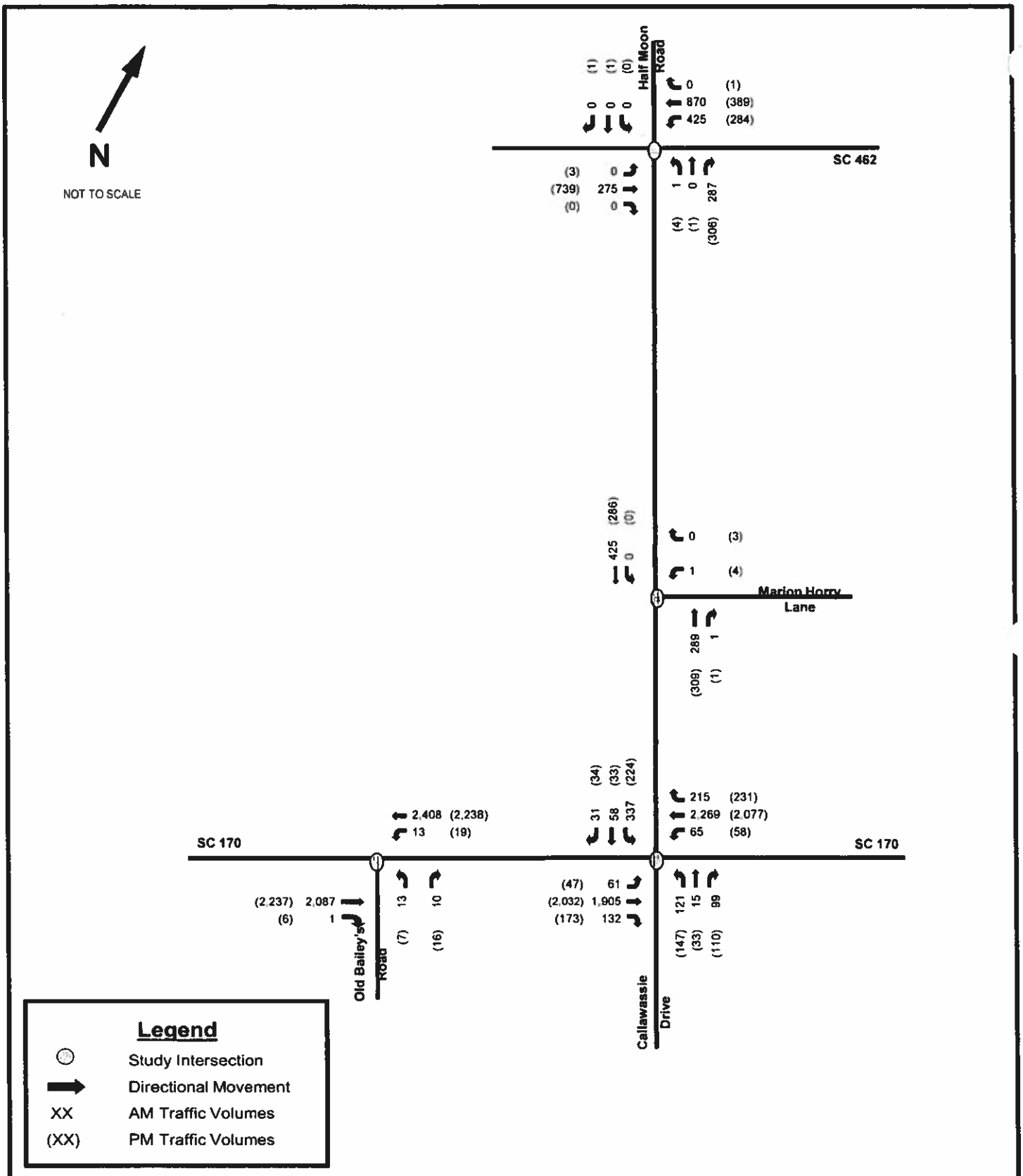
4.3 PLANNED TRANSPORTATION PROJECTS

No projects contained in the current SCDOT Statewide Transportation Improvement Program (STIP) fall within the study area.

2026 and 2031 Background AM and PM peak hour traffic volumes are provided in **Figure 4.1** and **Figure 4.2**, respectively.



Kimley»Horn	Chelsea Park Development Traffic Impact Analysis	2026 Background AM and PM Peak Hour Traffic Volumes	Figure 4.1



Kimley»Horn	Chelsea Park Development Traffic Impact Analysis	2031 Background AM and PM Peak Hour Traffic Volumes	Figure 4.2

5.0 Site Traffic Volume Development

Site traffic developed for this TIA consists of the vehicle trips expected to be generated by the proposed development and the distribution and assignment of these trips throughout the surrounding study network.

5.1 SITE ACCESS

Based on the site plan shown in **Figure 2.1**, primary external access to the development will occur via the following:

- Snake Road at Marion Horry Lane Site/Access #1 (proposed unsignalized, full-movement)
  - Site Access #1 is proposed to be located approximately 1,340' north of SC 170 along Snake Road across from Marion Horry Lane
- Snake Road at Site Access #2 (proposed unsignalized, full-movement)
  - Site Access #2 is proposed to be located approximately 3,460' north of SC 170 along Snake Road
- Snake Road at Site Access #3 (proposed unsignalized, full-movement)
  - Site Access #3 is proposed to be located approximately 5,830' north of SC 170 along Snake Road
  - *This site access is only part of Phase 2*
- SC 170 at Old Bailey's Road/Site Access #4
  - *The Chelsea Park Development is not proposed to connect to this site Access in Phase 1*
  - Site Access #4 is proposed to be signalized, full-movement in Phase 2
  - Site Access #4 is proposed to be located approximately 2,900' west of Snake Road along SC 170 across from Old Bailey's Road
  - Site Access #4 was only analyzed in Phase 2 Option 2

5.2 TRIP GENERATION

Phase 1

The traffic generation potential of the proposed development was determined using the trip generation rates in the ITE *Trip Generation Manual, 10th Edition* (Institute of Transportation Engineers 2017). Land uses planned during Phase 1 of the Chelsea Park Development are represented by Land Use Code (LUC) 210 – Single Family Housing and LUC 151 – Mini Warehouse. Due to nature of the proposed development, pass-by trips and internal capture were not considered in Phase 1.

Table 5.1 summarizes the projected trip generation of the proposed development during Phase 1. During a typical weekday, the proposed development has the potential to generate 323 and 431 net new external trips during the AM and PM peak hours, respectively.

Table 5.1 - Chelsea Park Phase 1 Trip Generation

Land Use	Intensity		Daily	AM Peak Hour			PM Peak Hour		
				Total	In	Out	Total	In	Out
Single Family Housing (ITE 210)	438	DU	4,047	316	79	237	419	264	155
Mini Warehouse (ITE 151)	69,600	SF	105	7	4	3	12	6	6
Subtotal			**4,152**	**323**	**83**	**240**	**431**	**270**	**161**
Internal Capture			**0**	**0**	**0**	**0**	**0**	**0**	**0**
Pass-By			**0**	**0**	**0**	**0**	**0**	**0**	**0**
Total Net New External Trips			**4,152**	**323**	**83**	**240**	**431**	**270**	**161**

Phase 2

The traffic generation potential of the proposed development was determined using the trip generation rates in the ITE *Trip Generation Manual, 10th Edition* (Institute of Transportation Engineers 2017).

Land uses planned during Phase 2 of the Chelsea Park Development are represented by LUC 220 – Multifamily (Low-Rise) and LUC 820 – Shopping Center. Due to mixed-use nature of the proposed development, pass-by trips and internal capture were considered in Phase 2. The internal capture was limited to 20% of the subtotal trip generation per SCDOT guidance.

Table 5.2 summarizes the projected trip generation of the proposed development. During a typical weekday, the proposed development has the potential to generate 774 and 938 net new external trips during the AM and PM peak hours, respectively.

Table 5.2 - Chelsea Park Phase 2 Trip Generation

Land Use	Intensity		Daily	AM Peak Hour			PM Peak Hour		
				Total	In	Out	Total	In	Out
Single Family Housing (ITE 210) *(Phase 1)*	438	DU	4,047	316	79	237	419	264	155
Multifamily Housing (Low-Rise) (ITE 220)	597	DU	4,472	260	60	200	290	183	107
Mini Warehouse (ITE 151) *(Phase 1)*	69,600	SF	105	7	4	3	12	6	6
Shopping Center (ITE 820)	110,000	SF	6,415	207	128	79	583	280	303
Subtotal			**15,039**	**790**	**271**	**519**	**1,304**	**733**	**571**
Internal Capture			**2,150**	**16**	**8**	**8**	**214**	**107**	**107**
Pass-By			**152**	**0**	**0**	**0**	**152**	**76**	**76**
Total Net New External Trips			**12,737**	**774**	**263**	**511**	**938**	**550**	**388**

5.3 SITE TRAFFIC DISTRIBUTION AND ASSIGNMENT

Net new external trips generated by the proposed development were assigned to the surrounding network based on existing peak hour turning movements, surrounding land uses, population densities in the area, and the proposed site layout.

5.4 2026 BUILD TRAFFIC VOLUMES

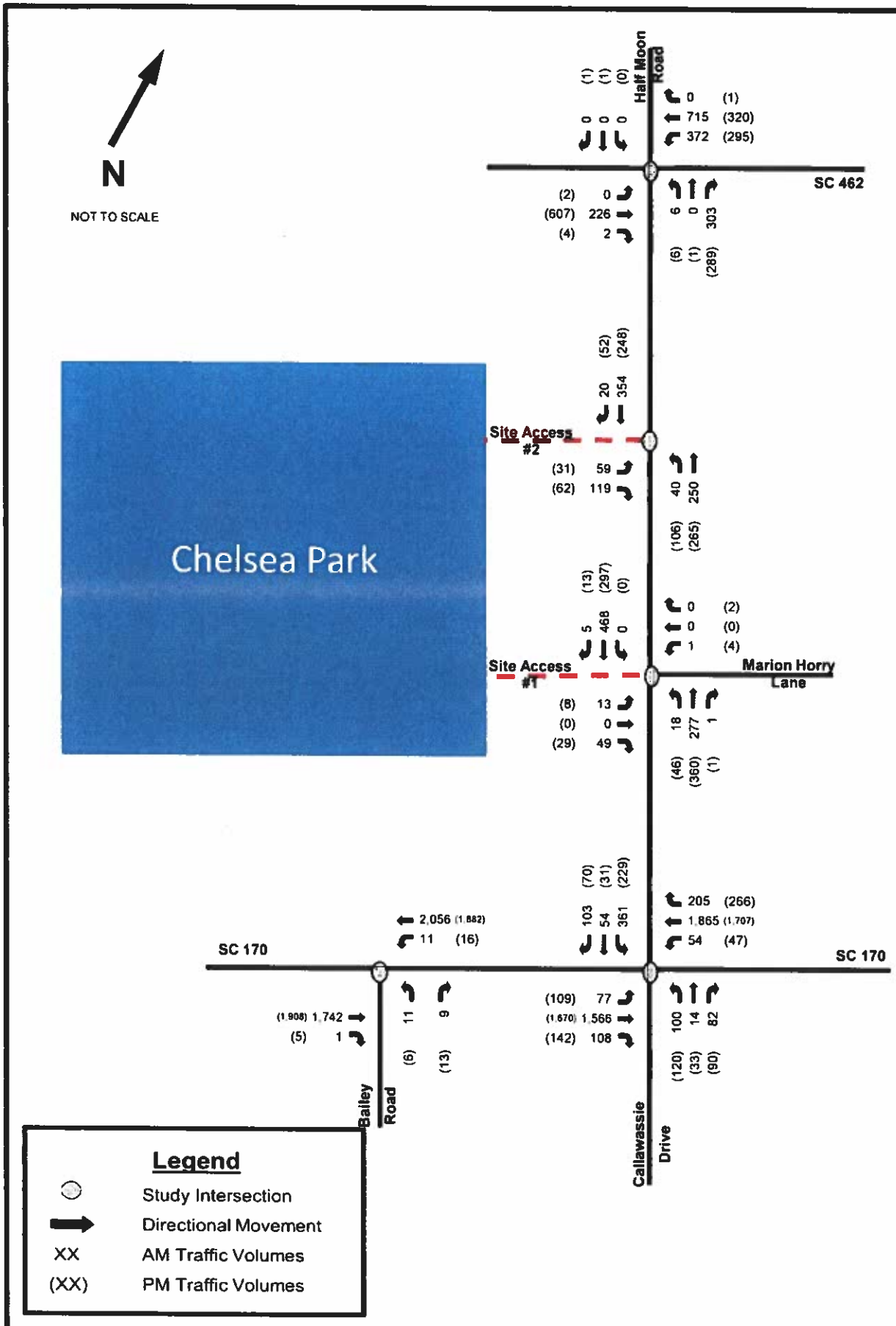
The 2026 Build traffic volumes include assignment of site-generated trips and 2026 Background traffic volumes. Projected 2026 Build traffic volumes during the AM and PM peak hours are summarized in **Figure 5.1.**

5.5 2031 BUILD TRAFFIC VOLUMES

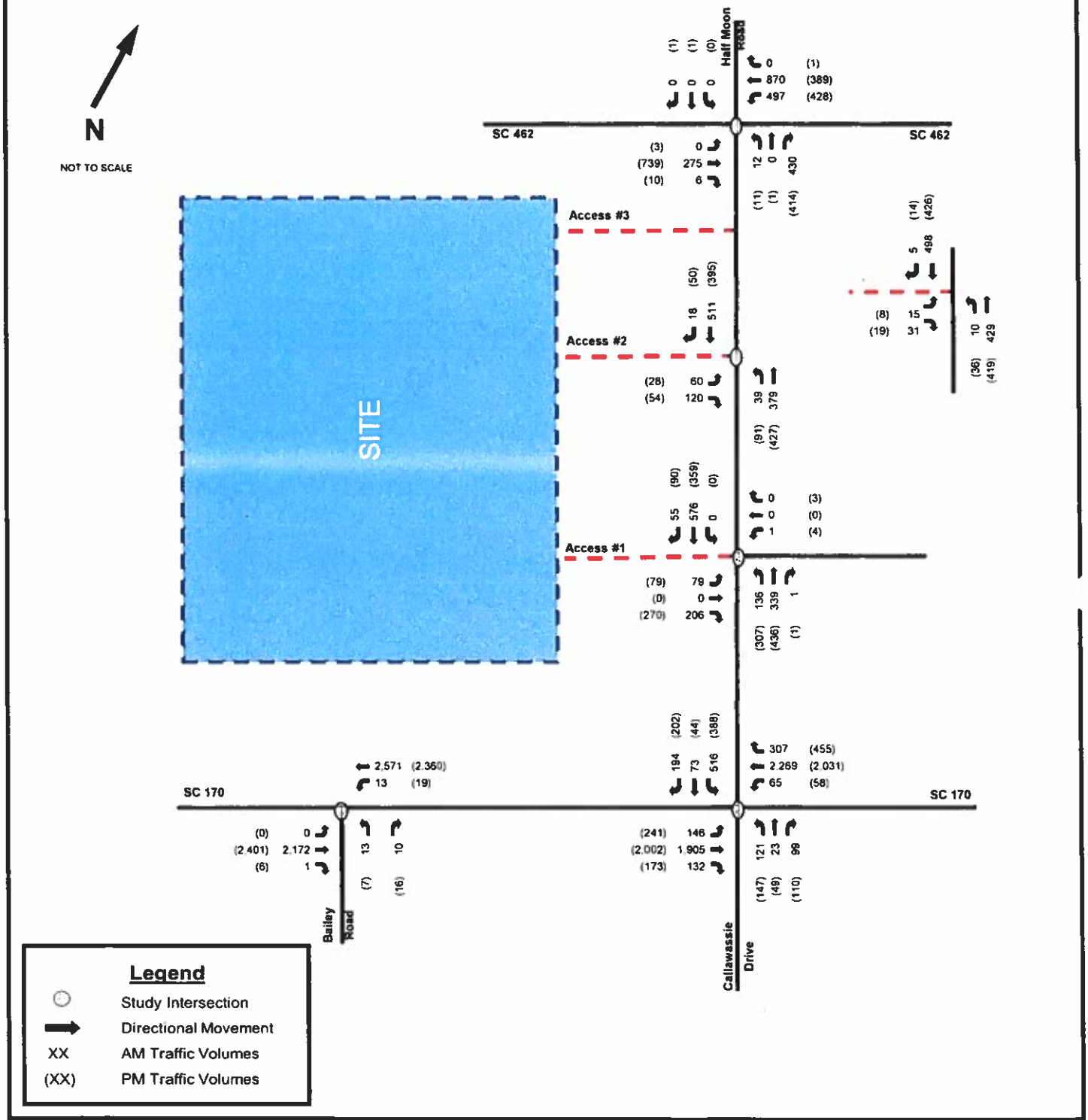
The 2031 Build traffic volumes include assignment of site-generated trips and 2031 Background traffic volumes. Projected 2031 Build traffic volumes during the AM and PM peak hours are summarized in the following figures:

- Figure 5.2 2031 Phase 2 – Option 1 Total Build Peak Hour Traffic Volumes
- Figure 5.3 2031 Phase 2 – Option 2 Total Build Peak Hour Traffic Volumes

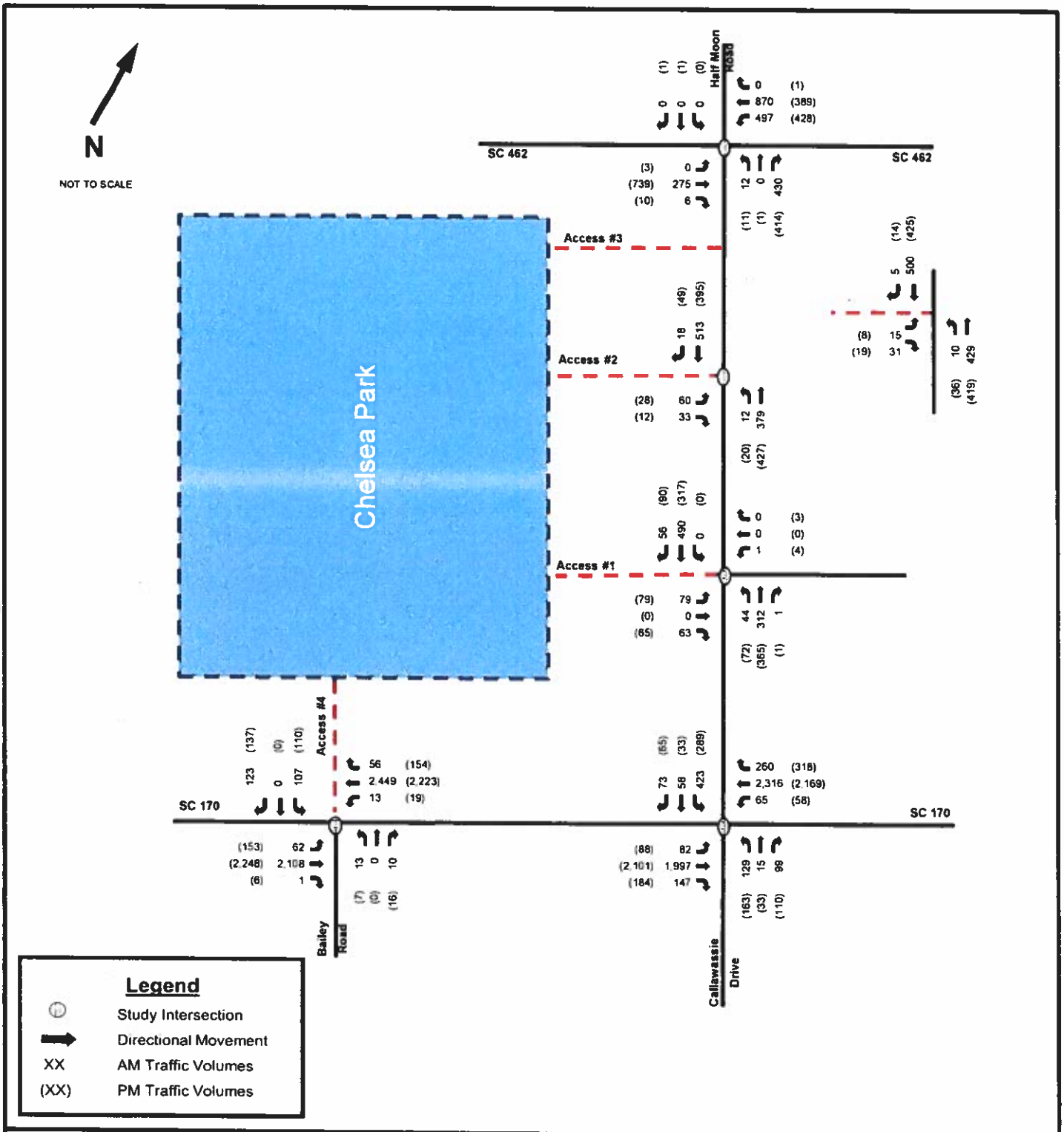
Intersection volume development worksheets for all intersections within the study network are provided in the **Appendix**.



Kimley»Horn	Chelsea Park Development Traffic Impact Analysis	2026 Phase 1 Total Build Peak Hour Traffic Volumes	Figure 5.1



Kimley»Horn	Chelsea Park Development Traffic Impact Analysis	2031 Phase 2 Option 1 Total Build Peak Hour Traffic Volumes	Figure 5.2



Kimley»Horn	Chelsea Park Development Traffic Impact Analysis	2031 Phase 2 Option 2 Total Build Peak Hour Traffic Volumes	Figure 5.3

6.0 Capacity Analysis

Capacity analyses were performed for the AM and PM peak hours using Synchro Version 10 software to determine the operating characteristics at the signalized and stop-controlled intersections of the adjacent street network and to evaluate the impacts of the proposed development. In the 6th Edition of the Highway Capacity Manual (HCM), capacity is defined as "the maximum sustainable hourly flow rate at which persons or vehicles reasonably can be expected to traverse a point of uniform section of a lane or roadway during a given time period under prevailing conditions." Synchro uses methodologies contained in the HCM to determine the operating characteristics of an intersection, which are typically evaluated in terms of level of service (LOS).

The HCM defines LOS as a "quantitative stratification of a performance measure or measures representing quality of service" and is used to "translate complex numerical performance results into a simple A-F system representative of travelers' perceptions of the quality of service provided by a facility or service". The HCM defines six levels of service, LOS A through LOS F, with A having the best operating conditions from the traveler's perspective and F having the worst. However, it must be understood that "the LOS letter results hides much of the complexity of facility performance", and that "the appropriate LOS for a given system element in the community is a decision for local policy makers". According to the HCM, "for cost, environmental impact, and other reasons, roadways are typically designed not to provide LOS A conditions during peak periods but instead to provide some lower LOS that balances individual travers' desires against society's desires and financial resources. Nevertheless, during low-volume periods of the day, a system element may operate at LOS A."

LOS for a two-way stop-controlled (TWSC) intersection is determined by the control delay at the side-street approaches, typically during the highest volume periods of the day, the AM and PM peak periods. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. It is typical for stop sign-controlled side streets and driveways intersecting major streets to experience long delays during peak hours, particularly for left-turn movements. The majority of the traffic moving through the intersection on the major street experiences little or no delay.

Tables 6.0A and 6.0B list the LOS control delay thresholds published in the HCM for unsignalized and signalized intersections, respectively, as well as the unsignalized operational descriptions assumed herein.

Table 6.0A
Vehicular LOS Control Delay Thresholds for Unsignalized Intersections

Level-of-Service	Average Control Delay per Vehicle [sec/veh]	
A	≤ 10	Short Delays
B	> 10 – 15	
C	> 15 – 25	
D	> 25 – 35	Moderate Delays
E	> 35 – 50	
F	> 50	Long Delays

Table 6.0B Vehicular LOS Control Delay Thresholds for Signalized Intersections	
Level-of-Service	**Average Control Delay per Vehicle [sec/veh]**
A	≤ 10
B	> 10 – 20
C	> 20 – 35
D	> 35 – 55
E	> 55 – 80
F	> 80

Capacity analyses were performed for 2021 Existing, 2026 Background, 2026 Build/Phase 1, 2031 Background, and 2031 Build/Phase 2 traffic conditions. Mitigation of traffic impacts caused by the proposed development were noted and recommended based on guidance provided in the *SCDOT ARMS Manual* where applicable.

When determining the proposed development's traffic impact to the study area intersections, the 2026 Background and 2026 Build conditions were compared as well as the 2031 Background and 2031 Build conditions.

The 2026 Phase 1 trips were left out of the 2031 Background traffic volumes in order to calculate and account for internal capture within the Chelsea Park Development for Phase 2. However, the recommended improvements for the 2026 Phase 1 traffic volumes were included in the 2031 Background Synchro network because the improvements would need to be in place before the 2031 Phase 2 development can occur.

Existing signal plans were provided by the SCDOT and are included in the **Appendix**.

Synchro LOS results and 95th percentile queues are reported in the following subsections. Capacity analysis reports are included in the **Appendix**.

6.1 SC 170 AT OLD BAILEY'S ROAD/SITE ACCESS #4

Table 6.1.A summarizes the LOS, control delay, and 95th percentile queue lengths at the currently unsignalized intersection of SC 170 at Old Bailey's Road/Site Access #4 for Phase 1.

Table 6.1.A - SC 170 at Old Bailey's Road/ Site Access #4 (Phase 1)										
Condition	Measure	EB		WB			NB		SB	
		EBL	EBTR	WBL	WBT	WBR	NBL	NBTR	SBL	SBTR
AM Peak Hour										
2021 Existing	LOS (Delay)	A (0.0)		A (0.1)			D (27.3)		N/A	
	Synchro 95th Q	N/A	0'	3'	0'	N/A	5'	3'		
2026 Background	LOS (Delay)	A (0.0)		A (0.1)			E (41.7)		N/A	
	Synchro 95th Q	N/A	0'	3'	0'	N/A	13'	3'		
2026 Build	LOS (Delay)	A (0.0)		A (0.1)			E (43.3)		NA	
	Synchro 95th Q	N/A	0'	3'	0'	N/A	13'	3'		
PM Peak Hour										
2021 Existing	LOS (Delay)	A (0.0)		A (0.1)			C (22.5)		N/A	
	Synchro 95th Q	N/A	0'	3'	0'	N/A	3'	3'		
2026 Background	LOS (Delay)	A (0.0)		A (0.2)			D (31.1)		N/A	
	Synchro 95th Q	N/A	0'	5'	0'	N/A	5'	5'		
2026 Build	LOS (Delay)	A (0.0)		A (0.3)			D (33.4)		N/A	
	Synchro 95th Q	N/A	0'	5'	0'	N/A	8'	5'		

N/A - Site Access #3 is not proposed to be constructed in Phase 1

Phase 1

The side street, northbound approach, of Old Bailey's Road at SC 170 currently operates with moderate delays during the AM peak hour and short delays during the PM peak hour. Under 2026 Background and 2026 Build Phase 1 conditions, the minor street northbound approach is anticipated to operate with moderate delays during the AM and PM peak hours. *It is important to note, that Site Access #3, is not considered in Phase 1.*

This intersection does not require mitigation per SCDOT's standards under 2026 Build Phase 1 conditions. Therefore, no improvements are recommended to mitigate the impacts of site traffic at this intersection.

Table 6.1.B summarizes the LOS, control delay, and 95th percentile queue lengths at the currently unsignalized intersection of SC 170 at Old Bailey's Road/Site Access #4 for Phase 2-Option 1.

Table 6.1.B - SC 170 at Old Bailey's Road/Site Access #4 (Phase 2 - Option 1)								
Condition	Measure	EB		WB			NB	
		EBL	EBTR	WBL	WBT	WBR	NBL	NBTR
AM Peak Hour								
2031 Background	LOS (Delay)	A (0.0)		A (0.1)			F (76.6)	
	Synchro 95th Q	N/A	0'	5'	0'	N/A	25'	5'
2031 Build Option 1	LOS (Delay)	A (0.0)		A (0.1)			F (87.7)	
	Synchro 95th Q		0'	5'	0'	N/A	28'	5'
PM Peak Hour								
2031 Background	LOS (Delay)	A (0.0)		A (0.2)			E (48.1)	
	Synchro 95th Q	N/A	0'	8'	0'	N/A	13'	8'
2031 Build Option 1	LOS (Delay)	A (0.0)		A (0.2)			F (59.2)	
	Synchro 95th Q	N/A	0'	10'	0'	N/A	15'	10'

N/A - Site Access #3 is not proposed to be constructed in Phase 1

Phase 2 – Option 1

Under 2031 Background and 2031 Build Phase 2-Option 1 conditions, the minor street northbound approach is anticipated to operate with moderate to long delays the AM and PM peak hours. *It is important to note, that Site Access #3, is not considered in Phase 2-Option 1.*

This intersection does not require mitigation per SCDOT's standards under 2031 Build Phase 2-Option 1 conditions. Therefore, no improvements are recommended to mitigate the impacts of site traffic at this intersection.

Table 6.1.C summarizes the LOS, control delay, and 95th percentile queue lengths at the currently unsignalized intersection of SC 170 at Old Bailey's Road/Site Access #4 for Phase 2-Option 2.

Table 6.1.C - SC 170 at Old Bailey's Road/Site Access #4 (Phase 2 Option 2)											
Condition	Measure	EB		WB			NB		SB		Intersection
		EBL	EBTR	WBL	WBT	WBR	NBL	NBTR	SBL	SBTR	
AM Peak Hour											
2031 Background	LOS (Delay)	A (0.0)		A (0.1)			F (76.6)		N/A		N/A
	Synchro 95th Q	N/A	0'	5'	0'	N/A	25'	5'			
2031 Build Option 2	LOS (Delay)	A (1.2)		A (0.1)			F ($)		F ($)		N/A
	Synchro 95th Q	45'	0'	5'	0'	N/A	58'	5'	380'	150'	
2031 Build Option 2 Improved	LOS (Delay)	B (14.3)		D (40.1)			E (66.5)		E (60.8)		C (29.8)
	Synchro 95th Q	66'	683'	m1'	m76'	m0'	39'	0'	166'	124'	
PM Peak Hour											
2031 Background	LOS (Delay)	A (0.0)		A (0.2)			E (48.1)		N/A		N/A
	Synchro 95th Q	N/A	0'	8'	0'	N/A	13'	8'			
2031 Build Option 2	LOS (Delay)	A (7.3)		A (0.2)			F ($)		F ($)		N/A
	Synchro 95th Q	188'	0'	8'	0'	N/A	53'	8'	430'	173'	
2031 Build Option 2 Improved	LOS (Delay)	C (20.0)		C (22.1)			E (73.8)		E (71.4)		C (23.7)
	Synchro 95th Q	#287'	835'	44'	#1341'	18'	28'	0'	189'	123'	

$ - Delay exceeds 300 seconds

Phase 2 – Option 2

During 2031 Background conditions, the side street northbound approach is anticipated to operate with long delays during the AM Peak hour and moderate delays during the PM peak hour. During 2031 Build conditions, the side street northbound and southbound approaches are anticipated to operate with exceedingly long delays during the AM and PM peak hours. Side street approaches operating with long delays are typical during peak hour conditions however, the delays for the side street movements show there are not gaps available for the side streets.

A signal warrant analysis was performed as shown in **Section 7.0** and a signal is projected to be warranted at this interseciton based on 8-hour MUTCD warrants, when the site traffic for Phase 2-Option 2 is added to the roadway network. Therefore, a traffic signal is recommended to be constructed at this intersection, if 8-hour warrants are met when the site traffic is on the roadway network. SCDOT does not allow traffic signals to be constructed based on projected signal warrants.

The following additional laneage improvements are recommended to mitigate the impact of the site:

- A westbound right-turn lane with 250' of storage should be constructed
- The southbound approach is recommended to be constructed with a southbound left-turn lane with a minimum storage of 200' and a shared southbound through right-turn lane.
- An eastbound left-turn lane with a minimum storage of 300' is recommended to be striped in the existing two-way left-turn lane (TWLTL) median along SC 170

With these improvements in place, the intersection is anticipated to operate at LOS C during the AM and PM peak hours.

6.2 SC 170 AT CALLAWASSIE DRIVE/SNAKE ROAD

Table 6.2.A summarizes the LOS, control delay, and 95th percentile queue lengths at the signalized, full-movement intersection of SC 170 at Callawassie Drive/Snake Road for Phase 1.

Table 6.2.A - SC 170 at Callawassie Drive/Snake Road (Phase 1)															
Condition	Measure	EB			WB			NB			SB			Intersection
		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	LOS (Delay)
AM Peak Hour														
2021 Existing	LOS (Delay)	C (22.7)			C (26.5)			D (52.0)			E (63.1)			C (29.1)
	Synchro 95th Q	33'	661'	29'	35'	893'	62'	21'	25'	18'	324'	79'	N/A	
2026 Background	LOS (Delay)	D (37.1)			E (69.2)			D (47.6)			E (63.7)			E (55.1)
	Synchro 95th Q	52'	#995'	42'	64'	#1327'	85'	145'	28'	34'	#434'	92'	N/A	
2026 Build	LOS (Delay)	D (41.4)			F (81.7)			D (49.6)			F (91.6)			E (66.1)
	Synchro 95th Q	#112'	#995'	42'	63'	#1327'	98'	150'	30'	34'	#637'	155'	N/A	
2026 Build Improved	LOS (Delay)	D (39.0)			E (74.4)			D (44.6)			F (98.1)			E (62.3)
	Synchro 95th Q	#116'	915'	41'	62'	#1305'	93'	147'	31'	74'	#650'	85'	96'	
PM Peak Hour														
2021 Existing	LOS (Delay)	B (18.4)			B (18.5)			D (44.0)			D (47.7)			C (21.5)
	Synchro 95th Q	18'	534'	26'	22'	560'	32'	122'	38'	4'	179'	48'	N/A	
2026 Background	LOS (Delay)	C (32.0)			C (34.2)			D (41.7)			D (48.5)			C (34.5)
	Synchro 95th Q	22'	#823'	38'	25'	#859'	46'	145'	43'	18'	#244'	53'	N/A	
2026 Build	LOS (Delay)	C (34.3)			D (41.5)			D (43.0)			E (59.2)			D (39.8)
	Synchro 95th Q	#115'	#823'	38'	25'	#859'	57'	146'	49'	18'	#331'	68'	N/A	
2026 Build Improved	LOS (Delay)	C (31.8)			D (37.5)			D (39.6)			E (63.4)			D (37.1)
	Synchro 95th Q	#121'	#805'	37'	24'	#842'	53'	146'	50'	60'	#350'	47'	43'	

Phase 1

The intersection of SC 170 at Callawassie Drive/Snake Road currently operates at LOS C during the AM and PM peak hours. During the 2026 background conditions, the intersection LOS is anticipated to drop to LOS E during the AM peak hour and is anticipated to remain at LOS C.

During the 2026 Phase 1 conditions, the intersection is anticipated to remain at LOS E during the AM peak hour and drop to LOS D during the PM peak hour.

To mitigate the impact of the proposed development, a southbound right-turn is recommended to be constructed. *While the southbound approach delays increase, the southbound right-turn lane and right-turn overlap phase, allows more green time to the eastbound and westbound (SC 170) approaches.* With the southbound right-turn lane constructed, the overall intersection delay is anticipated to operate at LOS E during the AM peak hour and LOS D during the PM peak hour.

Table 6.2.B summarizes the LOS, control delay, and 95th percentile queue lengths at the signalized, full-movement intersection of SC 170 at Callawassie Drive/Snake Road for Phase 2-Option 1.

Table 6.2.B - SC 170 at Callawassie Drive/Snake Road (Phase 2 Option 1)															
Condition	Measure	EB			WB			NB			SB			Intersection
		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	LOS (Delay)
AM Peak Hour														
2031 Background	LOS (Delay)	F (120.5)			F (202.4)			D (40.9)			E (67.6)			F (152.1)
	Synchro 95th Q	68'	#1427'	62'	#100'	#1846'	130'	167'	30'	87'	#541'	84'	19'	
2031 Build Option 1	LOS (Delay)	F (126.6)			F (210.5)			D (41.8)			F (178.4)			F (167.9)
	Synchro 95th Q	#291'	#1427'	62'	#98'	#1846'	188'	167'	42'	87'	#969'	102'	183'	
2031 Build Option 1 Improved	LOS (Delay)	F (104.3)			F (174.5)			E (66.1)			E (74.0)			F (130.4)
	Synchro 95th Q	#170'	#1395'	21'	#100'	#1802'	31'	161'	58'	39'	#384'	131'	179'	
PM Peak Hour														
2031 Background	LOS (Delay)	E (74.4)			F (83.2)			D (49.5)			E (61.9)			E (76.4)
	Synchro 95th Q	51'	#1491'	89'	66'	#1592'	101'	201'	56'	53'	310'	56'	22'	
2031 Build Option 1	LOS (Delay)	F (114.9)			F (176.2)			D (44.2)			F (114.8)			F (137.7)
	Synchro 95th Q	#431'	#1457'	89'	61'	#1615'	306'	202'	76'	53'	#692'	69'	177'	
2031 Build Option 1 Improved	LOS (Delay)	E (66.1)			E (79.1)			E (75.7)			F (123.5)			E (78.4)
	Synchro 95th Q	#242'	#1330'	25'	61'	#1428'	157'	208'	#103'	93'	#346'	89'	212'	

Phase 2-Option 1

During the 2031 background conditions, the intersection LOS is anticipated to drop to LOS F during the AM peak hour and LOS E during the PM peak hour.

During the 2031 Phase 2-Option 1 conditions, the intersection is anticipated to remain at LOS F during the AM peak hour and drop to LOS F during the PM peak hour.

To mitigate the impact of the proposed development the following laneage and signal improvements are recommended:

- Construct a southbound left-turn with a minimum storage of 250' to create dual southbound left-turn lanes
- Construct an eastbound left-turn lane with a minimum storage of 225' to create dual eastbound left-turn lanes
- *Construct a southbound right-turn lane with a minimum storage of 375' (this is from Phase 1)*
- Implement permitted + overlap phasing for all right-turn movements at the intersection
- Implement protected + permitted phasing for the northbound left-turn movement
- Optimize the traffic signal splits

With these mitigations in place, the AM Build Improved delay is anticipated to be less than the 2031 background and the PM Build Improved LOS is anticipated to improve to LOS E.

Table 6.2.C summarizes the LOS, control delay, and 95th percentile queue lengths at the signalized, full-movement intersection of SC 170 at Callawassie Drive/Snake Road for Phase 2-Option 2 conditions.

Table 6.2.C - SC 170 at Callawassie Drive/Snake Road (Phase 2-Option 2)															
Condition	Measure	EB			WB			NB			SB			Intersection
		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	LOS (Delay)
AM Peak Hour														
2031 Background	LOS (Delay)	F (120.5)			F (202.4)			D (40.9)			E (67.6)			F (152.1)
	Synchro 95th Q	68'	#1427'	62'	#100'	#1846'	130'	167'	30'	87'	#541'	84'	19'	
2031 Build	LOS (Delay)	F (145.1)			F (216.3)			D (41.0)			F (112.9)			F (170.7)
	Synchro 95th Q	#114'	#1535'	75'	#96'	#1905'	161'	175'	30'	86'	#745'	84'	59'	
2031 Build Improved	LOS (Delay)	E (57.2)			F (116.0)			E (68.9)			F (173.5)			F (96.5)
	Synchro 95th Q	m65'	#1351'	m34'	#97'	#1707'	23'	185'	42'	81'	#408	110'	43'	
PM Peak Hour														
2031 Background	LOS (Delay)	E (74.4)			F (83.2)			D (49.5)			E (61.9)			E (76.4)
	Synchro 95th Q	51'	#1491'	89'	66'	#1592'	101'	201'	56'	53'	310'	56'	22'	
2031 Build	LOS (Delay)	E (79.3)			F (93.2)			D (52.6)			F (110.7)			F (86.3)
	Synchro 95th Q	#147'	#1456'	80'	60'	#1542'	128'	243'	61'	109'	#533'	61'	59'	
2031 Build Improved	LOS (Delay)	D (43.4)			E (58.7)			E (78.2)			F (116.3)			E (57.3)
	Synchro 95th Q	#149'	#1366'	26'	61'	#1453'	25'	#239'	74'	93'	#272'	73'	33'	

Phase 2 – Option 2

During the 2031 Background conditions, the intersection LOS is anticipated to operate at LOS F during the AM peak hour and LOS E during the PM peak hours. It is important to note that the 2031 Background conditions include the southbound right-turn lane recommended in Phase 1.

During the 2031 Phase 2-Option 2 conditions, the intersection is anticipated to remain at LOS F during the AM and PM peak hours.

To mitigate the impact of the proposed development, an additional southbound left-turn lane is recommended to be constructed.

With these improvements in place, the interseciton is anticipated to operate at LOS F during AM peak hour and improve to LOS E during the PM peak hour.

6.3 SNAKE ROAD AT MARION HORRY LANE/ SITE ACCESS #1

Table 6.3.A summarizes the LOS, control delay, and 95th percentile queue lengths at the unsignalized, full-movement intersection of Snake Road at Marion Horry Lane/Site Access #1 for Phase 1.

Table 6.3.A - Snake Road at Marion Horry Lane/Site Access #1						
Condition	Measure	EB	WBL	NB		SB
		EBLTR	WBLTR	NBL	NBTR	SBTLR
AM Peak Hour						
2021 Existing	LOS (Delay)	N/A	B (12.0)	A (0.0)		A (0.0)
	Synchro 95th Q		0'	N/A	0'	0'
2026 Background	LOS (Delay)	N/A	B (13.1)	A (0.0)		A (0.0)
	Synchro 95th Q		0'	N/A	0'	0'
2026 Build	LOS (Delay)	B (14.0)	C (19.9)	A (0.5)		A (0.0)
	Synchro 95th Q	13'	0'	N/A	3'	0'
2026 Build Improved	LOS (Delay)	B (14.0)	C (19.9)	A (0.5)		A (0.0)
	Synchro 95th Q	13'	0'	3'	0'	0'
PM Peak Hour						
2021 Existing	LOS (Delay)	N/A	B (10.7)	A (0.0)		A (0.0)
	Synchro 95th Q		0'	N/A	0'	0'
2026 Background	LOS (Delay)	N/A	B (11.5)	A (0.0)		A (0.0)
	Synchro 95th Q		0'	N/A	0'	0'
2026 Build	LOS (Delay)	B (12.5)	C (16.5)	A (0.9)		A (0.0)
	Synchro 95th Q	8'	3'	N/A	3'	0'
2026 Build Improved	LOS (Delay)	B (12.4)	C (16.4)	A (0.9)		A (0.0)
	Synchro 95th Q	8'	3'	3'	0'	0'

Phase 1

The sidestreet westbound approach currently operates with short delays during the 2021 Existing AM and PM peak hour conditions. During the 2026 Background and 2026 Build Phase 1 conditions, the westbound approach is anticipated to operate with short delays during the AM and PM peak hour conditions.

The eastbound approach, Access #1, is anticipated to operate with short delays during the AM and PM peak hours once constructed.

Per SCDOT Auxiliary Turn Lane Warrants, discussed in **Section 8.0** of this report, a northbound left-turn lane should be constructed at this site access for 2026 Build Phase 1 Conditions.

Site Access #1 is recommended to have a single ingress lane and a single egress lane for 2026 Build Phase 1. It is also recommended to dedicate right-of-way for a future southbound right-turn lane and separate egress lanes for future development.

Table 6.3.B summarizes the LOS, control delay, and 95th percentile queue lengths at the unsignalized, full-movement intersection of Snake Road at Marion Horry Lane/Site Access #1 for Phase 2-Option 1.

Table 6.3.B - Snake Road at Marion Horry Lane/Site Access #1 (Phase 2 Option 1)								
Condition	Measure	EB		WB	NB		SB	
		EBL	EBR	WBLTR	NBL	NBTR	SBTLR	SBR
AM Peak Hour								
2031 Background	LOS (Delay)	N/A		B (14.8)	A (0.0)		A (0.0)	
	Synchro 95th Q			0'	N/A	0'	0'	N/A
2031 Build Option 1	LOS (Delay)	F (153.7)		F (74.3)	A (2.8)		A (0.0)	
	Synchro 95th Q	350'	N/A	3'	N/A	15'	0'	N/A
2031 Build Option 1 Improved	LOS (Delay)	E (35.4)		F (71.8)	A (2.8)		A (0.0)	
	Synchro 95th Q	93'	55'	3'	15'	0'	0'	0'
PM Peak Hour								
2031 Background	LOS (Delay)	N/A		B (12.1)	A (0.0)		A (0.0)	
	Synchro 95th Q			0'	N/A	0'	0'	N/A
2031 Build Option 1	LOS (Delay)	F ($)		F (109.3)	A (4.1)		A (0.0)	
	Synchro 95th Q	655'	N/A	15'	N/A	35'	0'	N/A
2031 Build Option 1 Improved	LOS (Delay)	F (84.1)		F (103.6)	A (4.1)		A (0.0)	
	Synchro 95th Q	180'	60'	15'	35'	0'	0'	0'

Phase 2-Option 1

During the 2031 Background conditions, westbound approach is anticipated to operate with short delays during the AM and PM peak hour conditions. The intersection delays are anticipated to increase such that the westbound approach operates at LOS F during the AM and PM build peak hour conditions. It is not uncommon for stop-controlled, side-street approaches to operate at LOS F during peak hour conditions.

The eastbound approach, Access #1, is anticipated to operate with short delays during the AM and PM peak hours once constructed.

Per SCDOT Auxiliary Turn Lane Warrants, discussed in **Section 8.0** of this report, a northbound left-turn lane should be constructed at this site access for 2026 Build Phase 1 Conditions. For 2031 Phase 2 – Option 1 condition, a southbound right-turn lane should be constructed into site access #1.

Site Access #1 is recommended to be a single ingress lane and two egress lanes for 2031 Build Phase 2-Option 1 conditions.

Table 6.3.C summarizes the LOS, control delay, and 95th percentile queue lengths at the unsignalized, full-movement intersection of Snake Road at Marion Horry Lane/Site Access #1 for Phase 2.

Table 6.3.C - Snake Road at Marion Horry Lane/Site Access #1 (Phase 2-Option 2)								
Condition	Measure	EB		WB	NB		SB	
		EBL	EBTR	WBLTR	NBL	NBTR	SBTLR	SBR
AM Peak Hour								
2031 Background	LOS (Delay)	N/A		B (14.8)	A (0.0)		A (0.0)	
	Synchro 95th Q			0'	N/A	0'	0'	N/A
2031 Build Option 2	LOS (Delay)	D (29.8)		D (25.2)	A (1.1)		A (0.0)	
	Synchro 95th Q	70'	N/A	0'	50'	5'	0'	N/A
2031 Build Option 2 Improved	LOS (Delay)	C (20.8)		C (24.9)	A (1.1)		A (0.0)	
	Synchro 95th Q	40'	10'	0'	5'	0'	0'	0'
PM Peak Hour								
2031 Background	LOS (Delay)	N/A		B (12.1)	A (0.0)		A (0.0)	
	Synchro 95th Q			0'	N/A	0'	0'	N/A
2031 Build Option 2	LOS (Delay)	D (28.7)		C (19.1)	A (1.4)		A (0.0)	
	Synchro 95th Q	70'	N/A	3'	5'	0'	0'	N/A
2031 Build Option 2 Improved	LOS (Delay)	C (20.8)		C (18.8)	A (1.4)		A (0.0)	
	Synchro 95th Q	40'	8'	3'	5'	0'	0'	0'

Phase 2 – Option 2

The sidestreet westbound approach is anticipated to operate with short delays during the 2031 AM and PM peak hour conditions. During the 2031 Build Phase 2 conditions, the westbound approach is anticipated to remain with short delays during the AM peak hour drop to moderate delays during PM peak hour conditions.

The eastbound approach, Access #1, is anticipated to operate with short delays during the AM peak hour and moderate delays during the PM peak hour.

Per SCDOT Auxiliary Turn Lane Warrants, discussed in **Section 8.0** of this report, a northbound left-turn lane and southbound right-turn lane should be constructed at this site access for 2031 Build Phase 2 Conditions.

Site Access #1 is recommended to be a single ingress lane and two egress lanes for 2031 Build Phase 2. With the auxiliary turn lane in place and two egress lanes, the eastbound approach is anticipated to improve to short delays during the AM and PM peak hours.

6.4 SC 462 AT SNAKE ROAD

Table 6.4.A summarizes the LOS, control delay, and 95th percentile queue lengths at the unsignalized, full-movement intersection of SC 462 at Snake Road for Phase 1.

Table 6.4.A - SC 462 at Snake Road						
Condition	Measure	EB	WB		NB	SB
		EBTLR	WBL	WBTR	NBLTR	SBLTR
AM Peak Hour						
2021 Existing	LOS (Delay)	A (0.0)	A (2.8)		B (11.7)	A (0.0)
	Synchro 95th Q	0'	25'	0'	33'	0'
2026 Background	LOS (Delay)	A (0.0)	A (2.9)		B (12.7)	A (0.0)
	Synchro 95th Q	0'	33'	0'	40'	0'
2026 Build	LOS (Delay)	A (0.0)	A (3.1)		C (20.0)	A (0.0)
	Synchro 95th Q	0'	35'	0'	98'	0'
PM Peak Hour						
2021 Existing	LOS (Delay)	A (0.0)	A (3.9)		C (16.9)	C (19.6)
	Synchro 95th Q	0'	18'	0'	53'	0'
2026 Background	LOS (Delay)	A (0.0)	A (4.3)		D (26.4)	D (27.2)
	Synchro 95th Q	0'	28'	0'	105'	0'
2026 Build	LOS (Delay)	A (0.0)	A (5.2)		E (37.7)	D (33.8)
	Synchro 95th Q	0'	38'	0'	160'	0'

Phase 1

The sidestreet northbound and southbound approach currently operate with short delays during the 2021 Existing AM and PM peak hour conditions. During the 2026 Background and 2026 Build Phase 1 AM peak hour conditions, the northbound and southbound approaches are anticipated to operate with short delays.

During the 2026 Phase 1 PM peak hour conditions, the northbound and southbound approaches are anticipated to operate with moderate delays.

This intersection does not require mitigation per SCDOT's standards. Therefore, no improvements are recommended to mitigate the site traffic at this intersection.

Table 6.4.B summarizes the LOS, control delay, and 95th percentile queue lengths at the unsignalized, full-movement intersection of SC 462 at Snake Road for Phase 2-Option 1.
Table 6.4.B – SC 462 at Snake Road (Phase 2-Option 1)

Table 6.4.B - SC 462 at Snake Road (Phase 2 Option 1)							
Condition	Measure	EB	WB		NB		SB
		EBTLR	WBL	WBTR	NBL	NBTR	SBLTR
AM Peak Hour							
2031 Background	LOS (Delay)	A (0.0)	A (3.2)		C (15.7)		A (0.0)
	Synchro 95th Q	0'	45'	0'	N/A	68'	0'
2031 Build Option 1	LOS (Delay)	A (0.0)	A (3.7)		F (269.0)		A (0.0)
	Synchro 95th Q	0'	60'	0'	N/A	680'	0'
2031 Build Option 1 Improved	LOS (Delay)	A (0.0)	A (3.7)		D (31.9)		A (0.0)
	Synchro 95th Q	0'	60'	0'	53'	128'	0'
PM Peak Hour							
2031 Background	LOS (Delay)	A (0.0)	A (5.0)		F (69.5)		E (43.3)
	Synchro 95th Q	0'	40'	0'	N/A	248'	3'
2031 Build Option 1	LOS (Delay)	A (0.0)	A (7.6)		F ($)		-
	Synchro 95th Q	0'	85'	0'	N/A	733'	-
2031 Build Option 1 Improved	LOS (Delay)	A (0.0)	A (7.6)		F (138.6)		-
	Synchro 95th Q	0'	85'	0'	40'	435'	-

$- Delay exceeds 300 seconds -Computation not provided by HCM

Phase 2-Option 1

During the 2031 Background conditions, the side street northbound approach is anticipated to operate with short delays during the AM peak hour and long delays during the PM peak hour. The side street southbound approach is anticipated to operate with short delays during the AM peak hour and moderate delays during the PM peak hour for 2031 Background Conditions.

During the 2031 Build conditions, the side street northbound approach is anticipated to operate with long delays during the AM and PM peak hours. The side street southbound approach is anticipated to operate with short delays during the AM peak hour and long delays during the PM peak hour during the for 2031 Build Conditions.

To mitigate the impact the Phase 2 site traffic has on this interseciton, a northbound left-turn lane is recommended. With the northbound left-turn in place, the AM peak hour is anticipated to improve to moderate delays and the PM peak hour is anticipated to remain with long delays. It is important to note, the southbound approach has a volume of 2 vehicles during the PM peak hour.

Table 6.4.C summarizes the LOS, control delay, and 95th percentile queue lengths at the unsignalized, full-movement intersection of SC 462 at Snake Road for Phase 2 Option 2.
Table 6.4.C – SC 462 at Snake Road (Phase 2-Option 2)

Table 6.4.C - SC 462 at Snake Road (Phase 2-Option 2)							
Condition	Measure	EB	WB		NB		SB
		EBTLR	WBL	WBTR	NBL	NBTR	SBLTR
AM Peak Hour							
2031 Background	LOS (Delay)	A (0.0)	A (3.2)		C (15.7)		A (0.0)
	Synchro 95th Q	0'	45'	0'	N/A	68'	0'
2031 Build Option 2	LOS (Delay)	A (0.0)	A (3.8)		F (269.0)		A (0.0)
	Synchro 95th Q	N/A	60'	0'	N/A	680'	0'
2031 Build Option 2 Improved	LOS (Delay)	A (0.0)	A (3.8)		D (31.9)		A (0.0)
	Synchro 95th Q	0'	60'	0'	2'	128'	0'
PM Peak Hour							
2031 Background	LOS (Delay)	A (0.0)	A (5.0)		F (69.5)		E (43.3)
	Synchro 95th Q	0'	40'	0'	N/A	248'	3'
2031 Build Option 2	LOS (Delay)	A (0.0)	A (7.8)		F ($)		-
	Synchro 95th Q	0'	85'	0'	N/A	730'	-
2031 Build Option 2 Improved	LOS (Delay)	A (0.0)	A (7.6)		F (138.6)		-
	Synchro 95th Q	0'	85'	0'	40'	435'	

$- Delay exceeds 300 seconds -Computation not provided by HCM

Phase 2-Option 2

During the 2031 Background conditions, the side street northbound approach is anticipated to operate with short delays during the AM peak hour and long delays during the PM peak hour. The side street southbound approach is anticipated to operate with short delays during the AM peak hour and moderate delays during the PM peak hour for 2031 Background Conditions.

During the 2031 Build conditions, the side street northbound approach is anticipated to operate with long delays during the AM and PM peak hours. The side street southbound approach is anticipated to operate with short delays during the AM and PM peak hours during the PM peak hour for 2031 Build Conditions.

To mitigate the impact the Phase 2 site traffic has on this interseciton, a northbound left-turn lane is recommended. With the northbound left-turn in place, the AM peak hour is anticipated to improve to moderate delays and the PM peak hour is anticipated to remain with long delays. The northbound delay with a left-turn is anticipated to be less than half of the delay without the left-turn lane. It is important to note, the southbound approach has a volume of 2 vehicles during the PM peak hour.

6.5 SNAKE ROAD AT SITE ACCESS #2

Table 6.5.A summarizes the LOS, control delay, and 95th percentile queue lengths at the proposed unsignalized intersection of Snake Road at Site Access #2 for Phase 1.

Table 6.5.A - Snake Road at Site Access #2					
Condition	Measure	EB	NB		SB
		EBLR	NBL	NBT	SBT
AM Peak Hour					
2026 Build	LOS (Delay)	C (15.9)	A (1.1)		A (0.0)
	Synchro 95th Q	43'	N/A	3'	0'
2026 Build Improved	LOS (Delay)	C (15.9)	A (1.1)		A (0.0)
	Synchro 95th Q	43'	3'	0'	0'
PM Peak Hour					
2026 Build	LOS (Delay)	B (14.2)	A (2.4)		A (0.0)
	Synchro 95th Q	20'	N/A	5'	0'
2026 Build Improved	LOS (Delay)	B (14.0)	A (2.4)		A (0.0)
	Synchro 95th Q	20'	8'	0'	0'

Phase 1

The sidestreet eastbound approach is anticipated to operate with short delays during 2026 Build conditions.

Per SCDOT Auxiliary Turn Lane Warrants, discussed in **Section 8.0** of this report, a northbound left-turn lane should be constructed at this site access for 2026 Build Phase 1 Conditions.

Site Access #2 is recommended to be a single ingress lane and single egress lane for 2026 Build Phase 1. It is also recommended to dedicate right-of-way for a future southbound right-turn lane and separate egress lanes for future development.

Table 6.5.B summarizes the LOS, control delay, and 95th percentile queue lengths at the proposed unsignalized intersection of Snake Road at Site Access #2 for Phase 2-Option 1.

Table 6.4.B - Snake Road at Site Access #2 (Phase 2-Option 1)							
Condition	Measure	EB		NB		SB	
		EBL	EBR	NBL	NBT	SBTR	SBR
AM Peak Hour							
2031 Build Option 1	LOS (Delay)	C (24.2)		A (0.8)		A (0.0)	
	Synchro 95th Q	70'	N/A	3'	0'	0'	0'
2031 Build Option 1 Improved	LOS (Delay)	C (17.6)		A (0.8)		A (0.0)	
	Synchro 95th Q	25'	23'	3'	0'	0'	0'
PM Peak Hour							
2031 Build Option 1	LOS (Delay)	C (18.6)		A (1.5)		A (0.0)	
	Synchro 95th Q	25'	0'	8'	0'	0'	0'
2031 Build Option 1 Improved	LOS (Delay)	C (16.2)		A (1.5)		A (0.0)	
	Synchro 95th Q	8'	0'	8'	0'	0'	0'

Phase 2-Option 1

The sidestreet eastbound approach is anticipated to operate with short delays during the AM and PM peak hours for the 2031 Build Phase 2-Option 1 conditions.

Per SCDOT Auxiliary Turn Lane Warrants, discussed in **Section 8.0** of this report, a northbound left-turn lane (as identified in Phase 1) should be constructed at this site access for 2031 Build Phase 2 – Option 1 Conditions. A southbound right-turn lane is recommended to be constructed to improve exiting movements on Site Access #2.

Site Access #2 is recommended to be a single ingress lane and two egress lanes for 2031 Build Phase 2- Option 1. With the auxiliary turn lane in place and two egress lanes, the eastbound approach is anticipated to remain with short delays during the AM and PM peak hours.

Table 6.5.C summarizes the LOS, control delay, and 95th percentile queue lengths at the proposed unsignalized intersection of Snake Road at Site Access #2 for Phase 2.
Table 6.5.C – Snake Road at Site Access #2 (Phase 2-Option 2)

Table 6.5.C - Snake Road at Site Access #2 (Phase 2-Option 2)							
Condition	Measure	EB		NB		SB	
		EBL	EBR	NBL	NBT	SBT	SBR
AM Peak Hour							
2031 Build Option 2	LOS (Delay)	C (21.0)		A (0.3)		A (0.0)	
	Synchro 95th Q	N/A	33'	0'	0'	0'	N/A
2031 Build Option 2 Improved	LOS (Delay)	C (18.8)		A (0.3)		A (0.0)	
	Synchro 95th Q	23'	5'	0'	0'	0'	0'
PM Peak Hour							
2031 Build Option 2	LOS (Delay)	C (18.0)		A (0.4)		A (0.0)	
	Synchro 95th Q	N/A	13'	3'	0'	0'	N/A
2031 Build Option 2 Improved	LOS (Delay)	C (17.0)		A (0.4)		A (0.0)	
	Synchro 95th Q	10'	3'	3'	0'	0'	0'

Phase 2-Option 2

The sidestreet eastbound approach is anticipated to operate with short delays during the AM and PM peak hours for the 2031 Build Phase 2 – Option 2 conditions.

Per SCDOT Auxiliary Turn Lane Warrants, discussed in **Section 8.0** of this report, a northbound left-turn lane (as identified in Phase 1) should be constructed at this site access for 2031 Build Phase 2 – Option 2 Conditions. A southbound right-turn lane is recommended to be constructed to improve exiting movements on Site Access #2.

Site Access #2 is recommended to be a single ingress lane and two egress lanes for 2031 Build Phase 2 – Option 2. With the auxiliary turn lane in place and two egress lanes, the eastbound approach is anticipated to remain with short delays during the AM and PM peak hours.

6.6 SNAKE ROAD AT SITE ACCESS #3

Table 6.6.A summarizes the LOS, control delay, and 95th percentile queue lengths at the proposed unsignalized intersection of Snake Road at Site Access #2 for Phase 2-Option 1.

Table 6.6.A - Snake Road at Site Access #3 (Phase 2-Option 1)						
Condition	Measure	EBR	WB		NB	
		EBTR	WBL	WBT	NBL	NBR
AM Peak Hour						
2031 Build Option 1	LOS (Delay)	A (0.0)	A (0.2)		C (15.8)	
	Synchro 95th Q	0'	N/A	0'	N/A	13'
2031 Build Option 1 Improved	LOS (Delay)	A (0.0)	A (0.2)		B (14.9)	
	Synchro 95th Q	0'	0'	0'	5'	5'
PM Peak Hour						
2031 Build Option 1	LOS (Delay)	A (0.0)	A (0.7)		B (14.3)	
	Synchro 95th Q	0'	N/A	3'	N/A	5'
2031 Build Option 1 Improved	LOS (Delay)	A (0.0)	A (0.7)		B (13.9)	
	Synchro 95th Q	0'	3'	0'	3'	3'

Phase 2-Option 1

The sidestreet eastbound approach is anticipated to operate with short delays during the AM and PM peak hours for the 2031 Build Phase 2 – Option 1 conditions.

Per SCDOT Auxiliary Turn Lane Warrants, discussed in **Section 8.0** of this report, a westbound left-turn lane should be constructed at this site access for 2031 Build Phase 2 – Option 1 Conditions.

Site Access #2 is recommended to be a single ingress lane and two egress lanes for 2031 Build Phase 2 – Option 1. With the auxiliary turn lane in place and two egress lanes, the eastbound approach is anticipated to remain with short delays during the AM and PM peak hours.

Table 6.6.B summarizes the LOS, control delay, and 95th percentile queue lengths at the proposed unsignalized intersection of Snake Road at Site Access #2 for Phase 2-Option 2.
Table 6.6.B – Snake Road at Site Access #2 (Phase 2-Option 2)

Table 6.6.B - Snake Road at Site Access #3 (Phase 2 - Option 2)						
Condition	Measure	EB	WB		NB	
		EBTR	WBL	WBT	NBL	NBR
AM Peak Hour						
2031 Build Option 2	LOS (Delay)	A (0.0)	A (0.2)		C (15.8)	
	Synchro 95th Q	0'	N/A	0'	N/A	13'
2031 Build Option 2 Improved	LOS (Delay)	A (0.0)	A (0.2)		B (15.0)	
	Synchro 95th Q	0'	0'	0'	5'	5'
PM Peak Hour						
2031 Build Option 2	LOS (Delay)	A (0.0)	A (0.7)		B (14.3)	
	Synchro 95th Q	0'	N/A	3'	N/A	5'
2031 Build Option 2 Improved	LOS (Delay)	A (0.0)	A (0.7)		B (13.9)	
	Synchro 95th Q	0'	3'	0'	3'	3'

Phase 2-Option 2

The sidestreet eastbound approach is anticipated to operate with short delays during the AM and PM peak hours for the 2031 Build Phase 2 – Option 1 conditions.

Per SCDOT Auxiliary Turn Lane Warrants, discussed in **Section 8.0** of this report, a westbound left-turn lane should be constructed at this site access for 2031 Build Phase 2 – Option 1 Conditions.

Site Access #2 is recommended to be a single ingress lane and two egress lanes for 2031 Build Phase 2 – Option 1. With the auxiliary turn lane in place and two egress lanes, the eastbound approach is anticipated to remain with short delays during the AM and PM peak hours.

7.0 Signal Warrant Analysis

Using the 13-hour turning movement data and existing intersection laneage, a signal warrant analysis was performed at the intersection of SC 170 at Old Bailey's Road/Site Access #3 based on guidance within the *Manual on Uniform Traffic Control Devices* (MUTCD). It is important to note that SCDOT District 6 does not prefer to use COVID factors for signal warrant analysis; thus, the volumes used are from the raw traffic count volumes.

Additionally, SCDOT District 6 does not allow signals to be constructed based on projected warrants. The information provided in this section is for planning purposes and will need to be verified through actual traffic counts once the Chelsea Park Development is constructed.

The MUTCD provides the following guidance for evaluating the installation of a traffic signal:

- *An engineering study of traffic conditions, pedestrian characteristics, and physical characteristics of the location shall be performed to determine whether installation of a traffic control signal is justified at a particular location*
- *The investigation of the need for a traffic control signal shall include an analysis of factors related to the existing operation and safety at the study location and the potential to improve these conditions, and the applicable factors contained in the following signal warrants:*
    - *Warrant 1, Eight-Hour Vehicular Volume*
    - *Warrant 2, Four-Hour Vehicular Volume*
    - *Warrant 3, Peak Hour*
    - *Warrant 4, Pedestrian Volume*
    - *Warrant 5, School Crossing*
    - *Warrant 6, Coordinated Signal System*
    - *Warrant 7, Crash Experience*
    - *Warrant 8, Roadway Network*
    - *Warrant 9, Intersection Near a Grade Crossing*

The satisfaction of a traffic signal warrant or warrants shall not, in itself, require the installation of a traffic control signal.

This analysis addresses the following warrants:

- Warrant 1 Eight-Hour Peak Volume
- Warrant 2 Four-Hour Vehicular Volume
- Warrant 3 Peak Hour

Warrant 1 Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic signal. Warrant 1 Condition B is intended for application where Condition A is not satisfied and where the traffic volume on a major street is so heavy that traffic on a minor intersecting street suffers excessive delay or conflict in entering or crossing the major street. If a combination of Condition A and Condition B are not satisfied, Warrant 1 may be satisfied by Condition C.

Warrant 2 is intended to be applied where the volume of intersecting traffic is the principal reason to consider installing a traffic signal.

Warrant 3 is intended for use at a location where traffic conditions are such that for a minimum of one (1) hour of an average day, the minor-street traffic suffers undue delay when entering or crossing the major street.

A traffic control signal should not be installed unless one or more of the above warrants are met. However, the satisfaction of a traffic signal warrant or warrants should not in itself require the installation of a traffic control signal.

The background traffic volumes without the development, do not meet peak hour traffic volumes, therefore background warrants were not analyzed. Only 2031 Phase 2 was analyzed since there is a proposed site access at this intersection under these scenarios.

Table 7.1 shows the results of the 2031 Phase 2 signal warrant analyses for the five scenarios analyzed, along with number of hours satisfied versus hours required. The following scenarios were examined:

- Scenario 1- 100% mainline rights and side-street rights
- Scenario 2- 0% mainline rights and 50% side-street rights
- Scenario 3 – 0% mainline rights and 75% side-street rights
- Scenario 4 – 100% westbound through volume and 100% eastbound left- volumes
- Scenario 5 -100% eastbound through volume and 100% westbound left- volumes

Table 7.1 – Phase 2 Traffic Signal Warrant Analysis Results (hours satisfied/required)

Warrant	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
1A (Eight Hour)	(12/8) - S	(8/8) - S	(10/8) - S	(7/8) - NS	(0/8) - NS
1B (Eight Hour)	(12/8) -S	(12/8) -S	(12/8) -S	(10/8) -S	(0/8) -NS
1C (Eight Hour)	(10/8,12/8) -S	(2/8,12/8) - NS	(8/8,12/8) -S	(4/8,9/8) -NS	(0/8,0/8) -NS
2 (Four Hour)	(12/4) -S	(12/4) -S	(12/4) -S	(9/4) -S	(0/4) -NS
3 (Peak Hour)	(12/1) -S	(12/1) -S	(12/1) -S	(9/1) -S	(0/1) -NS

NS = Not Satisfied, S= Satisfied

With the 2031 background growth and Phase 1 + Phase 2 proposed development traffic, a traffic signal is warranted at this intersection in four of the five scenarios analyzed. Thus, traffic signal warrants should be further studied once Phase 2 of the Chelsea Park Development is completed and operational. SCDOT District 6 does not install traffic signals based on projected warrants.

8.0 Auxiliary Turn Lane Warrants

Warrants for additional turn-lane improvements at the analyzed unsignalized intersections—beyond those necessary for capacity — were determined based on a review of Figure 9.5B found on page 9.5-3 of the 2017 *SCDOT Roadway Design Manual*. The results of the warrants for left-turn lanes are summarized below and included in the **Appendix**.

Phase 1

Snake Road at Site Access #1

- Right-turn lane may not be necessary
- Consider left-turn treatment

Snake Road at Site Access #2

- Right-turn lane may not be necessary
- Consider left-turn treatment

SC 170 at Site Access #3

- Not applicable; this site access is not proposed to be constructed in this phase

Phase 2 – Option 1 and Option 2

Snake Road at Site Access #1

- Consider right-turn lane
- Consider left-turn treatment

Snake Road at Site Access #2

- Right-turn lane may not be necessary
- Consider left-turn treatment

Snake Road at Site Access #3

- Right-turn lane may not be necessary
- Consider left-turn treatment

SC 170 at Site Access #4

- Consider right-turn lane
- Left-turn warrant not analyzed due to existing TWLTL

9.0 Recommendations

Kimley-Horn was retained to determine the potential traffic impacts of this development and identify transportation improvements that may be required to accommodate these impacts in accordance with the guidelines set forth in the South Carolina Department of Transportation (SCDOT) *Access and Roadside Management Standards* (ARMS) *Manual* requirements.

Based on the capacity analyses performed at each of the identified study intersections, along with review of the auxiliary turn-lane warrants contained herein, the following improvements have been identified to mitigate the impact of the proposed development on the adjacent street network under **2026 Build Phase 1 Conditions**:

SC 170 at Snake Road/Callawassie Road

- Construct a southbound right-turn lane with a minimum storage of 375
- Implement permitted + overlap phasing for the southbound and northbound right-turn movements
- Optimize the traffic signal splits

Snake Road at Marion Horry Lane/Site Access #1

- Construct a northbound left-turn lane with a minimum storage of 200
- For Phase1 the site access should include one ingress lane and one egress lane
- Dedicate right-of-way for a future southbound right-turn lane for future development
- Dedicate right-of-way for two egress lanes for future development

Snake Road at Site Access #2

- Construct a northbound left-turn lane with a minimum storage of 200
- For Phase 1 the site access should include one ingress lane and one egress lane
- Dedicate right-of-way for a future southbound right-turn lane for future development
- Dedicate right-of-way for two egress lanes for future development

Based on the capacity analyses performed at each of the identified study intersections, along with review of the auxiliary turn lane warrants contained herein, the following improvements have been identified to mitigate the impact of the proposed development on the adjacent street network under 2031 Build Phase 2 – Option 1 Conditions - (*Italicized bullets represent a carry-over recommendation from Phase 1):*

SC 170 at Snake Road/Callawassie Road

- Construct a southbound left-turn with a minimum storage of 250' to create dual southbound left-turn lanes
- Construct an eastbound left-turn lane with a minimum storage of 225' to create dual eastbound left-turn lanes
- *Construct a southbound right-turn lane with a minimum storage of 375'*
- Implement permitted + overlap phasing for all right-turn movements at the intersection
- Implement protected + permitted phasing for the northbound left-turn movement
- Optimize the traffic signal splits

Snake Road at Marion Horry Lane/Site Access #1

- Construct a northbound left-turn lane to drop at the site access to accommodate the dual eastbound left-turn lanes from the SC 170 at Snake Road/Callawassie Drive intersection
- Construct a southbound right-turn lane with a minimum storage of 100'
- Construct an eastbound left-turn lane with a minimum storage of 150'

Snake Road at Site Access #2

- *Construct a northbound left-turn lane with a minimum storage of 200'*
- Construct a southbound right-turn lane with a minimum storage of 100'
- Construct an eastbound left-turn lane with a minimum storage of 150'

Snake Road at Site Access #3

- Construct a westbound left-turn lane with a minimum storage of 200'
- Construct a northbound left-turn lane with a minimum storage of 150'

SC 462 at Snake Road

- Construct a northbound left-turn lane with a minimum storage of 200'

Based on the capacity analyses performed at each of the identified study intersections, along with review of the auxiliary turn lane warrants contained herein, the following improvements have been identified to mitigate the impact of the proposed development on the adjacent street network under **2031 Build Phase 2 – Option 2 Conditions - (***Italicized bullets represent a carry-over recommendation from Phase 1)*:

SC 170 at Old Bailey's Road/Site Access #4

- Conduct a full signal warrant analysis once Phase 2 of the Chelsea Park Development is constructed to evaluate the need for installing a traffic signal
  - A traffic signal at this intersection is warranted based on projected 2031 Phase 2 Build peak-hour traffic volumes, but SCDOT District 6 does not allow a traffic signal to be constructed based on projected volumes
- Construct a westbound right-turn lane with a minimum storage of 250'
- Restripe the existing two-way left-turn lane (TWLTL) to function as an exclusive eastbound left-turn lane with 300' of storage
- Construct a southbound left-turn lane with a minimum full-width storage of 200'
- Construct a southbound shared through/right-turn turn lane

SC 170 at Snake Road/Callawassie Road

- Construct a southbound left-turn with a minimum storage of 250' to create dual southbound left-turn lanes
- *Construct a southbound right-turn lane with a minimum storage of 375'*
- Implement permitted + overlap phasing for all right-turn movements at the intersection
- Implement protected + permitted phasing for the northbound left-turn movement
- Optimize the traffic signal splits

Snake Road at Marion Horry Lane/Site Access #1

- *Construct a northbound left-turn lane with a minimum storage of 200'*
- Construct a southbound right-turn lane with a minimum storage of 100'
- Construct an eastbound right-turn lane with a minimum storage of 150'

Snake Road at Site Access #2

- *Construct a northbound left-turn lane with a minimum storage of 200'*
- Construct a southbound right-turn lane with a minimum storage of 100'
- Construct an eastbound right-turn lane with a minimum storage of 150'

Snake Road at Site Access #3

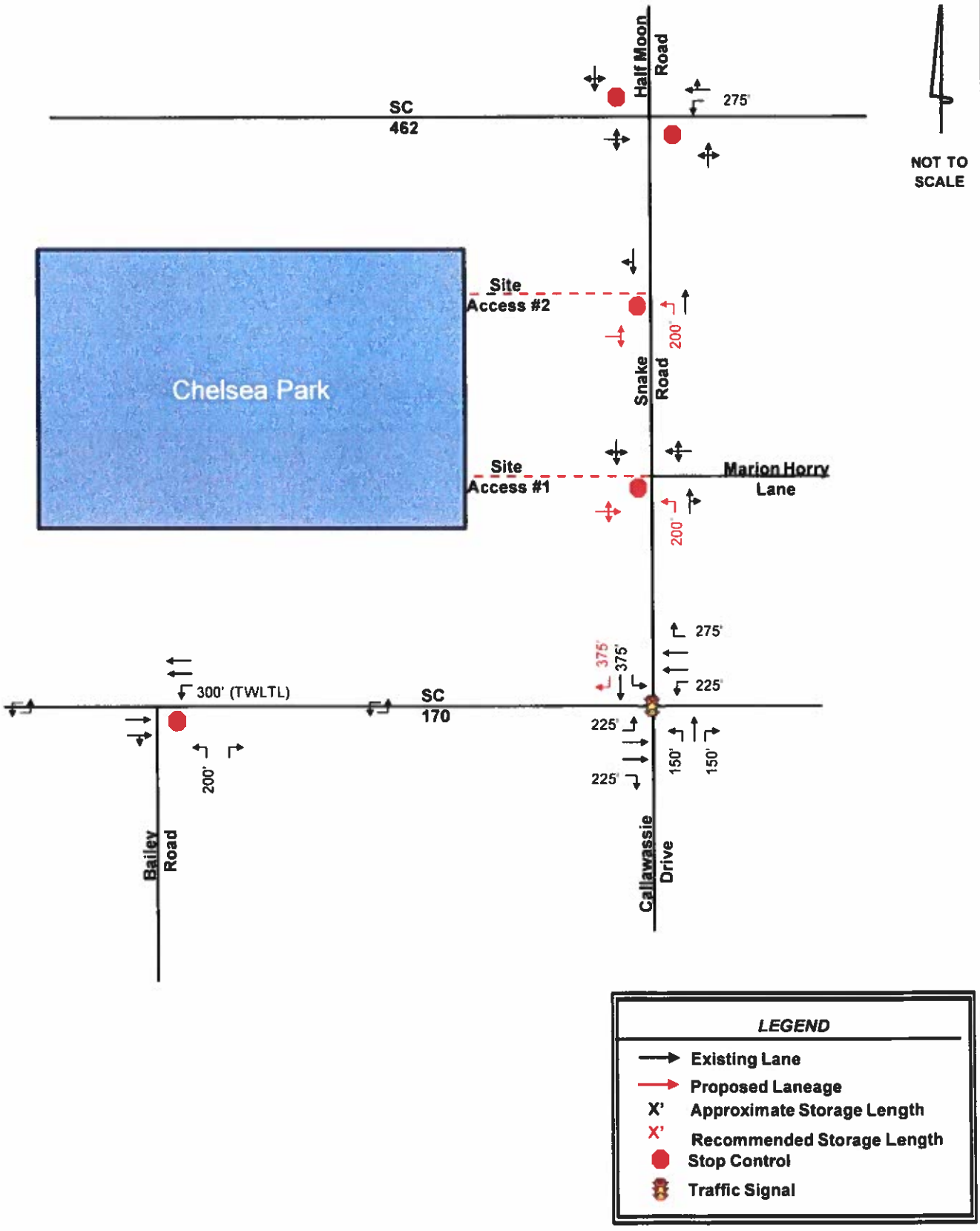
- Construct a westbound left-turn lane with a minimum storage of 200'
- Construct a northbound left-turn lane with a minimum storage of 150'

SC 462 at Snake Road

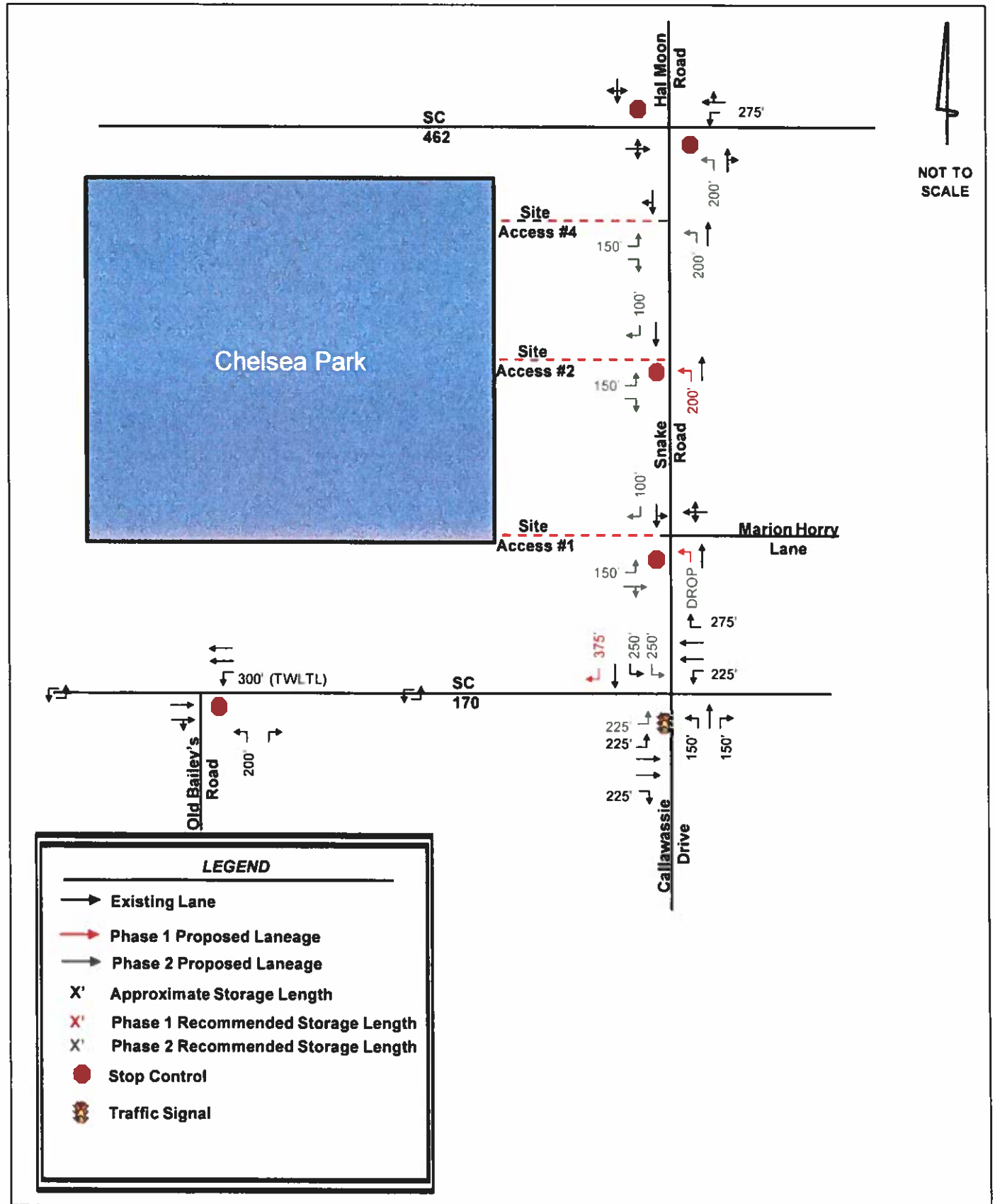
- Construct a northbound left-turn lane with a minimum storage of 200'

The recommended improvements identified within the study area are shown in **Figure 9-1, Figure 9-2,** and **Figure 9-3** for the 2026 Phase 1, 2031 Phase 2 – Option 1, and 2031 Phase 2- Option 2 conditions, respectively. The improvements shown on these figures are subject to approval by

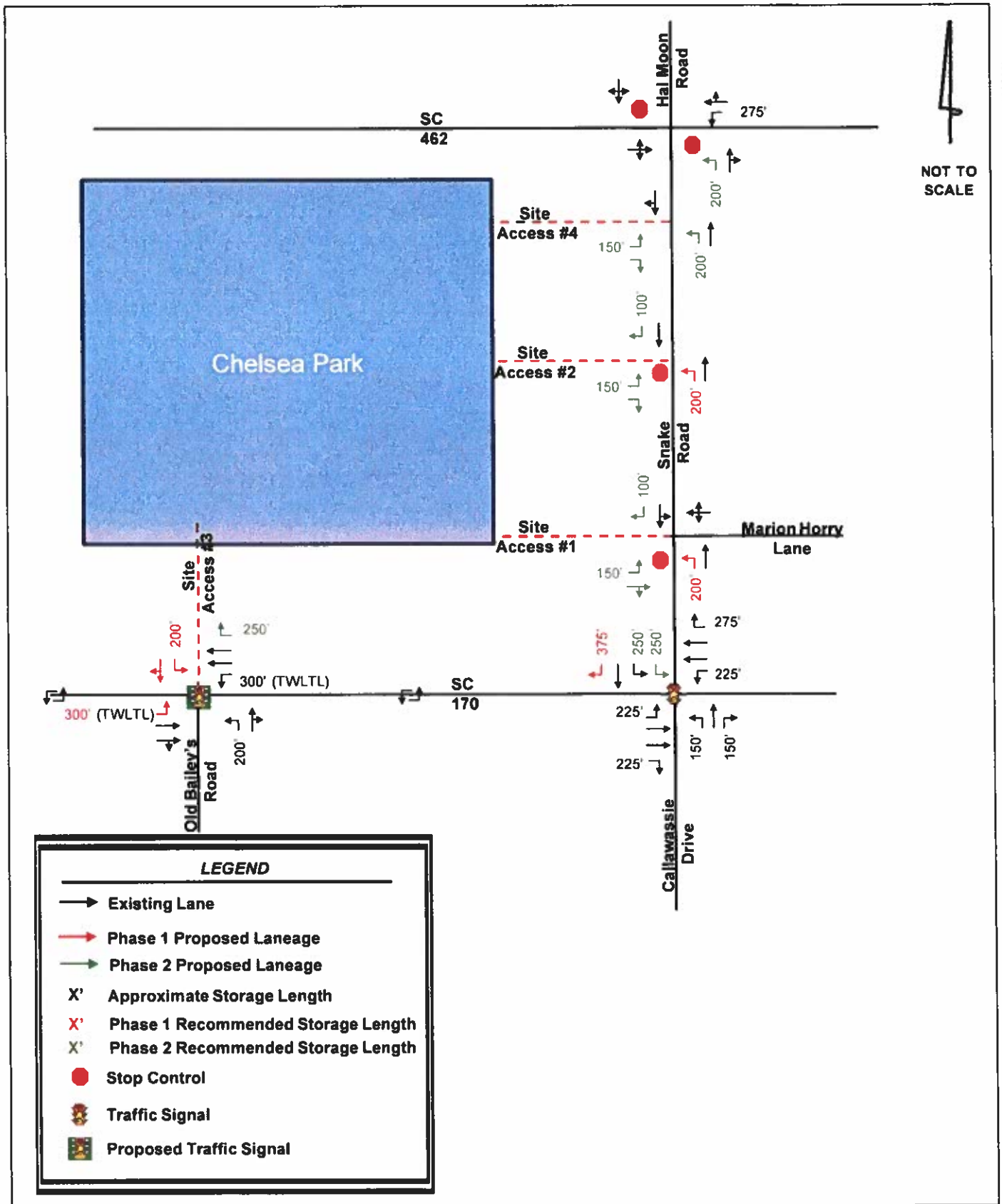
SCDOT and Jasper County. All additions and attachments to the State roadway system shall be properly permitted, designed, and constructed in conformance to standards maintained by SCDOT and Jasper County.



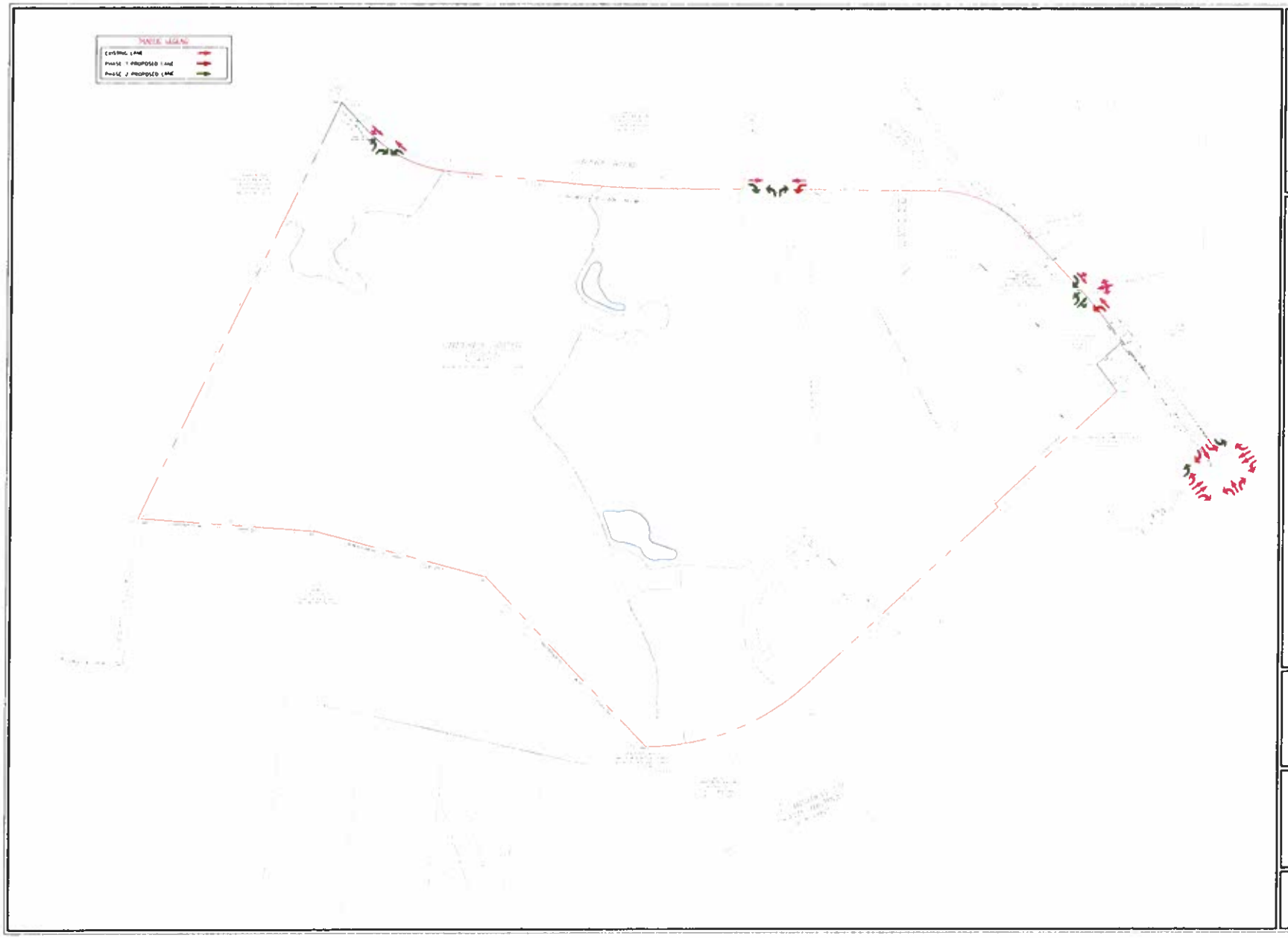
Kimley»Horn	Chelsea Park Development Traffic Impact Analysis	2026 Phase 1 Recommended Mitigation	Figure 9.1

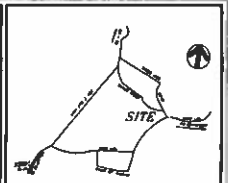


Kimley»Horn	Chelsea Park Development Traffic Impact Analysis	2031 Phase 2 - Option 1 Build Recommended Mitigation	Figure 9.2



Kimley»Horn	Chelsea Park Development Traffic Impact Analysis	2031 Phase 2 - Option 2 Build Recommended Mitigation	Figure 9.3





VICINITY MAP

Recommended Traffic Mitigation Exhibit

CHELSEA PARK

JASPER COUNTY, SOUTH CAROLINA

PREPARED FOR

CHELSEA PLANTATION, LLC

Ward Edwards ENGINEERING

APPENDIX N – HISTORIC & ARCHAEOLOGICAL PROPERTIES SURVEY

October 28, 2021

Mungo Homes
138 Canal Street, Suite 203
Pooler, GA 31322

Attention: Mr. Ryan Strickland, PE

Reference: **Historic and Archaeological Properties Survey**
Chelsea Park
Jasper County, South Carolina
S&ME Project No. 219226

Dear Mr. Strickland:

S&ME, Inc. (S&ME), on behalf of Mungo Homes, has completed a Historic and Archaeological Properties Survey (HAPS) for Chelsea Park in Ridgeland, Jasper County, South Carolina (Figures 1 and 2). S&ME staff completed this study in general accordance with S&ME Proposal Number 219226, dated October 4, 2021. We performed the background research and field investigation following the standard of care established in the *Guidelines for Historic & Archaeological Properties Survey Conducted for the Coastal Zone Management Program (CZMP)'s Coastal Zone Consistency Certification (CZC)*, developed by the State Historic Preservation Office (SHPO) in 2012.

Project Background

Mungo Homes is considering development of the Chelsea Park. The property is approximately 291.71 acres located south of Snake Road on Jasper County Parcel 081-00-02-008, in Ridgeland, Jasper County, South Carolina. (Appendix A). The South Carolina Department of Health and Environmental Control's Office of Coastal Resource Management (OCRM) consults with the SHPO concerning the effect of projects on historic and archaeological sites in South Carolina's coastal zone. The goal of the HAPS was to assess the Project Area's potential for containing significant resources, and to make recommendations regarding additional work or considerations that may be necessary to address effects that the proposed development may have on identified resources. This HAPS will serve as part of the due diligence efforts in advance of future planning and development.

The Project Area is located in the Lower Coastal Plain physiographic province. The topography is mostly level, with an elevation of approximately 15 – 20 feet above mean sea level (AMSL). The property has wooded areas, planted pine, secondary understory growth and hardwoods along borders of the property. (Figures 3-4).

The USDA records three soil types in the Project Area (Figure 5). The descriptions are presented below in Table 1 (USDA Web Soil Survey, Accessed October 4, 2021).

Table 1. Soils Identified in the Project Area

Map Unit Symbol	Map Unit Name	Drainage	Location	Percentage of Project Area
Ca	Cape Fear loam	Very Poorly Drained	Depressions, marine terraces, floodplains	11.9%
Cs	Coosaw loamy fine sand	Moderately Well Drained	Marine terraces	45.3%
To	Tomotley loamy fine sand	Poorly Drained	Depressions, Marine terraces	42.8%

Methods

This section of the report discusses the methods used during this study.

Background Research

On October 4, 2021, Quinn-Monique Ogden, RPA, conducted a background literature review and records search by reviewing available historic maps, ArchSite a GIS-based Cultural Resource Information System, and the South Carolina Department of Archives and History *Finding Aid* for previous archaeological and architectural surveys. Background research also included a review of available historic maps.

Field Investigation

The field crew investigated the Project Area by conducting a pedestrian reconnaissance along the roads crossing the tract and other areas with exposed ground surfaces. The field crew then initiated excavation of shovel test pits. In most cases, the shovel test pits were judgmentally placed to confirm published soil characteristics or examine select locations. Shovel test pits were 30 cm by 30 cm and excavated to the water table, culturally sterile subsoil, or to a minimum of 80 centimeters below the surface (cmbs) if no artifacts were recovered. Soil was screened through 0.25-inch hardware cloth. The field crew kept notes in a weatherproof field journal and recorded field conditions in the Project Area with digital photographs.

In addition to the archaeological survey, a limited architectural resource reconnaissance was conducted to locate historic architectural resources on or adjacent to the Project Area.

Results

This section of the report discusses the results of the background research and field investigation.

Background Research

Background research (Figure 6) indicated that the Project Area has not been the subject of past archaeological survey. No previously documented historic structures, and one previously documented archaeological site are located in the 0.5-mile search radius (Table 2, Figure 1, 2, and 6). Two cultural resource surveys (Fletcher and Harvey 1999, Jordan 1998) occurred in the 0.5-mile search radius (Figure 1, 2, and 6).

Table 2. Previously recorded cultural resources adjacent and in vicinity of the Project Area.

Site No.	Description	NRHP Status
38JA0221	20th century artifact concentration	Not eligible

As part of the background research, S&ME staff examined historic maps of the vicinity of the Project Area. Mills' Atlas (1825) depicts the Project Area, on Mannigaults Neck, northeast of the Ocketee River with no settlements within the Project Area or its vicinity (Figure 7). The USGS 1920 Okatie quadrangle features the Project Area west of a primary road with two structures in the northeast portion of the Project Area (Figure 8). The USGS 1942 Okatie quadrangle depicts the Project Area along the roadway with seven structures in the western portion of the Project Area along secondary roads (Figure 9). The 1983 Jasper (Figure 1) indicates no structures and one secondary road in the Project Area. A 2006 aerial image available through Google Earth Aerial shows the majority of the Project Area used as agricultural fields and a sparsely wooded area (Figure 10). Google Earth Aerial Image from 2014 shows that most of the Project Area was cleared at that time (Figure 11). Neither the 2006 or 2014 Google Earth image show indications of structures in the location depicted on the 1920 and 1942 Okatie quadrangles.

Potential for Archaeological Resources

In the Coastal Plain of South Carolina, researchers have used various predictive models to identify areas having a high potential for containing archaeological sites (e.g., Brooks and Scurry 1978; Cable 1996; Scurry 2003). These models have been revised based on data from Francis Marion National Forest (O'Donoughue 2008). In general, the most significant variables for determining site location are distance to a permanent water source, proximity to a wetland or other ecotone, slope, and soil drainage. Prehistoric sites tend to occur on relatively level areas with well-drained soils that are within 200 m of a permanent water source or wetland. Historic home sites tend to be located on well-drained soils near historic roadways.

The Project Area has historic roadways and forested conditions recorded on the twentieth century maps. Based on the proximity, of perennial water sources, we characterized the portions of the tract with moderately well drained soils (Coosaw) as having a relatively higher potential to contain archaeological remains dating to both the historic and prehistoric periods compared to other parts of the property (Figure 12).

Results of the Field Investigation

On October 22, 2021, Quinn-Monique Ogden, RPA conducted the fieldwork portion of this investigation. The field crew excavated 58 shovel test pits, ranging from 10 to 60 cm below the surface. The shovel test pits were placed in transects parallel to the road and other locations to examine the higher probability areas and characterize the property across Project Area (Figure 13). The field crew excavated shovel test pits at the location of the structures featured on the USGS 1920 and 1942 Okatie Quadrangles (Figure 8 and 9) in the Project Area. Shovel testing at the former structures did not recover artifacts. Only push piles were present in the former structure locations. The Project Area has been disturbed by agriculture, silviculture, and clearing of vegetation (Figures 14-17).

The typical soil profile in northern portion of the Project Area consisted of approximately 25 cm of very dark grayish brown (10 YR 3/2) loamy fine sand overlying 10+ cm of light gray (10 YR 7/2) with yellow brown (10YR 5/6 and 5/8) fine sand that contained ferric concretions (Figure 18). The typical soil profile in southern portion of the Project Area consisted of approximately 10 cm of very dark grayish brown (10 YR 3/2) loamy fine sand overlying 10+ cm of light gray (10 YR 7/2) with strong brown (7.5YR 5/8) fine sand that contained ferric concretions (Figure 19).

Neither the pedestrian reconnaissance nor the shovel testing recovered artifacts, identified subsurface features, or observed other indications of the presence of archaeological remains.

The field crew did not identify undocumented structures in the Project Area or on adjacent properties that appeared to be 45 years old or older.

♦ Conclusion

This HAPS identified no archaeological remains within the Project Area. No previously eligible undocumented historic architectural resources were documented during this study. We conclude that there are no NRHP-listed or eligible resources in the Project Area. Based on the results of this study, it is S&ME's opinion that the construction of the proposed development will not have an adverse effect on NRHP-listed or eligible resources, and no additional cultural resource investigations are necessary.

Closing

S&ME appreciates the opportunity to provide you with this report. If you have questions about the report, please do not hesitate to contact Quinn-Monique Ogden at (843) 884-0005 or via e-mail at qogden@smeinc.com.

Sincerely,

S&ME, Inc.

Aaron Brummitt, RPA
Senior Reviewer

Quinn-Monique Ogden, RPA
Principal Investigator

Attachments: Appendix A: Client-Provided Maps, Figures 1-19