

# 2217 HOMESTEAD TOWNHOMES

## RESIDENTIAL DEVELOPMENT

### **DRAFT** TRANSPORTATION IMPACT ANALYSIS

#### EXECUTIVE SUMMARY



#### **Prepared for:**

The Town of Chapel Hill  
Public Works Department - Engineering

#### **Prepared by:**

***HNTB North Carolina, PC***

*343 East Six Forks Road  
Suite 200  
Raleigh, NC 27609*

*NCBELS License #: C-1554*

September 2022



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## EXECUTIVE SUMMARY - DRAFT

### **Project Overview**

A new residential community, known as 2217 Homestead Townhomes, is being proposed in Chapel Hill along Homestead Road near the Weaver Dairy Road Extension. **Figure ES-1** shows the general location of the site. The project proposes to construct 103 individual residential townhome/condominium units and is anticipated to be fully complete and occupied by 2025. This report analyzes the full build-out scenario for 2217 Homestead Townhomes for the year 2026 (one year after anticipated completion), the no-build scenario for 2026, as well as 2022 existing year traffic conditions for typical weekday AM, noon, and PM peak hours.

The current proposed site plan shows a provision for a full movement access driveway serving the site that connects to Homestead Road and a secondary access point to Kipling Lane in the Courtyards at Homestead Road subdivision. No other external roadway vehicular access connections are proposed. **Figure ES- 2** displays the overall site plan and nearby land uses and roadways. The 2217 Homestead Townhomes site is expected to provide individual vehicle parking spaces located on individual driveways as part of each condominium lot – with potential on-street parking allowed in areas where curb space permits. This report analyzes and presents the transportation impacts that the 2217 Homestead Townhomes project will have on the following intersections in the project study area:

- Homestead Road and Seawell School Road
- Homestead Road and Greenway Landing / Future Bridgepoint Access Driveway
- Homestead Road and Weaver Dairy Road Extension
- Homestead Road and NC 86 (Martin Luther King, Jr. Boulevard)
- Homestead Road and Proposed Site Driveway

### **Existing Conditions**

#### **Study Area**

The site is located in north Chapel Hill along Homestead Road just west of the Weaver Dairy Road Extension. The study area contains three signalized intersections along Homestead Road at NC 86 (Martin Luther King, Jr. Boulevard), Weaver Dairy Road Extension and Seawell School Road. NC 86 (Martin Luther King, Jr. Boulevard) is a major north-south arterial providing connectivity between downtown Chapel Hill, north and south Chapel Hill, the I-40 corridor and Hillsborough. Homestead Road is a minor east-west arterial providing connectivity through northern Chapel Hill. Remaining study area network roadways are either suburban collector streets or local neighborhood/commercial access streets.

#### **Site Traffic Generation**

With the addition of new trips during the weekday AM, noon, and PM peak hours, there are potential site traffic impacts to study area intersections. **Table ES-1** shows the site trip generation details, with rates taken from the Institute of Transportation Engineers (ITE) *Trip Generation Manual, Version 10*.

#### **Background Traffic**

Background traffic growth for the 2026 analysis years is expected to come from two sources - ambient regional traffic growth and specific development-related traffic growth. Five Town-approved sites near the project study area were considered for specific development related growth. All remaining estimated traffic volume increases are assumed to occur due to overall region-wide ambient growth (assumed 0.5 percent per year) based on NCDOT/Town historic growth data and taking into consideration the on-going rebound to pre-COVID traffic levels caused by the pandemic.



**Table ES-1. Weekday Vehicle Trip Generation Summary**

Description	Density	Daily			AM Peak			Noon Peak*			PM Peak		
		Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
Condominiums – Low-Rise	103 Units	369	369	738	11	38	49	25	31	56	38	23	61

\* - No Noon Peak ITE Data Available – Used Average of AM and PM Peak Data

## Impact Analysis

### Peak Hour Intersection Level of Service

Existing traffic operations at all study area intersections are acceptable during all three peak hours analyzed. The projected ambient and background development traffic growth will increase impacts by 2026. Even with the addition of peak hour site-generated trips to the projected 2026 background traffic volumes, no study area intersection is expected to experience deficient traffic operations in any peak hour and projected maximum queues at all locations are not expected to be excessive. No additional mitigation improvements to any intersection were considered necessary. A summary of the traffic operations for each intersection, related to vehicular delays (intersection average as a whole if signalized, critical movement if stop-controlled) and the corresponding traffic simulation Level-of-Service (LOS<sub>s</sub>) is shown in **Table ES-2**.

**Table ES-2. Peak Hour Intersection Capacity Analysis Summary**

Intersections	Peak Hour	2022 Existing		2026 No-Build		2026 Build		2026 Mitigated	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Homestead Road & Seawell School Road	AM	C	21.2	C	22.1	C	22.0	N/A	N/A
	NOON	B	12.5	B	12.5	B	12.1	N/A	N/A
	PM	B	13.9	B	14.2	B	14.1	N/A	N/A
Homestead Road & Greenway Landing / Future Bridgepoint Site Driveway <sup>#</sup>	AM	A	7.6	C	15.5	C	15.9	N/A	N/A
	NOON	A	6.2	A	8.0	A	8.0	N/A	N/A
	PM	A	7.1	C	17.0	C	18.6	N/A	N/A
Homestead Road & Weaver Dairy Road Extension	AM	B	14.4	B	14.0	B	13.9	N/A	N/A
	NOON	B	14.0	B	13.4	B	12.9	N/A	N/A
	PM	B	18.7	B	19.0	B	18.8	N/A	N/A
Homestead Road & NC 86 (Martin Luther King, Jr. Boulevard)	AM	B	19.1	C	20.1	C	20.7	N/A	N/A
	NOON	C	20.1	C	21.8	C	22.1	N/A	N/A
	PM	B	17.4	B	19.3	C	20.1	N/A	N/A
Homestead Road & Proposed Site Driveway <sup>#</sup>	AM	N/A	N/A	N/A	N/A	A	9.5	N/A	N/A
	NOON	N/A	N/A	N/A	N/A	A	5.4	N/A	N/A
	PM	N/A	N/A	N/A	N/A	A	6.8	N/A	N/A

N/A – Not Applicable or No Improvements Necessary

# - Worst-Case LOS/Delay for Unsignalized/Stop-Controlled Critical Movement

### Access Analysis

Vehicular site access to the project is to be accommodated at a proposed full movement driveway access connecting to Homestead Road about 400 feet to the west of the Weaver Dairy Road Extension intersection with the Homestead Road. The proposed driveway has single inbound and outbound lanes.



A second internal local street access connection is also proposed to link with existing Kipling Lane within the Courtyards at Homestead subdivision. Driveway throat lengths, and intersection/driveway separation minimum criteria, as set forth in the 2003 *NCDOT Policy on Street and Driveway Access to North Carolina Highways* and the 2017 Town of Chapel Hill Design Manual are generally acceptable for the current site concept plans for the project.

Access for pedestrians is adequate in the project study area and will be improved with the construction of the Town's Homestead Road Improvements project. Crosswalk exists across the NC 86, Seawell School Road, and Weaver Dairy Extension intersections with some connectivity along Homestead Road. No specific bicycle amenities are present along Homestead Road, but bicycle lanes are present on the Weaver Dairy Road Extension and along NC 86 north of Homestead Road. Additional bicycle lanes/off-road paved paths along Homestead Road will be provided and provided the needed connectivity upon the completion of the Town's improvement project.

### Signal Warrant Analysis

Based on projected 2026 traffic volumes and proposed access plans, no unsignalized study area intersection with Homestead Road would warrant the installation of a traffic signal, based on the Peak Hour warrant methodology found in the 2009 *Manual on Uniform Traffic Control Devices (MUTCD)*.

### Crash Analysis

Pre-COVID crash data from the NCDOT Traffic Safety Unit was used from a previous TIA study for the five-year period 2/1/2015 to 1/31/2020 for the segment of Homestead Road Extension in the vicinity of the proposed site. There were 36 crashes reported along Homestead Road study area corridor between Seawell School Road and NC 86 over the five year period. The primary crash type was rear end crashes and crashes were primarily clustered near the NC 86 intersection. Overall, the number and rate of crashes along Homestead Road in the project study area is lower than state-wide averages for similar facilities, with the rate and index of severe crashes being higher, due to a single fatal crash (with a pedestrian) that occurred during the five year crash collection period.

### Other Transportation-Related Analyses

Other transportation-related analyses relevant to the 2001 Town of Chapel Hill Guidelines for the preparation of Traffic Impact Studies were completed as appropriate. The following topics listed in **Table ES-3** are germane to the scope of this study.

**Table ES-3. Other Transportation-Related Analyses**

Analysis	Comment
Turn Lane Storage Requirements	Storage bay lengths at study area intersections were analyzed using TransModeler maximum queue length estimates for the 2026 Build Scenario. At the intersection of Homestead Road and Weaver Dairy Road Extension, the southbound right-turn lane queue may exceed its existing storage regardless of site traffic impacts. Adjustments to signal timing may be necessary to mitigate this issue. No other intersection maximum queue results indicate potential queue spillback.
Appropriateness of Acceleration/Deceleration Lanes	With relatively light traffic turning volumes, no additional acceleration/deceleration lanes are necessary in the vicinity of the project site driveway along Homestead Road, other than the proposed westbound center left-turn lane included in the U-4726 Town project design for Homestead Road.
Pedestrian and Bicycle Analysis	Existing pedestrian access and connectivity is adequate along the Homestead Road corridor in the vicinity of the site, though some gaps exist on both sides of the road in certain areas. Bicycle lanes extend along NC 86 north of Homestead Road and along the Weaver Dairy Road Extension, but no bicycle facilities exist along Homestead Road within the project study area. The Town's Homestead Road Improvements project will



Analysis	Comment
	considerably improve pedestrian and bicycle facilities along Homestead Road within and to the west of the project study area by providing off-road paved paths that enhance bicycle and pedestrian connections.
Public Transportation Analysis	Public transportation service to the study area, and to the proposed site is adequate, with bus stops and multiple local and regional bus routes on both NC 86 and Homestead Road proximate to the site. In the immediate site vicinity, only one CHT Route (HS) directly runs adjacent to the site, with 30+ minute headways and service currently only in the peak AM and PM time periods.

## **Mitigation Measures/Recommendations**

### **Planned Improvements**

There are no North Carolina Department of Transportation improvement projects for study area roadway facilities within the analysis year time frame of 2022-2026. The Town of Chapel Hill has a transportation improvement project slated for construction prior to the 2026 site build-out year. The Homestead Road Improvements project (U-4726 IK) will create a consistent three-lane roadway cross-section west of the Weaver Dairy Road Extension intersection, as well as construct pedestrian and bicycle facility improvements between Seawell School Road and Weaver Dairy Road Extension. Improvements related to this project are shown schematically on **Figure ES-3**.

The Town also has the North-South Bus Rapid Transit Project, which will provide dedicated lanes for transit along the NC 86 corridor, along with other transit amenity improvements scheduled for construction in 2028. As final design details are not complete as of the submittal of this TIA, no specific lane usage changes along NC 86 were analyzed as part of this study.

### **Background Committed Improvements**

Several traffic impact studies for development projects in and near the study area recommended signal timing reoptimization for signalized intersections along the NC 86 (Martin Luther King, Jr. Blvd) corridor by their respective build-out years. It is assumed that signal timing reoptimization will occur for the NC 86 corridor and for the Homestead Road / Weaver Dairy Road Extension intersection by the year 2026, whether or not specifically needed by any of the proposed background traffic generating developments included in this study. Improvements and access changes necessitated by the combined Bridgepoint and 2200 Homestead Road Residential projects are shown in **Figure ES-3** and are located primarily in the vicinity of the existing Greenway Landing intersection along Homestead Road.

### **Applicant Committed Improvements**

Based on the preliminary site plans and supporting development information provided, there are several specific transportation-related improvements proposed for the 2217 Homestead Townhomes project. Internal and external improvements (shown schematically in **Figure ES-2 and ES-3**) include:

- Construction of a primary full movement access driveway connecting to Homestead Road with a proposed sidewalk along both sides of the driveway to connect to the new multi-use path provided by Town project U-4726.
- Construction of a full access minor street connection to existing Kipling Lane with an accompanying extension of sidewalk on both sides of the street connection.

### **Necessary Improvements**

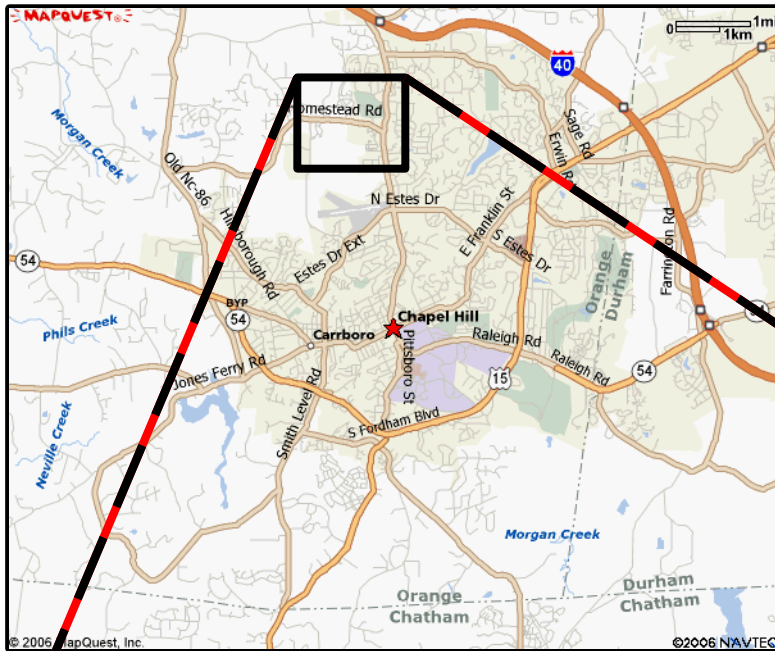
Based on traffic capacity analyses for the 2026 design year for the 2217 Homestead Townhomes development and analyses of existing study area turning bay storage lengths and site access, the



following improvements are recommended as being necessary for adequate transportation network operations and safety (see **Figure ES-3**).

- Restripe Center Turn Lane Created as part of the Town Homestead Road Improvements project for a 100' Westbound Left-Turn and Taper at the proposed Site Driveway and Use Remaining Available Storage in the center lane For Eastbound Left-Turn storage and Taper at the Homestead Road / Weaver Dairy Road Extension intersection.
- Provide Crosswalk across the proposed Site Driveway at its intersection with Homestead Road.

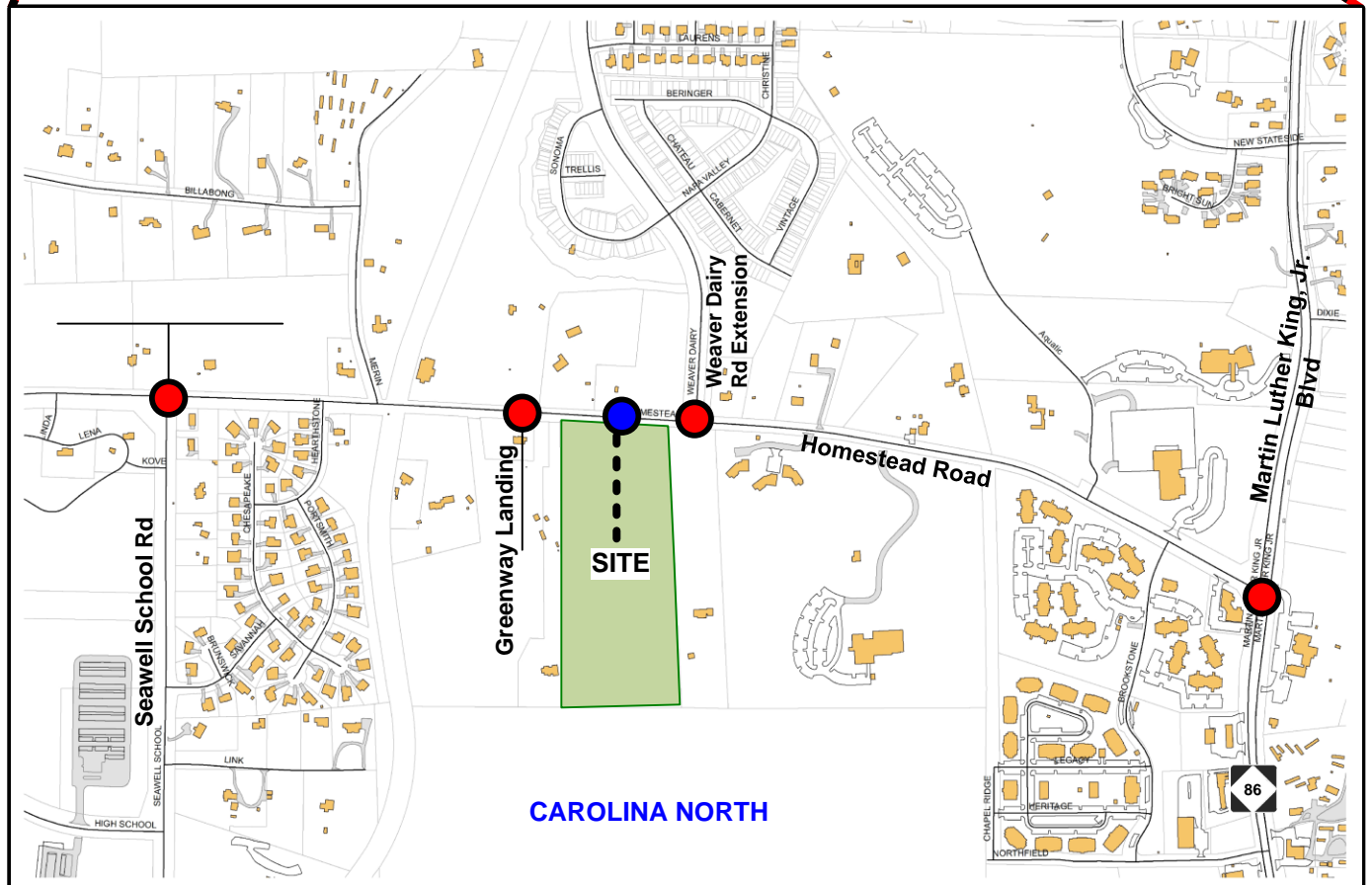




**LEGEND**

- = Existing Building Footprint
- = Existing Study Area Intersection
- = Proposed Site Driveway
- = Proposed 2217 Homestead Townhomes Site

**NOT TO SCALE**



**DRAFT**

Source: Town of Chapel Hill GIS Files

**HNTB**



**2217 Homestead Townhomes  
Transportation Impact Analysis**

**PROJECT STUDY AREA**

**DATE:** September 2022

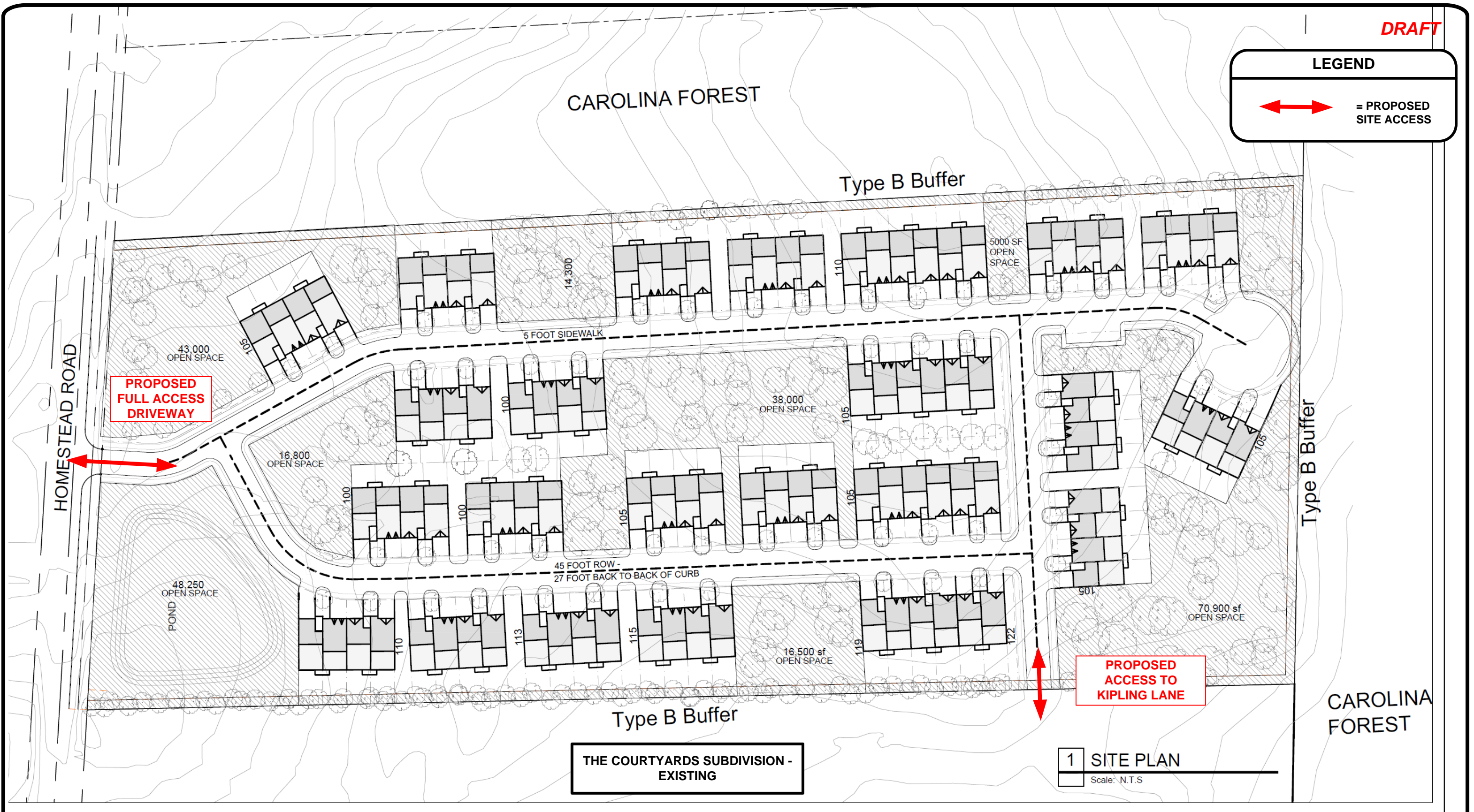
**FIGURE ES-1**



DRAFT

LEGEND

↔ = PROPOSED SITE ACCESS



HNTB



NOT TO  
SCALE






2217 Homestead Townhomes  
Transportation Impact Analysis

SITE CONCEPT PLAN

DATE: September 2022

FIGURE ES-2

LEGEND

-  = TOWN / DEVELOPER BACKGROUND COMMITTED IMPROVEMENT
-  = APPLICANT COMMITTED IMPROVEMENT
-  = NECESSARY IMPROVEMENT
-  = NEW CROSS-WALK / PEDESTRIAN SIGNAL
-  = PEDESTRIAN / BICYCLE IMPROVEMENTS

