

# OLD CHAPEL HILL ROAD APARTMENTS

## **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*

November 2024



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## **EXECUTIVE SUMMARY**

### **Project Overview**

This study analyzes the transportation impacts from Old Chapel Hill Road Apartments, a residential development proposed on a site located along Old Chapel Hill Road and White Oak Drive. The project proposes to develop vacant land north of Old Chapel Hill Road in this vicinity and construct several multi-family residential buildings, with a total of 370 residential units, east of White Oak Drive and 25 residential townhome/duplex units west of White Oak Drive. **Figure ES-1** shows the general location of the site. The entire project is anticipated to be fully complete by 2029. This report analyzes the transportation impacts for the build-out scenario for the year 2029 (one year after anticipated completion), the no-build scenario for the 2029 analysis year, as well as 2024 base year traffic conditions.

The preliminary site concept plans show internal transportation network connections and external access points. A new site driveway is proposed to connect to Old Chapel Hill Road for a proposed parking structure on the east side of the development. White Oak Drive will be connected to an internal local street constructed for the Gateway Residential Development and connecting to Lakeview Drive. Parking will include structured garages, surface lots and private lots/garages. **Figure ES-2** displays the preliminary site concept plan for the development, transportation network changes, and nearby land uses and roadways. This report analyzes and presents the transportation impacts that the Old Chapel Hill Road Apartments development is expected to have on the following existing and future intersections in the project study area:

- US 15-501 and Sage Road / Old Durham Road
- US 15-501 and Eastowne Drive (South) / Service Road
- US 15-501 and Eastowne Drive (North) / Lakeview Drive
- US 15-501 and I-40 Eastbound Ramps
- US 15-501 and I-40 Westbound Ramps
- Lakeview Drive / Nova Apartments Driveway & Old Durham Road
- Lakeview Drive and W. Lakeview Drive / Red Roof Inn Driveway
- Lakeview Drive and Future Gateway Residential Development Local Street
- Old Chapel Hill Road and White Oak Drive
- Old Chapel Hill Road and Proposed Site Access Driveway
- Old Chapel Hill Road and Pope Road
- Old Chapel Hill Road and Mount Moriah Road

The impacts of the proposed site at the study area intersections were evaluated during the AM and PM peak hours of an average weekday.

### **Existing Conditions**

#### **Study Area**

The site is located in northeast Chapel Hill along Old Chapel Hill Road and an unpaved portion of White Oak Drive. The study area contains four unsignalized intersections along Old Chapel Hill Road, two of which are roundabouts at Pope Road and Mt. Moriah Road, and the signalized intersections along US 15-501 between Sage Road/Old Durham Road and the I-40 interchange. US 15-501 is a major arterial facility providing connectivity between Chapel Hill, Durham and the I-40 corridor. Old Chapel Hill Road is a minor arterial facility providing connectivity between the US 15-501 corridor and southwest Durham. Remaining study area network roadways are minor collector or local access streets.



### Site Traffic Generation

With additional new trips during the weekday AM and PM peak hours, there are potential site traffic impacts to the study area intersections. **Table ES-1** shows site trip generation details, with generation rates taken from the Institute of Transportation Engineers *Trip Generation Manual, Version 11*.

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

Description	Density	Daily			AM Peak			PM Peak		
		Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
Townhomes/Duplex Low-Rise	25 units	118	118	236	7	24	31	20	11	31
Multi-Family Mid-Rise Apartments	373 units	867	867	1,734	35	118	153	89	57	146
<b>Unadjusted Trip Generation Totals</b>		<b>985</b>	<b>985</b>	<b>1,970</b>	<b>42</b>	<b>142</b>	<b>184</b>	<b>109</b>	<b>68</b>	<b>177</b>
<b>Multi-Modal Trip Reduction (Transit/Ped/Bike) - 10%</b>		<b>-99</b>	<b>-99</b>	<b>-198</b>	<b>-4</b>	<b>-14</b>	<b>-18</b>	<b>-11</b>	<b>-7</b>	<b>-18</b>
<b>Total Vehicular Trips Generated</b>		<b>886</b>	<b>886</b>	<b>1,772</b>	<b>38</b>	<b>128</b>	<b>166</b>	<b>98</b>	<b>61</b>	<b>159</b>

### Background Traffic

Background traffic growth for the 2029 analysis year is expected to come from two sources - ambient regional traffic growth and specific development-related traffic growth. Three developments in the project study area that are currently approved by the Town of Chapel Hill were included to contribute to specific background traffic generator growth. They are the UNC Health Care Medical Office Building #2 development, Gateway Residential, and Chapel Hill Crossing. All remaining estimated traffic volume increases are assumed to occur due to overall region-wide ambient growth (assumed 1.0 percent per year based on NCDOT/Town provided historic growth data).

### Impact Analysis

#### Peak Hour Intersection Simulation Level of Service (LOSs)

Existing traffic operations at all study area intersections are acceptable during the two peak hours analyzed, though the intersection of US 15-501 and Sage Road/Old Durham Road is congested and nearing capacity during peak travel periods. No unsignalized intersection along Old Durham/Old Chapel Hill Road has existing operational issues. The projected ambient and background development traffic growth may increase intersection delay and queue impacts by 2029 but would be mitigated to some extent by committed background development improvements and traffic signal reoptimization along the US 15-501 corridor. The southbound stop-controlled left-turn at Old Chapel Hill Road/Lakeview Drive intersection is expected to operate at a LOSs F in the 2029 PM peak hour. Northbound Lakeview Drive traffic at the US 15-501 intersection is expected to potentially cause queueing issues that block the nearby W. Lakeview Drive/Red Roof Inn Access Roadway intersection.

With the addition of peak hour site-generated trips to the projected 2029 background traffic volumes, several study area intersections are expected to experience deficient traffic operations in the PM peak hour, particularly for the scenario where the additional two background adjacent developments are constructed. Proposed geometric and signal timing improvements are expected to mitigate anticipated deficient LOS conditions throughout the study area and improve queue storage and safety, as well. 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 microsimulation Level-of-Service (LOSs) is shown in **Table ES-2**.



**Town of Chapel Hill: *DRAFT* Transportation Impact Analysis**  
*Old Chapel Hill Road Apartments – Proposed Residential Development*

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

Intersections	Peak Hour	2024 Existing		2029 No-Build		2029 Build		2029 Mitigated	
		LOS <sub>s</sub>	Delay	LOS <sub>s</sub>	Delay	LOS <sub>s</sub>	Delay	LOS <sub>s</sub>	Delay
US 15-501 and Sage Road / Old Durham Road	AM	D	38.3	D	48.2	D	48.2	C	34.5
	PM	D	39.6	D	54.0	D	51.0	D	54.3
US 15-501 and Eastowne Drive (South) / Service Road	AM	B	14.7	B	18.9	B	16.9	C	23.5
	PM	B	17.7	C	22.2	C	20.6	C	22.5
US 15-501 and Eastowne Drive (North) / Lakeview Drive	AM	B	14.6	C	22.7	C	24.8	B	19.5
	PM	C	23.0	C	26.4	C	33.3	C	28.7
US 15-501 and I-40 Eastbound Ramps	AM	C	31.5	C	28.2	C	28.9	C	27.2
	PM	C	34.8	C	27.1	C	28.0	C	28.2
US 15-501 and I-40 Westbound Ramps	AM	C	33.0	C	34.8	C	34.8	C	33.7
	PM	C	27.4	C	29.2	C	30.9	C	34.3
Old Durham Road and Lakeview Drive# @	AM	B	12.0	D	28.1	D	29.5	A	9.6
	PM	C	23.9	<b>F</b>	<b>265</b>	<b>F</b>	<b>299</b>	B	12.1
Old Chapel Hill Road and White Oak Road#	AM	A	5.3	A	7.7	B	14.5	B	13.5
	PM	B	11.2	C	17.4	C	23.2	C	22.2
Old Chapel Hill Road and Site Driveway#	AM	n/a	n/a	n/a	n/a	A	7.8	n/a	n/a
	PM	n/a	n/a	n/a	n/a	A	8.0	n/a	n/a
Old Chapel Hill Road and Pope Road	AM	A	3.9	A	4.7	A	4.9	n/a	n/a
	PM	A	6.0	A	7.1	A	7.3	n/a	n/a
Old Chapel Hill Road and Mount Moriah Road	AM	A	4.8	A	5.4	A	5.5	n/a	n/a
	PM	A	6.7	A	7.7	A	7.8	n/a	n/a
Lakeview Drive and W. Lakeview Dr/Red Roof Dr#	AM	A	4.6	D	25.2	E	35.6	C	17.1
	PM	A	6.0	C	20.7	D	27.4	B	14.6
Lakeview Drive and Gateway Residential Access St# @	AM	n/a	n/a	A	7.1	B	11.8	A	2.7
	PM	n/a	n/a	A	5.6	A	6.2	A	2.9

**BOLD/ITALICS** – Critical Movement or Overall Intersection Requires Mitigation Per Town TIA Guidelines

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

@ - Mitigated Results For Overall Roundabout/Traffic Signal Operations

### Access Analysis

Vehicular site access for the site parcel is to be accommodated by a proposed access driveway connecting to Old Chapel Hill Road and several driveways connecting to White Oak Drive for entry/exit to the proposed on-site surface parking lots and parking garages, as shown on **Figure ES-2**. Design details related to driveway throat lengths shown on the site plan and driveway spacing from existing intersections and adjacent driveways adhere to NCDOT *Policy on Street and Driveway Access to North Carolina Highways* and the Town of Chapel Hill Design Manual.

Access for pedestrians and bicyclists in the immediate project study area along Old Chapel Hill Road is excellent, as marked bicycle lanes and sidewalk facilities on both sides of the road provided by the recent NCDOT STIP project. Connected sidewalk is shown on the site plans along White Oak Drive.



### Signal Warrant Analysis

Based on projected 2029 traffic volumes and proposed access plans, one unsignalized intersection in the project study area would warrant traffic signal installation, based on the peak hour warrant methodology found in the *2009 Manual on Uniform Traffic Control Devices (MUTCD)*. This refers to the intersection of Lakeview Drive and Old Durham Road. The intersection continues the need to be monitored for signalization or other traffic control improvements, as it is projected to experience PM peak queuing issues with additional background and site-related traffic growth.

### Crash Analysis

Data from the NCDOT Traffic Safety Unit was extracted for the five-year period 8/31/2019 to 9/30/2024 for the Old Chapel Hill Road and Lakeview Drive segments near the proposed site. There were 22 crashes reported along the Old Chapel Hill Road corridor between Lakeview Drive and Pope Road over the five year period, with 16 crashes along Lakeview Drive in the vicinity of the site between Old Chapel Hill Road and US 15-501. The primary crash types were rear end and angle crashes, and crashes were primarily clustered near the higher volume intersections. Overall, the number and severity of crashes along Old Chapel Hill Road and Lakeview Drive in the project study area are generally higher than state-wide averages for similar urban North Carolina secondary roadways. This may, in part, be due to on-going construction during the crash data collection period that is now complete, with the finished project along the Old Chapel Hill Road corridor expected to provide multi-modal safety benefits.

### 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 maximum queue length estimates for the 2029 Build Scenarios. One unsignalized intersection (Old Durham Road/Lakeview Drive) is expected to have excessive peak hour queues or conditions that exceed existing turn lane storage. Recommendations to improve turn lane storage were made for the US 15-501 and Eastowne Drive/Lakeview Drive intersection – as this location will have a high degree of site traffic and background development traffic impact.
Appropriateness of Acceleration/Deceleration Lanes	The site concept plan shows no specifics related to acceleration/deceleration lanes. Due to the speed limit on Old Chapel Hill Road (35 mph) and the potential blockages and safety issues caused by left-turn traffic entering White Oak Drive from both directions, left-turn lanes are recommended in both directions at this location.
Pedestrian and Bicycle Analysis	Pedestrian access to the site has excellent connectivity along the Old Chapel Hill Road/Old Durham Road corridor but is limited directly along the US 15-501 corridor. Bicycle lanes extend along Sage Road, Old Durham Road / Old Chapel Hill Road, and a short section of Eastowne Drive. Very limited bicycle facilities exist along/parallel to the US 15-501 corridor within the project study area. The site plan retention of existing sidewalk along site frontage on the north side of Old Chapel Hill Road and construction of sidewalks on both sides of White Oak Drive. A pedestrian crosswalk should be provided at the White Oak Drive intersection with Old Chapel Hill Road.
Public Transportation Analysis	Transit service to the study area, and to the proposed site, is excellent, with bus stops and multiple local and regional bus routes on both Old Chapel Hill Road and US 15-501 proximate to the site. Existing bus stops on both sides of Old Chapel Hill Road are provided to serve the site. Consideration should be made to adjust the CHT CL Route to potentially serve the Old Chapel Hill Road Apartments and Gateway Residential sites by extending the route along White Oak Drive, Gateway Residential Access Street and Lakeview Drive.





## **Mitigation Measures/Recommendations**

### **Planned Improvements**

There are no significant Town of Chapel Hill / North Carolina Department of Transportation improvement projects affecting study area roadway facilities within the analysis year time frame of 2024-2029.

NCDOT is in the process of upgrading signalized intersection configurations that feature an approach that has a shared through/right-turn lane and an exclusive right-turn lane utilizing right-turn overlap signal phasing – a condition that exists at the US 15-501/Lakeview Drive – Eastowne Drive intersection in the northbound direction on Lakeview Drive. For the purposes of this study, it was assumed that future 2029 scenarios would include a change to the Lakeview Drive approach that would initially convert the shared through/right-turn lane to a through-only lane and keep the right-turn lane and overlap signal phasing.

### **Background Committed Improvements**

The UNC Health Care Eastowne Medical Office Building #2 project, Gateway Residential, and Chapel Hill Crossing developments were included in the 2029 No-Build and Build scenarios for this study. All studies assumed re-optimization of the traffic signals along the US 15-501 corridor and each included small geometric improvements to site access intersections along US 15-501, Lakeview Drive, or Old Chapel Hill Road.

The intersection of Old Chapel Hill Road and Lakeview Drive, as part of the Wegman's permitting process, will be monitored for the need to make traffic control (signalization/roundabout) improvements, depending on the meeting signal warrant thresholds or exhibiting excessive observed delay/queuing from field data. The study results for this TIA indicate that the 2029 projected future peak hour traffic volumes will meet MUTCD peak hour signal warrants for the PM peak hour.

### **Applicant Committed Improvements**

Based on the preliminary site plans and supporting development information provided, there are several minor specific transportation-related improvements proposed internal to the site or related to site access. These improvements include the following:

- Improve existing White Oak Drive north of Old Chapel Hill Road to a paved local street with internal driveway connections, sidewalk, and a connection to the Gateway Residential development's primary east-west access street.
- Provision of a driveway access connection to Old Chapel Hill Road to the east of White Oak Drive and retention of sidewalk along site frontage along Old Chapel Hill Road.

### **Necessary Improvements**


Based on traffic capacity analyses for the 2029 design year, and analyses of existing study area turning bay storage lengths, site access and multi-modal mobility, the following improvements (see **Figure ES-3**) are recommended as being necessary for adequate transportation network operations for the Condition 4 Build Scenario with assumed background traffic:

- 1) To improve safety and remove turning traffic from the through traffic stream on Old Chapel Hill Road, particularly near the White Oak Drive intersection, it is recommended that left-turn lanes in each direction with 100 feet of vehicle storage be constructed along Old Chapel Hill Road at White Oak Drive. At this intersection, a marked pedestrian crosswalk should be installed across Old Chapel Hill Road.



- 2) To reduce the number of vehicular conflicts in this vicinity, the proposed driveway access connection to Old Chapel Hill Road to the east of White Oak Drive should be limited to right-turn in/right-turn out (RIRO) access only.
- 3) Signal timings at all five study area intersections should be reoptimized after the site is complete to account for the effects of site-related traffic in the AM and PM peak hours. Particular attention needs to be made to the US 15-501 intersection with Lakeview Drive / Eastowne Drive, where site traffic impact along the corridor is expected to be the greatest.
- 4) To reduce congestion and traffic conflicts and better manage access in the vicinity of the US 15-501/Lakeview Drive intersection, it is recommended to install a concrete median from the intersection northbound approach back to the proposed Gateway Residential access street connection to Lakeview Drive, restricting both side streets (W. Lakeview Drive and Red Roof Inn Access) along Lakeview Drive to RIRO operation.
- 5) In addition, to provide adequate vehicle storage for the northbound approach on Lakeview Drive to US 15-501, the left-turn lane should be extended to provide 300 feet of storage, the current through/right-turn lane should be converted to a right-turn only lane and the existing outer right-turn lane retained. This configuration eliminates a signal phase at the intersection, improving efficiency and allows for the dual right-turn lanes to have an overlap signal phase, reducing northbound queues. Additional signage, pavement markings, and median channelization for the right-turn lanes to prevent northbound through traffic movements will be necessary.
- 6) To allow traffic to/from W. Lakeview Drive and the Red Roof Inn Driveway to make u-turn movements to access these roadway facilities, it is recommended that a single-lane roundabout be designed for the future Gateway Residential access street intersection with Lakeview Drive.
- 7) Consideration should be given to adjust the existing Chapel Hill Transit CL route southbound on Old Chapel Hill Road to directly serve the proposed site and adjacent Gateway Residential developments. The route change, as shown in **Figure ES-3**, would utilize White Oak Drive and the proposed Gateway Residential Access Street and return to Old Chapel Hill Road via southbound Lakeview Drive. If the route change is implemented, transit stops and amenities should be constructed for both developments.








NOT  
TO  
SCALE


DRAFT


LEGEND

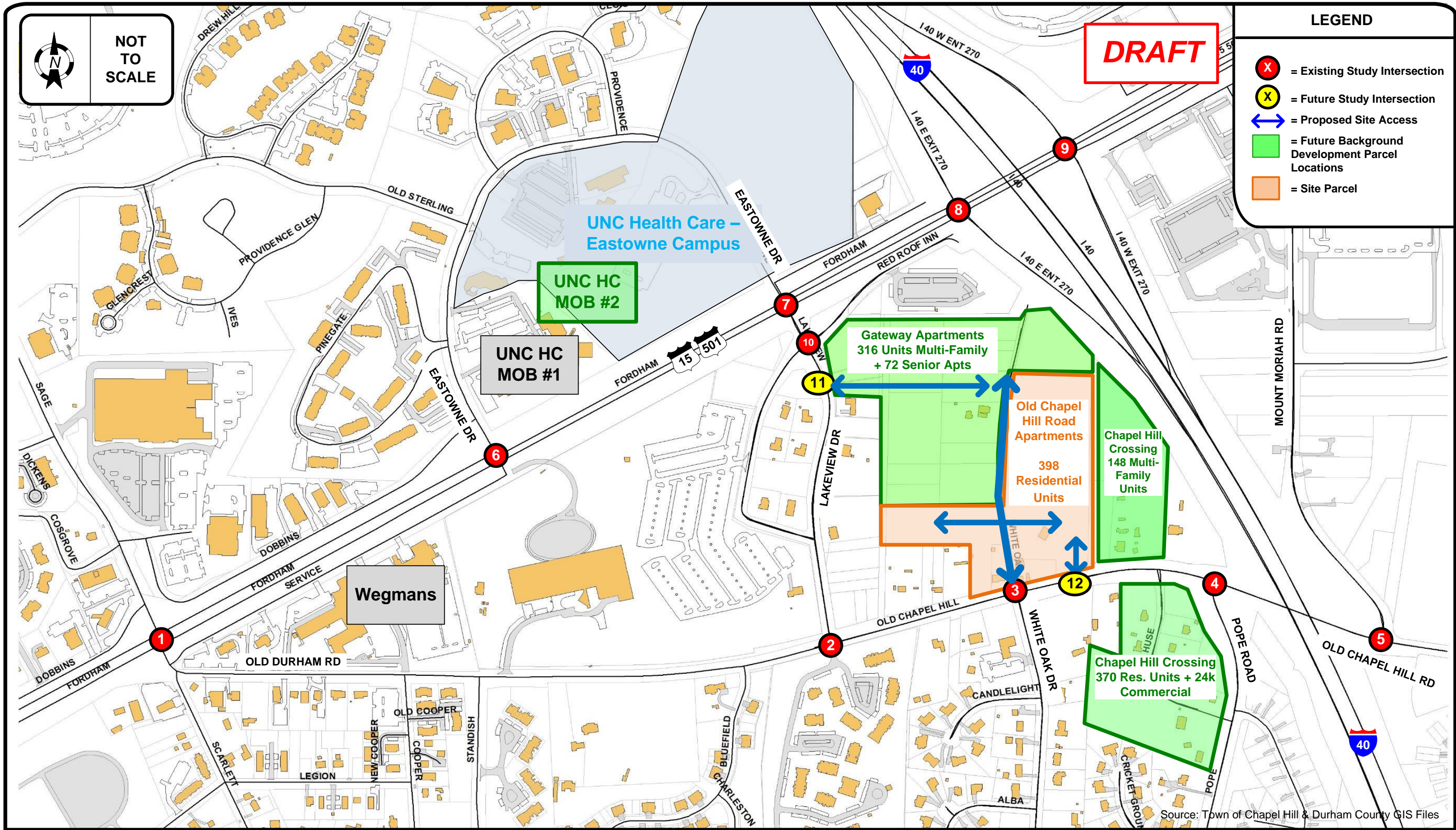

= Existing Study Intersection


= Future Study Intersection


= Proposed Site Access


= Future Background Development Parcel Locations


= Site Parcel



Source: Town of Chapel Hill & Durham County GIS Files



FUTURE GATEWAY LOCAL STREET CONNECTION

LEGEND

Proposed Vehicular Access



potential additional access per fire code

DRAFT



NOT TO SCALE

HILL, NC- CONCEPT PLAN 5

HNTB



Old Chapel Hill Road Apartments  
Transportation Impact Analysis

PRELIMINARY SITE CONCEPT PLAN

DATE: November 2024

FIGURE ES-2

