

**WEAVERS GROVE
RESIDENTIAL DEVELOPMENT
TRAFFIC IMPACT STUDY
EXECUTIVE SUMMARY**



Prepared for:

The Town of Chapel Hill
Public Works Department - Engineering

Prepared by:

HNTB North Carolina, PC

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Suite 200
Raleigh, NC 27609*

NCBELS License #: C-1554

June 2020



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Project Overview

A new residential subdivision, known as Weavers Grove, is being proposed along Sunrise Road near its intersection with Weaver Dairy Road in Chapel Hill, NC. The project proposes to create multi-family residential buildings and single-family detached homes on a 30+ acre tract just south of the I-40 corridor. **Figure ES-1** shows the general location of the site. All residences for the overall project are anticipated to be fully complete and occupied by 2028. This report analyzes the build-out scenario for the year 2029 (one year after anticipated completion), the no-build scenario for 2029, as well as 2019 existing year traffic conditions.

This document updates and supplants information found in the *Habitat-Carol Woods Community Traffic Impact Study* (HNTB, 2019). Some content in report sections and figures remains unchanged from that study, particularly related to the 2019 Existing Conditions Scenario and 2029 No-Build Scenario analysis methods, results and descriptions. Primary changes to this report focus on an updated site plan, new access considerations and new levels of projected development type and density.

The proposed site concept plan shows a provision for one full movement access driveway that connects to Sunrise Road. No other external vehicular access connections are proposed, although the current site plan proposes a third access connection to Amesbury Drive just south of the site parcel – but only for emergency vehicle, pedestrian, and bicycle access. The main site driveway is proposed to have internal connectivity with on-site buildings and their respective parking areas. Internal residential streets will serve to access individual residences. **Figure ES-2** displays the preliminary concept plan of Weavers Grove and nearby land uses and roadways. The site is expected to provide approximately 400 parking spaces on surface lots and with additional on-street parking spaces within the site. Additional parking will also be provided on individual lot driveways/garages. This report analyzes and presents the transportation impacts that Weavers Grove will have on the following intersections in the project study area:

- Weaver Dairy Road and Silo Drive / Carol Woods Main Entrance
- Weaver Dairy Road and Cedar Fork Trail
- Weaver Dairy Road and Sunrise Road
- Weaver Dairy Road and Cedar Falls Park Entrance / East Chapel Hill HS Bus Entrance
- Weaver Dairy Road and East Chapel Hill HS Main Entrance
- Sunrise Road and Sweeten Creek Road
- Sunrise Road and Carol Woods Existing Access
- Sunrise Road and Proposed Site Main Entrance

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

Existing Conditions

Study Area

The site is located in north Chapel Hill along Sunrise Road north of the Weaver Dairy Road corridor. The study area contains three signalized intersections along Weaver Dairy Road at Silo Drive / Carol Woods Main Entrance, Sunrise Road, and East Chapel Hill High School Main Entrance. All future site traffic is expected use the proposed Main Site Driveway along Sunrise Road. Internal driveways shown on the preliminary site plan will circulate site traffic to designated parking areas and on-street parking. Weaver Dairy Road is a minor east-west arterial providing connectivity in north Chapel Hill to the NC 86, Erwin



Road, and US 15-501 corridors. Sunrise Road is a minor collector street for access to local streets and areas north of Weaver Dairy Road. Remaining study area network roadways are local neighborhood/commercial/institutional access streets.

Site Traffic Generation

With the addition of new peak hour trips during the weekday AM, noon, and PM peak hours, there are potential site traffic impacts to the study area intersections. **Table ES-1** shows the site trip generation details, with generation rates taken from the Institute of Transportation Engineers (ITE) *Trip Generation Manual, Version 10* and the most conservative estimates of potential trip generation yield taken from information on potential residential development type options provided by the Applicant.

Table ES-1. Weekday Vehicle Trip Generation Summary

Development	Density	Daily			AM Peak Hour			Noon Peak Hour			PM Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
Total Site Aggregate	229 Units – Mixed Multi-Family / Single Family Homes	816	816	1,632	27	84	111	43	51	94	87	53	140

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. Historic growth patterns taken from daily traffic volume information do not indicate substantial increases in the project study area, however a number of development projects are occurring or are expected to occur just outside the project study area, which may contribute to future area-wide traffic growth. To conservatively account for this potential, a 1.5 percent per year ambient growth rate was applied to 2019 traffic volumes to estimate 2029 background traffic on study area roadways.

Impact Analysis

Peak Hour Intersection Level of Service

Existing 2019 traffic operations at all study area intersections are acceptable during all three peak hours analyzed, except for the northbound stop-controlled approach at the Weaver Dairy Road intersection with East Chapel Hill HS Bus Lot / Cedar Falls Park Entrance in the AM and PM peak hours. Projected ambient and background development traffic growth will increase impacts at this location by 2029, but not cause any other intersection to operate at deficient levels in any peak hour. With the addition of peak hour site-generated trips to the projected 2029 background traffic volumes, no additional study area intersections are expected to experience deficient traffic operations in any peak hour. 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 Level-of-Service (LOS) is shown in **Table ES-2** on the following page.

Access Analysis

Vehicular site access is to be accommodated at one proposed access driveway connecting to Sunrise Road. The main site driveway is about 1,400 feet to the north of the Weaver Dairy Road signalized intersection with Sunrise Road. As conceptually shown in **Figure ES-2**, the main site driveway will function as a local access street with on-street parking. The driveway connection to Sunrise Road would have throat length that is acceptable, based on 50 foot minimum throat length standards found on Page 69 of the 2019 *Town of Chapel Hill Public Works Design Manual*.



Table ES-2. Peak Hour Intersection Capacity Analysis Summary

Intersections	Peak Hour	2019 Existing		2029 No-Build		2029 Build	
		LOS	Delay	LOS	Delay	LOS	Delay
Weaver Dairy Road & Silo Drive / Carol Woods Main Entrance	AM	A	6.6	A	6.9	A	7.2
	NOON	A	8.6	A	8.8	A	8.6
	PM	A	9.0	B	10.7	B	11.1
Weaver Dairy Road & Cedar Fork Trail [#]	AM	C	22.6	D	31.8	D	33.4
	NOON	B	13.9	C	15.4	C	16.0
	PM	C	17.9	C	21.9	C	23.6
Weaver Dairy Road & Sunrise Road	AM	B	13.3	B	15.4	B	17.6
	NOON	A	8.1	A	8.9	B	10.7
	PM	B	14.4	B	17.6	B	20.0
Weaver Dairy Road & Cedar Falls Park Entrance / ECHHS Bus Lot [#]	AM	F	51.9	F	80.4	F	89.2
	NOON	C	22.2	D	27.5	D	29.3
	PM	F	91.4	F	224	F	280
Weaver Dairy Road & ECHHS Main Entrance	AM	B	18.0	C	22.4	C	23.2
	NOON	B	13.6	B	14.3	B	14.2
	PM	A	9.0	A	9.7	A	9.9
Sunrise Road & Sweeten Creek Road [#]	AM	B	11.0	B	11.5	B	12.7
	NOON	A	9.7	A	9.9	B	10.6
	PM	B	11.1	B	11.7	B	13.1
Sunrise Road & Carol Woods Access Drive [#]	AM	A	9.4	A	9.6	A	9.6
	NOON	A	8.7	A	8.7	A	8.7
	PM	B	10.0	B	10.3	B	10.4
Sunrise Road & Proposed Main Site Driveway [#]	AM	N/A	N/A	N/A	N/A	B	12.7
	NOON	N/A	N/A	N/A	N/A	B	10.0
	PM	N/A	N/A	N/A	N/A	B	12.6

BOLD/ITALICS – Critical Movement or Overall Intersection Requires Mitigation Analysis Per Town TIS Guidelines

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

Driveway distances along Sunrise Road from the signalized intersection at Weaver Dairy Road is approximately 1,400 feet as noted above, and approximately 500 feet to the nearest unsignalized intersection at Sweeten Creek Road. These separations are acceptable, based on recommendations of 100 foot minimum corner clearance as set forth in the 2003 *NCDOT Policy on Street and Driveway Access to North Carolina Highways* and the 100 foot minimum along collector streets specified in the Town Design Manual.

Access for pedestrians and bicycles is lacking connectivity in the project study area. Sidewalk is present along the Weaver Dairy Road corridor and along sections of some of the local study area side streets. However, sidewalk ends along Sunrise Road near Sweeten Creek Road and does not currently continue to the site frontage along Sunrise Road. Bicycle lanes are present along the entire segment of Weaver Dairy Road in the project study area, but no other bicycle facilities exist in the project study area.

Signal Warrant Analysis

Based on projected 2029 traffic volumes and proposed access plans, the unsignalized site driveway intersections with Sunrise Road would **NOT** warrant the installation of a traffic signal, based on the methodology found in the 2009 *Manual on Uniform Traffic Control Devices (MUTCD)*. The stop-controlled approaches at the Weaver Dairy Road and East Chapel Hill High School Bus Lot / Cedar Falls Park Driveway intersection operate at a LOS F in the 2029 analysis year with site traffic added. 2029 peak hour volumes and existing geometrics at this location were analyzed for meeting the Peak Hour



Warrant. Results indicate that the Weaver Dairy Road and East Chapel Hill High School Bus Lot / Cedar Falls Park Driveway intersection would NOT warrant the installation of a traffic signal.

Crash Analysis

Crash analysis of the Weaver Dairy Road and Sunrise Road corridors was compiled from the NCDOT TEAAS software for the last five years and results indicate that both corridors experience crash rates lower than North Carolina statewide averages for similar roadway facilities.

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	At the intersection of Weaver Dairy Road / ECHHS Bus Lot – Cedar Falls Park Entrance, projected 95 th percentile queue lengths may exceed existing delineated storage bay length for the northbound left-turn stop-controlled movement in the 2029 PM peak hour for all 2029 scenarios. The eastbound left-turn lane at the Weaver Dairy Road signalized intersection with the ECHHS Main Entrance is expected to exceed storage bay length in the 2029 AM peak hour in all scenarios with existing signal timings. Retiming for additional green time for this movement will mitigate the potential storage issue.
Appropriateness of Acceleration / Deceleration Lanes	The site concept plan does not show any deceleration lanes at the proposed Main Site Driveway. Provision of a northbound right-turn lane may bring safety and operational benefits of removing right-turn site traffic from the Sunrise Road traffic stream but is not critical to providing adequate traffic operations at the intersection. The intersection volumes do meet NCDOT Right-Turn Lane Warrants for the 2029 PM Peak Hour. No other specific acceleration or deceleration lane issues were analyzed in the project study area. Auxiliary turn lanes are provided at most locations along Weaver Dairy Road and at select minor street approaches.
Pedestrian and Bicycle Analysis	Existing pedestrian access and connectivity is currently lacking along Sunrise Road adjacent to the site, but pedestrian connections and crosswalk/pedestrian signals are present along Weaver Dairy Road. Additional connectivity is planned within the site itself. Striped bicycle lanes are present along the higher volume Weaver Dairy Road facility. At a minimum, a multi-modal connection to Amesbury Drive should be considered to provide access to the high school area.
Public Transportation Analysis	Public transportation service to the study area is available, with bus stops and the local CHT T bus route along Weaver Dairy Road in both directions proximate to the site. It is recommended that pedestrian connectivity along Sunrise Road be provided to safely allow pedestrians to walk to nearby bus stops on Weaver Dairy Road.

Mitigation Measures/Recommendations

Planned Improvements

There are no planned transportation improvement projects by NCDOT or the Town of Chapel Hill expected to be complete between 2019 and 2029 in the immediate project study area.



Background Committed Improvements

There are no specific transportation network improvements to study area roadway intersections related to background private development projects that are expected to be completed between 2019 and 2029. Based on the preliminary site concept plans and supporting development information provided, there are no specific transportation-related improvement proposed external to the Weavers Grove site. The restricted vehicular access/multi-modal connection shown on the current site plan extending to Amesbury Drive should be considered to allow better local pedestrian and bicycling options and provide better access in the East Chapel Hill High School area. This improvement is recommended for the Weavers Grove development.

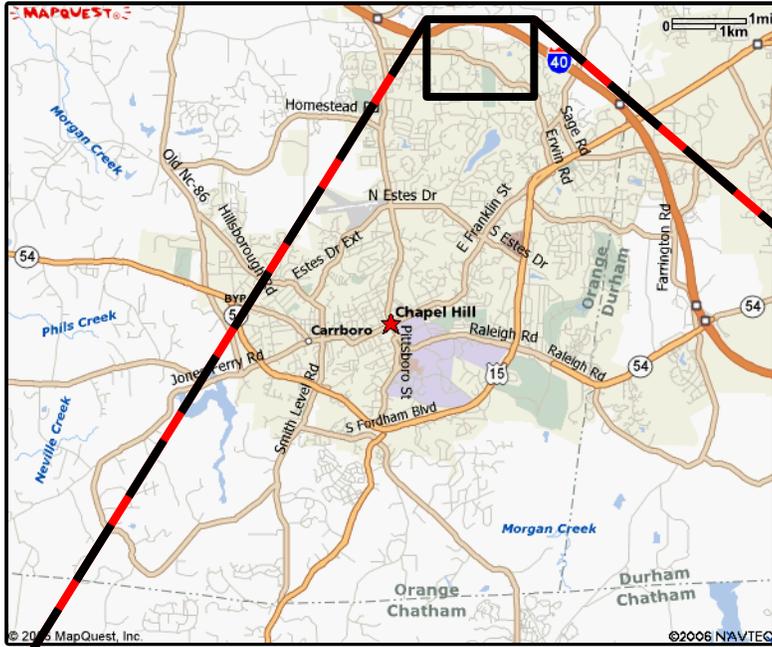
All other remaining Applicant-committed improvements to the transportation network are internal to the site. The proposed site driveway along Sunrise Road and initial laneage assumptions are schematically shown in **Figure ES-3**, based on the preliminary concept plans shown in **Figure ES-2**.

Necessary Improvements

Based on traffic capacity analyses for the 2029 design year, 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 (see **Figure ES-3**).

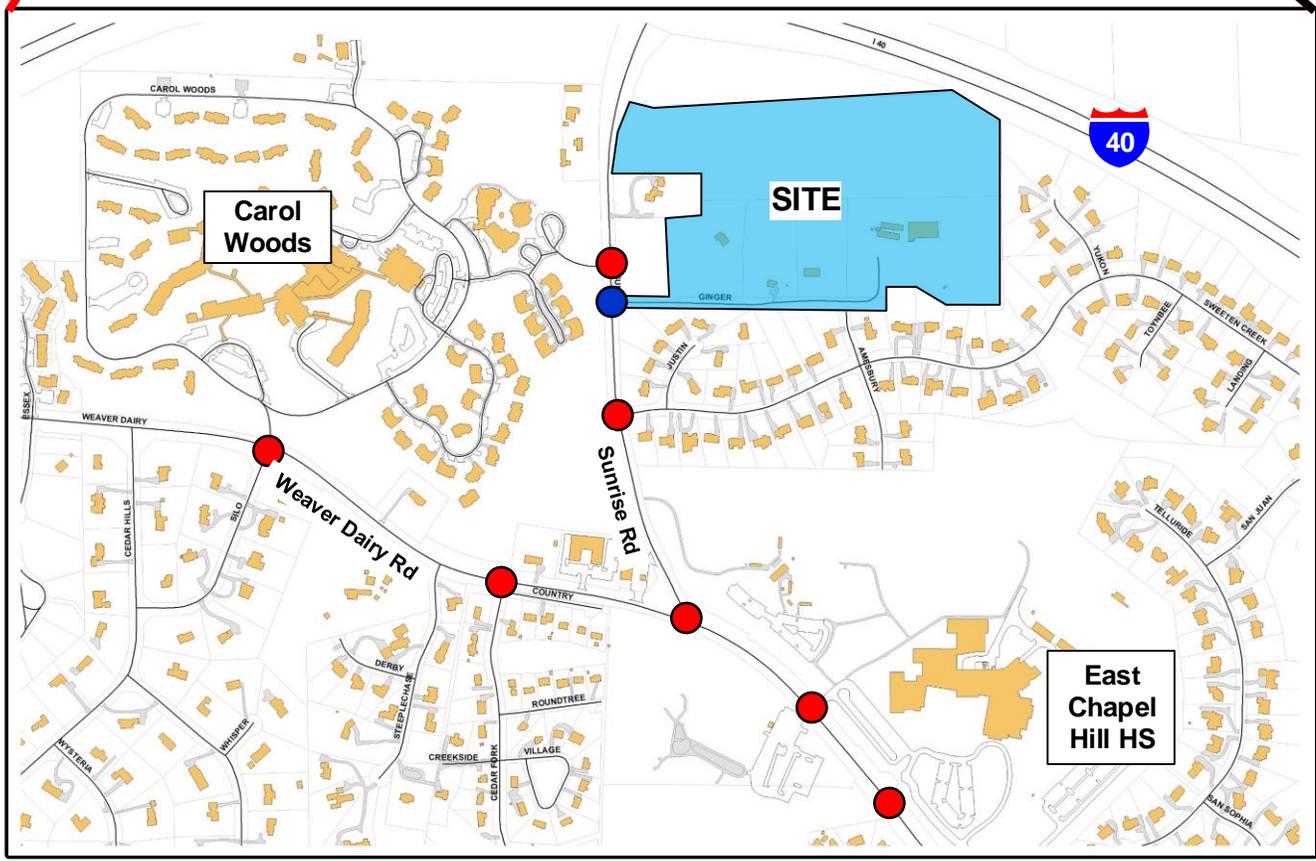
- 1) Due to potential AM peak hour queuing issues for the eastbound left-turn lane at the Weaver Dairy Road intersection with the ECHHS Main Entrance, reoptimize the traffic signal timings to allow adequate green time for this movement in the AM peak hour. This improvement is recommended whether or not if the Weavers Grove site is developed.
- 2) To provide adequate pedestrian connectivity along Sunrise Road and to better access the Weaver Dairy Road corridor and study area bus stops, extend pedestrian sidewalk along the frontage of the proposed development on the east side of Sunrise Road to the proposed Main Site Driveway from its current terminus at Sweeten Creek Road. This improvement is recommended for the Weavers Grove development.
- 3) Based on projected future site traffic turning movement volumes accessing the Main Site Driveway, provide a northbound right-turn deceleration lane with 75 feet of full storage and adequate taper on Sunrise Road at the proposed Main Site Driveway intersection. The provision of the right-turn deceleration lane is not necessary to provide adequate traffic operations at the intersection but does provide additional safety benefits and can be constructed as a lateral shift of the widened pavement cross-section to the south at Sweeten Creek Road. This improvement is recommended for the Weavers Grove development.

The intersection of Weaver Dairy Road at the ECHHS Bus Lot / Cedar Falls Park Entrance currently operates at a LOS F from northbound stop-controlled left-turns in the AM and PM peak hours and is expected to remain as such in all 2029 Build-Out+1 year analyses. This intersection does not satisfy MUTCD Peak Hour Signal Warrants, and it is not recommended that a signal be installed at this location without further justification. No other modifications to the intersection are recommended at this time. Operations for school bus traffic entering/exiting this area can be controlled by school traffic control officers, if needed.



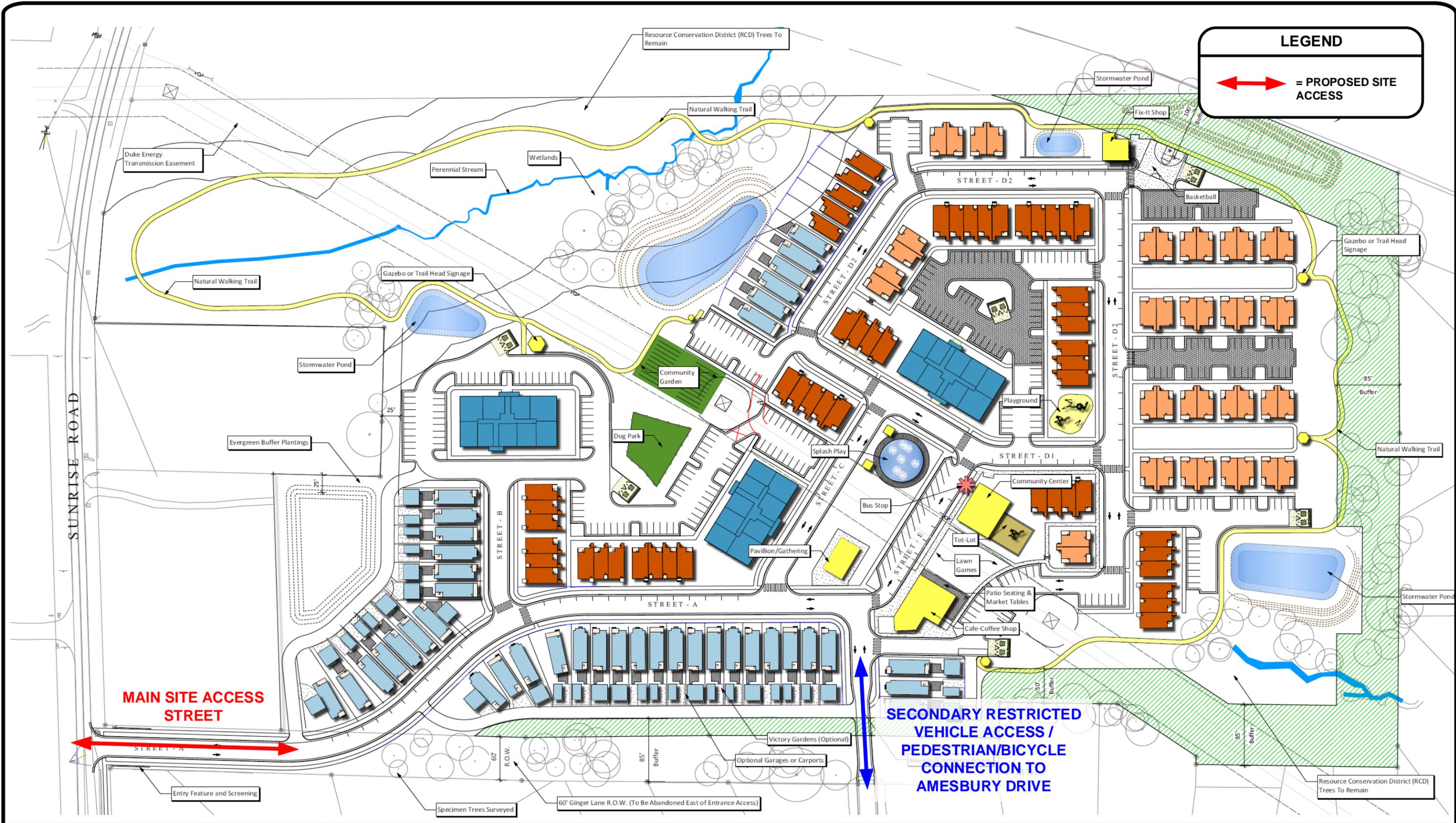
LEGEND

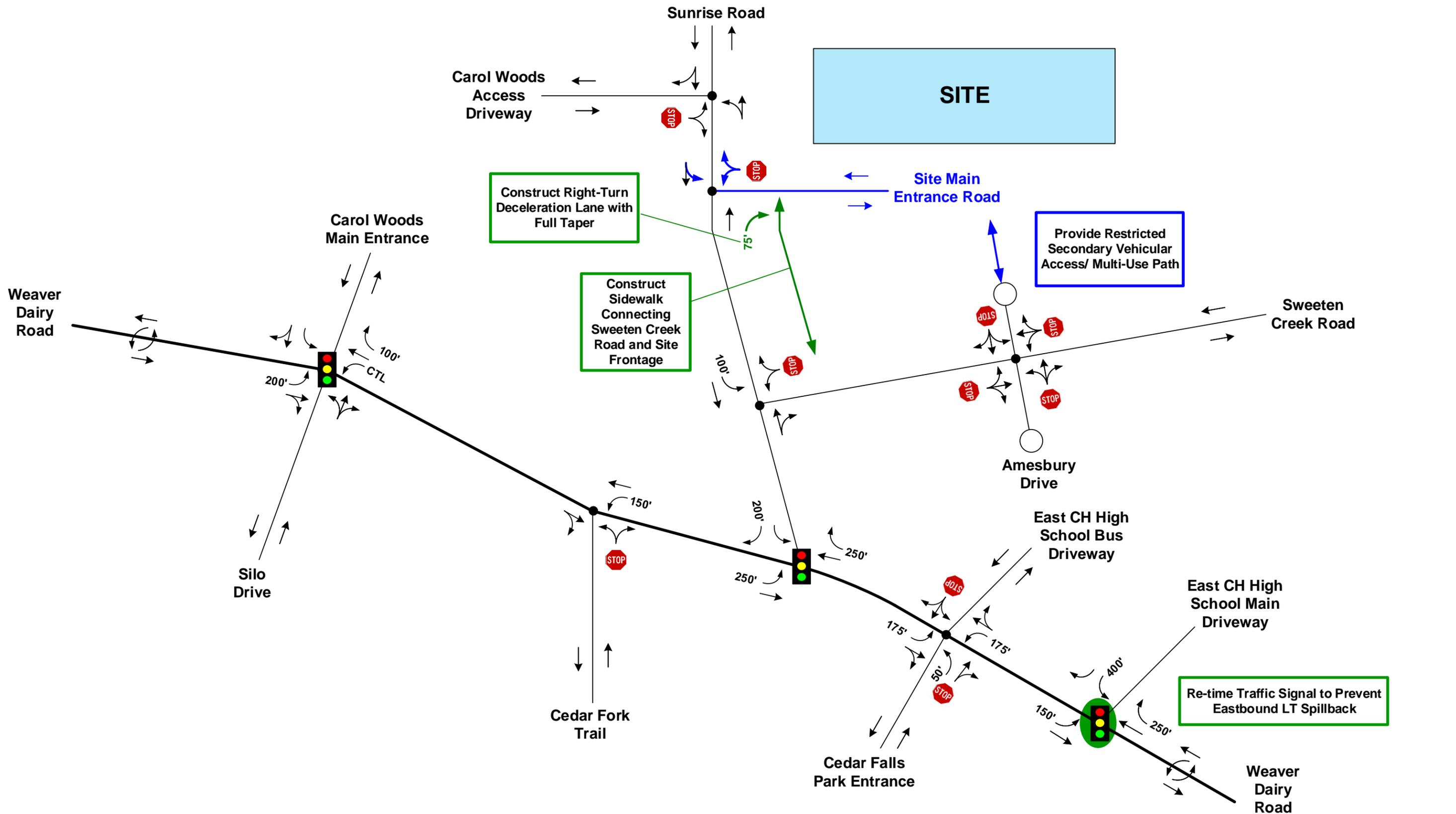
- = Existing Building Footprint
- = Existing Study Area Intersection
- = Proposed Site Driveway
- = Proposed Site Parcel



Source: Town of Chapel Hill GIS Files

NOT TO SCALE





		LEGEND		 NOT TO SCALE	Weavers Grove Traffic Impact Study	DATE: June 2020
		= APPLICANT COMMITTED IMPROVEMENT	= NECESSARY IMPROVEMENT		COMMITTED AND RECOMMENDED IMPROVEMENTS	FIGURE ES-3