

JAY STREET APARTMENTS

TRANSPORTATION IMPACT ANALYSIS

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

March 2022



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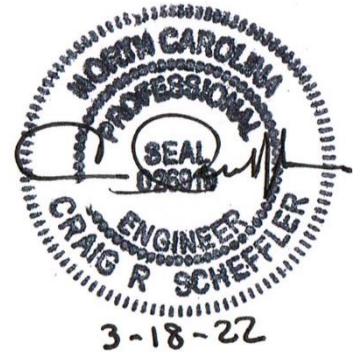
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EXECUTIVE SUMMARY

Project Overview

A residential development known as Jay Street Apartments, located adjacent to Jay Street and just south of Village Drive, is being proposed in Chapel Hill. The project proposes to construct a new multi-family residential development featuring 52 units on an existing parcel just to the east of the Norfolk Southern railroad corridor in western Chapel Hill. **Figure ES-1** shows the general location of the site. The project is anticipated to be fully complete by late 2024. This report analyzes the complete build-out scenario for the year 2025 (one year after anticipated completion), the no-build scenario for 2025, as well as 2021 existing year traffic conditions.

The proposed site concept plan shows one primary vehicular access point along Jay Street. A pedestrian/bicycle connection is also planned on the east side of the property connecting to the Bolin Creek Greenway Trail. **Figure ES-2** displays the preliminary site plan for the Jay Street Apartments and nearby land uses and roadways. The project is expected to provide 95 parking spaces on several surface parking lots on-site.

Study Area Summary

This report analyzes and presents the transportation impacts that the Jay Street Apartments development will have on the following existing and future intersections in the project study area:

- NC 86 (Martin Luther King Jr. Boulevard) and Umstead Drive / Hillsborough Street
- Estes Drive and Village Drive
- Village Drive and Jay Street
- Umstead Drive and Village Drive
- Umstead Drive and Pritchard Avenue Extension
- Jay Street and Proposed Site Driveway

The site is located north of downtown Chapel Hill along Jay Street near its intersection with Village Drive. The study area contains one signalized intersection along NC 86 at Umstead Drive/Hillsborough Street. NC 86 is a major arterial facility providing connectivity between the UNC Main Campus/downtown area, Carrboro, and the region. Remaining study area network roadways are either collector streets or local neighborhood access streets. The existing study area transportation network features numerous bus routes and connected sidewalks, greenways, and bicycle facilities.

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 and methodologies taken from the *Institute of Transportation Engineers (ITE) Trip Generation Manual, Version 10* and adjusted, as appropriate, for the potential effects of transit/pedestrian/bicycle trips to/from the site.

Background Traffic

Background traffic growth for the 2025 analysis year is expected to come from two sources - ambient regional traffic growth and specific development-related traffic growth. Based on existing information, three Town-approved development projects (Aura, W. Rosemary Street Hotel, E. Rosemary Street Parking Deck and Office Building) in or near the project study area are expected to add background traffic by the 2025 analysis year. All remaining estimated traffic growth in the area is assumed to occur due to overall region-wide ambient growth. To account for this, an ambient area-wide traffic growth percentage



Table ES-1. Weekday Vehicle Trip Generation Summary

Land Use	Density	Daily			AM Peak Hour			Noon Peak Hour**			PM Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
Apartments	52 Units	141	141	282	5	13	18	8	9	17	14	10	24
10% Transit/Ped/Bike Reduction		-14	-14	-28	-1	-1	-2	-1	-1	-2	-1	-1	-2
Vehicular Trips Added to Network		127	127	254	4	12	16	7	8	15	13	9	22

** - No ITE Data Available, Assumed 75% of Average of AM/PM Peak Hour Data

of 2.0 percent per year was applied to existing traffic volumes based on information from the historic daily traffic growth patterns in the project study (NCDOT daily traffic information) and assuming full rebound effects from the impacts on traffic volumes from COVID-19.

Impact Analysis

Peak Hour Intersection Simulation Level-of-Service (LOS_s)

Study results indicate existing 2021 traffic operations at all study area intersections are acceptable during the weekday peak hours. 2025 build-out year+1 background traffic growth impacts cause marginal increases in delay in the 2025 No-Build scenario. The addition of peak hour site-generated trips do not cause any additional study area intersections 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 traffic simulation Level-of-Service (LOS_s) is shown in **Table ES-2**.

Table ES-2. LOS_s and Delay (Seconds/Vehicle) Summary

Intersections	Peak Hour	2021 Existing		2025 No-Build		2025 Build		2025 Mitigated	
		LOS _s	Delay	LOS _s	Delay	LOS _s	Delay	LOS _s	Delay
NC 86 (Martin Luther King Jr. Boulevard) and Umstead Drive / Hillsborough Street	AM	B	10.2	B	10.4	B	10.6	N/A	N/A
	NOON	B	12.8	B	13.5	B	13.2	N/A	N/A
	PM	B	19.4	C	22.2	C	21.4	N/A	N/A
Estes Drive & Village Drive*	AM	A	9.6	B	11.9	B	11.4	N/A	N/A
	NOON	A	3.4	A	3.7	A	5.9	N/A	N/A
	PM	B	13.5	C	16.8	C	16.3	N/A	N/A
Village Drive and Jay Street*	AM	A	3.5	A	3.5	A	4.0	N/A	N/A
	NOON	A	4.5	A	4.7	A	5.3	N/A	N/A
	PM	A	3.7	A	3.6	A	3.8	N/A	N/A
Umstead Drive and Village Drive*	AM	A	4.9	A	5.1	A	5.6	N/A	N/A
	NOON	A	5.1	A	5.1	A	5.6	N/A	N/A
	PM	A	5.3	A	5.6	A	6.3	N/A	N/A
Umstead Drive and Pritchard Avenue Extension*	AM	A	4.8	A	4.9	A	5.5	N/A	N/A
	NOON	A	5.0	A	5.2	A	5.7	N/A	N/A
	PM	A	5.6	A	5.5	A	6.6	N/A	N/A
Jay Street and Proposed Site Driveway*	AM	N/A	N/A	N/A	N/A	A	2.0	N/A	N/A
	NOON	N/A	N/A	N/A	N/A	A	4.8	N/A	N/A
	PM	N/A	N/A	N/A	N/A	A	2.0	N/A	N/A

N/A – Not Applicable or No Improvements Necessary

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

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



Access Analysis

Vehicular site access is to be accommodated via a proposed site driveway connection to the existing adjacent Jay Street roadway facility. The proposed site driveway distance from the unsignalized intersection at Village Drive and Jay Street is acceptable (300 feet), 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 50 foot minimum along local/subdivision streets as required in the 2017 *Town of Chapel Hill Public Works Engineering Design Manual*. Access for pedestrians is currently provided by sidewalk on one side of Village Drive connecting to all other study area roadways and crosswalk/pedestrian signalization at all signalized study area intersections. Bicycle access is available via the Bolin Creek Greenway Trail, which is proposed to have an extension to the site.

Crash Analysis

Data from the NCDOT Traffic Safety Unit TEAAS software database was compiled for the recent five-year period for several existing study area intersections and the Village Drive corridor. Crash rates for the Village Drive corridor indicate that the frequency of crashes for both facilities are higher than North Carolina statewide average for similar facilities, due to a cluster of crashes at the Estes Drive intersection.

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
Long-Range Planning Level Daily Volume-Capacity Analysis	Since the proposed site will add less than 300 new daily trips to the study area network, no long-range planning-level analyses of daily traffic impacts were conducted.
Turn Lane Storage Requirements	Storage bay lengths at study area intersections were analyzed using maximum TransModeler microsimulation queue length estimates for the 2025 Build Scenario. In most cases, existing storage for turn lanes is adequate in the project study area and for situations where queue spillback may occur, signal timing adjustments can prevent the situation from occurring.
Appropriateness of Acceleration/Deceleration Lanes	Given the proposed location and configuration of site driveway and the lane geometrics, traffic patterns and posted speeds on Jay Street, Village Drive and other local streets in the study area, no special acceleration or deceleration lanes are required due to the proposed Jay Street Apartments project.
Pedestrian and Bicycle Analysis	Existing pedestrian access to sidewalks and greenways is available through the study area. Continuous sidewalk and intersections with crosswalks/pedestrian signals are present throughout the study area. Off-road cycling connectivity is present in the study area via the Bolin Creek Greenway Trail. There is missing pedestrian connectivity between the site and Village Drive, as no sidewalk exists along the Jay Street corridor.
Public Transportation Analysis	Public transportation service to the site is readily available, with on-street bus stops for the CHT N Route located approximately 500 feet away from the site and multiple routes serving the study area.

Mitigation Measures/Recommendations

Planned Improvements

The Town *North-South Corridor Bus Rapid Transit (NSBRT)* project includes additional transit amenities for the NC 86 corridor through the study area, as well as potential cross-section widening and reallocation



for dedicated transit lanes. Since final design details are not complete, the changes associated with this project were not explicitly considered to be complete for the purposes of this study.

NCDOT STIP Project EB-5886B is a pedestrian and bicycle improvement project along Estes Drive through the project study area that will add shared use paths/sidewalks/bicycle facilities to Estes Drive. It is planned for construction in 2025. This is shown in **Figure ES-3**.

Background Committed Improvements

There are no other known background committed improvements at study area intersections from any of the other background traffic generators analyzed in this report.

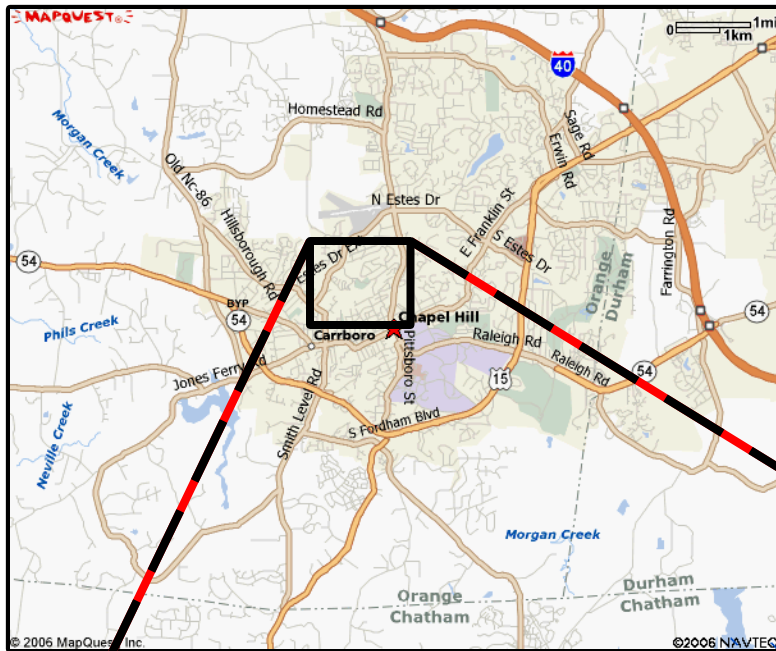
Applicant Committed Improvements

Based on the preliminary site concept plans and supporting development information provided, there are no external transportation-related improvements proposed adjacent to the Jay Street Apartments site. Site plans show an internal sidewalk network that also features connection to the Bolin Creek Trail Greenway.




Necessary Improvements

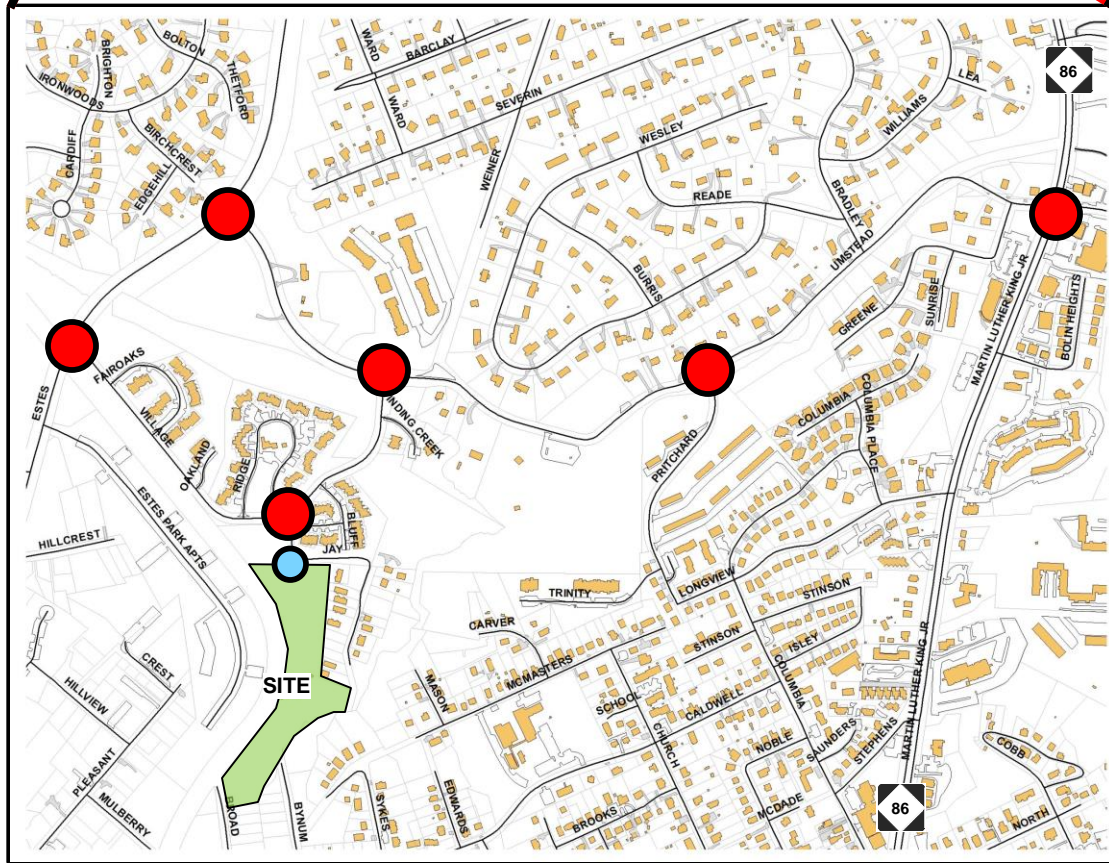
Based on the 2025 design year peak hour intersection capacity analyses, no study area signalized intersection is expected to be over capacity (overall LOS_s E or F) in any of the three weekday peak hours studied in this report. No unsignalized stop-controlled intersection is expected to operate at deficient levels (LOS_s F) for critical stop-controlled movements in any 2025 peak hour with or without the Jay Street Apartments project.

- One recommended improvement, whether or not the Jay Street Apartments project is constructed, is to monitor signal operations in the PM peak hour at the NC 86 (Martin Luther King, Jr. Boulevard) intersection with Umstead Drive and Hillsborough Street. 2025 analysis year maximum queue results indicate that the eastbound Umstead Drive approach may experience queue spillback from the left-turn lane that may require re-optimization of traffic signal timings to provide additional green time for the signal phase that serves Umstead Drive.
- One recommended improvement, unrelated to intersection capacity analyses, is to provide continuous sidewalk along the eastern side of Jay Street between the site and Village Drive. This improvement would provide safe access to the existing CHT bus stop along the south side of Village Drive near the Jay Street intersection. This is schematically shown in **Figure ES-3**.



LEGEND

-  = Existing Study Area Intersections
-  = Proposed Site Driveway
-  = Existing Building Footprints



Source: Town of Chapel Hill GIS Files



**Jay Street Apartments
Transportation Impact Analysis**

SITE LOCATION MAP

DATE: March 2022

FIGURE ES-1

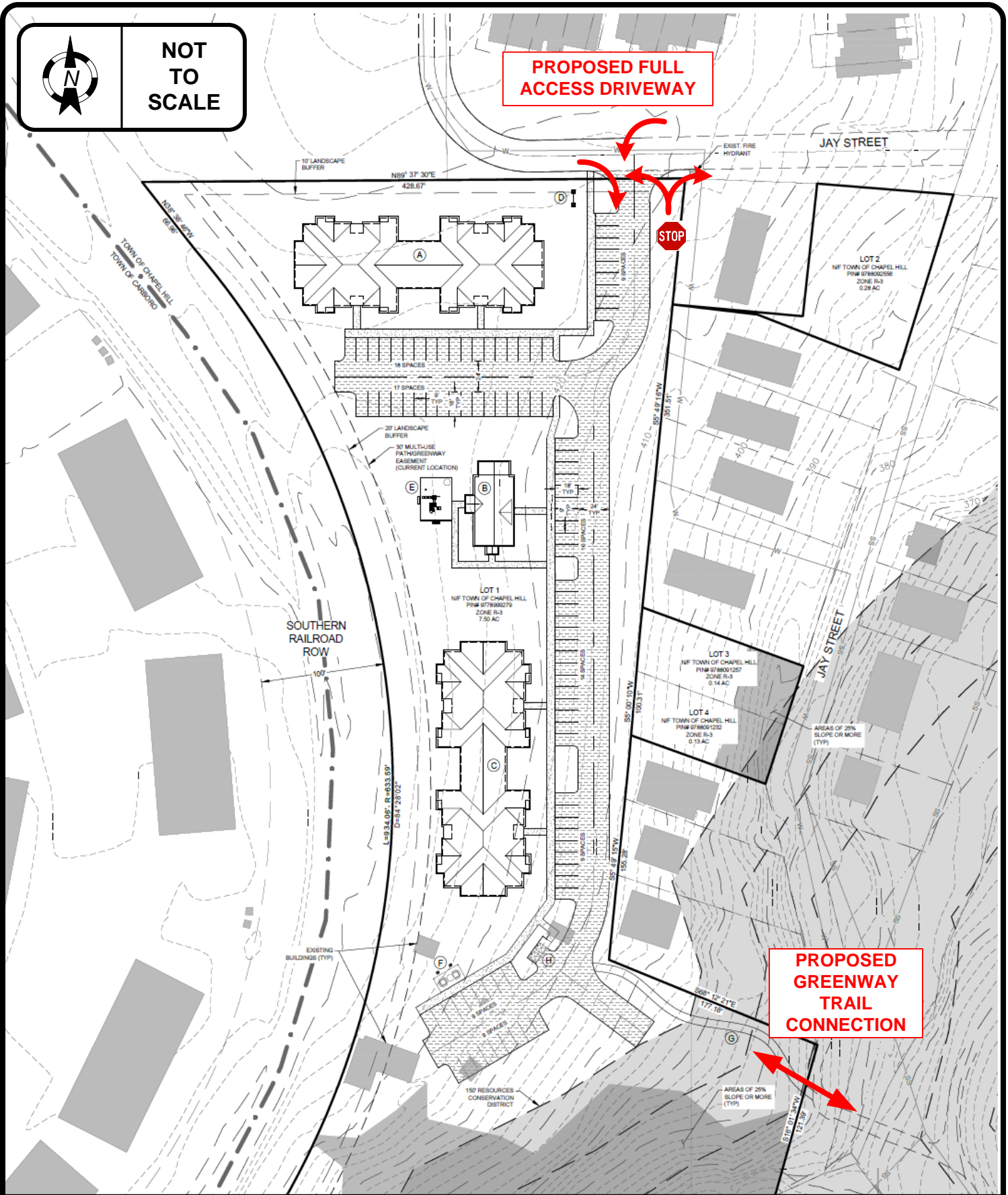


**NOT
TO
SCALE**

**PROPOSED FULL
ACCESS DRIVEWAY**

STOP

**PROPOSED
GREENWAY
TRAIL
CONNECTION**



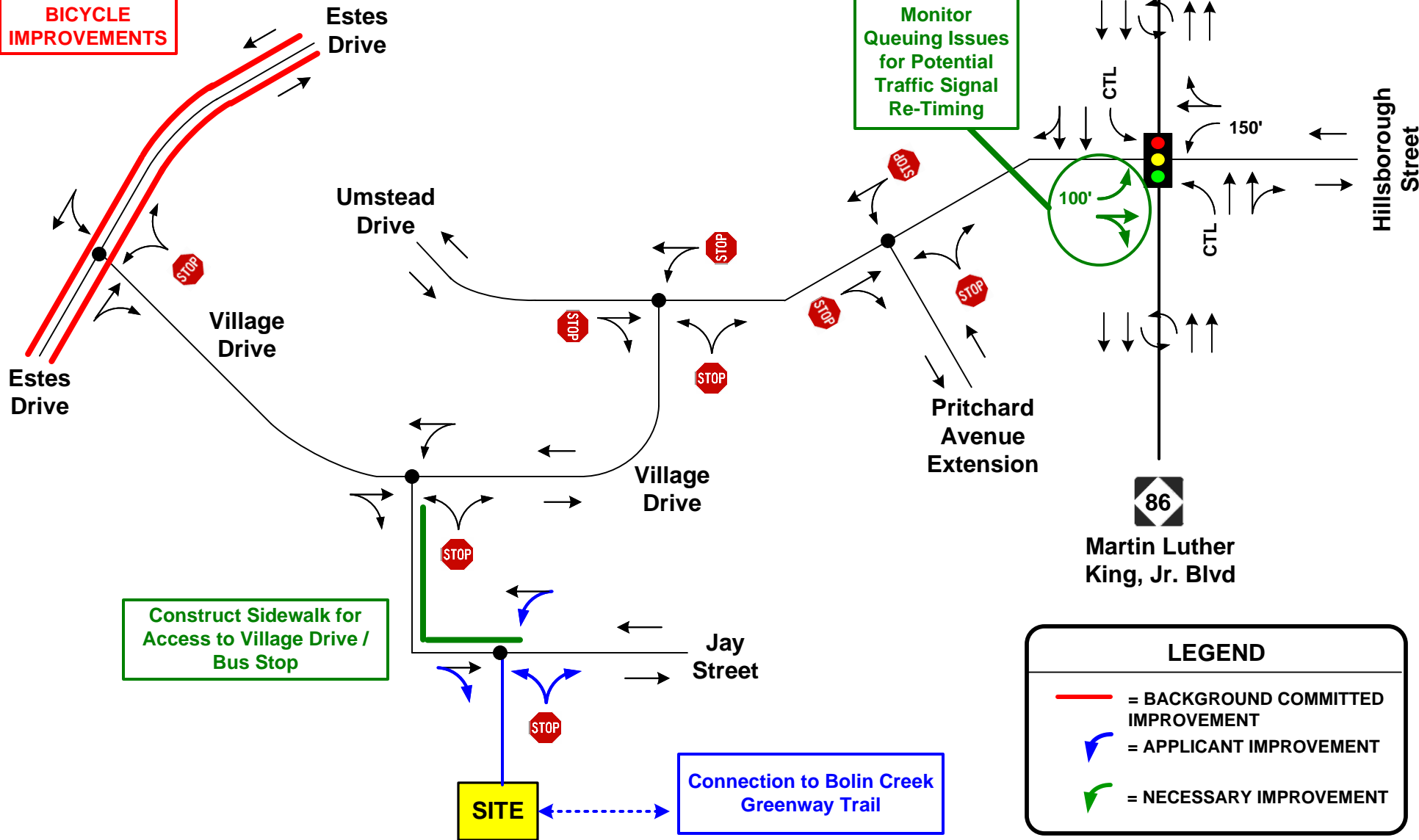
**Jay Street Apartments
Transportation Impact Analysis**

PRELIMINARY SITE PLAN

DATE: March 2022

FIGURE ES-2

**NCDOT STIP EB-5883
PEDESTRIAN/
BICYCLE
IMPROVEMENTS**



LEGEND

- = BACKGROUND COMMITTED IMPROVEMENT
- ↷ = APPLICANT IMPROVEMENT
- ↷ = NECESSARY IMPROVEMENT



**Jay Street Apartments
Transportation Impact Analysis**
COMMITTED & RECOMMENDED
IMPROVEMENTS



NOT
TO
SCALE

DATE: March 2022

FIGURE ES-3