

BRIDGEPOINT - 2200 HOMESTEAD ROAD

RESIDENTIAL DEVELOPMENTS

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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NCBELS License #: C-1554

June 2020



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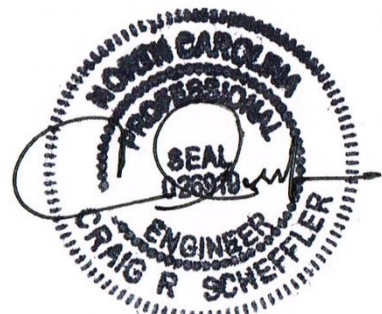
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EXECUTIVE SUMMARY

Project Overviews

Two new residential communities, known for this study as Bridgepoint and 2200 Homestead Road Residential, are being proposed in Chapel Hill along Homestead Road near its intersection with the Weaver Dairy Road Extension. The Bridgepoint project proposes to construct 53 individual residential townhome units and the 2200 Homestead Road development proposes 138 residential units in a mixture of one to three story apartments, duplexes, and townhomes. **Figure ES-1** shows the general location of the two sites. The 2200 Homestead Road project is anticipated to be fully complete and occupied by 2023 and the Bridgepoint project is anticipated to be fully complete and occupied by 2024. This report analyzes the following scenarios:

- 2020 existing year traffic conditions,
- 2024 No-build scenario for 2200 Homestead Road (which includes the assumption that Bridgepoint is complete),
- 2024 Full build-out scenario for 2200 Homestead Road (one year after anticipated completion),
- 2025 No-build scenario for Bridgepoint (which includes the assumption that the 2200 Homestead Road site is complete)
- 2025 Full build-out scenario for Bridgepoint (one year after anticipated completion)
- 2025 Full build-out scenario for Bridgepoint (2200 Homestead Road site is not built and primary access to Bridgepoint is from Weaver Dairy Road Extension)

A proposed combined site plan shows a provision for a full movement access driveway serving both sites that connects to Homestead Road forming a fourth leg with its existing intersection with Greenway Landing and a provision for a full movement access street connection to the Weaver Dairy Road Extension from the Bridgepoint site. No other vehicular access connections are proposed. The main site driveway is proposed to have an internal stop-controlled intersection with local driveway/street connections that will serve on-site parking areas. **Figure ES-2** displays the overall site plan of the Bridgepoint and 2200 Homestead Road Residential developments and nearby land uses and roadways.

This report analyzes and presents the transportation impacts that the 2200 Homestead Road and Bridgepoint developments will have on the following intersections in the project study area:

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

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

Existing Conditions

Study Area

The sites are located in north Chapel Hill along Homestead Road. 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. All future site traffic is expected use the proposed combined main site driveway at the Homestead Road / Greenway Landing intersection and a North



Access Street driveway that connects to Weaver Dairy Road Extension. Internal driveways shown on the preliminary site plans will circulate site traffic to designated parking areas and residential buildings. 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*.

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
Bridgepoint	53 Units	180	180	360	6	20	26	14	17	31	21	13	34
2200 Homestead Road	138 Units	501	501	1,002	15	50	65	33	40	73	50	29	79

Background Traffic

Background traffic growth for the 2024 and 2025 analysis years are expected to come from two sources - ambient regional traffic growth and specific development-related traffic growth. Three 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 consistent with recent study area traffic impact studies).

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 2024 and 2025. Even with the addition of peak hour site-generated trips to the projected 2020 background traffic volumes, only one study area intersection (Homestead Road and Main Site Driveway / Greenway Landing) is expected to experience deficient traffic operations in any peak hour and projected side street queues at this location are not expected to be excessive. No additional mitigation improvements to this 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 Level-of-Service (LOS) is shown in **Table ES-2**.

Access Analysis

Vehicular site access to the two projects is to be accommodated at a proposed full movement local street access connecting to Homestead Road immediately opposite Greenway Landing about 750 feet to the west of Homestead Road’s signalized intersection with the Weaver Dairy Road Extension. The proposed driveway has a single inbound lane and two outbound (left-turn and shared through/right-turn) lanes. A second local street access connection is also proposed along Weaver Dairy Road Extension that would primarily serve the Bridgepoint project but would have internal connectivity through Bridgepoint to the 2200 Homestead Road development. It is proposed to be located 300 feet north of the Weaver Dairy Road Extension intersection with Homestead Road.



Table ES-2. Peak Hour Intersection Capacity Analysis Summary

Intersections	Peak Hour	2020 Existing		2025 No-Build Bridgepoint (Build 2200 Homestead)		2025 Build Both Developments		2025 Mitigated	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Homestead Road & Seawell School Road	AM	C	34.0	D	37.9	D	38.3	N/A	N/A
	NOON	B	11.0	B	11.9	B	11.9	N/A	N/A
	PM	B	15.8	B	16.8	B	16.9	N/A	N/A
Homestead Road & Greenway Landing / Combined Main Site Driveway [#]	AM	C	17.0	F	62.5	F	70.3	N/A	N/A
	NOON	B	11.8	C	19.9	C	20.5	N/A	N/A
	PM	B	12.6	E	38.1	E	40.5	N/A	N/A
Homestead Road & Active Adult Housing Site Driveway [#]	AM	N/A	N/A	C	20.6	C	20.8	N/A	N/A
	NOON	N/A	N/A	B	12.1	B	12.2	N/A	N/A
	PM	N/A	N/A	B	14.2	B	14.4	N/A	N/A
Homestead Road & Weaver Dairy Rd Extension	AM	A	8.1	A	8.6	A	8.7	N/A	N/A
	NOON	A	7.1	A	7.9	A	8.0	N/A	N/A
	PM	B	12.2	B	14.3	B	15.3	N/A	N/A
Homestead Road & NC 86 (MLK Jr, Boulevard)	AM	C	24.6	C	27.9	C	28.6	N/A	N/A
	NOON	C	27.8	D	36.0	D	37.2	N/A	N/A
	PM	C	25.1	C	30.2	C	31.0	N/A	N/A
Weaver Dairy Road Extension & Bridgepoint North Site Driveway [#]	AM	N/A	N/A	N/A	N/A	B	13.2	N/A	N/A
	NOON	N/A	N/A	N/A	N/A	B	10.0	N/A	N/A
	PM	N/A	N/A	N/A	N/A	B	12.2	N/A	N/A

N/A – Not Applicable or No Improvements Necessary

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

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

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 acceptable for current site plans for both projects.

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 Homestead Road signalized intersections and across Homestead Road at Northern Park Drive to the east of the Bridgepoint - 2200 Homestead Road Residential sites. No specific bicycle amenities are present along Homestead Road, but bicycle lanes are present on one side of Seawell School Road and the Weaver Dairy Road Extension and along NC 86 north of Homestead Road. These bike facilities will be connected by bicycle lanes/off-road paved paths along Homestead Road at the completion of the Town’s improvement project.

Signal Warrant Analysis

Based on projected 2025 traffic volumes and proposed access plans, the unsignalized Combined Main Driveway / Greenway Landing intersection with Homestead Road would not 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

Data from the NCDOT Traffic Safety Unit was provided for the five-year period 2/1/2015 to 1/31/2020 for the segment Homestead Road 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 severity of crashes along Homestead Road in the project study area is lower than state-wide averages for similar facilities. There was one pedestrian fatality recorded near the Seymour Senior Center to the east of the project sites.

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 Synchro and HCS 95 th percentile (max) queue length estimates for the 2024 and 2025 Build Scenarios. At the intersection of Homestead Road and Weaver Dairy 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. At the intersection of Homestead Road and NC 86 (Martin Luther King, Jr. Blvd), projected 95 th percentile queue lengths may exceed the northbound and eastbound existing delineated storage bay lengths if existing signal timings are not adjusted to reflect expected increases in traffic volumes related to those movements.
Appropriateness of Acceleration/Deceleration Lanes	The site concept plans show an eastbound left-turn lane and westbound right-turn lane at the Combined Main Site Driveway intersection with Homestead Road, both will improve intersection capacity and safety. No other specific acceleration/deceleration lane issues were analyzed in the project study area.
Pedestrian and Bicycle Analysis	Existing pedestrian access and connectivity is adequate along the Homestead Road corridor adjacent to the sites, 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 and Seawell School Road, but no bicycle facilities exist along Homestead Road within the project study area. The Town's Homestead Road Improvements project will considerably improve pedestrian and bicycle facilities along Homestead Road in the project study area.
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

Mitigation Measures/Recommendations

Planned Improvements

The Town of Chapel Hill has two transportation improvement projects currently slated for construction prior to the 2024 and 2025 site build-out years. The Homestead Road Improvements project (U-4726 IK) will create a consistent three-lane roadway cross-section along the site frontages to Weaver Dairy Road Extension, 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 2022. As final design details are not complete as of the submittal of this TIS, no specific lane usage changes were analyzed as part of this study.

Background Committed Improvements

There is one specific geometric improvement to the study area roadway intersections related to background private development projects that are expected to be completed between 2020 and 2025. A full access driveway and widening of Homestead Road to a consistent three-lane cross-section was proposed in the Overture (Active Adult Housing) TIS. 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 by the year 2025, whether or not specifically needed by any of the background traffic generating developments included in this study.

Applicant Committed Improvements

There are several specific transportation-related improvements proposed external to the Bridgepoint - 2200 Homestead Road Residential sites. Site plans, though developed independently, have had and currently have on-going coordination to provide reasonable cross-access and external access opportunities for both sites. External improvements (shown schematically in **Figure ES-3**) include:

- Provision of a combined main access driveway along Homestead Road immediately opposite Greenway Landing with internal connectivity from this driveway to both sites. The driveway location is on 2200 Homestead Road property. It would be constructed regardless of which site actually began development first, but if the Bridgepoint site were constructed first, this location would only serve as a temporary secondary restricted access point. If 2200 Homestead Road were developed first, it would function as a primary full access driveway. The driveway exit would have a left-turn lane with 75 feet of storage and a shared through/right-turn lane when fully developed, as shown in **Figure ES-2**.
- Construction of a full access minor street connection to Weaver Dairy Road Extension with stop-control for the Bridgepoint access eastbound approach. This access would only be built as part of the Bridgepoint project. If the 2200 Homestead Road Residential project is developed first, a temporary secondary gravel/grass restricted-access connection for its use will be established on Homestead Road.
- Construction of continuous sidewalk along west side of Weaver Dairy Road Extension across Bridgepoint site frontage

Necessary Improvements

Based on traffic capacity analyses for the 2025 design year (with the most conservative estimates of background and combined traffic from both sites), 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**).

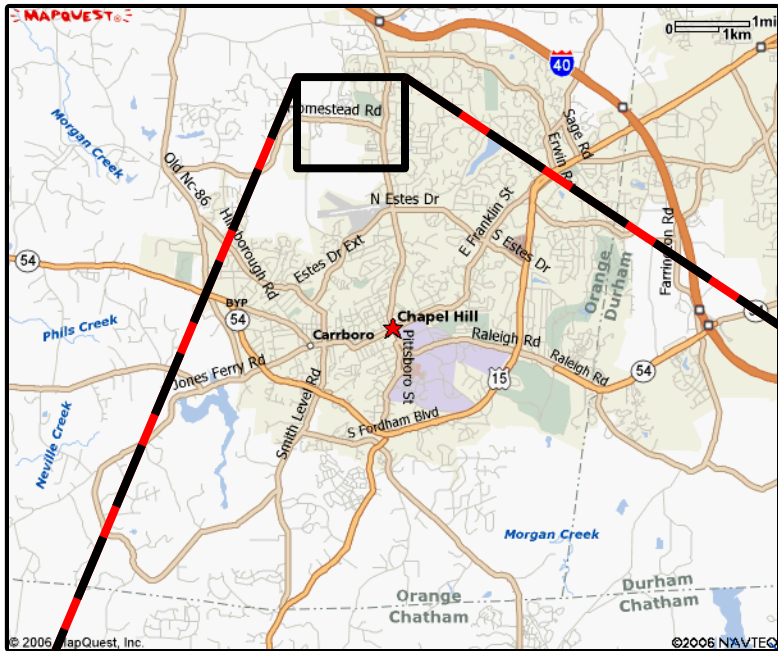
- 1) Retime the Homestead Road and Weaver Dairy Road intersection traffic signal to ensure that the southbound right-turn lane has adequate green time to avoid excessive queue spillback. This improvement is recommended whether or not if the Bridgepoint and 2200 Homestead Road Residential sites are developed.



- 2) Provide pavement markings to delineate at least 175 feet of eastbound left-turn bay storage at the Homestead Road and Weaver Dairy Road intersection. The cross-section at this location features a continuous left-turn center lane, so actual storage for vehicles at the intersection can feasibly be longer. 175 feet is recommended as a minimum if the Active Adult Housing project is constructed with its site driveway located as analyzed in the 2017 Traffic Impact Study for this project (then known as Overture). That site driveway, and its 100 foot recommended westbound left-turn lane storage would leave approximately 175 feet of full storage for eastbound left-turning vehicles at the Weaver Dairy Extension intersection. This improvement is recommended whether or not if the Bridgepoint and 2200 Homestead Road Residential sites are developed and can be incorporated in the Town's Homestead Road Improvements project.

- 3) Provide 100 feet of full eastbound left-turn storage on Homestead Road at its intersection with the proposed Combined Main Site Driveway/Greenway Landing. This improvement will necessitate a small amount of cross-section widening on Homestead Road along the 2200 Homestead Road Residential parcel site frontage and would require minor adjustments to the current Town of Chapel Hill Homestead Road Improvements roadway design plans. This improvement is recommended for the Bridgepoint - 2200 Homestead Road Residential projects and would be necessary once the 2200 Homestead Road Residential project is built and the Combined Main Site Driveway is opened to access both sites.

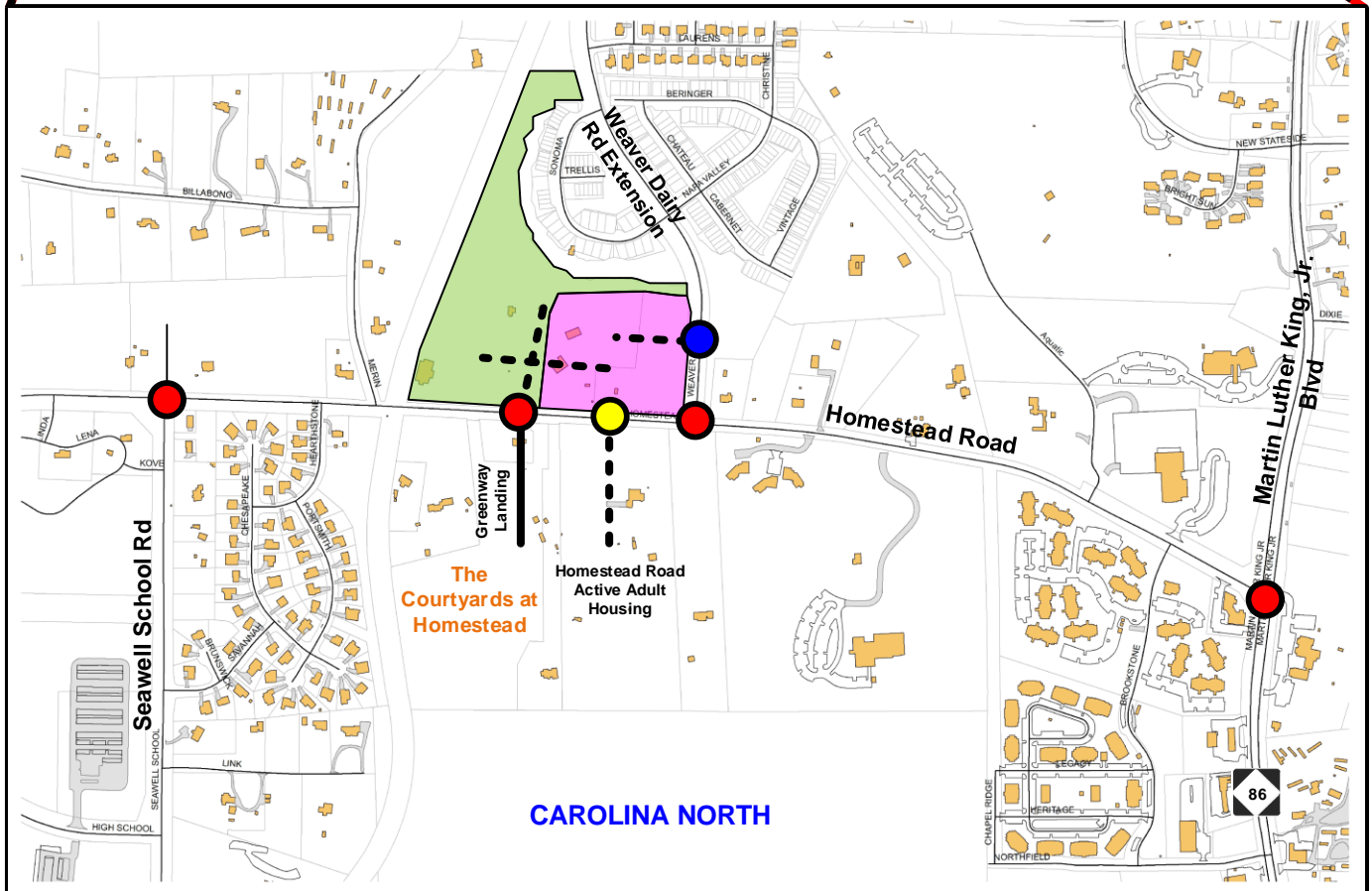
- 4) Provide a right-turn lane westbound on Homestead Road at the Combined Main Site Driveway with 100 feet of queue storage. The construction of this lane will need coordination with Homestead Road Improvements project plans. This improvement is recommended for the Bridgepoint - 2200 Homestead Road Residential projects and would be necessary once the 2200 Homestead Road Residential project is built and the Combined Main Site Driveway is opened to access both sites.



LEGEND

- = Existing Building Footprint
- = Existing Study Area Intersection
- = Proposed Site Driveway
- = Future Development Driveway
- = Proposed Bridgepoint Site
- = Proposed 2200 Homestead Site

**NOT
TO
SCALE**



Source: Town of Chapel Hill GIS Files




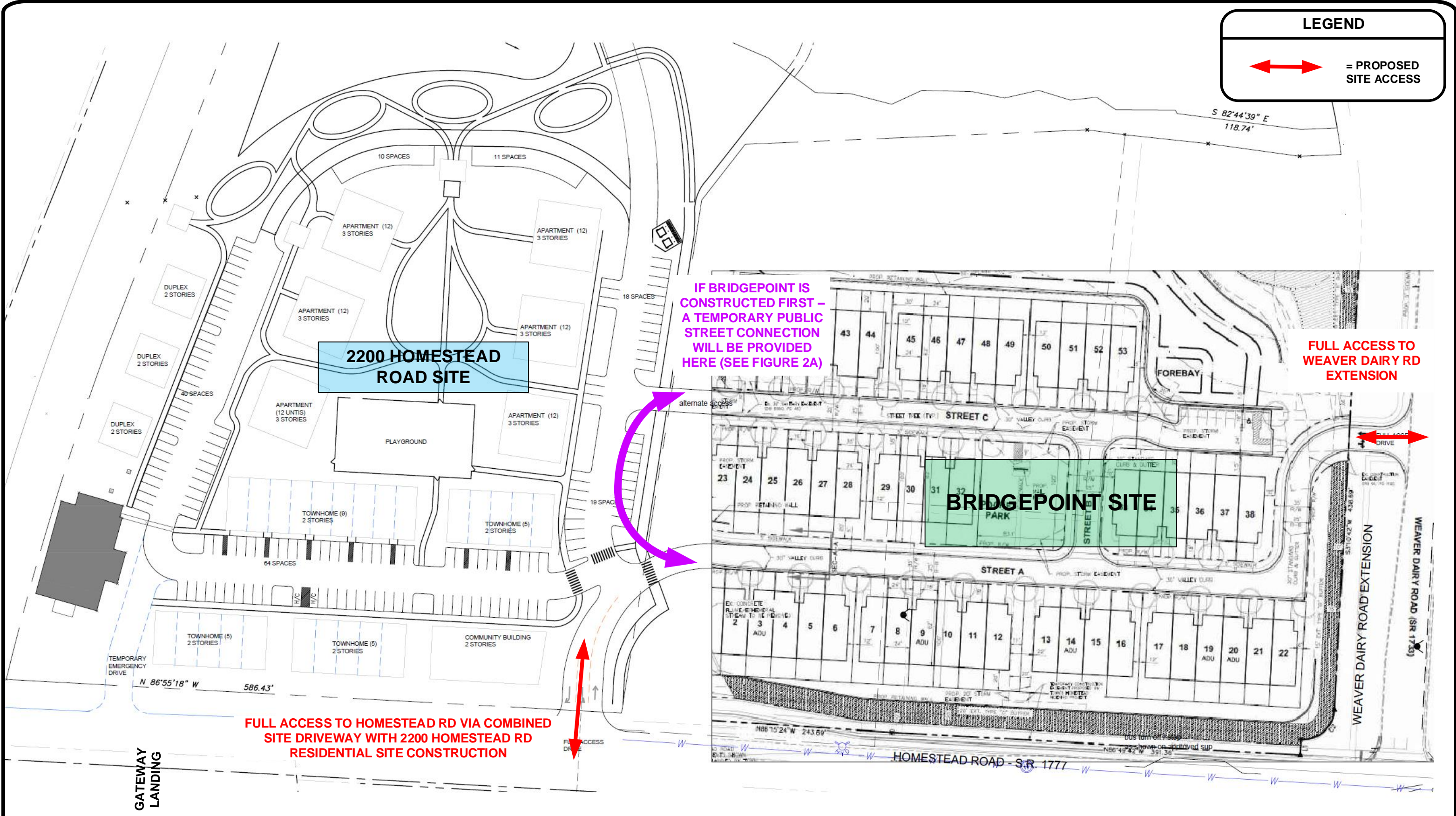
**Bridgepoint - 2200 Homestead Road
Residential
Traffic Impact Study
PROJECT STUDY AREA**

DATE: June 2020

FIGURE ES-1

LEGEND

 = PROPOSED SITE ACCESS



FULL ACCESS TO HOMESTEAD RD VIA COMBINED SITE DRIVEWAY WITH 2200 HOMESTEAD RD RESIDENTIAL SITE CONSTRUCTION

IF BRIDGEPOINT IS CONSTRUCTED FIRST - A TEMPORARY PUBLIC STREET CONNECTION WILL BE PROVIDED HERE (SEE FIGURE 2A)

FULL ACCESS TO WEAVER DAIRY RD EXTENSION

**Bridgepoint - 2200 Homestead Road Residential
Traffic Impact Study**

DATE: June 2020








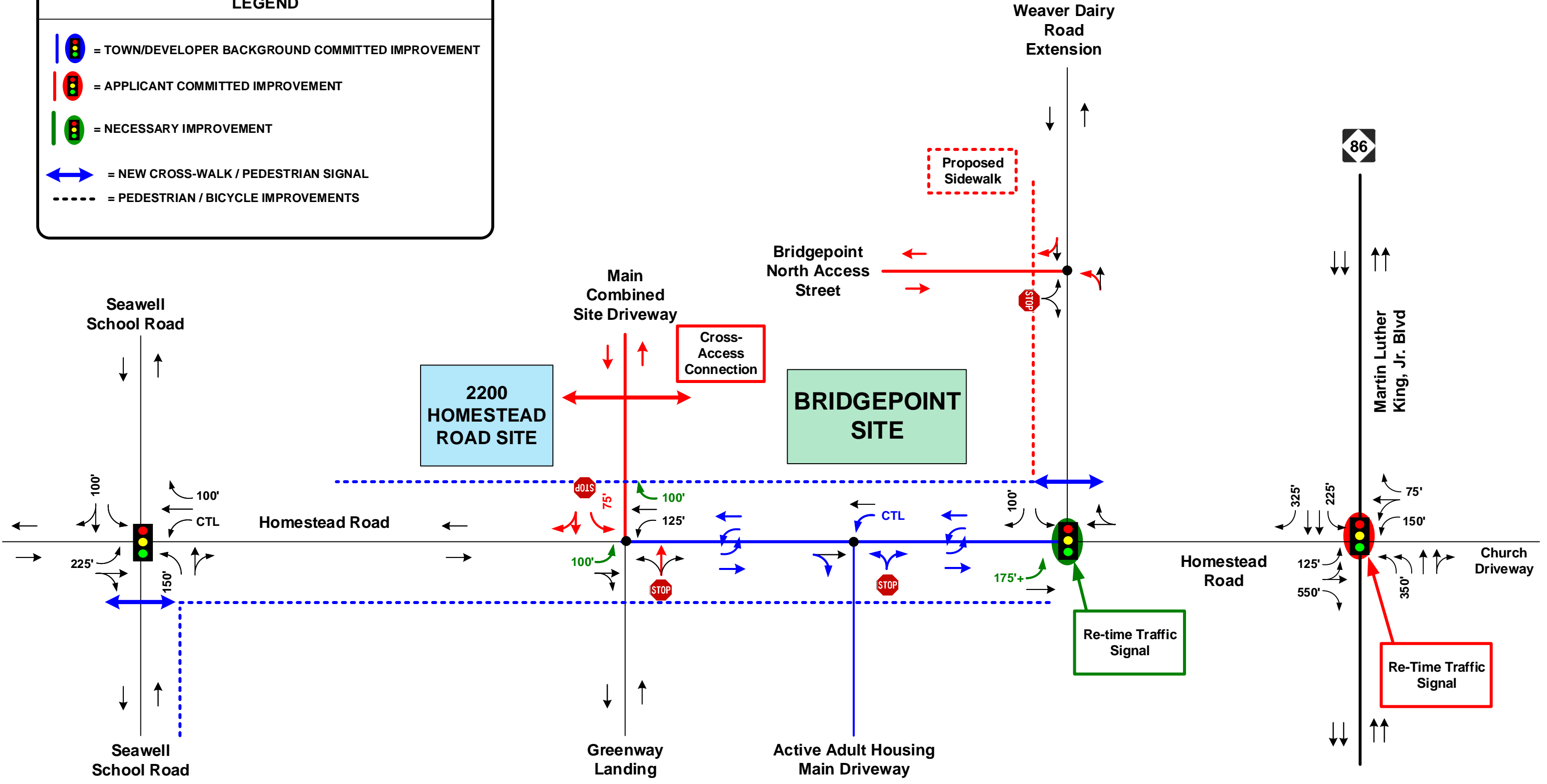
NOT TO SCALE

PRELIMINARY SITE PLAN - COMBINED SITES

FIGURE ES-2

LEGEND

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



NOT TO SCALE

Bridgepoint - 2200 Homestead Road Residential Traffic Impact Study

COMMITTED AND RECOMMENDED IMPROVEMENTS

DATE: June 2020

FIGURE ES-3