*Traffic Impact Analysis*

# Stadium Drive Mixed-Use

## Wake Forest, NC

Prepared for:

Capitol Commercial, LLC.

Kimley»Horn

**Traffic Impact Analysis for**

# Stadium Drive Mixed-Use

**Wake Forest, North Carolina**

**Prepared for:**

## Capitol Commercial, LLC

**Raleigh, NC**

**Prepared by:**


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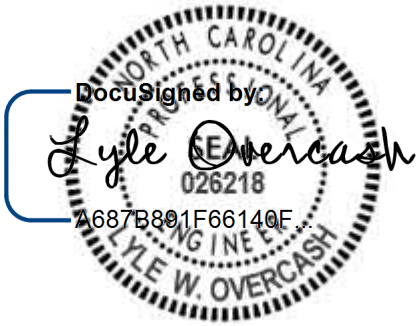


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## Executive Summary

Kimley-Horn and Associates, Inc. has performed a Traffic Impact Analysis (TIA) for the proposed Stadium Drive Mixed-Use project located along US 1 (Capital Boulevard). This project site is located in the northeast quadrant of the intersection of US 1 and Jenkins Road/Stadium Drive.

The proposed development is currently expected to consist of approximately 350 mid-rise apartments, 25,000 square feet (SF) of medical office space, and 20,000 SF of retail space. The development is expected to be completed in 2025. The mixed-use development is proposed to be accessed by a right-in, right-out driveway (Old Stadium Drive) on US 1 and a full movement driveway on Stadium Drive that will connect with the existing Shopping Center Driveway south of the future site. In addition, there will be multiple internal site driveways along the realigned Old Stadium Drive.

This report presents trip generation, distribution, traffic analyses, and recommendations for transportation improvements required to meet anticipated traffic demands in conjunction with the development. The traffic conditions studied include the existing (2022) traffic condition, the projected (2025) background traffic condition, and the projected (2025) build-out traffic condition.

As shown in Table ES-1, the project is projected to generate 2,790 new daily trips, 232 new trips during the AM peak hour, and 290 new trips during the PM peak hour on a typical weekday.

**Table ES-1**
**ITE Traffic Generation (Vehicles)**

| Land Use Code | Land Use | Intensity | | Daily | AM Peak Hour | | PM Peak Hour | |
|---|---|---|---|---|---|---|---|---|
| | | | | | In | Out | In | Out |
| 221 | Multifamily Housing (Mid-Rise) | 350 | d.u. | 1,624 | 33 | 109 | 84 | 54 |
| 720 | Medical Office Building | 25,000 | s.f. | 874 | 51 | 14 | 24 | 63 |
| 822 | Retail | 20,000 | s.f. | 1,074 | 27 | 18 | 64 | 63 |
| **Subtotal** | | | | **3,572** | **111** | **141** | **172** | **180** |
| ***Internal Capture*** | | | | **782** | ***10*** | ***10*** | ***31*** | ***31*** |
| **Total Net New External Trips** | | | | **2,790** | **101** | **131** | **141** | **149** |

Capacity analyses were performed using Synchro software. Table ES-2 summarizes the operation of the study intersections for the AM and PM peak hour traffic conditions.

| Table ES-2 - Level of Service Summary | | | | | | | |
|---|---|---|---|---|---|---|---|
| Intersection and Approach/Movement | Traffic Control | Existing (2022) Traffic | | Background (2025) Traffic | | Build-out (2025) Traffic | |
| | | AM | PM | AM | PM | AM | PM |
| US 1 at Jenkins Road/Stadium Drive | Signalized | D (54.9) | D (46.9) | E (64.9) | E (58.1) | E (72.6) | E (64.0) |
| US 1 (Capital Boulevard) at Stadium Drive | Unsignalized | - (-) | - (-) | - (-) | - (-) | - (-) | - (-) |
| Westbound | | B (13.6) | C (18.9) | B (14.8) | C (22.3) | C (15.3) | C (24.5) |
| US 1 at Country Club Drive/Templeridge Road | Unsignalized | - (-) | - (-) | - (-) | - (-) | - (-) | - (-) |
| Eastbound | | E (49.0) | F (57.3) | F (70.3) | F (83.1) | F (74.0) | F (86.6) |
| Westbound | | E (40.1) | F (62.2) | F (53.8) | F (90.2) | F (55.8) | F (96.5) |
| Northbound Left | | C (17.8) | C (15.1) | C (21.5) | C (17.5) | C (21.8) | C (17.8) |
| Southbound Left | | B (12.4) | C (17.8) | B (13.7) | C (21.7) | B (13.8) | C (22.2) |
| Stadium Drive at Shopping Center Driveway/Stadium Drive | Unsignalized | - (-) | - (-) | - (-) | - (-) | - (-) | - (-) |
| Northbound | | B (11.3) | B (12.9) | B (11.5) | B (14.4) | C (17.8) | F (57.6) |
| Southbound | | N/A | N/A | N/A | N/A | C (15.5) | C (21.4) |
| Eastbound Left | | N/A | N/A | N/A | N/A | A (8.2) | A (8.0) |
| Westbound Left | | A (8.0) | A (8.4) | A (8.1) | A (8.6) | A (8.1) | A (8.6) |
| Stadium Drive at Glencoe Drive | Unsignalized | - (-) | - (-) | - (-) | - (-) | - (-) | - (-) |
| Southbound | | B (13.3) | B (12.1) | B (13.2) | B (13.0) | B (13.5) | B (13.6) |
| Eastbound Left | | A (8.1) | A (8.1) | A (8.0) | A (8.2) | A (8.1) | A (8.3) |
| Glencoe Drive at Stadium Drive | Unisignalized | - (-) | - (-) | - (-) | - (-) | N/A | N/A |
| Eastbound | | A (9.1) | A (8.9) | A (9.0) | A (9.0) | | |
| Northbound Left | | A (7.5) | A (7.5) | A (7.4) | A (7.5) | | |
| Stadium Drive at Medical Driveway 1 | Unisgnalized | N/A | N/A | N/A | N/A | - (-) | - (-) |
| Northbound | | | | | | A (8.7) | A (8.7) |
| Westbound Left | | | | | | A (7.3) | A (7.3) |
| Stadium Drive at Stadium Drive/Site Driveway 1 | Unisgnalized | N/A | N/A | N/A | N/A | A (7.4) | A (7.2) |
| Eastbound | | | | | | A (7.1) | A (7.0) |
| Westbound | | | | | | A (7.5) | A (7.5) |
| Northbound | | | | | | A (7.5) | A (7.2) |
| Stadium Drive at Medical Driveway 2/Site Driveway 2 | Unisgnalized | N/A | N/A | N/A | N/A | - (-) | - (-) |
| Eastbound | | | | | | A (9.7) | A (9.0) |
| Westbound | | | | | | B (10.3) | B (10.3) |
| Northbound Left | | | | | | A (7.4) | A (7.3) |
| Southbound Left | | | | | | A (7.3) | A (7.4) |

### *NCDOT STIP U-5307D Project*

Planning and development is underway on the NCDOT State Transportation Improvement Program (STIP) U-5307 project to convert US 1 (Capital Boulevard) to a controlled-access facility from I-540 in Raleigh to Purnell Road/Harris Road in Wake Forest. This project is intended to improve traffic congestion and reduce travel times along US 1. A controlled-access highway is one on which access is provided only via ramps at interchanges. Some cross-streets will be grade-separated, and no driveway connections will be allowed on US 1.

The "D" portion of the U-5307 project plans to realign Stadium Drive and reconfigure the US 1 at Jenkins Road/Stadium Drive intersection, creating an overpass, however, this segment is not funded. As part of the U-5307D preliminary design, a collector road (Y26B) was proposed that originally bisected the project site roughly in half, leaving some odd remnant parcels adjacent to US 1, see attached schematic. In addition, the original Y26B alignment would have likely been more expensive due to ROW acquisition driven by fill slopes.

In coordination with NCDOT and their STIP project consultant, Kimley-Horn prepared several options to realign Y26B while not affecting the overall alignment of the Stadium Drive overpass over US 1. Option B was selected as the preferred alternative, it is attached to this document, along with an interim design to accommodate the connection to Stadium Drive prior to U-5307D being constructed. Option B slid the collector road more towards US 1 and left a more developable area for the Stadium Drive Mixed-Use development site.

Through extensive coordination with NCDOT, the site plan was modified to accommodate the interim and future alignment of the Y26B collector road. Shaded portions of the site plan denote reserved areas for possible future NCDOT ROW. It is anticipated that NCDOT will incorporate this design in the U-5307D plans once this segment moves forward with funding.

### *Recommendations*

The following improvements are recommended to be performed with the Stadium Drive Mixed-Use development to accommodate projected site traffic volumes:

**Old Stadium Drive:**

- Realign Old Stadium Drive to intersect Stadium Drive at the existing intersection of Stadium Drive and the Wake Forest Crossing Shopping Center northern driveway instead of Glencoe Drive. This realignment is consistent with the plans for the Y26 Service Road as part of NCDOT STIP U-5307D
- Realigned Old Stadium Drive (future Y26 collector road) should be constructed as a 3-lane section to provide left-turn lanes at the site driveways

**Stadium Drive at Shopping Center Driveway/Old Stadium Drive:**

- Restripe eastbound Stadium Drive to provide a left-turn lane with 100 feet of storage
- Construct a westbound right-turn lane with 100 feet of storage on Stadium Drive
- Construct the southbound approach with a through-right-turn lane and a left-turn lane that extends back into a TWLTL towards the intersection of Stadium Drive at Medical Driveway 2/Site Driveway 2.
- Restripe the northbound Shopping Center Driveway approach to add a through movement to the northbound right-turn lane

**Old Stadium Drive at Medical Driveway 1:**

- Construct the full-movement Medical Driveway 1 with one ingress and one egress lane

**Old Stadium Drive at Site Driveway 1:**

- Construct the full-movement Site Driveway 1 with one ingress and one egress lane
- Construct the northbound approach with a right-turn lane and a left-turn lane that extends back into a two-way left-turn lane (TWLTL) towards the intersection of Old Stadium Drive at Medical Driveway 2/Site Driveway 2
- Construct the eastbound approach with one through-right lane
- Implement all-way stop control

**Old Stadium Drive at Medical Driveway 2/Site Driveway 2:**

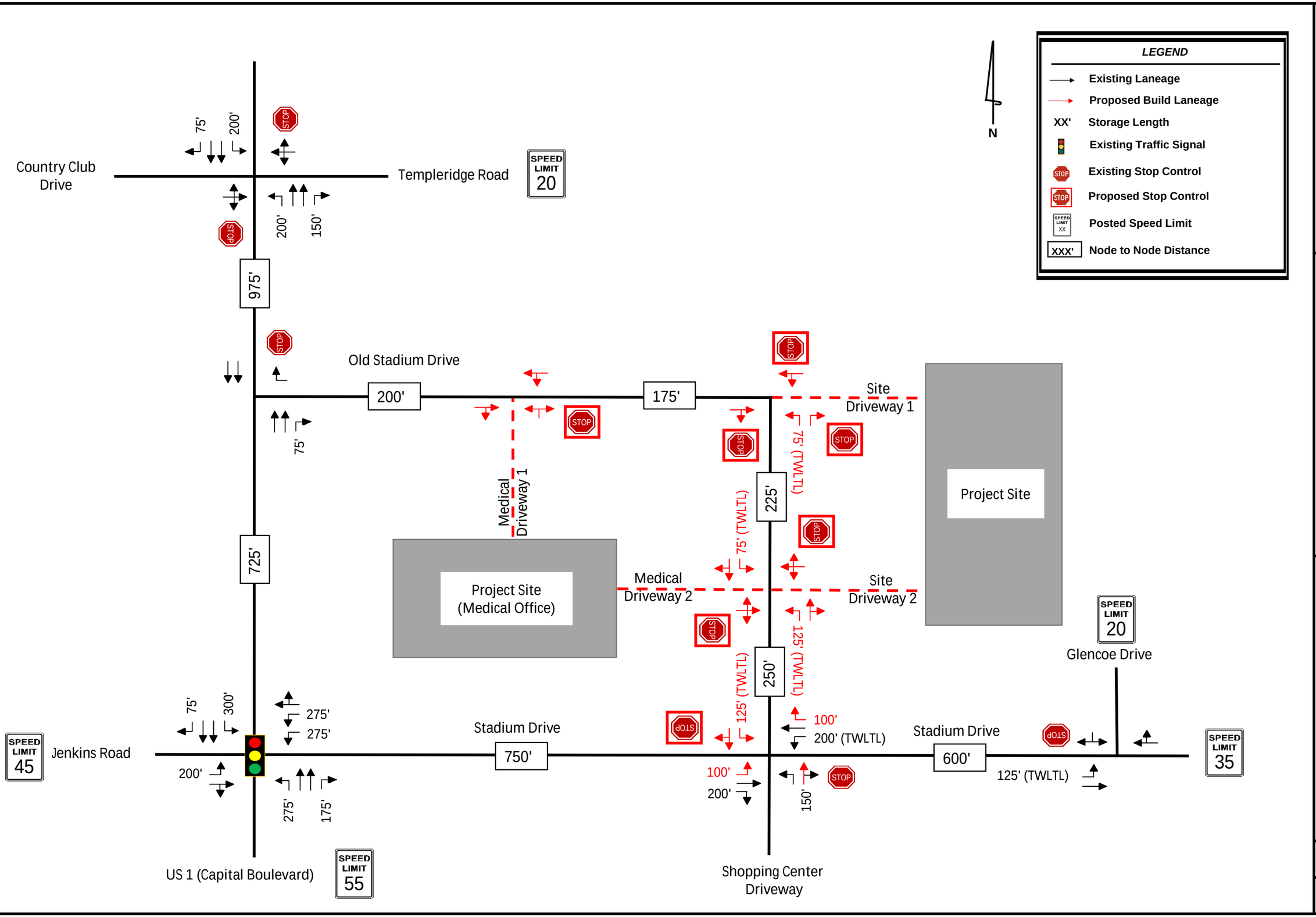
- Construct the full-movement Medical Driveway 2 with one ingress and one egress lane
- Construct the full-movement Site Driveway 2 with one ingress and one egress lane.
- Construct a northbound left-turn lane that extends back into a TWLTL towards the intersection of Stadium Drive at Shopping Center Driveway/Old Stadium Drive

Analyses indicate that the intersection of US 1 at Jenkins Road/Stadium Drive is the only signalized study intersection that is anticipated to operate at an unacceptable LOS in the build-out condition. However, that intersection is expected to operate at an unacceptable LOS in the study year 2025 with or without the proposed project in place and anticipated publicly funded improvements at this location (including the grade-separation of Jenkins Road/Stadium Drive) are expected to provide a comprehensive solution to delays and queues at that intersection. As project traffic at build-out is expected to account for less than 4% of the total intersection traffic, no improvements are recommended to be performed at this intersection as part of the Stadium Drive Mixed-Use project. An eastbound right-turn lane on Jenkins Road is the primary deficiency and would be beneficial.

Analyses also indicate that most of the unsignalized study intersections are expected to operate with short or moderate delays on minor street approaches at project build-out with the exception of the unsignalized intersections of US 1 (Capital Boulevard) at Country Club Drive/Templeridge Road. However, it is typical for stop sign controlled side streets and driveways intersecting major streets to experience long delays during peak hours, while the majority of the traffic moving through the intersection on the major street experiences little or no delay.

At the unsignalized intersection of Stadium Drive and the Shopping Center Driveway/Stadium Drive, the northbound minor street approach (Shopping Center Driveway) is expected to operate with unacceptable delays in the PM peak hour in the study year 2025 with the proposed Stadium Drive Mixed-Use development in place. However, no queueing issues are expected at this intersection and no roadway improvements are recommended to be performed for the northbound approach of intersection to accommodate projected site traffic.

**Figure ES-1** shows the recommended roadway laneage.




Recommended Roadway Laneage

Stadium Drive Mixed-Use
Wake Forest, North Carolina
Traffic Impact Analysis

Kimley»Horn

Figure ES-1