Executive Summary

Project Background

The Town of Cary received a request to prepare a traffic analysis report (19-TAR-440) for the proposed rezoning of a parcel of land on the north (east) side of Alston Avenue, between O’Kelly Chapel Road and NC 540, in Cary, NC (Figure 1). The project is located within the Base Zone as defined in the Town of Cary Land Development Ordinance (LDO). As indicated on the TAR application, the development program is to consist of 320 apartments and 50 townhomes.

Based on the preliminary site plan (Figure 2), the development will be accessed via two full movement accesses on Alston Avenue:

- Access #1: full movement access on Alston Avenue, approximately 1,200 feet south of O’Kelly Chapel Road
- Access #2: full movement access on Alston Avenue, approximately 750 feet south of Access #1

The following intersections meet the Town of Cary’s requirements for inclusion in the study area and were analyzed for existing and future conditions, where applicable:

- NC Highway 55 and Parkside Green Street (signalized)
- NC Highway 55 and O’Kelly Chapel Road (signalized)
- NC Highway 55 Northbound and NC 540 Westbound Off-Ramp (signalized)
- NC Highway 55 Southbound and NC 540 Westbound On-Ramp (signalized)
- NC Highway 55 Northbound and NC 540 Eastbound On-Ramp (signalized)
- NC Highway 55 Southbound and NC 540 Eastbound Off-Ramp (signalized)
- NC Highway 55 and Mahal Avenue/Petty Farm Road (signalized)
- NC Highway 55 and McCrimmon Parkway (signalized)
- O’Kelly Chapel Road and Parkside Main Street (signalized)
- O’Kelly Chapel Road and Little Drive/Louis Stephens Drive (unsignalized, future signalized)
- O’Kelly Chapel Road and Alston Avenue (unsignalized)
- O’Kelly Chapel Road and Green Level Church Road (signalized)
- O’Kelly Chapel Road and Stonecroft Lane (unsignalized)
- O’Kelly Chapel Road and Yates Store Road (signalized)
- Green Level Church Road and Stonewater Glen Lane (unsignalized)
- Green Level Church Road and Hortons Creek Road (unsignalized)
In accordance with the Town’s LDO requirements, a build-out year of 2023 was analyzed. Traffic analysis was therefore conducted under four (4) scenarios: Existing (2018), Background (2023), Build (2023), and Build (2023) with Improvements. The Existing (2018) scenario evaluates the status of existing roadways and intersections based on weekday AM and PM peak hour turning movement counts collected in March and November 2018. The Background (2023) scenario evaluates future status of roadways and intersections based on existing traffic with a two percent (2%) annual growth rate, site trips associated with sixteen background developments, as well as transportation improvements associated with four background developments and one roadway project in the study area. The Build (2023) evaluate the status of roadways and intersections with the addition of site trips generated by the proposed development. Future conditions with the recommended roadway improvements in place were analyzed in the Build (2023) with Improvements Scenario.

**Existing (2018) Conditions**

Existing analyses were conducted based on current roadway geometrics, traffic signal timings, and recently collected turning movement counts at the study intersections.

As reported in the Summary Level of Service (LOS) table on page ix, all signalized intersections included in the study area are operating at acceptable levels of service (LOS D or better) during both the AM and PM peak hours. Among the stop-controlled approaches, northbound Alston Avenue at O’Kelly Chapel Road is operating at LOS E in the PM peak hour, and southbound Alston Avenue at O’Kelly Chapel Road, southbound Stonecroft Lane at O’Kelly Chapel Road, westbound Hortons Creek Road at Green Level Church Road, and eastbound Weycroft Avenue at Green Level Church Road operate at LOS E or F during both the AM and PM peak hours.

Within the study area, Go Triangle provides transit services (Route 311) along NC 55.

**Background (2023) Conditions**

Based on previous studies and historic data in the area, an annual growth rate of two percent (2%) was applied to the existing traffic to account for the ambient growth between the base year (2018) and the build-out year (2023). In addition, sixteen (16) background developments in the vicinity of the study area were included:
• 13-TAR-350A Parkside Town Commons, 10% of northern parcel included to account for 13-SP-033/039 and 16-SP-032
• 13-TAR-364 RKM, 50% included to account for 18-DP-517/652
• 15-TAR-389 Ridgefield Farms, 80% included to account for uncompleted/unoccupied portion
• 15-TAR-391 O’Kelly Chapel Office and Daycare
• 16-TAR-398 Lewter Property
• 17-TAR-424 Village at the Park
• 16-SP-090 Alston Ridge Middle School
• 14-SP-046 Alston Town Center Phase 1, 5% included to account for uncompleted/unoccupied portion
• 15-SP-013 Alston Village Apartments
• 16-SB-004 Brickyard
• 16-SB-011 Channing Park
• 16-SB-030/16-SP-038 Sears Tract
• 18-DP-0480 UNCHCS Panther Creek MOB
• 18-DP-0654 Cary Solis
• 15-SP-053 Hawthorne at Parkside
• 19-DP-008 Alston Avenue Townhomes

For the projects that have been partially built-out or have development plan changes, only the uncompleted/unoccupied portions or updated traffic projections were included in the analysis. Mitigation improvements associated with the background projects were recommended in the traffic studies; however, only the improvements by four background projects with certain commitment and construction status were assumed in the background analysis.

In addition, NCDOT is working with the Town of Morrisville to extend Louis Stephens Drive (NCDOT TIP U-5827) from O’Kelly Chapel Road to Poplar Pike Lane, providing an alternative route for traffic traveling north-south. Geometric improvements and traffic diversion due to the Louis Stephens Drive Extension project were assumed in the background conditions.

Based on the Background (2023) analysis, the intersections included in the study area are projected to experience significant traffic growth and delay increases. As a result, the signalized NC 55 at O’Kelly Chapel Road intersection is projected to degrade to operate at LOS E in the PM peak hour, and the two intersections of Green Level Church Road at O’Kelly Chapel Road and at McRimmon Parkway are projected to degrade to LOS F in the PM peak hour. The five deficient, stop-controlled approaches identified under the Existing (2018) conditions are projected to continue to operate at failing levels of service with delay increases. In addition, four more stop-controlled approaches on Green Level Church Road including eastbound Stonewater Glen Lane, westbound Stonewater Glen Lane, eastbound Horton’s Creek Road, and westbound Weycroft Avenue are projected to degrade to operate at LOS E or F in the PM peak hour. The rest of signalized intersections and stop-controlled approaches are projected
to remain operating at acceptable levels of services during both the AM and PM peak hours despite delay increases.

**Trip Generation and Assignment**

The proposed development is to consist of the following land uses:

- 320 Apartments
- 50 Town Homes

Trip generation was conducted based on the land use code included in the ITE *Trip Generation Manual, 10th Edition*, NCDOT’s suggested method of calculation, and discussions with the Town of Cary staff. To provide a conservative analysis, no transit, walking, or bicycling reductions was applied.

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<tr>
<th>Land Use Code</th>
<th>Land Use Code Description</th>
<th>Land Use Unit</th>
<th>ADT</th>
<th>AM Peak Hour</th>
<th>PM Peak Hour</th>
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<tr>
<td>220</td>
<td>Multi-Family Housing (Low-Rise)</td>
<td>370 du</td>
<td>2,756</td>
<td>Enter 38, Exit 127, Total 165</td>
<td>Enter 119, Exit 70, Total 189</td>
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In total, the proposed development is projected to generate 2,756 external site trips on a typical weekday with 165 trips (38 entering, 127 exiting) occurring in the AM peak hour and 189 trips (119 entering, 70 exiting) in the PM peak hour.

The generated site trips were distributed in accordance with the observed traffic patterns and anticipated land uses in the study area.

**Build (2023) Conditions**

The Build (2023) conditions account for the Background (2023) traffic and site traffic generated by the proposed development.

As shown on the Summary LOS table on page ix, the three (3) deficient signalized intersections and nine (9) deficient stop-controlled approaches identified under the Background (2023) conditions are projected to remain operating at failing levels of services with delay increases. In addition, northbound Stonecroft Lane at O’Kelly Chapel Road is projected to degrade to LOS E in the PM peak hour with the addition of site trips.

The two planned site accesses are projected to operate acceptably during both the AM and PM peak hours.
As indicated in the traffic operations analyses, the proposed rezoning is projected to have traffic impacts on the surrounding roadway network and intersections. The following transportation system improvements are recommended to meet the Cary Community Plan standards and to comply with the Town of Cary LDO’s expectations for LOS:

**Frontage Widening**
The Town of Cary LDO outlines that new developments widen the roads along the frontage of their property to the standards specified in the Cary Community Plan and the Alston Activity Center Plan (AACP). The proposed Alston Avenue Apartments development has frontage along Alston Avenue, which is designated as a local road in the Cary Community Plan and “Street A” in the Alston Activity Center Plan. Under the existing conditions, Alston Avenue is a two-lane roadway without sidewalks. Therefore, the following improvements are recommended:

- Widen Alston Avenue along the frontage of the proposed development to achieve half of the cross-section defined in the Cary Community Plan and/or the Alston Activity Center Plan as needed.

**NC 55 and O’Kelly Chapel Road (signalized)**
Traffic analyses indicate that this intersection is projected to operate at LOS E in the PM peak hour under the Background (2023) conditions, and to experience delay increases with the addition of site trips. Therefore, the following transportation system improvements are recommended to comply with the LOS expectations in the LDO:

- Restripe the westbound approach to add a third left-turn lane with at least 500 feet of storage and appropriate taper. (also identified in 13-TAR-350A)
- Modify traffic signal at this intersection based on the Town of Cary and NCDOT’s design standards to accommodate the lane geometrics changes.

It should be noted that similar transportation improvements have been identified by a previous traffic study; therefore, these recommended improvements are needed only if they are not constructed by others by the project build-out year.

**Green Level Church Road and O’Kelly Chapel Road (signalized)**
Traffic analyses indicate that this intersection is projected to operate at LOS F in the PM peak hour under the Background (2023) conditions, and to experience delay increases with the addition of site trips. Therefore, the following transportation system improvements are recommended to comply with the LOS expectations in the LDO:

- Widen the eastbound approach to provide an exclusive right-turn lane with at least 150 feet of storage and appropriate taper; restripe the existing right-turn lane as a second through lane. Note roadway widening and restriping will also be needed at the east leg of this intersection to provide a second receiver lane. (also identified in 15-TAR-391, assumed in the Hawthorne Parkside TIA)
• Widen the westbound approach to provide an exclusive right-turn lane with at least 100 feet of storage and appropriate taper; restripe the existing right-turn lane as a second through lane (a second receiver lane already exists).
• Modify traffic signal at this intersection based on the Town of Cary and NCDOT’s design standards to accommodate the lane geometrics changes.

It should be noted that similar transportation improvements have been identified or assumed by multiple previous traffic studies; therefore, these recommended improvements are needed only if they are not constructed by others by the project build-out year.

Green Level Church Road and McCrimmon Parkway (signalized)
Traffic analyses indicate that this intersection is projected to operate at LOS F in the PM peak hour under the Background (2023) conditions, and to experience delay increases with the addition of site trips. Therefore, the following transportation system improvements are recommended to comply with the LOS expectations in the LDO:

• Widen the southbound approach to provide a second through lane with at least 500 feet of full-width length and appropriate taper. (also identified in 15-TAR-389, assumed in the Channing Park TIA, extending southbound thru/right lane with 100’ total storage and appropriate taper was not identified in 16-TAR-398 but offered by Lewter Property)
• Restripe the westbound approach to provide two left-turn lanes and a shared through/right-turn lane.
• Modify traffic signal at this intersection based on the Town of Cary and NCDOT’s design standards to accommodate the lane geometrics changes.

It should be noted that similar transportation improvements have been identified by multiple previous traffic studies; therefore, these recommended improvements are needed only if they are not constructed by others by the project build-out year.

O’Kelly Chapel Road and Alston Avenue (existing unsignalized, future signalized)
Traffic analyses indicate that both side street approaches are projected to operate at failing levels of service, and traffic volumes are expected to meet warrants for a traffic signal in the AM peak hour. Therefore, the following improvements are recommended to comply with the LOS expectations in the LDO:

• Widen the northbound approach to provide an exclusive left-turn lane with at least 100 feet of storage and appropriate taper.
• If warranted and approved, install a traffic signal with a CCTV camera and connections to the Town’s Advanced Traffic Management System (ATMS) that meets the Town of Cary and NCDOT’s engineering design standards.

O’Kelly Chapel Road and Stonecroft Lane (unsignalized)
Traffic analyses indicate that the northbound and southbound approaches of this intersection are projected to operate at failing conditions under the existing, background and buildout conditions. Nevertheless, traffic volumes are not expected
to meet warrants for a traffic signal, and turn lanes are already present on the high
traffic volume approach. Therefore, no improvements are recommended at this time.

**Green Level Church Road and Stonewater Glen Lane (existing unsignalized, future signalized)**

Traffic analyses indicate that the eastbound and westbound approaches of this
intersection are projected to operate at failing conditions under the background and
buildout conditions. Traffic volumes are expected to meet warrants for a traffic signal
in the AM peak hour. Therefore, the following improvements are recommended to
comply with the LOS expectations in the LDO:

- If warranted and approved, install a traffic signal with a CCTV camera and
  connections to the Town’s Advanced Traffic Management System (ATMS)
  that meets the Town of Cary and NCDOT’s engineering design standards.
  (also identified in 17-TAR-424)

It should be noted that performance decline at this intersection is largely associated
with site trips due to background developments, and similar transportation
improvements have been identified by a previous traffic study. Therefore, these
recommended improvements are needed only if they are not constructed by others by
the project build-out year.

**Green Level Church Road and Horton’s Creek Road (unsignalized)**

Traffic analyses indicate that the eastbound and westbound approaches of this
intersection are projected to operate at failing conditions under the existing,
background and buildout conditions. Traffic volumes are not projected to meet
warrants for a traffic signal. Therefore, the following improvements are recommended
to comply with the LOS expectations in the LDO:

- Widen the westbound approach to provide an exclusive left-turn lane with at
  least 50 feet of storage and appropriate taper. (also identified in 16-TAR-398)

**Green Level Church Road and Weycroft Avenue (existing unsignalized, future signalized)**

Traffic analyses indicate that the eastbound and westbound approaches of this
intersection are projected to operate at failing conditions under the existing,
background and buildout conditions. Future traffic volumes are projected to meet
warrants for a traffic signal in the AM peak hour. Therefore, the following
improvements are recommended to comply with the LOS expectations in the LDO:

- If warranted and approved, install a traffic signal with a CCTV camera and
  connections to the Town’s Advanced Traffic Management System (ATMS)
  that meets the Town of Cary and NCDOT’s engineering design standards.

**Alston Avenue and Access #1 (future unsignalized)**

Traffic analyses indicate that this planned access is projected to operate acceptably
during both the AM and PM peak hours. Extra capacity is desired for future
connections to Evans Farm. Therefore, the following improvements are
recommended:
• Construct Access #1 with one inbound and one outbound lane.
• Widen southbound Alston Avenue to provide an exclusive left-turn lane with at least 100 feet of storage length and appropriate taper.

_Alston Avenue and Access #2 (future unsignalized)_
Traffic analyses indicate that this planned access is projected to operate acceptably during both the AM and PM peak hours. Therefore, the following improvements are recommended:

• Construct Access #2 with one inbound and one outbound lane.

The rest of the study intersections are projected to operate at acceptable levels of service in the Build (2023) conditions. Therefore, no further improvements are recommended.
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**Summary Level of Service Table**

**Legend:** X (xx) = Overall signalized intersection LOS (intersection control delay in seconds/vehicle); x-xx = approach LOS approach – control delay in seconds/vehicle
Figure ES
Future (2023) Lane Geometrics and Traffic Control