Twyla Road North
(19-TAR-437)
Cary, NC

PREPARED FOR
Town of Cary
c/o Priyatham Konda, PE
316 N Academy Street
PO Box 8005
Cary, NC  27512-8005

PREPARED BY
VHB Engineering NC, P.C. (C-3705)
Venture I
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
919.829.0328

November 28, 2018
Executive Summary

Project Background

The Town of Cary received a request to prepare a traffic analysis report (19-TAR-437) for the proposed rezoning of a parcel of land on Twyla Road North, northeast of the NC 540 and Morrisville Parkway interchange, in western 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 420 multi-family dwelling units, 15,000-square foot (SF) of general retail, and one 200-room Hotel.

Based on the preliminary site plan (Figure 2), the development will be accessed via one full movement access on Highcroft Drive, one restricted access (right-in only) on Morrisville Parkway, and one potential access at the Morrisville Parkway and NC 540 Northbound Ramps roundabout intersection:

- Access #1 (Stockwell Lane): full movement access on Highcroft Drive, approximately 450 feet north of Morrisville Parkway
- Access #2 (Twyla Road): right-in only on Morrisville Parkway, approximately 1,000 feet west of Highcroft Drive
- Access #3: potential access as the fourth leg of the Morrisville Parkway and NC 540 Northbound Ramps roundabout intersection, approximately 250 feet west of Access #2

As requested by the applicant, the analysis includes evaluations of three access scenarios regarding the access options of Access #3:

- Access Scenario A: No access at the Morrisville Parkway and NC 540 Northbound Ramps roundabout
- Access Scenario B: Entrance only at the Morrisville Parkway and NC 540 Northbound Ramps roundabout
- Access Scenario C: Full movement at the Morrisville Parkway and NC 540 Northbound Ramps roundabout

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

- NC Highway 55 and Morrisville Parkway (signalized)
Morrisville Parkway and Sedgefield Park Lane (unsignalized)
Morrisville Parkway and Highcroft Drive (unsignalized)
Morrisville Parkway and NC 540 Northbound Ramps (future roundabout, potential Site Access #3)
Morrisville Parkway and NC 540 Southbound Ramps (future roundabout)
Morrisville Parkway and Mills Park Drive Extension (future unsignalized)
Morrisville Parkway and Green Level Church Road (signalized)
Green Level Church Road and Mills Park Drive/Courtland View Lane (signalized)
Green Level Church Road and Green Hope School Road (unsignalized)
Green Hope School Road and Highcroft Drive (unsignalized)
Highcroft Drive and Site Access #1 (full movement)
Morrisville Parkway and Site Access #2 (right-in only)

In accordance with the Town’s LDO requirements, a build-out year of 2023 was analyzed. Traffic analysis was therefore conducted under eight (8) scenarios: Existing (2018), Background (2023), Build (2023) Scenario A, Build (2023) Scenario B, Build (2023) Scenario C, Build (2023) Scenario A with Improvements, Build (2023) Scenario B with Improvements, and Build (2023) Scenario C 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 September and October 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 thirteen (13) background developments, as well as transportation improvements associated with two (2) roadway projects 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 under different access scenarios. Future conditions with the recommended roadway improvements in place were analyzed in Build (2023) with Improvements for Access Scenarios A, B, and C, respectively.

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 and stop-controlled approaches included in the study area are operating at acceptable overall levels of service (LOS D or better) during both the AM and PM peak hours, with an exception that the eastbound and westbound approaches of Green Hope School Road at Green Level Church Road operate at LOS F in the PM peak hour.

Within the study area, Go Triangle provides transit services (Route 311) along NC 55.
Background (2023) Conditions

Based on previous studies and historic growth in the area, an annual growth rate of two percent (2%) was applied to the existing traffic to account for the normal growth between the base year (2018) and the build-out year (2023). In addition, thirteen (13) background developments in the vicinity of the proposed development were included:

- 18-TAR-432 SAM’s Express Car Wash
- 18-TAR-431 CAML Academy
- 18-TAR-430 Duke Health
- 17-TAR-425 Cary Pointe Mixed-Use
- 17-TAR-421 Weldon Ridge Development, 50% included based on the newest development plans
- 16-TAR-406 Morrisville Parkway Daycare
- 16-TAR-398 Lewter Property
- 15-TAR-389 Ridgefield Farms, 20% built-out
- 14-TAR-387 Wackena Road Rezoning (Wackena Hills Subdivision)
- 14-TAR-386 Phillips Property (Parkside Villas)
- 13-TAR-364 RKM Retail Center, 50% built-out
- 08-TAR-290 Futrell-Cooke Property, 50% included based on the newest development plans
- 14-SP-072 Lowe's at Greystone

For the projects that have been partially built-out or have development plan changes, only the uncompleted/unoccupied portions and updated traffic projections were included in the analysis. Mitigation improvements associated with the background projects were recommended in traffic studies at multiple intersections in the study area; however, actual construction of these improvements is uncertain.

Transportation improvements due to one Town of Cary capital project were included in the Background (2023) analysis. Specifically, the Town of Cary is working with developers and the NCDOT to complete the last segment of the Morrisville Parkway corridor from NC 55 to Green Level Church Road, with the project (NCDOT TIP U-5315) initially including a two-lane road extension and an interchange at NC 540 (Western Wake Freeway) with roundabout control at both ramp intersections.

In addition, the extension of Mills Park Drive is assumed to be constructed from its existing terminus south of Mills Park Elementary School to Morrisville Parkway as part of the Lowe’s at Greystone project. A fourth leg is also assumed to be added at Morrisville Parkway and Sedgefield Park Lane by either or both of the Morrisville Parkway Daycare and Cary Pointe Mixed Use projects.

Based on the Background (2023) analysis, the intersections included in the study area are projected to experience significant traffic and delay increases. As a result, the signalized NC 55 at Morrisville Parkway intersection is projected to degrade to operate at LOS F during both the AM and PM peak hours. Both approaches of Green Hope
School Road at Green Level Church Road are projected to operate at failing levels service during both the AM and PM peak hours. In addition, four more stop-controlled approaches on Morrisville Parkway including southbound Highcroft Drive, northbound and southbound Sedgefield Park Lane, and southbound Mills Park Drive are projected to operate at LOS E or F during both the AM and PM peak hours. 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:

- 420 Multi-Family Dwelling Units
- One 200-Room Hotel
- 15,000 SF of General Retail

Trip generation was conducted based on the corresponding trip generation codes included in the ITE Trip Generation Manual, 10th Edition, NCDOT’s suggested method of calculation, and discussions with Town of Cary staff. Internal capture between mixed uses were calculated based on the NCHRP 684 method using the spreadsheet tool from NCDOT. To provide a conservative analysis, no transit, walking, or bicycling reduction was applied.

<table>
<thead>
<tr>
<th>Land Use Code</th>
<th>Land Use</th>
<th>Unit</th>
<th>ADT</th>
<th>AM Peak Hour</th>
<th>PM Peak Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>220</td>
<td>Multi-Family Housing (Low-Rise)</td>
<td>420 du</td>
<td>2,992</td>
<td>42 141 183</td>
<td>123 74 197</td>
</tr>
<tr>
<td>310</td>
<td>Hotel</td>
<td>200 rooms</td>
<td>1,731</td>
<td>56 35 91</td>
<td>56 60 116</td>
</tr>
<tr>
<td>820</td>
<td>Shopping Center</td>
<td>15,000 sf</td>
<td>1,525</td>
<td>94 59 153</td>
<td>61 55 116</td>
</tr>
</tbody>
</table>

Development Total 6,248 192 235 427 240 189 429

In total, the proposed development is projected to generate 6,248 external site trips on a typical weekday with 427 trips (192 entering, 235 exiting) occurring in the AM peak hour and 429 trips (240 entering, 189 exiting) in the PM peak hour.

Pass-by trips were calculated for the commercial/retail uses based on ITE Trip Generation Handbook, 3rd Edition, and are expected not to exceed 10% of adjacent street traffic volumes. The generated site trips were distributed in accordance with the existing traffic patterns and 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 under Access Scenarios A, B and C.

As shown on the Summary LOS table on page ix, the signalized NC 55 and Morrisville Parkway intersection is projected to remain operating at LOS F during both peak hours with delay increases. The 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 Highcroft Drive at Morrisville Parkway is projected to operate at LOS F in the PM peak hour under Access Scenario A, LOS E under Access Scenario B, and LOS D under Scenario C.

Among the planned site accesses, Site Accesses #1 and #2 are projected to operate acceptably during both the AM and PM peak hours. The Morrisville Parkway and NC 540 Northbound Ramps roundabout intersection is projected to remain operating at acceptable levels of service under all three access scenarios. 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.

Roadway Improvement Recommendations

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 (All Access Scenarios)**
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. The proposed development does not have frontage along any thoroughfare or collector street. Therefore, widening improvements are not required to meet the Cary Community Plan standards.

**NC 55 and Morrisville Parkway (All Access Scenarios)**
Traffic analyses indicate that this intersection is projected to operate at LOS F during both the AM and PM peak hours under the Background (2023) conditions, and to experience delay increases with the addition of site trips under all three access scenarios. Therefore, the following transportation system improvements are recommended to comply with the LOS expectations in the LDO:

- Widen the southbound approach to extend the existing left-turn lane and add a second left-turn lane with at least 325 feet of storage and appropriate taper.
  (also identified in 18-TAR-431, 18-TAR-432A)
- Widen the eastbound approach to add a second left-turn lane with at least 400 feet of storage and appropriate taper. (also identified in 14-TAR-386, 14-TAR-387, 17-TAR-425, 18-TAR-432A)
- Widen the westbound approach to provide a new right-turn lane with at least 250 feet of storage and appropriate taper, and restripe the existing right-turn lane to become a second through lane. (also identified in 18-TAR-432A)
- Widen the northbound approach to add a second left-turn lane with at least 275 feet of storage and appropriate taper (a third through lane was identified in 08-TAR-290).
- 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 studies. These recommended improvements are needed only if they are not constructed by others by the project build-out year.

**Morrisville Parkway and Sedgefield Park Lane (All Access Scenarios)**
Traffic analyses indicate that both side street approaches are projected to operate at failing levels of service during both the AM and PM peak hours, and peak hour traffic volumes are expected to meet warrants for a traffic signal under both the background and buildout conditions. Therefore, the following improvements are recommended to comply with the LOS expectations in the LDO:

- Conduct signal warrant analysis at the project build-out year to determine if a traffic signal is warranted. 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 18-TAR-432A)

It should be noted that performance decline at this intersection is largely associated with the background developments on both sides of Morrisville Parkway near this intersection, and similar transportation improvements have been identified in a previous study. These recommended improvements are needed only if these background developments occur while a signal is not constructed by others by the project build-out year.

**Morrisville Parkway and Highcroft Drive (All Access Scenarios)**
Traffic analyses indicate that the northbound approach of Highcroft Drive is projected to operate at failing conditions under Access Scenarios A and B, and the southbound approach is projected to operate at failing conditions under all three access scenarios. Exclusive turn lanes are already present, and peak hour traffic volumes are expected to meet warrants for installing a traffic signal under the build conditions. 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.

**Morrisville Parkway and Mills Park Drive (All Access Scenarios)**

Traffic analyses indicate that the southbound approach of this intersection is projected to operate at failing levels of service during both peak hours under the background and build conditions. Exclusive turn lanes are already present or planned to be constructed, and peak hour traffic volumes are expected to meet warrants for installing a traffic signal under the background and build conditions. Therefore, the following improvements are recommended to comply with the LOS expectations in the LDO:

- Conduct signal warrant analysis at the project build-out year to determine if a traffic signal is warranted. 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.

It should be noted that performance decline at this intersection is largely associated with traffic due to the Lowe’s at Greystone development and Mills Park Drive Extension. These recommended improvements are needed only if these background projects occur while a signal is not constructed by others by the project build-out year.

**Green Level Church Road and Green Hope School Road (All Access Scenarios)**

Traffic analyses indicate that both side street approaches are projected to operate at failing levels of service in the PM peak hour under the existing conditions, and during both the AM and PM peak hours under the background and build conditions. Traffic volumes are expected to meet warrants for a northbound right-turn lane and a new traffic signal under the existing, background, and build conditions. Therefore, the following improvements are recommended to comply with the LOS expectations in the LDO:

- Widen the northbound approach to provide an exclusive right-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. (also identified in 18-TAR-430A)

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

**Highcroft Drive and Access #1 (Stockwell Lane) (All Access Scenarios)**

Traffic analyses indicate that this planned access is projected to operate acceptably during both the AM and PM peak hours. Nevertheless, exclusive turn lanes are desired at this primary access point from a long-term planning perspective, particularly since left-turn movement traffic will increase after Highcroft Drive is extended northwards to Wackena Road and Carpenter Fire Station Road. Therefore,
the following improvements are recommended:

- Widen Stockwell Lane/Access #1 at the planned location to consist of one inbound lane and two outbound lanes with an exclusive left-turn lane and an exclusive right-turn lane with 100 feet of storage (Access Scenarios A and B), or
- Widen Stockwell Lane/Access #1 at the planned location to consist of one inbound lane and one outbound lane (Access Scenario C)

Morrisville Parkway and Access #2 (Twyla Road) (All Access Scenarios)

Traffic analyses indicate that this planned right-in only access is projected to operate acceptably during both the AM and PM peak hours. Traffic volumes are expected to meet warrants for an exclusive right-turn lane on westbound Morrisville Parkway. Therefore, the following improvements are recommended:

- Widen the westbound approach to provide an exclusive right-turn lane with at least 100 feet of storage and appropriate taper.
- Construct Access #2 at the planned location to consist of one inbound lane.

Morrisville Parkway and NC 540 Northbound Ramps/Access #3 (Access Scenarios B and C)

Traffic analyses indicate that this roundabout intersection is projected to operate acceptable with Access #3 either as an inbound only access (Scenario B) or as a full movement access (Scenario C) with the following improvements planned:

- Construct Access #3 at the planned location to consist of one inbound lane (Access Scenario B), or
- Construct Access #3 at the planned location to consist of one inbound lane and two outbound lanes with a shared left-turn/through lane and an exclusive right-turn lane (Access Scenario C).

It should be noted that introducing a fourth leg at this roundabout intersection will result in traffic demand and capacity utilization changes, as shown by slightly better traffic operations in Scenario C than Scenario B or Scenario A. However, adding the fourth leg will increase the number of vehicle conflicting points within the roundabout, causing potential safety performance decline. Although it is projected to operate acceptably at the project build-out year (2023) with no significant delay or queuing issues identified under all three access scenarios, this intersection should be further evaluated under the ultimate design conditions when Morrisville Parkway is widened to a four-lane facility and this intersection is expanded to a dual lane roundabout in the future.

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.
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AM</td>
<td>PM</td>
<td>AM</td>
<td>PM</td>
<td>AM</td>
<td>PM</td>
<td>PM</td>
<td>PM</td>
</tr>
<tr>
<td>NC 55 &amp; Morrisville Parkway</td>
<td>D</td>
<td>(51.2)</td>
<td>(41.3)</td>
<td>(4.2)</td>
<td>(1.0)</td>
<td>(10.9)</td>
<td>(11.6)</td>
<td>(11.4)</td>
</tr>
<tr>
<td>Eastbound</td>
<td>E-68.9</td>
<td>B-64.3</td>
<td>B-121.1</td>
<td>F-116.6</td>
<td>F-122.6</td>
<td>F-123.4</td>
<td>F-123.4</td>
<td>F-123.4</td>
</tr>
<tr>
<td>Westbrook</td>
<td>D-42.7</td>
<td>D-49.3</td>
<td>F-91.1</td>
<td>F-89.2</td>
<td>F-106.3</td>
<td>F-106.3</td>
<td>F-106.3</td>
<td>F-106.3</td>
</tr>
<tr>
<td>Northwest</td>
<td>E-41.1</td>
<td>C-30.7</td>
<td>C-103.5</td>
<td>E-104.3</td>
<td>F-124.5</td>
<td>F-124.5</td>
<td>F-124.5</td>
<td>F-124.5</td>
</tr>
<tr>
<td>Green Level Church Road &amp; Morrisville Parkway</td>
<td>C</td>
<td>(20.5)</td>
<td>(14.0)</td>
<td>(13.4)</td>
<td>(13.4)</td>
<td>(13.4)</td>
<td>(13.4)</td>
<td>(13.4)</td>
</tr>
<tr>
<td>Southbound</td>
<td>D</td>
<td>(25.0)</td>
<td>(30.4)</td>
<td>(30.4)</td>
<td>(30.4)</td>
<td>(30.4)</td>
<td>(30.4)</td>
<td>(30.4)</td>
</tr>
<tr>
<td>Green Level Church Road &amp; Courtland</td>
<td>C</td>
<td>(27.2)</td>
<td>(14.0)</td>
<td>(14.0)</td>
<td>(14.0)</td>
<td>(14.0)</td>
<td>(14.0)</td>
<td>(14.0)</td>
</tr>
<tr>
<td>View Lane Mills Park Drive</td>
<td>D</td>
<td>(58.3)</td>
<td>(57.7)</td>
<td>(57.7)</td>
<td>(57.7)</td>
<td>(57.7)</td>
<td>(57.7)</td>
<td>(57.7)</td>
</tr>
<tr>
<td>Eastbound</td>
<td>D-59.5</td>
<td>C-54.2</td>
<td>D-37.9</td>
<td>D-36.4</td>
<td>D-37.7</td>
<td>D-37.7</td>
<td>D-37.7</td>
<td>D-37.7</td>
</tr>
<tr>
<td>Westbound</td>
<td>B-57.2</td>
<td>B-51.7</td>
<td>C-50.4</td>
<td>B-49.1</td>
<td>B-51.2</td>
<td>B-51.2</td>
<td>B-51.2</td>
<td>B-51.2</td>
</tr>
<tr>
<td>Northwest</td>
<td>C-50.7</td>
<td>B-11.1</td>
<td>B-65.1</td>
<td>B-84.1</td>
<td>B-74.3</td>
<td>B-74.3</td>
<td>B-74.3</td>
<td>B-74.3</td>
</tr>
<tr>
<td>Southeast</td>
<td>B-22.8</td>
<td>B-11.0</td>
<td>B-17.2</td>
<td>B-117.6</td>
<td>B-116.0</td>
<td>B-118.0</td>
<td>B-118.0</td>
<td>B-118.0</td>
</tr>
<tr>
<td>Green Level Church Road &amp; Green Hope</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>School Road</td>
<td>B</td>
<td>(12.4)</td>
<td>(12.1)</td>
<td>(12.1)</td>
<td>(12.1)</td>
<td>(12.1)</td>
<td>(12.1)</td>
<td>(12.1)</td>
</tr>
<tr>
<td>Eastbound</td>
<td>D-53.0</td>
<td>E-151.4</td>
<td>F-360.1</td>
<td>E-179.9</td>
<td>F-255.2</td>
<td>F-255.2</td>
<td>F-255.2</td>
<td>F-255.2</td>
</tr>
<tr>
<td>Northwest</td>
<td>C-16.5</td>
<td>C-175.1</td>
<td>C-225.5</td>
<td>C-215.3</td>
<td>C-220.5</td>
<td>C-220.5</td>
<td>C-220.5</td>
<td>C-220.5</td>
</tr>
<tr>
<td>Southeast</td>
<td>C-17.1</td>
<td>D-26.2</td>
<td>D-16.8</td>
<td>C-257.2</td>
<td>C-242.4</td>
<td>C-242.4</td>
<td>C-242.4</td>
<td>C-242.4</td>
</tr>
<tr>
<td>Highsmith Drive &amp; Morrisville Parkway</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Eastbound</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Southeast</td>
<td>B-33.7</td>
<td>B-180.5</td>
<td>E-128.5</td>
<td>F-587.1</td>
<td>F-100.1</td>
<td>F-1131.6</td>
<td>F-100.1</td>
<td>F-1131.6</td>
</tr>
<tr>
<td>Monticello Parkway &amp; Segafredo Park Lane</td>
<td>B</td>
<td>(12.0)</td>
<td>(12.0)</td>
<td>(12.0)</td>
<td>(12.0)</td>
<td>(12.0)</td>
<td>(12.0)</td>
<td>(12.0)</td>
</tr>
<tr>
<td>Eastbound</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Northwest</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Southeast</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Monticello Parkway &amp; NC 540 NB Ramps/Access 13</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Westbound</td>
<td>—</td>
<td>A-8.3</td>
<td>B-10.9</td>
<td>B-12.1</td>
<td>B-12.1</td>
<td>B-12.1</td>
<td>B-12.1</td>
<td>B-12.1</td>
</tr>
<tr>
<td>Southeast</td>
<td>—</td>
<td>A-8.3</td>
<td>A-7.2</td>
<td>B-10.8</td>
<td>A-8.6</td>
<td>B-10.8</td>
<td>A-8.6</td>
<td>B-10.8</td>
</tr>
<tr>
<td>Monticello Parkway &amp; Mills Park Drive</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Eastbound</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Westbound</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Southeast</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Highsmith Drive &amp; Access #1 (Stockwell Loop)</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Eastbound</td>
<td>A-0.0</td>
<td>A-0.0</td>
<td>A-0.0</td>
<td>A-0.0</td>
<td>A-0.0</td>
<td>A-0.0</td>
<td>A-0.0</td>
<td>A-0.0</td>
</tr>
<tr>
<td>Monticello Parkway &amp; Access #2 (Twoyla Road)</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

**Summary Level of Service Table**

<table>
<thead>
<tr>
<th>Improvements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of Service Table</td>
</tr>
</tbody>
</table>

**Legend:** X (XX) = Overall signaled intersection LOS (intersection control delay in seconds/vehicle); xxx = approach LOS approach – control delay in seconds/vehicle
Figure ES-1
Future (2023) Lane Geometrics and Traffic Control (Scenario A)
Figure ES-2
Future (2023) Lane Geometrics and Traffic Control (Scenario B)
Figure ES-3
Future (2023) Lane Geometrics and Traffic Control (Scenario C)

Twyla North Development
Recommended Signalized Intersection Upgrade
Recommended New Signalized Intersection
Committed Roundabout Intersection
Existing Signalized Intersection

LEGEND
Existing Roadway
Future Roadway
Existing Stop Controlled Approach
Recommended Stop Controlled Approach
Committed Roundabout Intersection
Existing Signalized Intersection
Recommended Signalized Intersection Upgrade
Recommended New Signalized Intersection
Existing Lane Geometrics
Committed Lane Geometrics
Existing Lane Geometrics

Twyla Road North
(19-TAR-437)
Town of Cary, NC