



**LINCOLN COUNTY PLANNING & INSPECTIONS DEPARTMENT**  
302 NORTH ACADEMY STREET, SUITE A, LINCOLNTON, NORTH CAROLINA 28092  
704-736-8440 OFFICE 704-736-8434 INSPECTION REQUEST LINE 704-732-9010 FAX

To: Board of Commissioners  
Planning Board

From: Randy Hawkins, Zoning Administrator

Date: April 17, 2017

Re: PD #2017-1  
Meritage Homes of the Carolinas, Inc., applicant  
Parcel ID# 02357, 02364, 51875 and 31823 (portions of each)

*The following information is for use by the Lincoln County Board of Commissioners and Planning Board at their joint meeting/public hearing on May 1, 2017.*

#### REQUEST

The applicant is requesting the rezoning of 58.5 acres from R-T (Transitional Residential) to PD-R (Planned Development-Residential) to permit a subdivision with up to 152 lots for single-family detached homes. Under the Lincoln County Unified Development Ordinance, any proposed subdivision with 50 or more lots is subject to approval through the planned development process. The applicant is also proposing lots smaller in size than the minimum area permitted in the R-T district.

A concept plan and guidelines for the proposed development, Canopy Creek, have been submitted as part of the rezoning application and would serve as the master plan for the development if the rezoning request is approved. A traffic impact analysis has also been submitted. In addition, the applicant has provided minutes from a community involvement meeting that was held on April 6, 2017.

#### SITE AREA AND DESCRIPTION

The property is located on the west side of Saint James Church Road and north side of Verdict Ridge Drive. It is adjoined by property zoned R-T and PD-R. The Verdict Ridge subdivision borders the western side of this property. The site of the planned Killian Creek development is located to the south on the opposite side of Verdict Ridge Drive. Water and sewer lines are located in this area. Land uses in the area are primarily residential. This property is not located in a water-supply watershed. No portion of the property is located in a 100-year floodplain.

## PLAN CONFORMANCE

This property is part of an area designated by the Lincoln County Land Use Plan as Suburban Residential, primarily single-family in character with projected densities of upwards of 1-2 units per acre depending on the provision of utilities. The proposed subdivision would be served by county water and sewer. The proposed density is 2.6 homes per acre.

## UDO COMPLIANCE

The UDO requires that a planned development include a minimum of 12.5% recreation and open space. Approximately 20% of the acreage in Canopy Creek would be reserved as recreation and open space.

The proposed plan also complies with the UDO's subdivision standards for external access, internal connectivity, block length and cul-de-sac length.

## STAFF'S RECOMMENDATION

Staff recommends that the rezoning request be approved. See staff's proposed statement of consistency and reasonableness.



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704-736-8440 OFFICE 704-736-8434 INSPECTION REQUEST LINE 704-732-9010 FAX

### **Zoning Amendment Staff's Proposed Statement of Consistency and Reasonableness**

Case No. **PD #2017-1**  
Applicant **Meritage Homes of the Carolinas, Inc.**  
Parcel ID# **02357, 02364, 51875 and 31823 (portions of each)**  
Location **west side of Saint James Church Road, north side of Verdict Ridge Drive**  
Proposed amendment **rezone from R-T to PD-R to permit a subdivision with up to 152 lots for single-family detached homes**

This proposed amendment **is consistent** with the Lincoln County Comprehensive Land Use Plan and other adopted plans in that:

**This property is located in an area designated by the Land Use Plan as Suburban Residential, primarily single-family in character with projected densities of upwards of 1-2 homes per acre depending on the provision of utilities. The proposed development would consist entirely of single-family detached homes and would be served by county water and sewer. The proposed density is 2.6 homes per acre.**

This proposed amendment **is reasonable and in the public interest** in that:

**This property is located in an area that is primarily residential. The plans for this subdivision meet all of the requirements of the Unified Development Ordinance. Approximately 20% of the property will be set aside as recreation and open space. Amenities will be provided as part of the master plan.**





I-G

R-T

APEX LN

Proposed Subdivision  
Canopy Creek  
58.5 ac

R-T

PD-R - CU

SAPONA CT

OAKMONT DR

SAHALEE DR

VERDICT RIDGE DR

SAINT JAMES CHURCH RD

I-G

R-T

**LEGEND:**



Canopy Creek (58.5 ac.)



Building Footprints



Parcels



Streams

**County Residential District**

R-T Residential Transitional

**County Business Districts**

I-G Industrial General

**County Planned Districts**

Planned Development Residential

Conditional Zoning





## **Planned Development Rezoning Application**

Lincoln County Planning and Inspections Department  
Zoning Administrator  
302 N. Academy St., Lincolnton, NC 28092  
Phone: (704)736-8440 Fax: (704)732-9010

### **PART I**

Applicant Name Meritage Homes of the Carolinas, Inc.

Applicant Address 11605 North Community House Road, Suite 250 Charlotte, NC 28277

Applicant Phone Number 704-944-8940

Property Owner Name Estate of David Clark Sr / East Lincoln Land Company Inc

Property Owner Address PO Box 9 Lincolnton, NC 28093

Property Owner Phone Number \_\_\_\_\_

### **PART II**

Property Location Eastern section of Lincoln County off of Verdict Ridge Drive and Saint James Church Road

Property ID (10 digits) Portion of parcels 3693881369, 3693854884, 3693797198 & 3693994471 Property size 58.48 acres

Parcel # (5 digits) See Tax Map # List Deed Book(s) See Tax Map # List Page(s) \_\_\_\_\_

### **PART III**

Existing Zoning District R-T Proposed Zoning District PD-R

Briefly describe how the property is being used and any existing structures.

The property is currently undeveloped with no permanent structures on the site.

Briefly described the proposed planned development.

Kidville Road Subdivision is a proposed master planned single family residential community consisting of single family detached homes

### **\*SEE PLANNING DEPT. FOR PLANNED DEVELOPMENT FEES.**

*I hereby certify that all knowledge of the information provided for this application and attachments is true and correct to the best of my knowledge.*

CHRISTIAN JONES  
Applicant's Signature

2.3.2017  
Date

## **Planned Development Rezoning Application**

### **Canopy Creek - Property Tax Map # List**

1. Portion of parcel 3693881369  
Parcel #02357  
Estate of David Clark Sr  
PO Box 9  
Lincolnton, NC 28093  
Deed Reference – Book 1211, Page 562
2. Portion of parcel 3693797198  
Parcel #02364  
Estate of David Clark Sr  
PO Box 9  
Lincolnton, NC 28093  
Deed Reference – Book 1211, Page 562
3. Portion of parcel 3693854884  
Parcel #51875  
East Lincoln Land Company Inc  
PO Box 9  
Lincolnton, NC 28093  
Deed Reference – Book 711, Page 505
4. Portion of parcel 3693994471  
Parcel #31823  
Sarah C. Johnson  
1896 ST JAMES CHRCH RD  
Denver, NC 28037  
Deed Reference – Book 1601, Page 330

**CANOPY CREEK  
COMMUNITY INVOLVEMENT MEETING  
April 6, 2017**

**DATE, TIME AND LOCATION OF MEETING:**

The Community Involvement Meeting (CIM) for Canopy Creek was held on Thursday, April 6, 2017 at 7:00 p.m. at the East Lincoln Community Center located at 8160 Optimist Club Road, Denver, North Carolina. The purpose of the CIM was to provide information regarding the Canopy Creek Subdivision and to receive input from the community prior to a public hearing.

**PERSONS IN ATTENDANCE AT MEETING (see attached copy of sign-in sheet):**

Lincoln County mailed CIM notification letters on March 15, 2017 to surrounding property owners informing them of the upcoming meeting in accordance with the Lincoln County Unified Development Ordinance. The Community Involvement Meeting was attended by those individuals identified on the attached sign-in sheet.

**INTRODUCTION:**

Robert Davis and Peter Tatge with ESP Associates provided a presentation of the Canopy Creek Subdivision project. Team members consisting Robert Davis, Peter Tatge, Don Spence, Christian Jones, Brian Collins, and Brett Manery assisted with answering questions from the audience. Peter Tatge discussed Meritage Homes' proposed development program as it relates to their interest in developing the project as age-targeted home as well as additional funding Meritage Homes is willing to provide for road improvements for Optimist Club Road & NC Bypass 16. Don Spence explained the information from the TIA report in further detail.

**RESPONSE TO COMMUNITY INPUT AND COMMENTS:**

As part of tandem community outreach meetings, the petitioner has volunteered to include the following provisions as part of the Creek Park Subdivision:

- Architectural standards where vinyl siding will not be allowed as a siding material, except for soffits.
- Voluntarily providing stormwater BMPs to handle project related drainage.
- Monuments and signage for the community will be comparable to architectural characteristics of Verdict Ridge but will maintain different colors/fonts to ensure separate brand identity from Verdict Ridge.
- Increased perimeter buffer to 20'.
- The secondary entrance off of Verdict Ridge Drive will not be used for construction traffic to access Canopy Creek Subdivision.

## QUESTIONS RAISED BY THE MEETING PARTICIPANTS:

- What is the rough square footage of the proposed homes?  
*Petitioner: The homes are intended to be around 1,700-2,150 SF*
- What is the visual buffer between St. James Church Road and the homes?  
*Petitioner: The current plan is showing a 20' perimeter buffer, and each lot has a minimum rear setback of 20'.*
- Will the existing berm along Verdict Ridge Road be removed or maintained?  
*Petitioner: The PDR report will layout the architectural and landscape standards. The developer is interested in maintaining the berm where possible.*
- What is the actual process of designating a second entrance? Why can't a second entrance be located off of St. James Church Road instead of Verdict Ridge Road?  
*Petitioner: NCDOT provides a certain distance between entrance locations. Due to existing entrances and current road geometry of St. James Church Road, NCDOT suggested the second entrance be located off of Verdict Ridge Drive aligned with the proposed entrance for Killian Crossing.*
- If the 'emergency' access is not built until the second phase, how will emergency services access the site?  
*Petitioner: Two entrances are required for the site. The two main entrances will be constructed as part of the first phase which have the ability to serve as an emergency access. By the time the second phase is constructed, there will be two full-service entrances as well as an emergency access which will be restricted to emergency vehicles and will not be for every-day use.*
- Why isn't the emergency access point a full access?  
*Petitioner: As part of the planning process entrances and road improvements are discussed with NCDOT. During this process they look at the curvature of the road, sight distances and current intersections to determine the best locations for entrances to the subdivision. During this process it was discussed wanting to align the entrance along St. James Road with the bus drive.*
- This project is being proposed as an age-targeted community, but how is that realistic with the topography?  
*Petitioner: The project is too early in the process for engineering and grading. However, the road grade will be built to NCDOT standards and the houses are built close to the grade of the roads.*
- How would this project impact the surrounding properties including the flooding on the golf course?  
*Petitioner: Lincoln County does not require stormwater areas. The Developer realizes the current issues and conditions of the surrounding areas and is taking that into consideration by voluntarily proposing stormwater areas. These areas*



*will help control and distribute water from the site at a lower rate and will at a minimum match current natural water flow rates on the site.*

- The topography is steep along neighbors within Verdict Ridge. How will that be handled?  
*Petitioner: Though it is too early in the process to tell, retaining walls are suspected to be used to assist with the proposed grade changes and help maintain some of the existing vegetation.*
- Will St. James Church Road be widened for thru traffic and increased volumes?  
*Petitioner: St. James Church Road is believed to be currently wide enough for the proposed road improvements. If the width of the road is not substantial enough, the developer will in fact be responsible for widening the road.*
- Although the community is being proposed as age-targeted, families with children are also open to moving in. How will this be addressed?  
*Petitioner: Although the project is age-targeted rather than age-restricted, the floorplans of the proposed product appeal to those 55+ rather than younger families along with the maintenance of lawns. Also, the amenities will be softer than those typically proposed in single-family developments and will be aimed toward this population.*
- How are daily trips considered for the Traffic Report and proposed road improvements?  
*Petitioner: Since this is an age-targeted community, daily trips typically do not occur during peak hours. Older folks tend to wait for peak hours to be over. Keep in mind, the TIA calculates traffic impacts and daily trips based on a traditional subdivision that is not age-targeted so the improvements will reflect this number versus the lower number of daily trips for an age-targeted community.*
- Can the buffers be increased for the homes off of Oakmont Drive?  
*Petitioner: Nothing is finalized as of yet, it is still very early in the process. There is currently a minimum 20' perimeter buffer shown which is twice the width of the requirement. The size of the buffer will increase in some areas based upon the final layout.*
- How will the existing vegetation be addressed?  
*Petitioner: The developer wants to keep as much as the existing vegetation as possible, especially in the buffer areas.*
- The Southern BMP is still higher than the properties along Oakmont Drive. How will water be detained, especially if it is primarily rock?  
*Petitioner: The existing stormwater areas are still very preliminary; they have potential of being larger or even smaller. More information has to be collected in regards to current conditions of the land. The ponds will collect water from higher elevations and slowly release it back into the creeks and streams.*

- As previously discussed with the developers of Killian Crossing, will Verdict Ridge Drive be used as a construction entrance?  
*Petitioner: No, it has already been discussed with the Verdict Ridge HOA. An agreement has been made that Verdict Ridge Drive will **not** be used as a construction entrance.*
- How many phases?  
*Petitioner: Currently there are two phases planned for the project with the stream being the dividing line but there could be up to three phases.*

Canopy Creek  
COMMUNITY INVOLVEMENT MEETING  
Thursday, April 6, 2017  
SIGN-IN SHEET

Name: PETER TATGE  
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Name: Stan Roseboro  
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Canopy Creek  
COMMUNITY INVOLVEMENT MEETING  
Thursday, April 6, 2017  
SIGN-IN SHEET

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Canopy Creek  
COMMUNITY INVOLVEMENT MEETING  
Thursday, April 6, 2017  
SIGN-IN SHEET

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**Canopy Creek**  
**COMMUNITY INVOLVEMENT MEETING**  
**Thursday, April 6, 2017**  
**SIGN-IN SHEET**

Name: John Folk  
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Name: \_\_\_\_\_  
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Name: Scott Knapp  
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Phone: \_\_\_\_\_  
Email: \_\_\_\_\_

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Name: SMITH, JULIUS & PATRICIA  
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CANOPY CREEK SUBDIVISION  
PD-R REPORT

SAINT JAMES CHURCH ROAD  
LINCOLN COUNTY, NC

1. PROJECT INFORMATION

Canopy Creek Subdivision is a proposed single family residential community consisting of single family detached homes on an approximately 58.48-acre site on the west side of Saint James Church Road and north of Verdict Ridge Drive (see Preliminary Development Concept Plan). The project will include a portion of Parcel ID numbers 3693881369, 3693854884, 3693797198 and 3693994471. The current plan features a total of up to 152 single family lots with a density of approximately 2.6 units per acre.

Access to the site will be from Saint James Church Road and Verdict Ridge Drive, as generally depicted on the Preliminary Development Concept Plan. Land uses surrounding the site consist of single family residential homes. The Preliminary Development Concept Plan with vicinity map is included for reference.

A key feature of the proposed community will be the ample open spaces, existing streams, trails, and the community amenity area. Approximately 20% of the site will be left undeveloped as natural buffer area and/or passive and active open space.

The property is currently zoned R-T. Proposed zoning will be PD-R. The property is not located in a regulated watershed, so density is not limited.

2. GENERAL PROVISIONS

The Planned Development Concept Plan is intended to reflect a generalized arrangement of the site in terms of lot layout, street network, and open space areas. Final lot configuration, placement and size of the individual site elements, streets alignments, etc. may be altered or modified within the limits of the Lincoln County Unified Development Ordinance and the standards established within these conditional notes during the design development (platting) and construction documentation phases. The Petitioner reserves the right to make minor modifications and adjustments to the approved Planned Development Concept Plan, including minor reconfiguration of lots and street layout, subject to staff approval, provided that the total number of residential units does not exceed the maximum permitted. Any major modifications will require resubmittal to the Board of Commissioners per section 9.5.12 of the UDO.

3. DEVELOPMENT STANDARDS

Pursuant to Sections 2.4.9 and 9.5 of the Lincoln County Unified Development Ordinance entitled Planned Development Districts and Planned Development Review respectively; the Petitioner seeks to obtain approval of the use of the following Development Standards concurrently with the approval of the Rezoning Petition. These standards, as established both by the conditional notes as set out below and as depicted on the Planned Development Concept Plan shall be followed for the development of the property. Unless otherwise approved as part of these conditional notes, the Lincoln County Unified Development Ordinance shall prevail when developing the site. All homes will be sided with Brick, Concrete Fiber Cement boards (ex: Hardiplank), architectural concrete, stone, stone veneer, stucco or a combination of these materials. Vinyl siding will not be allowed as a siding material, except for soffits.

## A. PERMITTED USES

- 1) The project shall be limited to detached single family residential dwellings along with any incidental or accessory uses and amenity.
- 2) Uses on the Common Open Space (COS) may include a pool, clubhouse, landscaping, fences, walls, berms, pedestrian trails, recreational uses, entry signage, monuments, and storm water BMPs (if required).

## B. DENSITY

Gross residential density for the project will not exceed 2.6 units per acre. Open space areas shall be included in the calculations for gross residential density.

## C. LOT STANDARDS

The proposed development includes a Class 'B' buffer around the perimeter of the project per section 3.4.6 of the UDO. Existing vegetation will be used to meet the buffer requirements where possible. Residential lots will have the following minimum setbacks:

Front Minimum Setback:	10 feet (from right of way)
Garage Minimum Setback:	20 feet (from right of way)
Side Minimum Setback:	Aggregate 10 feet building separation
Side Corner Minimum Setback:	10 feet (from right of way)
Rear Minimum Setback:	20 feet

Building height shall be limited to 40 feet. Lot platting will meet Lincoln County subdivision regulations.

Overhanging roofs, eaves, gutters, chimneys, bay windows, cornice or other architectural features and awnings may extend into required yards in conjunction with yard encroachments discussed in section 2.6.10.B in the UDO.

## D. GENERAL SITE DESIGN

The following items are offered as part of this development:

- 1) Streets within the subdivision shall be designed per NCDOT and County guidelines. Roadways will be dedicated to NCDOT for maintenance once density requirements are met. Any roadways or sections not accepted by NCDOT will be maintained by the HOA. The developer has agreed to have curbs, gutters, and sidewalks (1 side) constructed throughout the neighborhood.
- 2) The project will contain the following proposed amenity features, which will be installed as part of the third phase of the development or sooner:
  - a. Swimming Pool with Bathrooms
  - b. Landscape areas
  - c. Pedestrian walking trails
  - d. Entrance monumentation applicable to the community will only be located on Canopy Creek Subdivision property. A signage plan shall be submitted at the time construction drawings are prepared for the first section of the development. Signage shall conform to standards of the Lincoln County Unified Development Ordinance. Monuments and signage for the community will be comparable to architectural characteristics of Verdict Ridge but will maintain different colors/fonts to ensure separate brand identity from Verdict Ridge. The monumentation to be used at the St. James Road entrance should be larger and more significant than the Verdict Ridge Drive entrance in order to indicate that this is the main entrance to the Canopy Creek Subdivision.



- 3) Canopy street trees, with a minimum of 1.5-inch caliper at time of planting, shall be placed at the rate of one canopy tree per lot or one canopy tree for every 40 linear feet (spaced a maximum of 50 feet apart) along both sides of the proposed streets. Driveway locations and street intersections may vary the placement of street trees.
- 4) Street lighting shall be used throughout the project.
- 5) Mailbox kiosks will be located and reviewed by the Postmaster.
- 6) Telephone, cable TV, electricity, and natural gas will be provided by local utility companies. Utilities within the community shall be placed underground. The main feed lines and transformers from the main road may be located above ground.
- 7) Open Space
  - a. The project will exceed the minimum 12.5% common open space requirement by offering a minimum of +/-20% common open space in the development. Common open space will be provided as generally depicted on the Planned Development Concept Plan. A portion of the open space will be active open space.
  - b. The project will offer a Class B perimeter buffers as required by the Lincoln County UDO.

#### E. STORMWATER COMPLIANCE

The development will be subject to Lincoln County's stormwater management regulations in place at the time of preliminary plat submittal. Stream buffers shall be provided along all jurisdictional streams in accordance with NCDENR and Lincoln County requirements.

Up to four (4) stormwater BMPs are proposed for the project. However, the engineering design could vary slightly based on design factors. Stormwater BMPs should ensure long-term performance and eliminate any additional impacts to neighboring properties, including the golf course. HOA documents will provide for proper maintenance by the Declarant until the Declarant transitions the property to the HOA, and the HOA budget shall at times provide for proper reserves being set aside regularly in order that funds are available if needed for repairs and maintenance to the BMPs and the stormwater drainage system.

#### F. ESTABLISHMENT OF A HOME OWNERS ASSOCIATION

A Home Owners Association shall be established and will be responsible for maintaining all rights-of-way, landscaping, signs, amenity features, storm water BMPs, trails and common open space areas. The documents covering the structure of the association shall be filed with the recorded final plat.

#### G. RESTRICTIVE COVENANTS

Restrictive Covenants will be created and recorded prior to final plat recordation, to establish, among other items, permitted uses and maintenance responsibility of the Homeowners Association (HOA). Restrictive covenants will include language that ensures stream buffers, perimeter buffers, and setback areas are protected.

#### H. VEHICULAR ACCESS AND ROAD IMPROVEMENTS

##### Vehicular Access

Access will be provided via two (2) main entrances with the primary entrance off of Saint James Road and a secondary entrance off Verdict Ridge Drive as generally depicted on the Preliminary Development Concept Plan. The local residential streets will have a 50' right-of-way with a minimum five-foot wide sidewalk and six-foot wide planting median on one side of the street only as depicted on the Preliminary Development Concept

Plan. Access locations depicted on the Preliminary Development Concept Plan are subject to NCDOT approval and may be modified as needed to meet NCDOT requirements.

The Canopy Creek entrance off of St. James Church Road will be the primary entrance to the neighborhood. When constructed, the Verdict Ridge Drive entrance will be a secondary entrance.

During construction, the St. James Church Road entrance shall be the only entrance to be used by construction traffic to access Canopy Creek Subdivision. No construction traffic shall be allowed on Verdict Ridge Drive. The developer will post prominent signage at both entrances to this effect.

#### Emergency Access

A 20 feet minimum access easement for emergency vehicles will be provided off of St. James Church Road connecting to the northern section of the development as shown on the Preliminary Development Concept Plan. The access road shall have an unobstructed width of not less than 20 feet, except for approved security gates in accordance with North Carolina Fire Code. Access road shall be designed and maintained to support the imposed loads of a fire apparatus and shall be surfaced so as to provide all-weather driving capabilities.

#### Improvements to Existing Roads

A Traffic Impact Analysis (TIA) has been prepared for this project and reviewed by NCDOT. Improvements by the developer required by NCDOT will be installed per NCDOT regulations and based on the timeline determined by NCDOT and the traffic engineer's phasing analysis. Some of these improvements are recommended to accommodate the site trips and mitigate existing and projected deficiencies in the future No Build Conditions. These improvements are necessitated by the collective impacts of the background traffic growth, off-site developments, and site trips.

The TIA recommends the following improvements:

- Construct a northbound left turn lane with 100 feet of storage on St. James Church Road at the proposed Canopy Creek primary entrance (Access 1).
- The developer will make a monetary contribution that will be combined with other funds to improve the intersections of Optimist Club Road and Hwy 16 and/or Optimist Club Road and St. James Church Road. The developer's total contribution for the two (2) intersections will be \$100,000. Payment shall be due at the time of the Phase 1 final plat recording.

#### **I. PERMITTING**

The Petitioner understands that all permits from Lincoln County and appropriate agencies must be obtained prior to grading or construction activities.

#### **J. CONSTRUCTION SCHEDULE AND PHASING**

This proposed residential community shall be constructed in no more than four (4) phases, and phase lines are preliminarily identified on the Preliminary Development Concept Plan. Actual Phase lines are subject to change based on infrastructure and design considerations. Construction of infrastructure is scheduled to begin in the first quarter of 2018.

#### **K. MODEL HOMES / SALES OFFICES**

Model homes may be constructed within residential areas. Mobile temporary sales offices shall be allowed at the developer's discretion and shall be subject to any special permits required by Lincoln County.

#### L. WATER AND SEWER AVAILABILITY

The property is within the Lincoln County Sewer District and Lincoln County Water District. The Petitioner understands that water and sewer availability must be approved by Lincoln County prior to development. It is the Petitioner's responsibility to incur all permit fees, availability fees, infrastructure costs for providing the water and sewer throughout the project for all buildings. The Petitioner will comply with all the County's water and sewer standards.

An existing 12-inch water line is located along Kidville Road and along Verdict Ridge Drive. The Petitioner proposes to connect to the existing 12-inch water line at both entrances to provide a looped connection. Sanitary sewer stubs are provided in two locations on or near the property. Gravity sewer will drain to the existing 15-inch trunk line that runs along Killian Creek. Preliminary analysis indicates sufficient capacity in the existing gravity sewer lines.

#### M. APPLICABLE ORDINANCES & PLANS

Development will be subject to the standards and requirements of the Lincoln County UDO in effect at the date of submission of the application for rezoning. The development is also subject to the Lincoln County Land Use Plan and recommendations thereof.

#### N. BINDING EFFECT

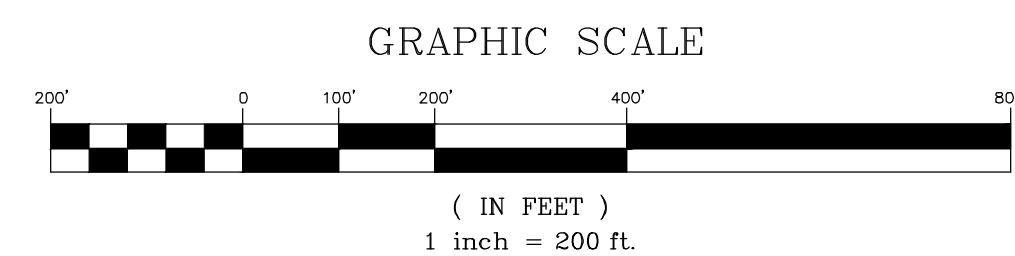
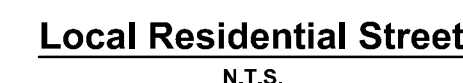
All conditions applicable to the development of the property approved with this rezoning, unless amended by the manner provided in the UDO, shall be binding to the Petitioner and subsequent owners of the site and their assignees.

#### O. AMENDMENTS TO THE APPROVED CONDITIONAL DISTRICT PLAN

It is understood that the owner of the property must apply for any future amendments to the Development Standards, Conditional Notes and in accordance to the provisions of the UDO.



**REVIEW AGENCY:** LINCOLN COUNTY PLANNING DEPARTMENT  
**ADDRESS:** 115 W. MAIN ST.  
 LINCOLNTON, NC 28092  
**PHONE:** (704) 736-8440



1. *Journal of the American Medical Association*, 2000; 283: 2689-2695.

PRELIMINARY  
NOT FOR  
CONSTRUCTION

NO.	DATE	REVISION	BY
1	3/22/17	Addition of Potential Stormwater Areas & Entrance Adjustment	MMW
2	04/17/2017	Per Staff Comments / CDM Input	MMK

PRELIMINARY DEVELOPMENT  
CONCEPT PLAN

CANOPY CREEK

PROJECT INFORMATION	
PROJECT MANAGER:	PT
DESIGNED BY:	MK
DRAWN BY:	MW
PROJECT NUMBER:	EV25
ORIGINAL DATE:	2/17/20

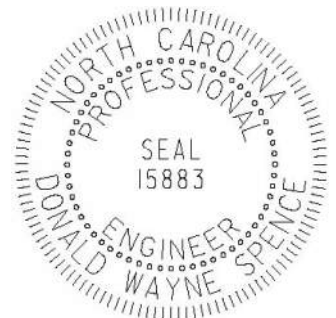


# TRAFFIC IMPACT ANALYSIS

# Lincoln County, North Carolina



For  
Meritage Homes of the Carolinas Inc.  
April 2017



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## 1. EXECUTIVE SUMMARY

Meritage Homes of the Carolinas, Inc., NC proposes to develop 58.48 acres in the northwest quadrant of St. James Church Road and Verdict Ridge Road. The proposed development will consist of 165 single-family detached homes. For this study, the site is assumed to be developed within a five-year time period.

This report provides an analysis of the traffic operations within the area of influence. It provides recommended access management for the site and intersection improvements needed for mitigating traffic impacts. This study evaluates existing traffic conditions in 2017 as well as in 2022 under No Build and Build scenarios, as approved by the North Carolina Department of Transportation (NCDOT) and the Lincoln County Planning Department. This traffic impact analysis is valid at any time within the 2017-2022 interval.

The area of influence of the study site as provided by the Lincoln County Planning Department and the NCDOT includes the following eight intersections:

1. St. James Church Road and Kidville Road (unsignalized)
2. St. James Church Road and the St. James Elementary School bus driveway (unsignalized)
3. St. James Church Road and the St. James Elementary School driveway (unsignalized)
4. St. James Church Road and Verdict Ridge Road (unsignalized)
5. St. James Church Road/N. Egypt Rd. and Optimist Club Road (unsignalized)
6. NC 16 and Optimist Club Road (unsignalized-directional crossover)
7. NC 16 and U-Turn movement North of Optimist Club Road – AM peak only (unsignalized)
8. NC 16 and U-Turn movement South of Optimist Club Road – AM peak only (unsignalized)



*Southbound St. James Church Road at St. James Elementary School Bus Drive*

According to the current site plan, the Canopy Creek subdivision site will be served by the two access points. Access 1 will be on St. James Church Road opposite the St. James Elementary School bus roadway. Access 2 will be on Verdict Ridge Road opposite of the site access for the proposed Killian Creek Subdivision. Both will be full movement access points. The trip generation results indicate that the Canopy Creek Subdivision will generate approximately 1,648 daily trips, 125 morning-peak-hour trips and approximately 165 new afternoon-peak-hour trips.

The Canopy Creek Subdivision property is currently zoned R-T. Meritage Homes of the Carolinas, Inc., is proposing to rezone the property to PD-R.

The Lincoln County Planning Department has requested that one approved but not yet completed development be included in the document as an offsite traffic generator. The Killian Creek Subdivision which will consist of 58 single-family detached housing is situated on the southwest corner of St. James Church Road and Verdict Ridge Road. The build-out time for this offsite traffic generator is estimated to be completed by 2022, the build-out time frame for Canopy Creek.

All intersections within the study area are all unsignalized. The directional crossover at NC 16 and Optimist Club Road is the only intersection in the study area that has a Level of Service (LOS) less than a C. The directional crossover is operating at a LOS D and E during the morning and afternoon



peak hours, respectfully. Typically, a LOS of “D” or better is considered an acceptable LOS for traffic impact analysis. During the 2022 No Build scenario, the LOS degrades to a LOS E and F during the morning and afternoon peak hours, respectfully.

Of particular interest is the U-turn crossovers on NC 16, just north and south of Optimist Club Road. Although the capacity analysis did not show LOS issues, queues during the AM peak hour at the north U-turn crossover would sometimes back up to a maximum observed queue of 12 vehicles.

All of the other unsignalized intersections currently have fairly low volume and although an overall LOS is not defined for two-way stop-controlled (TWSC) intersections, all other intersections have minimal delays for the side street traffic.

In 2022 under the No Build scenario, with the growth in the background traffic and the addition of the offsite traffic, LOS and delay deteriorated at the NC 16 and Optimist Club road directional crossover to a LOS E and F during the morning and afternoon peak hours, respectfully.

In 2022 under the Build scenario, NC 16 and Optimist Club Road directional crossover only deteriorated slightly. All other unsignalized intersections operated at a LOS A, B or C.

The results of the capacity analysis indicate that the current lane configurations can accommodate the proposed development. The required improvements and corresponding responsibility are discussed in the next section.

### **Improvements Due to Background Traffic Growth:**

The NC 16 U-turn median cut north of Optimist Club Road is the closest access to the west side of NC 16 and provides the most convenient cross movement for motorists utilizing Optimist Club Road as well as those seeking to access the Charlotte area. The northbound U-turn median cut is situated approximately 1,390 feet north of Optimist Club Road and serves approximately 400 movements in the AM peak hour.

Many concerns expressed for accessing the southbound lanes of NC 16 is for those attempting to gain access to the west leg of Optimist Club Road, some of which are school buses. This movement requires acceleration from a stop position to cross two southbound through lanes in order to access a deceleration lane intersecting the west leg of Optimist Club Road. Typically, super street designs allow traffic signal control for U-turns, however, given the speed and volumes observed during the AM peak hour on southbound NC 16 this treatment does not appear prudent. Further study will be required to thoroughly evaluate the alternatives, one that is evident is to consider connecting the bulb serving the U-turns to the existing southbound right turn lane at Optimist Club Road, thereby eliminating the necessity of an extended weaving movement.



*NC 16 at Optimist Club Road Facing North*

### **Improvements by Developer:**

In analyzing the intersections within the study area, we recommend the following specific improvements to accommodate the proposed development. These roadway improvements are needed for access management and are directly attributable to the site traffic volumes for the specific movements. These improvements should be the responsibility of the developer.

#### St. James Church Road & Access 1/St. James Elementary School Bus Driveway

- Install a northbound left-turn lane on St. James Church Road with 100 feet of storage.

In addition, the developer is providing participating shares toward improvements to Optimist Club Road at St. James Church Road and NC 16 and Optimist Club Road.



*Northbound St. James Church Road at Access 1  
/St. James Elementary School Bus Driveway*

## 2. PROPOSED DEVELOPMENT

Meritage Homes of the Carolinas, Inc., NC proposes to develop 58.48 acres in the northwest quadrant of St. James Church Road and Verdict Ridge Road. The proposed development will consist of 165 single-family detached homes. For this study, the site is assumed to be developed within a five-year time period.

According to the current site plan, the Canopy Creek subdivision site will be served by the two access points. Access 1 will be on St. James Church Road opposite the St. James Elementary School bus roadway. Access 2 will be on Verdict Ridge Road opposite of the site access for the proposed Killian Creek Subdivision. Both will be full movement access points. The trip generation results indicate that the Canopy Creek Subdivision will generate approximately 1,648 daily trips, 125 morning-peak-hour trips and approximately 165 new afternoon-peak-hour trips.



*Verdict Ridge Road at St. James Church Road*

## 3. AREA CONDITIONS

The area of influence of the study site as provided by the Lincoln County Planning Department and the NCDOT includes the following eight intersections:

1. St. James Church Road and Kidville Road (unsignalized)
2. St. James Church Road and the St. James Elementary School bus driveway (unsignalized)
3. St. James Church Road and the St. James Elementary School driveway (unsignalized)
4. St. James Church Road and Verdict Ridge Road (unsignalized)
5. St. James Church Road/N. Egypt Rd. and Optimist Club Road (unsignalized)
6. NC 16 and Optimist Club Road (unsignalized-directional crossover)
7. NC 16 and U-Turn movement North of Optimist Club Road – AM peak only (unsignalized)
8. NC 16 and U-Turn movement South of Optimist Club Road – AM peak only (unsignalized)

St. James Church Road/North Little Egypt Road is a two-lane rural arterial roadway with a posted speed limit of 45 mph. Verdict Ridge Road is a two-lane residential street with a posted speed limit of 25 mph. Optimist Club Road is a two-lane rural collector roadway with a posted speed limit of 45 mph. NC 16 is a four-lane divided major thoroughfare with a posted speed limit of 60 mph.

There are currently no projected transportation improvements in the study area.

Morning and afternoon peak period turning movement counts were conducted at the five existing intersections as indicated in the following table:

<u>Intersection</u>	<u>AM Peak</u>	<u>PM Peak</u>
St. James Ch. Rd. & Kidville Rd.	6:30-8:30 AM on 11/9/16	4:30-6:30 PM on 11/9/16
St. James Ch. Rd. & St. James Elementary School Driveway	6:30-8:30 AM on 11/9/16	4:30-6:30 PM on 11/9/16
St. James Ch. Rd. & Verdict Ridge Rd.	6:30-8:30 AM on 11/9/16	4:30-6:30 PM on 11/9/16
St. James Ch. Rd./N. Little Egypt Rd. & Optimist Club Rd.	6:30-8:30 AM on 11/9/16	4:30-6:30 PM on 11/9/16
NC 16 & Optimist Club Rd.	6:30-8:30 AM on 11/9/16	4:30-6:30 PM on 11/9/16
NC 16 U-Turn North of Optimist Club Rd.	6:30-9:00 AM on 11/9/16	Not analyzed
NC 16 U-Turn North of Optimist Club Rd.	6:30-9:00 AM on 11/16/16	Not analyzed

Count data is provided in the Appendix. The count data was grown by 3 percent annually, per Lincoln County Planning Department. Figure 3 shows the 2010 turning movement volumes for the morning and afternoon peak hours.



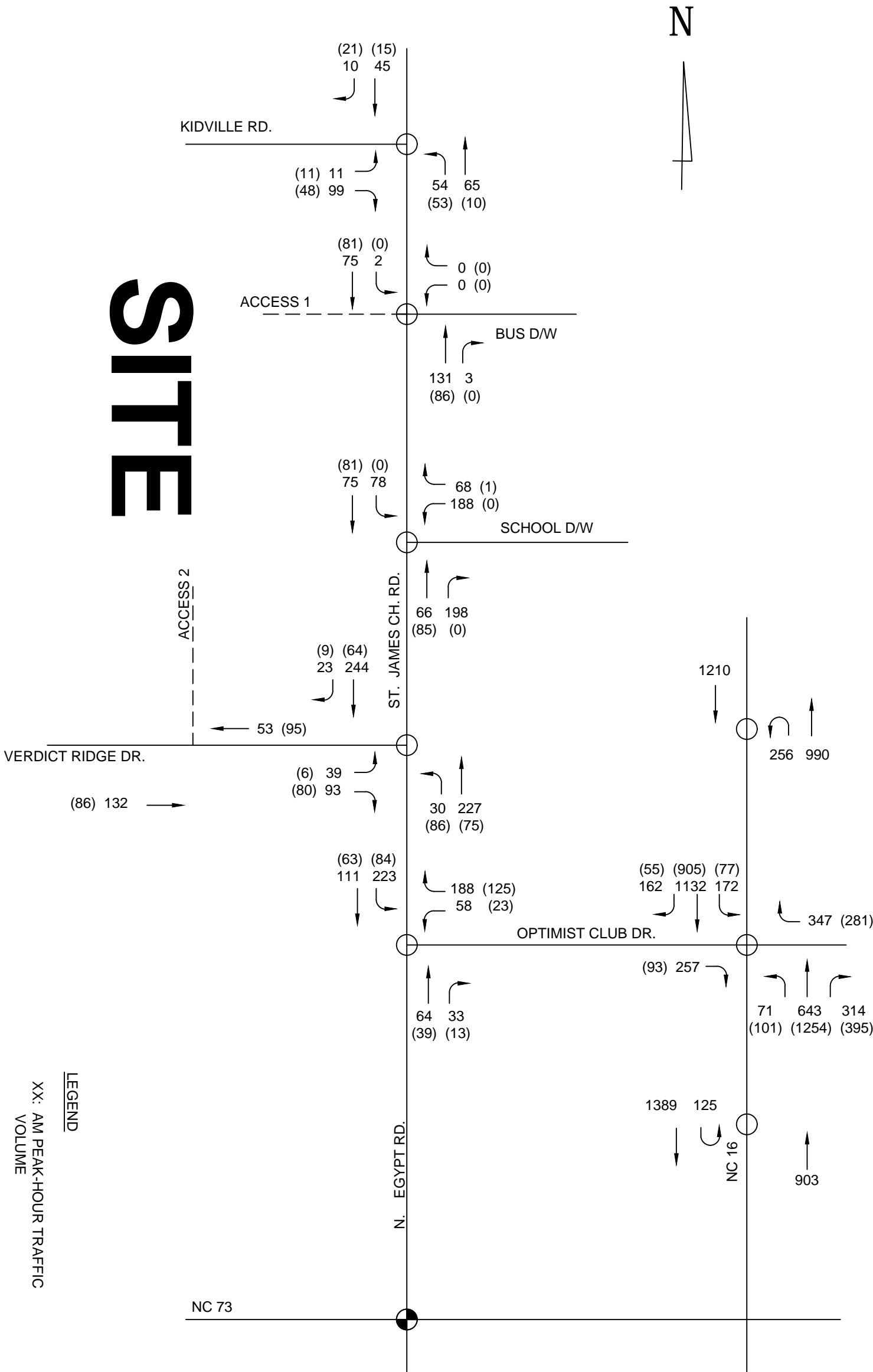
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#### 4. PROJECTED TRAFFIC

The projected background traffic volumes used in the analyses were developed from the existing (year 2017) peak-hour-turning-movement-count data. The 2017 intersection turning movement volumes were increased to obtain 2022 background volumes utilizing a growth rate of 3 percent, compounded annually. The projected traffic volumes used in the horizon year 2022 analysis are a compilation of three values: background traffic, offsite trip generation and site trip generation.

The daily and peak-hour-trip-generation data for the site is presented in Table 1. The estimates for the trips generated by all the land uses used in this study are obtained from the equations provided in the Institute of Transportation Engineers, Trip Generation Manual, 9<sup>th</sup> Edition. No hourly bus services exist in the study area and no trip generation reductions were taken for mass transit.

**Table 1: Site Trip Generation**

Land Use	Density	Daily	AM Peak Hour			PM Peak Hour		
			Enter	Exit	Total	Enter	Exit	Total
Single Family Detached Residential (LUC 210 equations)	165 DU	1,648	31	94	125	104	61	165

References: Trip Generation, 9th Edition, Institute of Transportation Engineers, Washington, DC. 2015.

The trip generation results indicate that the proposed development would generate approximately 1,648 daily trips, 125 morning-peak-hour trips and approximately 165 new afternoon-peak-hour trips.

The Lincoln County Planning Department has requested that one approved but not yet completed development be included in the document as an offsite traffic generator. The Killian Creek Subdivision which will consist of 58 single-family detached housing is situated on the southwest corner of St. James Church Road and Verdict Ridge Road. The build-out time for this offsite traffic generator is estimated to be completed by 2022, the build-out time frame for Canopy Creek.

Since a Traffic Study was not required for Killian Creek subdivision, the same directional distribution will be used as for the Canopy Creek Subdivision. The trip generation for the 58-unit subdivision is listed in Table 2.

**Table 2: Killian Creek Subdivision Trip Generation**

Land Use	Density	Daily	AM Peak Hour			PM Peak Hour		
			Enter	Exit	Total	Enter	Exit	Total
Single Family Detached Residential (LUC 210 equations)	58 DU	552	11	33	44	37	21	58

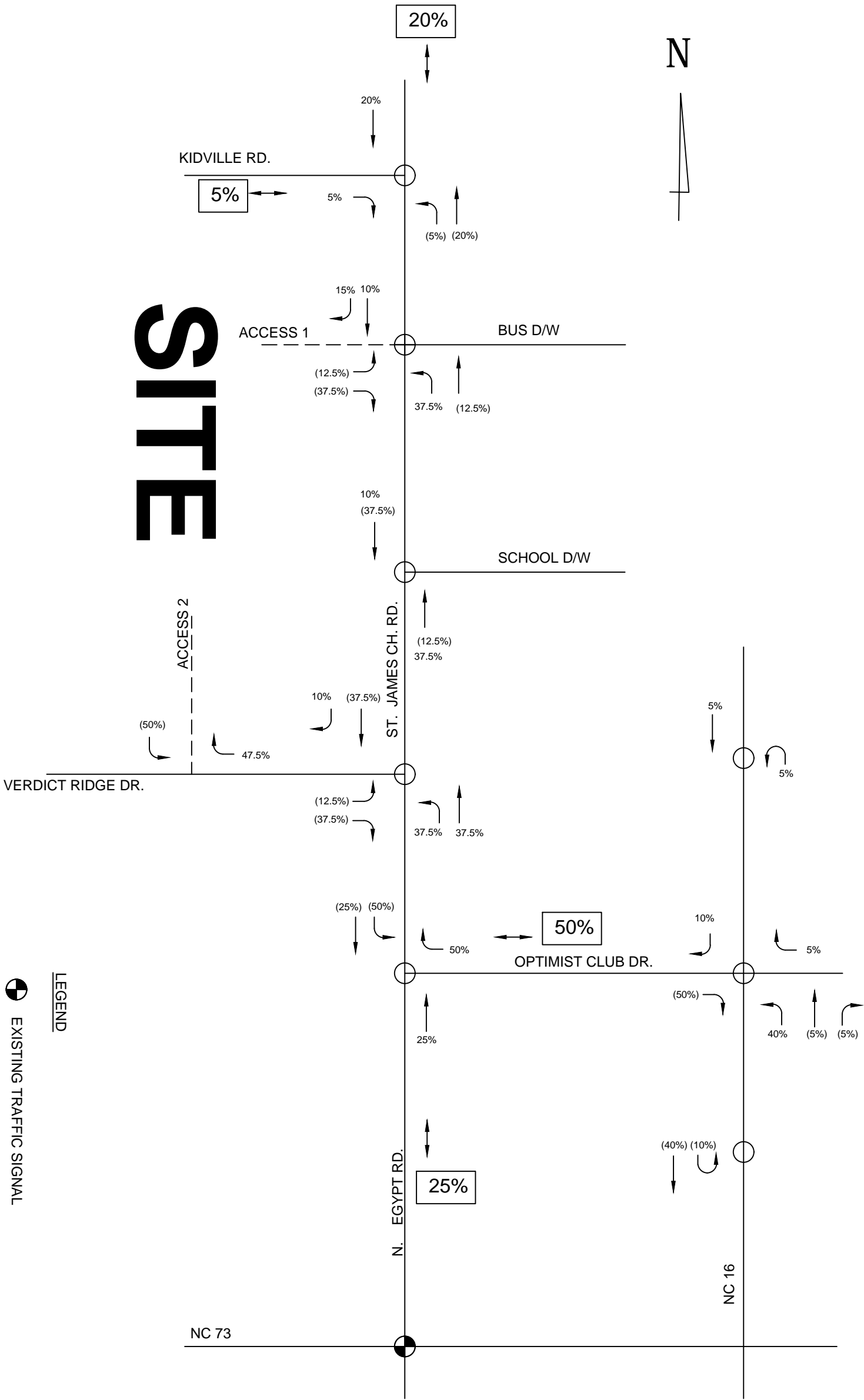
References: Trip Generation, 9th Edition, Institute of Transportation Engineers, Washington, DC. 2015.

The trip assignments for 2022 AM and PM peak hour traffic volumes under the No Build and Build scenarios are presented in Figures 5 through 8. The background traffic is indicated to the far left of the movement arrows followed by the offsite traffic in brackets and the site traffic in parentheses. The volumes are added to obtain the projected total traffic for that movement:

$$\text{Scenario 1: Background} + (\text{Offsite}) = [\text{Total}]$$

$$\text{Scenario 2: Background w/Offsite} + (\text{Site Traffic}) = [\text{Total}]$$

N



SITE

NOT TO SCALE

LEGEND

EXISTING TRAFFIC SIGNAL

STOP SIGN CONTROL

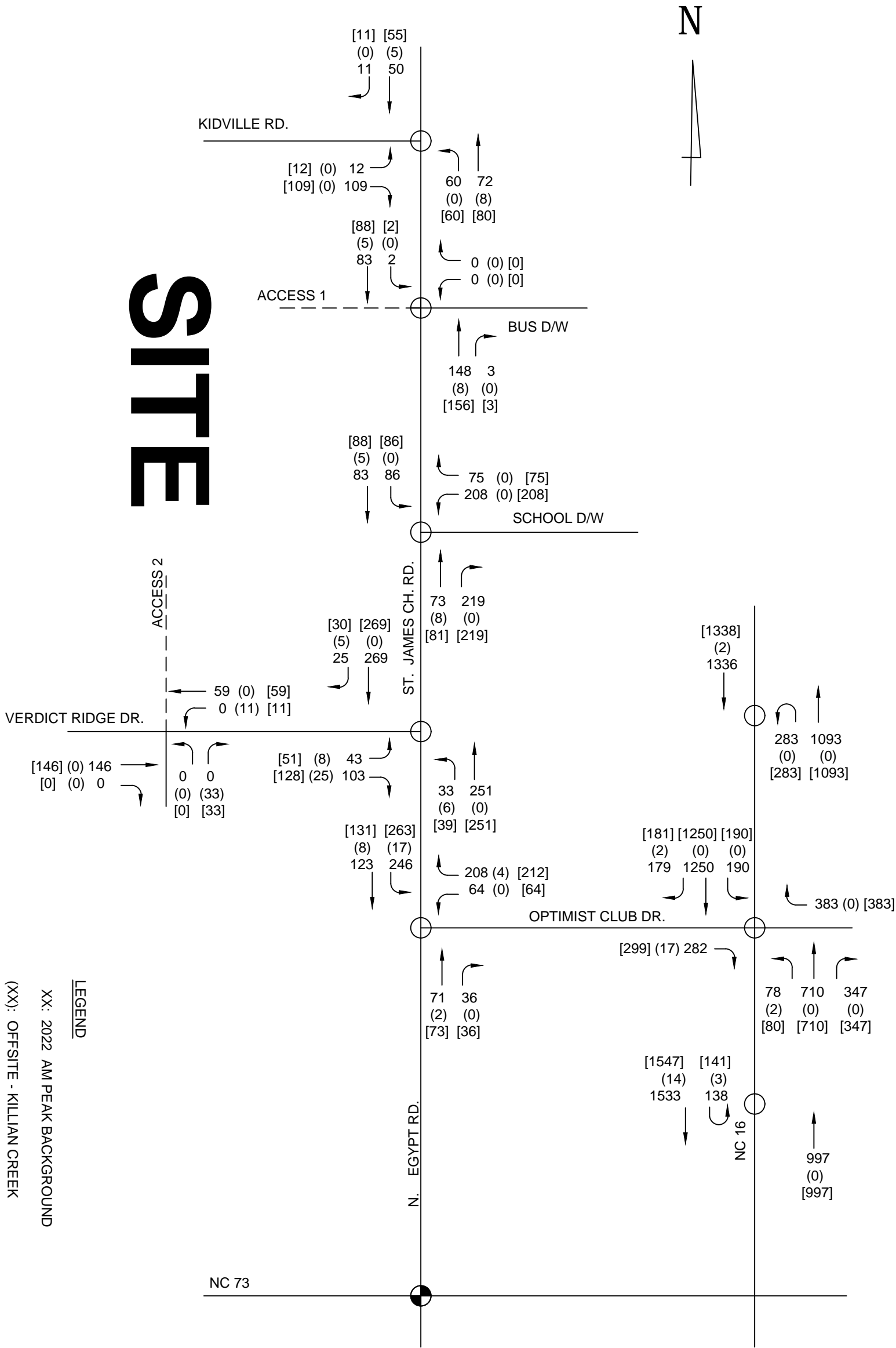
DIRECTIONAL MOVEMENT

xx% DIRECTIONAL % ENTERING SITE

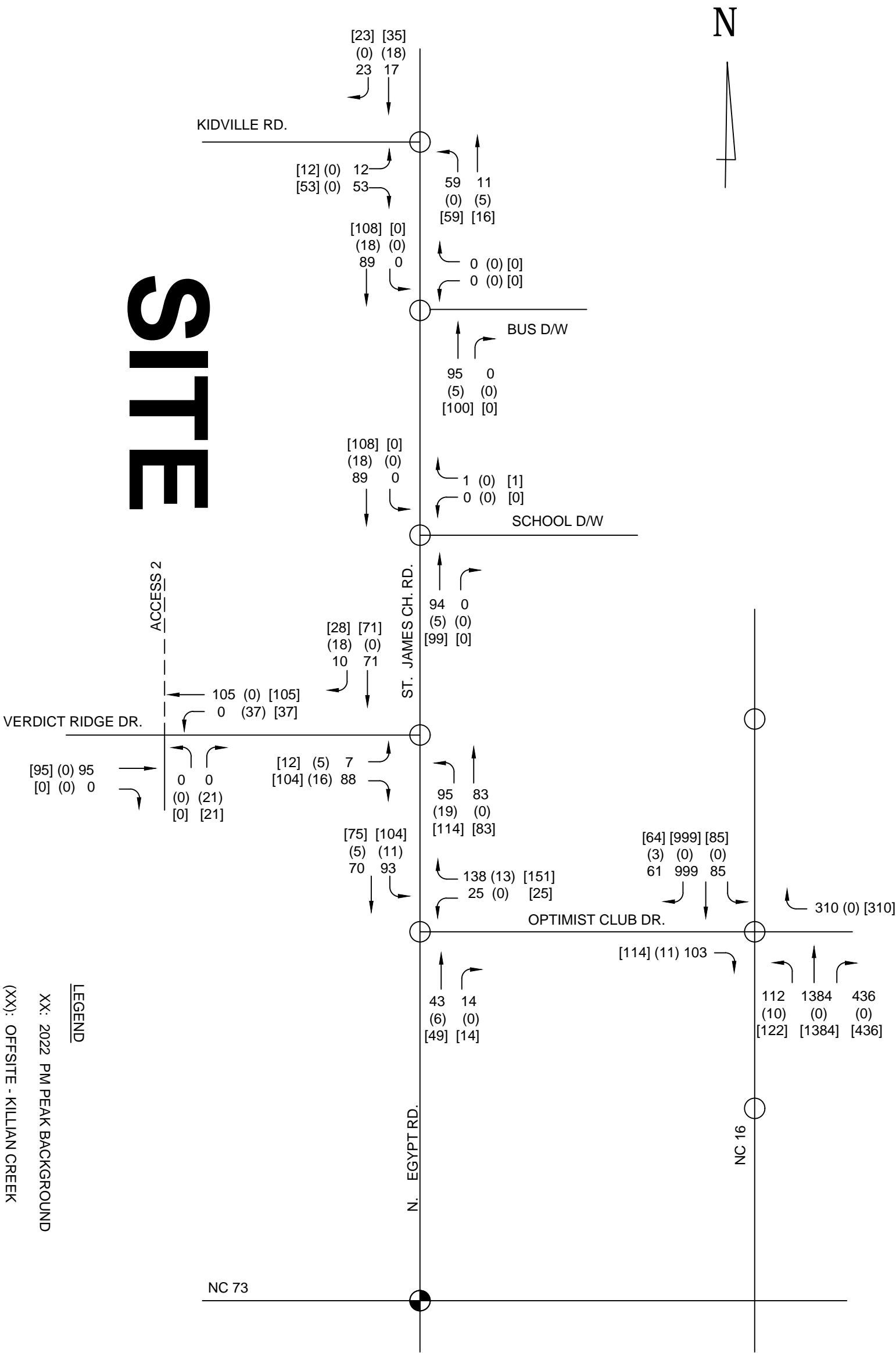
(xx%) DIRECTIONAL % EXITING SITE

xx% DIRECTIONAL %

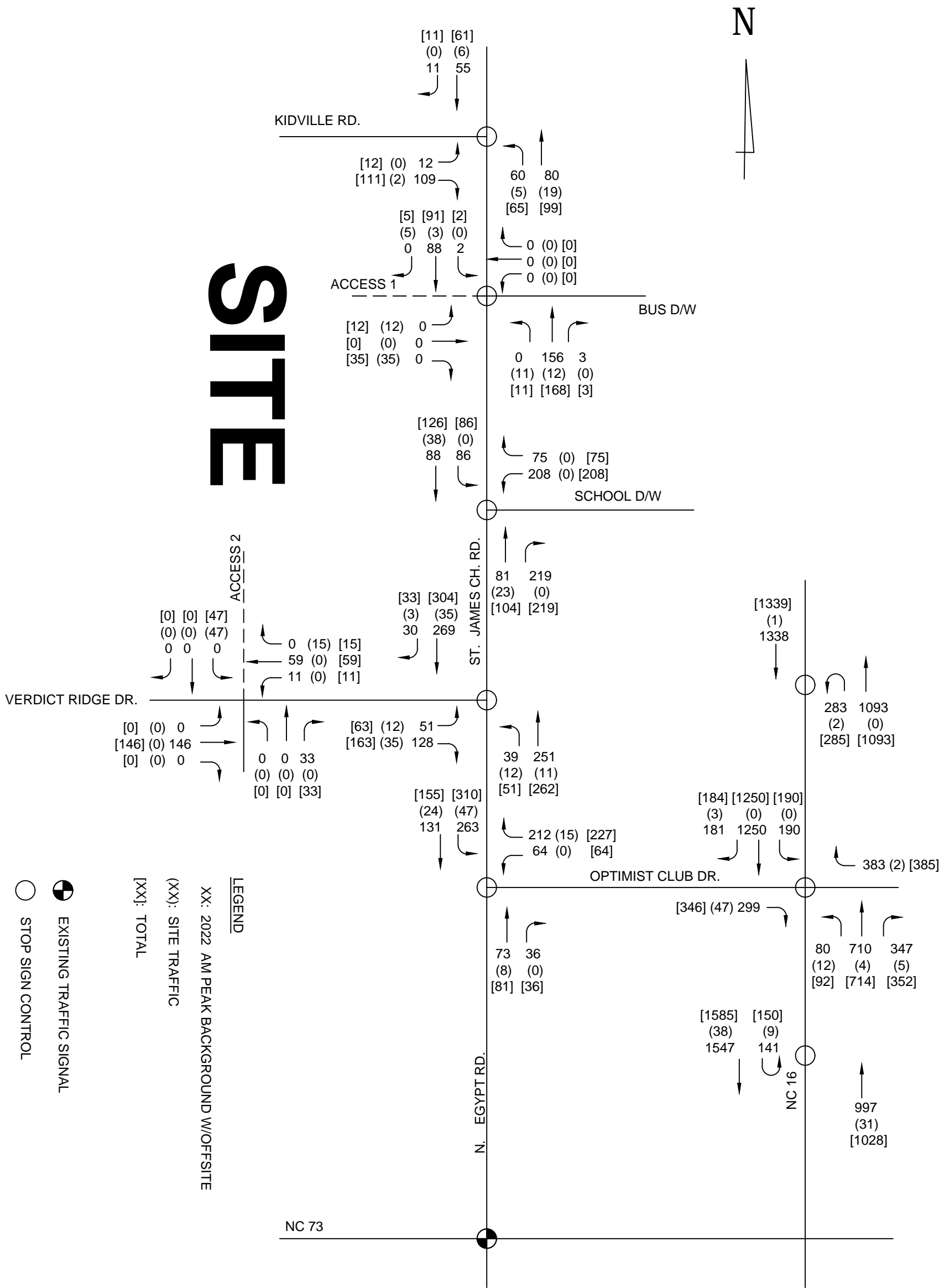
NOT TO SCALE



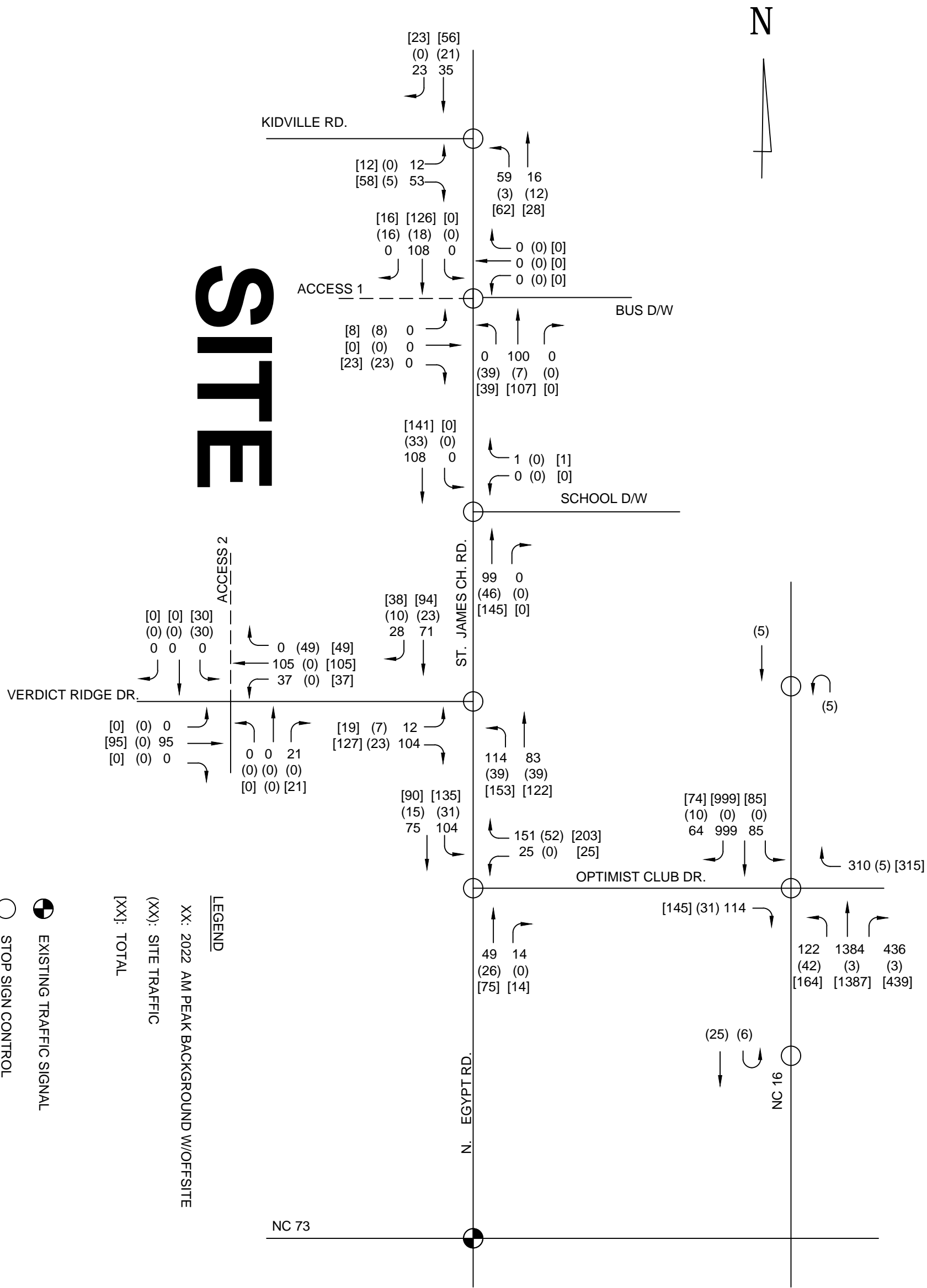
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NOT TO SCALE



NOT TO SCALE



## 5. TRAFFIC ANALYSIS

The intersections identified within the area of influence were analyzed to identify the traffic impact that the site development has under the build and no build conditions. Recommendations for roadway improvements to accommodate the traffic are a result of the analysis. The traffic analysis is based on the LOS analysis at the identified intersections. In order to determine the immediate impact of the site on the roadway network, the existing intersections were analyzed with and without the site traffic added to the 2022 traffic volumes. The intersections were analyzed assuming full development of the project in 2022.

The laneage required for each of the intersections within the study area to operate at acceptable levels of service in the year 2022 with site traffic added to the background volumes were determined by the analysis. In this way, it can be determined what improvements are necessitated by the development of the site.

Level of service is a qualitative measurement of traffic operations. It is a measure of delay time. The Transportation Research Board's Highway Capacity Manual<sup>1</sup> (HCM) defines six levels of service for intersections with LOS "A" representing the best operating condition and LOS "F" the worst. Table 16-2 of the HCM gives the criteria for signalized intersections and Table 17-2 gives the criteria for stop sign controlled intersections.

HCM Table 16-2		HCM Table 17-2	
Signalized Level of Service	Signal Delay per Vehicle (sec/veh)	Unsignalized Level of Service	Stopped Delay per Vehicle (sec/veh)
A	$\leq 10.0$	A	$\leq 10.0$
B	$> 10.0$ and $\leq 20.0$	B	$> 10.0$ and $\leq 15.0$
C	$> 20.0$ and $\leq 35.0$	C	$> 15.0$ and $\leq 25.0$
D	$> 35.0$ and $\leq 55.0$	D	$> 25.0$ and $\leq 35.0$
E	$> 55.0$ and $\leq 80.0$	E	$> 35.0$ and $\leq 50.0$
F	$> 80.0$	F	$> 50.0$

The Synchro Professional software (version 8.0) was used to determine the level of service, corresponding delay and capacity at the signalized and unsignalized intersections. This software is based on the analysis procedures defined in the HCM. The analysis optimizes the intersection splits for the approach volumes. A simulation was then performed using SimTraffic (Version 8) in order to obtain the queuing for each movement.

Typically, an intersection is said to be operating acceptably at a LOS "D" or better and at capacity with a volume-to-capacity (v/c) ratio of 1.00. A v/c ratio less than 1.00 is considered under capacity, 0.9 to 0.99 is considered approaching capacity and over 1.00 is considered over capacity. In addition, the v/c ratios for all approaches to an intersection should be 0.90 or less.

LOS for a TWSC intersection is determined by the control delay and is defined for the minor movements. Control delay includes initial deceleration delay, queue moveup time, stopped delay, and final acceleration delay. With respect to field measurements, control delay is defined as the total elapsed time from the time a vehicle stops at the end of the queue to the time the vehicle departs from the stop line. LOS is not defined for a TWSC intersection as a whole. For descriptive purposes, results

<sup>1</sup> National Research Council. Transportation Research Board. Highway Capacity Manual. Washington, DC. 2002. Chapters 2, 16, and 17.



between LOS A and LOS C for the side street approach are assumed to represent short delays. Results between LOS D and LOS E for the side street approach are assumed to represent moderate delays, and LOS F for the side street approach is assumed to represent long delays. It is typical for stop sign controlled side streets and roadways intersecting major streets to experience long delays during peak hours, particularly for left-turn movements. The majority of the traffic moving through the intersection on the major street experiences little or no delay.

The capacity analysis results are summarized by intersection below.

### **St. James Church Road and Kidville Road**

The intersection of St. James Church Road and Kidville Road is currently unsignalized and operating with stop control on the eastbound approach. The capacity analysis results for this intersection are shown in Table 3.

**Table 3: Capacity Analysis Results for St. James Church Road and Kidville Road**

Scenario	Approach	Lane Configuration	AM Peak Hour		PM Peak Hour	
			Approach LOS (Delay)	Overall LOS (Delay)	Approach LOS (Delay)	Overall LOS (Delay)
<b>2017 Existing</b>	EB <sup>1</sup>	L/R	A (9.2)	N/A <sup>2</sup>	A (8.9)	N/A <sup>2</sup>
	NB	L/T	A (3.2)		A (6.3)	
	SB	T/R	A (0.0)		A (0.0)	
<b>2022 No Build</b>	EB <sup>1</sup>	L/R	A (9.4)	N/A <sup>2</sup>	A (9.1)	N/A <sup>2</sup>
	NB	L/T	A (3.4)		A (5.9)	
	SB	T/R	A (0.0)		A (0.0)	
<b>2022 Build</b>	EB <sup>1</sup>	L/R	A (9.5)	N/A <sup>2</sup>	A (9.2)	N/A <sup>2</sup>
	NB	L/T	A (3.2)		A (5.3)	
	SB	T/R	A (0.0)		A (0.0)	

1. Stop-controlled approach for unsignalized intersection.

2. Overall intersection LOS is not provided for unsignalized intersections

As shown, this intersection is expected to operate under all scenarios with short delays on the minor street. No improvements are recommended at this intersection.

### **St. James Church Road and Access 1/St. James Elementary School Bus Driveway**

The intersection of St. James Church Road and St. James Elementary School Bus Driveway is currently unsignalized and operating with stop control on the St. James Elementary School Bus Driveway (eastbound) approach. A new westbound approach, Access 1 would be constructed as part of the site, which was assumed to have a shared left/through and exclusive right-turn lane for the analysis. In addition, northbound St. James Church Road was assumed to be restriped to provide an exclusive northbound left-turn lane to serve the entrance to Canopy Creek. The capacity analysis results for this intersection are shown in Table 4.

**Table 4: Capacity Analysis Results for St. James Church Road and Access 1/St. James Elementary School Bus Driveway**

Scenario	Approach	Lane Configuration	AM Peak Hour		PM Peak Hour	
			Approach LOS (Delay)	Overall LOS (Delay)	Approach LOS (Delay)	Overall LOS (Delay)
<b>2017 Existing</b>	WB <sup>1</sup>	L, R	A (0.0)	N/A <sup>2</sup>	A (0.0)	N/A <sup>2</sup>
	NB	T/R	A (0.0)		A (0.0)	
	SB	L, T	A (0.2)		A (0.0)	
<b>2022 No Build</b>	WB <sup>1</sup>	L, R	A (0.0)	N/A <sup>2</sup>	A (0.0)	N/A <sup>2</sup>
	NB	T/R	A (0.0)		A (0.0)	
	SB	L, T	A (0.2)		A (0.0)	
<b>2022 Build</b>	EB <sup>1</sup>	L/T/R	A (9.5)	N/A <sup>2</sup>	A (9.7)	N/A <sup>2</sup>
	WB <sup>1</sup>	L/T, R	A (0.0)		A (0.0)	
	NB	L, T/R	A (0.4)		A (2.0)	
	SB	L, T/R	A (0.2)		A (0.0)	

1. Stop-controlled approach for unsignalized intersection.

2. Overall intersection LOS is not provided for unsignalized intersections

As shown, this intersection is expected to operate under all scenarios with short delays on the minor street with the assumed laneage. No improvements are recommended at this intersection.

#### **St. James Church Road and the St. James Elementary School Driveway**

The intersection of St. James Church Road and St. James Elementary School Driveway is currently unsignalized and operating with stop control on the St. James Elementary School Driveway (westbound) approach. The capacity analysis results for this intersection are shown in Table 5.

**Table 5: Capacity Analysis Results for St. James Church Road and St. James Elementary School Driveway**

Scenario	Approach	Lane Configuration	AM Peak Hour		PM Peak Hour	
			Approach LOS (Delay)	Overall LOS (Delay)	Approach LOS (Delay)	Overall LOS (Delay)
<b>2017 Existing</b>	WB <sup>1</sup>	L, R	B (14.0)	N/A <sup>2</sup>	A (8.7)	N/A <sup>2</sup>
	NB	T/R	A (0.0)		A (0.0)	
	SB	L, T	A (4.1)		A (0.0)	
<b>2022 No Build</b>	WB <sup>1</sup>	L, R	C (15.9)	N/A <sup>2</sup>	A (8.8)	N/A <sup>2</sup>
	NB	T/R	A (0.0)		A (0.0)	
	SB	L, T	A (4.0)		A (0.0)	
<b>2022 Build</b>	WB <sup>1</sup>	L, R	C (17.7)	N/A <sup>2</sup>	A (9.1)	N/A <sup>2</sup>
	NB	T/R	A (0.0)		A (0.0)	
	SB	L, T	A (3.3)		A (0.0)	

1. Stop-controlled approach for unsignalized intersection.

2. Overall intersection LOS is not provided for unsignalized intersections

As shown, this intersection is expected to operate under all scenarios with short delays on the minor street. No improvements are recommended at this intersection.

### **St. James Church Road and Verdict Ridge Road**

The intersection of St. James Church Road and Verdict Ridge Road is currently unsignalized and operating with stop control on the Verdict Ridge Road (eastbound) approach. The capacity analysis results for this intersection are shown in Table 6.

**Table 6: Capacity Analysis Results for St. James Church Road and Verdict Ridge Road**

Scenario	Approach	Lane Configuration	AM Peak Hour		PM Peak Hour	
			Approach LOS (Delay)	Overall LOS (Delay)	Approach LOS (Delay)	Overall LOS (Delay)
<b>2017 Existing</b>	EB <sup>1</sup>	L/R	B (12.3)	N/A <sup>2</sup>	A (9.2)	N/A <sup>2</sup>
	NB	L/T	A (1.1)		A (4.2)	
	SB	T/R	A (0.0)		A (0.0)	
<b>2022 No Build</b>	EB <sup>1</sup>	L/R	B (13.9)	N/A <sup>2</sup>	A (9.7)	N/A <sup>2</sup>
	NB	L/T	A (1.4)		A (4.7)	
	SB	T/R	A (0.0)		A (0.0)	
<b>2022 Build</b>	EB <sup>1</sup>	L/R	C (16.6)	N/A <sup>2</sup>	B (10.6)	N/A <sup>2</sup>
	NB	L/T	A (1.7)		A (4.8)	
	SB	T/R	A (0.0)		A (0.0)	

1. Stop-controlled approach for unsignalized intersection.

2. Overall intersection LOS is not provided for unsignalized intersections

As shown, this intersection is expected to operate under all scenarios with short delays on the minor street. No improvements are recommended at this intersection.

### **St. James Church Road/N. Egypt Road and Optimist Club Road**

The intersection of St. James Church Road/N. Egypt Road and Optimist Club Road is currently unsignalized and operating with stop control on the Optimist Club Road (westbound) approach. The capacity analysis results for this intersection are shown in Table 7.

**Table 7: Capacity Analysis Results for St. James Church Road/N. Egypt Road and Optimist Club Road**

Scenario	Approach	Lane Configuration	AM Peak Hour		PM Peak Hour	
			Approach LOS (Delay)	Overall LOS (Delay)	Approach LOS (Delay)	Overall LOS (Delay)
<b>2017 Existing</b>	WB <sup>1</sup>	L/R	B (13.7)	N/A <sup>2</sup>	A (9.6)	N/A <sup>2</sup>
	NB	T/R	A (0.0)		A (0.0)	
	SB	L/T	A (5.7)		A (4.5)	
<b>2022 No Build</b>	WB <sup>1</sup>	L/R	C (16.4)	N/A <sup>2</sup>	A (10.0)	N/A <sup>2</sup>
	NB	T/R	A (0.0)		A (0.0)	
	SB	L/T	A (5.9)		A (4.6)	
<b>2022 Build</b>	WB <sup>1</sup>	L/R	C (20.0)	N/A <sup>2</sup>	B (10.7)	N/A <sup>2</sup>
	NB	T/R	A (0.0)		A (0.0)	
	SB	L/T	A (6.2)		A (4.9)	

1. Stop-controlled approach for unsignalized intersection.

2. Overall intersection LOS is not provided for unsignalized intersections

As shown, this intersection is expected to operate under all scenarios with short delays on the minor street. Due to minimal queueing and delay on southbound St. James Church Road, no improvements are recommended. On-site visual inspection of the intersection has determined there are instances of

occasional delay on westbound Optimist Club Road (a single lane approach) when a left-turning vehicle has to wait for a gap in oncoming traffic, resulting in gridlock for northbound right-turns. A short slip ramp will eliminate this dilemma and the developer has arranged to provide a participating share in the cost of construction.

### **NC 16 and Optimist Club Road**

The intersection of NC 16 and Optimist Club Road is operating as a unsignalized directional crossover with stop control on the Optimist Club Road (eastbound and westbound) approaches. The capacity analysis results for this intersection are shown in Table 8.

**Table 8: Capacity Analysis Results for NC 16 and Optimist Club Road**

Scenario	Approach	Lane Configuration	AM Peak Hour		PM Peak Hour	
			Approach LOS (Delay)	Overall LOS (Delay)	Approach LOS (Delay)	Overall LOS (Delay)
<b>2017 Existing</b>	EB <sup>1</sup>	R	D (27.1)	N/A <sup>2</sup>	B (13.5)	N/A <sup>2</sup>
	WB <sup>1</sup>	R	C (18.1)		E (39.8)	
	NB	L, T, T, R	A (1.0)		A (0.7)	
	SB	L, T, T, R	A (1.5)		A (1.4)	
<b>2022 No Build</b>	EB <sup>1</sup>	R	E (39.7)	N/A <sup>2</sup>	B (15.0)	N/A <sup>2</sup>
	WB <sup>1</sup>	R	C (22.4)		F (72.2)	
	NB	L, T, T, R	A (1.1)		A (0.8)	
	SB	L, T, T, R	A (1.6)		A (1.7)	
<b>2022 Build</b>	EB <sup>1</sup>	R	F (67.5)	N/A <sup>2</sup>	C (16.0)	N/A <sup>2</sup>
	WB <sup>1</sup>	R	C (22.8)		F (76.4)	
	NB	L, T, T, R	A (1.3)		A (1.1)	
	SB	L, T, T, R	A (1.7)		A (1.7)	

1. Stop-controlled approach for unsignalized intersection.

2. Overall intersection LOS is not provided for unsignalized intersections

As shown above, the directional crossover at NC 16 and Optimist Club Road is operating with moderate delays (LOS D and E) on the minor street approaches during the morning and afternoon peak hours, respectively. Under the 2022 No Build scenario, the minor street approaches are expected to operate with moderate and long delays (LOS E and F) during the morning and afternoon peak hours, respectively.

Under the 2022 Build scenario, the NC 16 and Optimist Club Road directional crossover is expected to deteriorate slightly.

This intersection has undergone extensive investigation and is a candidate for redesign and reconstruction. The developer of Canopy Creek has agreed to provide a participating share in the cost of that effort.

### **NC 16 and U-Turn movement North of Optimist Club Road**

The intersection facilitating U-turns just north of Optimist Club Road is currently unsignalized. The capacity analysis results for this intersection are shown in Table 9.

**Table 9: Capacity Analysis Results for NC 16 and U-Turn North of Optimist Club Road**

Scenario	Approach	Lane Configuration	AM Peak Hour		PM Peak Hour	
			Approach LOS (Delay)	Overall LOS (Delay)	Approach LOS (Delay)	Overall LOS (Delay)
<b>2017 Existing</b>	EB <sup>1</sup> NB SB	R U, T, T T, T	A (0.0) A (0.0) A (0.0)	N/A <sup>2</sup>	--	--
<b>2022 No Build</b>	EB <sup>1</sup> NB SB	R U, T, T T, T	A (0.0) A (0.0) A (0.0)	N/A <sup>2</sup>	--	--
<b>2022 Build</b>	EB <sup>1</sup> NB SB	R U, T, T T, T	A (0.0) A (0.0) A (0.0)	N/A <sup>2</sup>	--	--

1. Stop-controlled approach for unsignalized intersection.

2. Overall intersection LOS is not provided for unsignalized intersections

The capacity analysis results show acceptable levels of service at this intersection. It should be noted that queues of a maximum of 12 vehicles were observed at this location during the AM peak hour. No improvements are recommended at this intersection.

#### **NC 16 and U-Turn movement South of Optimist Club Road**

The intersection facilitating U-turns just south of Optimist Club Road is currently unsignalized. The capacity analysis results for this intersection are shown in Table 10.

**Table 10: Capacity Analysis Results for NC 16 and U-Turn South of Optimist Club Road**

Scenario	Approach	Lane Configuration	AM Peak Hour		PM Peak Hour	
			Approach LOS (Delay)	Overall LOS (Delay)	Approach LOS (Delay)	Overall LOS (Delay)
<b>2017 Existing</b>	NB SB	T, T U, T, T	A (0.0) A (0.0)	N/A <sup>1</sup>	--	--
<b>2022 No Build</b>	NB SB	T, T U, T, T	A (0.0) A (0.0)	N/A <sup>1</sup>	--	--
<b>2022 Build</b>	NB SB	T, T U, T, T	A (0.0) A (0.0)	N/A <sup>1</sup>	--	--

1. Overall intersection LOS is not provided for unsignalized intersections

As shown, this intersection is expected to operate under all scenarios with short delays; no improvements are recommended.

#### **Access 2 and Verdict Ridge Drive**

Access 2 is proposed as a full-movement access along Verdict Ridge Drive that would align with the proposed Killian Creek Subdivision access. This new intersection would operate with stop control on the northbound and southbound approaches. The capacity analysis results for this intersection are shown in Table 11.

**Table 11: Capacity Analysis Results for Access 2 and Verdict Ridge Drive**

Scenario	Approach	Lane Configuration	AM Peak Hour		PM Peak Hour	
			Approach LOS (Delay)	Overall LOS (Delay)	Approach LOS (Delay)	Overall LOS (Delay)
<b>2022 Build</b>	EB	L/T/R	A (0.0)	N/A <sup>2</sup>	A (0.0)	N/A <sup>2</sup>
	WB	L/T/R	A (1.0)		A (1.6)	
	NB <sup>1</sup>	L/T/R	A (9.2)		A (8.9)	
	SB <sup>1</sup>	L/T/R	B (11.2)		B (11.6)	

1. Stop-controlled approach for unsignalized intersection.

2. Overall intersection LOS is not provided for unsignalized intersections

As shown, this intersection is expected to operate with short delays on the minor street under 2022 Build conditions. No improvements are recommended at this intersection.

The existing and recommended laneage requirements for the intersections to operate at acceptable levels of service in 2022 are shown on Figures 9 and 10.



KIDVILLE RD.

BUS DRIVEWAY

SCHOOL D/W

ST. JAMES CH. RD.

VERDICT RIDGE DR.

OPTIMIST CLUB DR.

N. EGYPT RD.

NC 73

NC 16

SITE

LEGEND

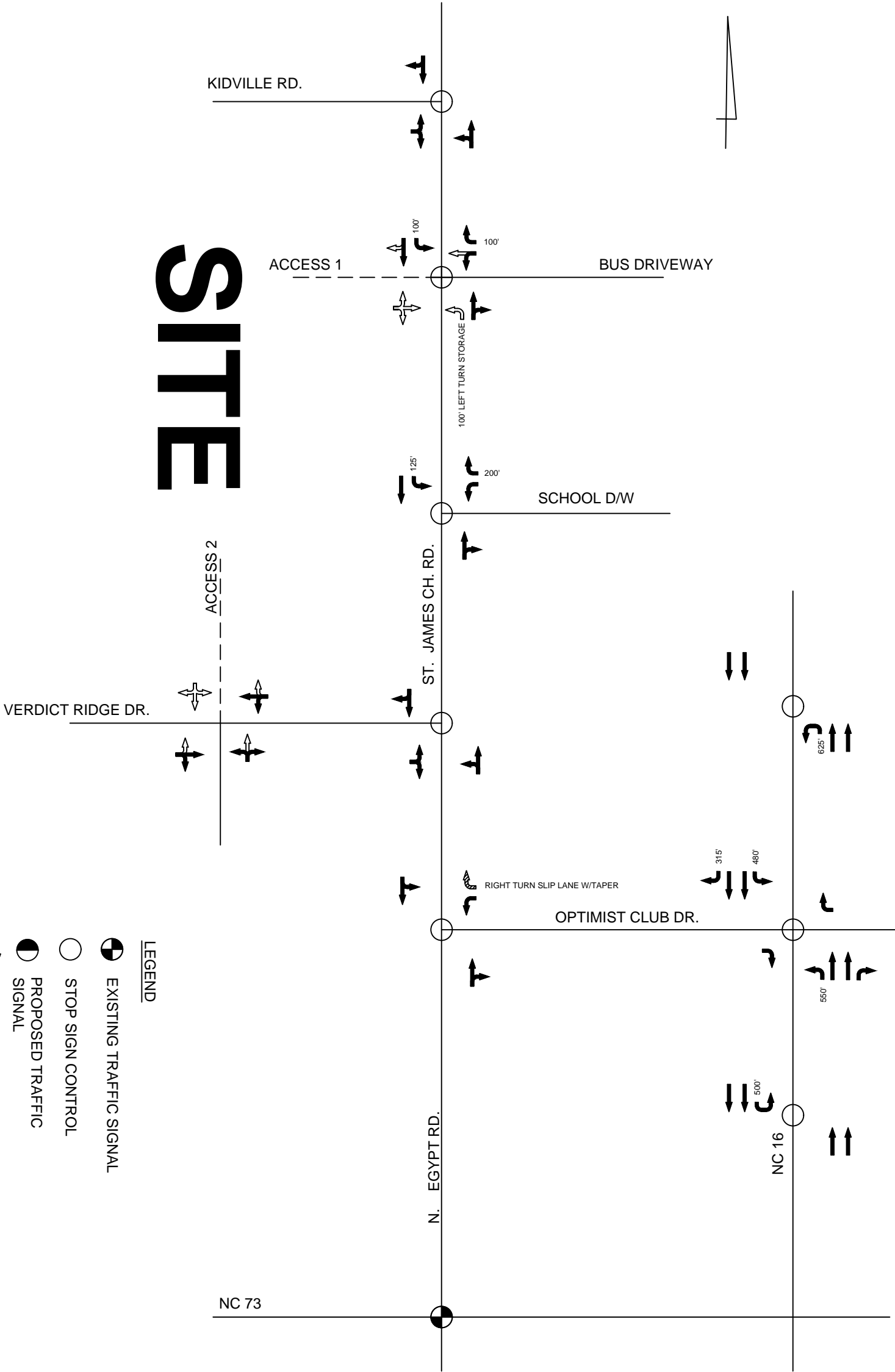
- EXISTING TRAFFIC SIGNAL
- STOP SIGN CONTROL
- EXISTING LANEAGE

NOT TO SCALE





# SITE



- LEGEND**
- EXISTING TRAFFIC SIGNAL
  - STOP SIGN CONTROL
  - PROPOSED TRAFFIC SIGNAL
  - EXISTING LANEAGE
  - DEVELOPER RESPONSIBILITY
  - OTHERS RESPONSIBILITY

NOT TO SCALE

FIGURE 10

RECOMMENDED LANEAGE

CANOPY CREEK  
SUBDIVISION

## 6. CONCLUSIONS

In conclusion, the results of the capacity analysis indicate the need for roadway improvements to the proposed street network by 2022. The required improvements and corresponding responsibility are discussed below:

### **Improvements Due to Background Traffic Growth:**

The NC 16 U-turn median cut north of Optimist Club Road is the closest access to the west side of NC 16 and provides the most convenient cross movement for motorists utilizing Optimist Club Road as well as those seeking to access the Charlotte area. The northbound U-turn median cut is situated approximately 1,390 feet north of Optimist Club Road and serves approximately 400 movements in the AM peak hour.

Many concerns expressed for accessing the southbound lanes of NC 16 is for those attempting to gain access to the west leg of Optimist Club Road, some of which are school buses. This movement requires acceleration from a stop position to cross two southbound through lanes in order to access a deceleration lane intersecting the west leg of Optimist Club Road. Typically, super street designs allow traffic signal control for U-turns, however, given the speed and volumes observed during the AM peak hour on southbound NC 16 this treatment does not appear prudent. Further study will be required to thoroughly evaluate the alternatives, one that is evident is to consider connecting the bulb serving the U-turns to the existing southbound right turn lane at Optimist Club Road, thereby eliminating the necessity of an extended weaving movement.

### **Improvements by Developer:**

In analyzing the intersections within the study area, we recommend the following specific improvements to accommodate the proposed development. These roadway improvements are needed for access management and are directly attributable to the site traffic volumes for the specific movements. These improvements should be the responsibility of the developer.

#### St. James Church Road & Access 1/St. James Elementary School Bus Roadway

- Install a northbound left-turn lane on St. James Church Road with 100 feet of storage.

In addition, the developer is providing participating shares toward improvements to Optimist Club Road at St. James Church Road and NC 16 and Optimist Club Road.