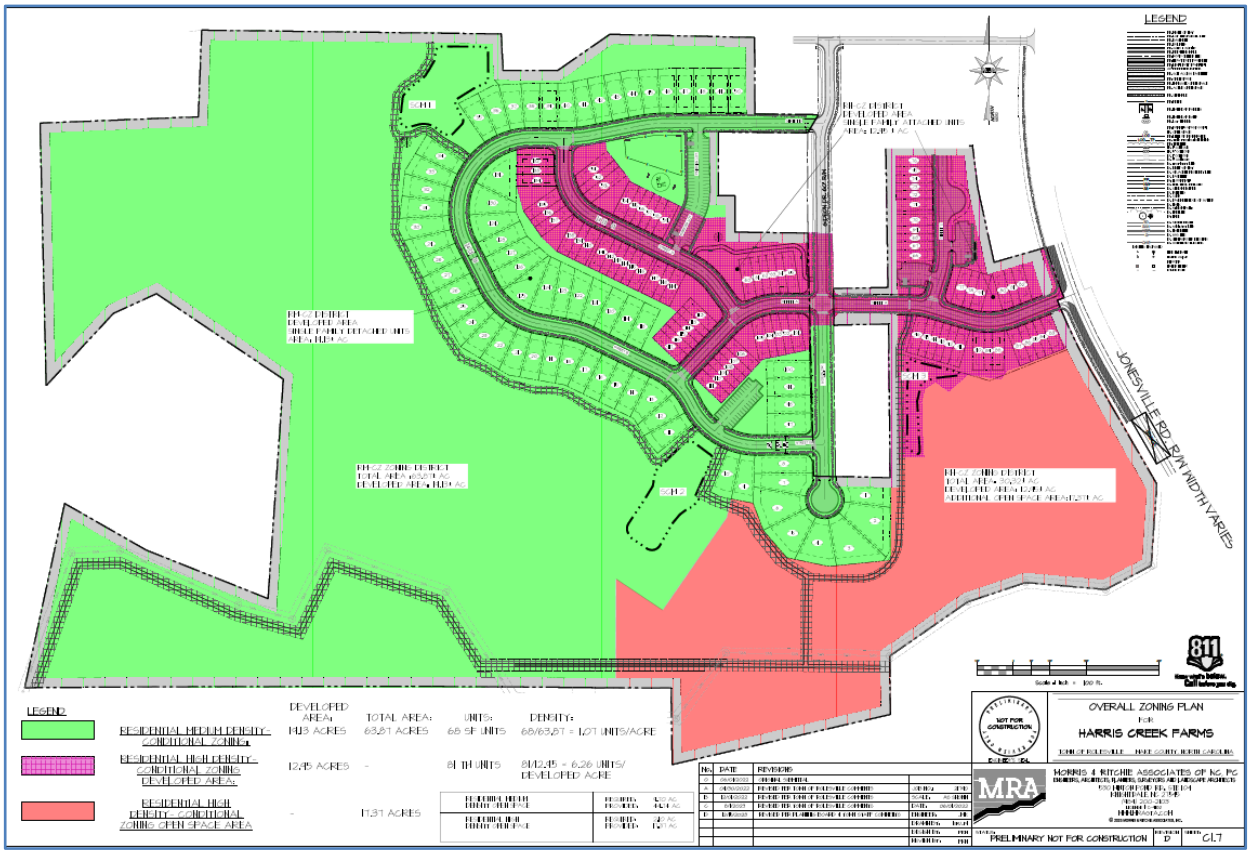
Memo

To: Town of Rolesville Planning Board
From: Meredith Gruber, Planning Director / Michael Elabarger, Senior Planner
Date: December 18, 2023
Re: Harris Creek Farms
Map Amendment Rezoning MA 22-08

Background

The Town of Rolesville Planning Department received a Map Amendment (Rezoning) application in August of 2022 [MA 22-08] for approximately 93 acres consisting of nineteen (19) tracts of land on the West side of Jonesville Road near Universal Drive. This application requests rezoning from Wake County's R-30 Zoning District to the Town's Land Development Ordinance (LDO), with a combination of two (2) Zoning Districts; Residential Medium as a Conditional Zoning District (RM-CZ) for an approximately 63 acre portion, and; Residential High as a Conditional Zoning (RH-CZ) District for approximately 30 acres. See Attachments 6 and 7 for Proposed District Boundary map and legal descriptions. Below is Sheet C1.7 (#11 in Attachment 5) whcih details the RM-CZ in green, and the RH-CZ District in red. The specifics of the project include maximums of 149 total residential dwellings units (comprised of maximums of 68 single-family detached units and 81 single-family attached (Townhome) units, and a minimum of 40% gross acreage (~37 acres) preserved as undisturbed open space.



Harris Creek Farms Concept Site Plan – District Boundaries

A Voluntary Annexation Petition (ANX 22-05) has also been submitted and reviewed and processed simultaneously with this Rezoning application request. There will be a combined Legislative hearing at a future Town Board of Commissioners meeting.

The Rezoning application includes a set of Conditions of Approval (see Attachment 8) and a Concept/Sketch Plan (see Attachment 5).

Applicant Justification

The Applicant provided this brief statement regarding the submittal (see Attachment 4 also).

> The development is proposing two zoning districts, RM-CZ and RH-CZ. The Cluster Development afforded in LDO Section 3.1.B will be utilized in the RM-CZ section of the project which will consist of single family residential uses. The RH-CZ section of the property will consist of single family attached uses in the form of townhomes. While the RH-CZ zoning allows 6-12 dwelling units per acre, the proposed density is 5.77 units/acre. A condition of a maximum allowable density of 6.0 units/acre within the RH-CZ district is proposed in order to ensure future conformance to the Site Plan proposed in this Map Amendment. The developed area within the RH-CZ portion of the site will be less than 15 acres. The RM-CZ section of the property will consist of single family detached units, the proposed density is 1.11 units/acre, under the maximum allowable density of 5.0 units/acre. The project as a whole will have a density of 1.60 units/total site area. The proposed uses are in accordance with 3.1.A.1-3-Residential Districts by providing a variety of residential housing choices with varied densities, types and designs; creating neighborhoods and preserving existing character while allowing for new, compatible development; and providing for safe, appropriately located lands for residential development consistent with the Rolesville Comprehensive Plan. The Future Land Use Map designates the subject property for residential use. The requested zoning is consistent and compatible with the Future Land Use Map and with the Rolesville 2017 Comprehensive Plan. We request your support for the proposed Zoning Map Amendment.

Neighborhood Meetings

The Applicant conducted a Neighborhood meeting on July 12, 2023, at which there were 24 attendees. The Applicant held an additional Meeting on October 24, 2023, at which there were 10 attendees; see Attachment 9.

Comprehensive Plan

Land Use

The 2017 Comprehensive Plan's Future Land Use Map designates the subject property, and the entire area south of Harris Creek to Mitchell Mill Road, as appropriate for Medium Density Residential development. Per the Plan, this is defined as:

> *Predominantly single-family residential uses with portion of duplex, townhouse, or multifamily residential. These are lots or tracts at a density range of three to five (3-5) dwelling units per gross acre including preserved open space areas along with limited non-residential uses under planned unit development or form base code provisions.*

Community Transportation Plan
The Town of Rolesville's Community Transportation Plan (CTP, adopted 2021) includes recommendations for Thoroughfares, Collectors, and intersections. There are no plans for new Collector roadways in the vicinity of the subject property, but there is this Thoroughfare Recommendation (page 79/131):

- Jonesville Road is planned to be a 2-lane (with Two Way Left Turn Lane), curb and gutter, bike lanes, and Sidewalks.

Per the Concept Site Plan, the project is proposing one new primary site access (Street A) to Jonesville Road, located south of where Universal Drive lies and the Harris Creek bridge crossing.

Intersection Recommendations
- There are no intersection recommendations associated with the subject property.
- The closest intersection recommendations are located at Mitchell Mill and Rolesville Roads, for an intersection realignment.

Transportation Improvements: To address transportation impacts reasonably expected to be generated by the development, the following road improvements shall be installed in accordance with plans approved by NCDOT and the Town of Rolesville:

- US 401 BYPASS AND JONESVILLE ROAD
  1. Conduct a full signal warrant analysis prior to full build-out of the proposed development and install a traffic signal if warranted and approved by the Town and NCDOT.
- US401 BYPASS AND EASTERN U-TURN LOCATION
  1. Conduct a full signal warrant analysis prior to full build-out of the proposed development and install a traffic signal if warranted and approved by the Town and NCDOT.
- MITCHELL MILL ROAD AND JONESVILLE ROAD/PEEBLES ROAD
  1. Construct a Southbound (Jonesville Road) left-turn lane with at least 10 feet of storage and appropriate deceleration and taper.
  2. Construct a Westbound (Mitchell Mill Road) right-turn lane with at least 100 feet of storage and appropriate deceleration and taper.
  3. Construct an Eastbound (Mitchell Mill Road) right-turn lane with at least 100 feet of storage and appropriate deceleration and taper.
  4. Conduct a full signal warrant analysis prior to full build-out of the proposed development and install a traffic signal if warranted and approved by the Town and NCDOT.
- JONESVILLE ROAD AND SITE DRIVE
  1. Construct the Eastbound approach (site drive) with one ingress land and one egress lane.
  2. Provide stop-control for the Eastbound approach (site drive).

Greenway and Bike Plans
As per the 2022 Greenway and Bike Plans, proposed pedestrian routes are shown in the following locations:
- A ten-foot (10') private maintained greenway trail with public access easement, turns into a twenty-foot (20') trail easement before returning to a ten-foot (10') private maintained

greenway trail with public access easement is shown on the northwest side of the property, along Harris Creek.

Consistency

The Applicant's rezoning request is consistent with the Town of Rolesville's Comprehensive Plan for the following reasons:

- The proposed mix of residential product types with a commercial element fits the Medium Density Residential land use description.
- The proposed vehicular circulation network is in harmony/no conflict with the Town's Community Transportation Plan.
- The proposed greenways will establish pedestrian connections as recommended by Rolesville's Greenway Plan.

Traffic

Traffic Impact Analysis

The consulting firm, Ramey Kemp Associates, performed the Traffic Impact Analysis (TIA) for this project on behalf of the Town; the study analyzed a development of 68 Single Family Detached and 81 Single family Attached (townhome) housing units. The Final Sealed Report dated May 08, 2023, is included as Attachment 10 to this memo. Traffic conditions during weekday AM and PM peak hours were looked at in four (4) scenarios: 2022 Existing Traffic Conditions, 2027 No-build Traffic Conditions, 2027 Build Traffic Conditions and 2027 Build-Improved Traffic Conditions. See excerpted Table E-1 from the TIA report:

Table E-1: Site Trip Generation

Land Use (ITE Code)	Intensity	Daily Traffic (vpd)	Weekday AM Peak Hour Trips (vph)			Weekday PM Peak Hour Trips (vph)		
			Enter	Exit	Total	Enter	Exit	Total
Single-Family Home (210)	68 DU	708	13	39	52	44	25	69
Single Family Attached (215)	81 DU	568	9	27	36	26	19	45
Total Primary Trips		**1,276**	**22**	**66**	**88**	**70**	**44**	**114**

Four intersections were studied for capacity analysis and Level of Service (LOS) impact of this development – US 401 Bypass and Jonesville Road; US 401 Bypass and Eastern U-turn location; Mitchell Mill Road and Jonesville Road / Peebles Road and Jonesville Road and Universal Drive.

TIA Summary – Intersection Improvements	
Recommendations	
Future Traffic Conditions A growth rate of 0% was used due to the number of developments included in the background traffic and the proximity of some of these developments to	• Cobblestone Crossing Mixed-Use (Cobblestone) • Young Street PUD (The Point) • Wheeler Tract (Rolesville Crossing) • Louisbury Road Assemblage • Kalas / Watkins Family Property (Kalas Falls) • 5109 Mitchell Mill • Hills at Harris Creek

the proposed development. The following adjacent developments were identified to be considered under future conditions:	
US 401 Bypass and Jonesville Road	• Conduct a full signal warrant analysis prior to Full Build-out of the proposed development and install a traffic signal if warranted and approved by NCDOT and Town.
Mitchell Mill Road and Jonesville Road / Peebles Road	• Construct a south-bound (Jonesville Rd) left-turn lane with at least 100 feet of storage and appropriate deceleration and taper. ○ *It should be noted that this improvement was also identified by the 5109 Mitchell Mill Rd and Hills at Harris Creek TIA.*
	• Construct an eastbound (Mitchell Mill Rd) left-turn lane with at least 100 feet of storage and appropriate deceleration and taper. • *It should be noted that this improvement was also identified by the 5109 Mitchell Mill Rd TIA.*
	• Construct a westbound (Mitchell Mill Road) right-turn lane with at least 100 feet of storage and appropriate deceleration and taper. • *It should be noted that this improvement was also identified by the Hills at Harris Creek TIA.*
	• Conduct a full signal warrant analysis prior to Full Build-out of the proposed development and install a traffic signal if warranted and approved by NCDOT and Town.
Jonesville Road and Site Drive	• Construct the eastbound approach (Site Drive) with one ingress lane and one egress lane.
	• Provide stop control for the eastbound approach (Site Drive).

Development Review

The Technical Review Committee (TRC) reviewed three (4) versions of the Rezoning application, with all comments pertinent to the consideration of the proposed districts and the general development plan being resolved. Note that the TRC review of the Concept Plan (Attachment 5) was not an LDO subdivision and/or site development regulation review, as it is only a conceptual plan, and not an engineered and dimensioned layout. Should the proposed Zoning Districts be approved, the project would next process an Administratively reviewed/approved Major Preliminary Subdivision Plat (PSP) application, followed by Construction Infrastructure Drawings (CID).

Overall Analysis

The proposed **Residential Medium (RM)** district (63.87 acres) entails developing a maximum of 68 single family detached (SFD) dwelling units, exercising the LDO Section 3.1.B. option of Cluster Development at the time of Major Preliminary Subdivision Plat to achieve that lot count. The resultant density – 68 dwelling units over 63.87 acres – is 0.93 dwelling units per acre. The theoretical by-right maximum density – 63.87 acres (2,782,177 SF) / 15,000 SF minimum lot size = 185 dwelling units or a density of [185 units/63.87 acres =] 2.89 d/u per acre. Therefore the proposed Density is approximately 1/3 that of the by-right density and will require a minimum of 40% preserved Open Space compared to the (LDO Section 6.2.1.D.1.) by-right minimum of 12%.

The proposed **Residential High (RH)** district (30.32 acres) entails developing a maximum of 81 single family attached (townhome) dwelling units; the Concept Site Plan is demonstrating that the project will comply with the LDO Section 3.1.3.B./Special Standard requirement that '*No more than 15 gross acres may be assigned to attached … uses*.' Note – this standard/requirement is not the same as the acreage of the RH District, but rather, the area physically supporting 'attached uses'. This requirement shall be accurately demonstrated at the time of Major Preliminary Subdivision Plat review. The resultant density – 81 dwelling units over 30.32 acres – is 2.67 dwelling Units per acre; when only contemplating the 81 units within the maximum of 15 acres maximum area used to support the use, the density calculation rises to 5.4 dwelling units per acre. Calculating a theoretical by-right lot yield for Townhomes in the RH district is more difficult than (SFD in the RM District) but using the minimum 2,000 SF lot size across the maximum of 15 acres, that yield would be 326 dwelling units; that number would be impossible to achieve given unique aspects like the minimum 30' separation requirements be Townhome buildings.

Individually, the proposed RM and RH Districts are committing to far less than the LDO stated maximum densities and far less than the theoretical by-right subdivision yields. Collectively, the gross density of the proposed combined 149 dwelling units over 93 acres = **1.6 units per acre**. In summary, the proposed housing types are consistent with the Comprehensive Plan Future Land Use designation of Medium Density Residential, and the proposed density actually matches the **Low** Density Future Land Use category.

Staff Recommendation

Staff finds the proposed Rezoning request MA 22-08 is consistent with the Comprehensive Plan and recommends Approval.

Proposed Motion

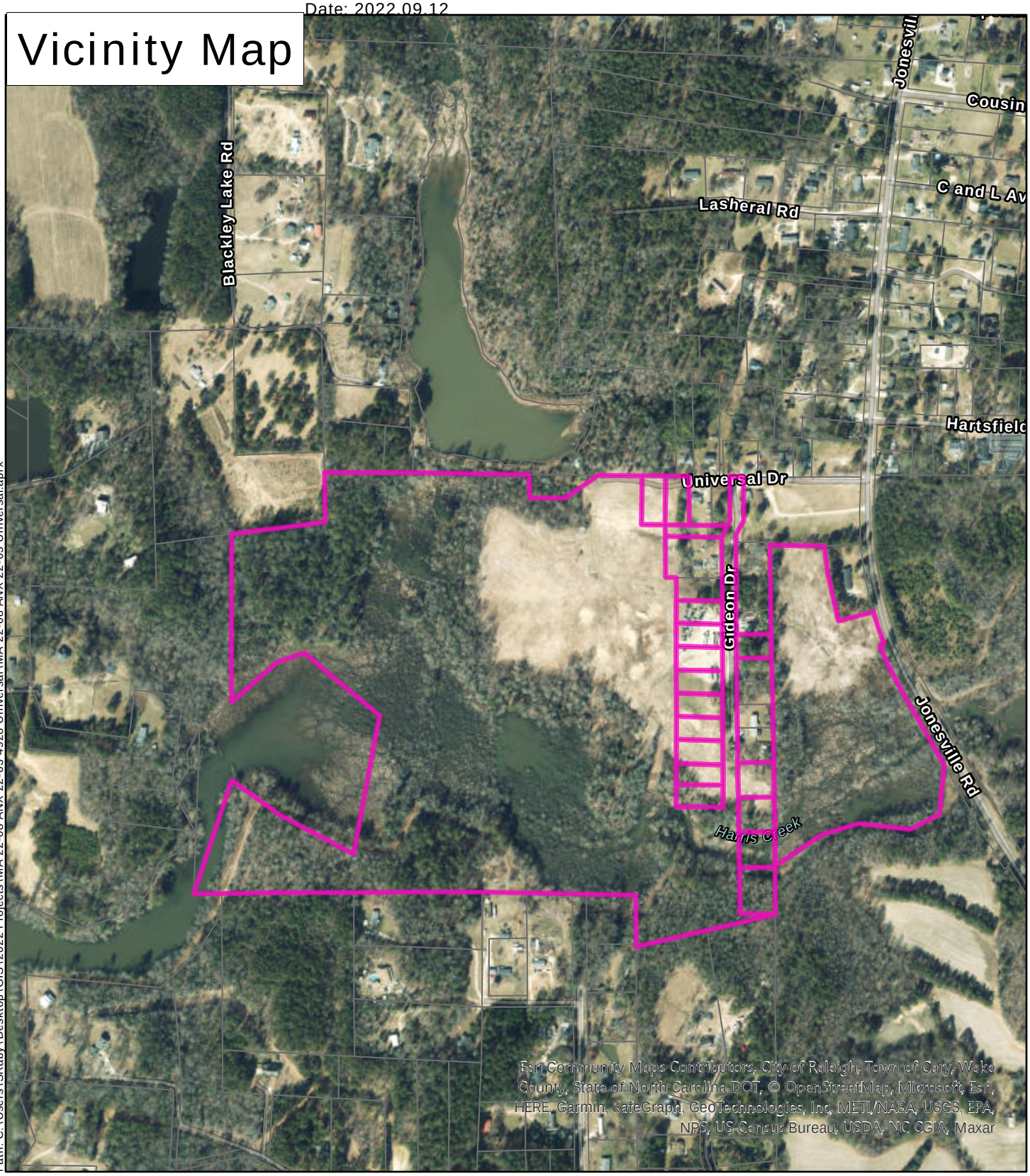
Motion to recommend to the Town Board of Commissioners (approval or denial) of Rezoning request MA 22-08 – Harris Creek Farms.

Attachments	
1	Vicinity Map
2	Zoning Map
3	Future Land Use Map
4	Map Amendment Application
5	Concept Site Plan, December 15, 2023
6	Zoning District Boundaries
7	Zoning District Legal Descriptions
8	Proposed Conditions of Approval
9	Neighborhood Meeting Package, July 12, 2023 and October 14, 2023
10	Traffic Impact Analysis (TIA), May 8, 2023

Attachment #1

Case: MA 22-08 ANX 22-05 Harris Creek Farms
Address: 4928 Universal
PIN: 1757277811, 1757375276, 1757375365, 1757375464, 1757375575, 1757375665, 1757375765, 1757375865, 1757375975, 1757385064, 1757384572, 1757383572, 1757368816, 1757378013, 1757378109, 1757378303, 1757377990, 1757471559, 1757385349
Date: 2022.09.12

Vicinity Map



0 0.07 0.15 0.3 Miles

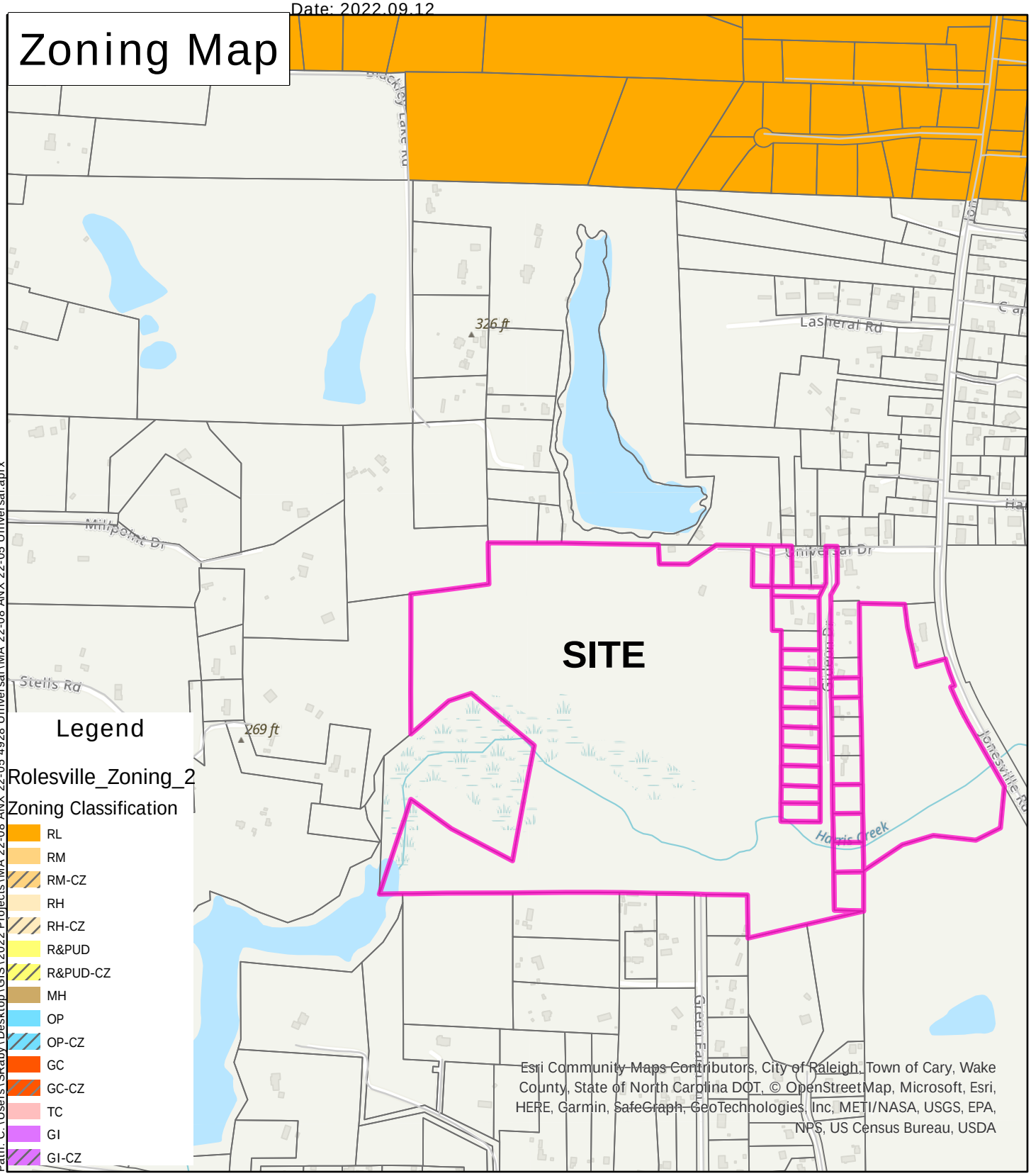
Date Saved: 9/12/2022 4:00 PM

Path: C:\Users\SRaby\Desktop\GIS\2022 Projects\MA 22-08 ANX 22-05 4928 Universal\MA 22-08 ANX 22-05 Universal.aprx

Attachment #2

Case: MA 22-08 ANX 22-05 Harris Creek Farms
Address: 4928 Universal
PIN: 1757277811, 1757375276, 1757375365, 1757375464, 1757375575, 1757375665, 1757375765, 1757375865, 1757375975, 1757385064, 1757384572, 1757383572, 1757368816, 1757378013, 1757378109, 1757378303, 1757377990, 1757471559, 1757385349
Date: 2022.09.12

Zoning Map



Date Saved: 9/13/2022 4:08 PM
Path: C:\Users\SRaby\Desktop\GIS\2022 Projects\MA 22-08 ANX 22-05 4928 Universal\MA 22-08 ANX 22-05 Universal.aprx

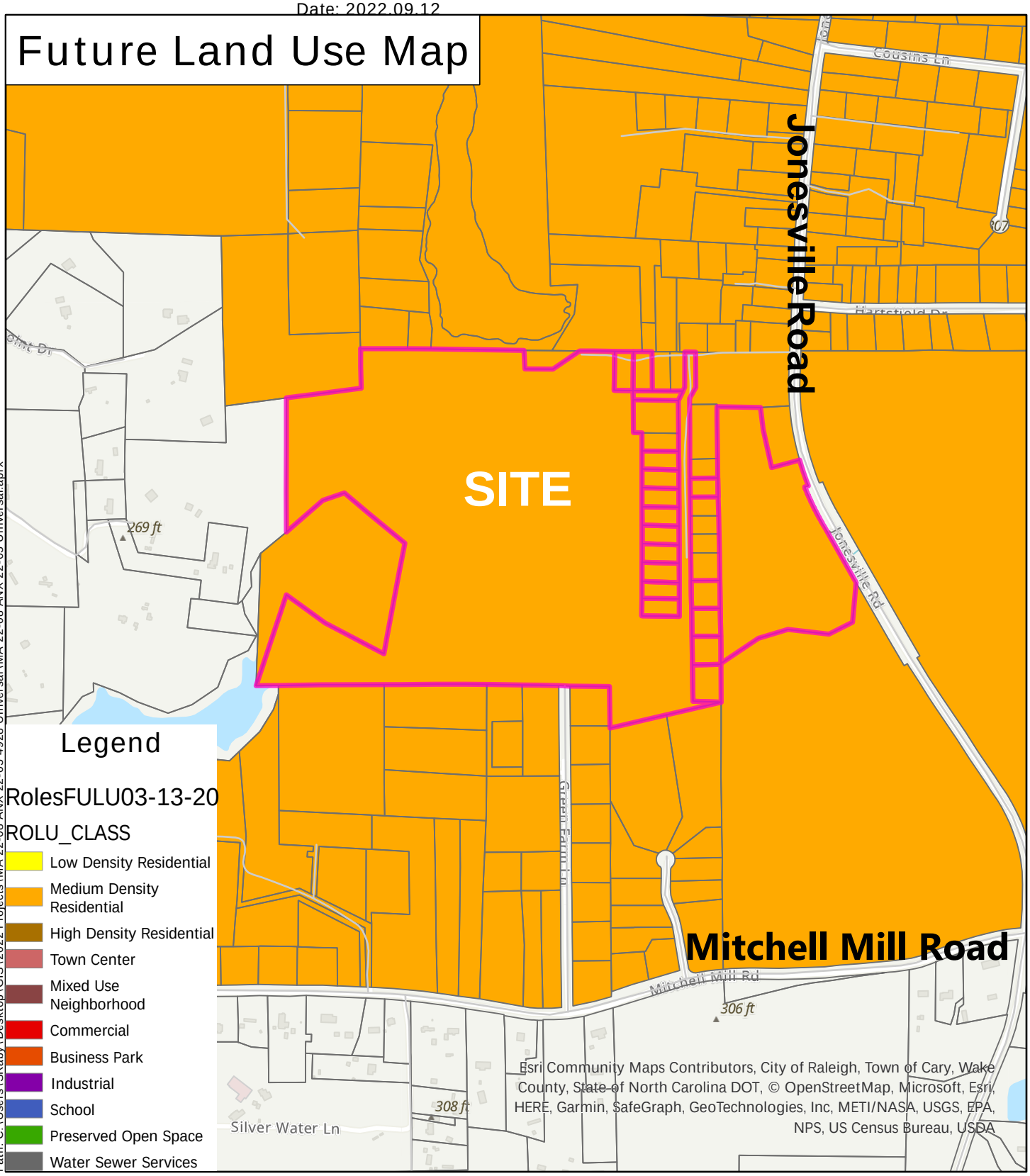
***Site is approximately 1 mile from Carlton Pointe**

0 0.04 0.08 0.16 Miles
Miles

Attachment #3

Case: MA 22-08 ANX 22-05 Harris Creek Farms
Address: 4928 Universal
PIN: 1757277811, 1757375276, 1757375365, 1757375464, 1757375575, 1757375665, 1757375765, 1757375865, 1757375975, 1757385064, 1757384572, 1757383572, 1757368816, 1757378013, 1757378109, 1757378303, 1757377990, 1757471559, 1757385349
Date: 2022.09.12

Future Land Use Map



Legend

RolesFULU03-13-20

ROLU_CLASS

- Low Density Residential
- Medium Density Residential
- High Density Residential
- Town Center
- Mixed Use Neighborhood
- Commercial
- Business Park
- Industrial
- School
- Preserved Open Space
- Water Sewer Services

0 0.1 0.2 0 0.4 Miles
Miles

Date Saved: 9/13/2022 4:16 PM

Path: C:\Users\SRaby\Desktop\GIS\2022 Projects\MA 22-08 ANX 22-05 4928 Universal\MA 22-08 ANX 22-05 Universal.aprx

Attachment #4

Rolesville
Genuine Community • Capital Connection
Est. 1837

Case No. MA 22-08-____

Date rcvd 12/1/2022

Map Amendment Application

Contact Information

Property Owner CHE NP ING

Address 10030 GREEN L EVEL CHUR CH RD STE 802 #149 City/State/Zip CARY NC 27519-8195

Phone 919-798-0429 Email plng@thecscgrp.com

Developer The CSC Group, LL C

Contact Name Ping Chen

Address 10030 GREEN LEVEL CHUR CH RD STE 802 #149 City/State/Zip CARY NC 27519-8195

Phone 919-798-0429 Email ping@thecscgrp.com

Property Information

Address 4928 UNIVERSAL DR.

Wake County PIN(s) 1757277811, 1757375276, 1757375365, 1757375464, 1757375575, 1757375665, 1757375765, 1757375865, 1757375975, 1757385064, 1757384572, 1757383572, 1757368816, 1757378013, 1757378109, 1757378303, 1757377368, 1757471

Current Zoning District R-30 Requested Zoning District RM-C Z an CH C Z

Total Acreage 93.22

Owner Signature

I hereby certify that the information contained herein is true and completed. I understand that if any item is found to be otherwise after evidentiary hearing before the Town Board of Commissioners, that the action of the Board may be invalidated.

Signature _____ Date 12/01/2022

STATE OF NORTH CAROLINA

COUNTY OF Wake

I, a Notary Public, do hereby certify that Ping Chen

personally appeared before me this day and acknowledged the due execution of the foregoing instrument. This the 1st *day of* December 2022.

My commission expires 8/18/2027

Signature _____

CHADWICK A BARBOUR NOTARY PUBLIC WAKE COUNTY NC My Commission Expires 08-18-27 Seal

Map Amendment Application

Metes and Bounds Description of Property

SEE EXHIBIT "A" AND "B" FOR METES AND BOUNDS DESCRIPTION.

Rolesville
Genuine Community • Capital Connection
Est. 1837

Map Amendment Application

Rezoning Justification

The applicant is proposing a Conditional Rezoning Map Amendment Application to zone the subject property to Residential Medium Density Conditional Zoning (RM-CZ) and Residential High Density Conditional Zoning (RH-CZ) Zoning Districts. In support of this request the applicant offers the following information and conditions:

The subject property is approximately 93 +/- acres located west of Jonesville Road north of it's intersection of Mitchell Mill Road and bordered by Harris Creek. The property is currently zoned R-30 by Wake County, a rural holding district. The subject property is planned to come into the Town of Rolesville and to be developed as a part of the town. The subject property was included in the 2017 Rolesville Comprehensive Plan.

The development is proposing two zoning districts, RM-CZ and RH-CZ. The Cluster Development afforded in LDO Section 3.1.B will be utilized in the RM-CZ section of the project which will consist of single family residential uses. The RH-CZ section of the property will consist of single family attached uses in the form of townhomes. While the RH-CZ zoning allows 6-12 dwelling units per acre, the proposed density is 5.77 units/acre. A condition of a maximum allowable density of 6.0 units/acre within the RH-CZ district is proposed in order to ensure future conformance to the Site Plan proposed in this Map Amendment. The developed area within the RH-CZ portion of the site will be less than 15 acres. The RM-CZ section of the property will consist of single family detached units, the proposed density is 1.11 units/acre, under the maximum allowable density of 5.0 units/acre. The project as a whole will have a density of 1.60 units/total site area. The proposed uses are in accordance with 3.1.A.1-3-Residential Districts by providing a variety of residential housing choices with varied densities, types and designs; creating neighborhoods and preserving existing character while allowing for new, compatible development; and providing for safe, appropriately located lands for residential development consistent with the Rolesville Comprehensive Plan. The Future Land Use Map designates the subject property for residential use. The requested zoning is consistent and compatible with the Future Land Use Map and with the Rolesville 2017 Comprehensive Plan. We request your support for the proposed Zoning Map Amendment.

Voluntary Zoning Conditions:
1. Layout proposed herein shall be preserved in all future submittal and plans.
2.Development shall consist of Townhomes, Duplexes, and Single Family Units only.
3.The maximum allowable density within the RH-CZ zoning shall be 6.0 units/acre.
4. Developed area within the RH-CZ portion of the Site will be less than 15 acres.

Rolesville
Genuine Community • Capital Connection
Est. 1837

Map Amendment Application

Property Owner Information

Wake County PIN	Property Owner	Mailing Address	Zip Code
1757277811	CHEN, PING	10030 GREEN LEVEL CHURCH RD STE 802 CARY NC	27519-8195
1757375276	CHEN, PING	10030 GREEN LEVEL CHURCH RD STE 802 CARY NC	27519-8195
1757375365	CHEN, PING	10030 GREEN LEVEL CHURCH RD STE 802 CARY NC	27519-8195
1757375464	CHEN, PING	10030 GREEN LEVEL CHURCH RD STE 802 CARY NC	27519-8195
1757375575	CHEN, PING	10030 GREEN LEVEL CHURCH RD STE 802 CARY NC	27519-8195
1757375665	CHEN, PING	10030 GREEN LEVEL CHURCH RD STE 802 CARY NC	27519-8195
1757375765	CHEN, PING	10030 GREEN LEVEL CHURCH RD STE 802 CARY NC	27519-8195
1757375865	CHEN, PING	10030 GREEN LEVEL CHURCH RD STE 802 CARY NC	27519-8195
1757375975	CHEN, PING	10030 GREEN LEVEL CHURCH RD STE 802 CARY NC	27519-8195
1757385064	CHEN, PING	10030 GREEN LEVEL CHURCH RD STE 802 CARY NC	27519-8195
1757384572	CHEN, PING	10030 GREEN LEVEL CHURCH RD STE 802 CARY NC	27519-8195
1757383572	CHEN, PING	10030 GREEN LEVEL CHURCH RD STE 802 CARY NC	27519-8195
1757368816	CHEN, PING	10030 GREEN LEVEL CHURCH RD STE 802 CARY NC	27519-8195
1757378013	CHEN, PING	10030 GREEN LEVEL CHURCH RD STE 802 CARY NC	27519-8195
1757378109	CHEN, PING	10030 GREEN LEVEL CHURCH RD STE 802 CARY NC	27519-8195
1757378303	CHEN, PING	10030 GREEN LEVEL CHURCH RD STE 802 CARY NC	27519-8195
1757377990	CHEN, PING	10030 GREEN LEVEL CHURCH RD STE 802 CARY NC	27519-8195
1757471559	CHEN, PING	10030 GREEN LEVEL CHURCH RD STE 802 CARY NC	27519-8195
1757385349	CHEN, PING	10030 GREEN LEVEL CHURCH RD STE 802 CARY NC	27519-8195

MAP AMENDMENT (CONDITIONAL REZONING) CONCEPT PLAN

Attachment 5

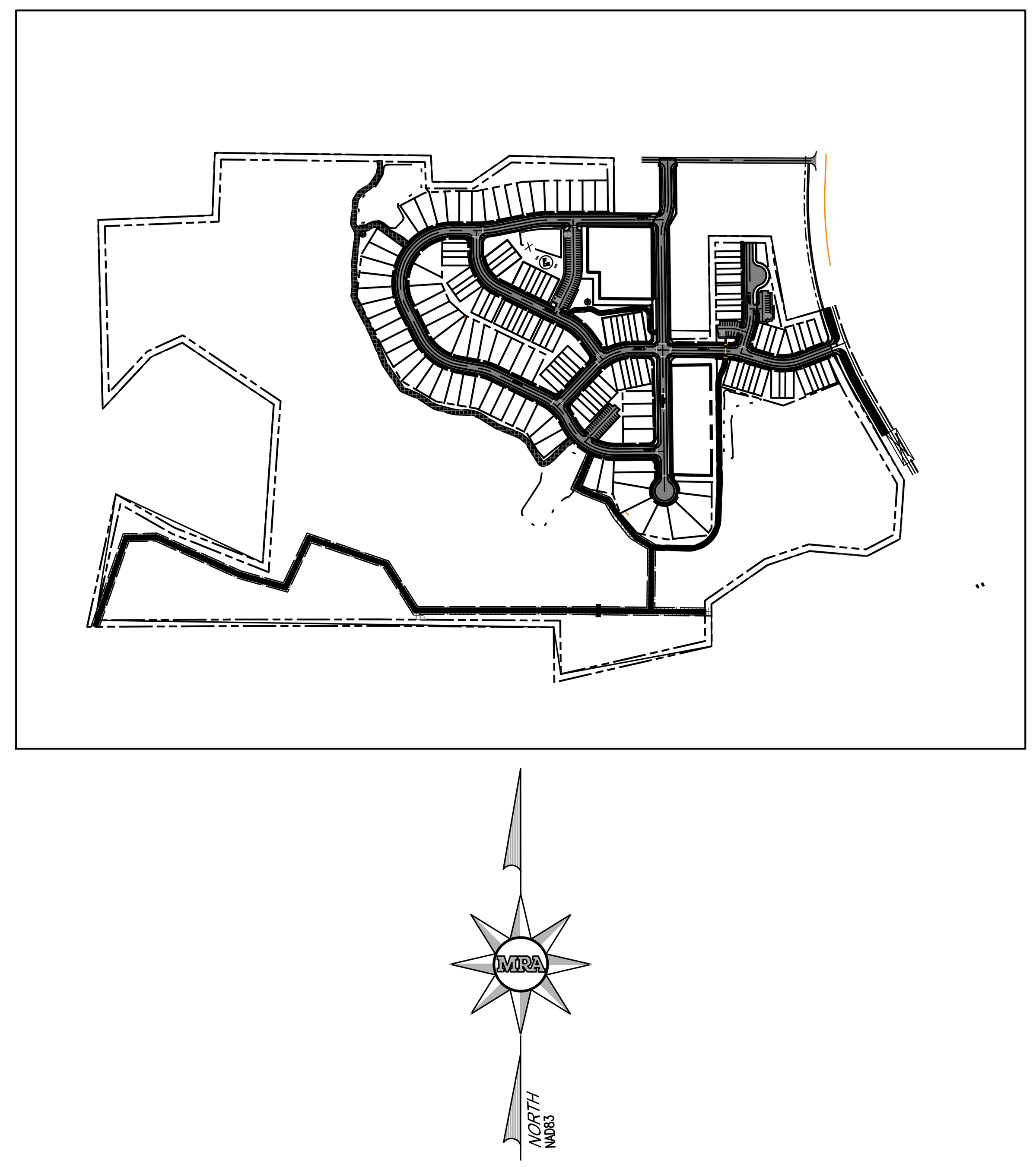
FOR

HARRIS CREEK FARMS

ROLESVILLE, NORTH CAROLINA

VICINITY MAP
SCALE: 1"=2000'

CASE NUMBER:
MA 22-08



KEY MAP
SCALE: 1" = 500'

500 0 500 1000 1500

SCALE 1" = 500

AGENCY CONTACTS

A. Town of Rolesville
Planning Department
502 Southtown Circle
Rolesville, NC 27571

B. Wake County
Watershed Management
Waverly F. Akins Building
337 S. Salisbury St
Raleigh, NC 27601
Contact: Karyn Pageau
Phone: (919)-796-8769
Email: karyn.pageau@wakegov.com

C. City of Raleigh Public Utilities Department
One Exchange Plaza
Suite 620
Raleigh, NC 27601
P.O.Box 590
Raleigh, NC 27602
Phone: 919-996-3245
Email: publicutilityinfo@raleighnc.gov

D. NCDOT
Division 5, District 1 Office
4009 District Drive
Raleigh, NC 27607
Contact: Amy Neidringhaus, District Engineer
Phone: 919-733-3213
Email: aneidringhaus@ncdot.gov

Sheet List Table

Sheet Number	Sheet Title	Date	Sheet Revision Number
C0.0	COVER - REZONING	6/1/2022	12/15/2023
C0.0A	VOLUNTARY REZONING CONDITIONS	6/1/2022	12/15/2023
C0.1	EXISTING CONDITIONS	6/1/2022	12/15/2023
C1.0	OVERALL SITE PLAN	6/1/2022	12/15/2023
C1.1	SITE PLAN - SHEET 1 OF 6	6/1/2022	12/15/2023
C1.2	SITE PLAN - SHEET 2 OF 6	6/1/2022	12/15/2023
C1.3	SITE PLAN - SHEET 3 OF 6	6/1/2022	12/15/2023
C1.4	SITE PLAN - SHEET 4 OF 6	6/1/2022	12/15/2023
C1.5	SITE PLAN - SHEET 5 OF 6	6/1/2022	12/15/2023
C1.6	SITE PLAN - SHEET 6 OF 6	6/1/2022	12/15/2023
C1.7	OVERALL ZONING PLAN	6/1/2022	12/15/2023

STREET DATA

STREET A	1,200 LF
STREET B	2,368 LF
STREET C	450 LF
STREET D	743 LF

SITE DATA

OWNER	CHEN, PING 10030 GREEN LEVEL CHURCH RD STE 802 CARY NC 27519	
SITE ADDRESS	4928 UNIVERSAL DR WAKE FOREST NC 27587-6356	
PIN	1757277811, 1757375276, 1757375365, 1757375464, 1757375575, 1757375665, 1757375765, 1757375865, 1757375975, 1757385064, 1757384572, 1757383572, 1757368816, 1757378013, 1757378109, 1757378303, 1757377990, 1757471559, 1757385349	
DEED BOOK/PAGE/MAP	018953/00623/1757 01, 018953/00592/1757 01	
CURRENT ZONING	R30	
PROPOSED ZONING	RM-CZ, RH-CZ	
MIN. LOT SIZE	5000 SQ FT (SINGLE FAMILY CLUSTER) 2000 SQ FT (TOWNHOMES)	
LAND USE	RESIDENTIAL	
PROPOSED DEVELOPMENT	149 UNITS 68 SINGLE FAMILY UNITS 81 TOWNHOUSE UNITS	
TOTAL SITE AREA	94.19 ACRES	
RESIDENTIAL HIGH DENSITY RESIDENTIAL MEDIUM DENSITY	30.32 ACRES (12.95 AC. + 17.37 AC (ADDITIONAL OPEN SPACE) 63.87 ACRES	
PROPOSED DENSITY	TOWNHOMES (RH-CZ)	9.0 UNITS/AC(MAX) 81/12.95 = 6.26 UNITS/ DEV. AC (PROVIDED)
	SINGLE FAMILY (RM-CZ) (CLUSTER)	5.0 UNITS/AC (MAX) 68/63.87 = 1.07 UNITS/AC (PROVIDED)
	TOTAL PROJECT DENSITY	1.60 UNITS/AC
FLOOD PLAIN/ZONE	ZONE AE/ZONE X	
FIRM PANEL NO	3720175700K	
WATERSHED PROTECTION	NONE	
MINIMUM LOT WIDTH	20' TOWNHOMES 40' SINGLE FAMILY (CLUSTER)	
OPEN SPACE	RESIDENTIAL HIGH DENSITY PASSIVE: 2.10 (REQUIRED) 44.74 (PROVIDED) RESIDENTIAL MEDIUM DENSITY PASSIVE: 9.70 (REQUIRED) 17.37 (PROVIDED) IMPROVED OPEN SPACES: REQUIRED: SMALL: 1 MEDIUM: 2 LARGE: 0 PROVIDED: SMALL: 1 0.73 AC (TOTAL PROVIDED) MEDIUM: 1 1.01 AC (TOTAL PROVIDED) LARGE: 1 13.79 AC (TOTAL PROVIDED)	
PARKING	REQUIRED: 2.0/DWELLING UNIT PLUS 0.25 GUEST SPACES/DWELLING UNIT 81 UNITS X 2.25 = 183 SPOTS PROVIDED: 81 UNITS X 1 (DRIVEWAY) = 81 SPOTS PARKING LOTS = 116 SPOTS TOTAL PROVIDED = 197 SPOTS	
SETBACKS	TOWNHOMES:	FRONT: 20' SIDE: 10' REAR: 15' CORNER: 15' MIN. WIDTH BETWEEN STRUCTURES: 30'
	SINGLE FAMILY: (CLUSTER)	FRONT: 20' SIDE: 5' REAR: 20' CORNER: 10' (CLUSTER)

PROJECT TEAM

DEVELOPER/ OWNER: THE CSC GROUP LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519
ATTN: PING CHENG
919-798-0429

LAND PLANNERS, CIVIL ENGINEER: MORRIS & RITCHIE ASSOCIATES OF NC, PC
530 HINTON POND ROAD, SUITE 104
KNIGHTDALE, NC 27545
ATTN: MR. JEREMY M KEENY, PE, PLS

SURVEYOR: GIL CLARK SURVEYING.
P.O. BOX 1243
KNIGHTDALE, NORTH CAROLINA 27545
ATTN: WALLACE G. CLARK, JR

ENVIRON. CONSULTANT: MORRIS & RITCHIE ASSOCIATES OF NC, PC.
530 HINTON POND ROAD, SUITE 104
KNIGHTDALE, NC 27545
ATTN: MR. JAMIE B. GUERRERO, PE, CPSWQ

GENERAL NOTES

1. OPEN SPACE IN EXCESS OF 40% PROPOSED ON SITE PER LDO SECTION 3.1D FOR CLUSTER DEVELOPMENTS
2. PROPOSED BUFFERS SHALL BE PLATTED AS SEPARATE TRACTS TO BE OWNED AND MAINTAINED BY THE HOMEOWNERS ASSOCIATION OR SIMILAR

FOR SITE PLAN REVIEW ONLY
NOT FOR CONSTRUCTION
PLAN IS SUBJECT TO REVISIONS DURING THE CONSTRUCTION APPROVAL PROCESS

PRELIMINARY FOR REVIEW ONLY
NOT FOR CONSTRUCTION
ENGINEER'S SEAL

COVER - REZONING
FOR
HARRIS CREEK FARMS
TOWN OF ROLESVILLE WAKE COUNTY, NORTH CAROLINA

No.	DATE	REVISIONS		
0	06/01/2022	ORIGINAL SUBMITTAL		
A	09/30/2022	REVISED PER TOWN OF ROLESVILLE COMMENTS	JOB NO.:	21790
B	12/01/2022	REVISED PER TOWN OF ROLESVILLE COMMENTS	SCALE:	AS SHOWN
C	8/1/2023	REVISED PER TOWN OF ROLESVILLE COMMENTS	DATE:	06/01/2022
D	12/15/2023	REVISED PER PLANNING BOARD & TOWN STAFF COMMENTS	ENGINEER:	JMK
			DRAWN BY:	ER/JM
			DESIGN BY:	PKN
			REVIEW BY:	PKN

MRA
MORRIS & RITCHIE ASSOCIATES OF NC, PC
ENGINEERS, ARCHITECTS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
530 HINTON POND RD., STE 104
KNIGHTDALE, NC 27545
(984) 200-2103
LICENSE # C-4182
WWW.MRAGTA.COM

STATUS: PRELIMINARY NOT FOR CONSTRUCTION
REVISION D
SHEET: C0.0

CAD FILE: S:\PROJECTS\CY 2021\21790 - Jonesville Rd\20-LDEV\0 Prelim\PLOT\C0-COVER.dwg PLOT DATE/TIME: 12/15/2023 10:08 AM USER: mcmillan, charles d.

VOLUNTARY REZONING CONDITIONS

1. The subject property shall be developed in general compliance with the map amendment (conditional rezoning) concept plan, dated 12/15/2023.
2. The development shall consist of maximums of 68 single-family detached dwelling units/lots and 81 single-family attached (townhome) dwelling units/lots as detailed in the map amendment (conditional rezoning) concept plan, dated 12/15/2023.
3. The maximum allowable density within the RH-CZ zoning shall be 6.0 units/acre.
4. Single family detached dwelling unit facade anti-monotony: in order to promote variation in home appearance, no single-family front façade shall be duplicated for three (3) lots in a row, or directly across the street. For corner lots, this shall apply to the lots diagonally across the intersection.
5. All garage doors shall either contain windows or carriage style adornments.
6. Single-family detached dwelling units shall:
   - A. Be a minimum of 1,500 heated square feet.
   - B. Have cementitious siding that shall vary in type and color with brick, shakes, board and batten, or stone accents provided as decorative features
   - C. Have at least two types of finishes on the front: lap siding, masonry, shakes, and board and batten.
7. Single-family attached (townhomes) shall have:
   - A. Cementitious siding that shall vary in type and color with brick, shakes, board and batten, or stone accents provided as decorative features.
   - B. Articulation in the end unit side elevations, which includes two of the following: side entry, windows (two or more), partial masonry, two types of finishes (i.e., Horizontal siding with board and batten or shakes in gables), and roofline changes.
   - C. First floor glazing which shall consist of one or more of the following: garage doors with glass windows, or front doors with windows or sidelights.
   - D. 8" minimum eaves and rakes on front, rear, and sides.
8. A homeowners' association (HOA) shall be created, and all open spaces observed in map amendment (conditional rezoning) concept plan, dated 7/24/2023, shall be owned and maintained by the HOA.
9. Foundations: All foundations are to be monolithic poured slab foundations. Top of slabs shall be elevated a minimum of 18 inches above finished grade for all dwelling units. All foundations shall be treated with masonry on the front and street-facing sides for a minimum of 10".
10. Recreational amenities: the following recreational amenities shall be constructed as observed in map amendment (conditional rezoning) concept plan, dated 12/15/2023. Public greenway (approximately 5,600 linear feet), private multi-use paths (approximately 410linear feet), gazebos, playgrounds, and a dog park. Amenities shall be built prior to the issuance of the building permit for the 70th lot.
11. Landscaping. At least twenty percent (20%) of all landscaping required by the LDO, that does not already qualify under LDO Section 6.2, shall utilize plant materials that are listed as native pollinator plants by the North Carolina Wildlife Federation. Where evergreen plantings or street trees are required by the LDO, native pollinator plantings shall not be required. Such plantings shall be clearly shown in construction drawings and installed as part of subdivision infrastructure. Nothing herein shall be constructed to limit the plant materials permitted on individual residential lots.
12. Sidewalk Easement. The development shall attempt to procure an easement from the owners of those properties with PINs 1757-48-1376 (Deed Book 19407, Page 984, Wake County Registry) and 1757-38-8408 (Deed Book 2261, Page 683, Wake County Registry), in order to provide a 5'-wide sidewalk running from the development's proposed access to Jonesville Road to the intersection with Universal Drive. If the development procures easements from both property owners, the sidewalk shall be located within said easements and constructed consistent with the Town of Rolesville Transportation Plan, and shall be completed prior to the issuance of the one hundredth (100th) building permit. If the development is unable to procure an easement from either property owner prior to the issuance of the first (1st) building permit, then the development shall pay a fee-in-lieu for the sidewalk construction to the Town of Rolesville. The fee-in-lieu shall be paid prior to the issuance of the one hundredth (100th) building permit.
13. Universal Drive. The development shall attempt to procure a minimum 20'-wide access easement (the ©Easement℠) from the owner of that property with PIN 1757-38-8408 (Deed Book 2261, Page 683, Wake County Registry) for vehicular ingress and egress to and from Gideon Drive and Jonesville Road (the ©Easement Area℠). This Easement shall be recorded with the Wake County Registry. If the Easement is obtained and recorded, the development shall pave the Easement Area with a 20'-wide asphalt surface coat over top of the existing private gravel access drive. The paving shall be completed prior to the issuance of the development's one hundredth (100th) building permits. Following completion of the paving, the development shall be responsible for maintenance of the Easement Area; this maintenance responsibility shall expire if Columbia Drive is dedicated as public right-of-way. If the development can not obtain and record the Easement before the issuance of the first (1st) building permit, then the development shall have no obligation to perform any work described in this Condition.
14. Prior to issuance of the first building permit for a dwelling unit, the development shall donate thirty-five thousand dollars and no cents ($35,000.00) to Homes for Heroes.

PRELIMINARY NOT FOR CONSTRUCTION FOR REVIEW ONLY
ENGINEER'S SEAL

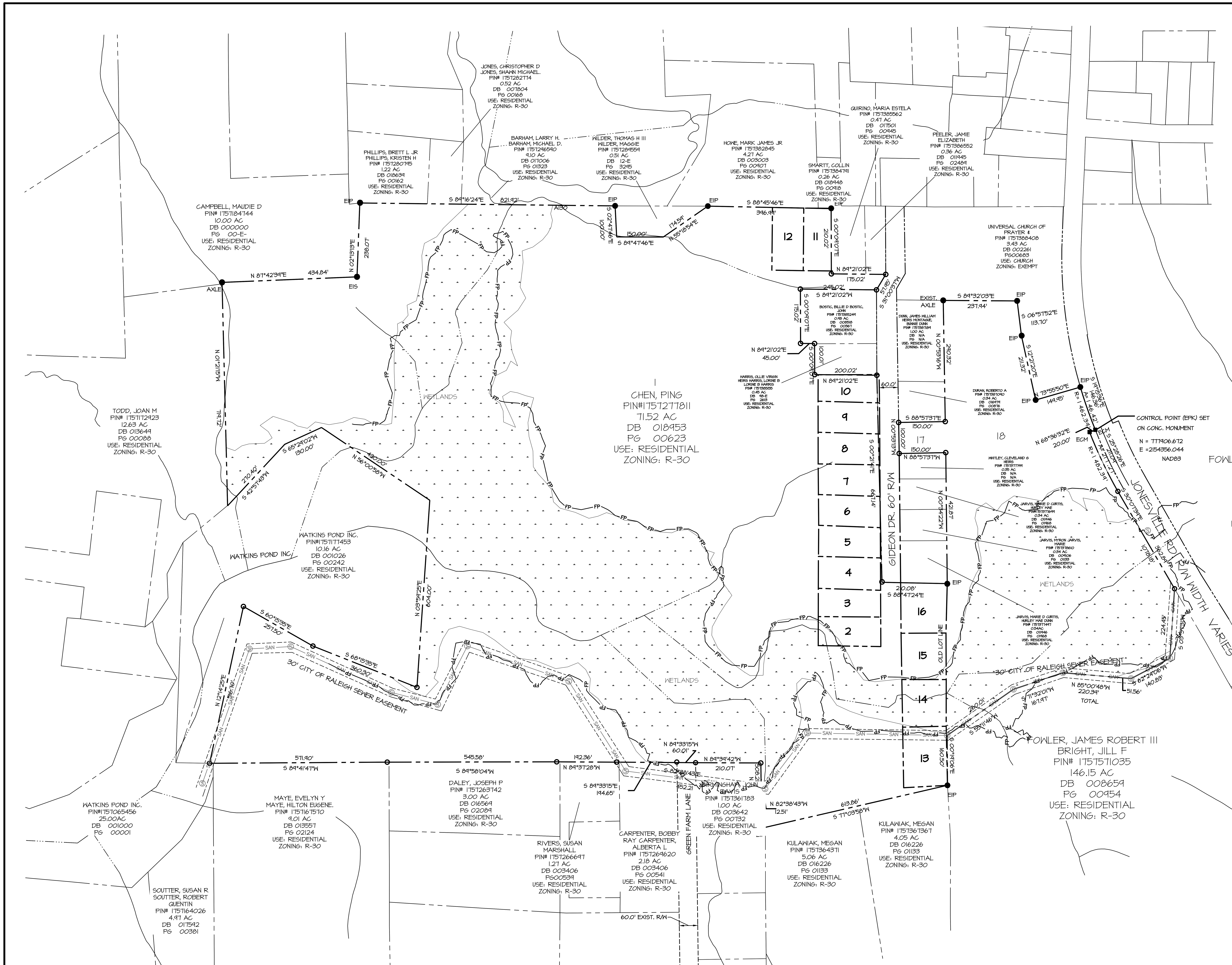
VOLUNTARY REZONING CONDITIONS
FOR
HARRIS CREEK FARMS
TOWN OF ROLESVILLE WAKE COUNTY, NORTH CAROLINA

No.	DATE	REVISIONS
0	06/01/2022	ORIGINAL SUBMITTAL
A	09/30/2022	REVISED PER TOWN OF ROLESVILLE COMMENTS
B	12/01/2022	REVISED PER TOWN OF ROLESVILLE COMMENTS
C	8/1/2023	REVISED PER TOWN OF ROLESVILLE COMMENTS
D	12/15/2023	REVISED PER PLANNING BOARD & TOWN STAFF COMMENTS

JOB NO.: 21790
SCALE: AS SHOWN
DATE: 06/01/2022
ENGINEER: JMK
DRAWN BY: ER/JM
DESIGN BY: PKN
REVIEW BY: PKN

MORRIS & RITCHIE ASSOCIATES OF NC, PC
ENGINEERS, ARCHITECTS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
530 HINTON POND RD., STE 104
KNIGHTDALE, NC 27545
(984) 200-2103
LICENSE # C-4182
WWW.MRAGTA.COM

STATUS: PRELIMINARY NOT FOR CONSTRUCTION | REVISION: D | SHEET: CO.0A



PARCELS INCLUDED IN DEVELOPMENT

PARCEL	OWNER	PIN NUMBER	AREA	DEED BOOK	PAGE NUMBER	USE	CURRENT ZONING
1	CHEN, PING	1757277811	71.52 AC	018953	00623	RESIDENTIAL	R-30
2	CHEN, PING	1757375276	0.44 AC	018953	00623	RESIDENTIAL	R-30
3	CHEN, PING	1757375365	0.41 AC	018953	00623	RESIDENTIAL	R-30
4	CHEN, PING	1757375464	0.48 AC	018953	00623	RESIDENTIAL	R-30
5	CHEN, PING	1757375575	0.45 AC	018953	00623	RESIDENTIAL	R-30
6	CHEN, PING	1757375665	0.46 AC	018953	00623	RESIDENTIAL	R-30
7	CHEN, PING	1757375765	0.46 AC	018953	00623	RESIDENTIAL	R-30
8	CHEN, PING	1757375865	0.46 AC	018953	00623	RESIDENTIAL	R-30
9	CHEN, PING	1757375975	0.46 AC	018953	00623	RESIDENTIAL	R-30
10	CHEN, PING	1757385064	0.45 AC	018953	00623	RESIDENTIAL	R-30
11	CHEN, PING	1757384572	0.49 AC	018953	00623	RESIDENTIAL	R-30
12	CHEN, PING	1757383572	0.48 AC	018953	00623	RESIDENTIAL	R-30
13	CHEN, PING	1757368816	0.69 AC	018953	00623	RESIDENTIAL	R-30
14	CHEN, PING	1757378013	0.54 AC	018953	00623	RESIDENTIAL	R-30
15	CHEN, PING	1757378109	0.53 AC	018953	00623	RESIDENTIAL	R-30
16	CHEN, PING	1757378303	0.53 AC	018953	00623	RESIDENTIAL	R-30
17	CHEN, PING	1757371990	0.35 AC	018953	00623	RESIDENTIAL	R-30
18	CHEN, PING	1757471559	14.90 AC	018953	05952	RESIDENTIAL	R-30
19	CHEN, PING	1757385349	0.28 AC	018953	00623	RESIDENTIAL	R-30

EXISTING CONDITIONS NOTES:

1. SURVEY PREPARED BY GIL CLARK SURVEY COMPANY UNDER THE SUPERVISION OF JERRY GOWER
2. PROPERTY LIES WITHIN ZONE "X" & ZONE "AE" PER NATIONAL INSURANCE PROGRAM FLOOD INSURANCE RATE MAPS #3720175700SK, DATED 07/19/2022.
3. SITE ZONED "R-30" FOR WAKE COUNTY PER COUNTY GIS.

No.	DATE	REVISIONS		
0	06/01/2022	ORIGINAL SUBMITTAL		
A	09/30/2022	REVISED PER TOWN OF ROLESVILLE COMMENTS	JOB NO.:	21790
B	12/01/2022	REVISED PER TOWN OF ROLESVILLE COMMENTS	SCALE:	AS SHOWN
C	8/1/2023	REVISED PER TOWN OF ROLESVILLE COMMENTS	DATE:	06/01/2022
D	12/15/2023	REVISED PER PLANNING BOARD & TOWN STAFF COMMENTS	ENGINEER:	JMK
			DRAWN BY:	ER/JM
			DESIGN BY:	PKN
			REVIEW BY:	PKN

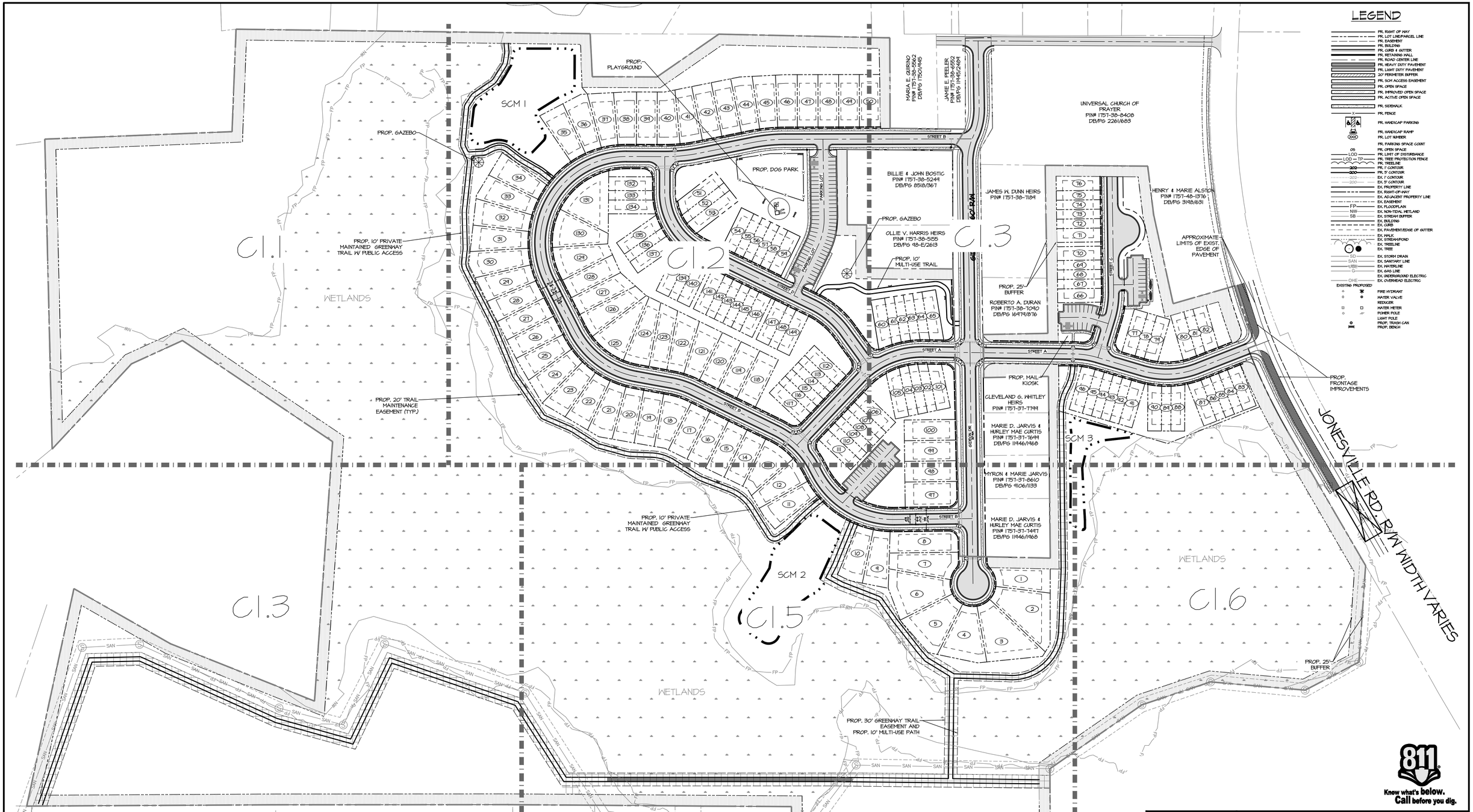
PRELIMINARY FOR REVIEW ONLY
NOT FOR CONSTRUCTION
ENGINEER'S SEAL

EXISTING CONDITIONS
FOR
HARRIS CREEK FARMS

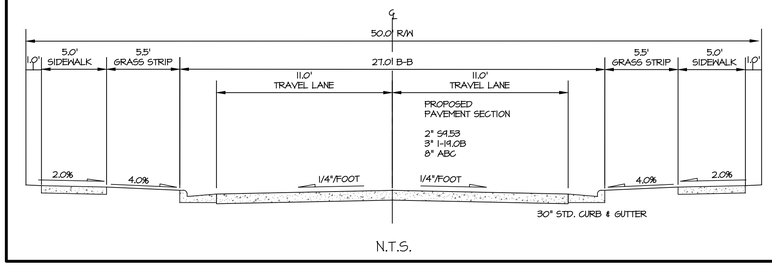
TOWN OF ROLESVILLE WAKE COUNTY, NORTH CAROLINA

MORRIS & RITCHIE ASSOCIATES OF NC, PC
ENGINEERS, ARCHITECTS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
530 HINTON POND RD., STE 104
KNIGHTDALE, NC 27545
(984) 200-2103
LICENSE # C-4182
WWW.MRAGTA.COM

STATUS: PRELIMINARY NOT FOR CONSTRUCTION
REVISION D
SHEET: C0.1



TYPICAL CROSS SECTION



N.T.S.

REQUIRED PARKING

REQUIRED:	2.0/DWELLING UNIT PLUS 0.25 GUEST SPACES/DWELLING UNIT 81 UNITS X 2.25 = 183 SPOTS REQUIRED
PROVIDED	81 UNITS X 1 (DRIVEWAY) = 81 SPOTS PARKING LOTS = 116 SPOTS (7 HANDICAP) TOTAL PROVIDED = 197 SPOTS

NORTH NAD83

100' 0 50' 100' 200' 400'

Scale :1 Inch = 100 ft.

No.	DATE	REVISIONS		
O	06/01/2022	ORIGINAL SUBMITTAL		
A	09/30/2022	REVISED PER TOWN OF ROLESVILLE COMMENTS	JOB NO.:	21790
B	12/01/2022	REVISED PER TOWN OF ROLESVILLE COMMENTS	SCALE:	AS SHOWN
C	8/1/2023	REVISED PER TOWN OF ROLESVILLE COMMENTS	DATE:	06/01/2022
D	12/15/2023	REVISED PER PLANNING BOARD & TOWN STAFF COMMENTS	ENGINEER:	JMK
			DRAWN BY:	ER/JM
			DESIGN BY:	PKN
			REVIEW BY:	PKN

PRELIMINARY NOT FOR CONSTRUCTION FOR REVIEW ONLY

ENGINEER'S SEAL

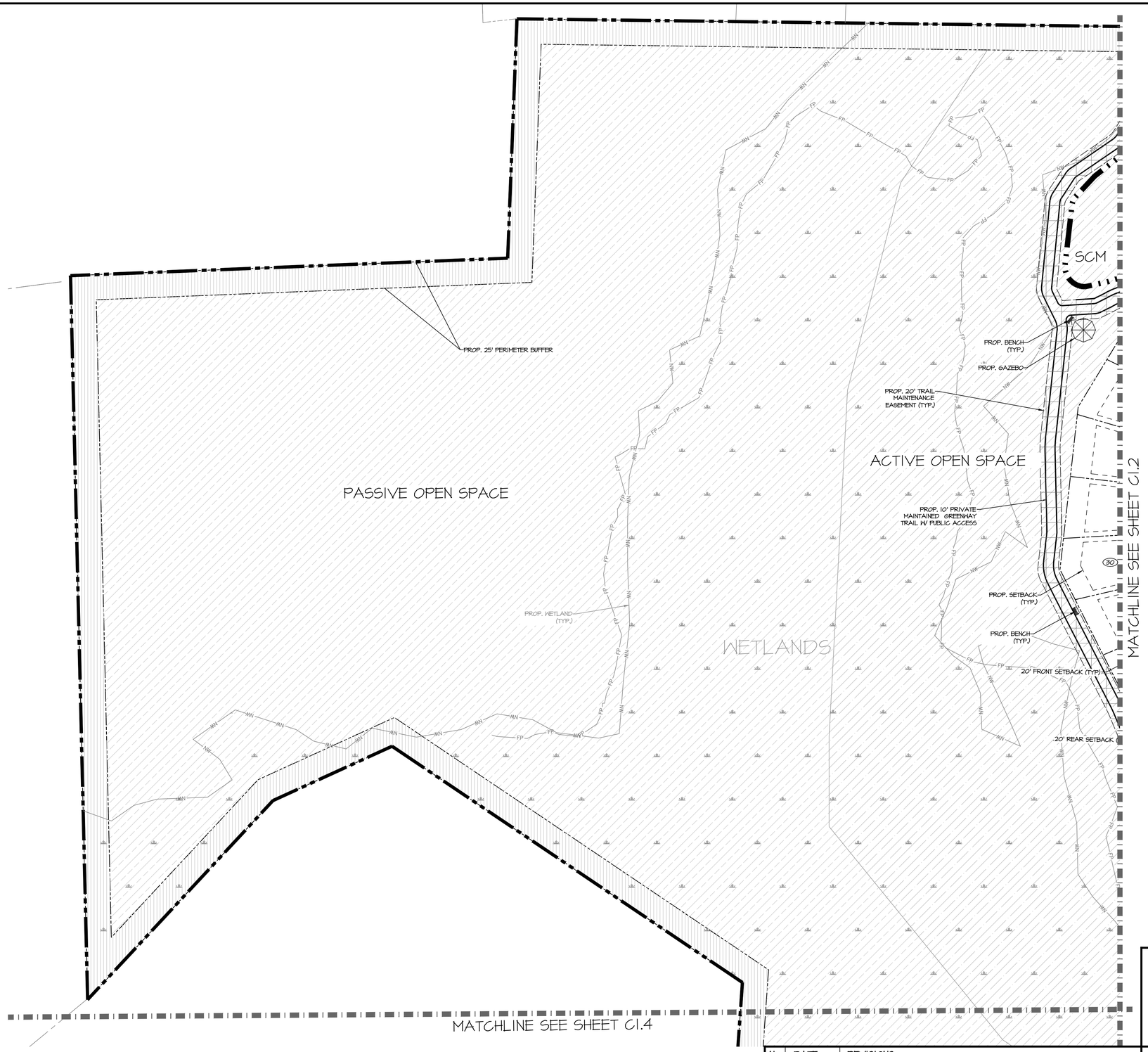
OVERALL SITE PLAN
FOR
HARRIS CREEK FARMS

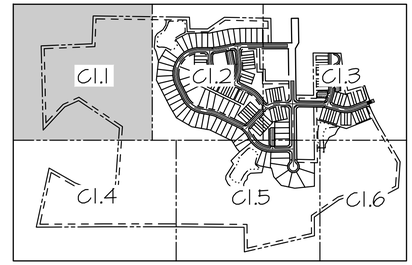
TOWN OF ROLESVILLE WAKE COUNTY, NORTH CAROLINA

MORRIS & RITCHIE ASSOCIATES OF NC, PC
ENGINEERS, ARCHITECTS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
530 HINTON POND RD., STE 104
KNIGHTDALE, NC 27545
(984) 209-2103
LICENSE # C-4182
WWW.MRAGTA.COM

STATUS: PRELIMINARY NOT FOR CONSTRUCTION | REVISION: D | SHEET: C1.0

CAD FILE: S:\PROJECTS\C7 2021\21790 - Jonesville Rd\20-LDEV\2 Prelim\PLOTS\1-OVERALL SITE PLAN.dwg PLOT DATE/TIME: 12/15/2023 10:04 AM USER: mcmillan, charles d.





KEY PLAN
NOT TO SCALE

NORTH
NAD83

LEGEND

- PR. RIGHT OF WAY
- PR. LOT LINE/PARCEL LINE
- PR. EASEMENT
- PR. BUILDING
- PR. CURB & GUTTER
- PR. RETAINING WALL
- PR. ROAD CENTER LINE
- PR. HEAVY DUTY PAVEMENT
- PR. LIGHT DUTY PAVEMENT
- 20' PERIMETER BUFFER
- PR. SCM ACCESS EASEMENT
- PR. OPEN SPACE
- PR. IMPROVED OPEN SPACE
- PR. ACTIVE OPEN SPACE
- PR. SIDEWALK
- PR. FENCE
- PR. HANDICAP PARKING
- PR. HANDICAP RAMP
- PR. LOT NUMBER
- PR. PARKING SPACE COUNT
- PR. OPEN SPACE
- PR. LIMIT OF DISTURBANCE
- PR. TREE PROTECTION FENCE
- PR. TREELINE
- PR. 1' CONTOUR
- PR. 5' CONTOUR
- EX. 1' CONTOUR
- EX. 5' CONTOUR
- EX. PROPERTY LINE
- EX. RIGHT-OF-WAY
- EX. ADJACENT PROPERTY LINE
- EX. EASEMENT
- EX. FLOODPLAIN
- EX. NON-TIDAL WETLAND
- EX. STREAM BUFFER
- EX. BUILDING
- EX. CURB
- EX. PAVEMENT/EDGE OF GUTTER
- EX. WALK
- EX. STREAM/POND
- EX. TREELINE
- EX. TREE
- EX. STORM DRAIN
- EX. SANITARY LINE
- EX. WATERLINE
- EX. GAS LINE
- EX. UNDERGROUND ELECTRIC
- EX. OVERHEAD ELECTRIC

EXISTING / PROPOSED

- FIRE HYDRANT
- WATER VALVE
- REDUCER
- WATER METER
- POWER POLE
- LIGHT POLE
- PROP. TRASH CAN
- PROP. BENCH

Know what's below. Call before you dig.

Scale :1 inch = 50 ft.

PRELIMINARY NOT FOR CONSTRUCTION FOR REVIEW ONLY

ENGINEER'S SEAL

SITE PLAN - SHEET 1 OF 6

FOR

HARRIS CREEK FARMS

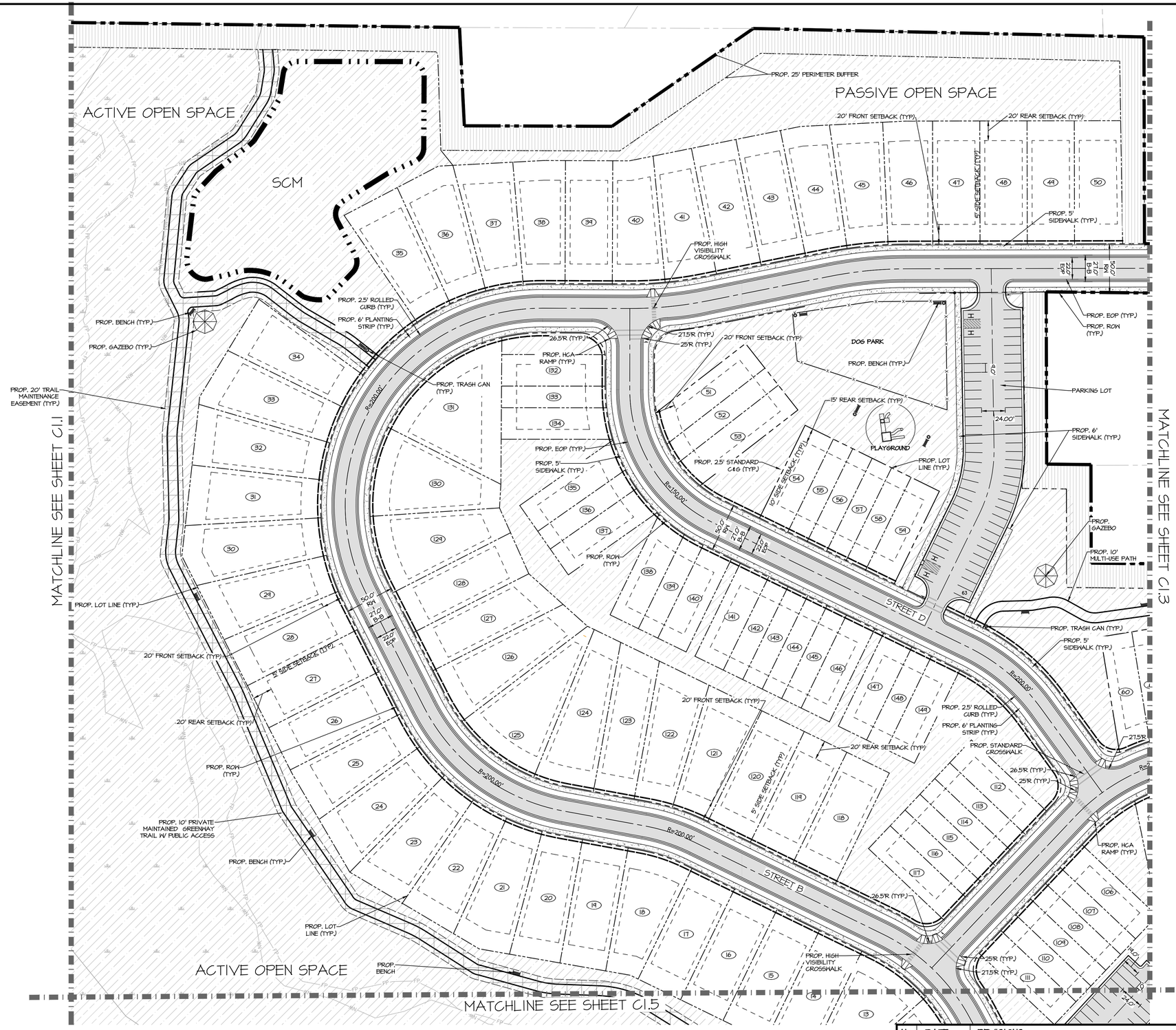
TOWN OF ROLESVILLE WAKE COUNTY, NORTH CAROLINA

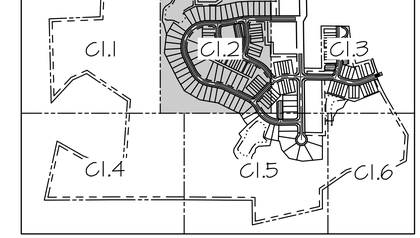
No.	DATE	REVISIONS
0	06/01/2022	ORIGINAL SUBMITTAL
A	09/30/2022	REVISED PER TOWN OF ROLESVILLE COMMENTS
B	12/01/2022	REVISED PER TOWN OF ROLESVILLE COMMENTS
C	8/1/2023	REVISED PER TOWN OF ROLESVILLE COMMENTS
D	12/15/2023	REVISED PER PLANNING BOARD & TOWN STAFF COMMENTS

JOB NO.:	21790
SCALE:	AS SHOWN
DATE:	06/01/2022
ENGINEER:	JMK
DRAWN BY:	ER/JM
DESIGN BY:	PKN
REVIEW BY:	PKN

MORRIS & RITCHIE ASSOCIATES OF NC, PC
ENGINEERS, ARCHITECTS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
530 HINTON POND RD., STE 104
KNIGHTDALE, NC 27545
(984) 200-2103
LICENSE # C-4482
WWW.MRAGTA.COM

STATUS: PRELIMINARY NOT FOR CONSTRUCTION | REVISION: D | SHEET: C1.1





KEY PLAN
NOT TO SCALE

LEGEND

- PR. RIGHT OF WAY
- PR. LOT LINE/PARCEL LINE
- PR. EASEMENT
- PR. BUILDING
- PR. CURB & GUTTER
- PR. RETAINING WALL
- PR. ROAD CENTER LINE
- PR. HEAVY DUTY PAVEMENT
- PR. LIGHT DUTY PAVEMENT
- 20' PERIMETER BUFFER
- PR. SCM ACCESS EASEMENT
- PR. OPEN SPACE
- PR. IMPROVED OPEN SPACE
- PR. ACTIVE OPEN SPACE
- PR. SIDEWALK
- PR. FENCE
- PR. HANDICAP PARKING
- PR. HANDICAP RAMP
- PR. LOT NUMBER
- PR. PARKING SPACE COUNT
- PR. OPEN SPACE
- PR. LIMIT OF DISTURBANCE
- PR. TREE PROTECTION FENCE
- PR. TREELINE
- PR. 1' CONTOUR
- PR. 5' CONTOUR
- EX. 1' CONTOUR
- EX. 5' CONTOUR
- EX. PROPERTY LINE
- EX. RIGHT-OF-WAY
- EX. ADJACENT PROPERTY LINE
- EX. EASEMENT
- EX. FLOODPLAIN
- EX. NON-TIDAL WETLAND
- EX. STREAM BUFFER
- EX. BUILDING
- EX. CURB
- EX. PAVEMENT/EDGE OF GUTTER
- EX. WALL
- EX. STREAM/POND
- EX. TREELINE
- EX. TREE
- EX. STORM DRAIN
- EX. SANITARY LINE
- EX. WATERLINE
- EX. GAS LINE
- EX. UNDERGROUND ELECTRIC
- EX. OVERHEAD ELECTRIC

EXISTING / PROPOSED

- FIRE HYDRANT
- WATER VALVE
- REDUCER
- WATER METER
- POWER POLE
- LIGHT POLE
- PROP. TRASH CAN
- PROP. BENCH

Know what's below. Call before you dig.

Scale : 1 Inch = 50 Ft.

No.	DATE	REVISIONS
0	06/01/2022	ORIGINAL SUBMITTAL
A	09/30/2022	REVISED PER TOWN OF ROLESVILLE COMMENTS
B	12/01/2022	REVISED PER TOWN OF ROLESVILLE COMMENTS
C	8/1/2023	REVISED PER TOWN OF ROLESVILLE COMMENTS
D	12/15/2023	REVISED PER PLANNING BOARD & TOWN STAFF COMMENTS

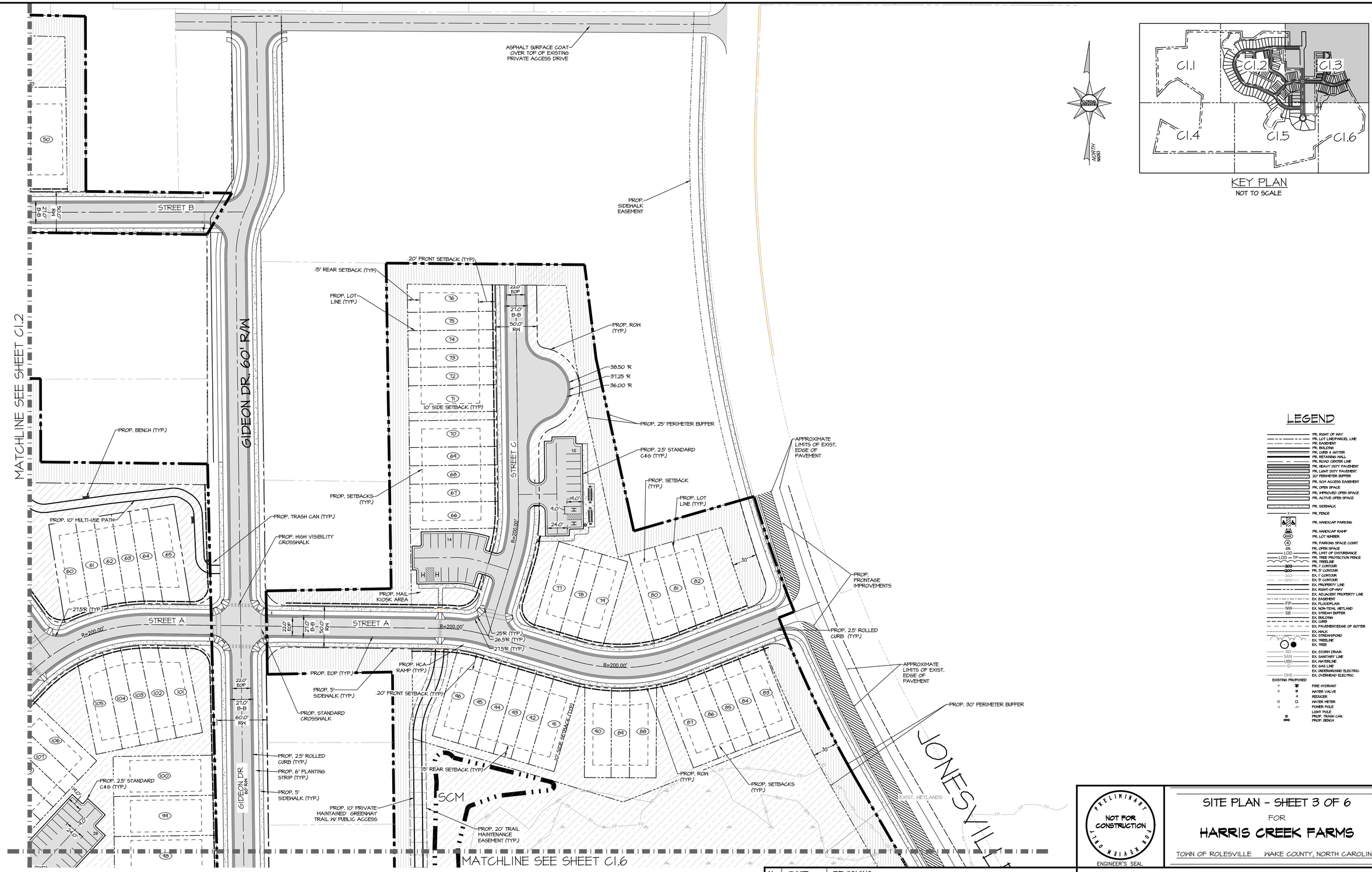
JOB NO.: 21790
SCALE: AS SHOWN
DATE: 06/01/2022
ENGINEER: JMK
DRAWN BY: ER/JM
DESIGN BY: PKN
REVIEW BY: PKN

PRELIMINARY NOT FOR CONSTRUCTION — NOT FOR REVIEW ONLY
ENGINEER'S SEAL

SITE PLAN - SHEET 2 OF 6
FOR
HARRIS CREEK FARMS
TOWN OF ROLESVILLE WAKE COUNTY, NORTH CAROLINA

MORRIS & RITCHIE ASSOCIATES OF NC, PC
ENGINEERS, ARCHITECTS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
530 HINTON POND RD., STE 104
KNIGHTDALE, NC 27545
(984) 200-2103
LICENSE # C-4182
WWW.MRAGTA.COM

STATUS: PRELIMINARY NOT FOR CONSTRUCTION | REVISION: D | SHEET: C1.2



KEY PLAN
NOT TO SCALE

LEGEND

- PR. RIGHT OF WAY
- PR. LOT LINE/PARCEL LINE
- PR. EASEMENT
- PR. BUILDING
- PR. CURB & GUTTER
- PR. RETAINING WALL
- PR. ROAD CENTER LINE
- PR. HEAVY DUTY PAVEMENT
- PR. LIGHT DUTY PAVEMENT
- 20' PERIMETER BUFFER
- PR. SCM ACCESS EASEMENT
- PR. OPEN SPACE
- PR. IMPROVED OPEN SPACE
- PR. ACTIVE OPEN SPACE
- PR. SIDEWALK
- PR. FENCE
- PR. HANDICAP PARKING
- PR. HANDICAP RAMP
- XXX PR. LOT NUMBER
- 6 / 05 PR. PARKING SPACE COUNT
- PR. OPEN SPACE
- LOD PR. LIMIT OF DISTURBANCE
- LOD — TP — PR. TREE PROTECTION FENCE
- PR. TREELINE
- 200 PR. 1' CONTOUR
- 200 PR. 5' CONTOUR
- 200 EX. 1' CONTOUR
- 200 EX. 5' CONTOUR
- EX. PROPERTY LINE
- EX. RIGHT-OF-WAY
- EX. ADJACENT PROPERTY LINE
- EX. EASEMENT
- FP EX. FLOODPLAIN
- NW EX. NON-TIDAL WETLAND
- SB EX. STREAM BUFFER
- EX. BUILDING
- EX. CURB
- EX. PAVEMENT/EDGE OF GUTTER
- EX. WALK
- EX. STREAM/POND
- EX. TREELINE
- EX. TREE
- SD EX. STORM DRAIN
- SAN EX. SANITARY LINE
- WTR EX. WATERLINE
- G EX. GAS LINE
- OHE EX. UNDERGROUND ELECTRIC
- EX. OVERHEAD ELECTRIC

EXISTING PROPOSED

- FIRE HYDRANT
- WATER VALVE
- REDUCER
- WATER METER
- POWER POLE
- LIGHT POLE
- PROP. TRASH CAN
- PROP. BENCH

811 Know what's below. Call before you dig.

Scale : 1 Inch = 50 ft.

PRELIMINARY NOT FOR CONSTRUCTION FOR REVIEW ONLY

ENGINEER'S SEAL

SITE PLAN - SHEET 3 OF 6

FOR

HARRIS CREEK FARMS

TOWN OF ROLESVILLE WAKE COUNTY, NORTH CAROLINA

No.	DATE	REVISIONS
0	06/01/2022	ORIGINAL SUBMITTAL
A	09/30/2022	REVISED PER TOWN OF ROLESVILLE COMMENTS
B	12/01/2022	REVISED PER TOWN OF ROLESVILLE COMMENTS
C	8/1/2023	REVISED PER TOWN OF ROLESVILLE COMMENTS
D	12/15/2023	REVISED PER PLANNING BOARD & TOWN STAFF COMMENTS

JOB NO.: 21790
SCALE: AS SHOWN
DATE: 06/01/2022
ENGINEER: JMK
DRAWN BY: ER/JM
DESIGN BY: PKN
REVIEW BY: PKN

MORRIS & RITCHIE ASSOCIATES OF NC, PC
ENGINEERS, ARCHITECTS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
530 HINTON POND RD., STE 104
KNIGHTDALE, NC 27545
(984) 209-2103
LICENSE # C-4182
WWW.MRAGTA.COM

STATUS: PRELIMINARY NOT FOR CONSTRUCTION | REVISION: D | SHEET: C1.3

MATCHLINE SEE SHEET C1.1

ACTIVE OPEN SPACE

PROP. 25' PERIMETER BUFFER

EXIST. WETLANDS (TYP.)

PASSIVE OPEN SPACE

EXIST. SEWER (TYP.)

EXIST. SEWER EASEMENT (TYP.)

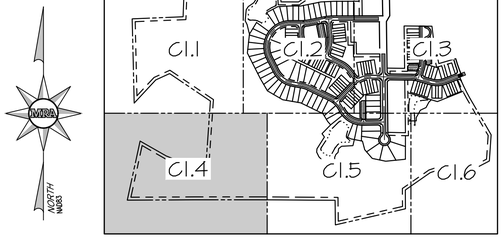
20.00'

PROP. 30' GREENWAY EASEMENT (TYP.) AND PROP. 10' MULTI-USE PATH (TYP.)

PROP. 25' PERIMETER BUFFER

ADJACENT PROPERTY OWNER (TYP.)

MATCHLINE SEE SHEET C1.5



KEY PLAN
NOT TO SCALE

LEGEND

- PR. RIGHT OF WAY
- PR. LOT LINE/PARCEL LINE
- PR. EASEMENT
- PR. BUILDING
- PR. CURB & GUTTER
- PR. RETAINING WALL
- PR. ROAD CENTER LINE
- PR. HEAVY DUTY PAVEMENT
- PR. LIGHT DUTY PAVEMENT
- 20' PERIMETER BUFFER
- PR. SCM ACCESS EASEMENT
- PR. OPEN SPACE
- PR. IMPROVED OPEN SPACE
- PR. ACTIVE OPEN SPACE
- PR. SIDEWALK
- PR. FENCE
- PR. HANDICAP PARKING
- PR. HANDICAP RAMP
- PR. LOT NUMBER
- PR. PARKING SPACE COUNT
- PR. OPEN SPACE
- PR. LIMIT OF DISTURBANCE
- PR. TREE PROTECTION FENCE
- PR. TREELINE
- PR. 1' CONTOUR
- PR. 5' CONTOUR
- EX. 1' CONTOUR
- EX. 5' CONTOUR
- EX. PROPERTY LINE
- EX. RIGHT-OF-WAY
- EX. ADJACENT PROPERTY LINE
- EX. EASEMENT
- EX. FLOODPLAIN
- EX. NON-TIDAL WETLAND
- EX. STREAM BUFFER
- EX. BUILDING
- EX. CURB
- EX. PAVEMENT/EDGE OF GUTTER
- EX. WALK
- EX. STREAM/POND
- EX. TREELINE
- EX. TREE
- EX. STORM DRAIN
- EX. SANITARY LINE
- EX. WATERLINE
- EX. GAS LINE
- EX. UNDERGROUND ELECTRIC
- EX. OVERHEAD ELECTRIC

EXISTING / PROPOSED

- FIRE HYDRANT
- WATER VALVE
- REDUCER
- WATER METER
- POWER POLE
- LIGHT POLE
- PROP. TRASH CAN
- PROP. BENCH

Know what's below. Call before you dig.

50' 0 25' 50' 100' 200'

Scale :1 Inch = 50 ft.

PRELIMINARY NOT FOR CONSTRUCTION FOR REVIEW ONLY

ENGINEER'S SEAL

SITE PLAN - SHEET 4 OF 6

FOR

HARRIS CREEK FARMS

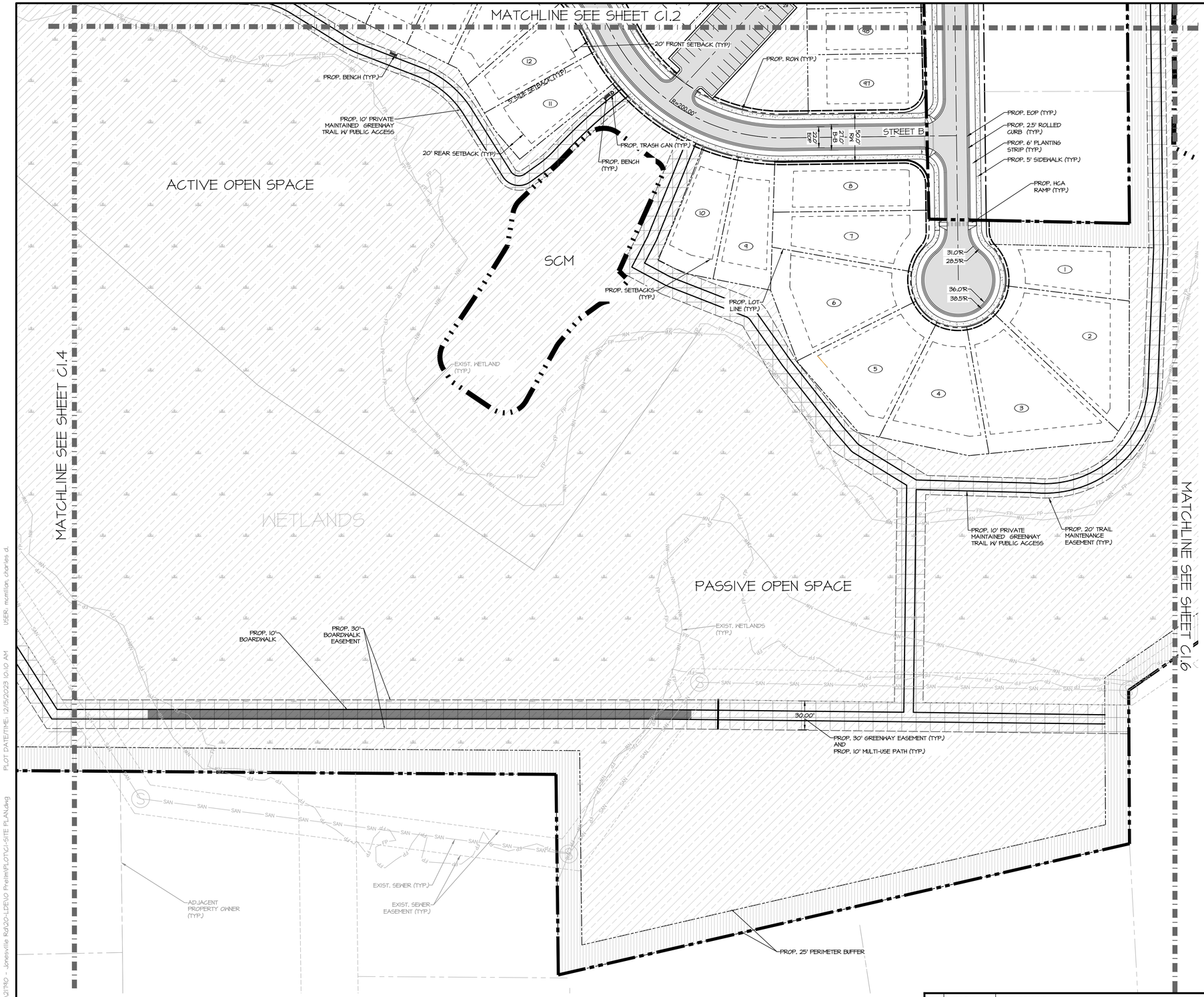
TOWN OF ROLESVILLE WAKE COUNTY, NORTH CAROLINA

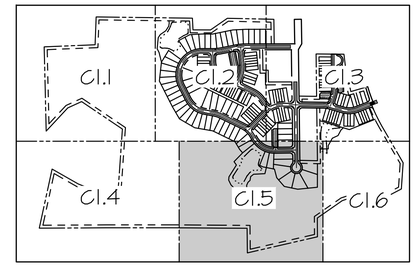
No.	DATE	REVISIONS
0	06/01/2022	ORIGINAL SUBMITTAL
A	09/30/2022	REVISED PER TOWN OF ROLESVILLE COMMENTS
B	12/01/2022	REVISED PER TOWN OF ROLESVILLE COMMENTS
C	8/1/2023	REVISED PER TOWN OF ROLESVILLE COMMENTS
D	12/15/2023	REVISED PER PLANNING BOARD & TOWN STAFF COMMENTS

JOB NO.:	21790
SCALE:	AS SHOWN
DATE:	06/01/2022
ENGINEER:	JMK
DRAWN BY:	ER/JM
DESIGN BY:	PKN
REVIEW BY:	PKN

MORRIS & RITCHIE ASSOCIATES OF NC, PC
ENGINEERS, ARCHITECTS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
530 HINTON POND RD., STE 104
KNIGHTDALE, NC 27545
(984) 200-2103
LICENSE # C-4182
WWW.MRAGTA.COM

STATUS: PRELIMINARY NOT FOR CONSTRUCTION | REVISION: D | SHEET: C1.4





KEY PLAN
NOT TO SCALE

LEGEND

- PR. RIGHT OF WAY
- PR. LOT LINE/PARCEL LINE
- PR. EASEMENT
- PR. BUILDING
- PR. CURB & GUTTER
- PR. RETAINING WALL
- PR. ROAD CENTER LINE
- PR. HEAVY DUTY PAVEMENT
- PR. LIGHT DUTY PAVEMENT
- 20' PERIMETER BUFFER
- PR. SCM ACCESS EASEMENT
- PR. OPEN SPACE
- PR. IMPROVED OPEN SPACE
- PR. ACTIVE OPEN SPACE
- PR. SIDEWALK
- PR. FENCE
- PR. HANDICAP PARKING
- PR. HANDICAP RAMP
- PR. LOT NUMBER
- PR. PARKING SPACE COUNT
- PR. OPEN SPACE
- PR. LIMIT OF DISTURBANCE
- PR. TREE PROTECTION FENCE
- PR. TREELINE
- PR. 1' CONTOUR
- PR. 5' CONTOUR
- EX. 1' CONTOUR
- EX. 5' CONTOUR
- EX. PROPERTY LINE
- EX. RIGHT-OF-WAY
- EX. ADJACENT PROPERTY LINE
- EX. EASEMENT
- EX. FLOODPLAIN
- EX. NON-TIDAL WETLAND
- EX. STREAM BUFFER
- EX. BUILDING
- EX. CURB
- EX. PAVEMENT/EDGE OF GUTTER
- EX. WALK
- EX. STREAM/POND
- EX. TREELINE
- EX. TREE
- EX. STORM DRAIN
- EX. SANITARY LINE
- EX. WATERLINE
- EX. GAS LINE
- EX. UNDERGROUND ELECTRIC
- EX. OVERHEAD ELECTRIC

EXISTING / PROPOSED

- FIRE HYDRANT
- WATER VALVE
- REDUCER
- WATER METER
- POWER POLE
- LIGHT POLE
- PROP. TRASH CAN
- PROP. BENCH

Know what's below. Call before you dig.

Scale :1 Inch = 50 ft.

PRELIMINARY NOT FOR CONSTRUCTION - FOR REVIEW ONLY

ENGINEER'S SEAL

SITE PLAN - SHEET 5 OF 6

FOR

HARRIS CREEK FARMS

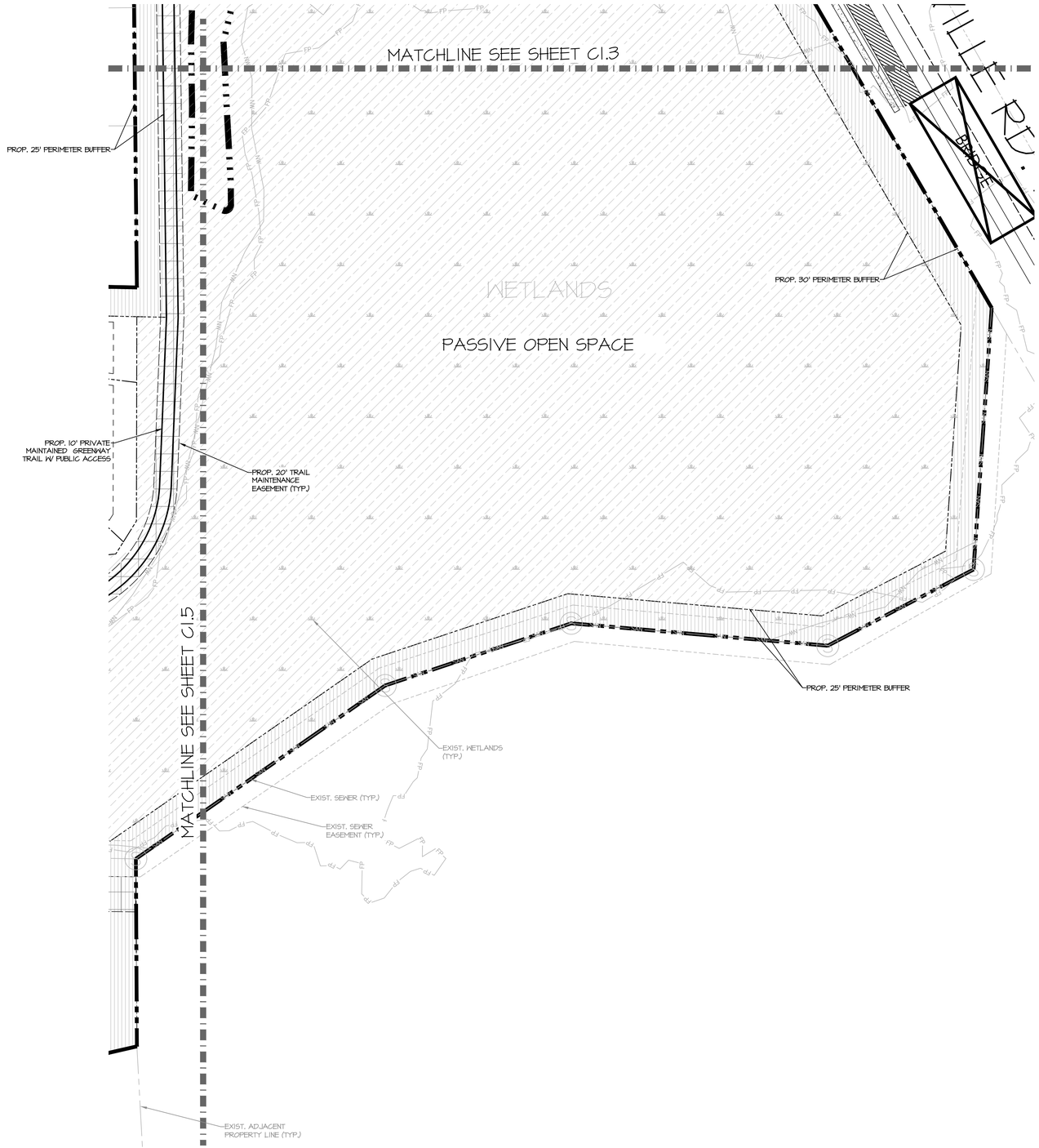
TOWN OF ROLESVILLE WAKE COUNTY, NORTH CAROLINA

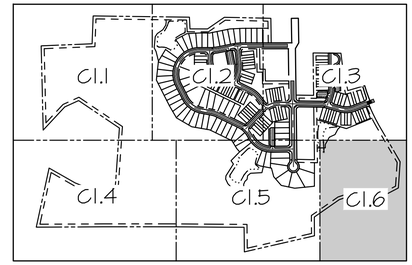
No.	DATE	REVISIONS
0	06/01/2022	ORIGINAL SUBMITTAL
A	09/30/2022	REVISED PER TOWN OF ROLESVILLE COMMENTS
B	12/01/2022	REVISED PER TOWN OF ROLESVILLE COMMENTS
C	8/1/2023	REVISED PER TOWN OF ROLESVILLE COMMENTS
D	12/15/2023	REVISED PER PLANNING BOARD & TOWN STAFF COMMENTS

JOB NO.: 21790
SCALE: AS SHOWN
DATE: 06/01/2022
ENGINEER: JMK
DRAWN BY: ER/JM
DESIGN BY: PKN
REVIEW BY: PKN

MORRIS & RITCHIE ASSOCIATES OF NC, PC
ENGINEERS, ARCHITECTS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
530 HINTON POND RD., STE 104
KNIGHTDALE, NC 27545
(984) 200-2103
LICENSE # C-4182
WWW.MRAGTA.COM

STATUS: PRELIMINARY NOT FOR CONSTRUCTION | REVISION: D | SHEET: C1.5





KEY PLAN
NOT TO SCALE

LEGEND

- PR. RIGHT OF WAY
- PR. LOT LINE/PARCEL LINE
- PR. EASEMENT
- PR. BUILDING
- PR. CURB & GUTTER
- PR. RETAINING WALL
- PR. ROAD CENTER LINE
- PR. HEAVY DUTY PAVEMENT
- PR. LIGHT DUTY PAVEMENT
- 30' PERIMETER BUFFER
- PR. SCM ACCESS EASEMENT
- PR. OPEN SPACE
- PR. IMPROVED OPEN SPACE
- PR. ACTIVE OPEN SPACE
- PR. SIDEWALK
- PR. FENCE
- PR. HANDICAP PARKING
- PR. HANDICAP RAMP
- PR. LOT NUMBER
- PR. PARKING SPACE COUNT
- PR. OPEN SPACE
- PR. LIMIT OF DISTURBANCE
- PR. TREE PROTECTION FENCE
- PR. TREELINE
- PR. 1' CONTOUR
- PR. 5' CONTOUR
- EX. 1' CONTOUR
- EX. 5' CONTOUR
- EX. PROPERTY LINE
- EX. RIGHT-OF-WAY
- EX. ADJACENT PROPERTY LINE
- EX. EASEMENT
- EX. FLOODPLAIN
- EX. NON-TIDAL WETLAND
- EX. STREAM BUFFER
- EX. BUILDING
- EX. CURB
- EX. PAVEMENT/EDGE OF GUTTER
- EX. WALK
- EX. STREAM/POND
- EX. TREELINE
- EX. TREE
- EX. STORM DRAIN
- EX. SANITARY LINE
- EX. WATERLINE
- EX. GAS LINE
- EX. UNDERGROUND ELECTRIC
- EX. OVERHEAD ELECTRIC

EXISTING / PROPOSED

- FIRE HYDRANT
- WATER VALVE
- REDUCER
- WATER METER
- POWER POLE
- LIGHT POLE
- PROP. TRASH CAN
- PROP. BENCH

Know what's below. Call before you dig.

50' 0 25' 50' 100' 200'

Scale : 1 Inch = 50 ft.

PRELIMINARY NOT FOR CONSTRUCTION - FOR REVIEW ONLY

ENGINEER'S SEAL

SITE PLAN - SHEET 6 OF 6

FOR

HARRIS CREEK FARMS

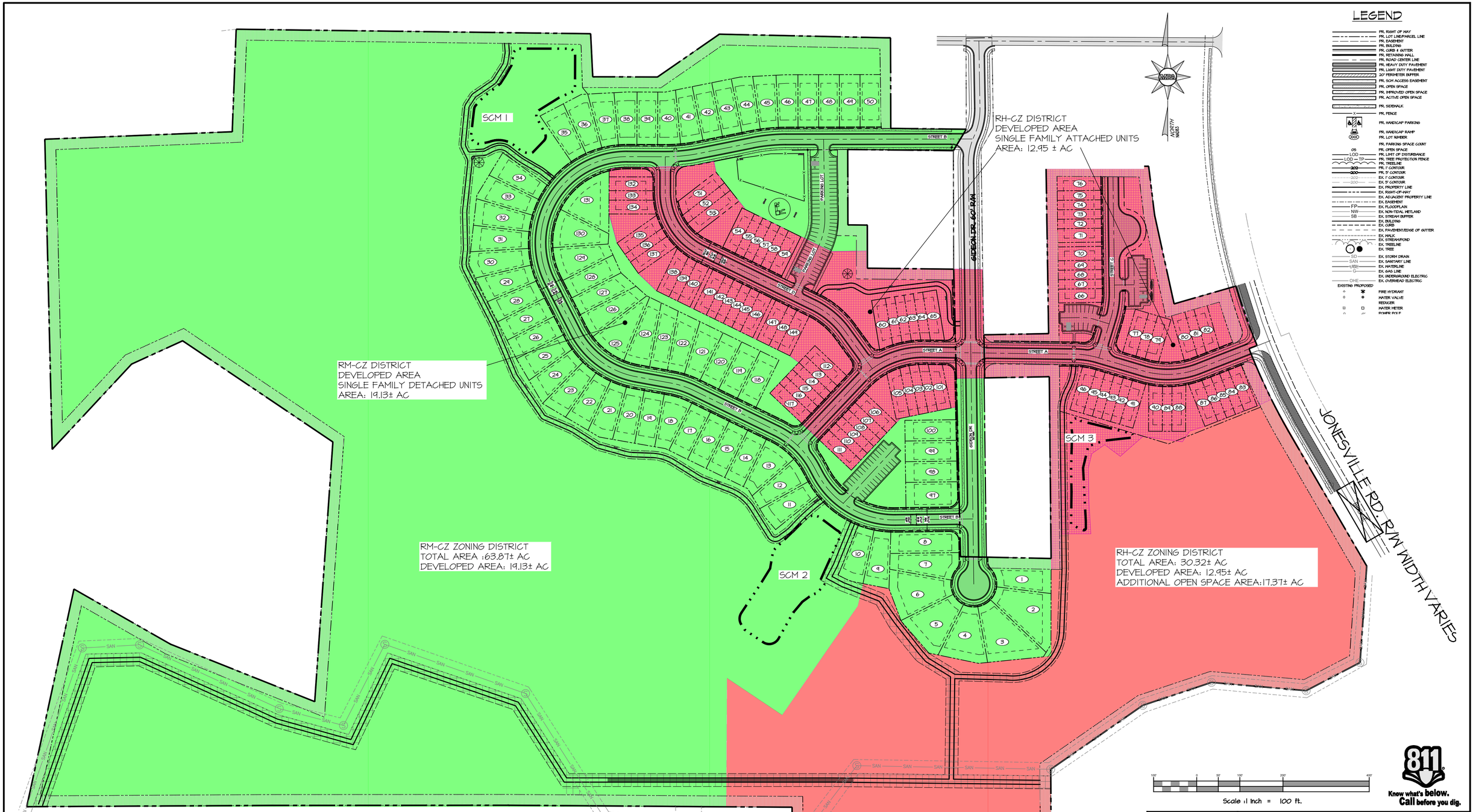
TOWN OF ROLESVILLE WAKE COUNTY, NORTH CAROLINA

No.	DATE	REVISIONS
0	06/01/2022	ORIGINAL SUBMITTAL
A	09/30/2022	REVISED PER TOWN OF ROLESVILLE COMMENTS
B	12/01/2022	REVISED PER TOWN OF ROLESVILLE COMMENTS
C	8/1/2023	REVISED PER TOWN OF ROLESVILLE COMMENTS
D	12/15/2023	REVISED PER PLANNING BOARD & TOWN STAFF COMMENTS

JOB NO.:	21790
SCALE:	AS SHOWN
DATE:	06/01/2022
ENGINEER:	JMK
DRAWN BY:	ER/JM
DESIGN BY:	PKN
REVIEW BY:	PKN

MORRIS & RITCHIE ASSOCIATES OF NC, PC
ENGINEERS, ARCHITECTS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
530 HINTON POND RD., STE 104
KNIGHTDALE, NC 27545
(984) 200-2103
LICENSE # C-4182
WWW.MRAGTA.COM

STATUS: PRELIMINARY NOT FOR CONSTRUCTION | REVISION: D | SHEET: C1.6



Scale : 1 Inch = 100 ft.

Know what's below. Call before you dig.

LEGEND

	DEVELOPED AREA:	TOTAL AREA:	UNITS:	DENSITY:
RESIDENTIAL MEDIUM DENSITY- CONDITIONAL ZONING:	19.13 ACRES	63.87 ACRES	68 SF UNITS	68/63.87 = 1.07 UNITS/ACRE
RESIDENTIAL HIGH DENSITY- CONDITIONAL ZONING DEVELOPED AREA:	12.95 ACRES	-	81 TH UNITS	81/12.95 = 6.26 UNITS/ DEVELOPED ACRE
RESIDENTIAL HIGH DENSITY- CONDITIONAL ZONING OPEN SPACE AREA	-	17.37 ACRES		

RESIDENTIAL MEDIUM DENSITY OPEN SPACE	REQUIRED:	9.70 AC
	PROVIDED:	44.74 AC
RESIDENTIAL HIGH DENSITY OPEN SPACE	REQUIRED:	2.10 AC
	PROVIDED:	17.37 AC

PRELIMINARY NOT FOR CONSTRUCTION DUE FOR REVIEW ONLY

ENGINEER'S SEAL

OVERALL ZONING PLAN

FOR

HARRIS CREEK FARMS

TOWN OF ROLESVILLE WAKE COUNTY, NORTH CAROLINA

No.	DATE	REVISIONS		
0	06/01/2022	ORIGINAL SUBMITTAL		
A	09/30/2022	REVISED PER TOWN OF ROLESVILLE COMMENTS	JOB NO.:	21790
B	12/01/2022	REVISED PER TOWN OF ROLESVILLE COMMENTS	SCALE:	AS SHOWN
C	8/1/2023	REVISED PER TOWN OF ROLESVILLE COMMENTS	DATE:	06/01/2022
D	12/15/2023	REVISED PER PLANNING BOARD & TOWN STAFF COMMENTS	ENGINEER:	JMK
			DRAWN BY:	ER/JM
			DESIGN BY:	PKN
			REVIEW BY:	PKN

MORRIS & RITCHIE ASSOCIATES OF NC, PC
ENGINEERS, ARCHITECTS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
530 HINTON POND RD., STE 104
KNIGHTDALE, NC 27545
(984) 200-2103
LICENSE # C-4182
WWW.MRAGTA.COM

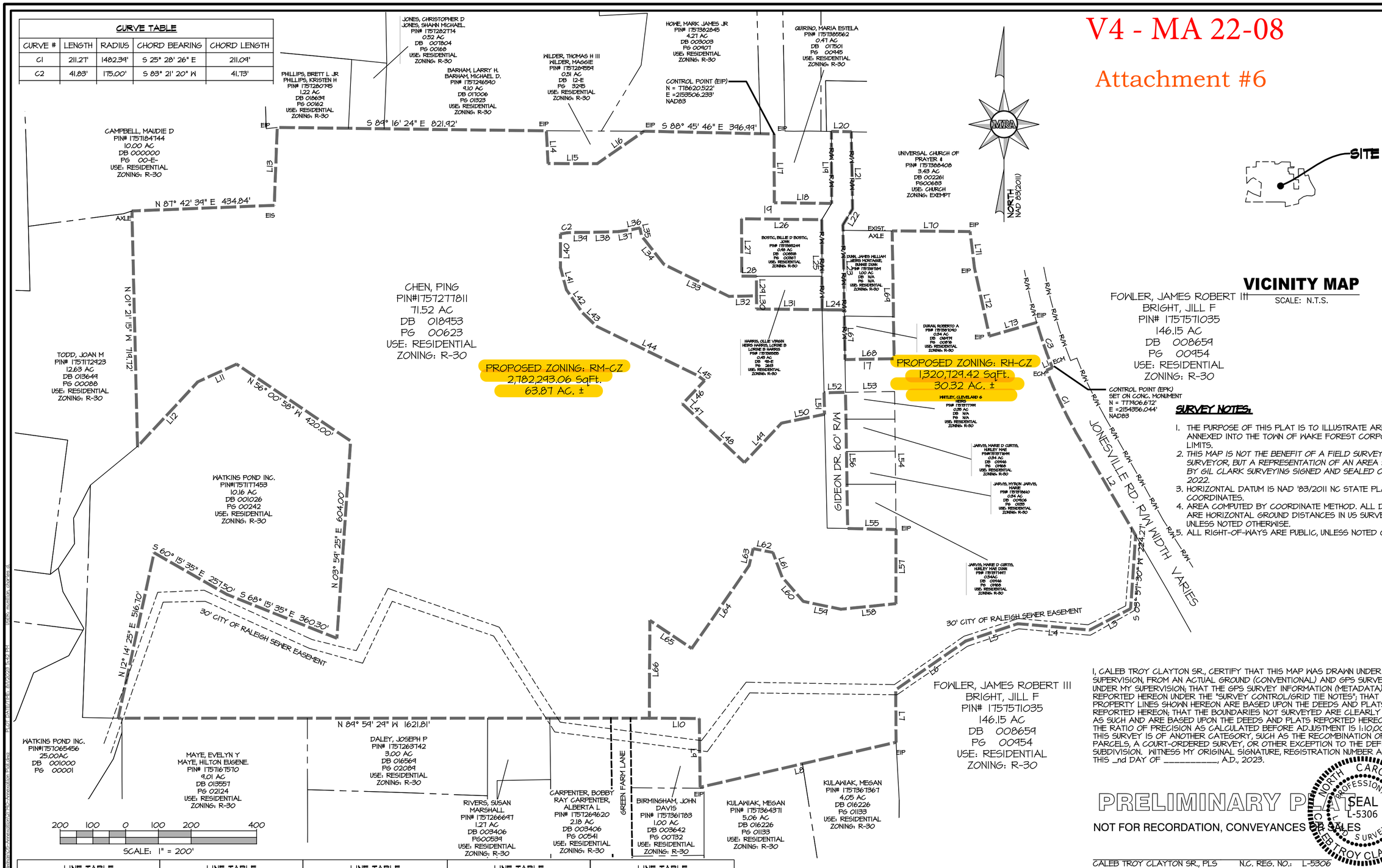
STATUS: PRELIMINARY NOT FOR CONSTRUCTION | REVISION: D | SHEET: C1.7

CAD FILE: S:\PROJECTS\C7 2021\21790 - Jonesville Rd\02-LDEV\0 Prelim\PLOTS\1-OVERALL SITE PLAN.dwg PLOT DATE/TIME: 12/15/2023 10:11 AM USER: mcmillan, charles d.

V4 - MA 22-08

Attachment #6

CURVE TABLE				
CURVE #	LENGTH	RADIUS	CHORD BEARING	CHORD LENGTH
C1	211.27'	1482.34'	S 25° 28' 26" E	211.09'
C2	41.83'	175.00'	S 83° 21' 20" W	41.73'



VICINITY MAP

SCALE: N.T.S.

SURVEY NOTES:

1. THE PURPOSE OF THIS PLAT IS TO ILLUSTRATE AREA TO BE ANNEXED INTO THE TOWN OF WAKE FOREST CORPORATE LIMITS.
2. THIS MAP IS NOT THE BENEFIT OF A FIELD SURVEY BY THIS SURVEYOR, BUT A REPRESENTATION OF AN AREA SURVEYED BY GIL CLARK SURVEYING SIGNED AND SEALED ON JULY 26, 2022.
3. HORIZONTAL DATUM IS NAD '83/2011 NC STATE PLANE COORDINATES.
4. AREA COMPUTED BY COORDINATE METHOD. ALL DISTANCES ARE HORIZONTAL GROUND DISTANCES IN US SURVEY FEET, UNLESS NOTED OTHERWISE.
5. ALL RIGHT-OF-WAYS ARE PUBLIC, UNLESS NOTED OTHERWISE.

LINE TABLE			LINE TABLE			LINE TABLE			LINE TABLE			LINE TABLE		
LINE #	BEARING	DISTANCE	LINE #	BEARING	DISTANCE	LINE #	BEARING	DISTANCE	LINE #	BEARING	DISTANCE	LINE #	BEARING	DISTANCE
L1	S 66° 41' 05" W	20.01'	L16	N 55° 18' 54" E	174.54'	L31	S 84° 21' 02" E	200.02'	L46	S 43° 25' 44" W	98.00'	L61	N 20° 34' 57" W	80.41'
L2	S 30° 07' 41" E	362.37'	L17	S 00° 04' 07" E	210.02'	L32	S 84° 04' 47" W	84.11'	L47	S 46° 34' 16" E	85.00'	L62	N 78° 57' 32" W	61.36'
L3	S 62° 24' 06" W	140.83'	L18	S 89° 21' 02" E	175.02'	L33	N 63° 50' 29" W	221.06'	L48	S 46° 34' 16" E	175.00'	L63	S 13° 20' 26" W	53.38'
L4	N 85° 00' 48" W	220.34'	L19	N 00° 10' 25" W	219.87'	L34	N 38° 15' 43" W	110.80'	L49	N 43° 25' 44" E	165.62'	L64	S 34° 42' 38" W	307.83'
L5	S 71° 32' 01" W	167.47'	L20	S 88° 58' 52" E	60.90'	L35	N 11° 19' 24" W	25.07'	L50	N 78° 24' 21" E	133.84'	L65	N 56° 11' 18" W	153.86'
L6	S 55° 11' 46" W	260.01'	L21	S 00° 53' 13" E	236.00'	L36	S 78° 40' 36" W	29.34'	L51	N 01° 21' 41" W	65.85'	L66	S 00° 20' 38" W	298.57'
L7	S 00° 19' 06" E	160.50'	L22	S 31° 00' 37" W	56.74'	L37	S 81° 10' 29" W	37.05'	L52	N 88° 57' 37" E	65.68'	L67	S 00° 53' 14" E	151.52'
L8	S 77° 03' 58" W	613.86'	L23	S 00° 53' 13" E	254.66'	L38	S 88° 34' 40" W	47.19'	L53	N 88° 57' 37" E	150.00'	L68	N 88° 57' 37" E	150.00'
L9	N 00° 39' 34" W	210.00'	L24	S 89° 21' 02" E	67.80'	L39	N 89° 47' 46" W	38.62'	L54	S 00° 34' 22" E	421.87'	L69	N 00° 53' 16" W	340.32'
L10	N 89° 39' 42" W	152.54'	L25	N 00° 04' 07" W	275.03'	L40	S 00° 03' 08" W	103.24'	L55	S 88° 46' 16" E	147.79'	L70	S 89° 32' 03" E	237.44'
L11	S 65° 29' 02" W	130.00'	L26	N 89° 21' 02" W	245.02'	L41	S 15° 09' 46" E	69.76'	L56	S 00° 53' 13" E	416.01'	L71	S 06° 57' 52" E	113.70'
L12	S 42° 57' 43" W	270.40'	L27	S 00° 04' 07" E	175.02'	L42	S 35° 01' 34" E	86.00'	L57	S 00° 06' 10" W	226.32'	L72	S 12° 21' 20" E	211.32'
L13	N 02° 13' 13" E	238.07'	L28	S 89° 21' 02" E	45.00'	L43	S 46° 12' 34" E	58.12'	L58	S 84° 15' 01" W	168.88'	L73	N 73° 55' 50" E	144.95'
L14	S 02° 47' 46" E	100.00'	L29	S 00° 04' 07" E	60.08'	L44	S 64° 00' 09" E	344.00'	L59	N 78° 15' 05" W	117.50'			
L15	S 89° 47' 46" E	150.00'	L30	S 00° 04' 07" E	39.93'	L45	S 53° 18' 37" E	25.93'	L60	N 40° 55' 01" W	98.07'			

I, CALEB TROY CLAYTON SR., CERTIFY THAT THIS MAP WAS DRAWN UNDER MY SUPERVISION, FROM AN ACTUAL GROUND (CONVENTIONAL) AND GPS SURVEY MADE UNDER MY SUPERVISION; THAT THE GPS SURVEY INFORMATION (METADATA) HAS BEEN REPORTED HEREON UNDER THE "SURVEY CONTROL/GRID TIE NOTES"; THAT SURVEYED PROPERTY LINES SHOWN HEREON ARE BASED UPON THE DEEDS AND PLATS REPORTED HEREON; THAT THE BOUNDARIES NOT SURVEYED ARE CLEARLY INDICATED AS SUCH AND ARE BASED UPON THE DEEDS AND PLATS REPORTED HEREON; THAT THE RATIO OF PRECISION AS CALCULATED BEFORE ADJUSTMENT IS 1:10,000 +; THAT THIS SURVEY IS OF ANOTHER CATEGORY, SUCH AS THE RECOMBINATION OF EXISTING PARCELS, A COURT-ORDERED SURVEY, OR OTHER EXCEPTION TO THE DEFINITION OF SUBDIVISION. WITNESS MY ORIGINAL SIGNATURE, REGISTRATION NUMBER AND SEAL THIS _nd DAY OF _____, A.D., 2023.

PRELIMINARY PLAT

NOT FOR RECORDATION, CONVEYANCES OR SALES

NORTH CAROLINA PROFESSIONAL SEAL L-5306 LAND SURVEYOR CALEB TROY CLAYTON SR.

CALEB TROY CLAYTON SR., PLS N.C. REG. NO.: L-5306

JOB NO.: 21709	
SCALE: 1"=200'	
DATE: 08-01-2023	
DRAWN BY: CDM	
REVIEW BY: CTC	

REZONING EXHIBIT

FOR: HARRIS CREEK FARMS
#4928 UNIVERSAL DRIVE
WAKE FOREST, NC 27587
TOWN OF WAKE FOREST - WAKE COUNTY - NORTH CAROLINA

MORRIS & RITCHIE ASSOCIATES OF NC, PC
ENGINEERS, ARCHITECTS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
5605 CHAPEL HILL RD, STE 112
RALEIGH, NC 27607
(984) 200-2103
LICENSE # C-4182
WWW.MRAGTA.COM

MORRIS & RITCHIE ASSOCIATES OF NC, PC
AN AFFILIATE OF MORRIS & RITCHIE ASSOCIATES, INC. WHICH PROVIDES ENGINEERING, ARCHITECTURE, PLANNING, SURVEYING & LANDSCAPE ARCHITECTURE THROUGHOUT THE MID-ATLANTIC REGION AND LANDSCAPE ARCHITECTS

RH-CZ Zoning District

Legal Description – Exhibit "A"
30.32 Acres ±
Portion of Lands of Ping Chen
Wake Forest Township – Wake County, North Carolina

All that certain parcel of land lying generally easterly of Jonesville Road, being located in Wake Forest Township, Wake County, North Carolina and being a portion of those lands described in deed dated March 11, 2022 from Jerri Jo Miller, Tammy Gower Batts, Clifton Edward Blackley and spouse Joetta May Blackley, Grantor to Ping Chen and recorded in the Land Records of Wake County, North Carolina in Deed Book 18953, page 592 and page 623, being more particularly described as follows, to wit:

Beginning at a PK nail set in an existing concrete monument on the Southwestern right-of-way of Jonesville Road, having North Carolina state plane coordinates N: 777,906.672 E: 2,154,356.044. Thence, with said right-of way, South 66°41'05" West 20.01 feet to a concrete monument on the Southwestern right-of-way line of Jonesville Road; thence, with said right-of-way and along a curve with a cord bearing distance South 25°28'26" East 211.09 feet and a radius of 1,482.39 feet to an iron pipe; thence along said right-of-way, South 30°07'41" East 362.37 feet to an iron pipe; thence leaving said right-of-way, South 03°57'30" West 224.27 feet to a point; thence, South 62°24'06" West 140.83 feet to a point; thence, North 85°00'48" West 220.39 feet to a point; thence, South 71°32'01" West 167.97 feet to a point; thence, South 55°11'46" West 260.01 feet to a point; thence South 00°19'06" East 160.50 feet to an iron pipe; thence, South 77°03'58" West 613.86 feet to an iron pipe; thence, North 00°39'34" West 210.00 feet to an iron pipe; thence, North 89°39'42" West 152.54 feet to a point; thence, North 00°20'38" East 298.57 feet to a point; thence, South 56°11'18" East 153.86 feet to a point; thence, North 34°42'38" East 298.57 feet to a point; thence, North 13°20'26" East 53.38 feet to a point; thence, South 78°57'32" East 61.36 feet to a point; thence, South 20°34'57" East 80.41 feet to a point; thence, South 40°55'01" East 98.07 feet to a point; thence, South 78°15'05" East 117.50 feet to a point; thence, North 84°15'01" East 168.88 feet to a point; thence, North 00°06'10" East 226.32 feet to an iron pipe; thence, North 00°34'22" West 421.87 feet to a point; thence, South 88°57'37" West 150.00 feet to a point; thence, South 88°57'37" West 65.68 feet to a point; thence, South 01°21'41" East 65.85 feet to a point; thence, South 78°24'21" West 133.89 feet to a point; thence, South 43°25'44" East 165.62 feet to a point; thence, North 46°34'16" West 175.00 feet to a point; thence, North 46°34'16" West 85.00 feet to a point; thence, North 43°25'44" East 98.00 feet to a point; thence, North 53°18'37" West 25.93 feet to a point; thence, North 64°00'09" West 344.00 feet to a point; thence, North 46°12'34" West 58.72 feet to a point; thence, North 35°01'39" West 86.00 feet to a point; thence, North 15°09'46" West 69.76 feet to a point; thence, North 00°03'08" East 103.24 feet to a point; thence, along a curve with a cord bearing distance North 83°21'20" East 41.73 feet and a radius of 175.00 feet to a point; thence, South 89°47'46" East 38.62 feet to a point; thence, North 88°34'40" East 97.19 feet to a point; thence, North 81°10'29" East 37.05 feet to a point; thence, North 78°40'36" East 29.34 feet to a point; thence, South 11°19'24" East 25.07 feet to a point; thence, South 38°15'43" East 110.80 feet to an iron pipe; thence, South 63°50'29" East 221.06 feet to a point;

thence, North 89°04’47” East 84.11feet to a point; thence, South 00°09’07” East 39.93 feet to an iron pipe; thence, South 89°21’02” East 200.02 feet to an iron pipe on the Western right-of-way of Gideon Drive; thence, leaving said right-of-way, South 89°21’02” East 67.80 feet to a point on the Eastern right-of-way of Gideon Drive; thence, with said right-of-way, South 00°53’14” East 151.52 feet to a point; thence leaving said right of way, North 88°57’37” East 150.00 feet to a point; thence, North 00°53’16” West 390.32 feet to an axle; thence, South 89°32’03” East 237.94 feet to an iron pipe; thence, South 06°57’52” East 113.70 feet to a point; thence, South 12°21’20” East 211.32 feet to an iron pipe; thence, North 73°55’50” East 149.95 feet to an iron pipe on the Southwestern right-of-way of Jonesville Road; thence, with said right-of-way and along a curve with a bearing and distance of South 19°15’36” East 146.36 feet and a radius of 1,462.39 feet to the point of beginning. Containing **30.32 AC.±**.

The total area of the **Exhibit “A”** herein described being a portion of Tract 1 as described in deed dated March 11, 2022 from Jerri Jo Miller, Tammy Gower Batts, Clifton Edward Blackley and spouse Joetta May Blackley, Grantor to Ping Chen and recorded in the Land Records of Wake County, North Carolina in Deed Book 18953, page 592 and page 623, and containing a total area of **30.32 AC.±** and being subject to any and all matters of which a current title package would disclose.

MORRIS & RITCHIE ASSOCIATES OF NC, PC
AN AFFILIATE OF MORRIS & RITCHIE ASSOCIATES, INC. WHICH PROVIDES ENGINEERING, ARCHITECTURE, PLANNING, SURVEYING & LANDSCAPE ARCHITECTURE THROUGHOUT THE MID-ATLANTIC REGION AND LANDSCAPE ARCHITECTS

RM-CZ Zoning District

Legal Description – Exhibit "B"

63.87 Acres
Portion of Lands of Ping Chen
Wake Forest Township – Wake County, North Carolina

All that certain parcel of land lying generally easterly of Jonesville Road, being located in Wake Forest Township, Wake County, North Carolina and being a portion of those lands described in deed dated March 11, 2022 from Jerri Jo Miller, Tammy Gower Batts, Clifton Edward Blackley and spouse Joetta May Blackley, Grantor to Ping Chen and recorded in the Land Records of Wake County, North Carolina in Deed Book 18953, page 592 and page 623, being more particularly described as follows, to wit:

Beginning at an existing iron pipe in the center of Universal Drive, having North Carolina state plane coordinates N: 778,620.5224 E: 2,153,506.2328. Thence, South 00°09'07" East 210.02 feet to an iron pipe; thence, South 89°21'02" East 175.02 feet to an iron pipe on the Western right-of-way of Gideon Drive; thence with said right-of-way, North 00°10'25" West 219.87 feet to a point; thence leaving said right of way, South 88°58'52" East 60.90 feet to a point on the Eastern right-of-way of Gideon Drive; thence, with said right-of-way South 00°53'13" East 236.00 feet to a point; thence, South 31°00'37" West 56.74 feet to a point; thence, South 00°53'13" East 259.68 feet to a point; thence, crossing said right-of-way, South 89°21'02" East 67.80 feet to an iron pipe; thence, with said right-of-way North 00°09'07" West 275.03 feet to an iron pipe on the Western right-of-way of Gideon Drive; thence, leaving said right-of-way, North 89°21'02" West 245.02 feet to an iron pipe; thence, South 00°09'07 East 175.02 feet to an iron pipe; thence, South 89°21'02" East 45.00 feet to an iron pipe; South 89°04'47" West 84.11 feet to a point; thence, North 63°50'29" West 221.06 feet to a point; thence, North 38°15'43" West 110.80 feet to a point; thence, North 11°19'24" West 25.07 feet to a point; thence, South 78°40'36" West 29.34 feet to a point; thence, South 81°10'29" West 37.05 feet to a point; thence, South 88°34'40" West 97.19 feet to a point; thence, North 89°47'46" West 38.62 feet to a point; thence along a curve with a cord bearing and distance, South 83°21'20" West 41.73 feet and a radius of 175.00 feet to a point; thence, South 00°03'08" West 103.24 feet to a point; thence, South 15°09'46" East 69.76 feet to a point; thence, South 35°01'39" East 86.00 feet to a point; thence, South 46°12'34" East 58.72 feet to a point; thence, South 64°00'09" East 344.00 feet to a point; thence, South 53°18'37" East 25.93 feet to a point; thence, South 43°25'44" West 98.00 feet to a point; thence, South 46°34'16" East 85.00 feet to a point; thence, South 46°34'16" East 175.00 feet to a point; thence, North 43°25'44" West 165.62 feet to a point; thence, North 78°24'21" East 133.89 feet to a point on the Western right-of-way of Gideon Drive; thence, North 01°21'41" West 65.85 feet to a point; thence, leaving said right-of-way North 88°57'37" East 65.68 feet to a point on the Eastern right-of-way of Gideon Drive; thence, with said right-of-way South 00°53'13" East 416.01 feet to a point; thence, leaving said right-of-way, South 88°46'16" East 147.79 feet to an iron pipe; thence, South 00°06'10" West 226.32 feet to a point; thence, South 84°15'01" West 168.88 feet to a point; thence, North 78°15'05" West 117.50 feet to a point; thence, North 40°55'01" West 98.07 feet to a point; thence, North 20°34'57" West 80.41 feet to a point; thence, North 78°57'32" West 61.36 feet to a point;

thence, South 13°20’26” West 53.38 feet to a point; thence, South 34°42’38” West 307.83 feet to a point; thence, North 56°11’18” West 153.86 feet to a point; thence, South 00°18’21” West 298.57 feet to a point; thence, North 89°59’29” West 1,621.81 feet to an iron pipe; thence, North 12°14’25” East 516.70 feet to an iron pipe; thence, South 60°15’35” East 257.50 feet to an iron pipe; thence, South 68°15’35” East 360.30 feet to an iron pipe; thence, North 03°59’25” East 604.00 feet to an iron pipe; thence, North 56°00’58” West 420.00 feet to an iron pipe; thence, South 65°29’02” West 130.00 feet to an iron pipe; thence, South 42°57’43” West 270.40 feet to an iron pipe; thence, North 01°21’15” West 719.72 feet to an axle; thence, North 87°42’39” East 434.84 feet to an iron pipe; thence, North 02°13’13” East 238.07 feet to an iron pipe; thence, South 89°16’24” East 821.92 feet to an iron pipe; thence, South 02°47’46” East 100.00 feet to an iron pipe; thence, South 89°47’46” East 150.00 feet to an iron pipe; thence, North 55°18’54” East 174.59 feet to an iron pipe; thence, South 88°45’46” East 396.99 feet to the point of beginning. Containing **63.87 AC.±**.

The total area of the **Exhibit “B”** herein described being a portion of Tract 1 as described in deed dated March 11, 2022 from Jerri Jo Miller, Tammy Gower Batts, Clifton Edward Blackley and spouse Joetta May Blackley, Grantor to Ping Chen and recorded in the Land Records of Wake County, North Carolina in Deed Book 18953, page 592 and page 623, and containing a total area of **63.87 AC.±** and being subject to any and all matters of which a current title package would disclose.

Attachment 8 -

12-15-2023

HARRIS CREEK FARMS

VOLUNTARY REZONING CONDITIONS

1.The subject property shall be developed in general compliance with the map amendment (conditional rezoning) concept plan, dated 12/15/2023.

2.The development shall consist of maximums of 68 single-family detached dwelling units/lots and 81 single-family attached (townhome) dwelling units/lots as detailed in the map amendment (conditional rezoning) concept plan, dated 12/15/2023.

3.The maximum allowable density within the RH-CZ zoning shall be 6.0 units/acre.

4.Single family detached dwelling unit facade anti-monotony: in order to promote variation in home appearance, no single-family front façade shall be duplicated for three (3) lots in a row, or directly across the street. For corner lots, this shall apply to the lots diagonally across the intersection.

5.All garage doors shall either contain windows or carriage style adornments.

6.**Single-family detached dwelling units shall:**

A. Be a minimum of 1,500 heated square feet.

B. Have cementitious siding that shall vary in type and color with brick, shakes, board and batten, or stone accents provided as decorative features

C. Have at least two types of finishes on the front: lap siding, masonry, shakes, and board and batten.

7.**Single-family attached (townhomes) shall have:**

A. Cementitious siding that shall vary in type and color with brick, shakes, board and batten, or stone accents provided as decorative features.

B. Articulation in the end unit side elevations, which includes two of the following: side entry, windows (two or more), partial masonry, two types of finishes (i.e., Horizontal siding with board and batten or shakes in gables), and roofline changes.

C. First floor glazing which shall consist of one or more of the following: garage doors with glass windows, or front doors with windows or sidelights.

D. 8" minimum eaves and rakes on front, rear, and sides.

8.A homeowners' association (HOA) shall be created, and all open spaces observed in map amendment (conditional rezoning) concept plan, dated 7/24/2023, shall be owned and maintained by the HOA.

9.**Foundations:** All foundations are to be monolithic poured slab foundations. Top of slabs shall be elevated a minimum of 18 inches above finished grade for all dwelling units. All foundations shall be treated with masonry on the front and street-facing sides for a minimum of 10".

10.**Recreational amenities:** the following recreational amenities shall be constructed as observed in map amendment (conditional rezoning) concept plan, dated 12/15/2023. Public greenway (approximately 5,600 linear feet), private multi-use paths (approximately 410linear feet), gazebos, playgrounds, and a dog park. Amenities shall be built prior to the issuance of the building permit for the 70th lot.

11. **Landscaping**. At least twenty percent (20%) of all landscaping required by the LDO, that does not already qualify under LDO Section 6.2, shall utilize plant materials that are listed as native pollinator plants by the North Carolina Wildlife Federation. Where evergreen plantings or street trees are required by the LDO, native pollinator plantings shall not be required. Such plantings shall be clearly shown in construction drawings and installed as part of subdivision infrastructure. Nothing herein shall be constructed to limit the plant materials permitted on individual residential lots.

12. **Sidewalk Easement**. The development shall attempt to procure an easement from the owners of those properties with PINs 1757-48-1376 (Deed Book 19407, Page 984, Wake County Registry) and 1757-38-8408 (Deed Book 2261, Page 683, Wake County Registry), in order to provide a 5'-wide sidewalk running from the development's proposed access to Jonesville Road to the intersection with Universal Drive. If the development procures easements from both property owners, the sidewalk shall be located within said easements and constructed consistent with the Town of Rolesville Transportation Plan, and shall be completed prior to the issuance of the one hundredth (100th) building permit. If the development is unable to procure an easement from either property owner prior to the issuance of the first (1st) building permit, then the development shall pay a fee-in-lieu for the sidewalk construction to the Town of Rolesville. The fee-in-lieu shall be paid prior to the issuance of the one hundredth (100th) building permit.

13. **Universal Drive**. The development shall attempt to procure a minimum 20'-wide access easement (the "Easement") from the owner of that property with PIN 1757-38-8408 (Deed Book 2261, Page 683, Wake County Registry) for vehicular ingress and egress to and from Gideon Drive and Jonesville Road (the "Easement Area"). This Easement shall be recorded with the Wake County Registry. If the Easement is obtained and recorded, the development shall pave the Easement Area with a 20'-wide asphalt surface coat over top of the existing private gravel access drive. The paving shall be completed prior to the issuance of the development's one hundredth (100^{th}) building permits. Following completion of the paving, the development shall be responsible for maintenance of the Easement Area; this maintenance responsibility shall expire if Columbia Drive is dedicated as public right-of-way. If the development can not obtain and record the Easement before the issuance of the first (1^{st}) building permit, then the development shall have no obligation to perform any work described in this Condition.

14. Prior to issuance of the first building permit for a dwelling unit, the development shall donate thirty-five thousand dollars and no cents ($35,000.00) to Homes for Heroes.

REZONING AND ANNEXATION OF PROPERTY CONSISTING OF +/- 93.609 ACRES, LOCATED SOUTHWEST OF THE JONESVILLE ROAD AND UNIVERSAL DRIVE INTERSECTION, IN THE TOWN OF ROLESVILLE

REPORT OF MEETING WITH ADJACENT PROPERTY OWNERS AND TENANTS ON JULY 12, 2022

Pursuant to applicable provisions of the Unified Development Ordinance, a meeting was held with respect to a potential rezoning and annexation with adjacent neighbors on Wednesday, July 12, 2023, at 6:00 p.m. The property considered for this potential rezoning totals approximately 93.609 acres, and is located along southwest of the Jonesville Road and Universal Drive intersection, in the Town of Rolesville. This meeting was held at virtually via a Zoom Meeting. All owners and tenants of property within 500 feet of the subject property were invited to attend the meeting. Attached hereto as **Exhibit A** is a copy of the neighborhood meeting notice. A copy of the required mailing list for the meeting invitations is attached hereto as **Exhibit B**. A summary of the items discussed at the meeting is attached hereto as **Exhibit C**. Attached hereto as **Exhibit D** is a list of individuals who attended the meeting.

EXHIBIT A – NEIGHBORHOOD MEETING NOTICE

LONGLEAF LAW PARTNERS

To: Neighboring Property Owners and Tenants
From: Samuel Morris
Date: June 23, 2023
Re: Virtual Neighborhood Meeting for Annexation and Rezoning of Harris Creek Farm (f.k.a. 4928 Universal) (ANX 22-05 & MA 22-08)

You are invited to attend a virtual meeting to discuss the proposed annexation and rezoning of Harris Creek Farm (f.k.a. 4928 Universal) (ANX 22-05 & MA 22-08). We have scheduled an informational meeting with surrounding neighbors on Wednesday, July 12, 2023 from 6:00 PM until 7:00 PM. This meeting will be held virtually. You can participate online or by telephone.

To join with video:

https://zoom.us/
Meeting ID: 871 7347 4235
Password: 922539

To join by telephone:

+1 646 558 8656
Meeting ID: 871 7347 4235
Password: 922539

The purpose of this meeting is to discuss the proposed annexation and rezoning of Harris Creek Farm (f.k.a. 4928 Universal) (ANX 22-05 & MA 22-08). The property assemblage totals approximately 93.609 acres in size and is located southwest of the Jonesville Road and Universal Drive intersection.

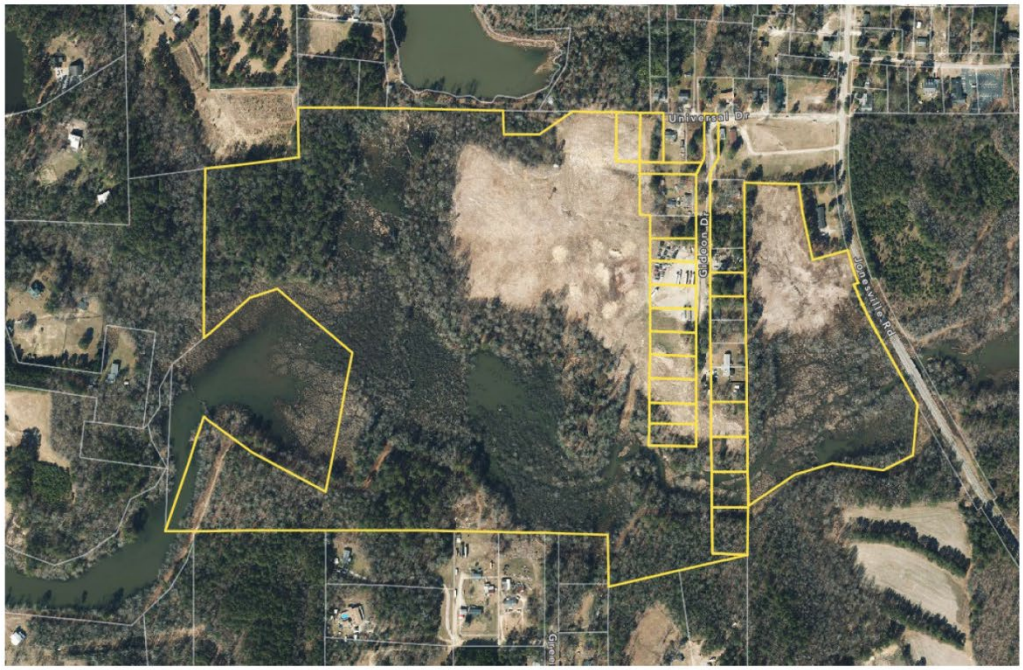
The property is currently zoned Residential-30 (R-30) under Wake County zoning. The proposed rezoning would change the zoning to Residential Medium Density Conditional Zoning and Residential High Density Conditional Zoning (RM-CZ & RH-CZ) under the Town of Rolesville zoning. The purpose of the rezoning is to allow for the development of single family homes and townhomes.

The Town of Rolesville requires a neighborhood meeting involving the owners and tenants of property within 500 feet of the properties during the rezoning process. After the meeting, we will prepare a report for the Planning Department regarding the items discussed at the meeting.

Please do not hesitate to contact me directly if you have any questions or wish to discuss any issues. I can be reached at 919.780.5438 and smorris@longleaflp.com. Also, for more information about the rezoning, you may visit https://www.rolesvillenc.gov/projects/harris-creek-farm-fka-4928-universal or contact the Town of Rolesville Planning Department at 919.554.6517.

Attached to this invitation are the following materials:
1. Subject Property Current Aerial
2. Proposed Zoning Map

CURRENT PROPERTY MAP



PROPOSED ZONING

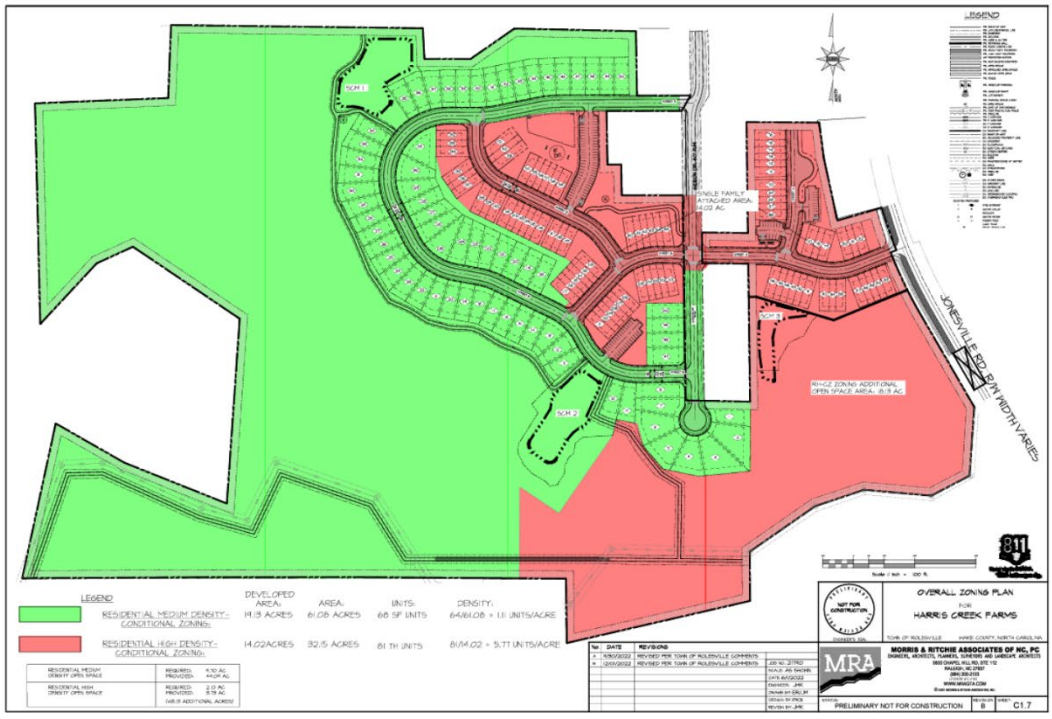


EXHIBIT B – NOTICE LIST

HUNT, FERDINAND V HUNT, LYDIA L
1000 SIMPSON ST APT 6B
BRONX NY 10459-3348

FERRELL, CHARLES E FERRELL, GRETTA L
3805 JONESVILLE RD
WAKE FOREST NC 27587-8181

HOWE, MARK JAMES JR
PO BOX 61122
RALEIGH NC 27661-1122

JARVIS, MARIE D CURTIS, HURLEY MAE
3704 GIDEON DR
WAKE FOREST NC 27587-6360

JARVIS, MARIE D CURTIS, HURLEY MAE
3704 GIDEON DR
WAKE FOREST NC 27587-6360

DONAN, JESUS CORDON, LUCY DONAN
3617 GREEN FARM LN
WAKE FOREST NC 27587-6828

WATKINS POND INC
ANTHONY BRIDGES
98 BERKSHIRE LN
HAMPSTEAD NC 28443-0480

TODD, JOAN M
4180 STELLS RD
WAKE FOREST NC 27587-6306

POWER ELEVEN CONSTRUCTION LLC
4125 DURHAM CHAPEL HILL BLVD STE 8A
DURHAM NC 27707-2666

WILDER, THOMAS H III WILDER, MAGGIE
104 DARTMOUTH RD APT 326
RALEIGH NC 27609-8409

HARTSFIELD, ROZELIA J HEIRS
HATTIE SMITH
2450 MINERAL SPRINGS RD
BOYDTON VA 23917-4404

BOUTAVONG, KIT
3521 WOOD DUCK LN
WAKE FOREST NC 27587-6874

FERRELL, BRIAN L
3807 JONESVILLE RD
WAKE FOREST NC 27587-8181

BIRMINGHAM, JOHN DAVIS
3636 GREEN FARM LN
WAKE FOREST NC 27587-6827

PEELER, JAMIE ELIZABETH
313 SHERWEE DR
RALEIGH NC 27603-3521

BIRMINGHAM, JOHN D
3636 GREEN FARM LN
WAKE FOREST NC 27587-6827

WW OVERTIME LLC
3728 GIDEON DR
WAKE FOREST NC 27587-6360

BOYD, KATHERINE B PAYNE, M TRAVIS
4220 MILLPOINT DR
WAKE FOREST NC 27587-6377

RIVERS, SUSAN MARSHALL
3627 GREEN FARM LN
WAKE FOREST NC 27587-6828

LEE, BRENDA HEIRS
BRENDEX MEEKS
3861 JONESVILLE RD
WAKE FOREST NC 27587-8181

PHILLIPS, BRETT L JR PHILLIPS, KRISTEN HOPE
9237 BLACKLEY LAKE RD
WAKE FOREST NC 27587-8196

MCGEE, LORIE ANN MCGEE, BILLY RAY
3621 GREEN FARM LN
WAKE FOREST NC 27587-6828

ALSTON, HENRY ALSTON, MARIE F
3741 JONESVILLE RD
WAKE FOREST NC 27587-8179

PULLEN, MAGGIE H
C/O SAREN GILMORE
3833 JONESVILLE RD
WAKE FOREST NC 27587-8181

FOWLER, JAMES ROBERT III BRIGHT, JILL F
7400 FOWLER RD
ZEBULON NC 27597-8318

BOSTIC, BILLIE D BOSTIC, JOHN J
9413 WHITE CARRIAGE DR
WAKE FOREST NC 27587-7046

WATKINS POND INC
ANTHONY BRIDGES
98 BERKSHIRE LN
HAMPSTEAD NC 28443-0480

CARTER, LISA CAROL
3604 GREEN FARM LN
WAKE FOREST NC 27587-6827

BIRMINGHAM, JOHN D
3636 GREEN FARM LN
WAKE FOREST NC 27587-6827

JARVIS, MYRON JARVIS, MARIE
3704 GIDEON DR
WAKE FOREST NC 27587-6360

BLACKLEY LAKE FISHING CLUB
C/O GLENN BARHAM
9001 BLACKLEY LAKE RD
WAKE FOREST NC 27587-8110

BURNHAM, ABRAHAM T BURNHAM, KYLA L
3803 JONESVILLE RD
WAKE FOREST NC 27587-8181

WHITLEY, CLEVELAND G HEIRS
DEBRA WHITLEY
3720 GIDEON DR
WAKE FOREST NC 27587-6360

CURTIS, HENDELL HEIRS
4917 UNIVERSAL DR
WAKE FOREST NC 27587-6357

HARRIS, OLLIE VIRGIN HEIRS HARRIS, LORINE B
LORINE B HARRIS
PO BOX 225
FRANKLINTON NC 27525-0225

KULAWIAK, MEGAN
3533 WOOD DUCK LN
WAKE FOREST NC 27587-6874

KULAWIAK, MEGAN
3533 WOOD DUCK LN
WAKE FOREST NC 27587-6874

DALEY, JOSEPH P
3619 GREEN FARM LN
WAKE FOREST NC 27587-6828

BARHAM, LARRY H. BARHAM, MICHAEL D.
5821 WILD ORCHID TRL
RALEIGH NC 27613-8549

PHILLIPS, BRETT LEE JR PHILLIPS, KRISTEN HOPE
9237 BLACKLEY LAKE RD
WAKE FOREST NC 27587-8196

DUNN, JAMES WILLIAM HEIRS MONTAGUE,
BUNNIE DUNN
2390 W RIVER RD
FRANKLINTON NC 27525-7217

SMARTT, COLLIN
147 ROLLING CREEK CIR
CLAYTON NC 27520-5132

QUIRINO, MARIA ESTELA
4916 UNIVERSAL DR
WAKE FOREST NC 27587-6356

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

SOUTTER, SUSAN R SOUTTER, ROBERT QUENTIN
3636 BRIDGES POND WAY
WAKE FOREST NC 27587-5611

WILSON, TIMOTHY LEE
5409 KNOLLWOOD RD
RALEIGH NC 27609-4552

JP MORGAN MORTGAGE ACQUISITION CORP
4817 LONG GREEN DR
WAKE FOREST NC 27587-5244

GHOLSON, RYAN PATRICK
7924 MANDREL WAY
RALEIGH NC 27616-9503

SUAREZ, HELENA TRUSTEE THE HELENA SUAREZ FAMILY TRUST
9660 FALLS OF NEUSE RD # 138-286
RALEIGH NC 27615-2473

PHILLIPS, BRETT L JR PHILLIPS, KRISTEN H
9237 BLACKLEY LAKE RD
WAKE FOREST NC 27587-8196

PHILLIPS, BRETT L JR PHILLIPS, KRISTEN H
9237 BLACKLEY LAKE RD
WAKE FOREST NC 27587-8196

GARCIA, SALVADOR
4901 OLD POOLE RD
RALEIGH NC 27610

HARTSFIELD, ROZELIA J HEIRS
HATTIE SMITH
2450 MINERAL SPRINGS RD
BOYDTON VA 23917-4404

JONES, CHRISTOPHER D JONES, SHAWN MICHAEL
5108 CHRISTIAN SCHOOL RD
PANTEGO NC 27860-9255

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

FERRELL, BRIAN L
3807 JONESVILLE RD
WAKE FOREST NC 27587-8181

FERRELL, CHARLES E FERRELL, SHARON R
3805 JONESVILLE RD
WAKE FOREST NC 27587-8181

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

CARPENTER, BOBBY RAY CARPENTER, ALBERTA L
3629 GREEN FARM LN
WAKE FOREST NC 27587-6828

RIVERS, SUSAN M
3627 GREEN FARM LN
WAKE FOREST NC 27587-6828

HOLLOWAY, ROY D HOLLOWAY, MARTHA L
3613 GREEN FARM LN
WAKE FOREST NC 27587-6828

HARTSFIELD, ROZELIA J HEIRS
HATTIE SMITH
2450 MINERAL SPRINGS RD
BOYDTON VA 23917-4404

SOUTTER, SUSAN R SOUTTER, ROBERT QUENTIN
3636 BRIDGES POND WAY
WAKE FOREST NC 27587-5611

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

MAYE, EVELYN Y MAYE, HILTON EUGENE
4725 MITCHELL MILL RD
WAKE FOREST NC 27587-7240

NC FARM AND FORAGE LLC
9261 BLACKLEY LAKE RD
WAKE FOREST NC 27587-8196

UNIVERSAL CHURCH OF PRAYER &
4912 UNIVERSAL DR
WAKE FOREST NC 27587-6356

EXHIBIT C – MEETING MINUTES

- What is proposed timing for construction to start on the development
  - Developer and attorney explained proposed timeline with development plan and permits
- Would you have plans to do with the area that isn't a part of development?
  - Developer explained that wetland and southern land will remain the way it is (no development)
- How do we plan to avoid pollution from construction to the wells.
  - Developer and engineer explained their precautions in the construction process and state level regulations
- What about the blacktop water runoff and drying wells
  - Engineer explains storm drainage system and pond that will be on site – state mandated process that requires permit from town to avoid flooding downstream properties.
- Worried about runoff into Watkins Pond – What guarantee that it won't "get dirtied up".
  - Engineer explains codes and state mandated permits required to help control effects to the pond. Municipality will also come out to inspect site and silt fence.
- Who is the Developer on this project
  - Attorney explained who the client is and their members
- What is the price point of the townhomes and single-family homes
  - Developer explained projections on cost per unit. Do not have final pricing due to market changes and upgrades
- Will there be any fencing on the wooded areas into the private properties to separate the areas. Worried about people passing through to private property with greenways. Worried about "higher quality resident"
  - Developer and attorney explained - Not projecting fencing due to where the wetlands are. Town of Rolesville will have public easement regarding the greenway – it is up to the Town of Rolesville regarding fencing. Unlikely due to natural features.
- What is going to happen to the property that is not accessible from the road and is not in the wetlands? Will this ever be developed?
  - Developer explains it will not be developed and remained untouched. Units will not be added later to the plan.
- Will the land owner that is located along road next to development be able to access the road?
  - Attorney and developer explained that they will have access in and out as it is today. It is a public road
- The buffer at the NE corner of the development, where the words Universal Dr are on the map, appears to back up to the front yard at 4921 (the last home on the right). Will access to that end of Universal Dr beyond Gideon be cut off?
  - Attorney explained that the owners will still have access to their property. We are not allowed to cut off access. The scope of the rezoning should not effect that.

- Does this project have anything to do with the greenway plan?
  - Attorney explained that we do not have control of greenway development – we give easement to the Town of Rolesville.
- Concerted that diesel fuel will get into the Watkins Pond
  - Engineer explained that the control of the fuel tank will be mandated at a state level by the contractor – this is handled at the construction phase.
- Is the town mandating the developer to address the traffic concerns?
  - Attorney and Developer explained that an Impact analysis was done by Ramey Kemp. The NCDOT signed off on this. Based on increased trips and conditions on site they make recommendations on monitoring and approved intersections. The results will be included in the request. The Town of Rolesville contracts that traffic engineer and the developer and are not associated with the developer
- Are there plans to pave Universal Dr as well as Gideon?
  - The town is requiring developer to pave all of Gideon Drive, not Universal
- Concerned about increased traffic load on Universal Drive
  - Developer explained access points to the development and town requirements
- Will Universal not be eligible for paving?
  - Engineer explained it has not been required by the town to be paved for this development. Not anticipate increased traffic to Universal due to it being unpaved. It is not a public road.
- Who sends out the meeting notifications for the City of Rolesville public hearings?
  - Attorney explained the notices will be coming from the Town of Rolesville. Mailed and signs are typical notification types as well as posted on their website.
- Will there be an HOA with this development?
  - Developer explained there will be an HOA that will maintain open areas as well as amenities.
- Where will the amenities be located within the development?
  - Engineer explained what amenities they are expecting to create and location of same.
- What type of barriers do you see with the proposal plan?
  - Developer and attorney explained that they have met with staff and made modification to address any of these concerns. Also explained there is a good path forward considering policies and overall plan for the Town of Rolesville
- If the church gave permission to be paved on Universal, could it be paved? Do we need to request it be paved with the Town of Rolesville?
  - Attorney explained that yes you can pave it if is your private road
- Residents on Jonesville Road – Concerned about safety on this road for children – there are no sidewalks. How do we get sidewalks put in on that road
  - Attorney and engineer explained improvements can only be made on our property. We can not take other people's property to create sidewalks. We are only required to improve along out frontage. We are building roadway and sidewalk on the property.
- Will school busses be stopping on Jonesville Road or will it go into the development? Will the roads be able to accommodate this?

    - Engineer and developer explained the education department will be making that decision later on in the process. We have not control/make on that decision.
- Has any analysis been done regarding any wildlife in the wetlands on the property?
    - Attorney and engineer explained the open space requirements as well as the other preliminary environmental analysis that are required. The development will be predominantly be taking place in the already cleared areas.
- What measure will be taking place for privacy to neighboring properties? Will there be n natural buffers?
    - Attorney, developer and engineer explained the tree preservation areas and that they will keep trees where they can. There will be vegetative buffers and open space around property line.
- Is there a sidewalk plan along the eastern portion of Gideon Drive?
    - The engineer explained the town street requirements will require sidewalk improvements.
- What is the architectural design for the homes in the development?
    - Developer explained that they will be colonial type design that generally matches other developments in the area. This will not be mandated affordable housing but will be market rate but not luxury
- Neighbors are worried that the prices of the homes are not in line with others in the area – they are too inexpensive compared to the "nice homes" in the area. We are worried about property value decreasing based on this development.
    - Developer and attorney explained that the prices will change in the future based on market rate. It depends on what the market will be like in the next 3-5 years. There will be a range depending on the home type (townhomes and single family).
- Is there a date on the next meeting?
    - Attorney and developer explained that there has not been a meeting set yet. More documentation must be submitted. A link for the Town's portal was shared in the Zoom chat

EXHIBIT D – MEETING ATTENDEES

1. Sam Morris (Attorney with Longleaf Law Partners)
2. Kaline Shelton (Assistant at Longleaf Law Partners)
3. Steven George (Development Team)
4. Jeremy Keeny (Engineer)
5. Joan Todd
6. Natasha Hayes Smart
7. Marie Jarvis
8. Helena Suarez
9. Collin Smartt
10. Bill Harrell
11. Bryan Yaborough
12. Jackie
13. Lorine Harris
14. Steve
15. Brett
16. 919-453-4522
17. 919-602-5532
18. 919-621-1068
19. 984-204-0897
20. 434-265-0618
21. 919-272-1335
22. 919-438-9979
23. 919-491-6535
24. 919-827-5639

LONGLEAF
LAW PARTNERS

To: Neighboring Property Owners and Tenants
From: Samuel Morris
Date: October 13, 2023
Re: Neighborhood Meeting for Annexation and Rezoning of Harris Creek Farm (f.k.a. 4928 Universal) (ANX 22-05 & MA 22-08)

You are invited to attend a meeting to discuss the proposed annexation and rezoning of Harris Creek Farm (f.k.a. 4928 Universal) (ANX 22-05 & MA 22-08). We have scheduled an informational meeting with surrounding neighbors on October 24, 2023 from 5:30 PM until 6:30 PM at the following location:

Rolesville Community Center
514 Southtown Circle
Rolesville, NC 27571

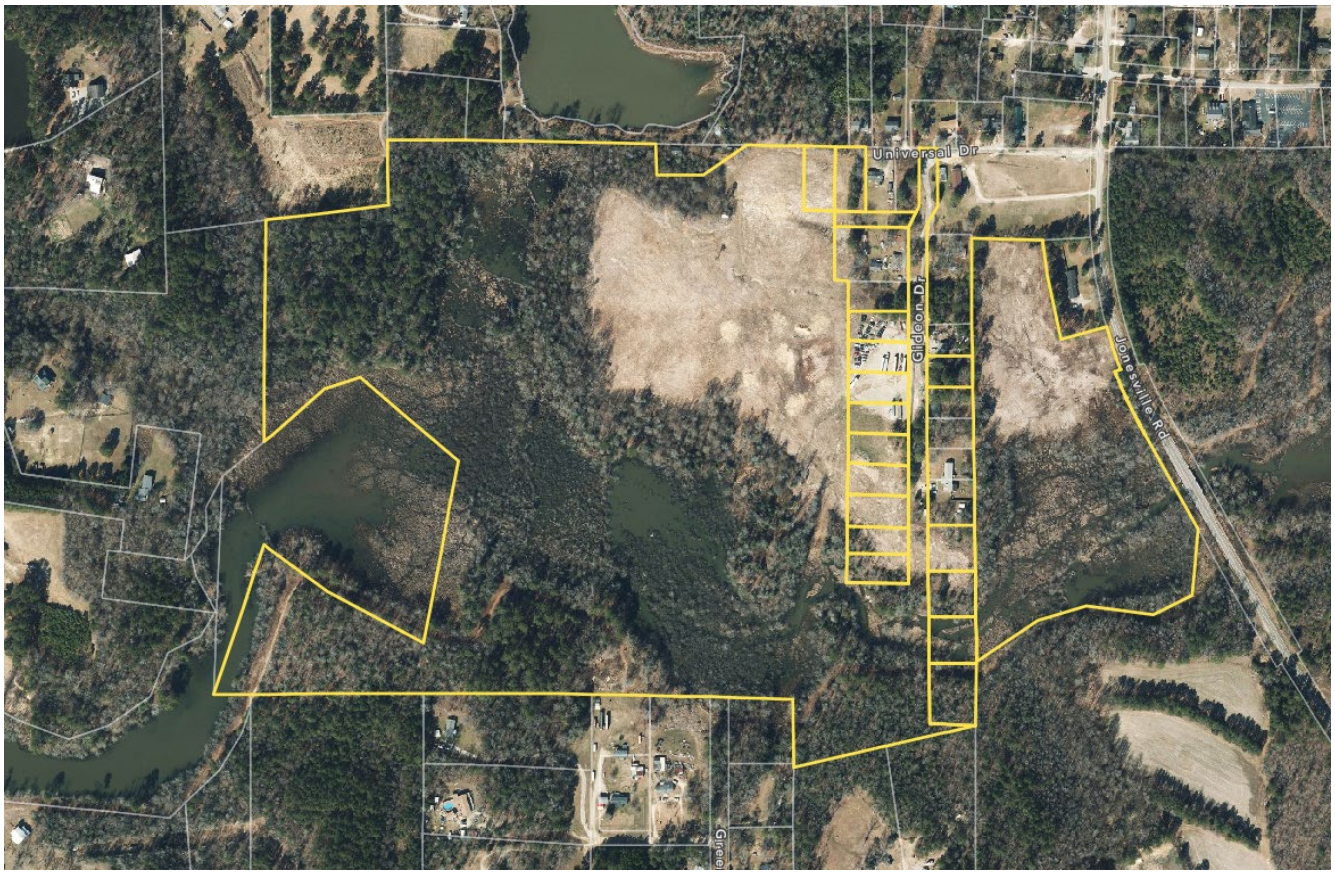
The purpose of this meeting is to discuss the proposed annexation and rezoning of Harris Creek Farm (f.k.a. 4928 Universal) (ANX 22-05 & MA 22-08). The property assemblage totals approximately 93 acres in size and is located southwest of the Jonesville Road and Universal Drive intersection.

The property is currently zoned Residential-30 (R-30) under Wake County zoning. The proposed rezoning would change the zoning to Residential Medium Density Conditional Zoning and Residential High Density Conditional Zoning (RM-CZ & RH-CZ) under the Town of Rolesville zoning. The purpose of the rezoning is to allow for the development of single family homes and townhomes.

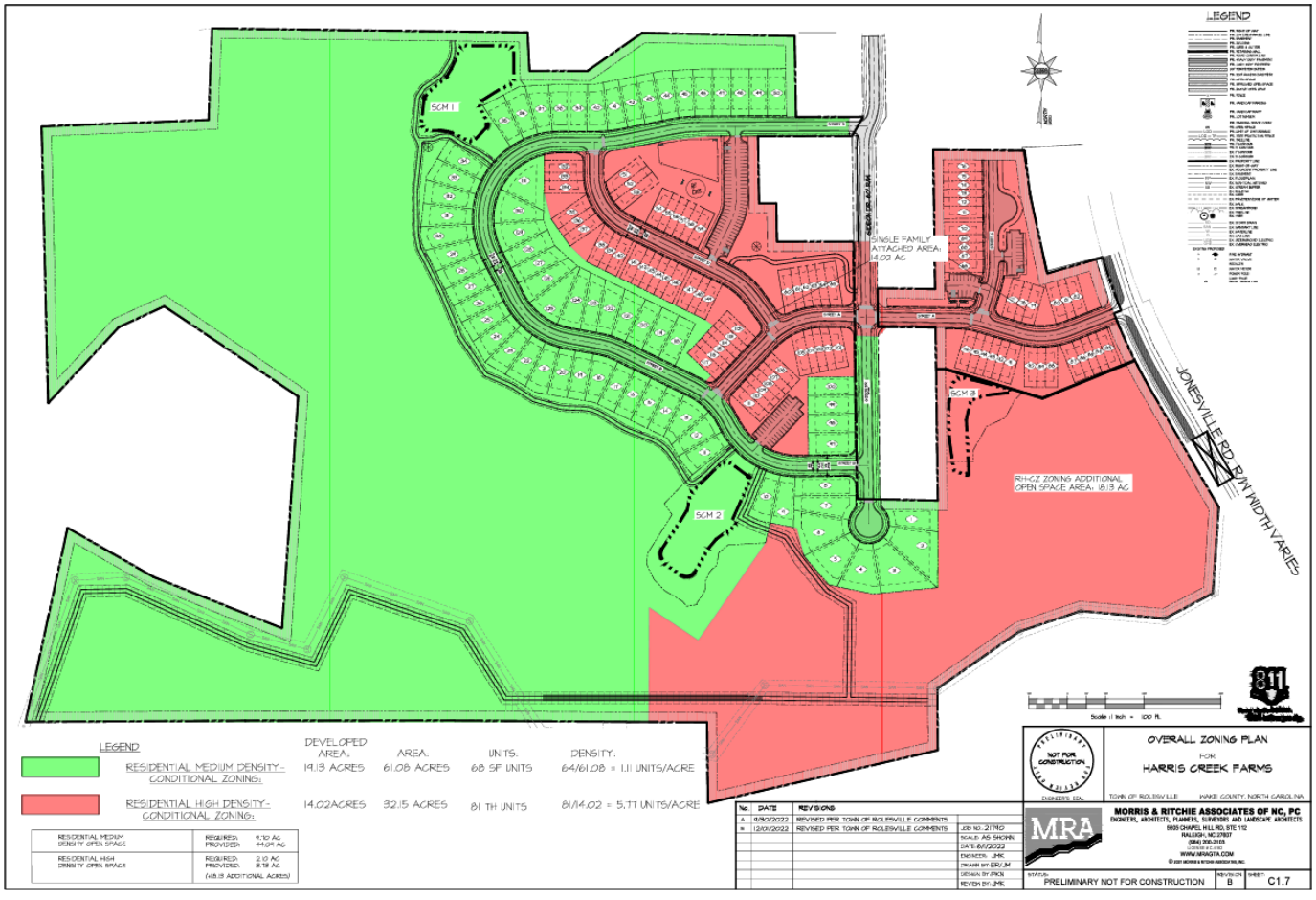
Please do not hesitate to contact me directly if you have any questions or wish to discuss any issues. I can be reached at 919.780.5438 and smorris@longleaflp.com. Also, for more information about the rezoning, you may visit https://www.rolesvillenc.gov/projects/harris-creek-farm-fka-4928-universal or contact the Town of Rolesville Planning Department at 919.554.6517.

Attached to this invitation are the following materials:
1. Subject Property Current Aerial
2. Proposed Zoning Map

CURRENT PROPERTY MAP



PROPOSED ZONING



JONES, CHARLES ALFONSO JONES, ALLIE V
3800 JONESVILLE RD
WAKE FOREST NC 27587-8180

JONES, CHARLES E JONES, DARLENE C
3816 JONESVILLE RD
WAKE FOREST NC 27587-8180

BADGETT, ROBIN D BADGETT, TANA F
4817 MITCHELL MILL RD
WAKE FOREST NC 27587-7242

HUNT, FERDINAND V HUNT, LYDIA L
1000 SIMPSON ST APT 6B
BRONX NY 10459-3348

FERRELL, CHARLES E FERRELL, GRETTA L
3805 JONESVILLE RD
WAKE FOREST NC 27587-8181

WALKER, ALESHIA FERRELL WALKER, AARON
5012 HARTSFIELD DR
WAKE FOREST NC 27587-9638

HOWE, MARK JAMES JR
PO BOX 61122
RALEIGH NC 27661-1122

JARVIS, MARIE D CURTIS, HURLEY MAE
3704 GIDEON DR
WAKE FOREST NC 27587-6360

JARVIS, MARIE D CURTIS, HURLEY MAE
3704 GIDEON DR
WAKE FOREST NC 27587-6360

DONAN, JESUS CORDON, LUCY DONAN
3617 GREEN FARM LN
WAKE FOREST NC 27587-6828

WATKINS POND INC
ANTHONY BRIDGES
98 BERKSHIRE LN
HAMPSTEAD NC 28443-0480

PRUDENT, VIRGINIA PRUDENT, ULRICK JR
3104 BILLIARD CT
WAKE FOREST NC 27587-9388

TODD, JOAN M
4180 STELLS RD
WAKE FOREST NC 27587-6306

FERRELL, BRIAN L
3807 JONESVILLE RD
WAKE FOREST NC 27587-8181

PERRY, LISA R
PO BOX 581
ROLESVILLE NC 27571-0581

CHAPPELL, CONNIE B PERRY, BETTY ANN BLACKLEY
4025 LOUISBURY RD
WAKE FOREST NC 27587-8118

POWER ELEVEN CONSTRUCTION LLC
4125 DURHAM CHAPEL HILL BLVD STE 8A
DURHAM NC 27707-2666

SESSOMS, JOHN B
5021 HARTSFIELD DR
WAKE FOREST NC 27587-9638

WILDER, THOMAS H III WILDER, MAGGIE
104 DARTMOUTH RD APT 326
RALEIGH NC 27609-8409

CHRIST HOLINESS CHURCH NUMBER 1
C/O WILIAM WHITFIELD
5016 HARTSFIELD DR
WAKE FOREST NC 27587-9638

BROWN, JAMES A BROWN, SHELBY W
4141 STELLS RD
WAKE FOREST NC 27587-5242

GILMORE, JOSEPH H GILMORE, SARAH L
3833 JONESVILLE RD
WAKE FOREST NC 27587-8181

ASWELL, FREDRICA T
3508 GREEN FARM LN
WAKE FOREST NC 27587-6825

GASPER, REGUGIO TECHICAC
7817 S COLORADO DR
RALEIGH NC 27616-0905

JEFFERYS, CHRISTOPHER JEFFERYS, STEPHANIE
2933 CANDLEHURST LN
RALEIGH NC 27616-6250

MAYE, HILTON EUGENE MAYE, EVELYN YOUNG
4725 MITCHELL MILL RD
WAKE FOREST NC 27587-7240

BERRY, WILLIAM ROSSER BERRY, JULIA D
9249 BLACKLEY LAKE RD
WAKE FOREST NC 27587-8196

HARTSFIELD, ROZELIA J HEIRS
HATTIE SMITH
2450 MINERAL SPRINGS RD
BOYDTON VA 23917-4404

HARTSFIELD, ROZELIA J HEIRS
HATTIE SMITH
2450 MINERAL SPRINGS RD
BOYDTON VA 23917-4404

HARTSFIELD, ROZELIA J HEIRS
HATTIE SMITH
2450 MINERAL SPRINGS RD
BOYDTON VA 23917-4404

HARTSFIELD, ROZELIA J HEIRS
HATTIE SMITH
2450 MINERAL SPRINGS RD
BOYDTON VA 23917-4404

PERRY, JAMES DONNELL PERRY, CYNTHIA D
3869 JONESVILLE RD
WAKE FOREST NC 27587-8181

HOLLINGSWORTH, JACOB BROOKS
3509 WOOD DUCK LN
WAKE FOREST NC 27587-6874

BOUTAVONG, KIT
3521 WOOD DUCK LN
WAKE FOREST NC 27587-6874

JONES, ERNESTINE
3848 JONESVILLE RD
WAKE FOREST NC 27587-8180

BUGG, SAMUEL WILLIAM
9245 BLACKLEY LAKE RD
WAKE FOREST NC 27587-8196

BROWN, JAMES ALLEN BROWN, SHELBY W
4141 STELLS RD
WAKE FOREST NC 27587-5242

MEDLIN, LISA C
3520 BRIDGES POND WAY
WAKE FOREST NC 27587-5606

FERRELL, BRIAN L
3807 JONESVILLE RD
WAKE FOREST NC 27587-8181

HARTSFIELD, MARY HEIRS
C/O KAREN BUTLER
3816 7TH ST NW
WASHINGTON DC 20011-5902

MCDANIEL, STEPHEN MCDANIEL, SHARON K
4213 MILLPOINT DR
WAKE FOREST NC 27587-5239

BIRMINGHAM, JOHN DAVIS
3636 GREEN FARM LN
WAKE FOREST NC 27587-6827

REEVES, LISA CAROL CARTER
3604 GREEN FARM LN
WAKE FOREST NC 27587-6827

MAYE, HILTON EUGENE MAYE, EVELYN RUTH
4725 MITCHELL MILL RD
WAKE FOREST NC 27587-7240

PHILLIPS, BRETT L JR PHILLIPS, KRISTEN H
9237 BLACKLEY LAKE RD
WAKE FOREST NC 27587-8196

BROWN, WILHELMINIA ANNETTE
7506 LINNET RD
WENDELL NC 27591-7279

BROWN, WILHELMINIA ANNETTE
7506 LINNET RD
WENDELL NC 27591-7279

BIRMINGHAM, JOHN D
3636 GREEN FARM LN
WAKE FOREST NC 27587-6827

LEITSCHUH, KARI DAWN
4605 MITCHELL MILL RD
WAKE FOREST NC 27587-7239

RUIZ, ALICIA GUADALUPE
3857 JONESVILLE RD
WAKE FOREST NC 27587-8181

WW OVERTIME LLC
3728 GIDEON DR
WAKE FOREST NC 27587-6360

MILLER, BERNARD
3516 WOOD DUCK LN
WAKE FOREST NC 27587-6873

PRINCE, TINA ATKINS ATKINS, JEFFREY RAY
PO BOX 111
WILLOW SPRING NC 27592-0111

BLACKMON, JOE
4805 MITCHELL MILL RD
WAKE FOREST NC 27587-7242

TOUTLOFF, KENNETH S TOUTLOFF, BILLIE ANNE
3512 WOOD DUCK LN
WAKE FOREST NC 27587-6873

DUNN, WILLIE JEAN
4821 MITCHELL MILL RD
WAKE FOREST NC 27587-7242

COVINGTON, LINDA MANNING
3812 JONESVILLE RD
WAKE FOREST NC 27587-8180

CHRIST HOLINESS CHURCH
5016 HARTSFIELD DR
WAKE FOREST NC 27587-9638

FERRELL, BENJAMIN
C/O JESSE FERRELL
248 CALIFORNIA AVE
PROVIDENCE RI 02905-2815

BOYD, KATHERINE B PAYNE, M TRAVIS
4220 MILLPOINT DR
WAKE FOREST NC 27587-6377

RIVERS, SUSAN MARSHALL
3627 GREEN FARM LN
WAKE FOREST NC 27587-6828

RIVERS, SUSAN M
3627 GREEN FARM LN
WAKE FOREST NC 27587-6828

LEE, BRENDA HEIRS
BRENDEX MEEKS
3861 JONESVILLE RD
WAKE FOREST NC 27587-8181

PHILLIPS, BRETT L JR PHILLIPS, KRISTEN HOPE
9237 BLACKLEY LAKE RD
WAKE FOREST NC 27587-8196

MCGEE, LORIE ANN MCGEE, BILLY RAY
3621 GREEN FARM LN
WAKE FOREST NC 27587-6828

BERGDOLT, BRIAN H
3612 MEDLIN WOODS RD
WAKE FOREST NC 27587-7202

COTTON, DIANE MAYO
5020 MISTLETOE DR
WAKE FOREST NC 27587-6373

LEE, WILLIE O'KELLY LEE, EDITH M
3845 JONESVILLE RD
WAKE FOREST NC 27587-8181

PULLEN, MAGGIE H
C/O SAREN GILMORE
3833 JONESVILLE RD
WAKE FOREST NC 27587-8181

CARPENTER, BOBBY RAY CARPENTER, ALBERTA L
3629 GREEN FARM LN
WAKE FOREST NC 27587-6828

CHRIST HOLINESS CHURCH # 1
C/O WILIAM WHITFIELD
5016 HARTSFIELD DR
WAKE FOREST NC 27587-9638

CARELOCK, TABATHA R
3513 GREEN FARM LN
WAKE FOREST NC 27587-6826

CARELOCK, TABATHA R
3513 GREEN FARM LN
WAKE FOREST NC 27587-6826

FOWLER, JAMES ROBERT III BRIGHT, JILL F
7400 FOWLER RD
ZEBULON NC 27597-8318

JONES, TANYA ELISHA
3517 WOOD DUCK LN
WAKE FOREST NC 27587-6874

PAYNE, JEFFREY
3808 JONESVILLE RD
WAKE FOREST NC 27587-8180

MARTINEZ, ROBERTO ZETINA SANDOVAL,
MARIA DE LOS ANGELES ORTIZ
4916 LASHERAL RD
WAKE FOREST NC 27587-6375

HOLDEN, MARCIE L
3524 WOOD DUCK LN
WAKE FOREST NC 27587-6873

VAN GORDER, JAMES
3200 MAYEVILLE LN
WAKE FOREST NC 27587-5637

JONES, CHRISTOPHER D JONES, SHAWN
MICHAEL
5108 CHRISTIAN SCHOOL RD
PANTEGO NC 27860-9255

HOCUTT, JOHN E
3517 GREEN FARM LN
WAKE FOREST NC 27587-6826

BOSTIC, BILLIE D BOSTIC, JOHN J
9413 WHITE CARRIAGE DR
WAKE FOREST NC 27587-7046

WATKINS POND INC
ANTHONY BRIDGES
98 BERKSHIRE LN
HAMPSTEAD NC 28443-0480

CARTER, LISA CAROL
3604 GREEN FARM LN
WAKE FOREST NC 27587-6827

BIRMINGHAM, JOHN D
3636 GREEN FARM LN
WAKE FOREST NC 27587-6827

JARVIS, MYRON JARVIS, MARIE
3704 GIDEON DR
WAKE FOREST NC 27587-6360

BLACKLEY LAKE FISHING CLUB
C/O GLENN BARHAM
9001 BLACKLEY LAKE RD
WAKE FOREST NC 27587-8110

FERRELL, CHARLES E FERRELL, SHARON R
3805 JONESVILLE RD
WAKE FOREST NC 27587-8181

BURNHAM, ABRAHAM T BURNHAM, KYLA L
3803 JONESVILLE RD
WAKE FOREST NC 27587-8181

JONES, CHARLES E JONES, DARLENE
3816 JONESVILLE RD
WAKE FOREST NC 27587-8180

WHITLEY, CLEVELAND G HEIRS
DEBRA WHITLEY
3720 GIDEON DR
WAKE FOREST NC 27587-6360

CURTIS, HENDELL HEIRS
4917 UNIVERSAL DR
WAKE FOREST NC 27587-6357

HAUFLER, DARREL EUGENE
4340 MILLPOINT DR
WAKE FOREST NC 27587-6384

HARRIS, OLLIE VIRGIN HEIRS HARRIS, LORINE B
LORINE B HARRIS
PO BOX 225
FRANKLINTON NC 27525-0225

CHRIST HOLINESS CHURCH NUMBER 1
5016 HARTSFIELD DR
WAKE FOREST NC 27587-9638

KULAWIAK, MEGAN
3533 WOOD DUCK LN
WAKE FOREST NC 27587-6874

KULAWIAK, MEGAN
3533 WOOD DUCK LN
WAKE FOREST NC 27587-6874

GREENE, JOE L
6415 HAWTHORNE ST
HYATTSVILLE MD 20785-1711

DALEY, JOSEPH P
3619 GREEN FARM LN
WAKE FOREST NC 27587-6828

BARHAM, LARRY H. BARHAM, MICHAEL D.
5821 WILD ORCHID TRL
RALEIGH NC 27613-8549

PHILLIPS, BRETT LEE JR PHILLIPS, KRISTEN HOPE
9237 BLACKLEY LAKE RD
WAKE FOREST NC 27587-8196

DUNN, JAMES WILLIAM HEIRS MONTAGUE,
BUNNIE DUNN
2390 W RIVER RD
FRANKLINTON NC 27525-7217

PERRY, ELWOOD RYAN
2004 TRAWICK RD
RALEIGH NC 27604-3841

ALSTON, CHRISTOPHER
2172 WARRENTON RD
HENDERSON NC 27537-9359

QUIRINO, MARIA ESTELA
4916 UNIVERSAL DR
WAKE FOREST NC 27587-6356

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

ROUSE, ELLEN CURTIS
4009 TRESCO XING
RALEIGH NC 27616-8473

HOLLOWAY, ROY D HOLLOWAY, MARTHA L
3613 GREEN FARM LN
WAKE FOREST NC 27587-6828

SOUTTER, SUSAN R SOUTTER, ROBERT QUENTIN
3636 BRIDGES POND WAY
WAKE FOREST NC 27587-5611

KELLY, NICOLAS KELLY, PEARLINE L
5025 HARTSFIELD DR
WAKE FOREST NC 27587-9638

WILSON, TIMOTHY LEE
5409 KNOLLWOOD RD
RALEIGH NC 27609-4552

JP MORGAN MORTGAGE ACQUISITION CORP
4817 LONG GREEN DR
WAKE FOREST NC 27587-5244

GHOLSON, RYAN PATRICK
7924 MANDREL WAY
RALEIGH NC 27616-9503

SUAREZ, HELENA TRUSTEE THE HELENA SUAREZ
FAMILY TRUST
9660 FALLS OF NEUSE RD # 138-286
RALEIGH NC 27615-2473

INTROINVEST LLC
4921 UNIVERSAL DR
WAKE FOREST NC 27587-6357

TYNER, BRENDA W TRUSTEE NANCY H WATKINS
IRREVOCABLE TRUST
PO BOX 221
ROLESVILLE NC 27571-0221

PHILLIPS, BRETT L JR PHILLIPS, KRISTEN H
9237 BLACKLEY LAKE RD
WAKE FOREST NC 27587-8196

PHILLIPS, BRETT L JR PHILLIPS, KRISTEN H
9237 BLACKLEY LAKE RD
WAKE FOREST NC 27587-8196

GARCIA, SALVADOR
4901 OLD POOLE RD
RALEIGH NC 27610

SOUTTER, SUSAN R SOUTTER, ROBERT QUENTIN
3636 BRIDGES POND WAY
WAKE FOREST NC 27587-5611

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

BERRY, WILLIAM R BERRY, JULIA D
9241 BLACKLEY LAKE RD
WAKE FOREST NC 27587-8196

NC FARM AND FORAGE LLC
9261 BLACKLEY LAKE RD
WAKE FOREST NC 27587-8196

MAYE, EVELYN Y MAYE, HILTON EUGENE
4725 MITCHELL MILL RD
WAKE FOREST NC 27587-7240

UNIVERSAL CHURCH OF PRAYER &
4912 UNIVERSAL DR
WAKE FOREST NC 27587-6356

REZONING AND ANNEXATION OF PROPERTY CONSISTING OF +/- 93 ACRES, LOCATED SOUTHWEST OF THE JONESVILLE ROAD AND UNIVERSAL DRIVE INTERSECTION, IN THE TOWN OF ROLESVILLE

REPORT OF MEETING WITH ADJACENT PROPERTY OWNERS AND TENANTS ON OCTOBER 24, 2022

Pursuant to applicable provisions of the Unified Development Ordinance, a meeting was held with respect to a potential rezoning and annexation with adjacent neighbors on Tuesday, October 24, 2023, at 5:30 p.m. The property considered for this potential rezoning totals approximately 93 acres and is located southwest of the Jonesville Road and Universal Drive intersection, in the Town of Rolesville. This meeting was held at the Rolesville Community Center. All owners and tenants of property within 1000 feet of the subject property were invited to attend the meeting. Attached hereto as **Exhibit A** is a copy of the neighborhood meeting notice. A copy of the required mailing list for the meeting invitations is attached hereto as **Exhibit B**. A summary of the items discussed at the meeting is attached hereto as **Exhibit C**. Attached hereto as **Exhibit D** is a list of individuals who attended the meeting.

EXHIBIT A – NEIGHBORHOOD MEETING NOTICE

LONGLEAF
LAW PARTNERS

To: Neighboring Property Owners and Tenants
From: Samuel Morris
Date: October 13, 2023
Re: Neighborhood Meeting for Annexation and Rezoning of Harris Creek Farm (f.k.a. 4928 Universal) (ANX 22-05 & MA 22-08)

You are invited to attend a meeting to discuss the proposed annexation and rezoning of Harris Creek Farm (f.k.a. 4928 Universal) (ANX 22-05 & MA 22-08). We have scheduled an informational meeting with surrounding neighbors on October 24, 2023 from 5:30 PM until 6:30 PM at the following location:

Rolesville Community Center
514 Southtown Circle
Rolesville, NC 27571

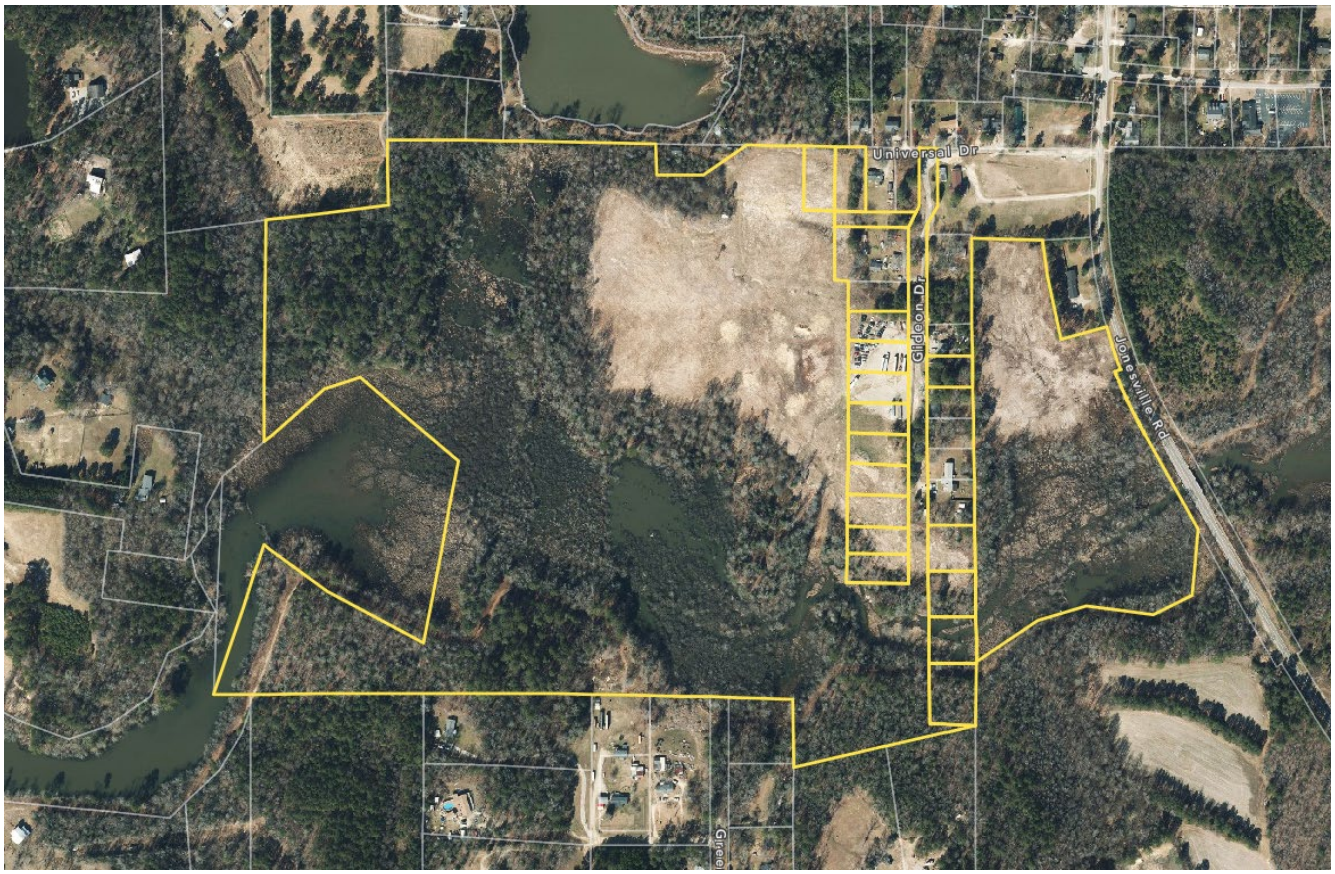
The purpose of this meeting is to discuss the proposed annexation and rezoning of Harris Creek Farm (f.k.a. 4928 Universal) (ANX 22-05 & MA 22-08). The property assemblage totals approximately 93 acres in size and is located southwest of the Jonesville Road and Universal Drive intersection.

The property is currently zoned Residential-30 (R-30) under Wake County zoning. The proposed rezoning would change the zoning to Residential Medium Density Conditional Zoning and Residential High Density Conditional Zoning (RM-CZ & RH-CZ) under the Town of Rolesville zoning. The purpose of the rezoning is to allow for the development of single family homes and townhomes.

Please do not hesitate to contact me directly if you have any questions or wish to discuss any issues. I can be reached at 919.780.5438 and smorris@longleaflp.com. Also, for more information about the rezoning, you may visit https://www.rolesvillenc.gov/projects/harris-creek-farm-fka-4928-universal or contact the Town of Rolesville Planning Department at 919.554.6517.

Attached to this invitation are the following materials:
1. Subject Property Current Aerial
2. Proposed Zoning Map

CURRENT PROPERTY MAP



PROPOSED ZONING

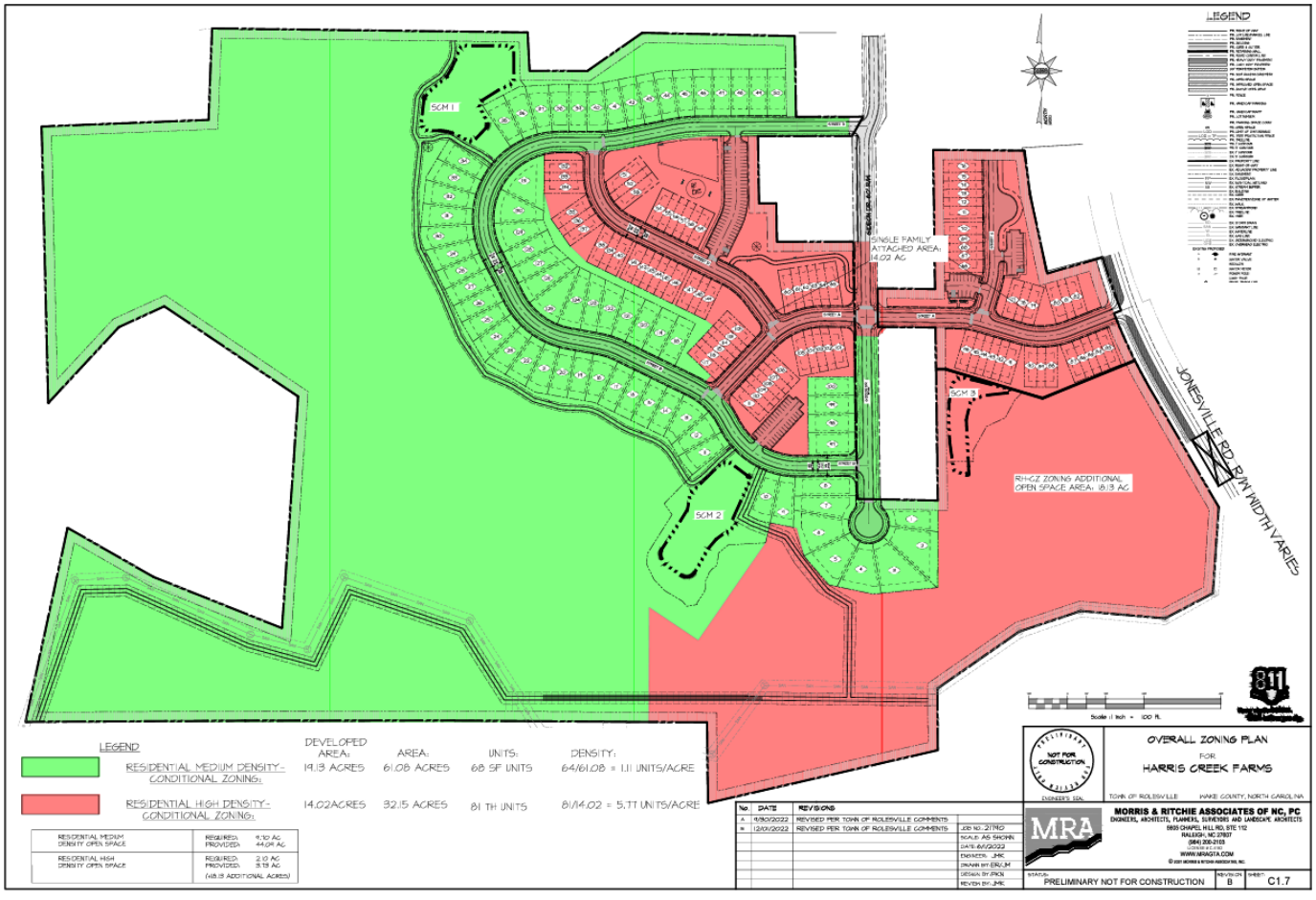


EXHIBIT B – NOTICE LIST

JONES, CHARLES ALFONSO JONES, ALLIE V
3800 JONESVILLE RD
WAKE FOREST NC 27587-8180

JONES, CHARLES E JONES, DARLENE C
3816 JONESVILLE RD
WAKE FOREST NC 27587-8180

BADGETT, ROBIN D BADGETT, TANA F
4817 MITCHELL MILL RD
WAKE FOREST NC 27587-7242

HUNT, FERDINAND V HUNT, LYDIA L
1000 SIMPSON ST APT 6B
BRONX NY 10459-3348

FERRELL, CHARLES E FERRELL, GRETTA L
3805 JONESVILLE RD
WAKE FOREST NC 27587-8181

WALKER, ALESHIA FERRELL WALKER, AARON
5012 HARTSFIELD DR
WAKE FOREST NC 27587-9638

HOWE, MARK JAMES JR
PO BOX 61122
RALEIGH NC 27661-1122

JARVIS, MARIE D CURTIS, HURLEY MAE
3704 GIDEON DR
WAKE FOREST NC 27587-6360

JARVIS, MARIE D CURTIS, HURLEY MAE
3704 GIDEON DR
WAKE FOREST NC 27587-6360

DONAN, JESUS CORDON, LUCY DONAN
3617 GREEN FARM LN
WAKE FOREST NC 27587-6828

WATKINS POND INC
ANTHONY BRIDGES
98 BERKSHIRE LN
HAMPSTEAD NC 28443-0480

PRUDENT, VIRGINIA PRUDENT, ULRICK JR
3104 BILLIARD CT
WAKE FOREST NC 27587-9388

TODD, JOAN M
4180 STELLS RD
WAKE FOREST NC 27587-6306

FERRELL, BRIAN L
3807 JONESVILLE RD
WAKE FOREST NC 27587-8181

PERRY, LISA R
PO BOX 581
ROLESVILLE NC 27571-0581

CHAPPELL, CONNIE B PERRY, BETTY ANN BLACKLEY
4025 LOUISBURY RD
WAKE FOREST NC 27587-8118

POWER ELEVEN CONSTRUCTION LLC
4125 DURHAM CHAPEL HILL BLVD STE 8A
DURHAM NC 27707-2666

SESSOMS, JOHN B
5021 HARTSFIELD DR
WAKE FOREST NC 27587-9638

WILDER, THOMAS H III WILDER, MAGGIE
104 DARTMOUTH RD APT 326
RALEIGH NC 27609-8409

CHRIST HOLINESS CHURCH NUMBER 1
C/O WILIAM WHITFIELD
5016 HARTSFIELD DR
WAKE FOREST NC 27587-9638

BROWN, JAMES A BROWN, SHELBY W
4141 STELLS RD
WAKE FOREST NC 27587-5242

GILMORE, JOSEPH H GILMORE, SARAH L
3833 JONESVILLE RD
WAKE FOREST NC 27587-8181

ASWELL, FREDRICA T
3508 GREEN FARM LN
WAKE FOREST NC 27587-6825

GASPER, REGUGIO TECHICAC
7817 S COLORADO DR
RALEIGH NC 27616-0905

JEFFERYS, CHRISTOPHER JEFFERYS, STEPHANIE
2933 CANDLEHURST LN
RALEIGH NC 27616-6250

MAYE, HILTON EUGENE MAYE, EVELYN YOUNG
4725 MITCHELL MILL RD
WAKE FOREST NC 27587-7240

BERRY, WILLIAM ROSSER BERRY, JULIA D
9249 BLACKLEY LAKE RD
WAKE FOREST NC 27587-8196

HARTSFIELD, ROZELIA J HEIRS
HATTIE SMITH
2450 MINERAL SPRINGS RD
BOYDTON VA 23917-4404

HARTSFIELD, ROZELIA J HEIRS
HATTIE SMITH
2450 MINERAL SPRINGS RD
BOYDTON VA 23917-4404

HARTSFIELD, ROZELIA J HEIRS
HATTIE SMITH
2450 MINERAL SPRINGS RD
BOYDTON VA 23917-4404

HARTSFIELD, ROZELIA J HEIRS
HATTIE SMITH
2450 MINERAL SPRINGS RD
BOYDTON VA 23917-4404

PERRY, JAMES DONNELL PERRY, CYNTHIA D
3869 JONESVILLE RD
WAKE FOREST NC 27587-8181

HOLLINGSWORTH, JACOB BROOKS
3509 WOOD DUCK LN
WAKE FOREST NC 27587-6874

BOUTAVONG, KIT
3521 WOOD DUCK LN
WAKE FOREST NC 27587-6874

JONES, ERNESTINE
3848 JONESVILLE RD
WAKE FOREST NC 27587-8180

BUGG, SAMUEL WILLIAM
9245 BLACKLEY LAKE RD
WAKE FOREST NC 27587-8196

BROWN, JAMES ALLEN BROWN, SHELBY W
4141 STELLS RD
WAKE FOREST NC 27587-5242

MEDLIN, LISA C
3520 BRIDGES POND WAY
WAKE FOREST NC 27587-5606

FERRELL, BRIAN L
3807 JONESVILLE RD
WAKE FOREST NC 27587-8181

HARTSFIELD, MARY HEIRS
C/O KAREN BUTLER
3816 7TH ST NW
WASHINGTON DC 20011-5902

MCDANIEL, STEPHEN MCDANIEL, SHARON K
4213 MILLPOINT DR
WAKE FOREST NC 27587-5239

BIRMINGHAM, JOHN DAVIS
3636 GREEN FARM LN
WAKE FOREST NC 27587-6827

REEVES, LISA CAROL CARTER
3604 GREEN FARM LN
WAKE FOREST NC 27587-6827

MAYE, HILTON EUGENE MAYE, EVELYN RUTH
4725 MITCHELL MILL RD
WAKE FOREST NC 27587-7240

PHILLIPS, BRETT L JR PHILLIPS, KRISTEN H
9237 BLACKLEY LAKE RD
WAKE FOREST NC 27587-8196

BROWN, WILHELMINIA ANNETTE
7506 LINNET RD
WENDELL NC 27591-7279

BROWN, WILHELMINIA ANNETTE
7506 LINNET RD
WENDELL NC 27591-7279

BIRMINGHAM, JOHN D
3636 GREEN FARM LN
WAKE FOREST NC 27587-6827

LEITSCHUH, KARI DAWN
4605 MITCHELL MILL RD
WAKE FOREST NC 27587-7239

RUIZ, ALICIA GUADALUPE
3857 JONESVILLE RD
WAKE FOREST NC 27587-8181

WW OVERTIME LLC
3728 GIDEON DR
WAKE FOREST NC 27587-6360

MILLER, BERNARD
3516 WOOD DUCK LN
WAKE FOREST NC 27587-6873

PRINCE, TINA ATKINS ATKINS, JEFFREY RAY
PO BOX 111
WILLOW SPRING NC 27592-0111

BLACKMON, JOE
4805 MITCHELL MILL RD
WAKE FOREST NC 27587-7242

TOUTLOFF, KENNETH S TOUTLOFF, BILLIE ANNE
3512 WOOD DUCK LN
WAKE FOREST NC 27587-6873

DUNN, WILLIE JEAN
4821 MITCHELL MILL RD
WAKE FOREST NC 27587-7242

COVINGTON, LINDA MANNING
3812 JONESVILLE RD
WAKE FOREST NC 27587-8180

CHRIST HOLINESS CHURCH
5016 HARTSFIELD DR
WAKE FOREST NC 27587-9638

FERRELL, BENJAMIN
C/O JESSE FERRELL
248 CALIFORNIA AVE
PROVIDENCE RI 02905-2815

BOYD, KATHERINE B PAYNE, M TRAVIS
4220 MILLPOINT DR
WAKE FOREST NC 27587-6377

RIVERS, SUSAN MARSHALL
3627 GREEN FARM LN
WAKE FOREST NC 27587-6828

RIVERS, SUSAN M
3627 GREEN FARM LN
WAKE FOREST NC 27587-6828

LEE, BRENDA HEIRS
BRENDEX MEEKS
3861 JONESVILLE RD
WAKE FOREST NC 27587-8181

PHILLIPS, BRETT L JR PHILLIPS, KRISTEN HOPE
9237 BLACKLEY LAKE RD
WAKE FOREST NC 27587-8196

MCGEE, LORIE ANN MCGEE, BILLY RAY
3621 GREEN FARM LN
WAKE FOREST NC 27587-6828

BERGDOLT, BRIAN H
3612 MEDLIN WOODS RD
WAKE FOREST NC 27587-7202

COTTON, DIANE MAYO
5020 MISTLETOE DR
WAKE FOREST NC 27587-6373

LEE, WILLIE O'KELLY LEE, EDITH M
3845 JONESVILLE RD
WAKE FOREST NC 27587-8181

PULLEN, MAGGIE H
C/O SAREN GILMORE
3833 JONESVILLE RD
WAKE FOREST NC 27587-8181

CARPENTER, BOBBY RAY CARPENTER, ALBERTA L
3629 GREEN FARM LN
WAKE FOREST NC 27587-6828

CHRIST HOLINESS CHURCH # 1
C/O WILIAM WHITFIELD
5016 HARTSFIELD DR
WAKE FOREST NC 27587-9638

CARELOCK, TABATHA R
3513 GREEN FARM LN
WAKE FOREST NC 27587-6826

CARELOCK, TABATHA R
3513 GREEN FARM LN
WAKE FOREST NC 27587-6826

FOWLER, JAMES ROBERT III BRIGHT, JILL F
7400 FOWLER RD
ZEBULON NC 27597-8318

JONES, TANYA ELISHA
3517 WOOD DUCK LN
WAKE FOREST NC 27587-6874

PAYNE, JEFFREY
3808 JONESVILLE RD
WAKE FOREST NC 27587-8180

MARTINEZ, ROBERTO ZETINA SANDOVAL,
MARIA DE LOS ANGELES ORTIZ
4916 LASHERAL RD
WAKE FOREST NC 27587-6375

HOLDEN, MARCIE L
3524 WOOD DUCK LN
WAKE FOREST NC 27587-6873

VAN GORDER, JAMES
3200 MAYEVILLE LN
WAKE FOREST NC 27587-5637

JONES, CHRISTOPHER D JONES, SHAWN
MICHAEL
5108 CHRISTIAN SCHOOL RD
PANTEGO NC 27860-9255

HOCUTT, JOHN E
3517 GREEN FARM LN
WAKE FOREST NC 27587-6826

BOSTIC, BILLIE D BOSTIC, JOHN J
9413 WHITE CARRIAGE DR
WAKE FOREST NC 27587-7046

WATKINS POND INC
ANTHONY BRIDGES
98 BERKSHIRE LN
HAMPSTEAD NC 28443-0480

CARTER, LISA CAROL
3604 GREEN FARM LN
WAKE FOREST NC 27587-6827

BIRMINGHAM, JOHN D
3636 GREEN FARM LN
WAKE FOREST NC 27587-6827

JARVIS, MYRON JARVIS, MARIE
3704 GIDEON DR
WAKE FOREST NC 27587-6360

BLACKLEY LAKE FISHING CLUB
C/O GLENN BARHAM
9001 BLACKLEY LAKE RD
WAKE FOREST NC 27587-8110

FERRELL, CHARLES E FERRELL, SHARON R
3805 JONESVILLE RD
WAKE FOREST NC 27587-8181

BURNHAM, ABRAHAM T BURNHAM, KYLA L
3803 JONESVILLE RD
WAKE FOREST NC 27587-8181

JONES, CHARLES E JONES, DARLENE
3816 JONESVILLE RD
WAKE FOREST NC 27587-8180

WHITLEY, CLEVELAND G HEIRS
DEBRA WHITLEY
3720 GIDEON DR
WAKE FOREST NC 27587-6360

CURTIS, HENDELL HEIRS
4917 UNIVERSAL DR
WAKE FOREST NC 27587-6357

HAUFLER, DARREL EUGENE
4340 MILLPOINT DR
WAKE FOREST NC 27587-6384

HARRIS, OLLIE VIRGIN HEIRS HARRIS, LORINE B
LORINE B HARRIS
PO BOX 225
FRANKLINTON NC 27525-0225

CHRIST HOLINESS CHURCH NUMBER 1
5016 HARTSFIELD DR
WAKE FOREST NC 27587-9638

KULAWIAK, MEGAN
3533 WOOD DUCK LN
WAKE FOREST NC 27587-6874

KULAWIAK, MEGAN
3533 WOOD DUCK LN
WAKE FOREST NC 27587-6874

GREENE, JOE L
6415 HAWTHORNE ST
HYATTSVILLE MD 20785-1711

DALEY, JOSEPH P
3619 GREEN FARM LN
WAKE FOREST NC 27587-6828

BARHAM, LARRY H. BARHAM, MICHAEL D.
5821 WILD ORCHID TRL
RALEIGH NC 27613-8549

PHILLIPS, BRETT LEE JR PHILLIPS, KRISTEN HOPE
9237 BLACKLEY LAKE RD
WAKE FOREST NC 27587-8196

DUNN, JAMES WILLIAM HEIRS MONTAGUE,
BUNNIE DUNN
2390 W RIVER RD
FRANKLINTON NC 27525-7217

PERRY, ELWOOD RYAN
2004 TRAWICK RD
RALEIGH NC 27604-3841

ALSTON, CHRISTOPHER
2172 WARRENTON RD
HENDERSON NC 27537-9359

QUIRINO, MARIA ESTELA
4916 UNIVERSAL DR
WAKE FOREST NC 27587-6356

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

ROUSE, ELLEN CURTIS
4009 TRESCO XING
RALEIGH NC 27616-8473

HOLLOWAY, ROY D HOLLOWAY, MARTHA L
3613 GREEN FARM LN
WAKE FOREST NC 27587-6828

SOUTTER, SUSAN R SOUTTER, ROBERT QUENTIN
3636 BRIDGES POND WAY
WAKE FOREST NC 27587-5611

KELLY, NICOLAS KELLY, PEARLINE L
5025 HARTSFIELD DR
WAKE FOREST NC 27587-9638

WILSON, TIMOTHY LEE
5409 KNOLLWOOD RD
RALEIGH NC 27609-4552

JP MORGAN MORTGAGE ACQUISITION CORP
4817 LONG GREEN DR
WAKE FOREST NC 27587-5244

GHOLSON, RYAN PATRICK
7924 MANDREL WAY
RALEIGH NC 27616-9503

SUAREZ, HELENA TRUSTEE THE HELENA SUAREZ
FAMILY TRUST
9660 FALLS OF NEUSE RD # 138-286
RALEIGH NC 27615-2473

INTROINVEST LLC
4921 UNIVERSAL DR
WAKE FOREST NC 27587-6357

TYNER, BRENDA W TRUSTEE NANCY H WATKINS
IRREVOCABLE TRUST
PO BOX 221
ROLESVILLE NC 27571-0221

PHILLIPS, BRETT L JR PHILLIPS, KRISTEN H
9237 BLACKLEY LAKE RD
WAKE FOREST NC 27587-8196

PHILLIPS, BRETT L JR PHILLIPS, KRISTEN H
9237 BLACKLEY LAKE RD
WAKE FOREST NC 27587-8196

GARCIA, SALVADOR
4901 OLD POOLE RD
RALEIGH NC 27610

SOUTTER, SUSAN R SOUTTER, ROBERT QUENTIN
3636 BRIDGES POND WAY
WAKE FOREST NC 27587-5611

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

KENNETH INVESTMENT LLC
10030 GREEN LEVEL CHURCH RD STE 802
CARY NC 27519-8195

BERRY, WILLIAM R BERRY, JULIA D
9241 BLACKLEY LAKE RD
WAKE FOREST NC 27587-8196

NC FARM AND FORAGE LLC
9261 BLACKLEY LAKE RD
WAKE FOREST NC 27587-8196

MAYE, EVELYN Y MAYE, HILTON EUGENE
4725 MITCHELL MILL RD
WAKE FOREST NC 27587-7240

UNIVERSAL CHURCH OF PRAYER &
4912 UNIVERSAL DR
WAKE FOREST NC 27587-6356

EXHIBIT C – MEETING MINUTES

- **Introduction of Development Team:**
    - Developer Steve George with The CSC Group, Attorney Samuel Morris with Longleaf Law Partners, and Engineer Jeremy Keeney with Morris & Ritchie Associates.

- **Development Team Presentation:**
    - Purpose of this neighborhood meeting and past meetings.
    - Discussion regarding rezoning and annexation process in Rolesville.
    - Description and location of the Subject Property.
    - Discussion regarding current zoning of the property under Wake County.
    - Discussion regarding Rolesville Future Land Use Map and Comprehensive Plan guidance
    - Description of proposed rezoning and reasons for the request.
    - Explanation of proposed building types and densities on the Subject Property.
    - Discussion regarding wetlands and open space that will be preserved on the property.
    - Forecast future meetings and public hearings.

- **Q & A:**
    - What is the name of the development company?
        - The CSC Group, which is a local real estate development group.
    - What is the price point and square footage of the townhomes and single-family homes?
        - Developer explained potential projections on cost per unit for townhouses and detached units. They will likely be between 1,800 and 3,000 square feet. Do not have final pricing due to potential market changes.
    - Was there a traffic impact analysis?
        - The development team explained that a Traffic Impact Analysis was done by Ramey Kemp, who was retained by the Town. The NCDOT signed off on this. Based on increased trips and conditions on site they make

recommendations on monitoring and approved intersections. The results and requirements have been included in the rezoning request.

- Will Universal Dr Gideon Dr be paved/improved?
  - The town is requiring the developer to pave and improve all of Gideon Drive, not Universal, but we are working privately with the Church regarding Universal Drive.
- What measure will be taking place for privacy to neighboring properties? Will there be any natural buffers?
  - The development team explained that there will be 25' vegetative buffers around all adjacent private property.
- Will there be sidewalks Gideon Drive?
  - The engineer explained the town street requirements will require sidewalk improvements along Gideon.
- What is proposed timeline for the development?
  - Development team explained the typical rezoning timeline with development plan and permits, and that construction would not likely occur over a year.
- Inquiry regarding the size, location, and purpose of stormwater ponds.
  - The engineer explained the details and purpose of the proposed stormwater pond.
- Questions regarding density, configuration, and approval process for nearby Mitchell Mill Reserve development.
  - The development team explained the details and nature of the approved Mithcell Mill Reserve case. Engineer explained that background traffic data from that rezoning was considered and used during our TIA.
- Will the homes be built-to-rent, or will they be for sale? What is to stop an owner from renting out a unit that they purchase?
  - The homes will be for sale. NC law limits the ability to prohibit people from leasing their property. Individual owners could buy a unit as an investment.

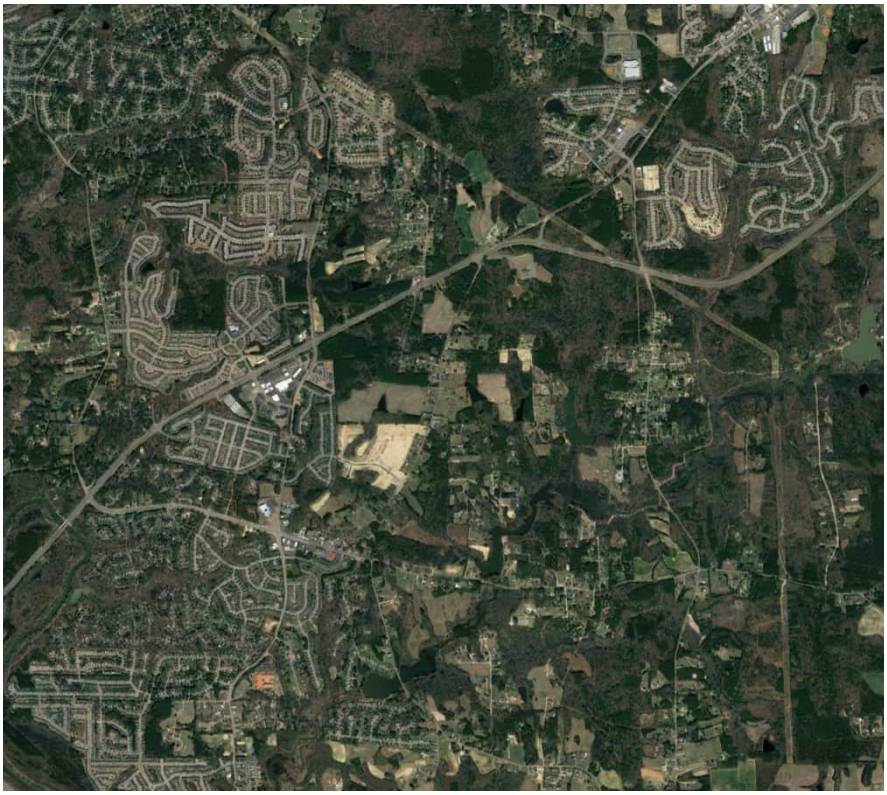
EXHIBIT D – MEETING ATTENDEES

1. Sam Morris
2. Steven George
3. Jeremy Keeny
4. John Birmingham
5. Guy Jones
6. Myron Jarvis
7. Marie Jarvis
8. Matthew Jarvis
9. Darlene Jones
10. Bryan Harris

Attachment #10

RAMEY KEMP ASSOCIATES

TOGETHER WE ARE LIMITLESS



Harris Creek Farm

Traffic Impact Analysis

Rolesville, North Carolina

RKA rameykemp.com

TRAFFIC IMPACT ANALYSIS

FOR

HARRIS CREEK FARM

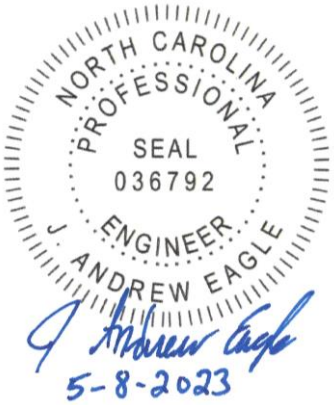
LOCATED

IN

ROLESVILLE, NORTH CAROLINA

Prepared For:
Town of Rolesville
502 Southtown Circle
Rolesville, NC 27571

Prepared By:
Infrastructure Consulting Services, Inc.
dba
Ramey Kemp Associates
5808 Faringdon Place
Raleigh, NC 27609
License #F-1489



MAY 2023

RKA Project No. 20498 - 009

Prepared By: DAR

Reviewed By: JAE

TRAFFIC IMPACT ANALYSIS
HARRIS CREEK FARM
ROLESVILLE, NORTH CAROLINA

EXECUTIVE SUMMARY

1. Development Overview

A Traffic Impact Analysis (TIA) was conducted for the proposed Harris Creek Farm development in accordance with the Town of Rolesville (Town) Land Development Ordinance (LDO) and North Carolina Department of Transportation (NCDOT) capacity analysis guidelines. The proposed development, anticipated to be completed in 2027, is to be located on the west side of Jonesville Road near Universal Drive in Rolesville, NC. The proposed development is expected to consist of 68 single-family homes and 81 townhomes. Site access is proposed via two (2) full-movement driveway connections: one on Universal Drive and one on Jonesville Road approximately 700 feet south of Universal Drive.

The study analyzes traffic conditions during the weekday AM and PM peak hours for the following scenarios:

- 2022 Existing Traffic Conditions
- 2027 No-Build Traffic Conditions
- 2027 Build Traffic Conditions
- 2027 Build-Improved Traffic Conditions

2. Existing Traffic Conditions

The study area for the TIA was determined through coordination with the Town and NCDOT and consists of the following existing intersections:

- US 401 Bypass and Jonesville Road
- US 401 Bypass and Eastern U-Turn Location
- Mitchell Mill Road and Jonesville Road / Peebles Road
- Jonesville Road and Universal Drive

Existing peak hour traffic volumes were determined based on traffic counts conducted at the study intersections listed above except for Jonesville Road and Universal Drive, in November of 2021 during typical weekday AM (7:00 AM – 9:00 AM) and PM (4:00 PM – 6:00 PM) peak periods, while schools were in session for in-person learning.

Existing peak hour turning movement volumes at the intersection of Jonesville Road and Universal Drive were estimated by generating and assigning trips for the nine (9) homes that are accessed via Universal Drive. It was estimated that there will be 8 AM trips: 2 enter 6 exit and 10 PM trips: 7 enter 3 exit. The trips were distributed to the north and south along Jonesville Road the same as site trips. Through traffic volumes were balanced from the Mitchell Mill Road/Jonesville Road intersection.

Previously collected counts from the year 2021 were projected to the 2022 existing analysis year using a compounded annual growth rate of 2%. Weekday AM and PM traffic volumes were balanced between study intersections, where appropriate.

3. Site Trip Generation

The proposed development is assumed to consist of 68 single-family homes and 81 townhomes,. Average weekday daily, AM peak hour, and PM peak hour trips for the proposed development were estimated using methodology contained within the ITE *Trip Generation Manual*, 11th Edition. Table E-1 provides a summary of the trip generation potential for the site.

Table E-1: Site Trip Generation

Land Use (ITE Code)	Intensity	Daily Traffic (vpd)	Weekday AM Peak Hour Trips (vph)			Weekday PM Peak Hour Trips (vph)		
			Enter	Exit	Total	Enter	Exit	Total
Single-Family Home (210)	68 DU	708	13	39	52	44	25	69
Single Family Attached (215)	81 DU	568	9	27	36	26	19	45
Total Primary Trips		**1,276**	**22**	**66**	**88**	**70**	**44**	**114**

4. Future Traffic Conditions

Through coordination with the Town and NCDOT, it was determined that an annual growth rate of 0% would be used to generate 2027 projected weekday AM and PM peak hour traffic volumes. A growth rate of 0% was used due to the number of developments included in the background traffic and the proximity of some of these developments to the proposed development. The following adjacent developments were identified to be considered under future conditions:

- Cobblestone Crossing Mixed-Use (Cobblestone)
- Young Street PUD (The Point)
- Wheeler Tract (Rolesville Crossing)
- Louisbury Road Assemblage
- Kalas / Watkins Family Property (Kalas Falls)
- 5109 Mitchell Mill
- Hills at Harris Creek

5. Capacity Analysis Summary

The analysis considered weekday AM and PM peak hour traffic for 2022 existing, 2027 no-build, 2027 build, and 2027 build-improved conditions. Refer to Section 7 of the TIA for the capacity analysis summary performed at each study intersection.

6. Recommendations

Based on the findings of this study, specific geometric and traffic control improvements have been identified at study intersections. The improvements are summarized below and are illustrated in Figure E-1.

Recommended Improvements by Developer

<u>US 401 Bypass and Jonesville Road</u>

- Conduct a full signal warrant analysis prior to full build-out of the proposed development and install a traffic signal if warranted and approved by the Town and NCDOT.

US 401 Bypass and Eastern U-Turn Location

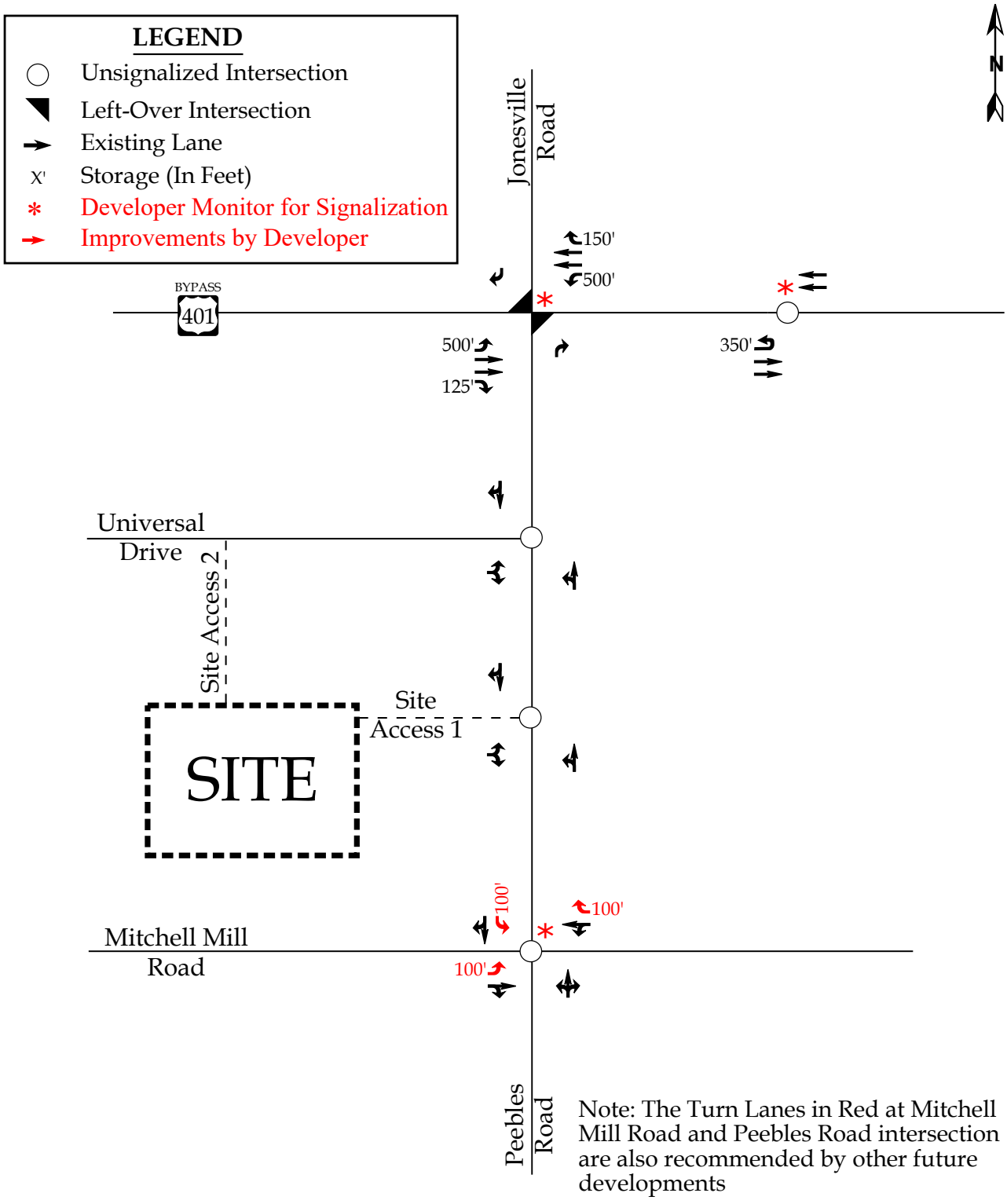
- Conduct a full signal warrant analysis prior to full build-out of the proposed development and install a traffic signal if warranted and approved by the Town and NCDOT.

Mitchell Mill Road and Jonesville Road / Peebles Road

- Construct a southbound (Jonesville Road) left-turn lane with at least 100 feet of storage and appropriate decel and taper.
    - It should be noted that this improvement was also identified by the 5109 Mitchell Mill Road TIA and Hills at Harris Creek TIA
- Construct a westbound (Mitchell Mill Road) right-turn lane with at least 100 feet of storage and appropriate decel and taper.
    - It should be noted that this improvement was also identified by the Hills at Harris Creek TIA
- Construct an eastbound (Mitchell Mill Road) left-turn lane with at least 100 feet of storage and appropriate decel and taper.
    - It should be noted that this improvement was also identified by the 5109 Mitchell Mill Road TIA
- Conduct a full signal warrant analysis prior to full build-out of the proposed development and install a traffic signal if warranted and approved by the Town and NCDOT.

Jonesville Road and Site Drive

- Construct the eastbound approach (Site Drive) with one ingress lane and one egress lane.
- Provide stop-control for the eastbound approach (Site Drive).



RAMEY KEMP ASSOCIATES

Harris Creek Farm
Rolesville, NC

Recommended Lane Configurations

Scale: Not to Scale | Figure E-1

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

TECHNICAL APPENDIX

TRAFFIC IMPACT ANALYSIS
HARRIS CREEK FARM
ROLESVILLE, NORTH CAROLINA

1. INTRODUCTION

The contents of this report present the findings of the Traffic Impact Analysis (TIA) conducted for the proposed Harris Creek Farm development in Rolesville, North Carolina. The proposed development, anticipated to be completed in 2027, is to be located on the west side of Jonesville Road near Universal Drive in Rolesville, NC. The proposed development is expected to consist of 68 single-family homes and 81 townhomes. The purpose of this study is to determine the potential impacts to the surrounding transportation system created by traffic generated by the proposed development, as well as recommend improvements to mitigate the impacts.

The study analyzes traffic conditions during the weekday AM and PM peak hours for the following scenarios:

- 2022 Existing Traffic Conditions
- 2027 No-Build Traffic Conditions
- 2027 Build Traffic Conditions

1.1. Site Location and Study Area

The proposed development is to be located on the west side of Jonesville Road near Universal Drive in Rolesville, NC. Refer to Figure 1 for the site location map. The study area for the TIA was determined through coordination with the North Carolina Department of Transportation (NCDOT) and the Town of Rolesville (Town) and consists of the following existing intersections:

- US 401 Bypass and Jonesville Road
- US 401 Bypass and Eastern U-Turn Location
- Jonesville Road and Universal Drive
- Mitchell Mill Road and Jonesville Road / Peebles Road

Refer to Appendix A for the approved scoping documentation.

1.2. Proposed Land Use and Site Access

The site is to be located on the west side of Jonesville Road near Universal Drive. The proposed development is anticipated to be completed in 2027, and is assumed to consist of the following uses:

- 68 single-family homes
- 81 townhomes

Site access to the proposed development is expected to be provided via two (2) full-movement driveway connections: one on Universal Drive and one on Jonesville Road approximately 700 feet south of Universal Drive. Refer to Figure 2 for a copy of the preliminary site plan.

1.3. Adjacent Land Uses

The proposed development is located in an area consisting primarily of undeveloped land and residential development.

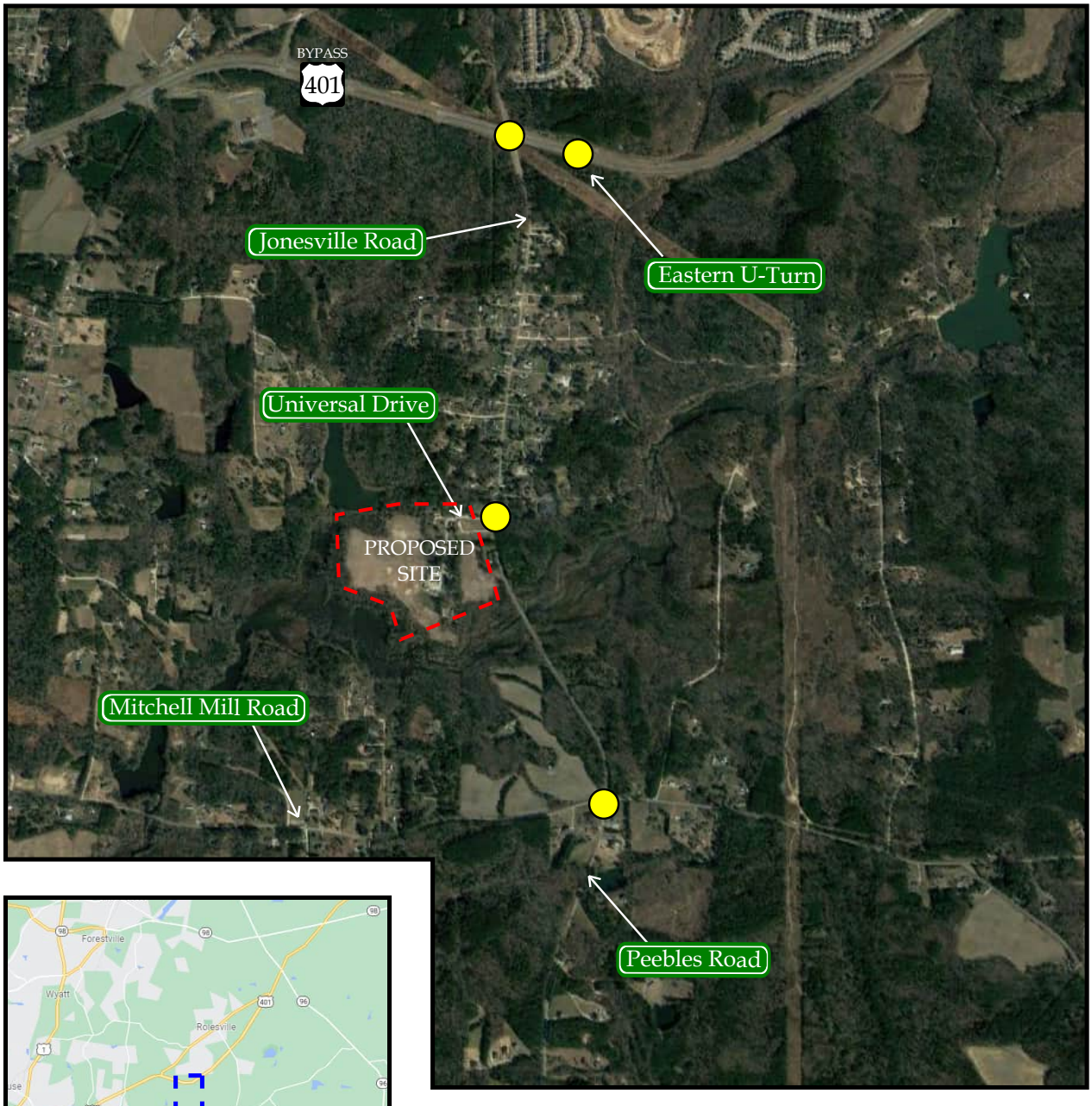
1.4. Existing Roadways

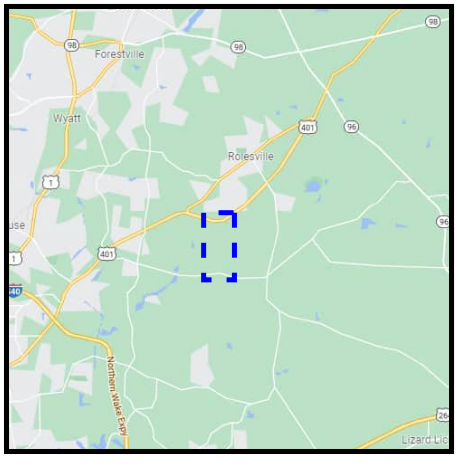
Existing lane configurations (number of traffic lanes on each intersection approach), storage capacities, and other intersection and roadway information within the study area are shown in Figure 3. Table 1 provides a summary of this information, as well.

Table 1: Existing Roadway Inventory

Road Name	Route Number	Typical Cross-Section	Speed Limit	Maintained By	2019 AADT (vpd)
US 401 Bypass		4-lane divided	55 mph	NCDOT	17,500
Jonesville Road	SR 2226	2-lane undivided	35 mph / 45 mph	NCDOT	2,210*
Mitchell Mill Road	SR 2224	2-lane undivided	45 mph	NCDOT	4,000
Peebles Road	SR 2929	2-lane undivided	45 mph	NCDOT	1,700*

*ADT based on 2022 existing traffic volumes and assuming the weekday PM peak hour volume is 10% of the average daily traffic.





N

LEGEND

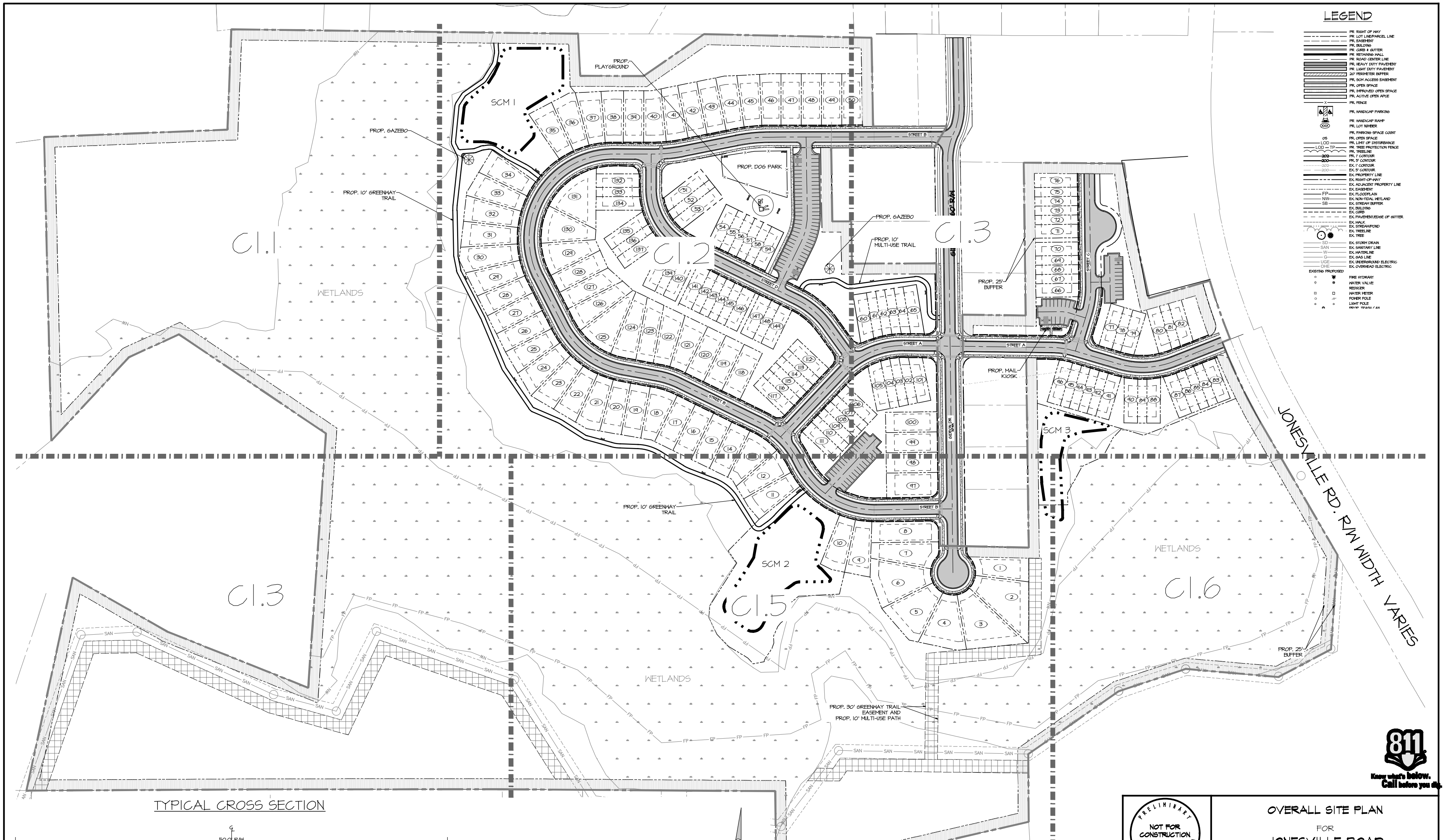
- Proposed Site Location
- Existing Study Intersection
- Study Area

RKA
RAMEY KEMP ASSOCIATES

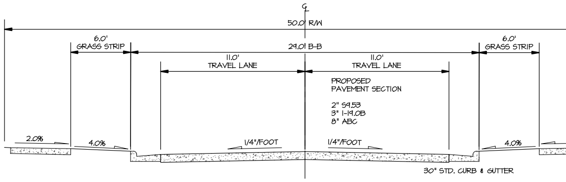
Harris Creek Farm
Rolesville, NC

Site Location Map

Scale: Not to Scale | Figure 1



TYPICAL CROSS SECTION



N.T.S.

REQUIRED PARKING

REQUIRED:	2.0/DWELLING UNIT PLUS 0.25 GUEST SPACES/DWELLING UNIT 81 UNITS X 2.25 = 183 SPOTS REQUIRED
PROVIDED	81 UNITS X 1 (DRIVEWAY) = 81 SPOTS PARKING LOTS = 116 SPOTS (7 HANDICAP) TOTAL PROVIDED = 197 SPOTS

NORTH NAD83

Scale :1 Inch = 100 ft.

811. Know what's below. Call before you dig.

PRELIMINARY NOT FOR CONSTRUCTION FOR REVIEW ONLY

ENGINEER'S SEAL

OVERALL SITE PLAN FOR JONESVILLE ROAD

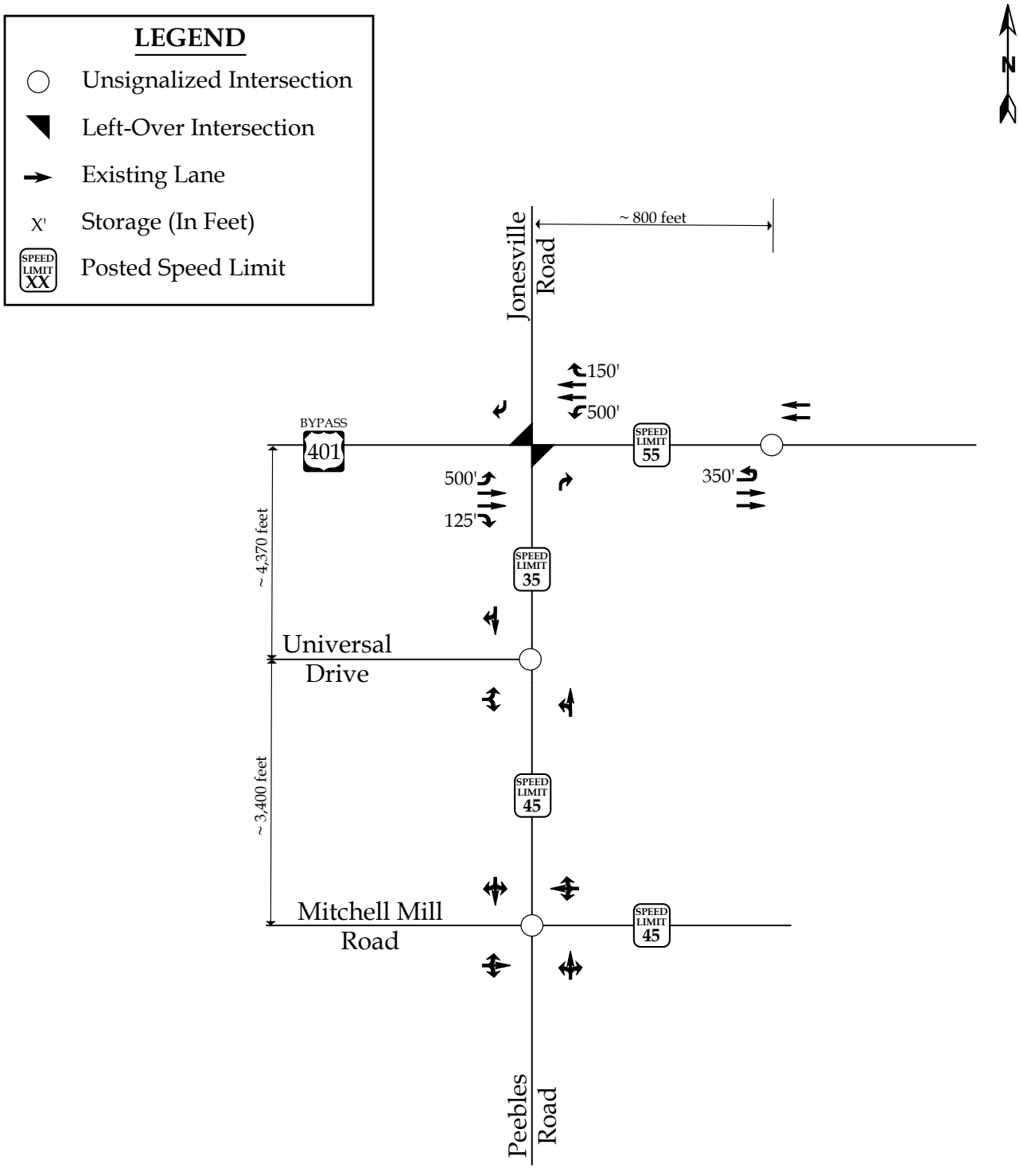
TOWN OF ROLESVILLE — WAKE COUNTY, NORTH CAROLINA

No.	DATE	REVISIONS
A	9/30/2022	REVISED PER TOWN OF ROLESVILLE COMMENTS

JOB NO.: 21790
SCALE: AS SHOWN
DATE: 6/1/2022
ENGINEER: JMK
DRAWN BY: ER/JM
DESIGN BY: DC
REVIEW BY: JMK

MORRIS & RITCHIE ASSOCIATES OF NC, PC
ENGINEERS, ARCHITECTS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
5605 CHAPEL HILL RD, STE 112
RALEIGH, NC 27607
(984) 200-2103
LICENSE # C-4182
WWW.MRAGTA.COM

STATUS: PRELIMINARY NOT FOR CONSTRUCTION — REVISION: A — SHEET: C1.0



RKA RAMEY KEMP ASSOCIATES	Harris Creek Farm Rolesville, NC	2022 Existing Lane Configurations Scale: Not to Scale | Figure 3

2. 2022 EXISTING PEAK HOUR CONDITIONS

2.1. 2022 Existing Peak Hour Traffic Volumes

Existing peak hour traffic volumes were determined based on previously collected traffic counts conducted at the study intersections listed below, in November of 2021 during typical weekday AM (7:00 AM – 9:00 AM) and PM (4:00 PM – 6:00 PM) peak periods, while schools were in session for in-person learning:

- US 401 Bypass and Jonesville Road
- US 401 Bypass and Eastern U-Turn Location
- Mitchell Mill Road and Jonesville Road / Peebles Road

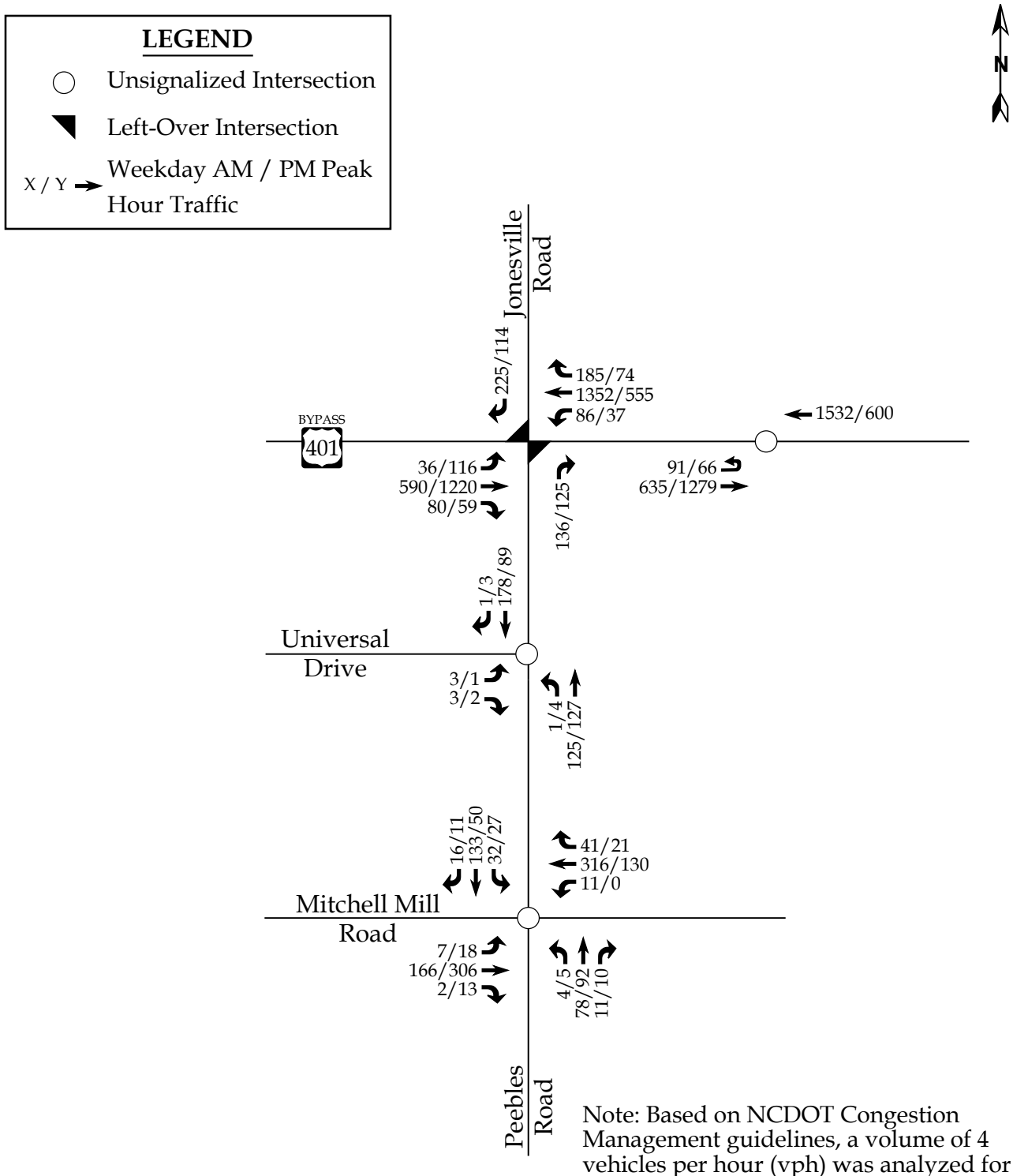
Previously collected counts from the year 2021 were projected to the 2022 existing analysis year using a compounded annual growth rate of 2%.

Existing peak hour turning movement volumes at the intersection of Jonesville Road and Universal Drive were estimated by generating and assigning trips for the nine (9) homes that are accessed via Universal Drive. It was estimated that there will be 8 AM trips: 2 enter 6 exit and 10 PM trips: 7 enter 3 exit. The trips were distributed to the north and south along Jonesville Road the same as site trips. Through traffic volumes were balanced from the Mitchell Mill Road/Jonesville Road intersection.

Weekday AM and PM traffic volumes were balanced between study intersections, where appropriate. Refer to Figure 4 for 2022 existing weekday AM and PM peak hour traffic volumes. A copy of the count data is located in Appendix B of this report.

2.2. Analysis of 2022 Existing Peak Hour Traffic Conditions

The 2022 existing weekday AM and PM peak hour traffic volumes were analyzed to determine the current levels of service at the study intersections under existing roadway conditions. The results of the analysis are presented in Section 7 of this report.



Note: Based on NCDOT Congestion Management guidelines, a volume of 4 vehicles per hour (vph) was analyzed for any movement with less than 4 vph.

RAMEY KEMP ASSOCIATES	Harris Creek Farm Rolesville, NC	2022 Existing Peak Hour Traffic	
		Scale: Not to Scale	Figure 4

3. 2027 NO-BUILD PEAK HOUR CONDITIONS

In order to account for growth of traffic and subsequent traffic conditions at a future year, no-build traffic projections are needed. No-build traffic is the component of traffic due to the growth of the community and surrounding area that is anticipated to occur regardless of whether or not the proposed development is constructed. No-build traffic is comprised of existing traffic growth within the study area and additional traffic created as a result of adjacent approved developments.

3.1. Ambient Traffic Growth

Through coordination with NCDOT and the Town, it was determined that an annual growth rate of 0% would be used to generate 2027 projected weekday AM and PM peak hour traffic volumes. A growth rate of 0% was used due to the number of developments included in the background traffic and the proximity of some of these developments to the proposed development. Refer to Figure 5 for 2027 projected peak hour traffic.

3.2. Adjacent Development Traffic

Through coordination with NCDOT and the Town, the following adjacent developments were identified to be included in this study:

- Cobblestone Crossing Mixed-Use (Cobblestone)
- Young Street PUD (The Point)
- Wheeler Tract (Rolesville Crossing)
- Louisbury Road Assemblage
- Kalas / Watkins Family Property (Kalas Falls)
- 5109 Mitchell Mill
- Hills at Harris Creek

Table 2, on the following page, provides a summary of the adjacent developments. Adjacent development trips are shown in Figure 6. Adjacent development information can be found in Appendix C.

Table 2: Adjacent Development Information

Development Name	Location	Build-Out Year	Land Use / Intensity	TIA Performed
Cobblestone Crossing Mixed-Use	Northwest quadrant of the intersection of Main Street and Young Street	2023	180 multi-family homes 18,200 sq. ft. municipal flex space 50,000 sq. ft. general retail	March 2021 by RKA
Young Street PUD	Along both sides of US 401 Bypass west of Young Street	2025	96 single-family homes 525 single-family homes 320 multi-family homes 122,800 sq. ft. general retail	June 2019 by Kimley Horn
Wheeler Tract	Northeast quadrant of the intersection of Rolesville Road and Mitchell Mill Road	2026	233 single-family homes 125 multi-family homes	June 2019 by RKA
Louisbury Road Assemblage	West of Louisbury Road and south of Stells Road	2025	152 single-family homes	May 2020 by RKA
Kalas / Watkins Family Property	Along the west side of Rolesville Road, north of Mitchell Mill Road	2025	439 single-family homes 96 multi-family homes	August 2019 by Stantec
5109 Mitchell Mill	Along both sides of Jonesville Road north of Mitchell Mill Road	2028	69 single-family homes 195 single-family homes 129 multi-family homes 50,000 sq. ft. shopping center	August 2022 by RKA
Hills at Harris Creek	North of Mitchell Mill Road, west of Manly Farm Road and east of Gro Peg Lane	2027	211 single-family homes 109 multi-family homes 25,400 sq. ft. general retail	May 2022 by RKA

3.3. Future Roadway Improvements

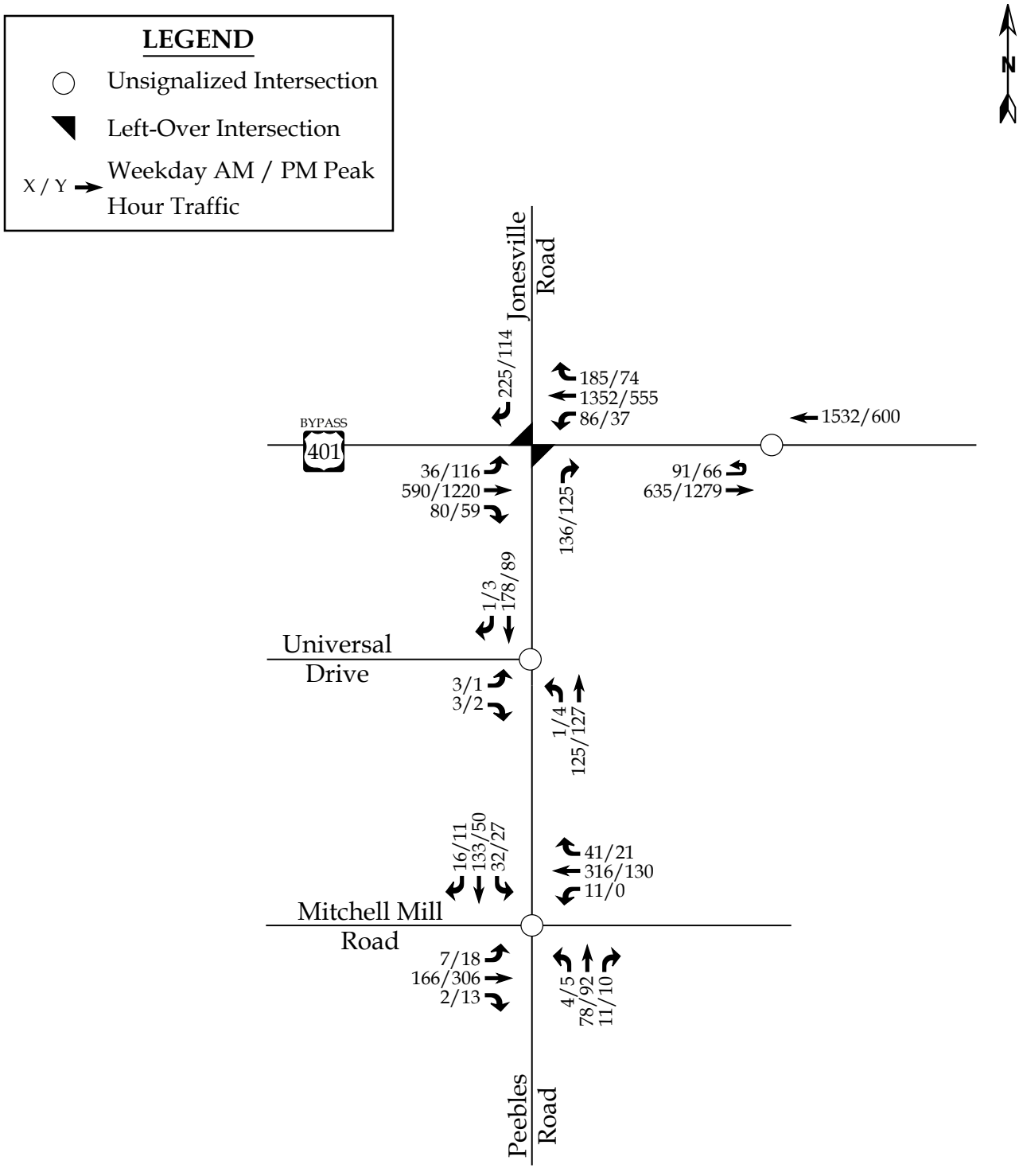
Based on coordination with NCDOT and the Town, it was determined there were two previously approved TIA's that recommended roadway improvements that were considered under future conditions with this study. Both developments are to construct improvements at the intersection of Jonesville Road and Mitchell Mill Road. An exclusive eastbound left-turn lane was identified in the 5109 Mitchell Mill Road TIA. An exclusive westbound right-turn lane was identified in the Hills at Harris Creek TIA. In both the 5109 Mitchell Mill Road TIA and the Hills at Harris Creek TIA an exclusive southbound left-turn lane improvement was identified. It should be noted that per the Rolesville Community Transportation Plan (dated May 2022), the ultimate cross-section of Jonesville Road is identified as a 2-lane roadway with a center two-way-left-turn-lane (TWLTL) and Mitchell Mill Road is identified as a 4-lane median-divided roadway.

3.4. 2027 No-Build Peak Hour Traffic Volumes

The 2027 no-build traffic volumes were determined by projecting the 2022 existing peak hour traffic to the year 2027 and adding the adjacent development trips. Refer to Figure 7 for an illustration of the 2027 no-build peak hour traffic volumes at the study intersections.

3.5. Analysis of 2027 No-Build Peak Hour Traffic Conditions

The 2027 no-build AM and PM peak hour traffic volumes at the study intersections were analyzed with existing geometric roadway conditions and traffic control. The analysis results are presented in Section 7 of this report.

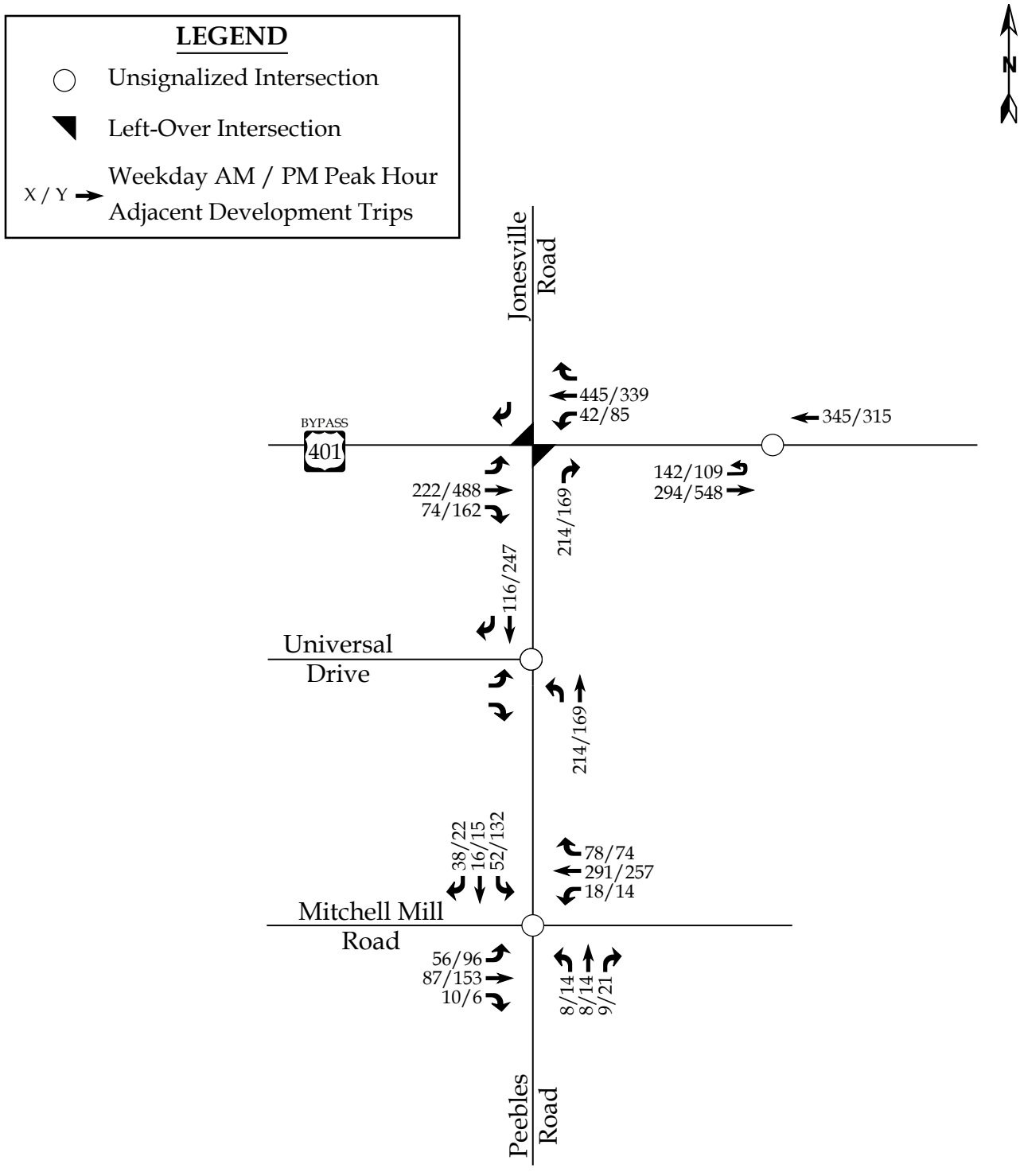


RAMEY KEMP ASSOCIATES

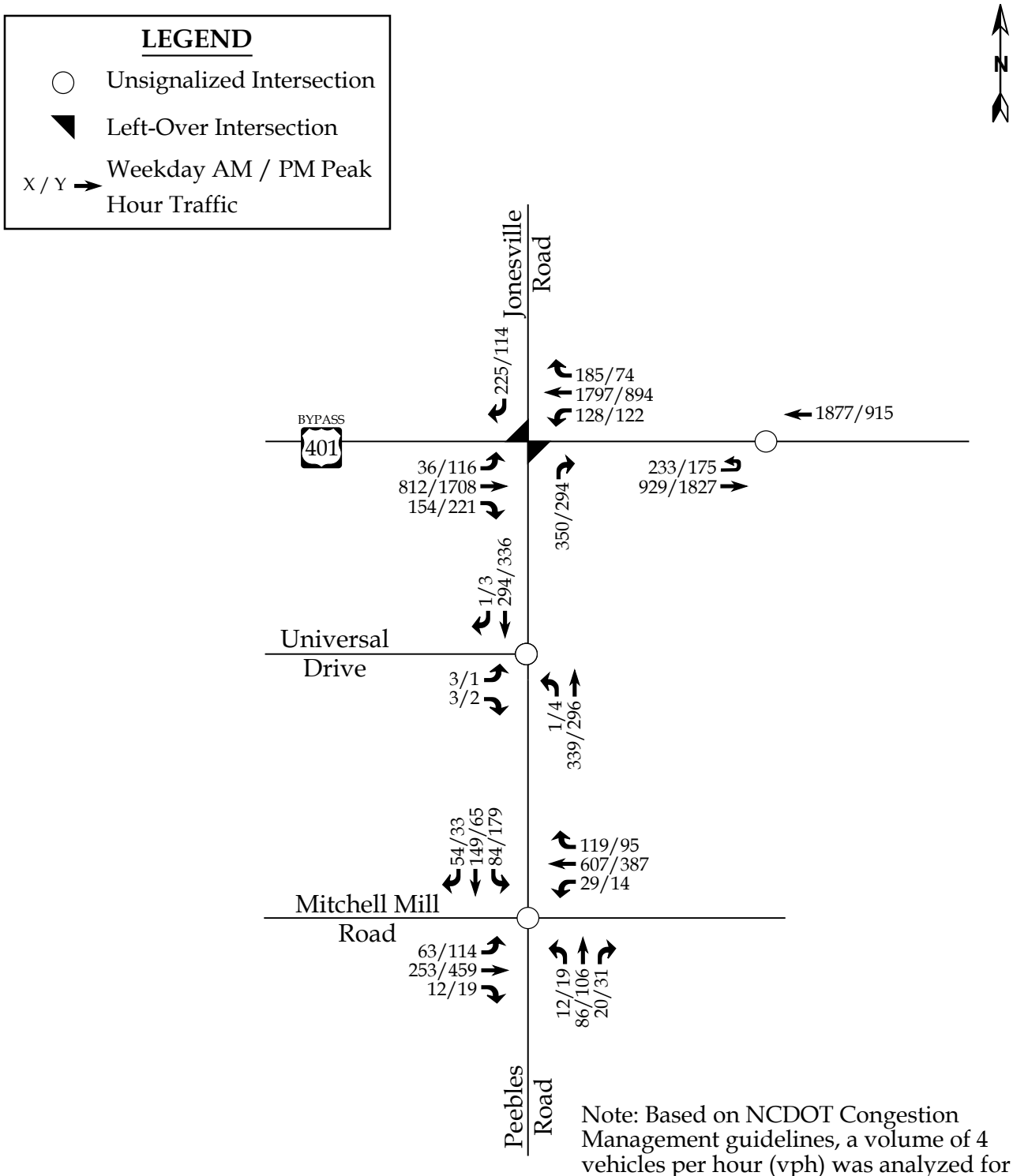
Harris Creek Farm
Rolesville, NC

2027 Projected Peak Hour Traffic

Scale: Not to Scale | Figure 5



RAMEY KEMP ASSOCIATES	Harris Creek Farm Rolesville, NC	Peak Hour Adjacent Developement Trips	
		Scale: Not to Scale	Figure 6



Note: Based on NCDOT Congestion Management guidelines, a volume of 4 vehicles per hour (vph) was analyzed for any movement with less than 4 vph.

RAMEY KEMP ASSOCIATES	Harris Creek Farm Rolesville, NC	2027 No-Build Peak Hour Traffic	
		Scale: Not to Scale	Figure 7

4. SITE TRIP GENERATION AND DISTRIBUTION

4.1. Trip Generation

The proposed development is assumed to consist of 68 single-family homes and 81 townhomes. Average weekday daily, AM peak hour, and PM peak hour trips for the proposed development were estimated using methodology contained within the ITE *Trip Generation Manual*, 11th Edition. Table 3 provides a summary of the trip generation potential for the site.

Table 3: Trip Generation Summary

Land Use (ITE Code)	Intensity	Daily Traffic (vpd)	Weekday AM Peak Hour Trips (vph)			Weekday PM Peak Hour Trips (vph)		
			Enter	Exit	Total	Enter	Exit	Total
Single-Family Home (210)	68 DU	708	13	39	52	44	25	69
Single Family Attached (215)	81 DU	568	9	27	36	26	19	45
Total Primary Trips		**1,276**	**22**	**66**	**88**	**70**	**44**	**114**

It is estimated that the proposed development will generate approximately 1,276 total site trips on the roadway network during a typical 24-hour weekday period. Of the daily traffic volume, it is anticipated that 88 trips (22 entering and 66 exiting) will occur during the weekday AM peak hour and 114 trips (70 entering and 44 exiting) will occur during the weekday PM peak hour.

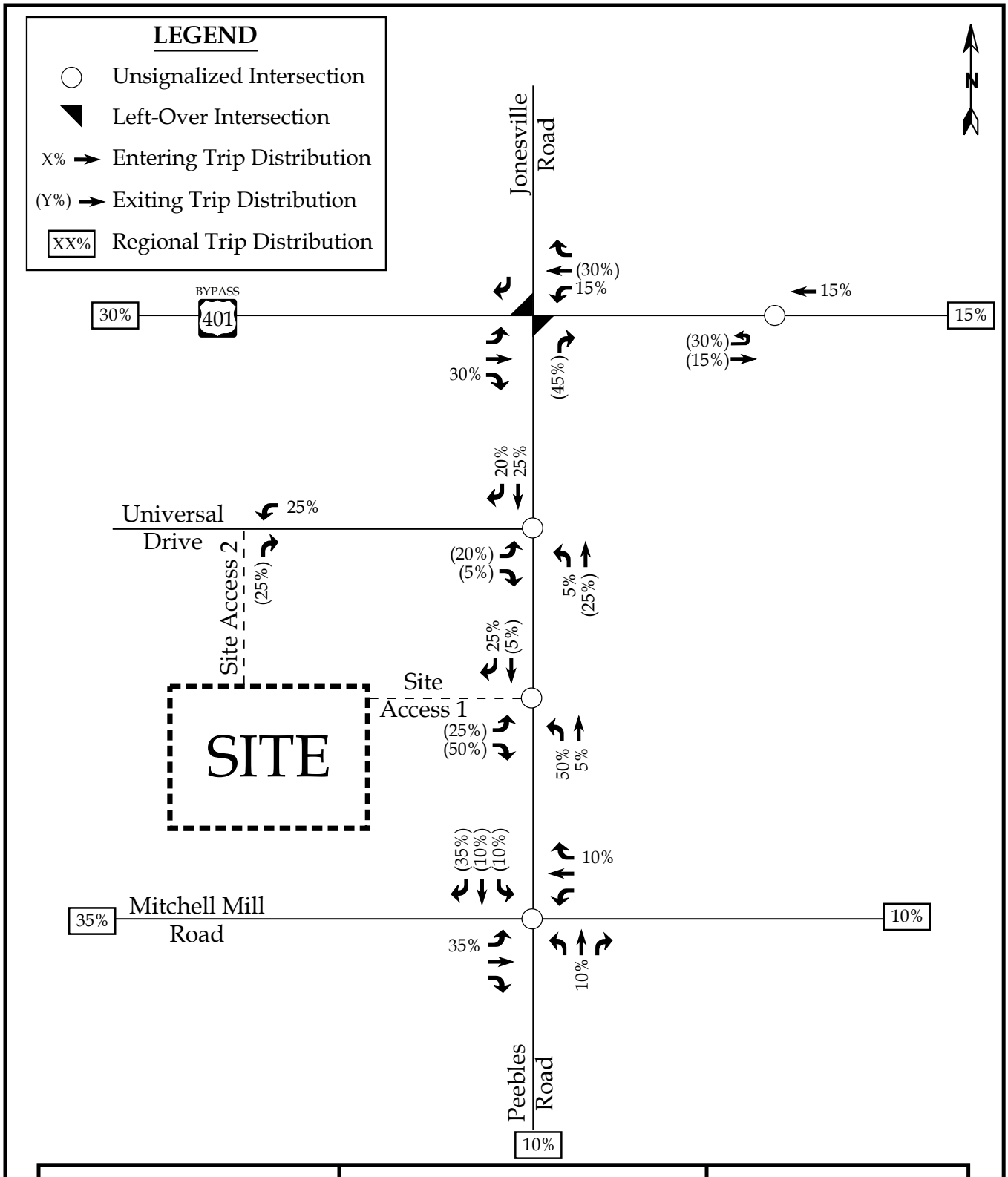
4.2. Site Trip Distribution and Assignment

Trip distribution percentages used in assigning site trips for this development were approved during the scoping process and were estimated based on a combination of existing traffic patterns, population centers adjacent to the study area, and engineering judgment.

It is estimated that the residential site trips will be regionally distributed as follows:

- 35% to/from the west via Mitchell Mill Road
- 30% to/from the west via US 401 Bypass
- 15% to/from the east via US 401 Bypass
- 10% to/from the south via Peebles Road
- 10% to/from the east via Mitchell Mill Road

The site trip distribution is shown in Figure 8 and the peak hour site trip assignment is shown in Figure 9.

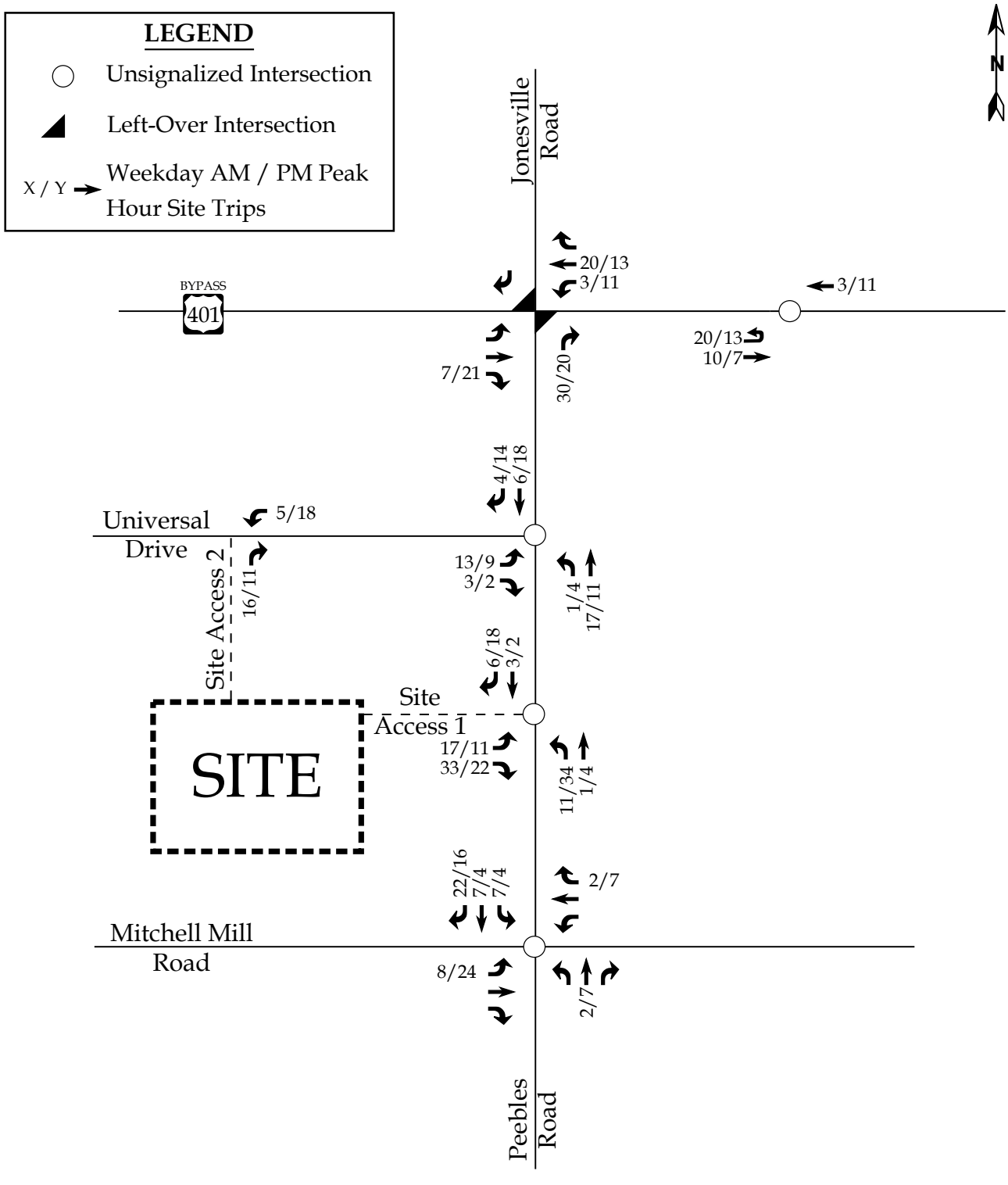


RAMEY KEMP ASSOCIATES

Harris Creek Farm
Rolesville, NC

Site Trip Distribution

Scale: Not to Scale | Figure 8



RAMEY KEMP ASSOCIATES	Harris Creek Farm Rolesville, NC	Site Trip Assignment Scale: Not to Scale | Figure 9

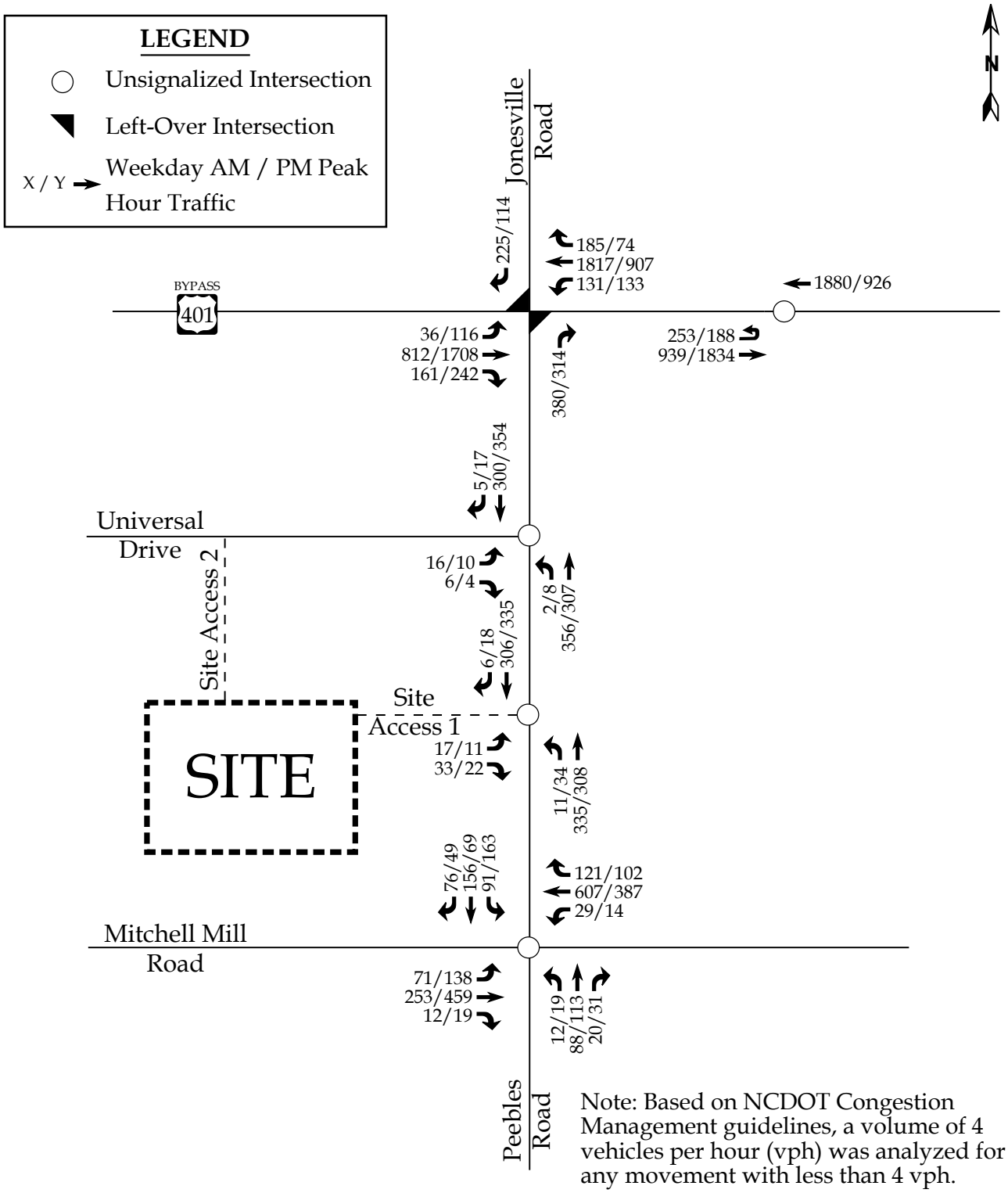
5. 2027 BUILD TRAFFIC CONDITIONS

5.1. 2027 Build Peak Hour Traffic Volumes

To estimate traffic conditions with the site fully built-out, the total site trips were added to the 2027 no-build traffic volumes to determine the 2027 build traffic volumes. Refer to Figure 10 for an illustration of the 2027 build peak hour traffic volumes with the proposed site fully developed.

5.2. Analysis of 2027 Build Peak Hour Traffic Conditions

Study intersections were analyzed with the 2027 build traffic volumes using the same methodology previously discussed for existing and no-build traffic conditions. Intersections were analyzed with improvements necessary to accommodate future traffic volumes. The results of the capacity analysis for each intersection are presented in Section 7 of this report.



Note: Based on NCDOT Congestion Management guidelines, a volume of 4 vehicles per hour (vph) was analyzed for any movement with less than 4 vph.

RKA RAMEY KEMP ASSOCIATES	Harris Creek Farm Rolesville, NC	2027 Build Peak Hour Traffic
		Scale: Not to Scale | Figure 10

6. TRAFFIC ANALYSIS PROCEDURE

Study intersections were analyzed using the methodology outlined in the *Highway Capacity Manual* (HCM), 6th Edition published by the Transportation Research Board. Capacity and level of service are the design criteria for this traffic study. A computer software package, Synchro (Version 11), was used to complete the analyses for most of the study area intersections. Please note that the unsignalized capacity analysis does not provide an overall level of service for an intersection; only delay for an approach with a conflicting movement.

The HCM defines capacity as "the maximum hourly rate at which persons or vehicles can reasonably be expected to traverse a point or uniform section of a lane or roadway during a given time period under prevailing roadway, traffic, and control conditions." Level of service (LOS) is a term used to represent different driving conditions, and is defined as a "qualitative measure describing operational conditions within a traffic stream, and their perception by motorists and/or passengers." Level of service varies from Level "A" representing free flow, to Level "F" where breakdown conditions are evident. Refer to Table 4 for HCM levels of service and related average control delay per vehicle for both signalized and unsignalized intersections. Control delay as defined by the HCM includes "initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay." An average control delay of 50 seconds at a signalized intersection results in LOS "D" operation at the intersection.

Table 4: Highway Capacity Manual – Levels-of-Service and Delay

UNSIGNALIZED INTERSECTION		SIGNALIZED INTERSECTION	
LEVEL OF SERVICE	AVERAGE CONTROL DELAY PER VEHICLE (SECONDS)	LEVEL OF SERVICE	AVERAGE CONTROL DELAY PER VEHICLE (SECONDS)
A	0-10	A	0-10
B	10-15	B	10-20
C	15-25	C	20-35
D	25-35	D	35-55
E	35-50	E	55-80
F	>50	F	>80

6.1. Adjustments to Analysis Guidelines

Capacity analysis at all study intersections was completed according to Town LDO and NCDOT Congestions Management Guidelines.

7. CAPACITY ANALYSIS

7.1. US 401 Bypass and Jonesville Road

The existing unsignalized intersection of US 401 Bypass Road and Jonesville Road was analyzed under 2022 existing, 2027 no-build, and 2027 build traffic conditions with the lane configurations and traffic control shown in Table 5. Refer to Table 5 for a summary of the analysis results. Refer to Appendix D for the Synchro capacity analysis reports.

Table 5: Analysis Summary of US 401 Bypass and Jonesville Road

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
2022 Existing	EB WB* NB	2 TH, 1 RT 1 LT 1 RT	-- C[1] B[2]	N/A	-- E[1] C[2]	N/A
	EB** WB SB	1 LT 2 TH, 1 RT 1 RT	F[1] -- E[2]	N/A	C[1] -- B[2]	N/A
2027 No-Build	EB WB* NB	2 TH, 1 RT 1 LT 1 RT	-- D[1] D[2]	N/A	-- F[1] F[2]	N/A
	EB** WB SB	1 LT 2 TH, 1 RT 1 RT	F[1] -- F[2]	N/A	E[1] -- B[2]	N/A
2027 Build	EB WB* NB	2 TH, 1 RT 1 LT 1 RT	-- D[1] D[2]	N/A	-- F[1] F[2]	N/A
	EB** WB SB	1 LT 2 TH, 1 RT 1 RT	F[1] -- F[2]	N/A	E[1] -- B[2]	N/A
2027 Build-Improved	EB WB* NB	2 TH, 1 RT 1 LT 1 RT	B B B	B (16)	B D C	C (23)
	EB** WB SB	1 LT 2 TH, 1 RT 1 RT	F[1] -- F[2]	N/A	E[1] -- B[2]	N/A

*Synchro analyzed the WB left-turns as SB through movements due to the nature of the superstreet and synchro limitations.
**Synchro analyzed the EB left-turns as NB through movements due to the nature of the superstreet and synchro limitations.
1. Level of service for major-street left-turn movement.
2. Level of service for minor-street approach.

Capacity analysis of 2022 existing traffic conditions indicates that the major-street left-turn movements and minor-street approaches are expected to operate at LOS D or better with the exception of the eastbound left-turn movement during the weekday AM peak hour (LOS F), the westbound left-turn movement during the weekday PM peak hour (LOS E), and the southbound minor-street approach during the weekday AM peak hour (LOS E).

Under 2027 no-build and 2027 build traffic conditions, the major-street left-turn movements are expected to operate at LOS E/F during the weekday AM and PM peak hours with the exception of the westbound left-turn movement during the weekday AM peak hour (LOS D) under 2027 no-build and 2027 build traffic conditions. The minor-street approaches are expected to operate at LOS E/F during the weekday AM and PM peak hours with the exception of the northbound approach during the weekday AM peak hour (LOS D) and the southbound approach during the weekday PM peak hour (LOS B) under 2027 no-build and 2027 build traffic conditions. It should be noted that the proposed development is expected to account for approximately 2% of the overall traffic at this intersection during the weekday AM and PM peak hours. The proposed development is expected to account for 8% and 6% of the northbound right movements during the AM and PM peak hours, respectively.

Due to the poor levels-of-service expected at this intersection, a traffic signal was considered under 2027 build traffic conditions to achieve acceptable levels of service. Weekday AM and PM peak hour traffic volumes were utilized in evaluating the potential need for signalization based on the guidelines contained within the *Manual on Uniform Traffic Control Devices* (MUTCD) and within the *Guidelines for Signalization of Intersections with Two or Three Approaches Final Report*, published by ITRE. Based on a review of the peak hour signal warrant at this intersection, the intersection is expected to meet the peak hour warrant for both the weekday AM and PM peak hours under 2027 no-build and 2027 build traffic conditions. It is not expected that this intersection would satisfy the MUTCD 8-hour (warrant 1) or 4-hour (warrant 2) warrants, which NCDOT favors for installation of a traffic signal. These longer period warrants are not typically met for residential areas due to the distinct peak traffic periods for these types of development. Based on a review of ITRE 95th percentile queue length calculations, the northbound right-turn movement demand is expected to be over 85%

capacity during the weekday AM peak hour and exceed capacity during the weekday PM peak hour under 2027 no-build and 2027 build traffic conditions. Refer to Appendix J for a copy of the MUTCD warrants and the ITRE 95th percentile queue length calculations.

Based on the Town's LDO, improvements must be identified to maintain no-build levels-of-service under build traffic conditions or to limit the degradation to less than a five percent increase in total delay on any approach for those operating at failing levels-of-service under no-build traffic conditions. Therefore, additional turn-lanes were considered for the northbound right-turn and westbound left-turn movements at this intersection to achieve acceptable operation per the Town's LDO. However, additional turn-lanes are not a realistic or practical improvement at an unsignalized intersection operating with superstreet configurations.

Based on the Town's LDO, it is recommended that this intersection be monitored for signalization and a full signal warrant analysis be conducted prior to the full build-out of the proposed development and install a traffic signal if warranted and approved by the Town and NCDOT. With signalization, it is expected that this intersection will operate at acceptable levels-of-service during the weekday AM and PM peak hours.

7.2. US 401 Bypass and Eastern U-Turn Location

The existing unsignalized intersection of US 401 Bypass and Eastern U-Turn Location was analyzed under 2022 existing, 2027 no-build, and 2027 build traffic conditions with the lane configurations and traffic control shown in Table 6. Refer to Table 6 for a summary of the analysis results. Refer to Appendix E for the Synchro capacity analysis reports.

Table 6: Analysis Summary of US 401 Bypass and Eastern U-Turn Location

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
2022 Existing	EB* WB	1 UT 2 TH	C[1] --	N/A	B[1] --	N/A
2027 No-Build	EB* WB	1 UT 2 TH	F[1] --	N/A	C[1] --	N/A
2027 Build	EB* WB	1 UT 2 TH	F[1] --	N/A	C[1] --	N/A
2027 Build – Improved	EB* WB	1 UT 2 TH	D B	C (21)	B A	B (11)

*Synchro analyzed the EB u-turn as a NB left-turn movement due to the nature of the superstreet and synchro limitations.

1. Level of service for major-street u-turn movement.

Capacity analysis of 2022 existing and 2027 no-build traffic conditions indicates that the major-street u-turn movement is expected to operate at LOS C or better during the weekday AM and PM peak hours, with the exception of the weekday AM peak hour under 2027 no-build conditions (LOS F).

Under 2027 build traffic conditions, the major-street u-turn movement is expected to operate at LOS F during the weekday AM peak hour and at LOS C during the weekday PM peak hour. It should be noted that the proposed development is expected to account for approximately 1% of the overall traffic at this intersection during the weekday AM and PM peak hours. The proposed development is expected to account for approximately 8% and 7%

of the overall eastbound u-turn movements at this intersection during the weekday AM and PM peak hours, respectively.

Due to the poor levels-of-service expected at this intersection, a traffic signal was considered under 2027 build traffic conditions to achieve acceptable levels of service. Weekday AM and PM peak hour traffic volumes were utilized in evaluating the potential need for signalization based on the guidelines contained within the *Manual on Uniform Traffic Control Devices* (MUTCD) and within the *Guidelines for Signalization of Intersections with Two or Three Approaches Final Report*, published by ITRE. Based on a review of signal warrants at this intersection, the peak hour warrant (warrant 3) from the MUTCD is expected to be met for the weekday AM peak hour under 2027 no-build and build traffic conditions. It is not expected that this intersection would satisfy the MUTCD 8-hour (warrant 1) or 4-hour (warrant 2) warrants, which NCDOT favors for installation of a traffic signal. These longer period warrants are not typically met for residential areas due to the distinct peak traffic periods for these types of development. Based on a review of ITRE 95th percentile queue length calculations, the eastbound u-turn movement demand is expected to exceed capacity during the weekday AM peak hour under 2027 no-build and 2027 build traffic conditions. Refer to Appendix J for a copy of the MUTCD warrants and the ITRE 95th percentile queue length calculations.

Based on the Town's LDO, improvements must be identified to maintain no-build levels-of-service under build traffic conditions or to limit the degradation to less than a five percent increase in total delay on any approach for those operating at failing levels-of-service under no-build traffic conditions. Therefore, additional turn-lanes were considered for the eastbound u-turn movement at this intersection to achieve acceptable operation per the Town's LDO. However, additional turn-lanes are not a realistic or practical improvement at an unsignalized intersection operating with superstreet configurations.

Based on the Town's LDO, it is recommended that this intersection be monitored for signalization and a full signal warrant analysis be conducted prior to the full build-out of the proposed development and install a traffic signal if warranted and approved by the Town

and NCDOT. With signalization, it is expected that this intersection will operate at acceptable levels-of-service during the weekday AM and PM peak hours.

7.3. Mitchell Mill Road and Jonesville Road / Peebles Road

The existing unsignalized four-way stop intersection of Mitchell Mill Road and Jonesville Road / Peebles Road was analyzed under 2022 existing, 2027 no-build, and 2027 build traffic conditions with the lane configurations and traffic control shown in Table 7. Refer to Table 7 for a summary of the analysis results. Refer to Appendix F for the Synchro capacity analysis reports.

Table 7: Analysis Summary of Mitchell Mill Road and Jonesville Road / Peebles Road

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
2022 Existing	EB WB NB SB	1 LT-TH-RT 1 LT-TH-RT 1 LT-TH-RT 1 LT-TH-RT	B[1] B[1] B[1] B[1]	B (13)	B[1] A[1] A[1] A[1]	B (11)
2027 No-Build	EB WB NB SB	1 LT, 1 TH-RT 1 LT-TH, 1 RT 1 LT-TH-RT 1 LT, 1 TH-RT	C[1] F[1] C[1] C[1]	F (95)	F[1] E[1] C[1] C[1]	F (57)
2027 Build	EB WB NB SB	1 LT, 1 TH-RT 1 LT-TH, 1 RT 1 LT-TH-RT 1 LT, 1 TH-RT	C[1] F[1] C[1] C[1]	F (104)	F[1] F[1] C[1] C[1]	F (61)
2027 Build - Improved	EB WB NB SB	1 LT, 1 TH-RT 1 LT-TH, 1 RT 1 LT-TH-RT 1 LT, 1 TH-RT	A B B C	B (14)	B B B B	B (13)

1. Level of service for all-way stop controlled approach.

Capacity analysis of 2022 existing indicates that the intersection is expected to operate at an overall LOS B or better during the weekday AM and PM peak hours. Under 2027 no-build and 2027 build traffic conditions, this intersection is expected to operate at an overall LOS F during the weekday AM and PM peak hours. It should be noted that the proposed development is expected to account for approximately 3% and 4% of the overall traffic at this

intersection during the weekday AM and PM peak hours, respectively. The proposed development is expected to account for approximately 11% and 17% of the eastbound left movement and 17% and 7% of the westbound right movements during the weekday AM and PM peak hours, respectively.

Several turn lanes expected to be constructed by adjacent developments were included in the 2027 no-build and 2027 build scenarios. An exclusive eastbound left-turn lane was identified in the 5109 Mitchell Mill Road TIA. An exclusive westbound right-turn lane was identified in the Hills at Harris Creek TIA. In both the 5109 Mitchell Mill Road TIA and the Hills at Harris Creek TIA an exclusive southbound left-turn lane improvement was identified.

Due to the poor levels-of-service expected at this intersection, a traffic signal was considered under 2027 build traffic conditions to achieve acceptable levels-of-service. The peak hour warrant (warrant 3) from the *Manual on Uniform Traffic Control Devices* (MUTCD) was considered. Based on a review of the peak hour signal warrant at this intersection, the intersection is expected to meet the peak hour warrant for both the weekday AM and PM peak hours under 2027 no-build and 2027 build traffic conditions. It is not expected that this intersection would satisfy the MUTCD 8-hour (warrant 1) or 4-hour (warrant 2) warrants, which NCDOT favors for installation of a traffic signal. These longer period warrants are not typically met for residential areas due to the distinct peak traffic periods for these types of development. Refer to Appendix J for a copy of the MUTCD warrants.

Based on the Town's LDO, it is recommended that this intersection be monitored for signalization and a full signal warrant analysis be conducted prior to the full build-out of the proposed development and install a traffic signal if warranted and approved by the Town and NCDOT. With signalization, it is expected that this intersection will operate at acceptable levels-of-service during the weekday AM and PM peak hours.

7.4. Jonesville Road and Universal Drive

The existing unsignalized intersection of Jonesville Road and Universal Drive was analyzed under 2027 build traffic conditions with the lane configurations and traffic control shown in Table 8. Refer to Table 8 for a summary of the analysis results. Refer to Appendix G for the synchro capacity analysis reports.

Table 8: Analysis Summary of Jonesville Road and Universal Drive

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
2022 Existing	EB NB SB	1 LT-RT 1 LT-TH 1 TH-RT	A[2] A[1] --	N/A	A[2] A[1] --	N/A
2027 No-Build	EB NB SB	1 LT-RT 1 LT-TH 1 TH-RT	B[2] A[1] --	N/A	B[2] A[1] --	N/A
2027 Build	EB NB SB	1 LT-RT 1 LT-TH 1 TH-RT	B[2] A[1] --	N/A	B[2] A[1] --	N/A

1. Level of service for major-street left-turn movement.
2. Level of service for minor-street approach.

Capacity analysis of 2027 build traffic conditions indicates that the major-street left-turn movement is expected to operate at LOS A during the weekday AM and PM peak hours. The minor-street approach is expected to operate at LOS B or better during the weekday AM and PM peak hours.

Right and left-turn lanes were considered based on the NCDOT *Policy on Street and Driveway Access to North Carolina Highways*. Based on the estimated low volume of right-turn and left-turn movements into the proposed development at this intersection, exclusive right-turn and left-turn lanes are not recommended. Refer to Appendix I for a copy of the turn lane warrants. No improvements are recommended by the developer.

7.5. Jonesville Road and Site Drive

The proposed intersection of Jonesville Road and Site Drive was analyzed under 2027 build traffic conditions with the lane configurations and traffic control shown in Table 9. Refer to Table 9 for a summary of the analysis results. Refer to Appendix H for the synchro capacity analysis reports.

Table 9: Analysis Summary of Jonesville Road and Site Drive

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
2027 Build	EB	1 LT-RT	B[2]	N/A	B[2]	N/A
	NB	1 LT-TH	A[1]		A[1]	
	SB	1 TH-RT	--		--	

1. Level of service for major-street left-turn movement.
2. Level of service for minor-street approach.

Capacity analysis of 2027 build traffic conditions indicates that the major-street left-turn movement is expected to operate at LOS A during the weekday AM and PM peak hours. The minor-street approach is expected to operate at LOS B or better during the weekday AM and PM peak hours.

Right and left-turn lanes were considered based on the NCDOT *Policy on Street and Driveway Access to North Carolina Highways*. Based on the estimated low volume of right-turn and left-turn movements into the proposed development at this intersection, exclusive right-turn and left-turn lanes are not recommended. Refer to Appendix I for a copy of the turn lane warrants. No improvements are recommended by the developer.

8. CONCLUSIONS

This Traffic Impact Analysis was conducted to determine the potential traffic impacts of the proposed Harris Creek Farm development to be located on the west side of Jonesville Road near Universal Drive in Rolesville, North Carolina. The development is expected to consist of 68 single-family homes and 81 townhomes and to be built-out in 2027. Site access is proposed via two (2) full-movement driveway connections: one on Universal Drive and one on Jonesville Road approximately 700 feet south of Universal Drive.

The study analyzes traffic conditions during the weekday AM and PM peak hours for the following scenarios:

- 2022 Existing Traffic Conditions
- 2027 No-Build Traffic Conditions
- 2027 Build Traffic Conditions

Trip Generation

It is estimated that the proposed development will generate approximately 1,276 site trips on the roadway network during a typical 24-hour weekday period. Of the daily traffic volume, it is anticipated that 88 trips (22 entering and 66 exiting) will occur during the weekday AM peak hour and 114 trips (70 entering and 44 exiting) will occur during the weekday PM peak hour.

Adjustments to Analysis Guidelines

Capacity analysis at all study intersections was completed according to NCDOT Congestion Management Guidelines. Refer to section 6.1 of this report for a detailed description of any adjustments to these guidelines made throughout the analysis.

Intersection Capacity Analysis Summary

All the study area intersections (including the proposed site driveways) are expected to operate at acceptable levels-of-service under existing and future year conditions with the exception of those identified in Section 7 of this report.

9. RECOMMENDATIONS

Based on the findings of this study, specific geometric improvements have been identified and are recommended to accommodate future traffic conditions. See a more detailed description of the recommended improvements below. Refer to Figure 11 for an illustration of the recommended lane configurations for the proposed development.

Recommended Improvements by Developer

US 401 Bypass and Jonesville Road

- Conduct a full signal warrant analysis prior to full build-out of the proposed development and install a traffic signal if warranted and approved by the Town and NCDOT.

US 401 Bypass and Eastern U-Turn Location

- Conduct a full signal warrant analysis prior to full build-out of the proposed development and install a traffic signal if warranted and approved by the Town and NCDOT.

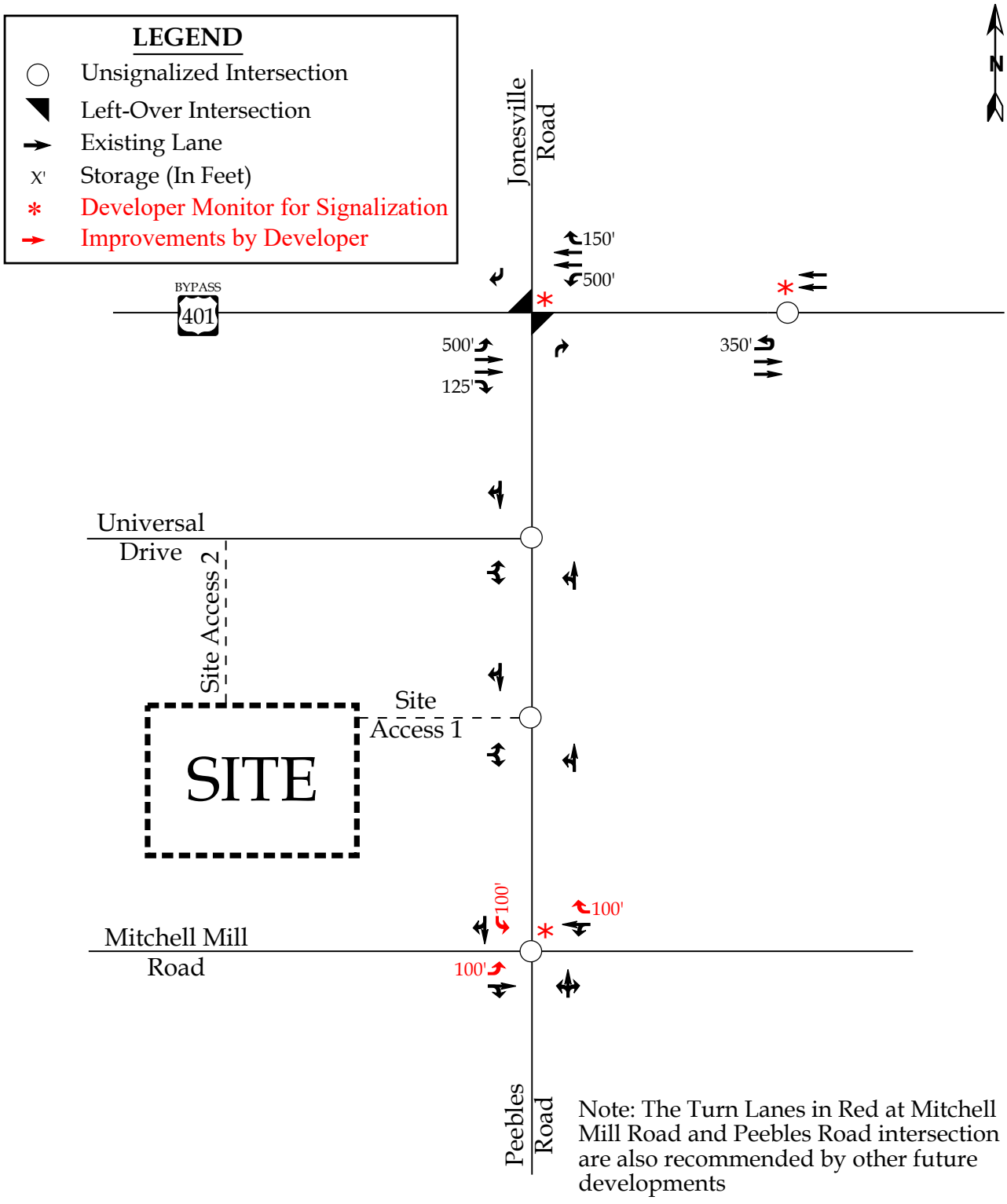
Mitchell Mill Road and Jonesville Road / Peebles Road

- Construct a southbound (Jonesville Road) left-turn lane with at least 100 feet of storage and appropriate decel and taper.
    - It should be noted that this improvement was also identified by the 5109 Mitchell Mill Road TIA and Hills at Harris Creek TIA
- Construct a westbound (Mitchell Mill Road) right-turn lane with at least 100 feet of storage and appropriate decel and taper.
    - It should be noted that this improvement was also identified by the Hills at Harris Creek TIA
- Construct an eastbound (Mitchell Mill Road) left-turn lane with at least 100 feet of storage and appropriate decel and taper.
    - It should be noted that this improvement was also identified by the 5109 Mitchell Mill Road TIA

- Conduct a full signal warrant analysis prior to full build-out of the proposed development and install a traffic signal if warranted and approved by the Town and NCDOT.

Jonesville Road and Site Drive

- Construct the eastbound approach (Site Drive) with one ingress lane and one egress lane.
- Provide stop-control for the eastbound approach (Site Drive).



RAMEY KEMP ASSOCIATES

Harris Creek Farm
Rolesville, NC

Recommended Lane Configurations

Scale: Not to Scale | Figure 11

TECHNICAL APPENDIX

APPENDIX A

SCOPING DOCUMENTATION

RAMEY KEMP ASSOCIATES
TOGETHER WE ARE LIMITLESS

T 919 872 5115
5808 Faringdon Pl,
Raleigh, NC 27609

March 17, 2023

Jeremy L. Warren, PE
NCDOT District 1 Engineer
4009 District Drive
Raleigh, NC 27507
jlwarren@ncdot.gov
[Sent via Email]

Reference: Harris Creek Farm
Rolesville, North Carolina

Subject: Memorandum of Understanding for TIA Report

Dear Mr. Warren:

The following is a Memorandum of Understanding (MOU) outlining the proposed scope of work and assumptions related to the Traffic Impact Analysis (TIA) for the proposed Harris Creek Farm development in Rolesville, North Carolina. The proposed development is to be located on the west side of Jonesville Road near Universal Drive in Rolesville, NC. The development is expected to consist of 68 single-family homes and 81 townhomes and is anticipated to be built out by 2027. Refer to the attached site location map. Site access to the proposed development is expected to be provided via two (2) full-movement driveway connections: one on Jonesville Road and one on Universal Drive. Refer to the attachments for a copy of the preliminary site plan.

Study Area

The study area is proposed to consist of the following intersections:

- Mitchell Mill Road & Jonesville Road / Peebles Road (unsignalized)
- US 401 Bypass and Jonesville Road (unsignalized)
- US 401 Bypass and Eastern U-Turn Location (unsignalized)
- Jonesville Road and Universal Drive (unsignalized)
- Jonesville Road and Site Driveway (unsignalized)

Existing Traffic Volumes

Existing peak hour traffic volumes will be determined based on previously collected traffic counts at the study intersections below, in November 2021 during typical weekday AM (7:00 AM – 9:00 AM) and PM (4:00 PM – 6:00 PM) peak periods, while schools were in session for in-person learning:

- Mitchell Mill Road & Jonesville Road / Peebles Road
- US 401 Bypass and Jonesville Road
- US 401 Bypass and Eastern U-Turn Location

These previously collected counts will be projected to the year 2022 using a compounded annual growth rate of 2%.

Existing peak hour turning movement volumes at the intersection of Jonesville Road and Universal Drive will be estimated by generating and assigning trips for the nine (9) homes that are accessed via Universal Drive (AM trips: 2 enter 6 exit and PM trips: 7 enter 3 exit, distributed to the north and south along Jonesville Road the same as site trips). Through traffic volumes will be balanced from the Mitchell Mill Road / Jonesville Road intersection.

Refer to the attachments for an illustration of 2022 existing peak hour traffic volumes.

Background Traffic Volumes

Background traffic volumes will be determined by projecting 2022 existing traffic volumes to the year 2027 using a 0% annual growth rate. A growth rate of 0% will be used due to the number of developments included in the background traffic and the proximity of some of these developments to the proposed development. It is assumed that the following adjacent developments are to be included in this study:

- Cobblestone Crossing Mixed-Use (Cobblestone)
- Young Street PUD (The Point)
- Wheeler Tract (Rolesville Crossing)
- Louisbury Road Assemblage
- Kalas / Watkins Family Property (Kalas Falls)
- 5109 Mitchell Mill
- Hills at Harris Creek

Future Roadway Improvements

There are no future roadway improvements within the study area to consider under future traffic conditions.

Trip Generation

Average weekday daily, AM peak hour, and PM peak hour trips for the proposed development were estimated using methodology contained within the ITE *Trip Generation Manual*, 11th Edition. Refer to Table 1, on the following page, for a summary of the proposed site trip generation for full buildout of the proposed development.

Table 1: Trip Generation Summary

Land Use (ITE Code)	Intensity	Daily Traffic (vpd)	Weekday AM Peak Hour Trips (vph)			Weekday PM Peak Hour Trips (vph)		
			Enter	Exit	Total	Enter	Exit	Total
Single-Family Home (210)	68 DU	710	13	39	52	44	25	69
Multi-Family Home (Low-Rise) (220)	81 DU	568	9	27	36	26	19	45
Total Trips		1,268	22	66	88	70	44	114

It is estimated that the proposed development will generate approximately 1,268 site trips on the roadway network during a typical 24-hour weekday period. Of the daily traffic volume, it is anticipated that 88 trips (22 entering and 66 exiting) will occur during the weekday AM peak hour and 114 trips (70 entering and 44 exiting) will occur during the weekday PM peak hour.

Trip Distribution and Assignment

Site trips are distributed based on the locations of existing traffic patterns, population centers adjacent to the study area, and engineering judgment. A summary of the overall distributions is below.

Residential

- 30% to / from the west via US 401 Bypass
- 15% to / from the east via US 401 Bypass
- 10% to / from the south via Peebles Road
- 35% to / from the west via Mitchell Mill Road
- 10% to / from the east via Mitchell Mill Road

Refer to the attached site trip distribution figure.

Analysis Scenarios

All capacity analyses will be performed utilizing Synchro (Version 11). All study intersections will be analyzed during the weekday AM and PM peak hours under the following proposed traffic scenarios:

- 2022 Existing Traffic Conditions
- 2027 No-Build Traffic Conditions
- 2027 Build Traffic Conditions

Report

The TIA report will be prepared based on the Town and NCDOT requirements.

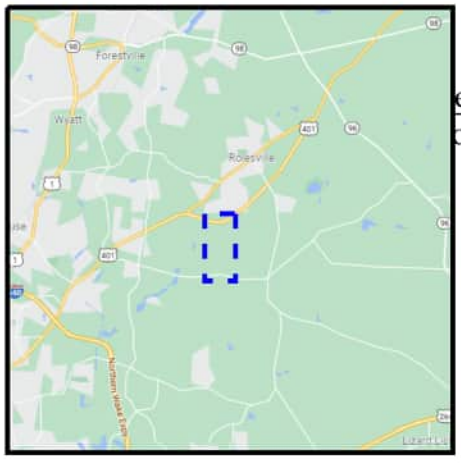
If you find this memorandum of understanding acceptable, please let me know so that we may include it in the TIA report. If you have any questions or concerns, please do not hesitate to contact me.

Sincerely,
Ramey Kemp Associates,

J. Andrew Eagle, PE, PTOE
Senior Traffic Engineering Project Manager

Attachments: Site Location Map
Site Plan
2022 Existing Traffic Volumes Figure
Proposed Site Trip Distribution Figure

cc: Matthew J. Nolfo, NCDOT
Holt Willis, NCDOT
Clarence Bunting, NCDOT
Nicholas Lineberger, NCDOT
Daniel Collins, NCDOT
Meredith Gruber, Town of Rolesville
Michael Elabarger, Town of Rolesville



Peebles Road

N

LEGEND

- Proposed Site Location
- Existing Study Intersection
- Study Area

RAMEY KEMP ASSOCIATES

Harris Creek Farm
Rolesville, NC

Site Location Map

Scale: Not to Scale | Figure 1

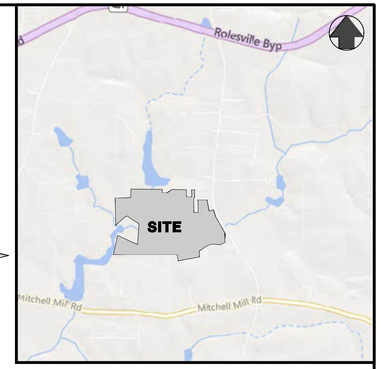
REZONING AND ANNEXATION

FOR

JONESVILLE ROAD

ROLESVILLE, NORTH CAROLINA

CASE NUMBER: MA 22-08



VICINITY MAP
SCALE: 1"=2000'

AGENCY CONTACTS

A. Town of Rolesville
Planning Department
502 Southtown Circle
Rolesville, NC 27571

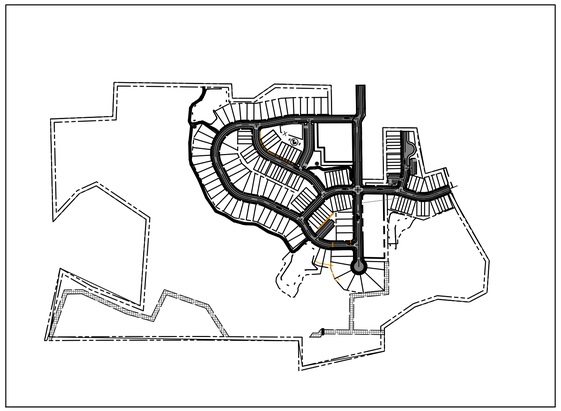
B. Wake County
Watershed Management
Waverly F. Akins Building
337 S. Salisbury St
Raleigh, NC 27601
Contact: Karyn Pageau
Phone: (919)-796-8769
Email: karyn.pageau@wakegov.com

C. City of Raleigh Public Utilities Department
One Exchange Plaza
Suite 620
Raleigh, NC 27601
P.O.Box 590
Raleigh, NC 27602
Phone: 919-996-3245
Email: publicutilityinfo@raleighnc.gov

D. NCDOT
Division 5, District 1 Office
4009 District Drive
Raleigh, NC 27607
Contact: Amy Neldringhaus, District Engineer
Phone: 919-733-3213
Email: anneldringhaus@ncdot.gov

Sheet List Table

Sheet Number	Sheet Title	Date	Revised Date
C0.0	COVER - REZONING	8/1/2022	9/30/2022
C0.1	EXISTING CONDITIONS	8/1/2022	9/30/2022
C1.0	OVERALL SITE PLAN	8/1/2022	9/30/2022
C1.1	SITE PLAN - SHEET 1 OF 6	8/01/2022	9/30/2022
C1.2	SITE PLAN - SHEET 2 OF 6	8/1/2022	9/30/2022
C1.3	SITE PLAN - SHEET 3 OF 6	8/1/2022	9/30/2022
C1.4	SITE PLAN - SHEET 4 OF 6	8/1/2022	9/30/2022
C1.5	SITE PLAN - SHEET 5 OF 6	8/1/2022	9/30/2022
C1.6	SITE PLAN - SHEET 6 OF 6	8/1/2022	9/30/2022
C1.7	OVERALL ZONING PLAN	8/1/2022	9/30/2022



KEY MAP
SCALE: 1" = 500'

500 0 500 1000 1500

SCALE 1" = 500

SITE DATA

OWNER	CHEN, PING 10030 GREEN LEVEL CHURCH RD STE 802 CARY NC 27519
SITE ADDRESS	4428 UNIVERSAL DR WAKE FOREST NC 27587-6356
PIN	1751271811, 1751375216, 1751315365, 1751375464, 1751375575, 1751375665, 1751375765, 1751375865, 1751375975, 1751385064, 1751384512, 1751383572, 1751368816, 1751378013, 1751378104, 1751378303, 1751377490, 1751471554, 1751385344
DEED BOOK/PAGE/MAP	018453/00623/1751 01, 018453/00592/1751 01
CURRENT ZONING	R30
PROPOSED ZONING	RM, RH
MIN. LOT SIZE	5000 SQ FT (SINGLE FAMILY CLUSTER) 2000 SQ FT (TOWNHOMES)
LAND USE	RESIDENTIAL
PROPOSED DEVELOPMENT	149 UNITS 68 SINGLE FAMILY UNITS 81 TOWNHOUSE UNITS
TOTAL SITE AREA	93.23 ACRES
RESIDENTIAL HIGH DENSITY	32.15 ACRES (14.02 AC. + 18.12 AC (ADDITIONAL OPEN SPACE)
RESIDENTIAL MEDIUM DENSITY	61.08 ACRES
PROPOSED DENSITY	TOWNHOMES (RH) 9.0 UNITS/AC(MAX) 81/14.02 = 5.77 UNITS/AC (PROVIDED) SINGLE FAMILY (RM) (CLUSTER) 5.0 UNITS/AC (MAX) 68/61.08 = 1.11 UNITS/AC (PROVIDED)
FLOOD PLAIN/ZONE	ZONE AE/ZONE X
FIRM PANEL NO	3720175700J
WATERSHED PROTECTION	NONE
MINIMUM LOT WIDTH	20' TOWNHOMES 40' SINGLE FAMILY (CLUSTER)
OPEN SPACE	RESIDENTIAL HIGH DENSITY PASSIVE: 2.10 (REQUIRED) 19.95 (PROVIDED) RESIDENTIAL MEDIUM DENSITY PASSIVE: 9.70 (REQUIRED) 44.09 (PROVIDED) IMPROVED OPEN SPACES: REQUIRED: SMALL: 1 MEDIUM: 2 LARGE: 0 SMALL: 1 0.73 AC (TOTAL PROVIDED) MEDIUM: 1 1.01 AC (TOTAL PROVIDED) LARGE: 1 13.74 AC (TOTAL PROVIDED)
PARKING	REQUIRED: 2.0/DWELLING UNIT PLUS 0.25 GUEST SPACES/DWELLING UNIT 81 UNITS X 2.25 = 183 SPOTS PROVIDED: 81 UNITS X 1 (DRIVEWAY) = 81 SPOTS PARKING LOTS = 116 SPOTS TOTAL PROVIDED = 197 SPOTS
SETBACKS	TOWNHOMES: FRONT: 20' SIDE: 10' REAR: 15' CORNER: 15' MIN. WIDTH BETWEEN STRUCTURES: 30' SINGLE FAMILY: (CLUSTER) FRONT: 20' SIDE: 5' REAR: 20' CORNER: 10' (CLUSTER)

STREET DATA

STREET A	1,200 LF
STREET B	2,368 LF
STREET C	450 LF
STREET D	743 LF

PROJECT TEAM

DEVELOPER/ OWNER:	THE CSC GROUP LLC 10030 GREEN LEVEL CHURCH RD STE 802 CARY NC 27519 ATTN: PING CHENG 919-748-0424
LAND PLANNERS, CIVIL ENGINEER:	MORRIS & RITCHIE ASSOCIATES OF NC, PC 5605 CHAPEL HILL ROAD, SUITE 112 RALEIGH, NC 27607 ATTN: MR. JEREMY M KEENY, PE, PLS
SURVEYOR:	MORRIS & RITCHIE ASSOCIATES OF NC, PC. 5605 CHAPEL HILL ROAD, SUITE 112 RALEIGH, NC 27607 ATTN: MR. JEREMY M KEENY, PE, PLS
ENVIRON. CONSULTANT:	MORRIS & RITCHIE ASSOCIATES OF NC, PC. 5605 CHAPEL HILL ROAD, SUITE 112 RALEIGH, NC 27607 ATTN: MR. JAMIE B. GUERRERO, PE, CPSWQ

FOR SITE PLAN REVIEW ONLY
NOT FOR CONSTRUCTION
PLAN IS SUBJECT TO REVISIONS DURING THE CONSTRUCTION APPROVAL PROCESS

PRELIMINARY NOT FOR CONSTRUCTION FOR REVIEW ONLY
ENGINEER'S SEAL

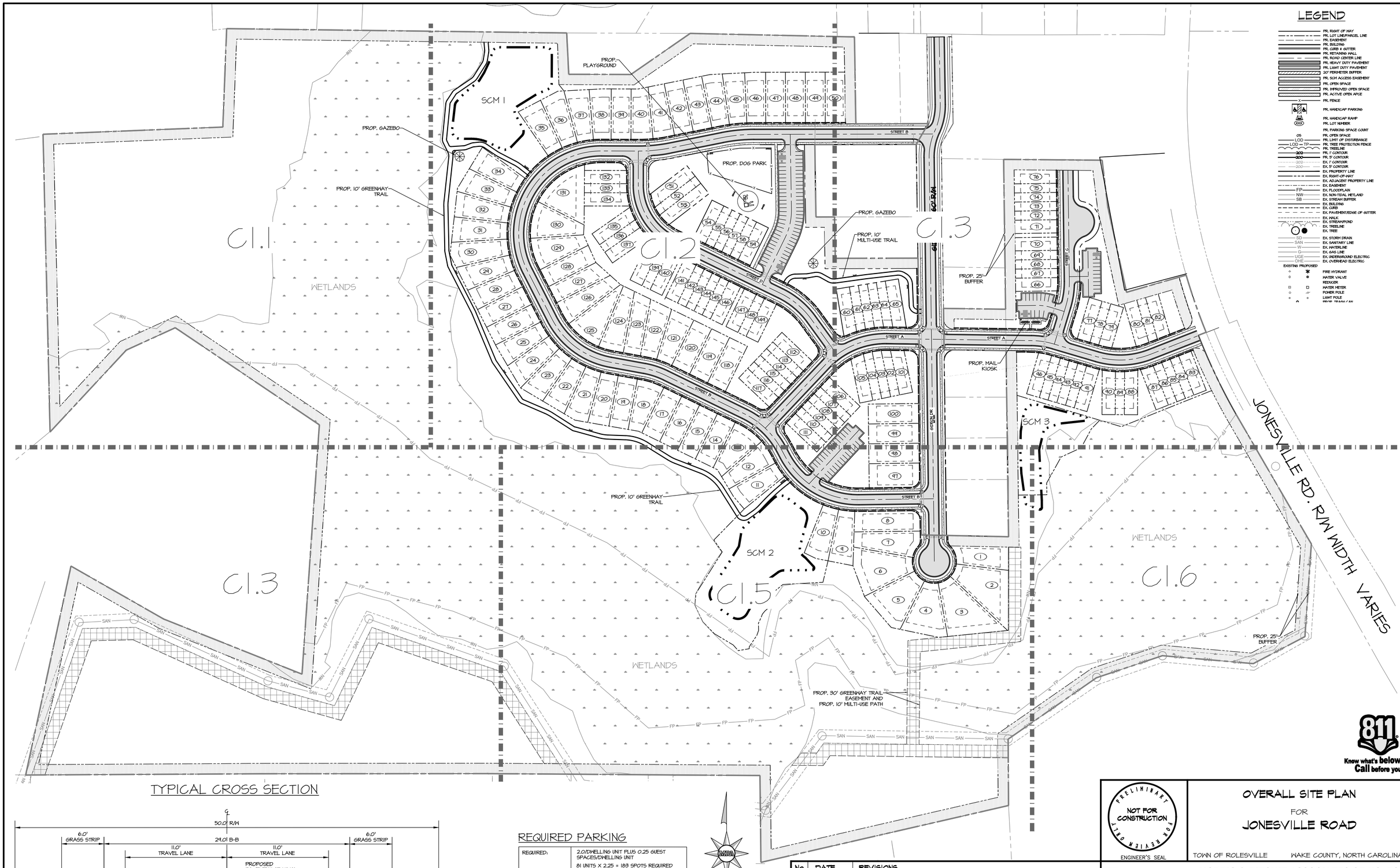
COVER - REZONING
FOR
JONESVILLE ROAD
TOWN OF ROLESVILLE WAKE COUNTY, NORTH CAROLINA

No.	DATE	REVISIONS
A	9/30/2022	REVISED PER TOWN OF ROLESVILLE COMMENTS

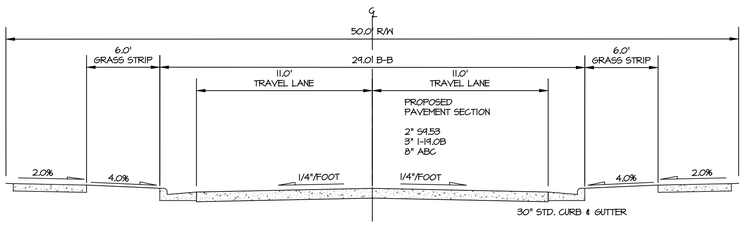
JOB NO.: 21790
SCALE: AS SHOWN
DATE: 6/1/2022
ENGINEER: JMK
DRAWN BY: ER/JM
DESIGN BY: DC
REVIEW BY: JMK

MORRIS & RITCHIE ASSOCIATES OF NC, PC
ENGINEERS, ARCHITECTS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
5605 CHAPEL HILL RD, STE 112
RALEIGH, NC 27607
(984) 200-2103
LICENSE # C-4182
WWW.MRAGTA.COM

STATUS: PRELIMINARY NOT FOR CONSTRUCTION | REVISION A | SHEET: C0.0



TYPICAL CROSS SECTION



N.T.S.

REQUIRED PARKING

REQUIRED:	2.0/DWELLING UNIT PLUS 0.25 GUEST SPACES/DWELLING UNIT 81 UNITS X 2.25 = 183 SPOTS REQUIRED
PROVIDED	81 UNITS X 1 (DRIVEWAY) = 81 SPOTS PARKING LOTS = 116 SPOTS (7 HANDICAP) TOTAL PROVIDED = 197 SPOTS

NORTH

100' 0 50' 100' 200' 400'

Scale : 1 Inch = 100 ft.

811 Know what's below. Call before you dig.

PRELIMINARY NOT FOR CONSTRUCTION FOR REVIEW ONLY

ENGINEER'S SEAL

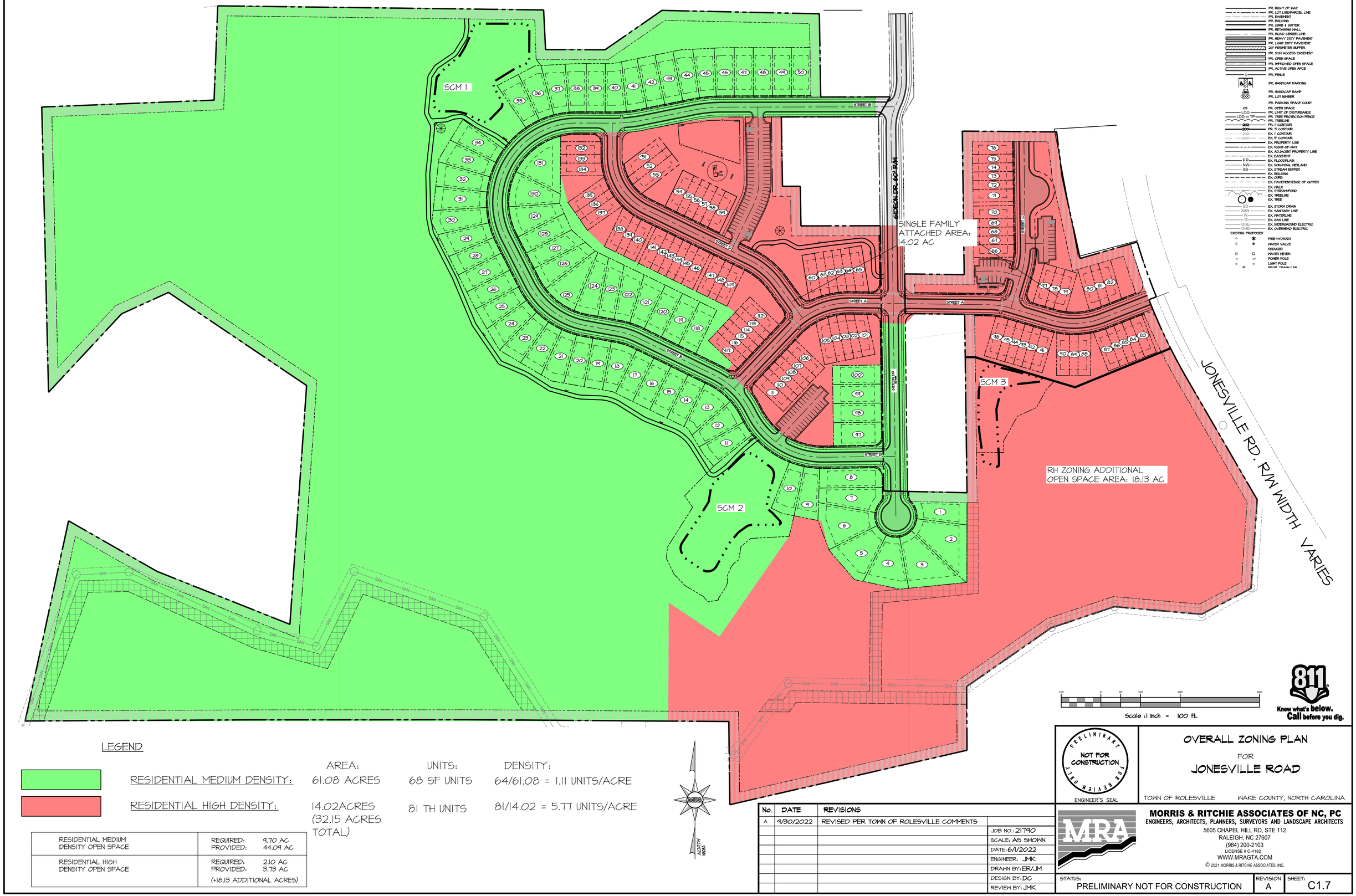
OVERALL SITE PLAN
FOR
JONESVILLE ROAD

TOWN OF ROLESVILLE WAKE COUNTY, NORTH CAROLINA

No.	DATE	REVISIONS	
A	9/30/2022	REVISED PER TOWN OF ROLESVILLE COMMENTS	
			JOB NO.: 21790
			SCALE: AS SHOWN
			DATE: 6/1/2022
			ENGINEER: JMK
			DRAWN BY: ER/JM
			DESIGN BY: DG
			REVIEW BY: JMK

MORRIS & RITCHIE ASSOCIATES OF NC, PC
ENGINEERS, ARCHITECTS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
5605 CHAPEL HILL RD, STE 112
RALEIGH, NC 27607
(984) 200-2103
LICENSE # C-4182
WWW.MRAGTA.COM

STATUS: PRELIMINARY NOT FOR CONSTRUCTION | REVISION: A | SHEET: C1.0



Scale 1 inch = 100 ft.

Know what's below. Call before you dig.

LEGEND

	AREA:	UNITS:	DENSITY:
RESIDENTIAL MEDIUM DENSITY:	61.08 ACRES	68 SF UNITS	64/61.08 = 1.11 UNITS/ACRE
RESIDENTIAL HIGH DENSITY:	14.02ACRES (32.15 ACRES TOTAL)	81 TH UNITS	81/14.02 = 5.77 UNITS/ACRE

RESIDENTIAL MEDIUM DENSITY OPEN SPACE	REQUIRED: 9.70 AC PROVIDED: 44.09 AC
RESIDENTIAL HIGH DENSITY OPEN SPACE	REQUIRED: 2.10 AC PROVIDED: 3.13 AC (18.13 ADDITIONAL ACRES)

PRELIMINARY NOT FOR CONSTRUCTION FOR REVIEW ONLY

ENGINEER'S SEAL

OVERALL ZONING PLAN
FOR
JONESVILLE ROAD

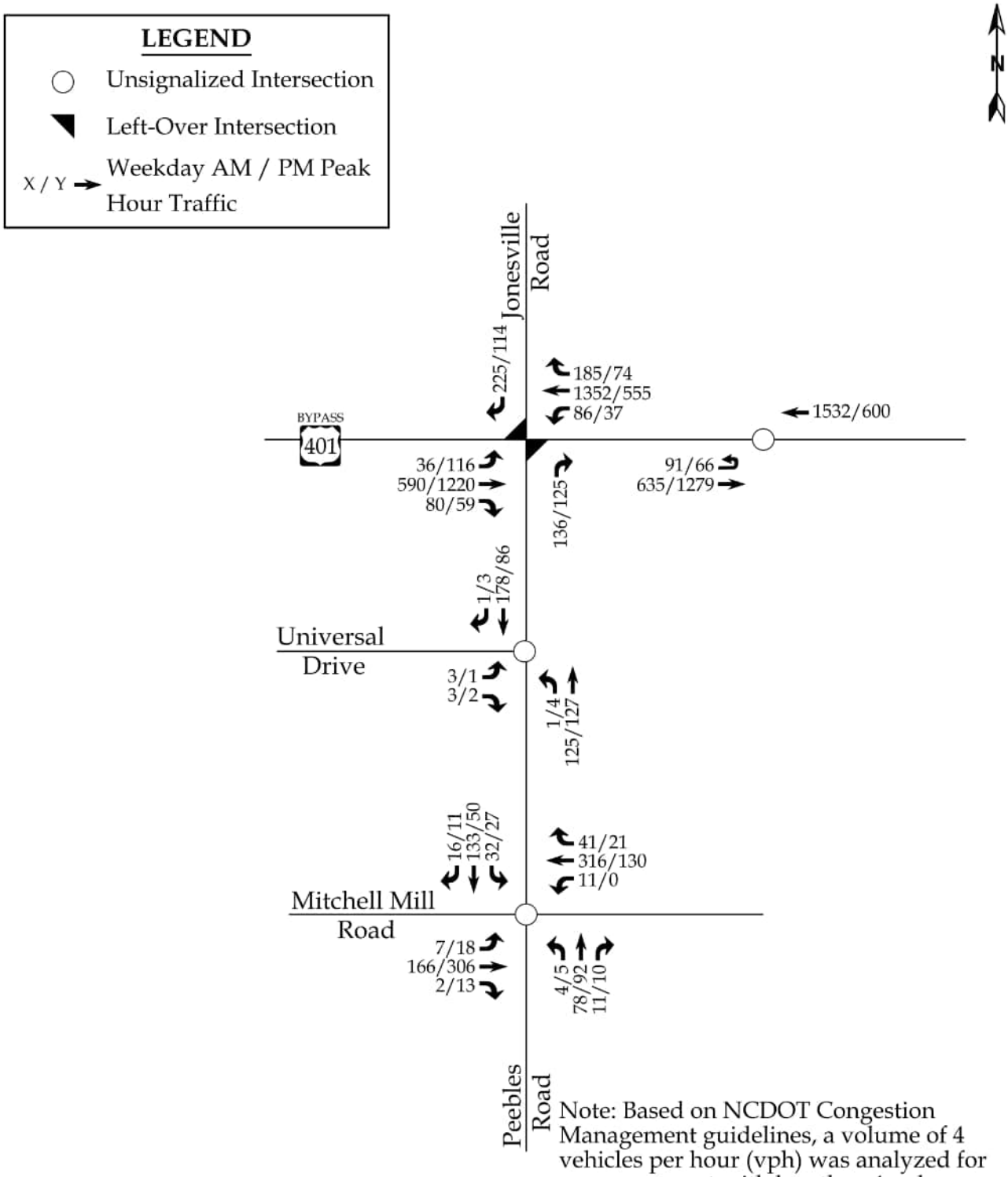
TOWN OF ROLESVILLE WAKE COUNTY, NORTH CAROLINA

No.	DATE	REVISIONS
A	9/30/2022	REVISED PER TOWN OF ROLESVILLE COMMENTS

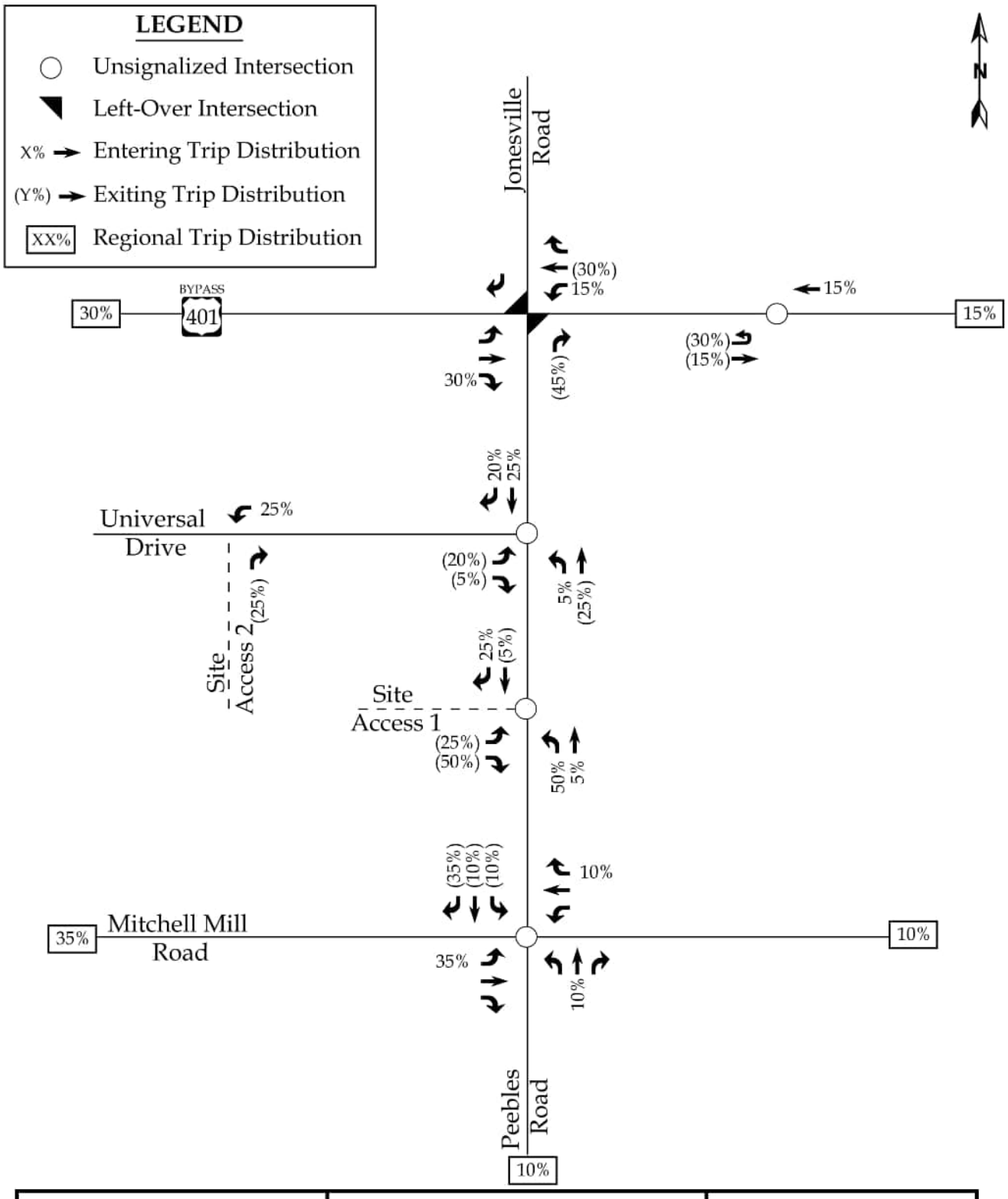
JOB NO.: 21790
SCALE: AS SHOWN
DATE: 6/1/2022
ENGINEER: JMK
DRAWN BY: ER/JM
DESIGN BY: DC
REVIEW BY: JMK

MORRIS & RITCHIE ASSOCIATES OF NC, PC
ENGINEERS, ARCHITECTS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
5605 CHAPEL HILL RD, STE 112
RALEIGH, NC 27607
(984) 200-2103
LICENSE # C-4182
WWW.MRAGTA.COM

STATUS: PRELIMINARY NOT FOR CONSTRUCTION | REVISION: A | SHEET: C1.7



RKA RAMEY KEMP ASSOCIATES	Harris Creek Farm Rolesville, NC	2022 Existing Peak Hour Traffic Scale: Not to Scale | Figure 4



RAMEY KEMP ASSOCIATES	Harris Creek Farm Rolesville, NC	Site Trip Distribution Scale: Not to Scale | Figure 8

APPENDIX B

TRAFFIC COUNTS

TRAFFIC DATA COLLECTION

File Name : Rolesville(US 401 and Jonesville)AM Peak
Site Code :
Start Date : 11/9/2021
Page No : 1

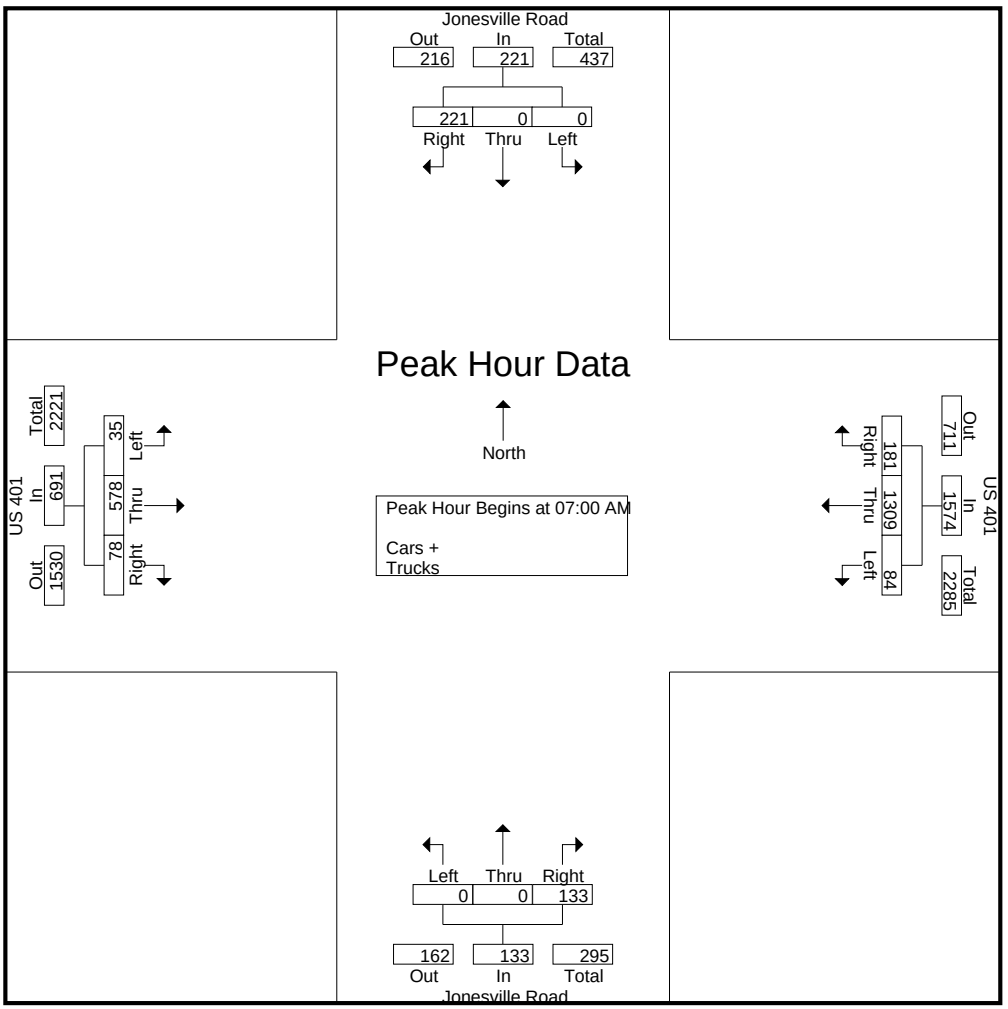
Groups Printed- Cars + - Trucks

	Jonesville Road Southbound				US 401 Westbound				Jonesville Road Northbound				US 401 Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
07:00 AM	63	0	0	63	24	380	21	425	23	0	0	23	18	182	3	203	714
07:15 AM	42	0	0	42	39	362	24	425	37	0	0	37	11	125	7	143	647
07:30 AM	51	0	0	51	80	318	23	421	48	0	0	48	24	136	15	175	695
07:45 AM	65	0	0	65	38	249	16	303	25	0	0	25	25	135	10	170	563
Total	221	0	0	221	181	1309	84	1574	133	0	0	133	78	578	35	691	2619
08:00 AM	61	0	0	61	26	236	13	275	23	0	0	23	30	120	10	160	519
08:15 AM	36	0	0	36	12	233	9	254	16	0	0	16	13	94	9	116	422
08:30 AM	24	0	0	24	10	213	5	228	9	0	0	9	6	91	3	100	361
08:45 AM	28	0	0	28	9	145	5	159	10	0	0	10	11	85	2	98	295
Total	149	0	0	149	57	827	32	916	58	0	0	58	60	390	24	474	1597
Grand Total	370	0	0	370	238	2136	116	2490	191	0	0	191	138	968	59	1165	4216
Apprch %	100	0	0		9.6	85.8	4.7		100	0	0		11.8	83.1	5.1		
Total %	8.8	0	0	8.8	5.6	50.7	2.8	59.1	4.5	0	0	4.5	3.3	23	1.4	27.6	
Cars +	366	0	0	366	233	2094	114	2441	188	0	0	188	135	916	57	1108	4103
% Cars +	98.9	0	0	98.9	97.9	98	98.3	98	98.4	0	0	98.4	97.8	94.6	96.6	95.1	97.3
Trucks	4	0	0	4	5	42	2	49	3	0	0	3	3	52	2	57	113
% Trucks	1.1	0	0	1.1	2.1	2	1.7	2	1.6	0	0	1.6	2.2	5.4	3.4	4.9	2.7

TRAFFIC DATA COLLECTION

File Name : Rolesville(US 401 and Jonesville)AM Peak
Site Code :
Start Date : 11/9/2021
Page No : 2

	Jonesville Road Southbound				US 401 Westbound				Jonesville Road Northbound				US 401 Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	63	0	0	63	24	**380**	21	**425**	23	0	0	23	18	**182**	3	**203**	**714**
07:15 AM	42	0	0	42	39	362	**24**	425	37	0	0	37	11	125	7	143	647
07:30 AM	51	0	0	51	**80**	318	23	421	**48**	0	0	**48**	24	136	**15**	175	695
07:45 AM	**65**	0	0	**65**	38	249	16	303	25	0	0	25	**25**	135	10	170	563
Total Volume	221	0	0	221	181	1309	84	1574	133	0	0	133	78	578	35	691	2619
% App. Total	100	0	0		11.5	83.2	5.3		100	0	0		11.3	83.6	5.1		
PHF	.850	.000	.000	.850	.566	.861	.875	.926	.693	.000	.000	.693	.780	.794	.583	.851	.917



File Name : Rolesville(US 401 and Jonesville)PM Peak
Site Code :
Start Date : 11/9/2021
Page No : 1

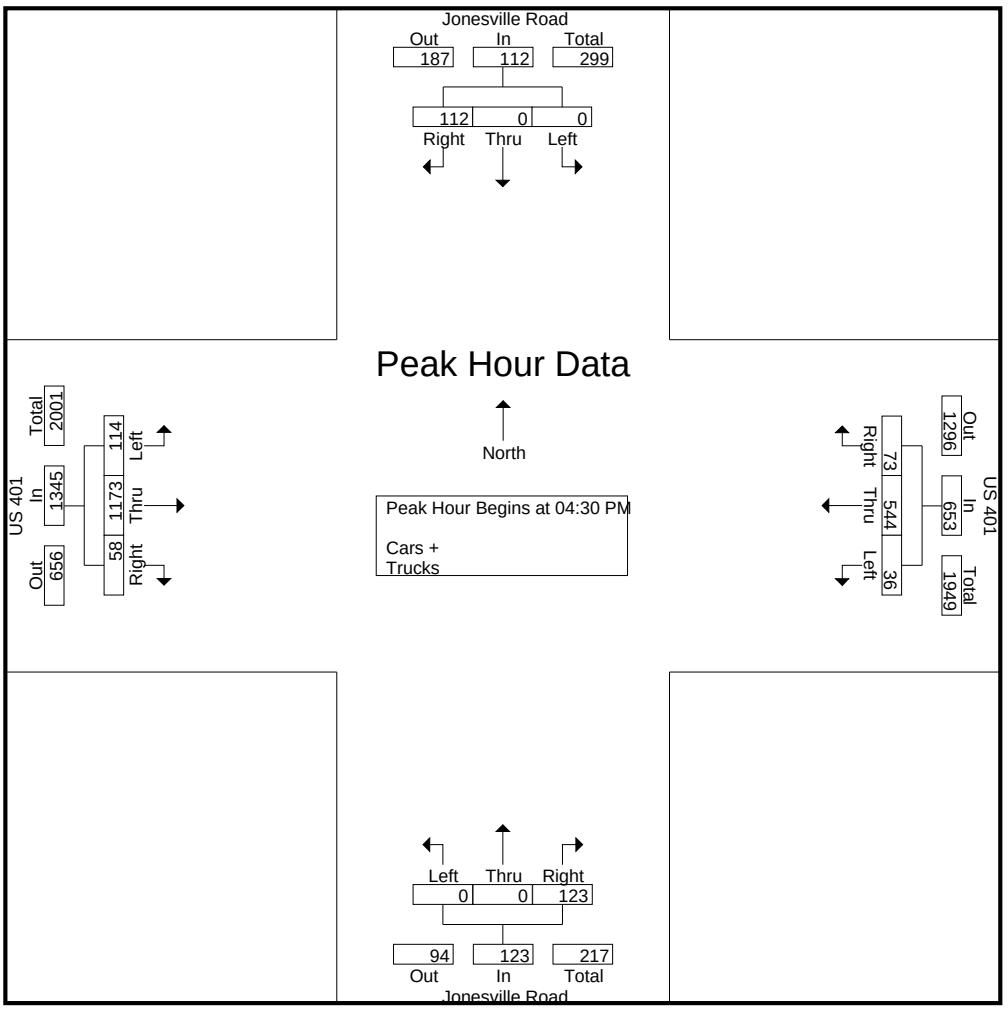
Groups Printed- Cars + - Trucks

	Jonesville Road Southbound				US 401 Westbound				Jonesville Road Northbound				US 401 Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
04:00 PM	47	0	0	47	13	124	6	143	21	0	0	21	37	217	22	276	487
04:15 PM	34	0	0	34	13	119	6	138	26	0	0	26	15	231	20	266	464
04:30 PM	30	0	0	30	19	118	12	149	32	0	0	32	12	291	28	331	542
04:45 PM	15	0	0	15	22	137	6	165	32	0	0	32	8	303	30	341	553
Total	126	0	0	126	67	498	30	595	111	0	0	111	72	1042	100	1214	2046
05:00 PM	37	0	0	37	10	143	7	160	23	0	0	23	23	322	30	375	595
05:15 PM	30	0	0	30	22	146	11	179	36	0	0	36	15	257	26	298	543
05:30 PM	39	0	0	39	20	145	3	168	34	0	0	34	23	262	14	299	540
05:45 PM	24	0	0	24	10	112	9	131	22	0	0	22	11	227	21	259	436
Total	130	0	0	130	62	546	30	638	115	0	0	115	72	1068	91	1231	2114
Grand Total	256	0	0	256	129	1044	60	1233	226	0	0	226	144	2110	191	2445	4160
Apprch %	100	0	0		10.5	84.7	4.9		100	0	0		5.9	86.3	7.8		
Total %	6.2	0	0	6.2	3.1	25.1	1.4	29.6	5.4	0	0	5.4	3.5	50.7	4.6	58.8	
Cars +	252	0	0	252	127	1020	60	1207	223	0	0	223	142	2051	191	2384	4066
% Cars +	98.4	0	0	98.4	98.4	97.7	100	97.9	98.7	0	0	98.7	98.6	97.2	100	97.5	97.7
Trucks	4	0	0	4	2	24	0	26	3	0	0	3	2	59	0	61	94
% Trucks	1.6	0	0	1.6	1.6	2.3	0	2.1	1.3	0	0	1.3	1.4	2.8	0	2.5	2.3

TRAFFIC DATA COLLECTION

File Name : Rolesville(US 401 and Jonesville)PM Peak
Site Code :
Start Date : 11/9/2021
Page No : 2

	Jonesville Road Southbound				US 401 Westbound				Jonesville Road Northbound				US 401 Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	30	0	0	30	19	118	**12**	149	32	0	0	32	12	291	28	331	542
04:45 PM	15	0	0	15	**22**	137	6	165	32	0	0	32	8	303	**30**	341	553
05:00 PM	**37**	0	0	**37**	10	143	7	160	23	0	0	23	**23**	**322**	30	**375**	**595**
05:15 PM	30	0	0	30	22	**146**	11	**179**	**36**	0	0	**36**	15	257	26	298	543
Total Volume	112	0	0	112	73	544	36	653	123	0	0	123	58	1173	114	1345	2233
% App. Total	100	0	0		11.2	83.3	5.5		100	0	0		4.3	87.2	8.5		
PHF	.757	.000	.000	.757	.830	.932	.750	.912	.854	.000	.000	.854	.630	.911	.950	.897	.938



TRAFFIC DATA COLLECTION

File Name : Rolesville(US 401 and Eastern U Turn)AM Peak
Site Code :
Start Date : 11/9/2021
Page No : 1

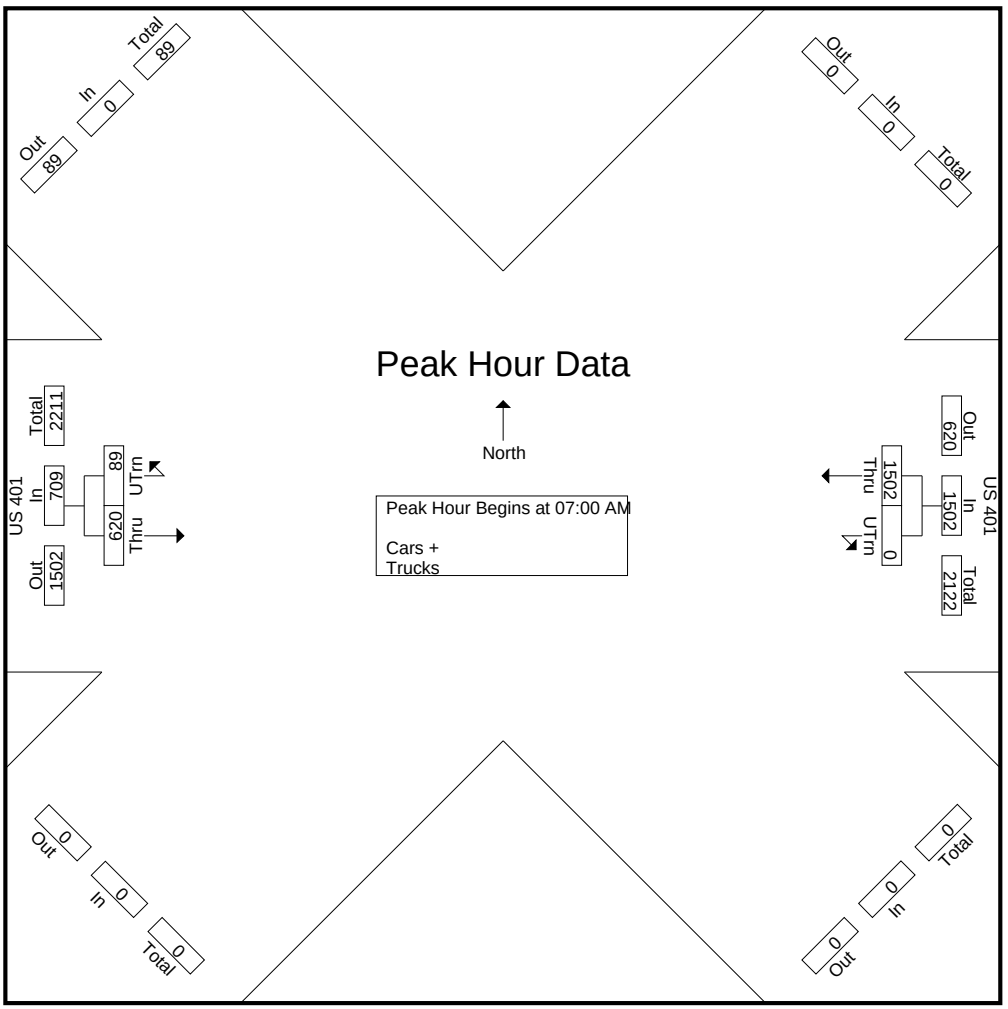
Groups Printed- Cars + - Trucks

	US 401 Westbound			US 401 Eastbound			
Start Time	Thru	UTrn	App. Total	Thru	UTrn	App. Total	Int. Total
07:00 AM	421	0	421	198	12	210	631
07:15 AM	410	0	410	136	24	160	570
07:30 AM	392	0	392	149	36	185	577
07:45 AM	279	0	279	137	17	154	433
Total	1502	0	1502	620	89	709	2211
08:00 AM	253	0	253	130	20	150	403
08:15 AM	243	0	243	98	13	111	354
08:30 AM	223	0	223	94	7	101	324
08:45 AM	147	0	147	85	9	94	241
Total	866	0	866	407	49	456	1322
Grand Total	2368	0	2368	1027	138	1165	3533
Apprch %	100	0		88.2	11.8		
Total %	67	0	67	29.1	3.9	33	
Cars +	2318	0	2318	973	136	1109	3427
% Cars +	97.9	0	97.9	94.7	98.6	95.2	97
Trucks	50	0	50	54	2	56	106
% Trucks	2.1	0	2.1	5.3	1.4	4.8	3

TRAFFIC DATA COLLECTION

File Name : Rolesville(US 401 and Eastern U Turn)AM Peak
Site Code :
Start Date : 11/9/2021
Page No : 2

	US 401 Westbound			US 401 Eastbound			
Start Time	Thru	UTrn	App. Total	Thru	UTrn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1							
Peak Hour for Entire Intersection Begins at 07:00 AM							
07:00 AM	**421**	0	**421**	**198**	12	**210**	**631**
07:15 AM	410	0	410	136	24	160	570
07:30 AM	392	0	392	149	**36**	185	577
07:45 AM	279	0	279	137	17	154	433
Total Volume	1502	0	1502	620	89	709	2211
% App. Total	100	0		87.4	12.6		
PHF	.892	.000	.892	.783	.618	.844	.876



TRAFFIC DATA COLLECTION

File Name : Rolesville(US 401 and Eastern U Turn)PM Peak
Site Code :
Start Date : 11/9/2021
Page No : 1

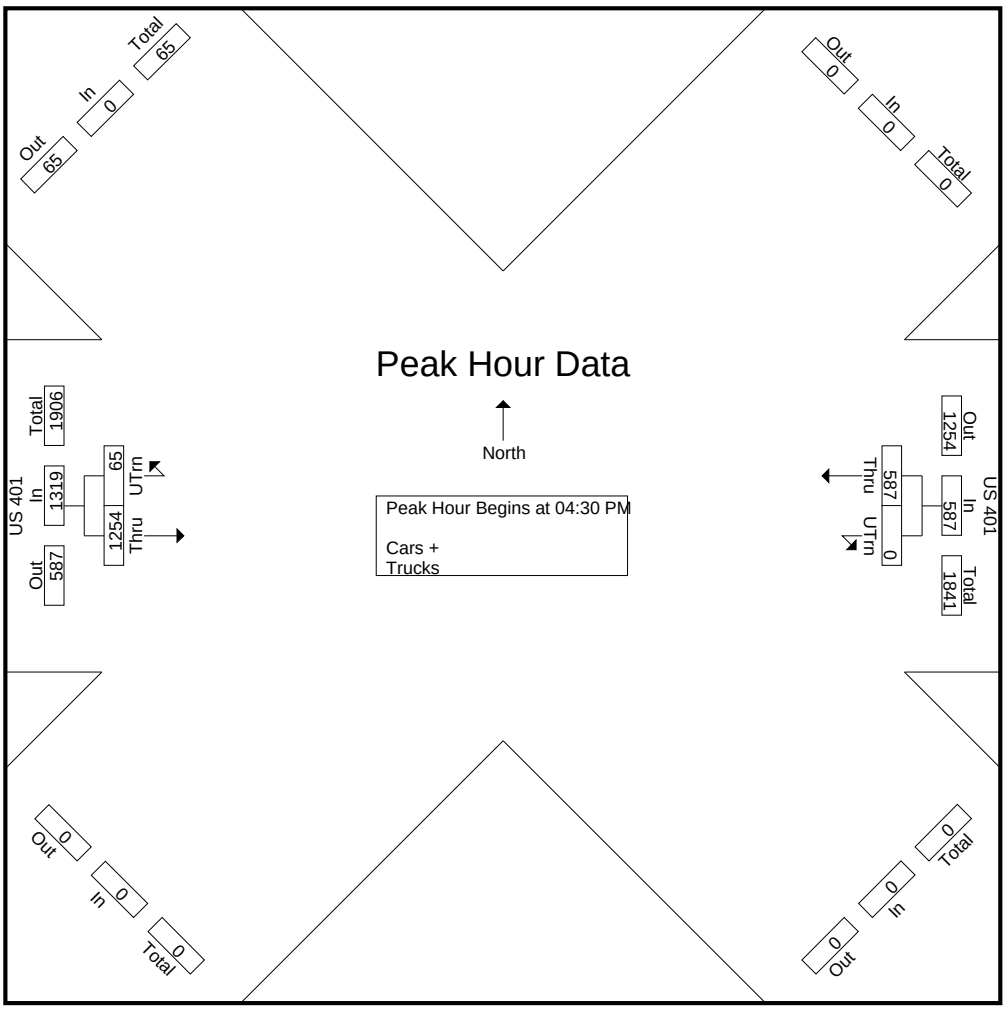
Groups Printed- Cars + - Trucks

	US 401 Westbound			US 401 Eastbound			
Start Time	Thru	UTrn	App. Total	Thru	UTrn	App. Total	Int. Total
04:00 PM	130	0	130	240	12	252	382
04:15 PM	128	0	128	237	15	252	380
04:30 PM	129	0	129	311	19	330	459
04:45 PM	149	0	149	317	19	336	485
Total	536	0	536	1105	65	1170	1706
05:00 PM	149	0	149	342	8	350	499
05:15 PM	160	0	160	284	19	303	463
05:30 PM	161	0	161	273	22	295	456
05:45 PM	120	0	120	235	12	247	367
Total	590	0	590	1134	61	1195	1785
Grand Total	1126	0	1126	2239	126	2365	3491
Apprch %	100	0		94.7	5.3		
Total %	32.3	0	32.3	64.1	3.6	67.7	
Cars +	1101	0	1101	2175	125	2300	3401
% Cars +	97.8	0	97.8	97.1	99.2	97.3	97.4
Trucks	25	0	25	64	1	65	90
% Trucks	2.2	0	2.2	2.9	0.8	2.7	2.6

TRAFFIC DATA COLLECTION

File Name : Rolesville(US 401 and Eastern U Turn)PM Peak
Site Code :
Start Date : 11/9/2021
Page No : 2

	US 401 Westbound			US 401 Eastbound			
Start Time	Thru	UTrn	App. Total	Thru	UTrn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1							
Peak Hour for Entire Intersection Begins at 04:30 PM							
04:30 PM	129	0	129	311	**19**	330	459
04:45 PM	149	0	149	317	19	336	485
05:00 PM	149	0	149	**342**	8	**350**	**499**
05:15 PM	**160**	0	**160**	284	19	303	463
Total Volume	587	0	587	1254	65	1319	1906
% App. Total	100	0		95.1	4.9		
PHF	.917	.000	.917	.917	.855	.942	.955



TRAFFIC DATA COLLECTION

File Name : Rolesville(Jonesville and Mitchell Mill)AM Peak
Site Code :
Start Date : 11/30/2021
Page No : 1

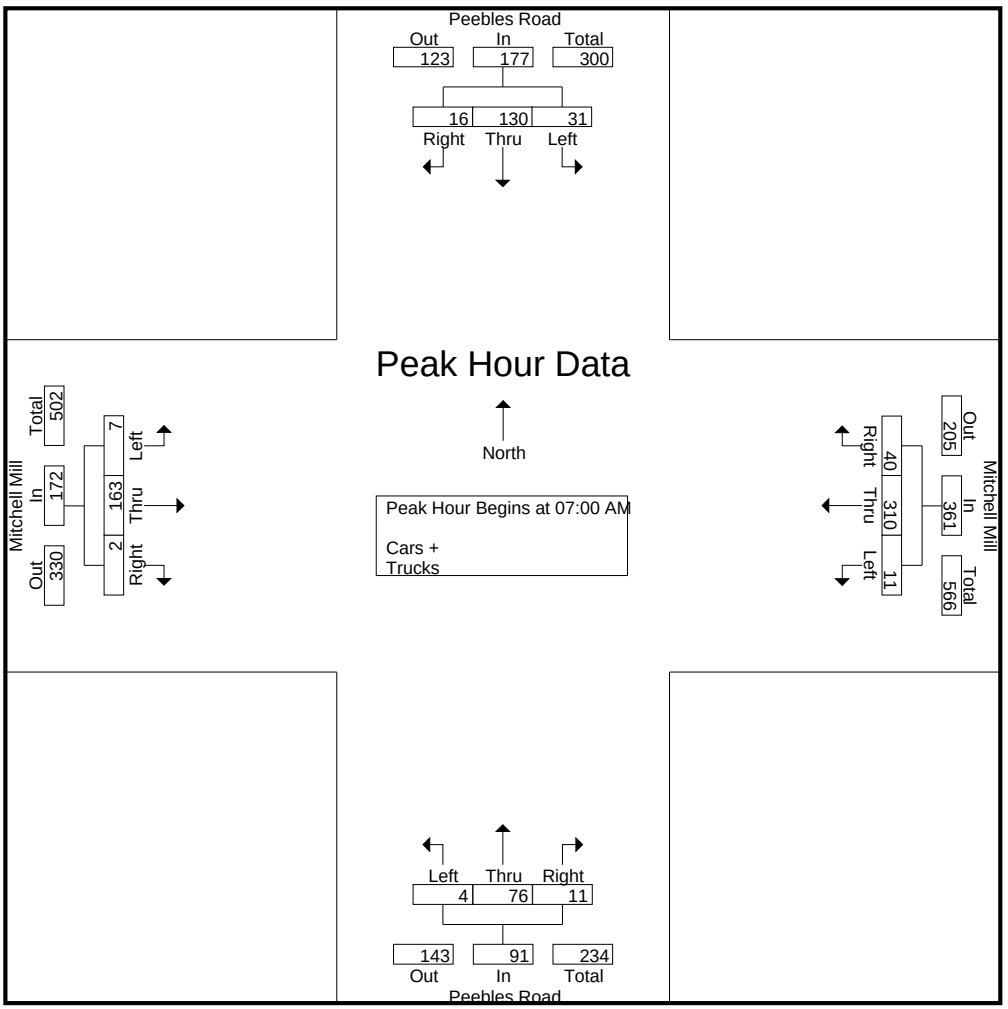
Groups Printed- Cars + - Trucks

	Peebles Road Southbound				Mitchell Mill Westbound				Peebles Road Northbound				Mitchell Mill Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
07:00 AM	4	17	13	34	8	73	5	86	6	11	3	20	0	74	1	75	215
07:15 AM	4	36	7	47	8	101	2	111	3	26	1	30	0	32	1	33	221
07:30 AM	6	34	5	45	16	87	3	106	0	24	0	24	1	33	1	35	210
07:45 AM	2	43	6	51	8	49	1	58	2	15	0	17	1	24	4	29	155
Total	16	130	31	177	40	310	11	361	11	76	4	91	2	163	7	172	801
08:00 AM	7	31	12	50	4	53	1	58	1	8	2	11	0	28	3	31	150
08:15 AM	12	17	3	32	1	37	1	39	1	7	0	8	1	24	1	26	105
08:30 AM	6	4	2	12	3	49	2	54	1	4	2	7	0	19	0	19	92
08:45 AM	1	13	3	17	4	32	1	37	1	3	1	5	1	18	2	21	80
Total	26	65	20	111	12	171	5	188	4	22	5	31	2	89	6	97	427
Grand Total	42	195	51	288	52	481	16	549	15	98	9	122	4	252	13	269	1228
Apprch %	14.6	67.7	17.7		9.5	87.6	2.9		12.3	80.3	7.4		1.5	93.7	4.8		
Total %	3.4	15.9	4.2	23.5	4.2	39.2	1.3	44.7	1.2	8	0.7	9.9	0.3	20.5	1.1	21.9	
Cars +	42	195	50	287	52	479	16	547	15	98	9	122	4	249	13	266	1222
% Cars +	100	100	98	99.7	100	99.6	100	99.6	100	100	100	100	100	98.8	100	98.9	99.5
Trucks	0	0	1	1	0	2	0	2	0	0	0	0	0	3	0	3	6
% Trucks	0	0	2	0.3	0	0.4	0	0.4	0	0	0	0	0	1.2	0	1.1	0.5

TRAFFIC DATA COLLECTION

File Name : Rolesville(Jonesville and Mitchell Mill)AM Peak
Site Code :
Start Date : 11/30/2021
Page No : 2

	Peebles Road Southbound				Mitchell Mill Westbound				Peebles Road Northbound				Mitchell Mill Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	4	17	**13**	34	8	73	**5**	86	**6**	11	**3**	20	0	**74**	1	**75**	215
07:15 AM	4	36	7	47	8	**101**	2	**111**	3	**26**	1	**30**	0	32	1	33	**221**
07:30 AM	**6**	34	5	45	**16**	87	3	106	0	24	0	24	**1**	33	1	35	210
07:45 AM	2	**43**	6	**51**	8	49	1	58	2	15	0	17	1	24	**4**	29	155
Total Volume	16	130	31	177	40	310	11	361	11	76	4	91	2	163	7	172	801
% App. Total	9	73.4	17.5		11.1	85.9	3		12.1	83.5	4.4		1.2	94.8	4.1		
PHF	.667	.756	.596	.868	.625	.767	.550	.813	.458	.731	.333	.758	.500	.551	.438	.573	.906



File Name : Rolesville(Jonesville and Mitchell Mill)PM Peak
Site Code :
Start Date : 11/30/2021
Page No : 1

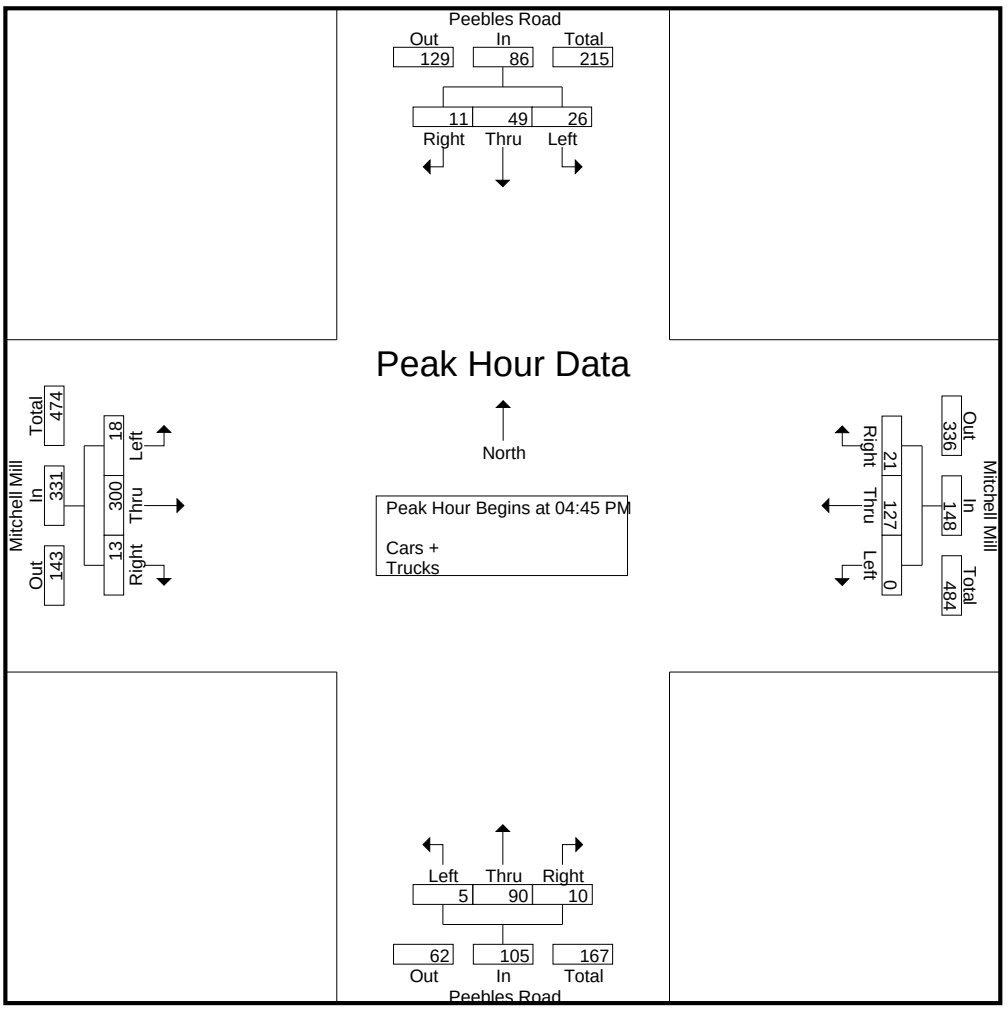
Groups Printed- Cars + - Trucks

	Peebles Road Southbound				Mitchell Mill Westbound				Peebles Road Northbound				Mitchell Mill Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
04:00 PM	7	11	13	31	6	25	1	32	1	14	1	16	2	44	6	52	131
04:15 PM	6	11	4	21	2	27	2	31	1	17	3	21	1	62	4	67	140
04:30 PM	3	13	3	19	4	30	2	36	0	27	1	28	3	64	3	70	153
04:45 PM	2	8	5	15	4	37	0	41	3	18	0	21	3	71	3	77	154
Total	18	43	25	86	16	119	5	140	5	76	5	86	9	241	16	266	578
05:00 PM	1	15	6	22	5	31	0	36	3	19	2	24	1	78	5	84	166
05:15 PM	3	15	6	24	4	23	0	27	3	26	1	30	4	89	7	100	181
05:30 PM	5	11	9	25	8	36	0	44	1	27	2	30	5	62	3	70	169
05:45 PM	1	7	4	12	2	21	1	24	2	13	2	17	4	55	6	65	118
Total	10	48	25	83	19	111	1	131	9	85	7	101	14	284	21	319	634
Grand Total	28	91	50	169	35	230	6	271	14	161	12	187	23	525	37	585	1212
Apprch %	16.6	53.8	29.6		12.9	84.9	2.2		7.5	86.1	6.4		3.9	89.7	6.3		
Total %	2.3	7.5	4.1	13.9	2.9	19	0.5	22.4	1.2	13.3	1	15.4	1.9	43.3	3.1	48.3	
Cars +	28	91	50	169	35	229	6	270	14	161	12	187	23	524	37	584	1210
% Cars +	100	100	100	100	100	99.6	100	99.6	100	100	100	100	100	99.8	100	99.8	99.8
Trucks	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
% Trucks	0	0	0	0	0	0.4	0	0.4	0	0	0	0	0	0.2	0	0.2	0.2

TRAFFIC DATA COLLECTION

File Name : Rolesville(Jonesville and Mitchell Mill)PM Peak
Site Code :
Start Date : 11/30/2021
Page No : 2

	Peebles Road Southbound				Mitchell Mill Westbound				Peebles Road Northbound				Mitchell Mill Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	2	8	5	15	4	**37**	0	41	**3**	18	0	21	3	71	3	77	154
05:00 PM	1	**15**	6	22	5	31	0	36	3	19	**2**	24	1	78	5	84	166
05:15 PM	3	15	6	24	4	23	0	27	3	26	1	**30**	4	**89**	**7**	**100**	**181**
05:30 PM	**5**	11	**9**	**25**	**8**	36	0	**44**	1	**27**	2	30	**5**	62	3	70	169
Total Volume	11	49	26	86	21	127	0	148	10	90	5	105	13	300	18	331	670
% App. Total	12.8	57	30.2		14.2	85.8	0		9.5	85.7	4.8		3.9	90.6	5.4		
PHF	.550	.817	.722	.860	.656	.858	.000	.841	.833	.833	.625	.875	.650	.843	.643	.828	.925



APPENDIX C

ADJACENT DEVELOPMENT INFORMATION

TRAFFIC IMPACT ANALYSIS

FOR

COBBLESTONE CROSSING MIXED-USE

LOCATED

IN

ROLESVILLE, NORTH CAROLINA

Prepared For:
Town of Rolesville
502 Southtown Circle
Rolesville, NC 27571

3-15-2021

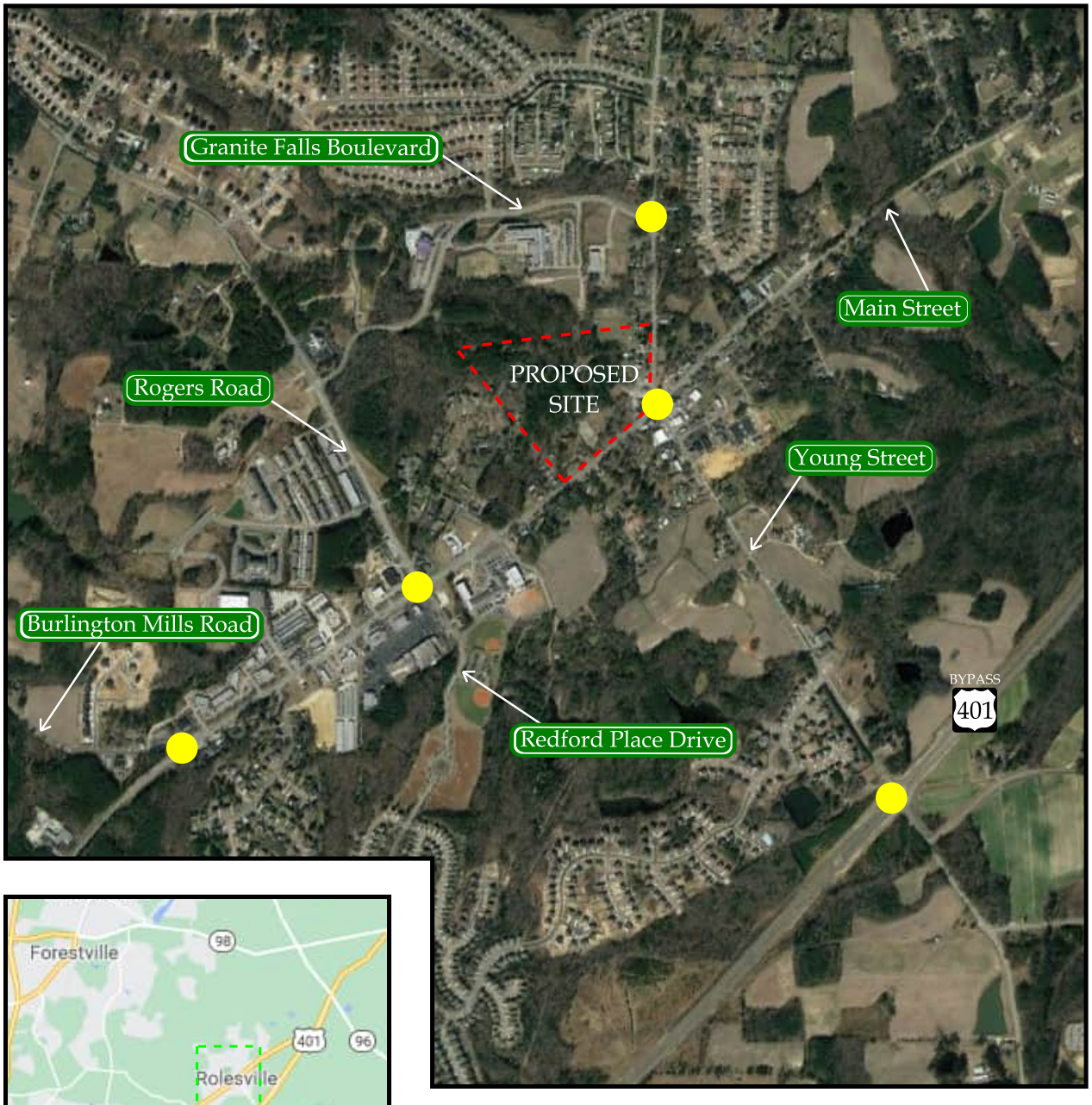
Prepared By:
Ramey Kemp & Associates, Inc.
5808 Faringdon Place, Suite 100
Raleigh, NC 27609
License #C-0910

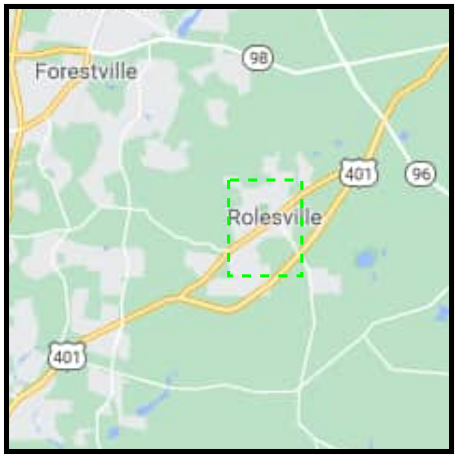
MARCH 2021

RKA Project No. 20498

Prepared By: TF

Reviewed By: MK



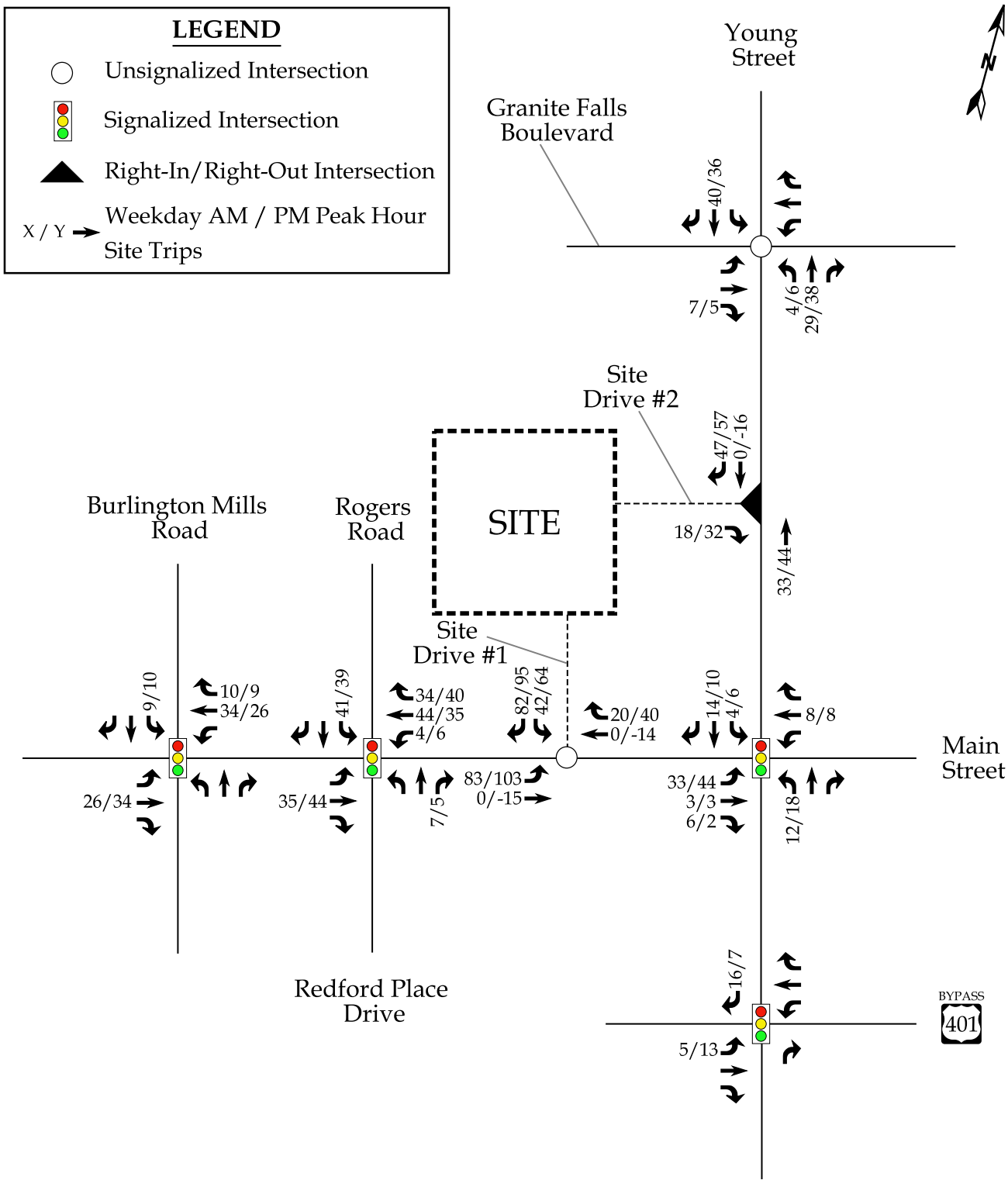


N

LEGEND

- Proposed Site Location
- Study Intersection
- Study Area

Moving forward. RKA RAMEY KEMP ASSOCIATES	Cobblestone Crossing Mixed-Use Rolesville, NC	Site Location Map
		Scale: Not to Scale | Figure 1



RAMEY KEMP ASSOCIATES	Cobblestone Crossing Mixed-Use Rolesville, NC	Total Site Trip Assignment Scale: Not to Scale | Figure 12

9. RECOMMENDATIONS

Based on the findings of this study, specific geometric improvements have been identified and are recommended to accommodate future traffic conditions. See a more detailed description of the recommended improvements below. Refer to Figure 14 for an illustration of the recommended lane configuration for the proposed development.

Improvements by STIP U-6241

STIP U-6241 is expected to realign Burlington Mills Road and install a traffic signal at the relocated intersection on Main Street. STIP U-6241 is also expected to provide improvements to the pedestrian and bike facilities along Main Street and add a concrete median island along Main Street west of Rogers Road. These improvements associated with STIP U-6241 will alter the existing lane configurations at the study intersections along Main Street.

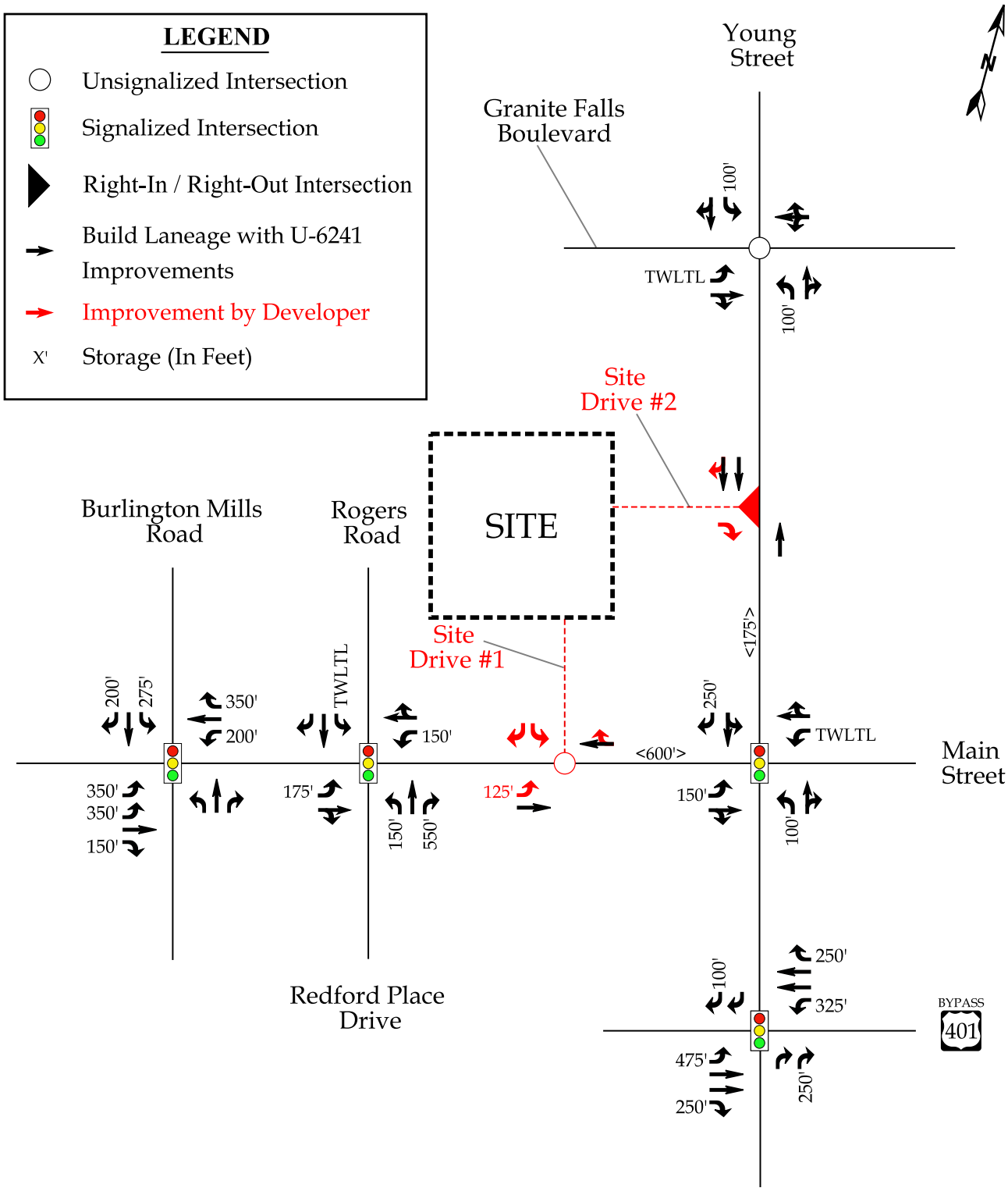
Recommended Improvements by Developer

Main Street and Site Drive 1

- Construct the southbound approach with one ingress and two egress lanes.
- Provide stop control for the southbound approach.
- Install an eastbound left-turn lane with at least 125 feet of storage and appropriate decel and taper.

Young Street and Site Drive 2

- Construct the eastbound approach with one ingress and egress lane.
- Provide stop control for the eastbound approach.



Moving forward. RKA RAMEY KEMP ASSOCIATES	Cobblestone Crossing Mixed-Use Rolesville, NC	Recommended Lane Configurations Scale: Not to Scale | Figure 14

Revised Traffic Impact Analysis for

Young Street PUD

Rolesville, North Carolina

Prepared for:

Ashton Woods
Raleigh, North Carolina

Prepared by:

Kimley-Horn and Associates, Inc.
NC License #F-0102
421 Fayetteville Street, Suite 600
Raleigh, NC 27601
(919) 677-2000

June 2019

015956012

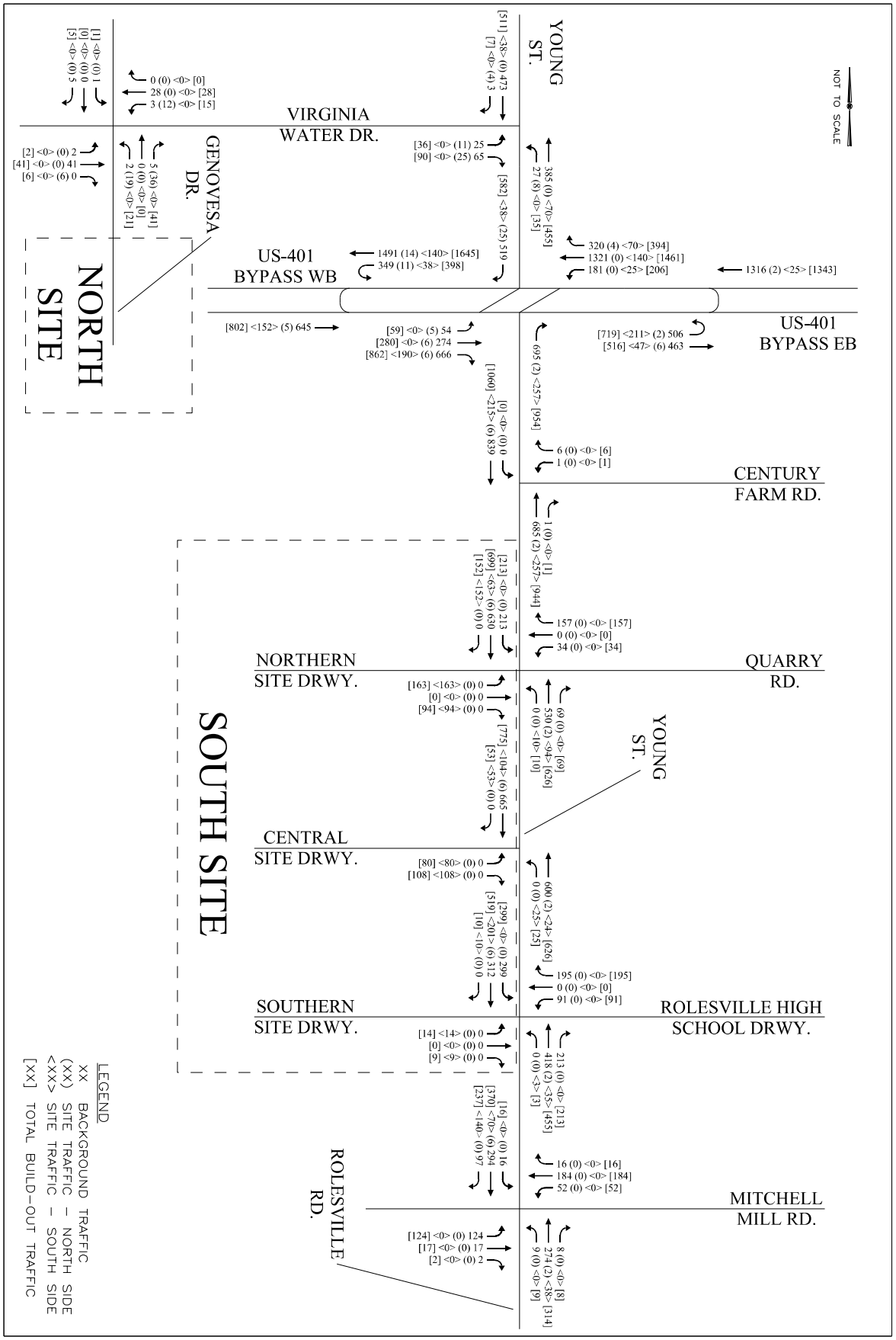
6/13/2019

Kimley»Horn

YOUNG STREET PUD
ROLESVILLE, NC
TRAFFIC IMPACT ANALYSIS

SITE LOCATION

FIGURE
1

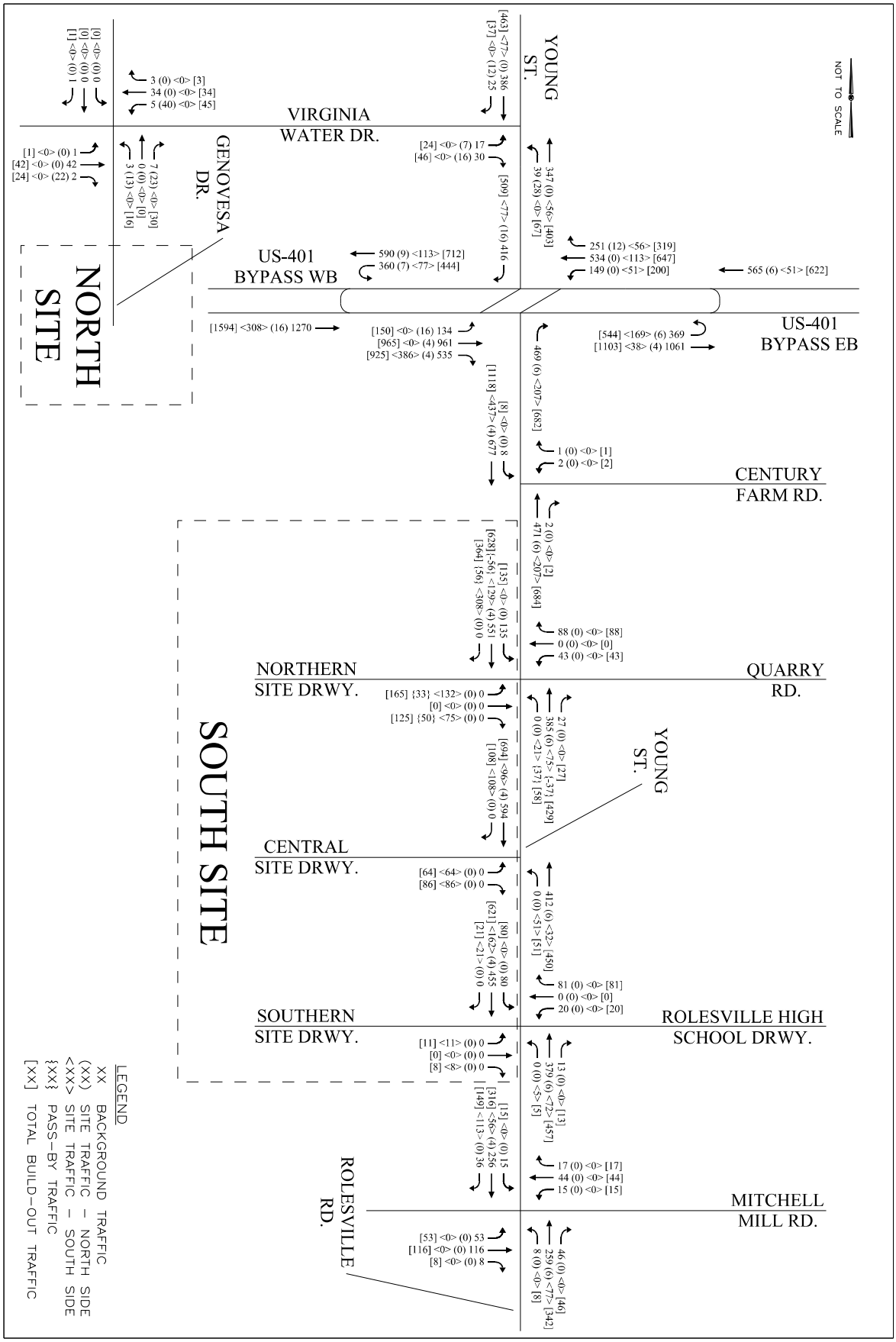


Kimley»Horn

YOUNG STREET PUD
ROLESVILLE, NC
TRAFFIC IMPACT ANALYSIS

PROJECTED (2025)
BUILD-OUT AM PEAK HOUR
TRAFFIC VOLUMES -
COMMERCIAL BUILD-OUT

FIGURE
14



Kimley»Horn	YOUNG STREET PUD ROLESVILLE, NC TRAFFIC IMPACT ANALYSIS	PROJECTED (2025) BUILD-OUT PM PEAK HOUR TRAFFIC VOLUMES - COMMERCIAL BUILD-OUT	FIGURE 16

7.0 Recommendations

Residential Build-out

The following improvements are recommended to be performed to accommodate projected site traffic volumes at build-out of the residential portion of the development:

US 401 Bypass:

- Coordinate the traffic signals at the intersections of US 401 at Young Street and the Superstreet U-turns

Young Street at Quarry Road/North Site Driveway:

- Construct a northbound left-turn lane on Young Street with 100 feet of storage and appropriate tapers
- Construct a southbound right-turn lane on Young Street with 100 feet of storage and appropriate tapers
- Restripe the existing westbound left-turn lane on Quarry Road to a shared left/through lane
- Provide an exclusive left-turn lane with 275 feet of storage and appropriate tapers and a shared through/right lane on the North Site Driveway
- Install a traffic signal when warranted

Young Street at Central Site Driveway:

- Construct a northbound left-turn lane on Young Street with 100 feet of storage and appropriate tapers
- Construct a southbound right-turn lane on Young Street with 100 feet of storage and appropriate tapers
- Provide exclusive left and right-turn lanes on the Central Site Driveway with 125 feet of storage and appropriate tapers for the left-turn lane

Young Street at Rolesville High School Driveway/South Site Driveway:

- Construct a northbound left-turn lane on Young Street with 50 feet of storage and appropriate tapers
- Provide one egress lane on the South Site Driveway

Rolesville Road at Mitchell Mill Road:

- Install a traffic signal when warranted

Analyses indicate that with the recommended improvements in place, all of the study intersections except for Young Street at Century Farm Road and Young Street at Rolesville High School Driveway/South Site Driveway are expected to operate at an acceptable LOS at build-out of the residential-only phase of the development.

Analyses indicate that the intersection of Young Street at Century Farm Road is expected to operate with long delays on the minor street approach (Century Farm Road) in the AM peak hour at project build-out. However, it is typical for stop sign controlled side streets and driveways intersecting major streets to experience long delays during peak hours while the majority of the traffic moving through the intersection on the major street experiences little or no delay. SimTraffic traffic simulations indicate that no queuing issues are expected at this intersection.

Analyses indicate that the intersection of Young Street at the Rolesville High School Driveway/South Site Driveway is expected to operate with long delays on the minor street approach (Rolesville High School Driveway) in the AM peak hour and school PM peak hour with or without the proposed project in place in the study year 2025. SimTraffic traffic simulations also indicate the possibility of long queues on the westbound left-turn movement at this intersection in the AM peak hour and school PM peak hour. However, it is typical for stop sign controlled side streets and driveways intersecting major streets to experience long delays during peak hours, while the majority of the traffic moving through the intersection on the major street experiences little or no delay. This intersection is not expected to meet 4-hour or 8-hour MUTCD traffic signal warrants.

Commercial Build-out

The following additional improvements are recommended to be performed in addition to those recommended above for the residential phase to accommodate projected site traffic volumes when the retail portion of the site is developed:

US 401 Bypass Eastbound at Young Street:

- Extend the storage of the existing eastbound right-turn lane on US 401 Bypass by approximately 175 feet to provide 400 feet of storage and appropriate tapers

Young Street at Quarry Road/North Site Driveway:

- Construct a northbound right-turn lane on Young Street with 100 feet of storage and appropriate tapers
- Modify the traffic signal to accommodate the additional laneage

Analyses indicate that with the recommended improvements in place, all of the study intersections except for Young Street at Century Farm Road, Young Street at the Central Site Driveway, and Young Street at Rolesville High School Driveway/South Site Driveway are expected to operate at acceptable LOS at commercial build-out of the development.

Analyses indicate that the intersection of Young Street at Century Farm Road is expected to operate with long delays on the minor street approach (Century Farm Road) in the AM peak hour at project build-out. It is typical for stop sign controlled side streets and driveways intersecting major streets to experience long delays during peak hours, while the majority of the traffic moving through the intersection on the major street experiences little or no delay. SimTraffic

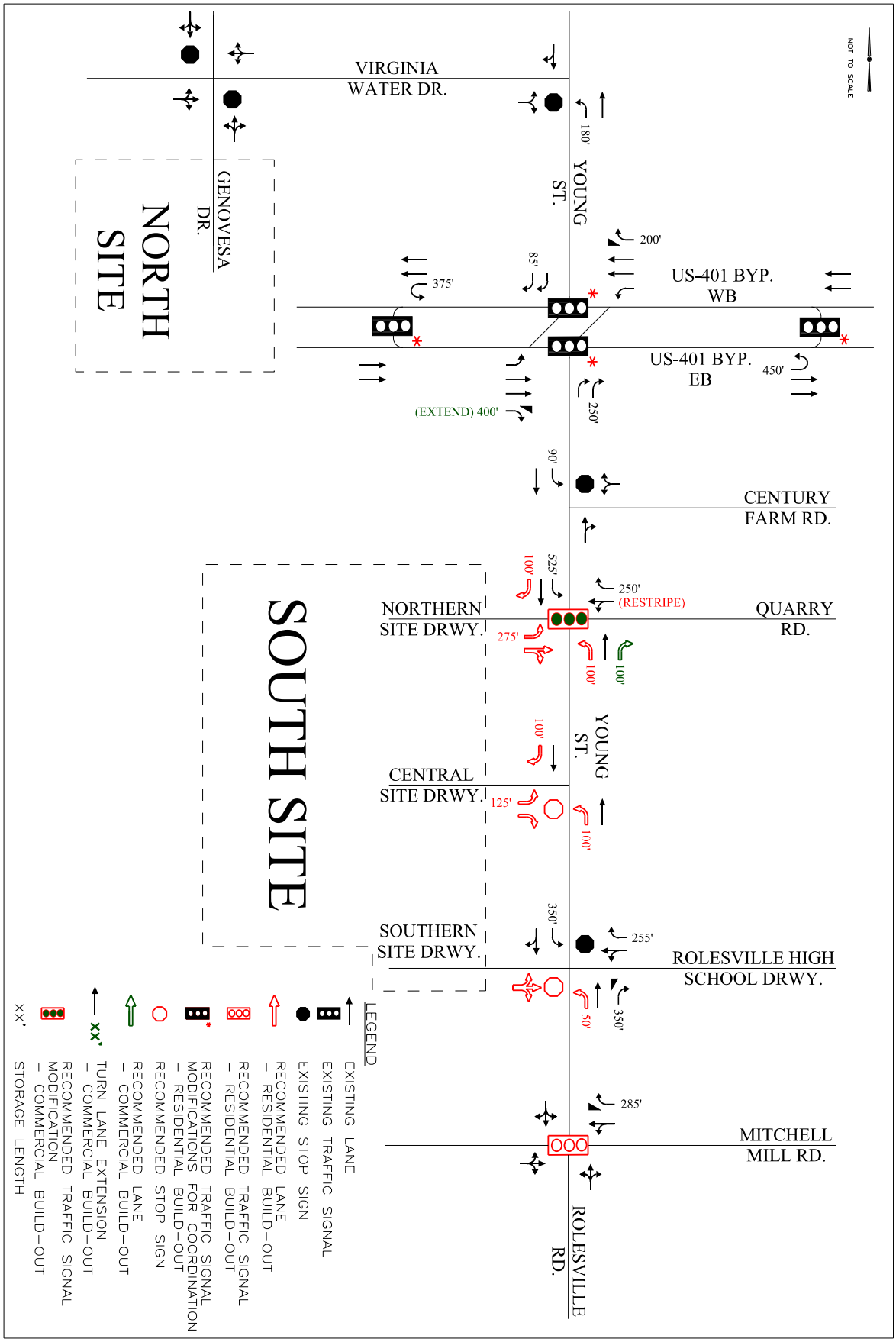
traffic simulations indicate that short queues are likely on the minor street approach in the AM peak hour at commercial build-out.

Analyses indicate that the intersection of Young Street at the Central Site Driveway is expected to operate with long delays on the minor street approach (Central Site Driveway) in the AM peak hour in the commercial build-out traffic condition. It is typical for stop sign controlled side streets and driveways intersecting major streets to experience long delays during peak hours, while the majority of the traffic moving through the intersection on the major street experiences little or no delay. SimTraffic traffic simulations indicate the possibility of long queues on the eastbound left-turn movement at this intersection in the AM peak hour in the commercial build-out condition.

Analyses indicate that the intersection of Young Street at the Rolesville High School Driveway/South Site Driveway is expected to operate with long delays on the minor street approach (Rolesville High School Driveway) in the AM peak hour and school PM peak hour with or without the proposed project in place in the study year 2025. SimTraffic traffic simulations also indicate the possibility of long queues on the westbound left-turn movement at this intersection in the AM peak hour and school PM peak hour. However, it is typical for stop sign controlled side streets and driveways intersecting major streets to experience long delays during peak hours, while the majority of the traffic moving through the intersection on the major street experiences little or no delay. This intersection is not expected to meet 4-hour or 8-hour MUTCD traffic signal warrants.

As shown in the analysis, the impact of site traffic associated with the commercial build-out of this proposed PUD is generally consistent with the currently-approved PUD for the site. The proposed PUD is expected to generate no more than 50 additional peak hour trips in each of the studied peak hours compared to the approved PUD, and delays at commercial build-out of both plans are generally consistent at each of the study intersections.

The recommended laneage for the development is shown on **Figure 17**.



Kimley»Horn	YOUNG STREET PUD ROLESVILLE, NC TRAFFIC IMPACT ANALYSIS	RECOMMENDED ROADWAY LANEAGE	FIGURE 17

TRAFFIC IMPACT ANALYSIS

FOR

WHEELER TRACT

LOCATED

IN

ROLESVILLE, NC

Prepared For:
Hopper Communities
173 Paraggi Court
Clayton, NC 27527

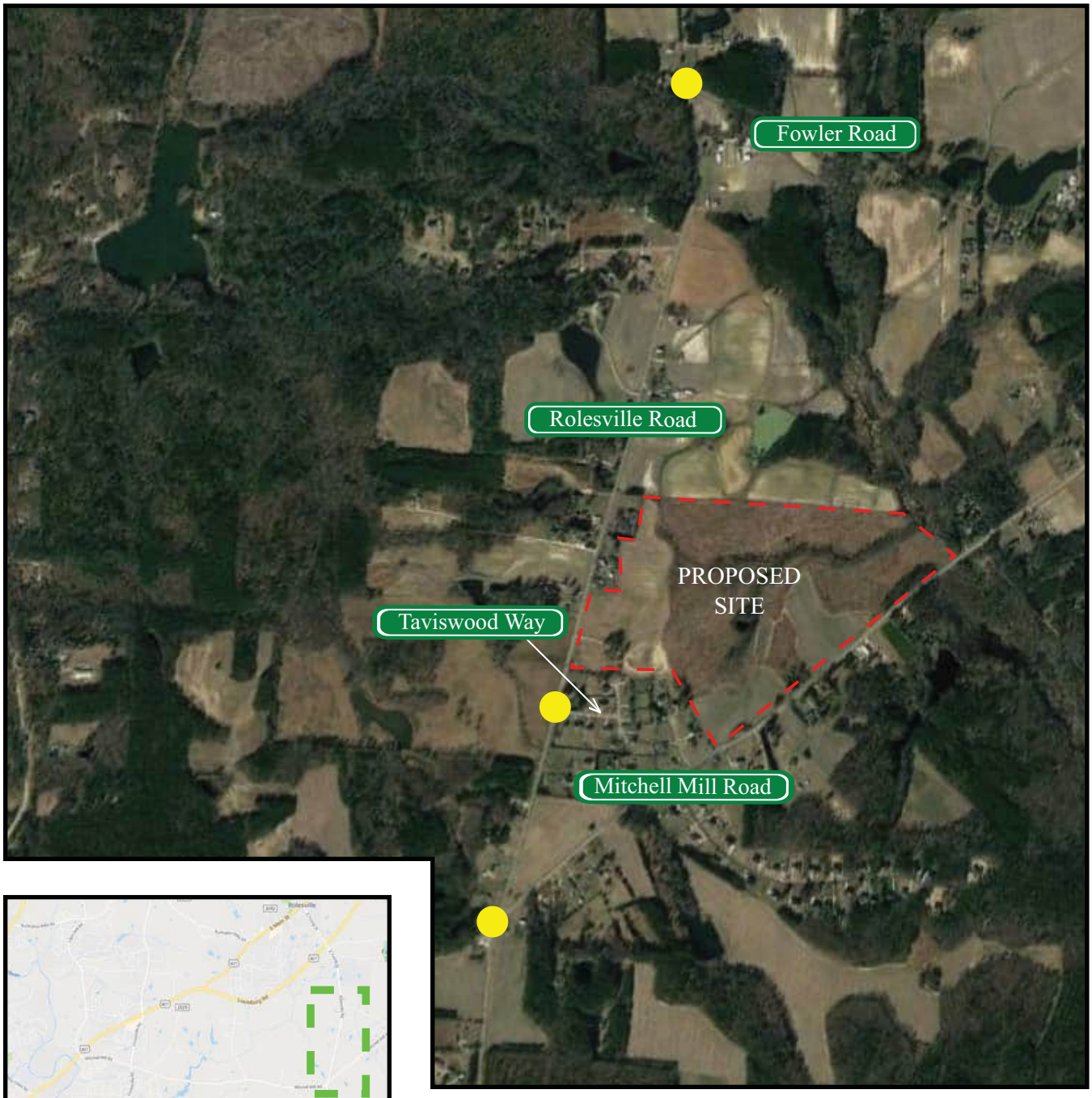
Prepared By:
Ramey Kemp & Associates, Inc.
5808 Faringdon Place, Suite 100
Raleigh, NC 27609
License #C-0910

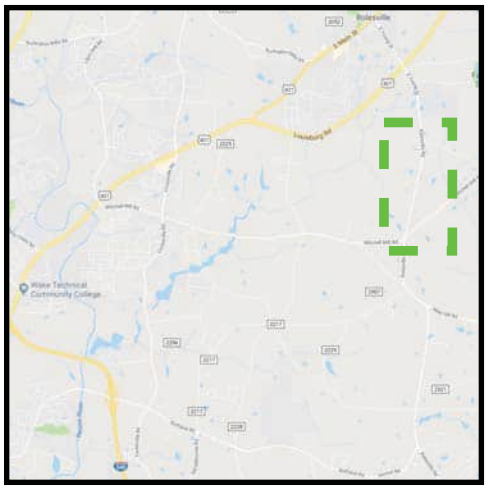
June 2019

RKA Project No. 19045

Prepared By: CAB

Reviewed By: JTR



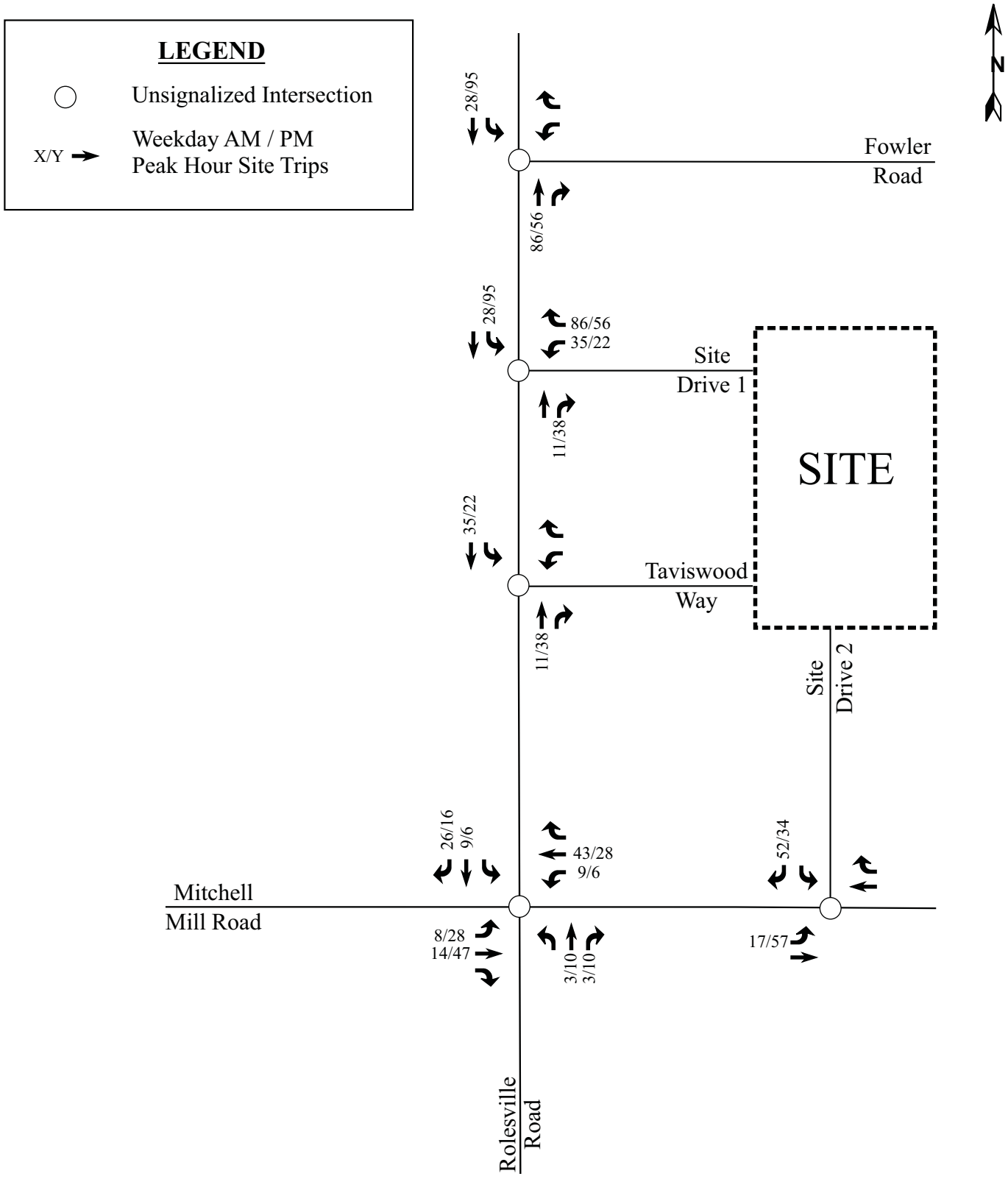


N

LEGEND

- Proposed Site Location
- Study Intersection
- Study Area

RAMEY KEMP & ASSOCIATES TRANSPORTATION ENGINEERS	Wheeler Tract Rolesville, NC	Site Location Map Scale: Not to Scale — Figure 1



RAMEY KEMP & ASSOCIATES
TRANSPORTATION ENGINEERS

Wheeler Tract
Rolesville, NC

Site
Trip Assignment

Scale: Not to Scale

Figure 9

9. RECOMMENDATIONS

Based on the findings of this study, specific geometric improvements have been identified and are recommended to accommodate future traffic conditions. See a more detailed description of the recommended improvements below. Refer to Figure 11 for an illustration of the recommended lane configuration for the proposed development.

Recommended Improvements by Developer

Rolesville Road and Mitchell Mill Road

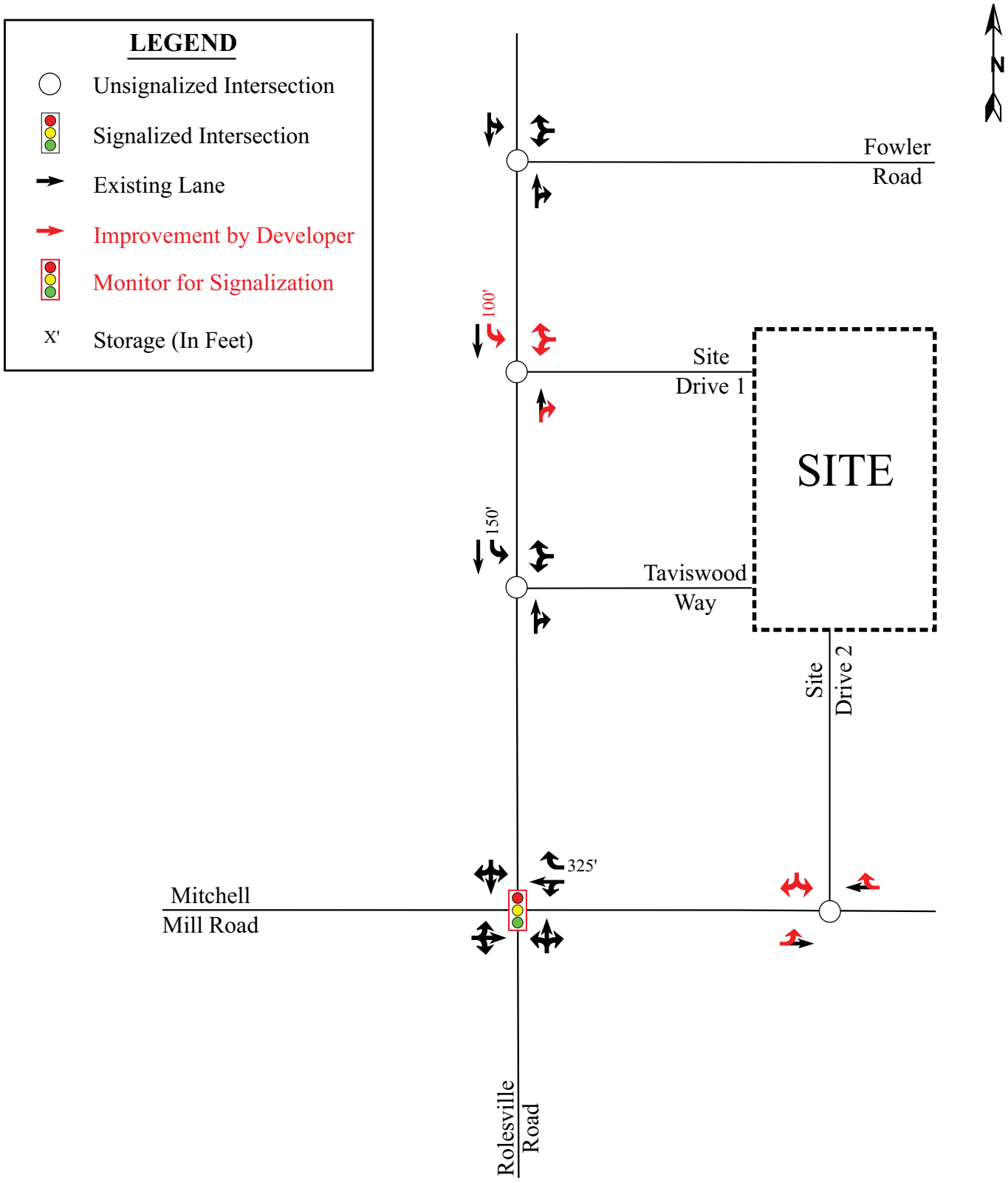
- Monitor intersection for signalization.

Rolesville Road and Site Drive 1

- Provide site access via a full movement intersection with one ingress lane and one egress lane.
- Provide stop control for westbound Site Drive 1 approach.
- Provide a designated southbound left-turn lane with at least 100 feet of storage and appropriate deceleration and taper.

Mitchell Mill Road and Site Drive 2

- Provide site access via a full movement intersection with one ingress lane and one egress lane.
- Provide stop control for southbound Site Drive 2 approach.



RAMEY KEMP & ASSOCIATES TRANSPORTATION ENGINEERS	Wheeler Tract Rolesville, NC	Recommended Lane Configurations Scale: Not to Scale | Figure 11

TRAFFIC IMPACT ANALYSIS

FOR

LOUISBURY ROAD ASSEMBLAGE

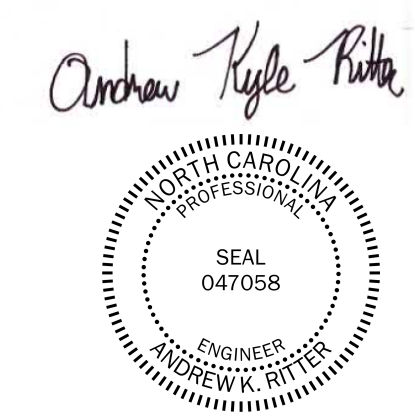
LOCATED

IN

RALEIGH, NC

Prepared For:
McAdams Company
2905 Meridian Parkway
Durham, NC 27713

Prepared By:
Ramey Kemp & Associates, Inc.
5808 Faringdon Place, Suite 100
Raleigh, NC 27609
License #C-0910



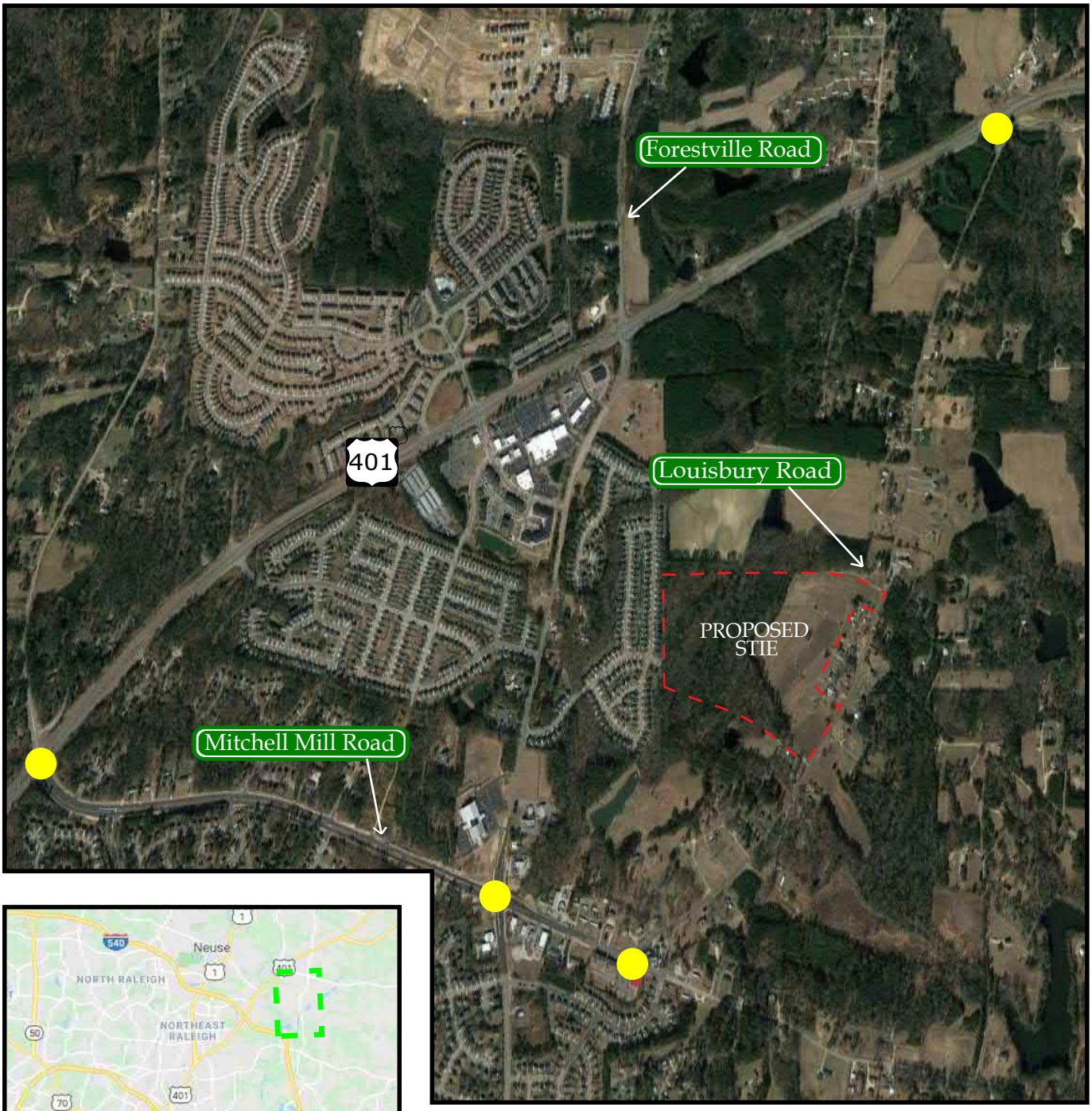
5/8/2020

May 2020

RKA Project No. 19418

Prepared By: DT

Reviewed By: DR



N

LEGEND

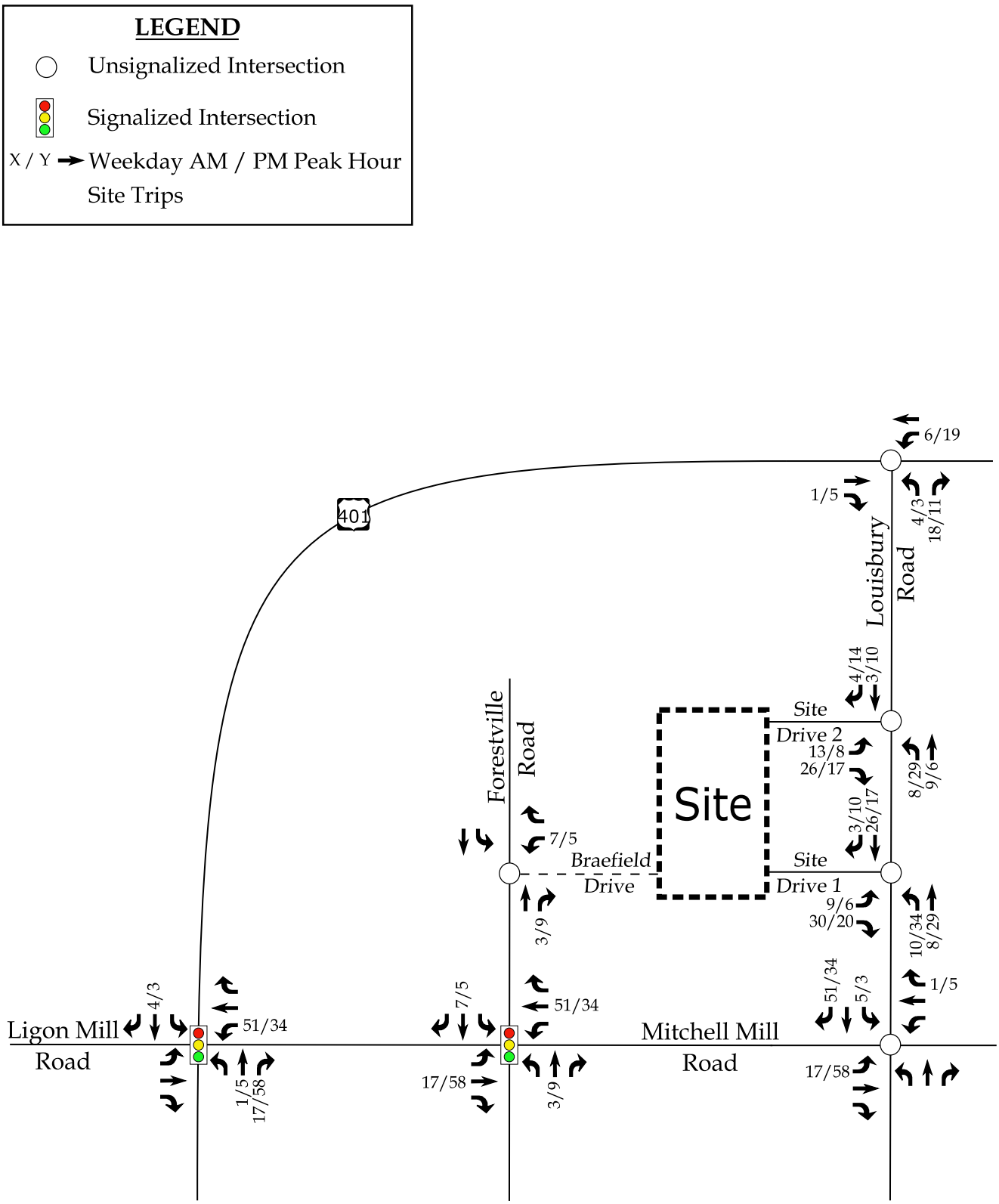
- Proposed Site Location
- Study Intersection
- Study Area

Moving forward.

RKA

RAMEY KEMP ASSOCIATES

Louisbury Road Assemblage Raleigh, NC	Site Location Map	
	Scale: Not to Scale	Figure 1



Moving forward. RKA RAMEY KEMP ASSOCIATES	Louisbury Road Assemblage Raleigh, NC	Site Trip Assignment Scale: Not to Scale | Figure 7

12. RECOMMENDATIONS

Based on the findings of this study, specific geometric improvements have been identified and are recommended to accommodate future traffic conditions. See a more detailed description of the recommended improvements below. Refer to Figure 9 for an illustration of the recommended lane configuration for the proposed development.

Recommended Improvements by Developer

Mitchell Mill Road and Louisbury Road

- Monitor for signalization after site is constructed.

US 401 and Louisbury Road

- Per NCDOT, extend northbound left turn lane to 175' of storage.
- Monitor for signalization after site is constructed.

Louisbury Road and Site Drive 1

- Provide site access via full movement intersection with one (1) ingress lane and one (1) egress lane.
- Per NCDOT, provide northbound left turn lane with 100' of storage.
- Provide stop control for eastbound approach.

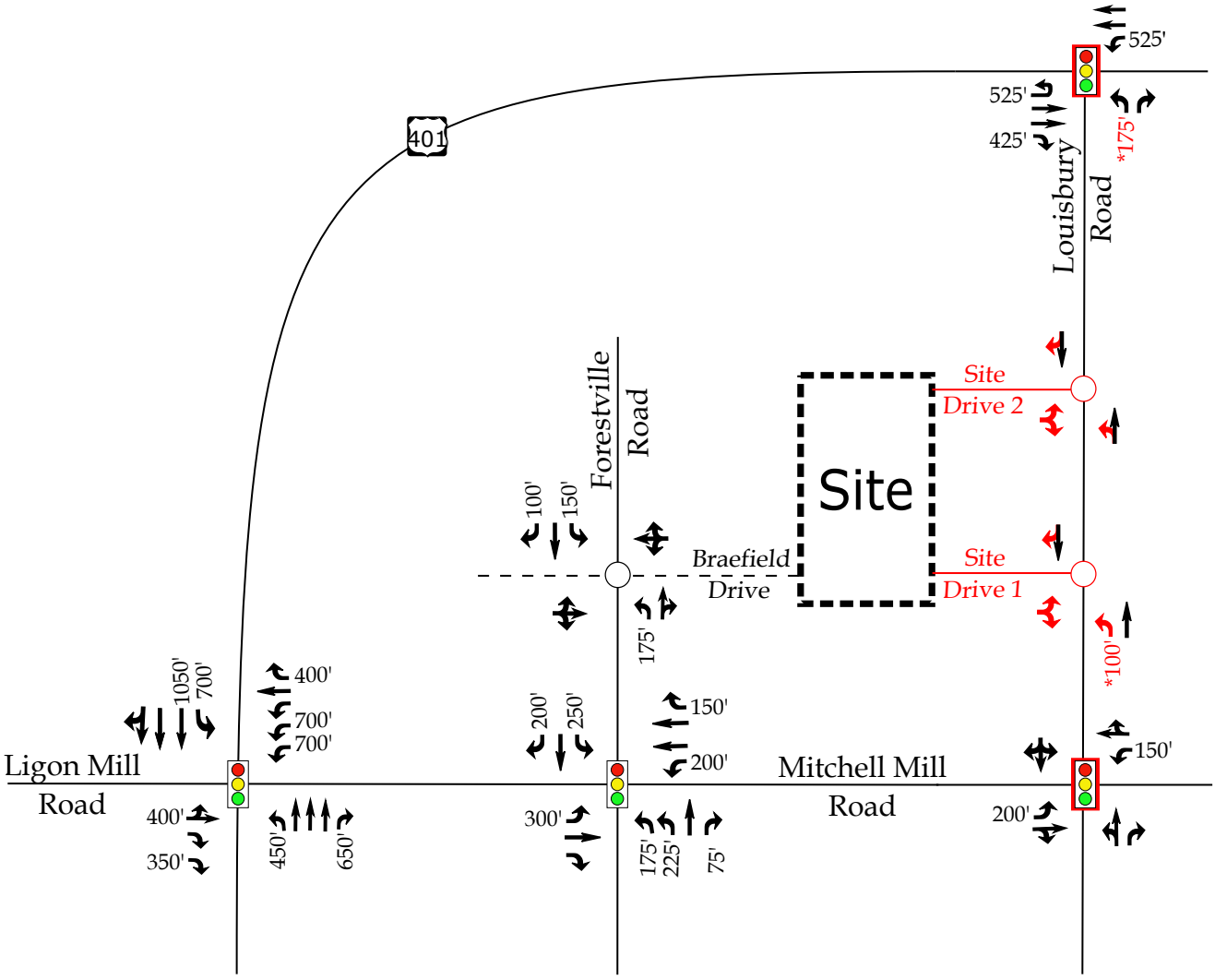
Louisbury Road and Site Drive 2

- Provide site access via full movement intersection with one (1) ingress lane and one (1) egress lane.
- Provide stop control for eastbound approach.

LEGEND

- Unsignalized Intersection
- Signalized Intersection
- Monitor for Signalization at Full Build-Out
- Existing Lane
- Improvement by Developer
- X' Storage (In Feet)

*Based on NCDOT Review



Moving forward.
RKA
RAMEY KEMP ASSOCIATES

Louisbury Road Assemblage
Raleigh, NC

Recommended Lane Configurations

Scale: Not to Scale | Figure 9

Kalas / Watkins Family Property
Traffic Impact Analysis

Rolesville Road, Rolesville, North Carolina

August 24, 2019

Prepared for:

Mitchell Mill Road Investors LLC
PO Box 3557
Cary, NC 27519

Prepared by:

Stantec Consulting Services Inc.

801 Jones Franklin Road
Suite 300
Raleigh, NC 27606

Sign-off Sheet

This document entitled Kalas / Watkins Family Property Traffic Impact Analysis was prepared by Stantec Consulting Services Inc. ("Stantec") for the account of Mitchell Mill Road Investors LLC (the "Client"). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Prepared by Maggie J Rogers

(signature)

Maggie Rogers

Reviewed by

(signature)

Matt Peach, PE, PTOE

Approved by Christa Greene

(signature)

Christa Greene, PE

NORTH CAROLINA PROFESSIONAL SEAL 039265 ENGINEER MATTHEW D. PEACH

8/24/2017

1.0 INTRODUCTION

The purpose of this report is to evaluate the transportation impacts of the proposed Kalas / Watkins Family Property development located on the west side of Rolesville Road just north of Mitchell Mill Road in Rolesville, NC. The project location is shown below in Figure 1.

Figure 1: Site Location

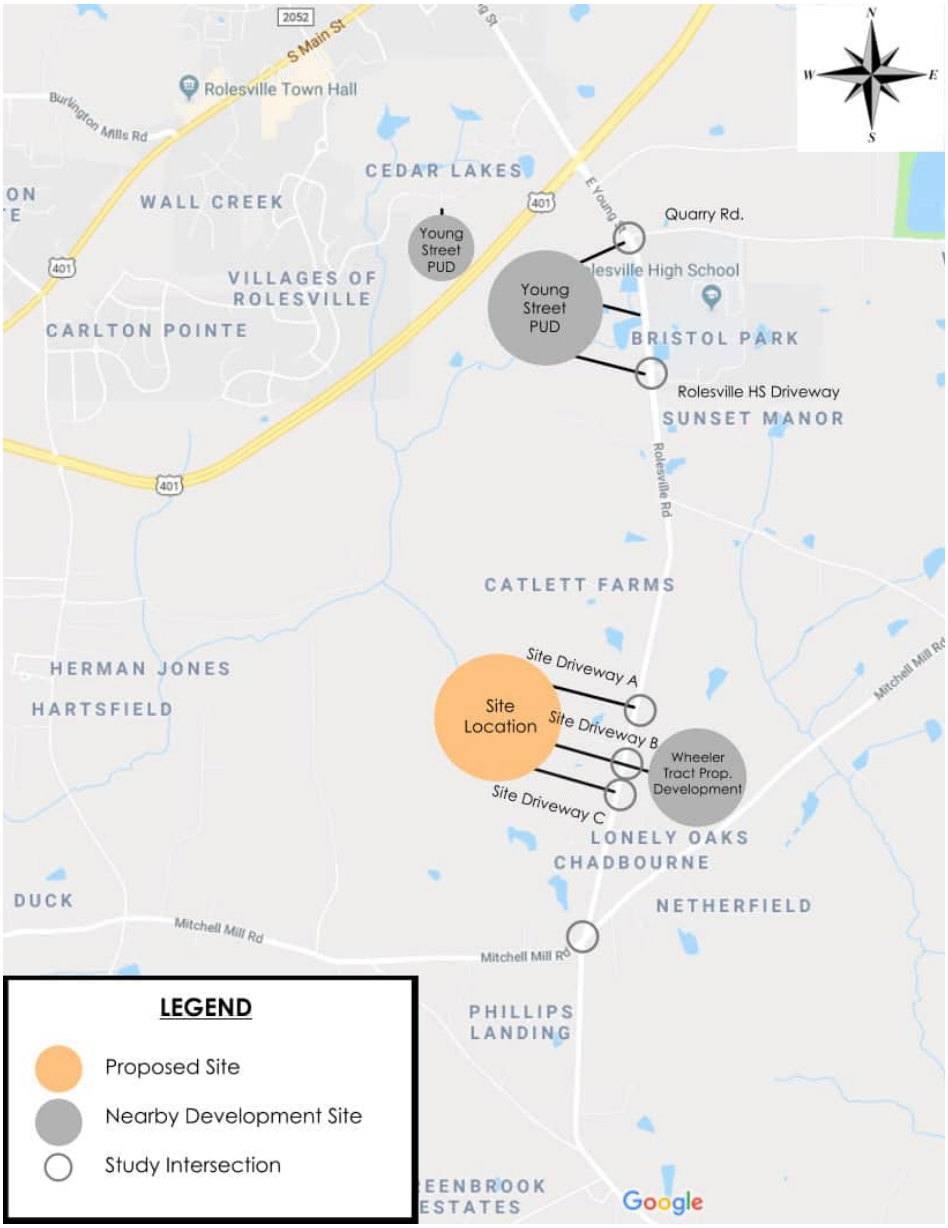
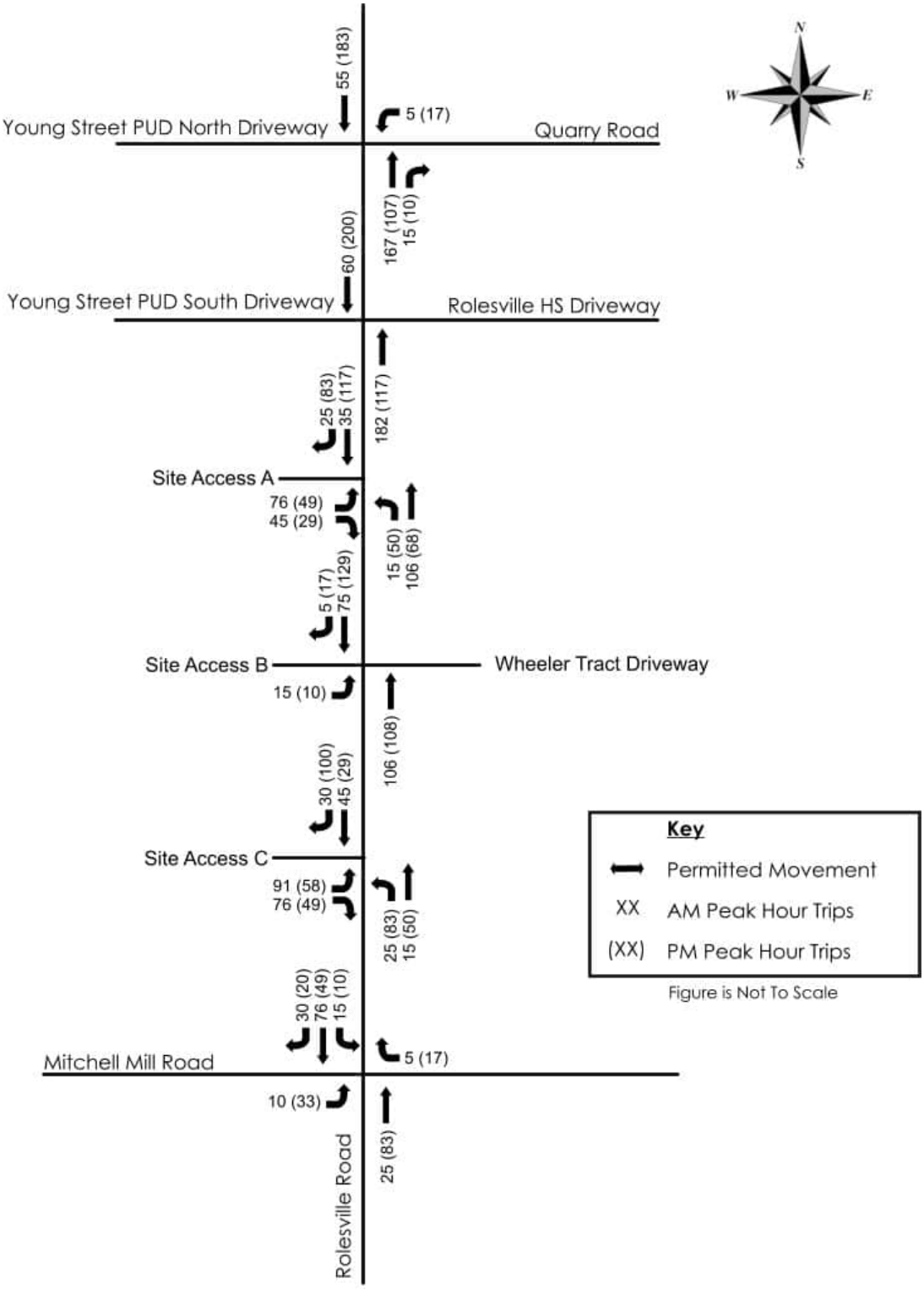


Figure 6: Site Trip Assignment



5.4 2025 BUILD WITH IMPROVEMENTS

Geometric improvements such as the installation of turn-lanes are recommended and therefore analyzed in this scenario. These items are listed below as well as in the recommendations section.

Rolesville Road at Site Driveway A

- Construct Driveway A as a full-movement access point onto Rolesville Road with one ingress lane and one egress lane.
- Construct an exclusive eastbound right-turn lane with 100 feet of full-width storage and appropriate taper on Driveway A.
- Construct an exclusive northbound left-turn lane with 100 feet of full-width storage and appropriate taper on Rolesville Road.
- Construct an exclusive southbound right-turn lane with 100 feet of full-width storage and appropriate taper on Rolesville Road.

Rolesville Road at Site Driveway B / Wheeler Tract Driveway

- Construct Driveway B as a full-movement access point onto Rolesville Road with one ingress lane and one egress lane.
- Construct an exclusive northbound left-turn lane with 100 feet of full-width storage and appropriate taper on Rolesville Road.
- Construct an exclusive southbound right-turn lane with 50 feet of full-width storage and appropriate taper on Rolesville Road.

Rolesville Road at Site Driveway C

- Construct Driveway C as a full-movement access point onto Rolesville Road with one ingress lane and one egress lane.
- Construct an exclusive eastbound right-turn lane with 100 feet of full-width storage and appropriate taper on Driveway C.
- Construct an exclusive northbound left-turn lane with 100 feet of full-width storage and appropriate taper on Rolesville Road.
- Construct an exclusive southbound right-turn lane with 100 feet of full-width storage and appropriate taper on Rolesville Road.

Accordingly, all study area intersections and approaches operate at acceptable levels of service with the following exceptions:

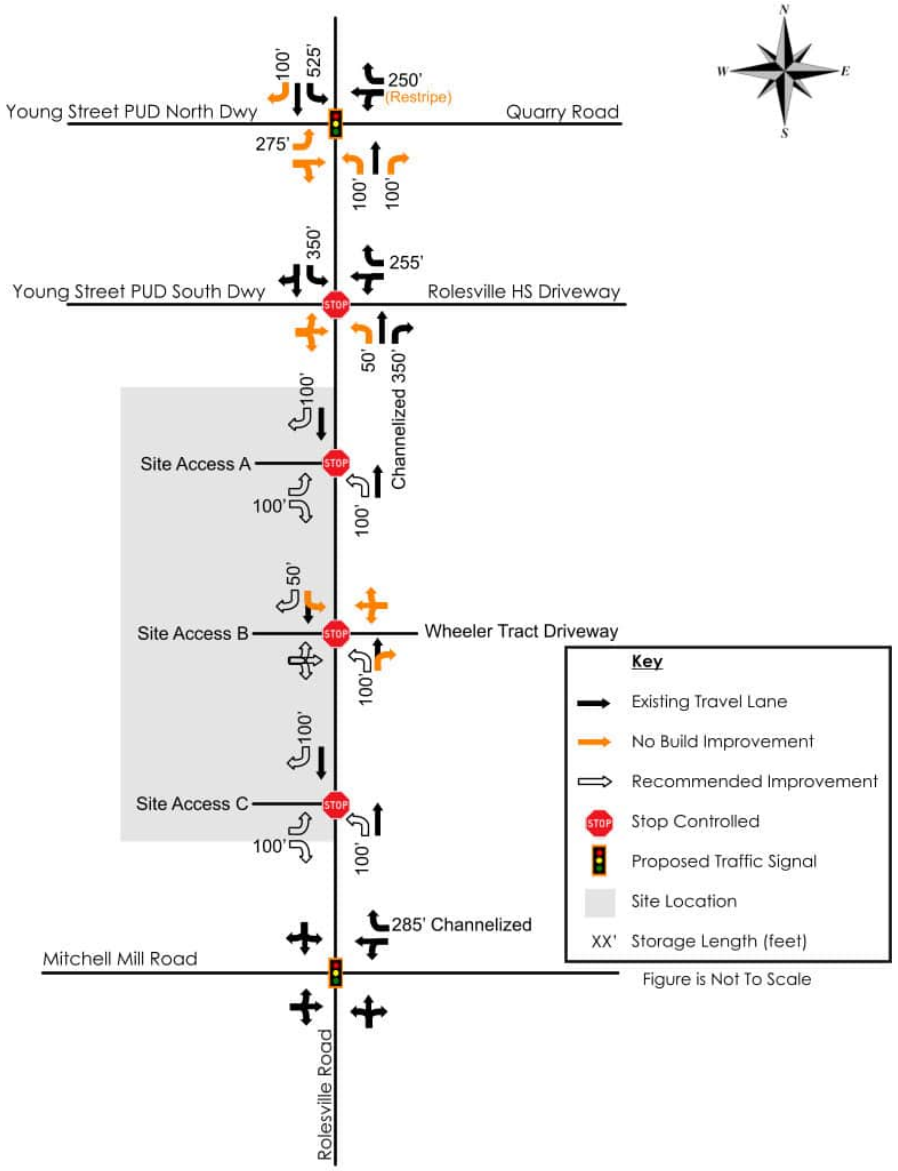
- The east and westbound approaches to the intersection of Rolesville Road at Rolesville High School Driveway / Young Street PUD Southern Driveway operates at LOS F in the AM peak hour. This causes high overall delays at the intersection. Furthermore, the eastbound approach operates at LOS F and westbound approach operates at LOS E in the PM peak hour.
- The east and westbound approaches at the intersection of Rolesville Road at Site Driveway B / Wheeler Tract Driveway operate at LOS E in the AM peak hour.

The east and westbound approaches to the intersection of Rolesville Road at Rolesville High School Driveway / Young Street PUD Southern Driveway performs unacceptably across analysis scenarios. These delays can be

attributed to both the Young Street PUD and High School traffic on the side street approaches. The Kalas / Watkins development is projected to only add through volumes to the intersection and are anticipated to have a minimal impact on overall delays at this intersection.

Delays on the eastbound approach of Site Driveway B at Rolesville Road can be attributed to high thru volumes on Rolesville Road during the AM peak hour. Traffic volumes using this approach are anticipated to be minor (i.e. 15 vehicles in the AM peak hour and 10 vehicles in the PM peak hour) and side street delays should dissipate after High School Traffic passes through the network. Table 8 lists the results of the capacity analysis under the 2025 build-improved traffic conditions. The recommended improvements are illustrated in figure 14.

Figure 14: Recommended Improvements



TRAFFIC IMPACT ANALYSIS

FOR

5109 MITCHELL MILL ROAD

LOCATED

IN

ROLESVILLE, NORTH CAROLINA

Prepared For:
Town of Rolesville
502 Southtown Circle
Rolesville, NC 27571

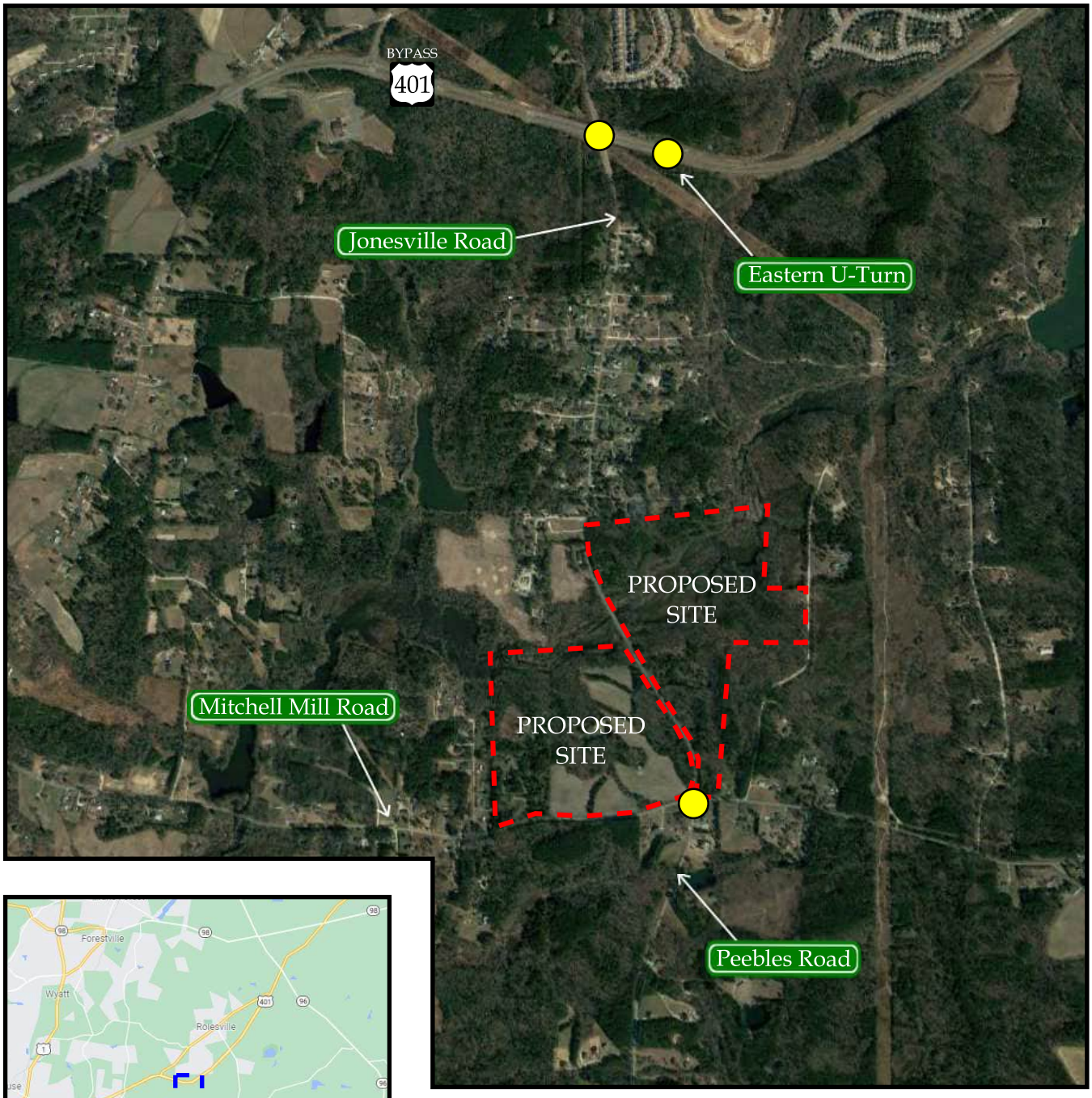
Prepared By:
Infrastructure Consulting Services, Inc.
dba
Ramey Kemp Associates
5808 Faringdon Place
Raleigh, NC 27609
License #F-1489

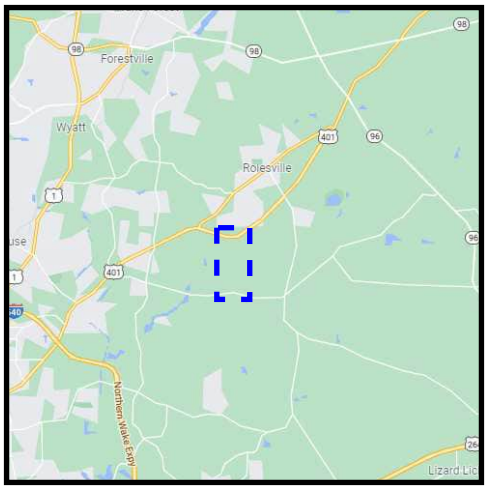
AUGUST 2022

RKA Project No. 20498 - 004

Prepared By: TF

Reviewed By: CH





N

LEGEND

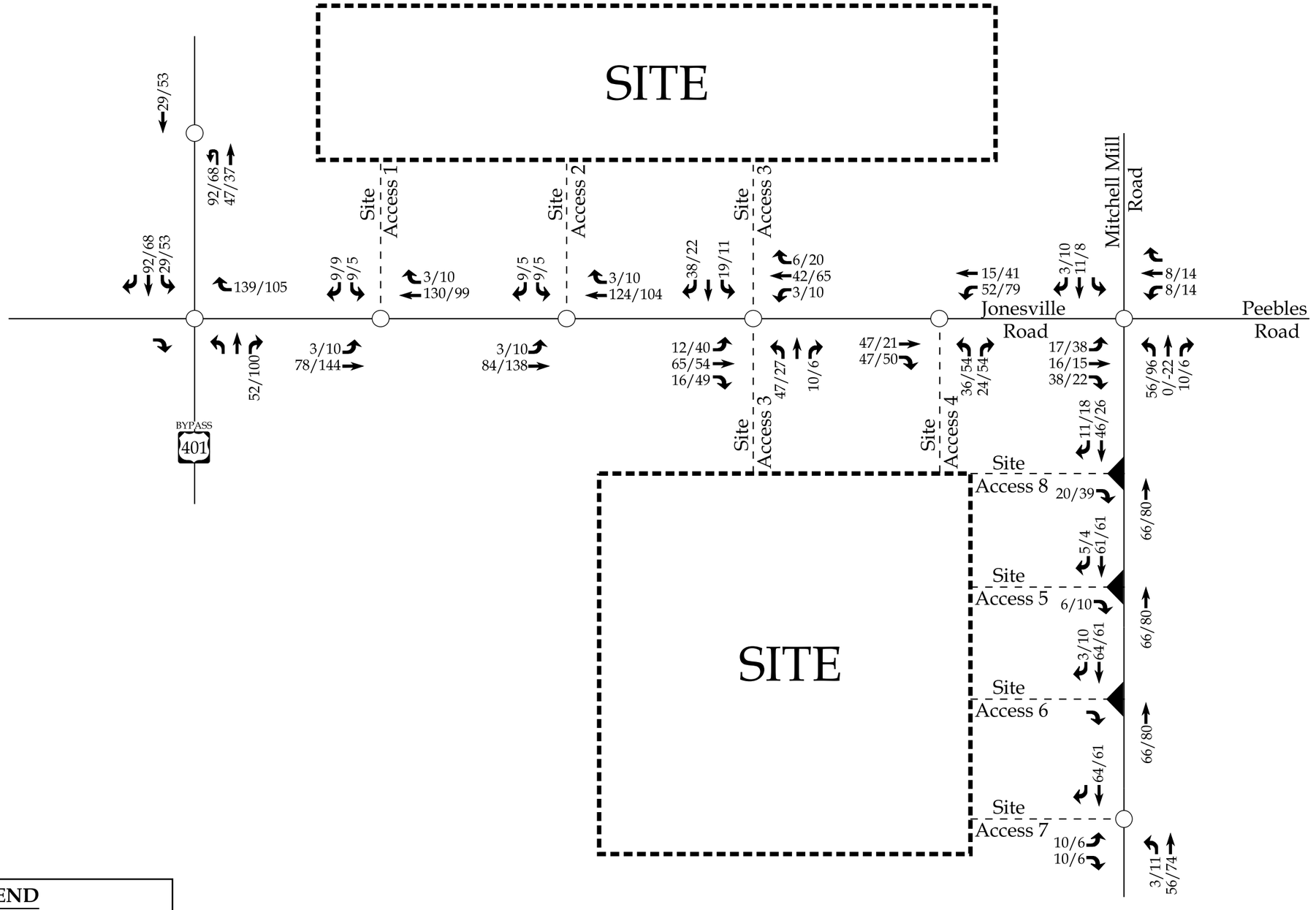
- Proposed Site Location
- Study Intersection
- Study Area

RAMEY KEMP ASSOCIATES

5109 Mitchell Mill Road
Rolesville, NC

Site Location Map

Scale: Not to Scale | Figure 1



LEGEND

- ○ Unsignalized Intersection
- ▲ Right-In/Right-Out Intersection
- X / Y → Weekday AM / PM Peak Hour Site Trips

RAMEY KEMP ASSOCIATES

5109 Mitchell Mill Road
Rolesville, NC

Total Site Trip Assignment

Scale: Not to Scale | Figure 12

9. RECOMMENDATIONS

Based on the findings of this study, specific geometric improvements have been identified and are recommended to accommodate future traffic conditions. See a more detailed description of the recommended improvements below. Refer to Figure 14 for an illustration of the recommended lane configurations for the proposed development.

Recommended Improvements by Developer

Required Frontage Improvements per Rolesville Community Transportation Plan

- Widen Jonesville Road along the site frontage between Site Access 1 and Mitchell Mill Road to this roadway's ultimate section (2-lane w/ TWLTL).
- Widen one-half section of Mitchell Mill Road along the site frontage to this roadway's ultimate section (4-lane median divided).

US 401 Bypass and Jonesville Road

- Conduct a full signal warrant analysis prior to full build-out of the proposed development and install a traffic signal if warranted and approved by the Town and NCDOT.

US 401 Bypass and Eastern U-Turn Location

- Conduct a full signal warrant analysis prior to full build-out of the proposed development and install a traffic signal if warranted and approved by the Town and NCDOT.

Mitchell Mill Road and Jonesville Road / Peebles Road

- Construct a southbound (Jonesville Road) left-turn lane with at least 100 feet of storage and appropriate decel and taper.
- Construct an eastbound (Mitchell Mill Road) left-turn lane with at least 100 feet of storage and appropriate decel and taper.
- Conduct a full signal warrant analysis prior to full build-out of the proposed development and install a traffic signal if warranted and approved by the Town and NCDOT.

Jonesville Road and Site Access 1

- Construct the westbound approach (Site Access 1) with one ingress lane and one egress lane.
- Provide stop-control for the westbound approach (Site Access 1).
- Construct a southbound (Jonesville Road) left-turn lane with at least 100 feet of storage and appropriate decel and taper.

Jonesville Road and Site Access 2

- Construct the westbound approach (Site Access 2) with one ingress lane and one egress lane.
- Provide stop-control for the westbound approach (Site Access 2).
- Construct a northbound (Jonesville Road) right-turn lane with at least 100 feet of storage and appropriate decel and taper.
- Construct a southbound (Jonesville Road) left-turn lane with at least 100 feet of storage and appropriate decel and taper.

Jonesville Road and Site Access 3

- Construct the eastbound and westbound approaches (Site Access 3) with one ingress lane and one egress lane.
- Provide stop-control for the eastbound and westbound approaches (Site Access 3).
- Construct a northbound (Jonesville Road) left-turn lane with at least 100 feet of storage and appropriate decel and taper.
- Construct a northbound (Jonesville Road) right-turn lane with at least 100 feet of storage and appropriate decel and taper.
- Construct a southbound (Jonesville Road) left-turn lane with at least 100 feet of storage and appropriate decel and taper.
- Construct a southbound (Jonesville Road) right-turn lane with at least 100 feet of storage and appropriate decel and taper.

Jonesville Road and Site Access 4

- Construct the eastbound approach (Site Access 4) with one ingress lane and one egress lane.
- Provide stop-control for the eastbound approach (Site Access 4).
- Construct a northbound (Jonesville Road) left-turn lane with at least 100 feet of storage and appropriate decel and taper.
- Construct a southbound (Jonesville Road) right-turn lane with at least 100 feet of storage and appropriate decel and taper.

Mitchell Mill Road and Site Access 5

- Construct the southbound approach (Site Access 5) with one ingress lane and one egress lane striped as an exclusive right-turn lane.
- Provide stop-control for the southbound approach (Site Access 5). This proposed intersection will be restricted to right-in/right-out operations.
- Construct an exclusive westbound (Mitchell Mill Road) right-turn lane with at least 100 feet of storage and appropriate decel and taper.

Mitchell Mill Road and Site Access 6

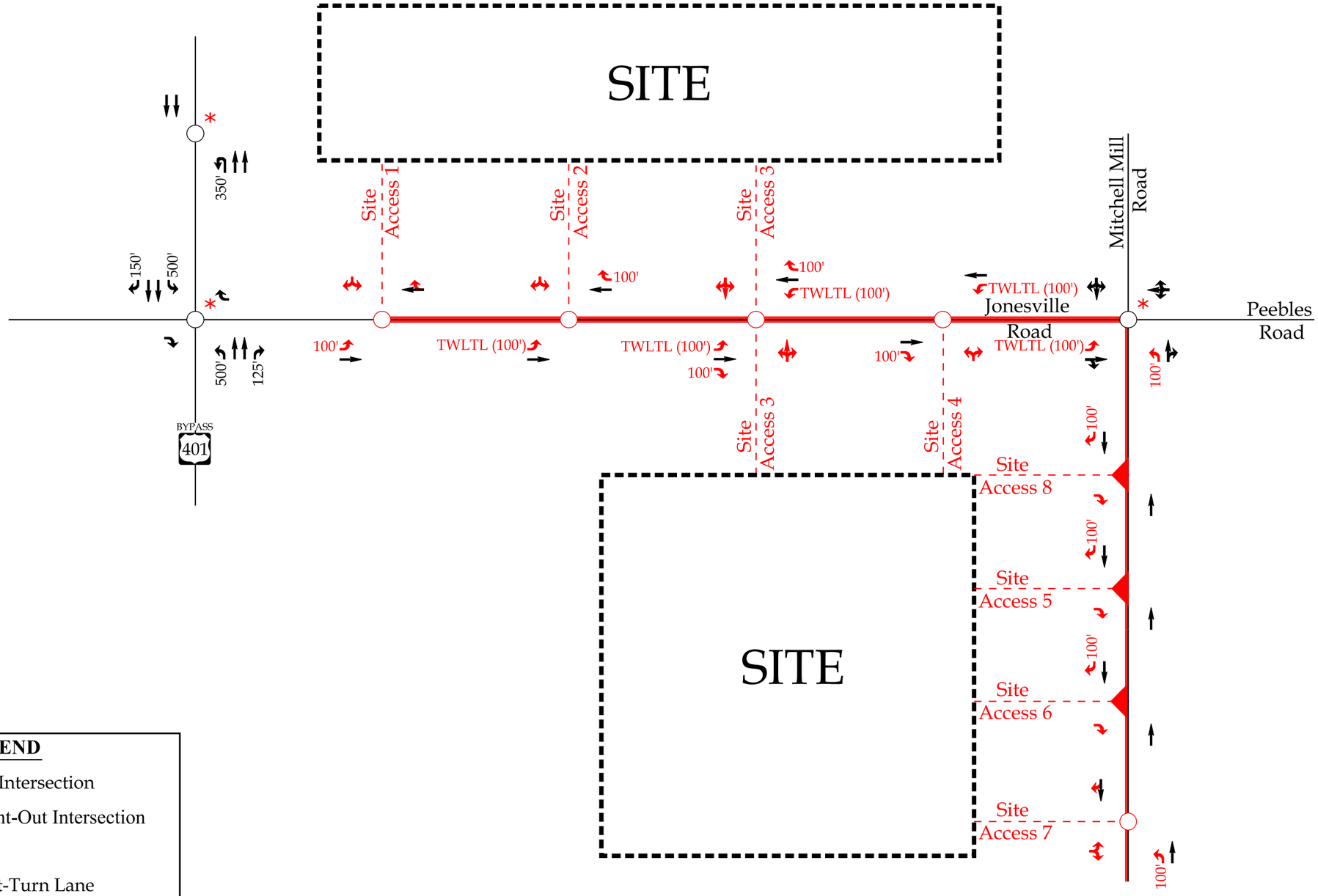
- Construct the southbound approach (Site Access 6) with one ingress lane and one egress lane striped as an exclusive right-turn lane.
- Provide stop-control for the southbound approach (Site Access 6). This proposed intersection will be restricted to right-in/right-out operations.
- Construct an exclusive westbound (Mitchell Mill Road) right-turn lane with at least 100 feet of storage and appropriate decel and taper.

Mitchell Mill Road and Site Access 7

- Construct the southbound approach (Site Access 7) with one ingress lane and one egress lane.
- Provide stop-control for the southbound approach (Site Access 7)
- Construct an exclusive eastbound (Mitchell Mill Road) left-turn lane with at least 100 feet of storage and appropriate decel and taper.

Mitchell Mill Road and Site Access 8

- Construct the southbound approach (Site Access 8) with one ingress lane and one egress lane striped as an exclusive right-turn lane.
- Provide stop-control for the southbound approach (Site Access 8). This proposed intersection will be restricted to right-in/right-out operations.
- Construct an exclusive westbound (Mitchell Mill Road) right-turn lane with at least 100 feet of storage and appropriate decel and taper.



LEGEND

- ○ Unsignalized Intersection
- ◢ Right-In / Right-Out Intersection
- → Existing Lane
- TWLTL Two-Way Left-Turn Lane
- * Developer Monitor for Signalization
- → Improvement by Developer
- — Frontage Widening Requirement**
- X' Storage (In Feet)

**Refer to Section 9 of the report for more information

RAMEY KEMP ASSOCIATES

5109 Mitchell Mill Road
Rolesville, NC

Recommended Lane Configurations

Scale: Not to Scale | Figure E-1

TRAFFIC IMPACT ANALYSIS

FOR

HILLS AT HARIS CREEK

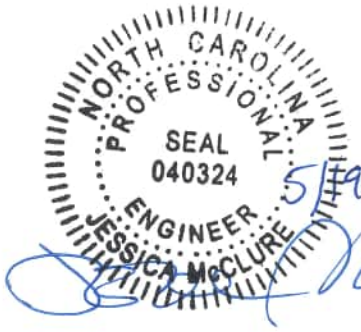
LOCATED

IN

ROLESVILLE, NORTH CAROLINA

Prepared For:
Town of Rolesville
502 Southtown Circle
Rolesville, NC 27571

Prepared By:
Ramey Kemp & Associates, Inc.
5808 Faringdon Place, Suite 100
Raleigh, NC 27609
License #C-0910

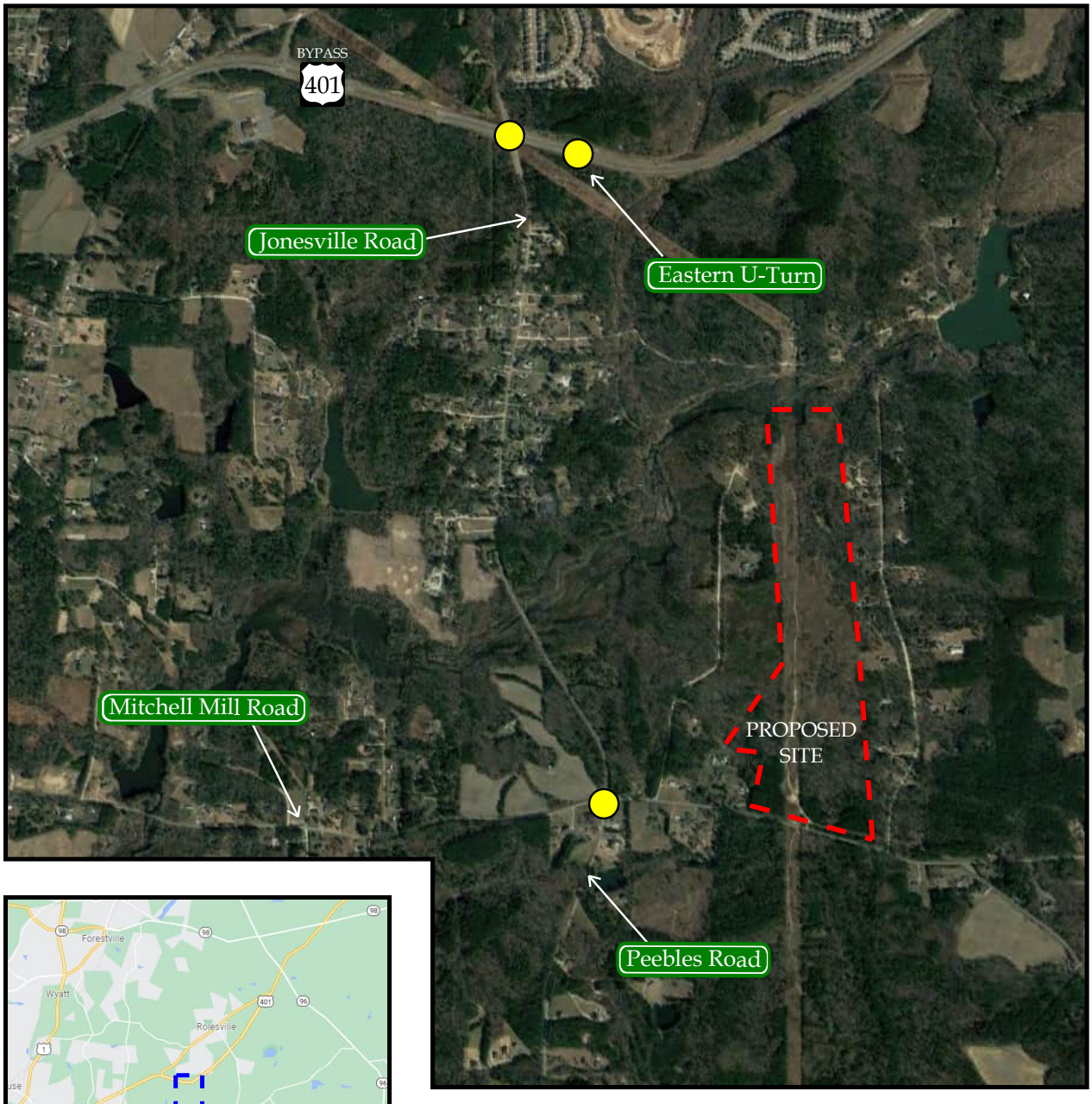


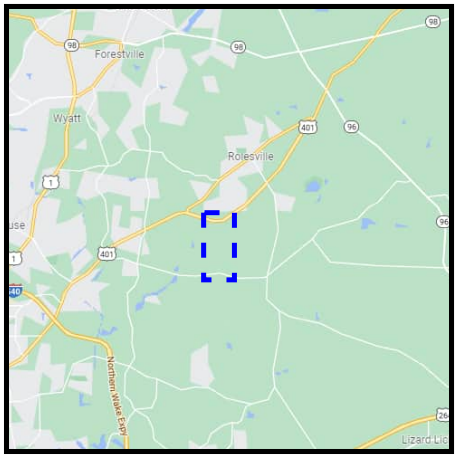
MAY 2022

RKA Project No. 20498 - 005

Prepared By: TF

Reviewed By: JMC





N

LEGEND

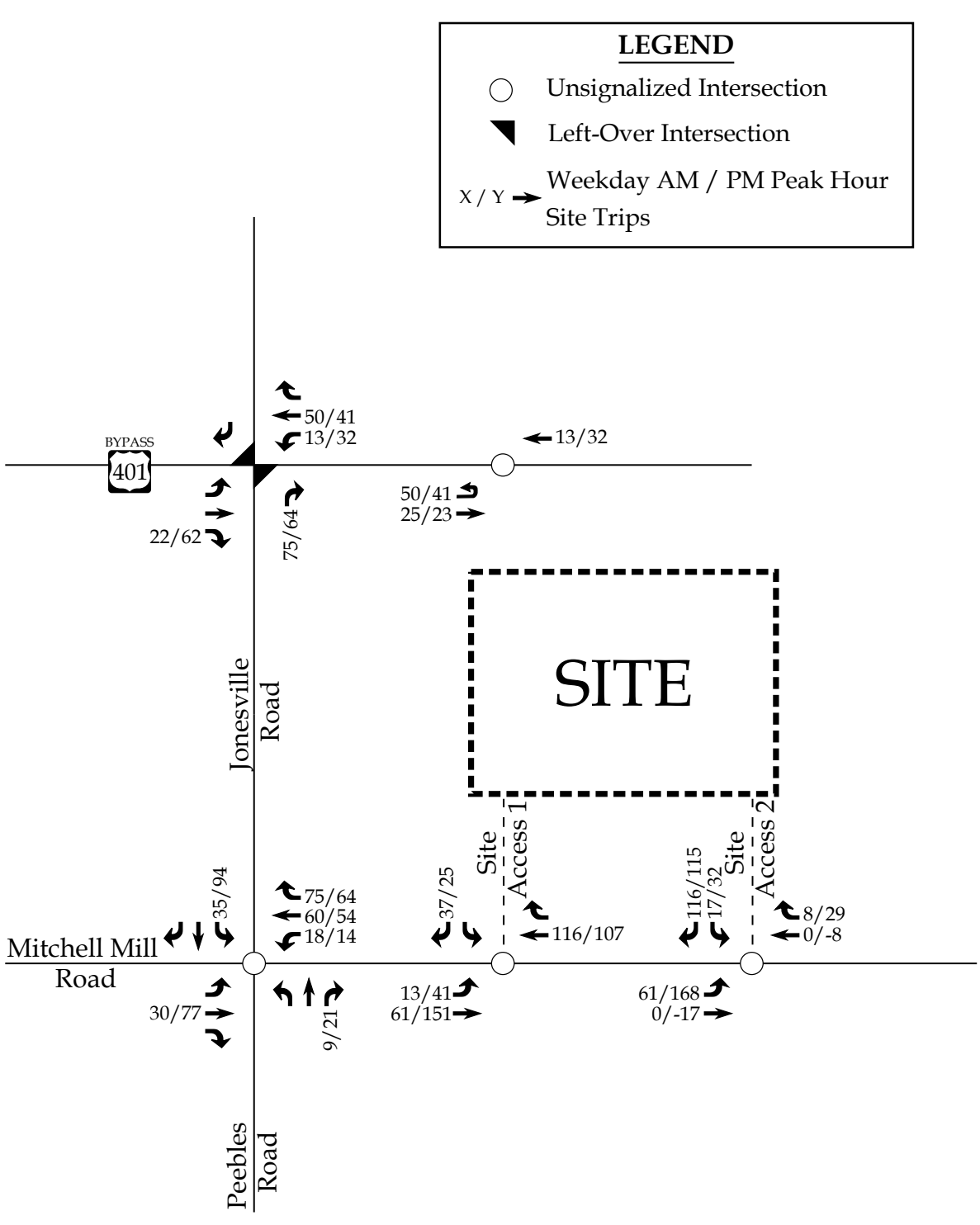
- Proposed Site Location
- Study Intersection
- Study Area

RAMEY KEMP ASSOCIATES

Hills at Harris Creek
Rolesville, NC

Site Location Map

Scale: Not to Scale | Figure 1



RKA RAMEY KEMP ASSOCIATES	Hills at Harris Creek Rolesville, NC	Total Site Trip Assignment	
		Scale: Not to Scale	Figure 12

9. RECOMMENDATIONS

Based on the findings of this study, specific geometric improvements have been identified and are recommended to accommodate future traffic conditions. See a more detailed description of the recommended improvements below. Refer to Figure 14 for an illustration of the recommended lane configurations for the proposed development.

Recommended Improvements by Developer

Required Frontage Improvements per Rolesville Community Transportation Plan

- Widen one-half section of Mitchell Mill Road along the site frontage to this roadway's ultimate section (4-lane median divided).

US 401 Bypass and Jonesville Road

- Conduct a full signal warrant analysis prior to full build-out of the proposed development and install a traffic signal if warranted and approved by the Town and NCDOT.

US 401 Bypass and Eastern U-Turn Location

- Conduct a full signal warrant analysis prior to full build-out of the proposed development and install a traffic signal if warranted and approved by the Town and NCDOT.

Mitchell Mill Road and Jonesville Road / Peebles Road

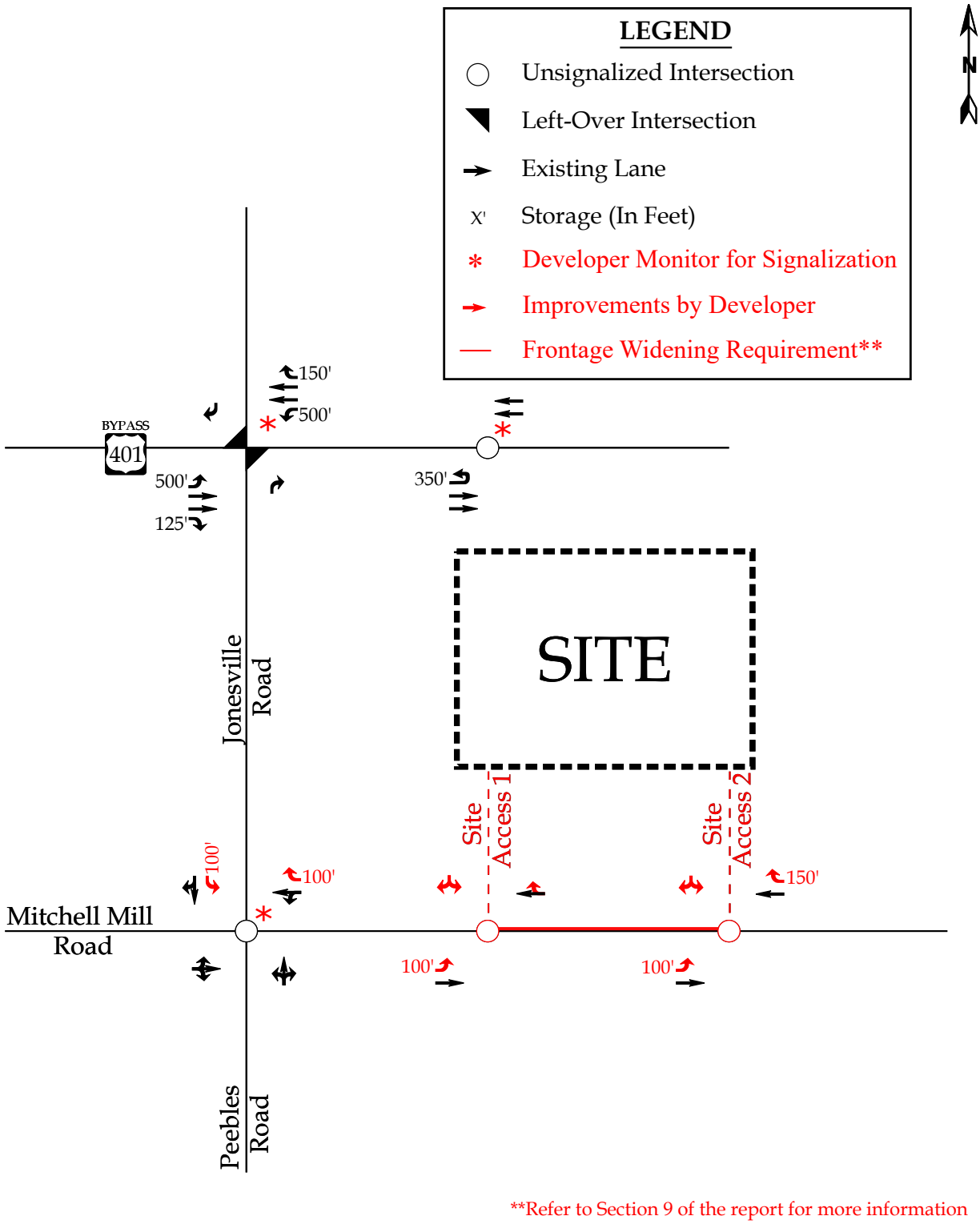
- Construct a southbound (Jonesville Road) left-turn lane with at least 100 feet of storage and appropriate decel and taper.
    - It should be noted that this improvement was also identified by the 5109 Mitchell Mill Road TIA.
- Construct a westbound (Mitchell Mill Road) right-turn lane with at least 100 feet of storage and appropriate decel and taper.
- Conduct a full signal warrant analysis prior to full build-out of the proposed development and install a traffic signal if warranted and approved by the Town and NCDOT.

Mitchell Mill Road and Site Access 1

- Construct the southbound approach (Site Access 1) with one ingress lane and one egress lane.
- Provide stop-control for the southbound approach (Site Access 1).
- Construct an eastbound (Mitchell Mill Road) left-turn lane with at least 100 feet of storage and appropriate decel and taper.

Mitchell Mill Road and Site Access 2

- Construct the southbound approach (Site Access 2) with one ingress lane and one egress lane.
- Provide stop-control for the southbound approach (Site Access 2).
- Construct an eastbound (Mitchell Mill Road) left-turn lane with at least 150 feet of storage and appropriate decel and taper.
- Construct a westbound (Mitchell Mill Road) right-turn lane with at least 100 feet of storage and appropriate decel and taper.



**Refer to Section 9 of the report for more information

RKA RAMEY KEMP ASSOCIATES	Hills at Harris Creek Rolesville, NC	Recommended Lane Configurations Scale: Not to Scale | Figure 14

APPENDIX D

CAPACITY ANALYSIS CALCULATIONS

US 401 BYPASS

&

JONESVILLE ROAD

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	590	80	0	0	0	0	0	136	0	86	0
Future Vol, veh/h	0	590	80	0	0	0	0	0	136	0	86	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	-	-	125	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	656	89	0	0	0	0	0	151	0	96	0

Major/Minor	Major1			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	328	-	656	-
Stage 1	-	-	-	-	-	-	-	0	-
Stage 2	-	-	-	-	-	-	-	656	-
Critical Hdwy	-	-	-	-	-	6.94	-	6.54	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	5.54	-
Follow-up Hdwy	-	-	-	-	-	3.32	-	4.02	-
Pot Cap-1 Maneuver	0	-	-	0	0	668	0	384	0
Stage 1	0	-	-	0	0	-	0	-	0
Stage 2	0	-	-	0	0	-	0	460	0
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	668	-	384	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	384	-
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	460	-

Approach	EB	NB	SB
HCM Control Delay, s	0	12	17.5
HCM LOS		B	C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	SBLn1
Capacity (veh/h)	668	-	-	384
HCM Lane V/C Ratio	0.226	-	-	0.249
HCM Control Delay (s)	12	-	-	17.5
HCM Lane LOS	B	-	-	C
HCM 95th %tile Q(veh)	0.9	-	-	1

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱						↱		↑	
Traffic Vol, veh/h	0	1220	59	0	0	0	0	0	125	0	37	0
Future Vol, veh/h	0	1220	59	0	0	0	0	0	125	0	37	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	-	-	125	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1356	66	0	0	0	0	0	139	0	41	0

Major/Minor	Major1			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	678	-	1356	-
Stage 1	-	-	-	-	-	-	-	0	-
Stage 2	-	-	-	-	-	-	-	1356	-
Critical Hdwy	-	-	-	-	-	6.94	-	6.54	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	5.54	-
Follow-up Hdwy	-	-	-	-	-	3.32	-	4.02	-
Pot Cap-1 Maneuver	0	-	-	0	0	395	0	148	0
Stage 1	0	-	-	0	0	-	0	-	0
Stage 2	0	-	-	0	0	-	0	216	0
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	395	-	148	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	148	-
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	216	-

Approach	EB	NB	SB
HCM Control Delay, s	0	19	38.4
HCM LOS		C	E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	SBLn1
Capacity (veh/h)	395	-	-	148
HCM Lane V/C Ratio	0.352	-	-	0.278
HCM Control Delay (s)	19	-	-	38.4
HCM Lane LOS	C	-	-	E
HCM 95th %tile Q(veh)	1.6	-	-	1.1

Intersection	
Int Delay, s/veh	8.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	812	154	0	0	0	0	0	350	0	128	0
Future Vol, veh/h	0	812	154	0	0	0	0	0	350	0	128	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	-	-	125	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	902	171	0	0	0	0	0	389	0	142	0

Major/Minor	Major1			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	451	-	902	-
Stage 1	-	-	-	-	-	-	-	0	-
Stage 2	-	-	-	-	-	-	-	902	-
Critical Hdwy	-	-	-	-	-	6.94	-	6.54	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	5.54	-
Follow-up Hdwy	-	-	-	-	-	3.32	-	4.02	-
Pot Cap-1 Maneuver	0	-	-	0	0	556	0	276	0
Stage 1	0	-	-	0	0	-	0	-	0
Stage 2	0	-	-	0	0	-	0	355	0
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	556	-	276	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	276	-
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	355	-

Approach	EB	NB	SB
HCM Control Delay, s	0	25.2	31.1
HCM LOS		D	D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	SBLn1
Capacity (veh/h)	556	-	-	276
HCM Lane V/C Ratio	0.699	-	-	0.515
HCM Control Delay (s)	25.2	-	-	31.1
HCM Lane LOS	D	-	-	D
HCM 95th %tile Q(veh)	5.5	-	-	2.7

Intersection	
Int Delay, s/veh	52.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1708	221	0	0	0	0	0	294	0	122	0
Future Vol, veh/h	0	1708	221	0	0	0	0	0	294	0	122	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	-	-	125	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1898	246	0	0	0	0	0	327	0	136	0

Major/Minor	Major1			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	949	-	1898	-
Stage 1	-	-	-	-	-	-	-	0	-
Stage 2	-	-	-	-	-	-	-	1898	-
Critical Hdwy	-	-	-	-	-	6.94	-	6.54	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	5.54	-
Follow-up Hdwy	-	-	-	-	-	3.32	-	4.02	-
Pot Cap-1 Maneuver	0	-	-	0	0	~ 261	0	~ 69	0
Stage 1	0	-	-	0	0	-	0	-	0
Stage 2	0	-	-	0	0	-	0	~ 116	0
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	~ 261	-	~ 69	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	~ 69	-
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	~ 116	-

Approach	EB	NB	SB
HCM Control Delay, s	0	180.2	$ 579.5
HCM LOS		F	F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	SBLn1
Capacity (veh/h)	261	-	-	69
HCM Lane V/C Ratio	1.252	-	-	1.965
HCM Control Delay (s)	180.2	-	-	$ 579.5
HCM Lane LOS	F	-	-	F
HCM 95th %tile Q(veh)	15.9	-	-	12.4

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	10.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	812	161	0	0	0	0	0	380	0	131	0
Future Vol, veh/h	0	812	161	0	0	0	0	0	380	0	131	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	-	-	125	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	902	179	0	0	0	0	0	422	0	146	0

Major/Minor	Major1			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	451	-	902	-
Stage 1	-	-	-	-	-	-	-	0	-
Stage 2	-	-	-	-	-	-	-	902	-
Critical Hdwy	-	-	-	-	-	6.94	-	6.54	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	5.54	-
Follow-up Hdwy	-	-	-	-	-	3.32	-	4.02	-
Pot Cap-1 Maneuver	0	-	-	0	0	556	0	276	0
Stage 1	0	-	-	0	0	-	0	-	0
Stage 2	0	-	-	0	0	-	0	355	0
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	556	-	276	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	276	-
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	355	-

Approach	EB	NB	SB
HCM Control Delay, s	0	29.1	31.7
HCM LOS		D	D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	SBLn1
Capacity (veh/h)	556	-	-	276
HCM Lane V/C Ratio	0.759	-	-	0.527
HCM Control Delay (s)	29.1	-	-	31.7
HCM Lane LOS	D	-	-	D
HCM 95th %tile Q(veh)	6.7	-	-	2.9

Intersection	
Int Delay, s/veh	64.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱						↱		↑	
Traffic Vol, veh/h	0	1708	242	0	0	0	0	0	314	0	133	0
Future Vol, veh/h	0	1708	242	0	0	0	0	0	314	0	133	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	-	-	125	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1898	269	0	0	0	0	0	349	0	148	0

Major/Minor	Major1			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	949	-	1898	-
Stage 1	-	-	-	-	-	-	-	0	-
Stage 2	-	-	-	-	-	-	-	1898	-
Critical Hdwy	-	-	-	-	-	6.94	-	6.54	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	5.54	-
Follow-up Hdwy	-	-	-	-	-	3.32	-	4.02	-
Pot Cap-1 Maneuver	0	-	-	0	0	~ 261	0	~ 69	0
Stage 1	0	-	-	0	0	-	0	-	0
Stage 2	0	-	-	0	0	-	0	~ 116	0
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	~ 261	-	~ 69	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	~ 69	-
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	~ 116	-

Approach	EB	NB	SB
HCM Control Delay, s	0	213	$ 655
HCM LOS		F	F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	SBLn1
Capacity (veh/h)	261	-	-	69
HCM Lane V/C Ratio	1.337	-	-	2.142
HCM Control Delay (s)	213	-	-	$ 655
HCM Lane LOS	F	-	-	F
HCM 95th %tile Q(veh)	18.2	-	-	13.8

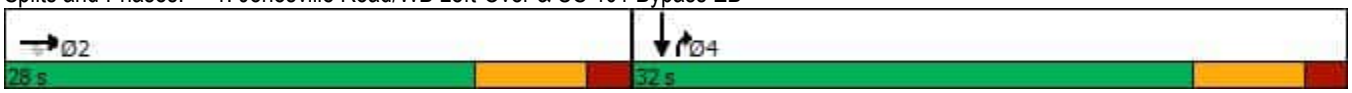
Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	812	161	0	0	0	0	0	380	0	131	0
Future Volume (vph)	0	812	161	0	0	0	0	0	380	0	131	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		125	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		1	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850						0.865			
Flt Protected												
Satd. Flow (prot)	0	3539	1583	0	0	0	0	0	1611	0	1863	0
Flt Permitted												
Satd. Flow (perm)	0	3539	1583	0	0	0	0	0	1611	0	1863	0
Right Turn on Red			No			No			No	No		No
Satd. Flow (RTOR)												
Link Speed (mph)		55			55			35			45	
Link Distance (ft)		278			727			1295			275	
Travel Time (s)		3.4			9.0			25.2			4.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	902	179	0	0	0	0	0	422	0	146	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	902	179	0	0	0	0	0	422	0	146	0
Turn Type		NA	Perm						Prot		NA	
Protected Phases		2							4		4	
Permitted Phases			2									
Detector Phase		2	2						4		4	
Switch Phase												
Minimum Initial (s)		14.0	14.0						7.0		7.0	
Minimum Split (s)		21.0	21.0						14.0		14.0	
Total Split (s)		28.0	28.0						32.0		32.0	
Total Split (%)		46.7%	46.7%						53.3%		53.3%	
Maximum Green (s)		21.0	21.0						25.0		25.0	
Yellow Time (s)		5.0	5.0						5.0		5.0	
All-Red Time (s)		2.0	2.0						2.0		2.0	
Lost Time Adjust (s)		-2.0	-2.0						-2.0		-2.0	
Total Lost Time (s)		5.0	5.0						5.0		5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0	3.0						3.0		3.0	
Recall Mode		None	None						Min		Min	
Act Effct Green (s)		20.8	20.8						20.4		20.4	
Actuated g/C Ratio		0.40	0.40						0.40		0.40	
v/c Ratio		0.63	0.28						0.66		0.20	
Control Delay		15.5	13.2						18.6		11.0	
Queue Delay		0.0	0.0						0.0		0.0	
Total Delay		15.5	13.2						18.6		11.0	
LOS		B	B						B		B	
Approach Delay		15.1						18.6			11.0	
Approach LOS		B						B			B	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		114	36						107		30	
Queue Length 95th (ft)		194	84						187		59	
Internal Link Dist (ft)		198			647			1215			195	
Turn Bay Length (ft)			125									
Base Capacity (vph)		1629	728						870		1006	
Starvation Cap Reductn		0	0						0		0	
Spillback Cap Reductn		0	0						0		0	
Storage Cap Reductn		0	0						0		0	
Reduced v/c Ratio		0.55	0.25						0.49		0.15	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 51.4			
Natural Cycle: 40			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 15.6		Intersection LOS: B	
Intersection Capacity Utilization 58.7%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Jonesville Road/WB Left-Over & US 401 Bypass EB



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1708	242	0	0	0	0	0	314	0	133	0
Future Volume (vph)	0	1708	242	0	0	0	0	0	314	0	133	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		125	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		1	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850						0.865			
Flt Protected												
Satd. Flow (prot)	0	3539	1583	0	0	0	0	0	1611	0	1863	0
Flt Permitted												
Satd. Flow (perm)	0	3539	1583	0	0	0	0	0	1611	0	1863	0
Right Turn on Red			No			No			No	No		No
Satd. Flow (RTOR)												
Link Speed (mph)		55			55			35			45	
Link Distance (ft)		278			727			1295			275	
Travel Time (s)		3.4			9.0			25.2			4.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1898	269	0	0	0	0	0	349	0	148	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1898	269	0	0	0	0	0	349	0	148	0
Turn Type		NA	Perm						Prot		NA	
Protected Phases		2							4		4	
Permitted Phases			2									
Detector Phase		2	2						4		4	
Switch Phase												
Minimum Initial (s)		14.0	14.0						7.0		7.0	
Minimum Split (s)		21.0	21.0						14.0		14.0	
Total Split (s)		40.0	40.0						20.0		20.0	
Total Split (%)		66.7%	66.7%						33.3%		33.3%	
Maximum Green (s)		33.0	33.0						13.0		13.0	
Yellow Time (s)		5.0	5.0						5.0		5.0	
All-Red Time (s)		2.0	2.0						2.0		2.0	
Lost Time Adjust (s)		-2.0	-2.0						-2.0		-2.0	
Total Lost Time (s)		5.0	5.0						5.0		5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0	3.0						3.0		3.0	
Recall Mode		None	None						Min		Min	
Act Effct Green (s)		35.0	35.0						15.0		15.0	
Actuated g/C Ratio		0.58	0.58						0.25		0.25	
v/c Ratio		0.92	0.29						0.87		0.32	
Control Delay		20.8	7.3						46.6		20.6	
Queue Delay		0.0	0.0						0.0		0.0	
Total Delay		20.8	7.3						46.6		20.6	
LOS		C	A						D		C	
Approach Delay		19.1						46.6			20.6	
Approach LOS		B						D			C	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		285	43						121		44	
Queue Length 95th (ft)		#481	78						#254		87	
Internal Link Dist (ft)		198			647			1215			195	
Turn Bay Length (ft)			125									
Base Capacity (vph)		2064	923						402		465	
Starvation Cap Reductn		0	0						0		0	
Spillback Cap Reductn		0	0						0		0	
Storage Cap Reductn		0	0						0		0	
Reduced v/c Ratio		0.92	0.29						0.87		0.32	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.92			
Intersection Signal Delay: 22.8		Intersection LOS: C	
Intersection Capacity Utilization 75.0%		ICU Level of Service D	
Analysis Period (min) 15			

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Jonesville Road/WB Left-Over & US 401 Bypass EB

Intersection	
Int Delay, s/veh	6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	1352	185	0	36	0	0	0	225
Future Vol, veh/h	0	0	0	0	1352	185	0	36	0	0	0	225
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	150	-	-	-	-	-	0
Veh in Median Storage, #	-	1	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	1502	206	0	40	0	0	0	250

Major/Minor	Major2			Minor1			Minor2			
Conflicting Flow All	-	-	0	-	1708	-	-	-	751	
Stage 1	-	-	-	-	0	-	-	-	-	
Stage 2	-	-	-	-	1708	-	-	-	-	
Critical Hdwy	-	-	-	-	6.54	-	-	-	6.94	
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	-	-	-	-	5.54	-	-	-	-	
Follow-up Hdwy	-	-	-	-	4.02	-	-	-	3.32	
Pot Cap-1 Maneuver	0	-	-	0	90	0	0	0	353	
Stage 1	0	-	-	0	-	0	0	0	-	
Stage 2	0	-	-	0	145	0	0	0	-	
Platoon blocked, %		-	-							
Mov Cap-1 Maneuver	-	-	-	-	90	-	-	-	353	
Mov Cap-2 Maneuver	-	-	-	-	90	-	-	-	-	
Stage 1	-	-	-	-	-	-	-	-	-	
Stage 2	-	-	-	-	145	-	-	-	-	

Approach	WB	NB	SB
HCM Control Delay, s	0	73.7	36.5
HCM LOS		F	E

Minor Lane/Major Mvmt	NBLn1	WBT	WBR	SBLn1
Capacity (veh/h)	90	-	-	353
HCM Lane V/C Ratio	0.444	-	-	0.708
HCM Control Delay (s)	73.7	-	-	36.5
HCM Lane LOS	F	-	-	E
HCM 95th %tile Q(veh)	1.9	-	-	5.2

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	555	74	0	116	0	0	0	114
Future Vol, veh/h	0	0	0	0	555	74	0	116	0	0	0	114
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	150	-	-	-	-	-	0
Veh in Median Storage, #	-	1	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	617	82	0	129	0	0	0	127

Major/Minor	Major2			Minor1			Minor2			
Conflicting Flow All	-	-	0	-	699	-	-	-	309	
Stage 1	-	-	-	-	0	-	-	-	-	
Stage 2	-	-	-	-	699	-	-	-	-	
Critical Hdwy	-	-	-	-	6.54	-	-	-	6.94	
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	-	-	-	-	5.54	-	-	-	-	
Follow-up Hdwy	-	-	-	-	4.02	-	-	-	3.32	
Pot Cap-1 Maneuver	0	-	-	0	362	0	0	0	687	
Stage 1	0	-	-	0	-	0	0	0	-	
Stage 2	0	-	-	0	440	0	0	0	-	
Platoon blocked, %		-	-							
Mov Cap-1 Maneuver	-	-	-	-	362	-	-	-	687	
Mov Cap-2 Maneuver	-	-	-	-	362	-	-	-	-	
Stage 1	-	-	-	-	-	-	-	-	-	
Stage 2	-	-	-	-	440	-	-	-	-	

Approach	WB	NB	SB
HCM Control Delay, s	0	20.3	11.4
HCM LOS		C	B

Minor Lane/Major Mvmt	NBLn1	WBT	WBR	SBLn1
Capacity (veh/h)	362	-	-	687
HCM Lane V/C Ratio	0.356	-	-	0.184
HCM Control Delay (s)	20.3	-	-	11.4
HCM Lane LOS	C	-	-	B
HCM 95th %tile Q(veh)	1.6	-	-	0.7

Intersection	
Int Delay, s/veh	15.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	1797	185	0	36	0	0	0	225
Future Vol, veh/h	0	0	0	0	1797	185	0	36	0	0	0	225
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	150	-	-	-	-	-	0
Veh in Median Storage, #	-	1	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	1997	206	0	40	0	0	0	250

Major/Minor	Major2			Minor1			Minor2			
Conflicting Flow All	-	-	0	-	2203	-	-	-	999	
Stage 1	-	-	-	-	0	-	-	-	-	
Stage 2	-	-	-	-	2203	-	-	-	-	
Critical Hdwy	-	-	-	-	6.54	-	-	-	6.94	
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	-	-	-	-	5.54	-	-	-	-	
Follow-up Hdwy	-	-	-	-	4.02	-	-	-	3.32	
Pot Cap-1 Maneuver	0	-	-	0	44	0	0	0	~ 242	
Stage 1	0	-	-	0	-	0	0	0	-	
Stage 2	0	-	-	0	81	0	0	0	-	
Platoon blocked, %		-	-							
Mov Cap-1 Maneuver	-	-	-	-	44	-	-	-	~ 242	
Mov Cap-2 Maneuver	-	-	-	-	44	-	-	-	-	
Stage 1	-	-	-	-	-	-	-	-	-	
Stage 2	-	-	-	-	81	-	-	-	-	

Approach	WB	NB	SB
HCM Control Delay, s	0	250.5	110.8
HCM LOS		F	F

Minor Lane/Major Mvmt	NBLn1	WBT	WBR	SBLn1
Capacity (veh/h)	44	-	-	242
HCM Lane V/C Ratio	0.909	-	-	1.033
HCM Control Delay (s)	250.5	-	-	110.8
HCM Lane LOS	F	-	-	F
HCM 95th %tile Q(veh)	3.6	-	-	10.2

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	5.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	894	74	0	116	0	0	0	114
Future Vol, veh/h	0	0	0	0	894	74	0	116	0	0	0	114
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	150	-	-	-	-	-	0
Veh in Median Storage, #	-	1	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	993	82	0	129	0	0	0	127

Major/Minor	Major2			Minor1			Minor2			
Conflicting Flow All	-	-	0	-	1075	-	-	-	497	
Stage 1	-	-	-	-	0	-	-	-	-	
Stage 2	-	-	-	-	1075	-	-	-	-	
Critical Hdwy	-	-	-	-	6.54	-	-	-	6.94	
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	-	-	-	-	5.54	-	-	-	-	
Follow-up Hdwy	-	-	-	-	4.02	-	-	-	3.32	
Pot Cap-1 Maneuver	0	-	-	0	218	0	0	0	519	
Stage 1	0	-	-	0	-	0	0	0	-	
Stage 2	0	-	-	0	294	0	0	0	-	
Platoon blocked, %		-	-							
Mov Cap-1 Maneuver	-	-	-	-	218	-	-	-	519	
Mov Cap-2 Maneuver	-	-	-	-	218	-	-	-	-	
Stage 1	-	-	-	-	-	-	-	-	-	
Stage 2	-	-	-	-	294	-	-	-	-	

Approach	WB	NB	SB
HCM Control Delay, s	0	42.9	14.2
HCM LOS		E	B

Minor Lane/Major Mvmt	NBLn1	WBT	WBR	SBLn1
Capacity (veh/h)	218	-	-	519
HCM Lane V/C Ratio	0.591	-	-	0.244
HCM Control Delay (s)	42.9	-	-	14.2
HCM Lane LOS	E	-	-	B
HCM 95th %tile Q(veh)	3.3	-	-	0.9

Intersection	
Int Delay, s/veh	15.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	1817	185	0	36	0	0	0	225
Future Vol, veh/h	0	0	0	0	1817	185	0	36	0	0	0	225
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	150	-	-	-	-	-	0
Veh in Median Storage, #	1	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	2019	206	0	40	0	0	0	250

Major/Minor	Major2			Minor1			Minor2			
Conflicting Flow All	-	-	0	-	2225	-	-	-	1010	
Stage 1	-	-	-	-	0	-	-	-	-	
Stage 2	-	-	-	-	2225	-	-	-	-	
Critical Hdwy	-	-	-	-	6.54	-	-	-	6.94	
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	-	-	-	-	5.54	-	-	-	-	
Follow-up Hdwy	-	-	-	-	4.02	-	-	-	3.32	
Pot Cap-1 Maneuver	0	-	-	0	43	0	0	0	~ 238	
Stage 1	0	-	-	0	-	0	0	0	-	
Stage 2	0	-	-	0	79	0	0	0	-	
Platoon blocked, %		-	-							
Mov Cap-1 Maneuver	-	-	-	-	43	-	-	-	~ 238	
Mov Cap-2 Maneuver	-	-	-	-	43	-	-	-	-	
Stage 1	-	-	-	-	-	-	-	-	-	
Stage 2	-	-	-	-	79	-	-	-	-	

Approach	WB	NB	SB
HCM Control Delay, s	0	260.9	116.8
HCM LOS		F	F

Minor Lane/Major Mvmt	NBLn1	WBT	WBR	SBLn1
Capacity (veh/h)	43	-	-	238
HCM Lane V/C Ratio	0.93	-	-	1.05
HCM Control Delay (s)	260.9	-	-	116.8
HCM Lane LOS	F	-	-	F
HCM 95th %tile Q(veh)	3.7	-	-	10.5

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	5.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	907	74	0	116	0	0	0	114
Future Vol, veh/h	0	0	0	0	907	74	0	116	0	0	0	114
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	150	-	-	-	-	-	0
Veh in Median Storage, #	7	471104	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	1008	82	0	129	0	0	0	127

Major/Minor	Major2			Minor1			Minor2			
Conflicting Flow All	-	-	0	-	1090	-	-	-	504	
Stage 1	-	-	-	-	0	-	-	-	-	
Stage 2	-	-	-	-	1090	-	-	-	-	
Critical Hdwy	-	-	-	-	6.54	-	-	-	6.94	
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	-	-	-	-	5.54	-	-	-	-	
Follow-up Hdwy	-	-	-	-	4.02	-	-	-	3.32	
Pot Cap-1 Maneuver	0	-	-	0	214	0	0	0	513	
Stage 1	0	-	-	0	-	0	0	0	-	
Stage 2	0	-	-	0	289	0	0	0	-	
Platoon blocked, %		-	-							
Mov Cap-1 Maneuver	-	-	-	-	214	-	-	-	513	
Mov Cap-2 Maneuver	-	-	-	-	214	-	-	-	-	
Stage 1	-	-	-	-	-	-	-	-	-	
Stage 2	-	-	-	-	289	-	-	-	-	

Approach	WB	NB	SB
HCM Control Delay, s	0	44.4	14.3
HCM LOS		E	B

Minor Lane/Major Mvmt	NBLn1	WBT	WBR	SBLn1
Capacity (veh/h)	214	-	-	513
HCM Lane V/C Ratio	0.602	-	-	0.247
HCM Control Delay (s)	44.4	-	-	14.3
HCM Lane LOS	E	-	-	B
HCM 95th %tile Q(veh)	3.4	-	-	1

APPENDIX E

CAPACITY ANALYSIS CALCULATIONS

US 401 BYPASS

&

EASTERN U-TURN LOCATION

Intersection	
Int Delay, s/veh	1.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	1532	91	0
Future Vol, veh/h	0	0	0	1532	91	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	1702	101	0

Major/Minor	Major2		Minor1	
Conflicting Flow All	-	-	851	-
Stage 1	-	-	0	-
Stage 2	-	-	851	-
Critical Hdwy	-	-	6.84	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	5.84	-
Follow-up Hdwy	-	-	3.52	-
Pot Cap-1 Maneuver	0	-	299	0
Stage 1	0	-	-	0
Stage 2	0	-	379	0
Platoon blocked, %		-		
Mov Cap-1 Maneuver	-	-	299	-
Mov Cap-2 Maneuver	-	-	299	-
Stage 1	-	-	-	-
Stage 2	-	-	379	-

Approach	WB	NB
HCM Control Delay, s	0	23.1
HCM LOS		C

Minor Lane/Major Mvmt	NBLn1	WBT
Capacity (veh/h)	299	-
HCM Lane V/C Ratio	0.338	-
HCM Control Delay (s)	23.1	-
HCM Lane LOS	C	-
HCM 95th %tile Q(veh)	1.4	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	600	66	0
Future Vol, veh/h	0	0	0	600	66	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	667	73	0

Major/Minor	Major2		Minor1	
Conflicting Flow All	-	-	334	-
Stage 1	-	-	0	-
Stage 2	-	-	334	-
Critical Hdwy	-	-	6.84	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	5.84	-
Follow-up Hdwy	-	-	3.52	-
Pot Cap-1 Maneuver	0	-	636	0
Stage 1	0	-	-	0
Stage 2	0	-	697	0
Platoon blocked, %		-		
Mov Cap-1 Maneuver	-	-	636	-
Mov Cap-2 Maneuver	-	-	636	-
Stage 1	-	-	-	-
Stage 2	-	-	697	-

Approach	WB	NB
HCM Control Delay, s	0	11.4
HCM LOS		B

Minor Lane/Major Mvmt	NBLn1	WBT
Capacity (veh/h)	636	-
HCM Lane V/C Ratio	0.115	-
HCM Control Delay (s)	11.4	-
HCM Lane LOS	B	-
HCM 95th %tile Q(veh)	0.4	-

Intersection	
Int Delay, s/veh	16.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑	↰	
Traffic Vol, veh/h	0	0	0	1877	233	0
Future Vol, veh/h	0	0	0	1877	233	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	2086	259	0

Major/Minor	Major2		Minor1	
Conflicting Flow All	-	-	1043	-
Stage 1	-	-	0	-
Stage 2	-	-	1043	-
Critical Hdwy	-	-	6.84	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	5.84	-
Follow-up Hdwy	-	-	3.52	-
Pot Cap-1 Maneuver	0	-	~ 225	0
Stage 1	0	-	-	0
Stage 2	0	-	300	0
Platoon blocked, %		-		
Mov Cap-1 Maneuver	-	-	~ 225	-
Mov Cap-2 Maneuver	-	-	~ 225	-
Stage 1	-	-	-	-
Stage 2	-	-	300	-

Approach	WB	NB
HCM Control Delay, s	0	152
HCM LOS		F

Minor Lane/Major Mvmt	NBLn1	WBT
Capacity (veh/h)	225	-
HCM Lane V/C Ratio	1.151	-
HCM Control Delay (s)	152	-
HCM Lane LOS	F	-
HCM 95th %tile Q(veh)	12.2	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	2.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	915	175	0
Future Vol, veh/h	0	0	0	915	175	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	1017	194	0

Major/Minor	Major2		Minor1	
Conflicting Flow All	-	-	509	-
Stage 1	-	-	0	-
Stage 2	-	-	509	-
Critical Hdwy	-	-	6.84	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	5.84	-
Follow-up Hdwy	-	-	3.52	-
Pot Cap-1 Maneuver	0	-	494	0
Stage 1	0	-	-	0
Stage 2	0	-	569	0
Platoon blocked, %		-		
Mov Cap-1 Maneuver	-	-	494	-
Mov Cap-2 Maneuver	-	-	494	-
Stage 1	-	-	-	-
Stage 2	-	-	569	-

Approach	WB	NB
HCM Control Delay, s	0	16.9
HCM LOS		C

Minor Lane/Major Mvmt	NBLn1	WBT
Capacity (veh/h)	494	-
HCM Lane V/C Ratio	0.394	-
HCM Control Delay (s)	16.9	-
HCM Lane LOS	C	-
HCM 95th %tile Q(veh)	1.9	-

Intersection	
Int Delay, s/veh	22.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑	↰	
Traffic Vol, veh/h	0	0	0	1880	253	0
Future Vol, veh/h	0	0	0	1880	253	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	2089	281	0

Major/Minor	Major2		Minor1	
Conflicting Flow All	-	-	1045	-
Stage 1	-	-	0	-
Stage 2	-	-	1045	-
Critical Hdwy	-	-	6.84	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	5.84	-
Follow-up Hdwy	-	-	3.52	-
Pot Cap-1 Maneuver	0	-	~ 224	0
Stage 1	0	-	-	0
Stage 2	0	-	300	0
Platoon blocked, %		-		
Mov Cap-1 Maneuver	-	-	~ 224	-
Mov Cap-2 Maneuver	-	-	~ 224	-
Stage 1	-	-	-	-
Stage 2	-	-	300	-

Approach	WB	NB
HCM Control Delay, s	0	189.6
HCM LOS		F

Minor Lane/Major Mvmt	NBLn1	WBT
Capacity (veh/h)	224	-
HCM Lane V/C Ratio	1.255	-
HCM Control Delay (s)	189.6	-
HCM Lane LOS	F	-
HCM 95th %tile Q(veh)	14.4	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	926	188	0
Future Vol, veh/h	0	0	0	926	188	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	1029	209	0

Major/Minor	Major2		Minor1	
Conflicting Flow All	-	-	515	-
Stage 1	-	-	0	-
Stage 2	-	-	515	-
Critical Hdwy	-	-	6.84	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	5.84	-
Follow-up Hdwy	-	-	3.52	-
Pot Cap-1 Maneuver	0	-	489	0
Stage 1	0	-	-	0
Stage 2	0	-	565	0
Platoon blocked, %		-		
Mov Cap-1 Maneuver	-	-	489	-
Mov Cap-2 Maneuver	-	-	489	-
Stage 1	-	-	-	-
Stage 2	-	-	565	-

Approach	WB	NB
HCM Control Delay, s	0	17.7
HCM LOS		C

Minor Lane/Major Mvmt	NBLn1	WBT
Capacity (veh/h)	489	-
HCM Lane V/C Ratio	0.427	-
HCM Control Delay (s)	17.7	-
HCM Lane LOS	C	-
HCM 95th %tile Q(veh)	2.1	-

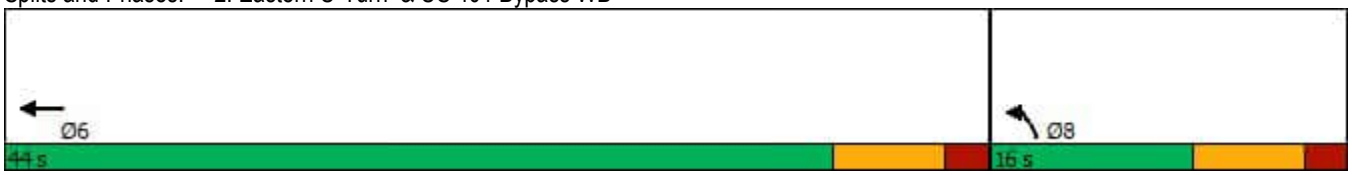
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	1880	253	0
Future Volume (vph)	0	0	0	1880	253	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00
Frt						
Flt Protected					0.950	
Satd. Flow (prot)	0	0	0	3539	1770	0
Flt Permitted					0.950	
Satd. Flow (perm)	0	0	0	3539	1770	0
Right Turn on Red		No			No	No
Satd. Flow (RTOR)						
Link Speed (mph)	55			55	45	
Link Distance (ft)	520			1076	100	
Travel Time (s)	6.4			13.3	1.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	2089	281	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	2089	281	0
Turn Type				NA	Prot	
Protected Phases				6	8	
Permitted Phases						
Detector Phase				6	8	
Switch Phase						
Minimum Initial (s)				14.0	7.0	
Minimum Split (s)				21.0	14.0	
Total Split (s)				44.0	16.0	
Total Split (%)				73.3%	26.7%	
Maximum Green (s)				37.0	9.0	
Yellow Time (s)				5.0	5.0	
All-Red Time (s)				2.0	2.0	
Lost Time Adjust (s)				-2.0	-2.0	
Total Lost Time (s)				5.0	5.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)				3.0	3.0	
Recall Mode				None	Min	
Act Effct Green (s)				39.0	11.0	
Actuated g/C Ratio				0.65	0.18	
v/c Ratio				0.91	0.87	
Control Delay				16.9	53.0	
Queue Delay				0.0	0.0	
Total Delay				16.9	53.0	
LOS				B	D	
Approach Delay				16.9	53.0	
Approach LOS				B	D	
Queue Length 50th (ft)				280	100	
Queue Length 95th (ft)				#513	#221	
Internal Link Dist (ft)	440			996	20	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Bay Length (ft)						
Base Capacity (vph)				2300	324	
Starvation Cap Reductn				0	0	
Spillback Cap Reductn				0	0	
Storage Cap Reductn				0	0	
Reduced v/c Ratio				0.91	0.87	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.91			
Intersection Signal Delay: 21.2		Intersection LOS: C	
Intersection Capacity Utilization 74.3%		ICU Level of Service D	
Analysis Period (min) 15			

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Eastern U-Turn & US 401 Bypass WB

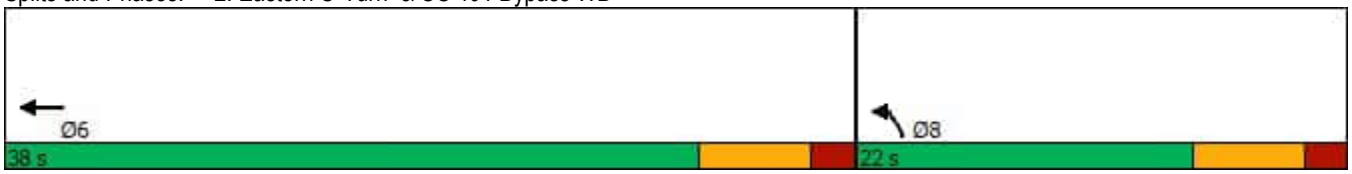


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	926	188	0
Future Volume (vph)	0	0	0	926	188	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00
Frt						
Flt Protected					0.950	
Satd. Flow (prot)	0	0	0	3539	1770	0
Flt Permitted					0.950	
Satd. Flow (perm)	0	0	0	3539	1770	0
Right Turn on Red		No			No	No
Satd. Flow (RTOR)						
Link Speed (mph)	55			55	45	
Link Distance (ft)	520			1076	100	
Travel Time (s)	6.4			13.3	1.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	1029	209	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1029	209	0
Turn Type				NA	Prot	
Protected Phases				6	8	
Permitted Phases						
Detector Phase				6	8	
Switch Phase						
Minimum Initial (s)				14.0	7.0	
Minimum Split (s)				21.0	14.0	
Total Split (s)				38.0	22.0	
Total Split (%)				63.3%	36.7%	
Maximum Green (s)				31.0	15.0	
Yellow Time (s)				5.0	5.0	
All-Red Time (s)				2.0	2.0	
Lost Time Adjust (s)				-2.0	-2.0	
Total Lost Time (s)				5.0	5.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)				3.0	3.0	
Recall Mode				None	Min	
Act Effct Green (s)				22.7	12.7	
Actuated g/C Ratio				0.50	0.28	
v/c Ratio				0.59	0.42	
Control Delay				9.9	17.9	
Queue Delay				0.0	0.0	
Total Delay				9.9	17.9	
LOS				A	B	
Approach Delay				9.9	17.9	
Approach LOS				A	B	
Queue Length 50th (ft)				87	43	
Queue Length 95th (ft)				157	111	
Internal Link Dist (ft)	440			996	20	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Bay Length (ft)						
Base Capacity (vph)				2642	680	
Starvation Cap Reductn				0	0	
Spillback Cap Reductn				0	0	
Storage Cap Reductn				0	0	
Reduced v/c Ratio				0.39	0.31	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 45.7			
Natural Cycle: 40			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.59			
Intersection Signal Delay: 11.2		Intersection LOS: B	
Intersection Capacity Utilization 44.3%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 2: Eastern U-Turn & US 401 Bypass WB



APPENDIX F

CAPACITY ANALYSIS CALCULATIONS

MITCHELL MILL ROAD

&

JONESVILLE ROAD / PEEBLES ROAD

Intersection	
Intersection Delay, s/veh	12.7
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	166	2	11	316	41	4	78	11	32	133	16
Future Vol, veh/h	7	166	2	11	316	41	4	78	11	32	133	16
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	184	2	12	351	46	4	87	12	36	148	18
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	10.8	14.8	10.1	11.4
HCM LOS	B	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	4%	4%	3%	18%
Vol Thru, %	84%	95%	86%	73%
Vol Right, %	12%	1%	11%	9%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	93	175	368	181
LT Vol	4	7	11	32
Through Vol	78	166	316	133
RT Vol	11	2	41	16
Lane Flow Rate	103	194	409	201
Geometry Grp	1	1	1	1
Degree of Util (X)	0.168	0.294	0.576	0.318
Departure Headway (Hd)	5.843	5.438	5.074	5.691
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	612	659	711	631
Service Time	3.897	3.483	3.111	3.736
HCM Lane V/C Ratio	0.168	0.294	0.575	0.319
HCM Control Delay	10.1	10.8	14.8	11.4
HCM Lane LOS	B	B	B	B
HCM 95th-tile Q	0.6	1.2	3.7	1.4

Intersection	
Intersection Delay, s/veh	10.8
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	18	306	13	0	130	21	5	92	10	27	50	11
Future Vol, veh/h	18	306	13	0	130	21	5	92	10	27	50	11
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	20	340	14	0	144	23	6	102	11	30	56	12
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	12.2	9.4	9.5	9.4
HCM LOS	B	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	5%	5%	0%	31%
Vol Thru, %	86%	91%	86%	57%
Vol Right, %	9%	4%	14%	12%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	107	337	151	88
LT Vol	5	18	0	27
Through Vol	92	306	130	50
RT Vol	10	13	21	11
Lane Flow Rate	119	374	168	98
Geometry Grp	1	1	1	1
Degree of Util (X)	0.175	0.488	0.227	0.146
Departure Headway (Hd)	5.3	4.694	4.868	5.368
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	669	760	730	660
Service Time	3.395	2.76	2.948	3.464
HCM Lane V/C Ratio	0.178	0.492	0.23	0.148
HCM Control Delay	9.5	12.2	9.4	9.4
HCM Lane LOS	A	B	A	A
HCM 95th-tile Q	0.6	2.7	0.9	0.5

Intersection	
Intersection Delay, s/veh	95.4
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	63	253	12	29	607	119	12	86	20	84	149	54
Future Vol, veh/h	63	253	12	29	607	119	12	86	20	84	149	54
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	70	281	13	32	674	132	13	96	22	93	166	60
Number of Lanes	1	1	0	0	1	1	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	2
HCM Control Delay	19.9	170.3	16.1	17.2
HCM LOS	C	F	C	C

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	10%	100%	0%	5%	0%	100%	0%
Vol Thru, %	73%	0%	95%	95%	0%	0%	73%
Vol Right, %	17%	0%	5%	0%	100%	0%	27%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	118	63	265	636	119	84	203
LT Vol	12	63	0	29	0	84	0
Through Vol	86	0	253	607	0	0	149
RT Vol	20	0	12	0	119	0	54
Lane Flow Rate	131	70	294	707	132	93	226
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.302	0.152	0.597	1.372	0.229	0.215	0.476
Departure Headway (Hd)	9.162	8.438	7.887	6.988	6.248	9.036	8.326
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	395	428	462	516	570	399	435
Service Time	7.162	6.138	5.587	4.777	4.036	6.736	6.026
HCM Lane V/C Ratio	0.332	0.164	0.636	1.37	0.232	0.233	0.52
HCM Control Delay	16.1	12.6	21.6	200.1	10.9	14.2	18.4
HCM Lane LOS	C	B	C	F	B	B	C
HCM 95th-tile Q	1.3	0.5	3.8	31.9	0.9	0.8	2.5

Intersection	
Intersection Delay, s/veh	57.2
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	114	459	19	14	387	95	19	106	31	159	65	33
Future Vol, veh/h	114	459	19	14	387	95	19	106	31	159	65	33
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	127	510	21	16	430	106	21	118	34	177	72	37
Number of Lanes	1	1	0	0	1	1	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	2
HCM Control Delay	90.6	50	19.2	17.4
HCM LOS	F	E	C	C

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	12%	100%	0%	3%	0%	100%	0%
Vol Thru, %	68%	0%	96%	97%	0%	0%	66%
Vol Right, %	20%	0%	4%	0%	100%	0%	34%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	156	114	478	401	95	159	98
LT Vol	19	114	0	14	0	159	0
Through Vol	106	0	459	387	0	0	65
RT Vol	31	0	19	0	95	0	33
Lane Flow Rate	173	127	531	446	106	177	109
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.429	0.289	1.13	0.95	0.204	0.443	0.251
Departure Headway (Hd)	9.353	8.206	7.661	7.994	7.251	9.428	8.662
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	388	438	473	459	498	385	417
Service Time	7.353	5.959	5.414	5.694	4.951	7.128	6.362
HCM Lane V/C Ratio	0.446	0.29	1.123	0.972	0.213	0.46	0.261
HCM Control Delay	19.2	14.3	108.8	59	11.8	19.4	14.2
HCM Lane LOS	C	B	F	F	B	C	B
HCM 95th-tile Q	2.1	1.2	18.4	11.3	0.8	2.2	1

Intersection	
Intersection Delay, s/veh	104
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	71	253	12	29	607	121	12	88	20	91	156	76
Future Vol, veh/h	71	253	12	29	607	121	12	88	20	91	156	76
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	79	281	13	32	674	134	13	98	22	101	173	84
Number of Lanes	1	1	0	0	1	1	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	2
HCM Control Delay	20.8	191.1	16.7	19
HCM LOS	C	F	C	C

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	10%	100%	0%	5%	0%	100%	0%
Vol Thru, %	73%	0%	95%	95%	0%	0%	67%
Vol Right, %	17%	0%	5%	0%	100%	0%	33%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	120	71	265	636	121	91	232
LT Vol	12	71	0	29	0	91	0
Through Vol	88	0	253	607	0	0	156
RT Vol	20	0	12	0	121	0	76
Lane Flow Rate	133	79	294	707	134	101	258
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.313	0.176	0.611	1.43	0.244	0.234	0.545
Departure Headway (Hd)	9.455	8.699	8.147	7.283	6.541	9.17	8.414
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	383	415	448	502	553	394	430
Service Time	7.455	6.399	5.847	4.983	4.241	6.87	6.114
HCM Lane V/C Ratio	0.347	0.19	0.656	1.408	0.242	0.256	0.6
HCM Control Delay	16.7	13.2	22.8	225.3	11.3	14.6	20.7
HCM Lane LOS	C	B	C	F	B	B	C
HCM 95th-tile Q	1.3	0.6	4	34.3	1	0.9	3.2

Intersection	
Intersection Delay, s/veh	60.9
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	138	459	19	14	387	102	19	113	31	163	69	49
Future Vol, veh/h	138	459	19	14	387	102	19	113	31	163	69	49
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	153	510	21	16	430	113	21	126	34	181	77	54
Number of Lanes	1	1	0	0	1	1	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	2
HCM Control Delay	96.6	54.4	20.2	18
HCM LOS	F	F	C	C

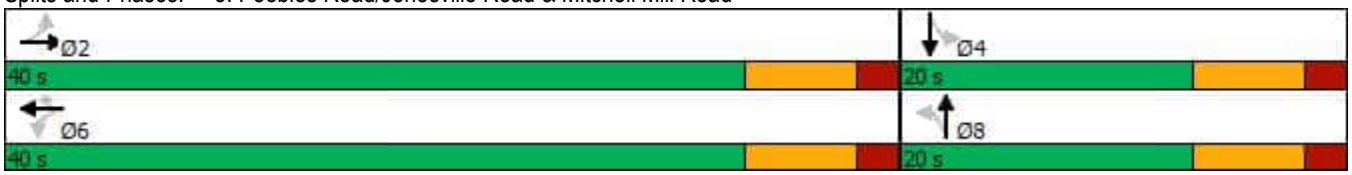
Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	12%	100%	0%	3%	0%	100%	0%
Vol Thru, %	69%	0%	96%	97%	0%	0%	58%
Vol Right, %	19%	0%	4%	0%	100%	0%	42%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	163	138	478	401	102	163	118
LT Vol	19	138	0	14	0	163	0
Through Vol	113	0	459	387	0	0	69
RT Vol	31	0	19	0	102	0	49
Lane Flow Rate	181	153	531	446	113	181	131
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.455	0.358	1.159	0.973	0.225	0.459	0.304
Departure Headway (Hd)	9.533	8.403	7.857	8.211	7.466	9.559	8.735
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	380	428	462	446	484	379	414
Service Time	7.533	6.158	5.612	5.911	5.166	7.259	6.435
HCM Lane V/C Ratio	0.476	0.357	1.149	1	0.233	0.478	0.316
HCM Control Delay	20.2	15.8	119.9	65.1	12.3	20.1	15.2
HCM Lane LOS	C	C	F	F	B	C	C
HCM 95th-tile Q	2.3	1.6	19.3	11.9	0.9	2.3	1.3

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	71	253	12	29	607	121	12	88	20	91	156	76
Future Volume (vph)	71	253	12	29	607	121	12	88	20	91	156	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	0		100	0		0	100		0
Storage Lanes	1		0	0		1	0		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.993				0.850		0.978			0.951	
Flt Protected	0.950				0.998			0.995		0.950		
Satd. Flow (prot)	1770	1850	0	0	1859	1583	0	1813	0	1770	1771	0
Flt Permitted	0.247				0.976			0.946		0.785		
Satd. Flow (perm)	460	1850	0	0	1818	1583	0	1723	0	1462	1771	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		1536			1126			1017			1092	
Travel Time (s)		23.3			17.1			15.4			16.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	79	281	13	32	674	134	13	98	22	101	173	84
Shared Lane Traffic (%)												
Lane Group Flow (vph)	79	294	0	0	706	134	0	133	0	101	257	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6		6	8			4		
Detector Phase	2	2		6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0	12.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	19.0	19.0		19.0	19.0	19.0	14.0	14.0		14.0	14.0	
Total Split (s)	40.0	40.0		40.0	40.0	40.0	20.0	20.0		20.0	20.0	
Total Split (%)	66.7%	66.7%		66.7%	66.7%	66.7%	33.3%	33.3%		33.3%	33.3%	
Maximum Green (s)	33.0	33.0		33.0	33.0	33.0	13.0	13.0		13.0	13.0	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0			-2.0	-2.0		-2.0		-2.0	-2.0	
Total Lost Time (s)	5.0	5.0			5.0	5.0		5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	Min	Min		Min	Min	
Act Effct Green (s)	26.5	26.5			26.5	26.5		13.3		13.3	13.3	
Actuated g/C Ratio	0.53	0.53			0.53	0.53		0.26		0.26	0.26	
v/c Ratio	0.33	0.30			0.74	0.16		0.29		0.26	0.55	
Control Delay	10.9	7.4			14.4	6.5		19.1		19.1	23.0	
Queue Delay	0.0	0.0			0.0	0.0		0.0		0.0	0.0	
Total Delay	10.9	7.4			14.4	6.5		19.1		19.1	23.0	
LOS	B	A			B	A		B		B	C	
Approach Delay		8.2			13.2			19.1			21.9	
Approach LOS		A			B			B			C	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)	12	45			150	19		32		24	67	
Queue Length 95th (ft)	37	81			258	40		80		65	147	
Internal Link Dist (ft)		1456			1046			937			1012	
Turn Bay Length (ft)	100					100				100		
Base Capacity (vph)	333	1342			1319	1148		536		455	552	
Starvation Cap Reductn	0	0			0	0		0		0	0	
Spillback Cap Reductn	0	0			0	0		0		0	0	
Storage Cap Reductn	0	0			0	0		0		0	0	
Reduced v/c Ratio	0.24	0.22			0.54	0.12		0.25		0.22	0.47	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 50.2			
Natural Cycle: 50			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 14.4		Intersection LOS: B	
Intersection Capacity Utilization 76.2%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 3: Peebles Road/Jonesville Road & Mitchell Mill Road

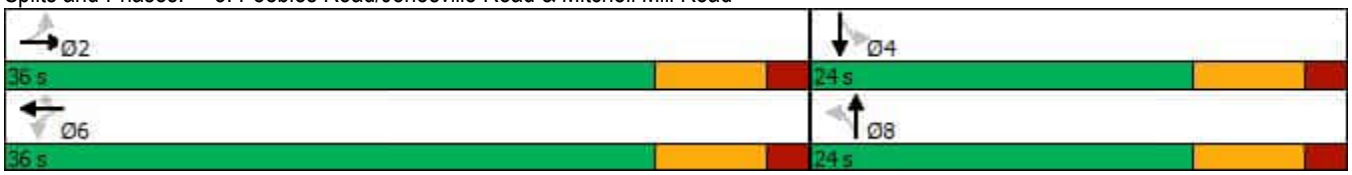


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	138	459	19	14	387	102	19	113	31	163	69	49
Future Volume (vph)	138	459	19	14	387	102	19	113	31	163	69	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	0		100	0		0	100		0
Storage Lanes	1		0	0		1	0		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.994				0.850		0.975			0.938	
Flt Protected	0.950				0.998			0.994		0.950		
Satd. Flow (prot)	1770	1852	0	0	1859	1583	0	1805	0	1770	1747	0
Flt Permitted	0.436				0.973			0.951		0.728		
Satd. Flow (perm)	812	1852	0	0	1812	1583	0	1727	0	1356	1747	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		1536			1126			1017			1092	
Travel Time (s)		23.3			17.1			15.4			16.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	153	510	21	16	430	113	21	126	34	181	77	54
Shared Lane Traffic (%)												
Lane Group Flow (vph)	153	531	0	0	446	113	0	181	0	181	131	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6		6	8			4		
Detector Phase	2	2		6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0	12.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	19.0	19.0		19.0	19.0	19.0	14.0	14.0		14.0	14.0	
Total Split (s)	36.0	36.0		36.0	36.0	36.0	24.0	24.0		24.0	24.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%	60.0%	40.0%	40.0%		40.0%	40.0%	
Maximum Green (s)	29.0	29.0		29.0	29.0	29.0	17.0	17.0		17.0	17.0	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0			-2.0	-2.0		-2.0		-2.0	-2.0	
Total Lost Time (s)	5.0	5.0			5.0	5.0		5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	Min	Min		Min	Min	
Act Effct Green (s)	21.1	21.1			21.1	21.1		13.9		13.9	13.9	
Actuated g/C Ratio	0.46	0.46			0.46	0.46		0.31		0.31	0.31	
v/c Ratio	0.41	0.62			0.53	0.15		0.34		0.44	0.25	
Control Delay	12.4	13.1			11.6	8.0		15.8		18.1	14.8	
Queue Delay	0.0	0.0			0.0	0.0		0.0		0.0	0.0	
Total Delay	12.4	13.1			11.6	8.0		15.8		18.1	14.8	
LOS	B	B			B	A		B		B	B	
Approach Delay		12.9			10.9			15.8			16.7	
Approach LOS		B			B			B			B	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)	23	92			73	15		34		35	24	
Queue Length 95th (ft)	68	198			160	41		95		101	71	
Internal Link Dist (ft)		1456			1046			937			1012	
Turn Bay Length (ft)	100					100				100		
Base Capacity (vph)	581	1326			1297	1133		758		595	766	
Starvation Cap Reductn	0	0			0	0		0		0	0	
Spillback Cap Reductn	0	0			0	0		0		0	0	
Storage Cap Reductn	0	0			0	0		0		0	0	
Reduced v/c Ratio	0.26	0.40			0.34	0.10		0.24		0.30	0.17	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 45.5			
Natural Cycle: 40			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.62			
Intersection Signal Delay: 13.2		Intersection LOS: B	
Intersection Capacity Utilization 81.0%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 3: Peebles Road/Jonesville Road & Mitchell Mill Road



APPENDIX G

CAPACITY ANALYSIS CALCULATIONS

Jonesville Road

&

Universal Drive

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	3	1	125	178	1
Future Vol, veh/h	3	3	1	125	178	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	3	1	139	198	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	340	199	199	0	-	0
Stage 1	199	-	-	-	-	-
Stage 2	141	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	656	842	1373	-	-	-
Stage 1	835	-	-	-	-	-
Stage 2	886	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	655	842	1373	-	-	-
Mov Cap-2 Maneuver	655	-	-	-	-	-
Stage 1	834	-	-	-	-	-
Stage 2	886	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.9	0.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1373	-	737	-	-
HCM Lane V/C Ratio	0.001	-	0.009	-	-
HCM Control Delay (s)	7.6	0	9.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	2	4	127	89	3
Future Vol, veh/h	1	2	4	127	89	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	2	4	141	99	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	250	101	102	0	-	0
Stage 1	101	-	-	-	-	-
Stage 2	149	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	739	954	1490	-	-	-
Stage 1	923	-	-	-	-	-
Stage 2	879	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	737	954	1490	-	-	-
Mov Cap-2 Maneuver	737	-	-	-	-	-
Stage 1	920	-	-	-	-	-
Stage 2	879	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	0.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1490	-	869	-	-
HCM Lane V/C Ratio	0.003	-	0.004	-	-
HCM Control Delay (s)	7.4	0	9.2	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	3	1	339	294	1
Future Vol, veh/h	3	3	1	339	294	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	3	1	377	327	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	707	328	328	0	-	0
Stage 1	328	-	-	-	-	-
Stage 2	379	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	402	713	1232	-	-	-
Stage 1	730	-	-	-	-	-
Stage 2	692	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	402	713	1232	-	-	-
Mov Cap-2 Maneuver	402	-	-	-	-	-
Stage 1	729	-	-	-	-	-
Stage 2	692	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.1	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1232	-	514	-	-
HCM Lane V/C Ratio	0.001	-	0.013	-	-
HCM Control Delay (s)	7.9	0	12.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	2	4	296	336	3
Future Vol, veh/h	1	2	4	296	336	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	2	4	329	373	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	712	375	376	0	-	0
Stage 1	375	-	-	-	-	-
Stage 2	337	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	399	671	1182	-	-	-
Stage 1	695	-	-	-	-	-
Stage 2	723	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	397	671	1182	-	-	-
Mov Cap-2 Maneuver	397	-	-	-	-	-
Stage 1	692	-	-	-	-	-
Stage 2	723	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.6	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1182	-	546	-	-
HCM Lane V/C Ratio	0.004	-	0.006	-	-
HCM Control Delay (s)	8.1	0	11.6	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	16	6	2	356	300	5
Future Vol, veh/h	16	6	2	356	300	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	18	7	2	396	333	6

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	736	336	339	0	-	0
Stage 1	336	-	-	-	-	-
Stage 2	400	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	386	706	1220	-	-	-
Stage 1	724	-	-	-	-	-
Stage 2	677	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	385	706	1220	-	-	-
Mov Cap-2 Maneuver	385	-	-	-	-	-
Stage 1	723	-	-	-	-	-
Stage 2	677	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.7	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1220	-	439	-	-
HCM Lane V/C Ratio	0.002	-	0.056	-	-
HCM Control Delay (s)	8	0	13.7	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	4	8	307	354	17
Future Vol, veh/h	10	4	8	307	354	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	4	9	341	393	19

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	762	403	412	0	-	0
Stage 1	403	-	-	-	-	-
Stage 2	359	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	373	647	1147	-	-	-
Stage 1	675	-	-	-	-	-
Stage 2	707	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	369	647	1147	-	-	-
Mov Cap-2 Maneuver	369	-	-	-	-	-
Stage 1	668	-	-	-	-	-
Stage 2	707	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.9	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1147	-	421	-	-
HCM Lane V/C Ratio	0.008	-	0.037	-	-
HCM Control Delay (s)	8.2	0	13.9	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

APPENDIX H

CAPACITY ANALYSIS CALCULATIONS

Jonesville Road

&

Site Drive

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	17	33	11	335	306	6
Future Vol, veh/h	17	33	11	335	306	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	19	37	12	372	340	7

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	740	344	347	0	-	0
Stage 1	344	-	-	-	-	-
Stage 2	396	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	384	699	1212	-	-	-
Stage 1	718	-	-	-	-	-
Stage 2	680	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	380	699	1212	-	-	-
Mov Cap-2 Maneuver	380	-	-	-	-	-
Stage 1	711	-	-	-	-	-
Stage 2	680	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.4	0.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1212	-	544	-	-
HCM Lane V/C Ratio	0.01	-	0.102	-	-
HCM Control Delay (s)	8	-	12.4	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	11	22	34	308	335	18
Future Vol, veh/h	11	22	34	308	335	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	24	38	342	372	20

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	800	382	392	0	-	0
Stage 1	382	-	-	-	-	-
Stage 2	418	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	354	665	1167	-	-	-
Stage 1	690	-	-	-	-	-
Stage 2	664	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	342	665	1167	-	-	-
Mov Cap-2 Maneuver	342	-	-	-	-	-
Stage 1	667	-	-	-	-	-
Stage 2	664	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.7	0.8	0
HCM LOS	B		

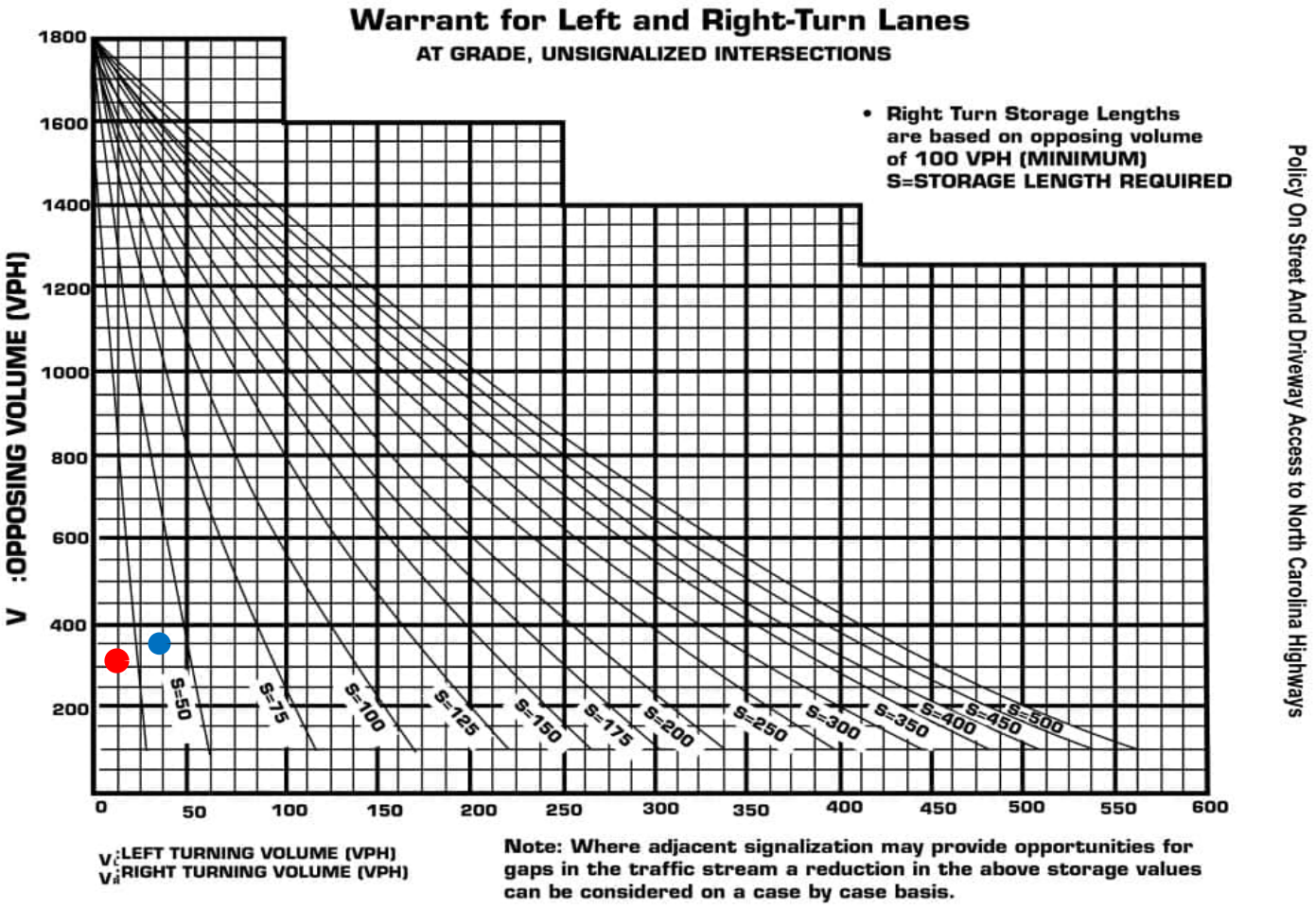
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1167	-	506	-	-
HCM Lane V/C Ratio	0.032	-	0.072	-	-
HCM Control Delay (s)	8.2	-	12.7	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

APPENDIX I

TURN LANE WARRANTS

HARRIS CREEK FARM

TURN LANE STORAGE WARRANTS

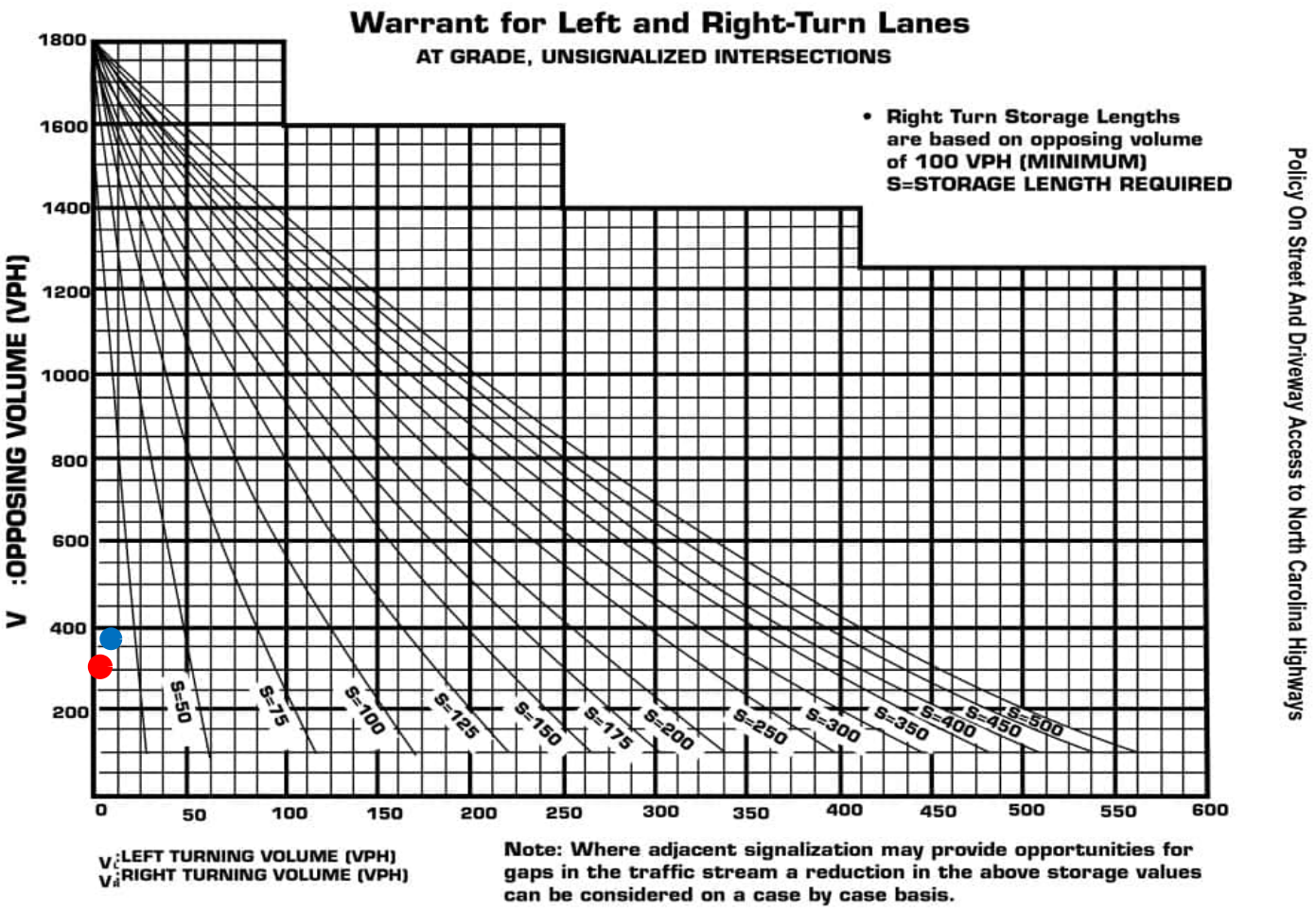


INTERSECTION: Jonesville Road & Site Drive

SCENARIO	Movement	Turn Lane	Turning Volume (V_R/V_L)	Approach / Opposing Volume (V_A/V_O)	Symbol
AM Build	NBL	Left	11	312	
PM Build	NBL	Left	34	353	

HARRIS CREEK FARM

TURN LANE STORAGE WARRANTS

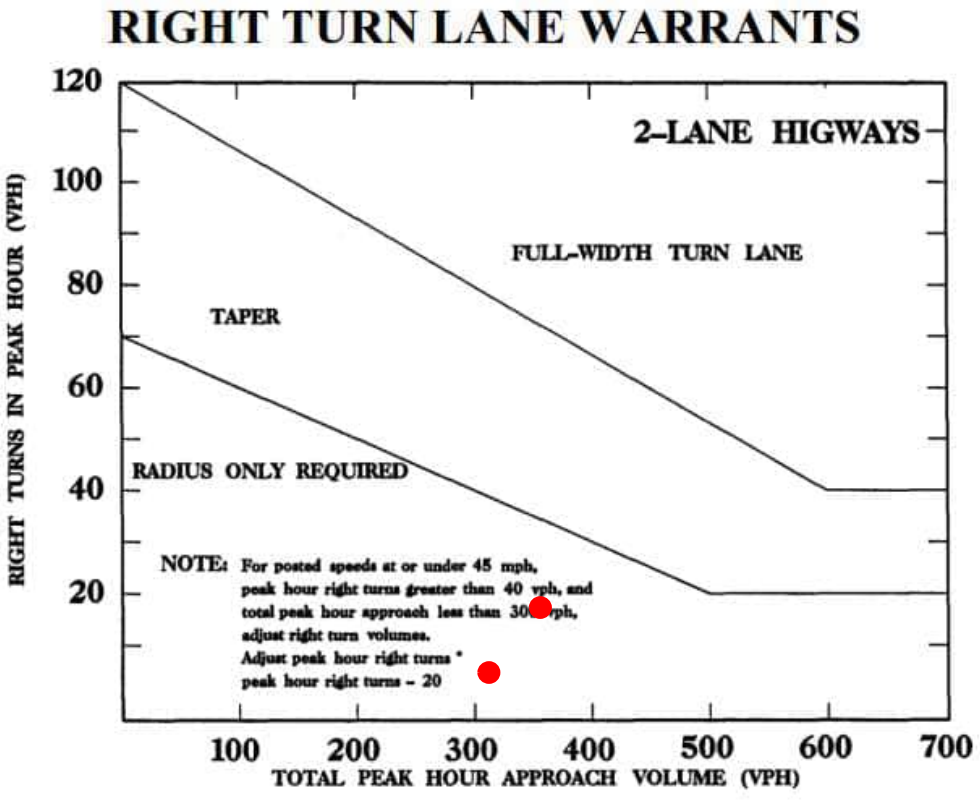


INTERSECTION: Jonesville Road & Univeral Drive

SCENARIO	Movement	Turn Lane	Turning Volume (V_R/V_L)	Approach / Opposing Volume (V_A/V_O)	Symbol
AM Build	NBL	Left	2	305	
PM Build	NBL	Left	8	371	

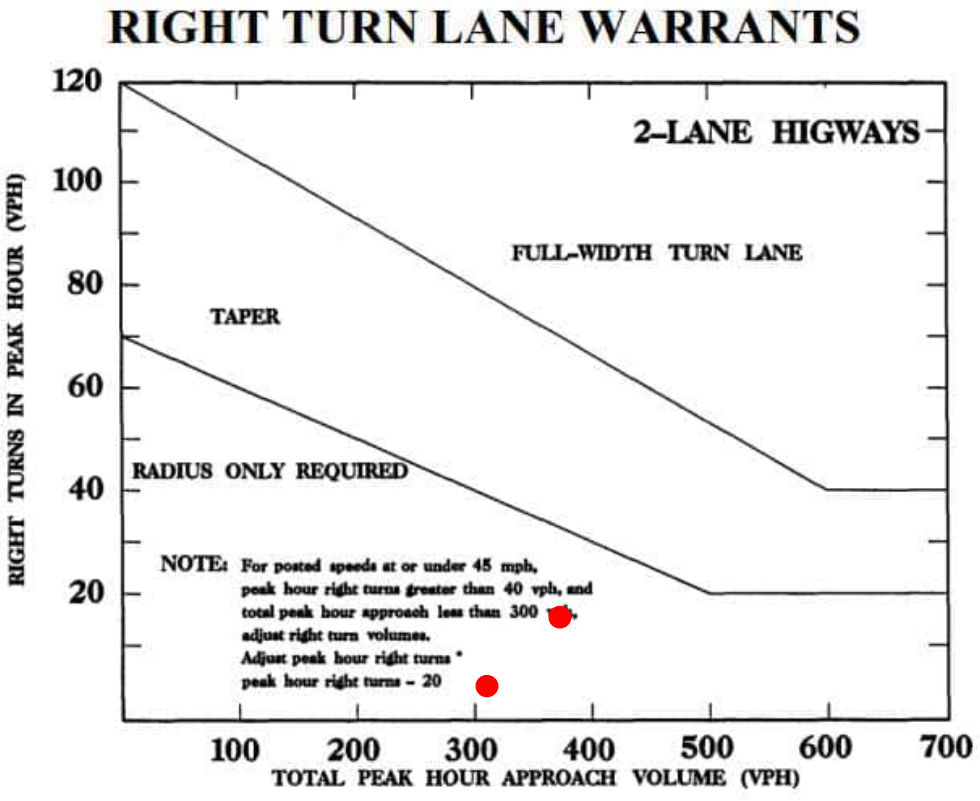
Jonesville Road and Site Drive

2027 Build				
Peak Hour	**Approach**	**Right Turn Volume**	**Approach Volume**	**Warranted?**
AM	Southbound	6	312	No
PM	Southbound	18	353	No



Jonesville Road and Universal Drive

2027 Build				
Peak Hour	**Approach**	**Right Turn Volume**	**Approach Volume**	**Warranted?**
AM	Southbound	5	305	No
PM	Southbound	17	371	No



APPENDIX J

MUTCD / ITRE

SIGNAL WARRANT ANALYSIS

Traffic Signal Warrant Analysis

Warrants 1 - 3 (Volume Warrants)

Project Name	Harris Creek Farm
Project/File #	20498 - 09
Scenario	2027 No-Build

Intersection Information			
Major Street (E/W Road)	US 401 Bypass	Minor Street (N/S Road)	Jonesville Road / WB Left-Over
Analyzed with	2 or more approach lanes	Analyzed with	1 Approach Lane
Total Approach Volume	2895 vehicles	Total Approach Volume	894 vehicles
Total Ped/Bike Volume	0 crossings	Total Ped/Bike Volume	0 crossings
Right turn reduction of	0 percent applied	Right turn reduction of	100 percent applied

No high speed or isolated community reduction applied to the Volume Warrant thresholds.

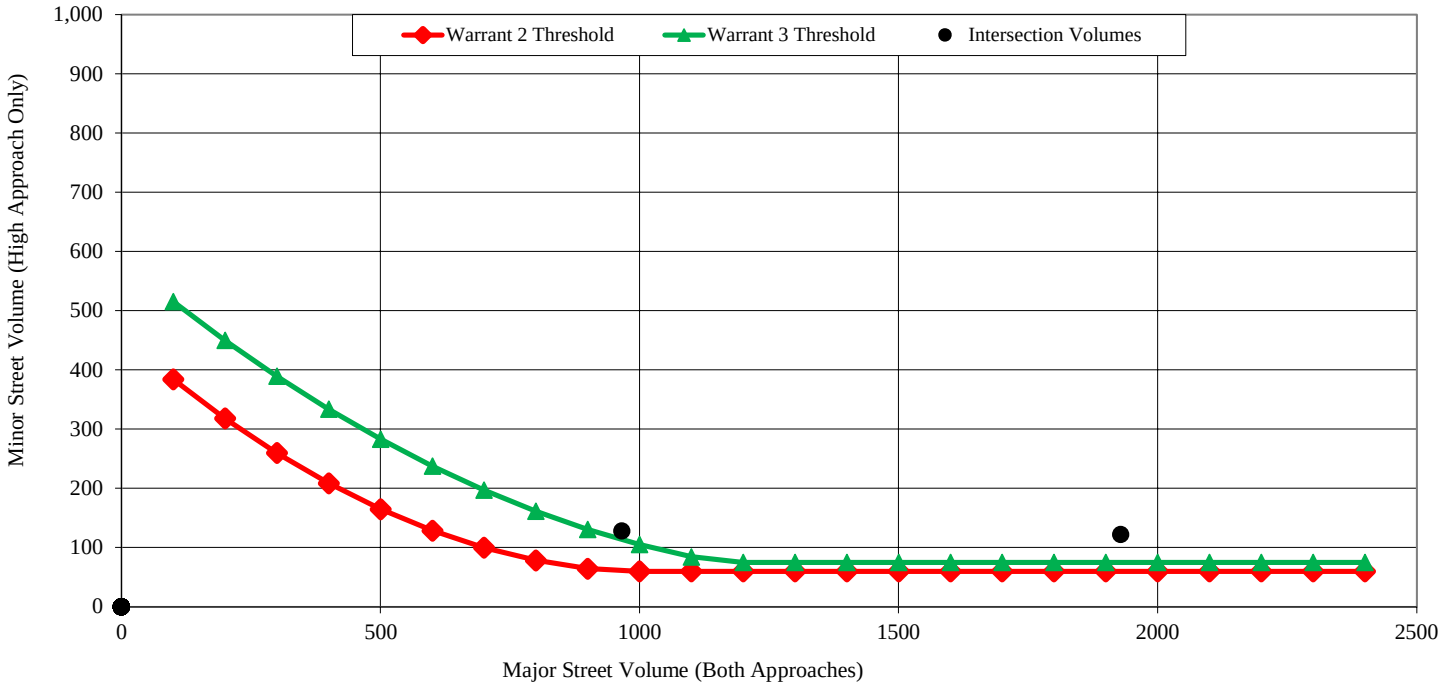
Warrant 1, Eight Hour Vehicular Volume			
	Condition A	Condition B	Condition A+B*
Condition Satisfied?	Not Satisfied	Not Satisfied	Not Satisfied
Required values reached for	2 hours	2 hours	2 (Cond. A) & 2 (Cond. B)
Criteria - Major Street (veh/hr)	420	630	336 (Cond. A) & 504 (Cond. B)
Criteria - Minor Street (veh/hr)	105	53	84 (Cond. A) & 42 (Cond. B)

* Should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

Warrant 2, Four Hour Vehicular Volume	
Condition Satisfied?	Not Satisfied
Required values reached for	2 hours
Criteria	See Figure Below

Warrant 3, Peak Hour Vehicular Volume		
	Condition A	Condition B
Condition Satisfied?	Not Satisfied	Satisfied
Required values reached for	2051 total, 122 minor, 0 delay	2 hours
Criteria - Total Approach Volume (veh in one hour)	800	See Figure Below
Criteria - Minor Street High Side Volume (veh in one hour)	100	
Criteria - Minor Street High Side Delay (veh-hrs)	4	

Figure 4C-2 (Warrant 2 - 70% Factor) & Figure 4C-4 (Warrant 3 - 70% Factor)



Traffic Signal Warrant Analysis

Warrants 1 - 3 (Volume Warrants)

Project Name	Harris Creek Farm
Project/File #	20498 - 09
Scenario	2027 Build

Intersection Information			
Major Street (E/W Road)	US 401 Bypass	Minor Street (N/S Road)	Jonesville Road / WB Left-Over
Analyzed with	2 or more approach lanes	Analyzed with	1 Approach Lane
Total Approach Volume	2923 vehicles	Total Approach Volume	958 vehicles
Total Ped/Bike Volume	0 crossings	Total Ped/Bike Volume	0 crossings
Right turn reduction of	0 percent applied	Right turn reduction of	100 percent applied

No high speed or isolated community reduction applied to the Volume Warrant thresholds.

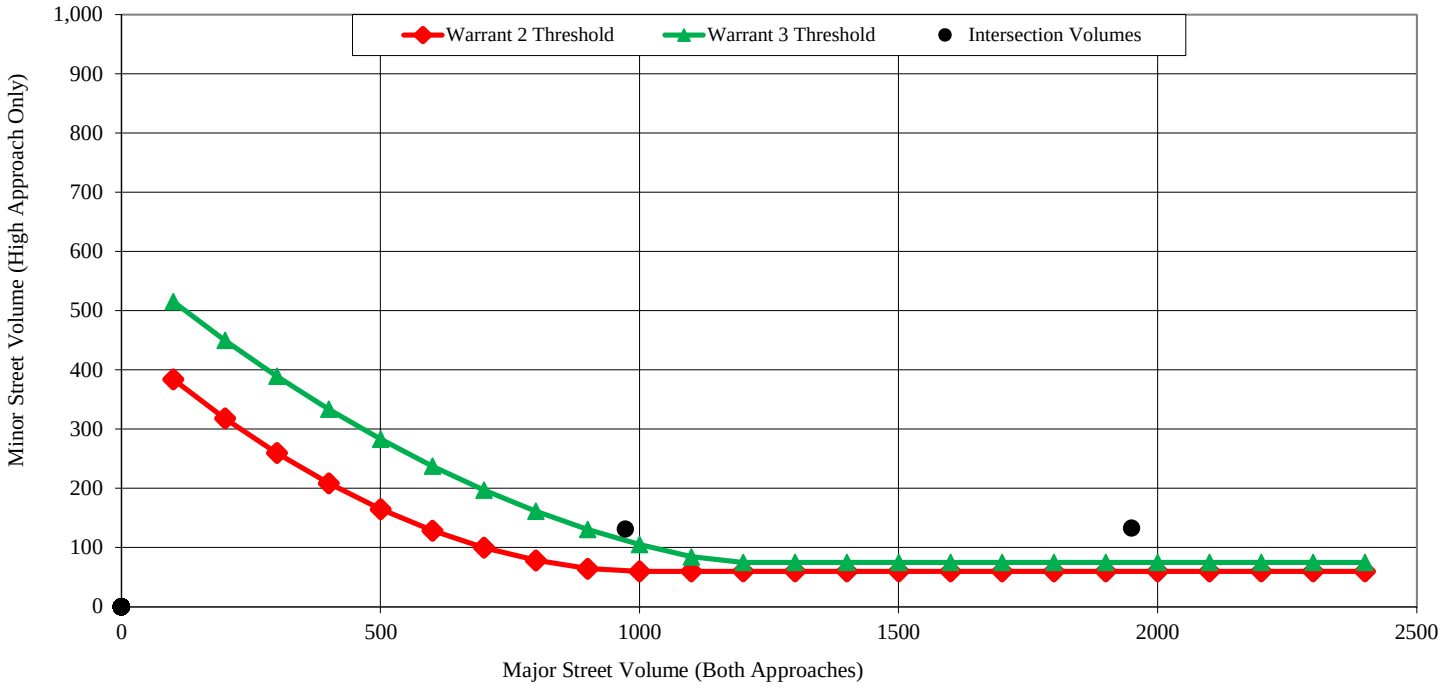
Warrant 1, Eight Hour Vehicular Volume			
	Condition A	Condition B	Condition A+B*
Condition Satisfied?	Not Satisfied	Not Satisfied	Not Satisfied
Required values reached for	2 hours	2 hours	2 (Cond. A) & 2 (Cond. B)
Criteria - Major Street (veh/hr)	420	630	336 (Cond. A) & 504 (Cond. B)
Criteria - Minor Street (veh/hr)	105	53	84 (Cond. A) & 42 (Cond. B)

* Should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

Warrant 2, Four Hour Vehicular Volume	
Condition Satisfied?	Not Satisfied
Required values reached for	2 hours
Criteria	See Figure Below

Warrant 3, Peak Hour Vehicular Volume		
	Condition A	Condition B
Condition Satisfied?	Not Satisfied	Satisfied
Required values reached for	2083 total, 133 minor, 0 delay	2 hours
Criteria - Total Approach Volume (veh in one hour)	800	See Figure Below
Criteria - Minor Street High Side Volume (veh in one hour)	100	
Criteria - Minor Street High Side Delay (veh-hrs)	4	

Figure 4C-2 (Warrant 2 - 70% Factor) & Figure 4C-4 (Warrant 3 - 70% Factor)



Traffic Signal Warrant Analysis

Warrants 1 - 3 (Volume Warrants)

Project Name	Harris Creek Farm
Project/File #	20498 - 09
Scenario	2022 Existing

Intersection Information			
Major Street (E/W Road)	US 401 Bypass	Minor Street (N/S Road)	Eastern U-Turn Location
Analyzed with	2 or more approach lanes	Analyzed with	1 Approach Lane
Total Approach Volume	2132 vehicles	Total Approach Volume	157 vehicles
Total Ped/Bike Volume	0 crossings	Total Ped/Bike Volume	0 crossings
Right turn reduction of	0 percent applied	Right turn reduction of	0 percent applied

No high speed or isolated community reduction applied to the Volume Warrant thresholds.

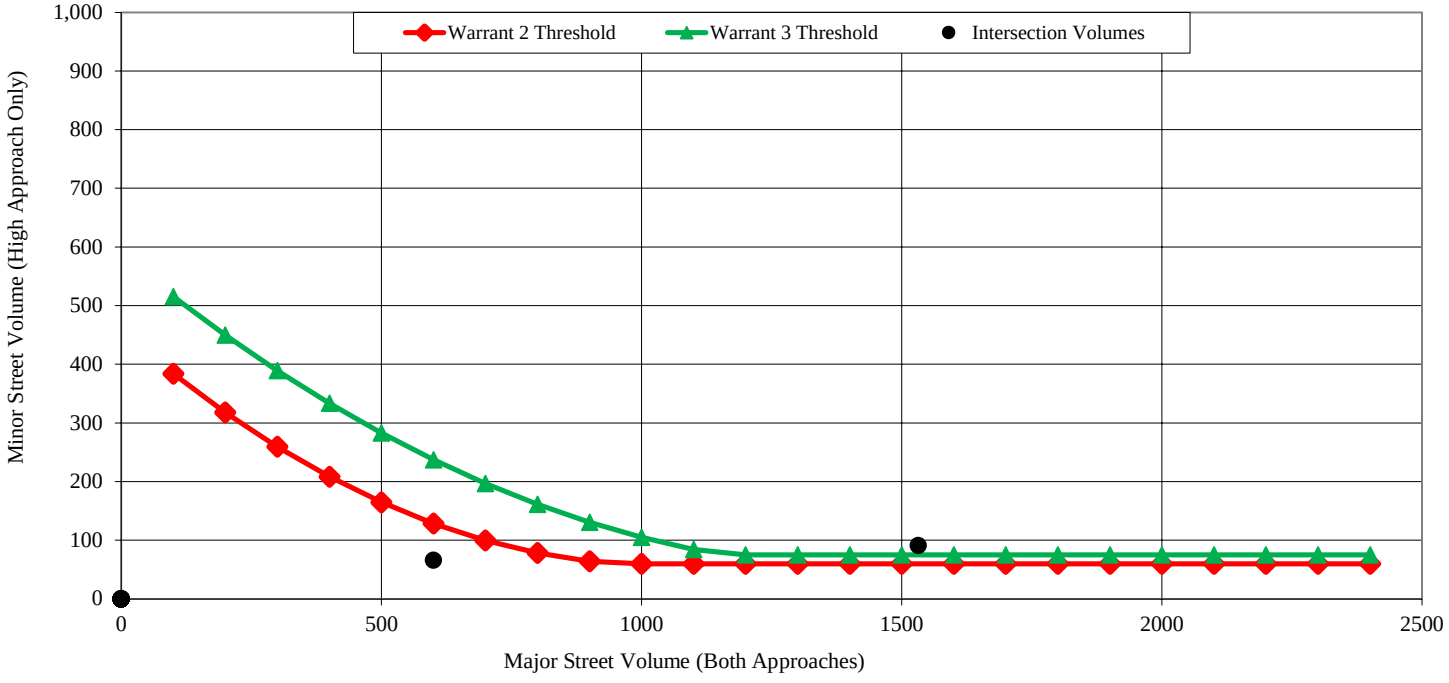
Warrant 1, Eight Hour Vehicular Volume			
	Condition A	Condition B	Condition A+B*
Condition Satisfied?	Not Satisfied	Not Satisfied	Not Satisfied
Required values reached for	0 hours	1 hour	1 (Cond. A) & 2 (Cond. B)
Criteria - Major Street (veh/hr)	420	630	336 (Cond. A) & 504 (Cond. B)
Criteria - Minor Street (veh/hr)	105	53	84 (Cond. A) & 42 (Cond. B)

* Should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

Warrant 2, Four Hour Vehicular Volume	
Condition Satisfied?	Not Satisfied
Required values reached for	1 hour
Criteria	See Figure Below

Warrant 3, Peak Hour Vehicular Volume		
	Condition A	Condition B
Condition Satisfied?	Not Satisfied	Satisfied
Required values reached for	1623 total, 91 minor, 0 delay	1 hour
Criteria - Total Approach Volume (veh in one hour)	650	See Figure Below
Criteria - Minor Street High Side Volume (veh in one hour)	100	
Criteria - Minor Street High Side Delay (veh-hrs)	4	

Figure 4C-2 (Warrant 2 - 70% Factor) & Figure 4C-4 (Warrant 3 - 70% Factor)



Traffic Signal Warrant Analysis

Warrants 1 - 3 (Volume Warrants)

Project Name	Harris Creek Farm
Project/File #	20498 - 09
Scenario	2027 No-Build

Intersection Information			
Major Street (E/W Road)	US 401 Bypass	Minor Street (N/S Road)	Eastern U-Turn Location
Analyzed with	2 or more approach lanes	Analyzed with	1 Approach Lane
Total Approach Volume	2792 vehicles	Total Approach Volume	408 vehicles
Total Ped/Bike Volume	0 crossings	Total Ped/Bike Volume	0 crossings
Right turn reduction of	0 percent applied	Right turn reduction of	0 percent applied

No high speed or isolated community reduction applied to the Volume Warrant thresholds.

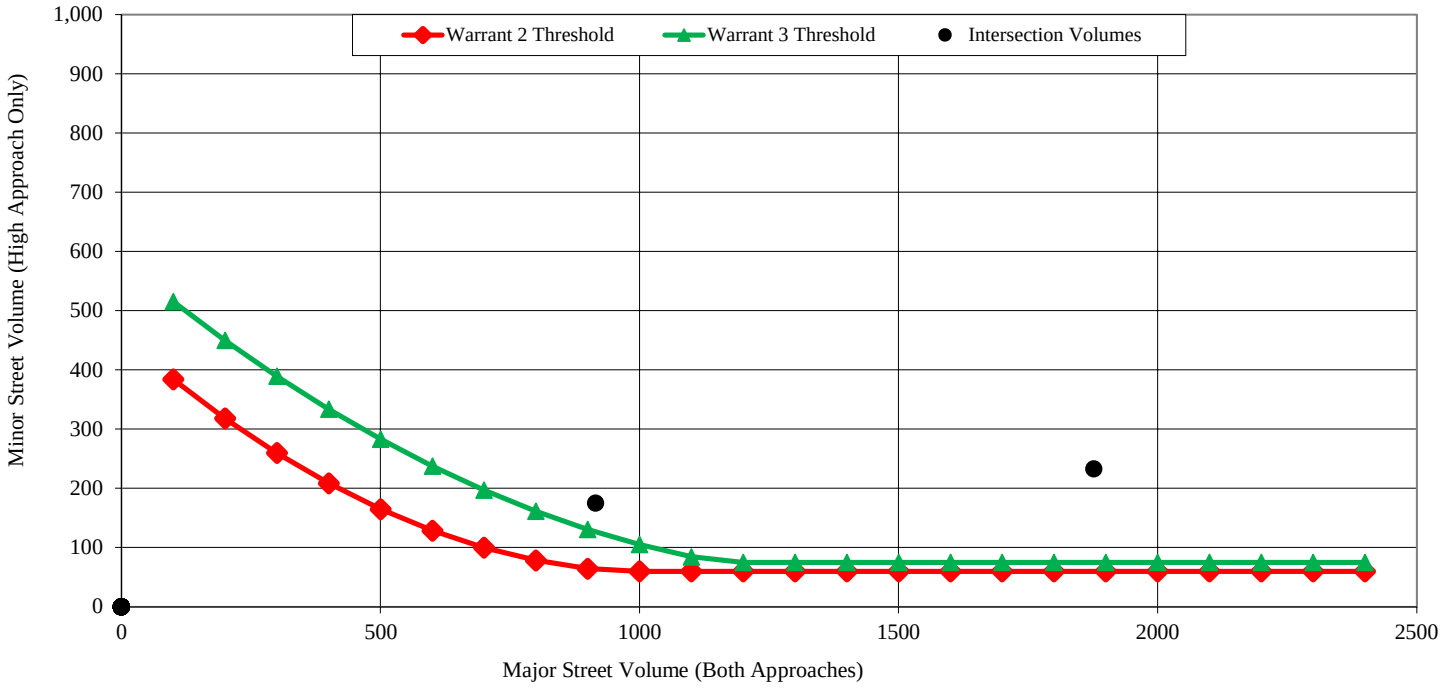
Warrant 1, Eight Hour Vehicular Volume			
	Condition A	Condition B	Condition A+B*
Condition Satisfied?	Not Satisfied	Not Satisfied	Not Satisfied
Required values reached for	2 hours	2 hours	2 (Cond. A) & 2 (Cond. B)
Criteria - Major Street (veh/hr)	420	630	336 (Cond. A) & 504 (Cond. B)
Criteria - Minor Street (veh/hr)	105	53	84 (Cond. A) & 42 (Cond. B)

* Should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

Warrant 2, Four Hour Vehicular Volume	
Condition Satisfied?	Not Satisfied
Required values reached for	2 hours
Criteria	See Figure Below

Warrant 3, Peak Hour Vehicular Volume		
	Condition A	Condition B
Condition Satisfied?	Not Satisfied	Satisfied
Required values reached for	2110 total, 233 minor, 0 delay	2 hours
Criteria - Total Approach Volume (veh in one hour)	650	See Figure Below
Criteria - Minor Street High Side Volume (veh in one hour)	100	
Criteria - Minor Street High Side Delay (veh-hrs)	4	

Figure 4C-2 (Warrant 2 - 70% Factor) & Figure 4C-4 (Warrant 3 - 70% Factor)



Traffic Signal Warrant Analysis

Warrants 1 - 3 (Volume Warrants)

Project Name	Harris Creek Farm
Project/File #	20498 - 09
Scenario	2027 Build

Intersection Information			
Major Street (E/W Road)	US 401 Bypass	Minor Street (N/S Road)	Eastern U-Turn Location
Analyzed with	2 or more approach lanes	Analyzed with	1 Approach Lane
Total Approach Volume	2806 vehicles	Total Approach Volume	441 vehicles
Total Ped/Bike Volume	0 crossings	Total Ped/Bike Volume	0 crossings
Right turn reduction of	0 percent applied	Right turn reduction of	0 percent applied

No high speed or isolated community reduction applied to the Volume Warrant thresholds.

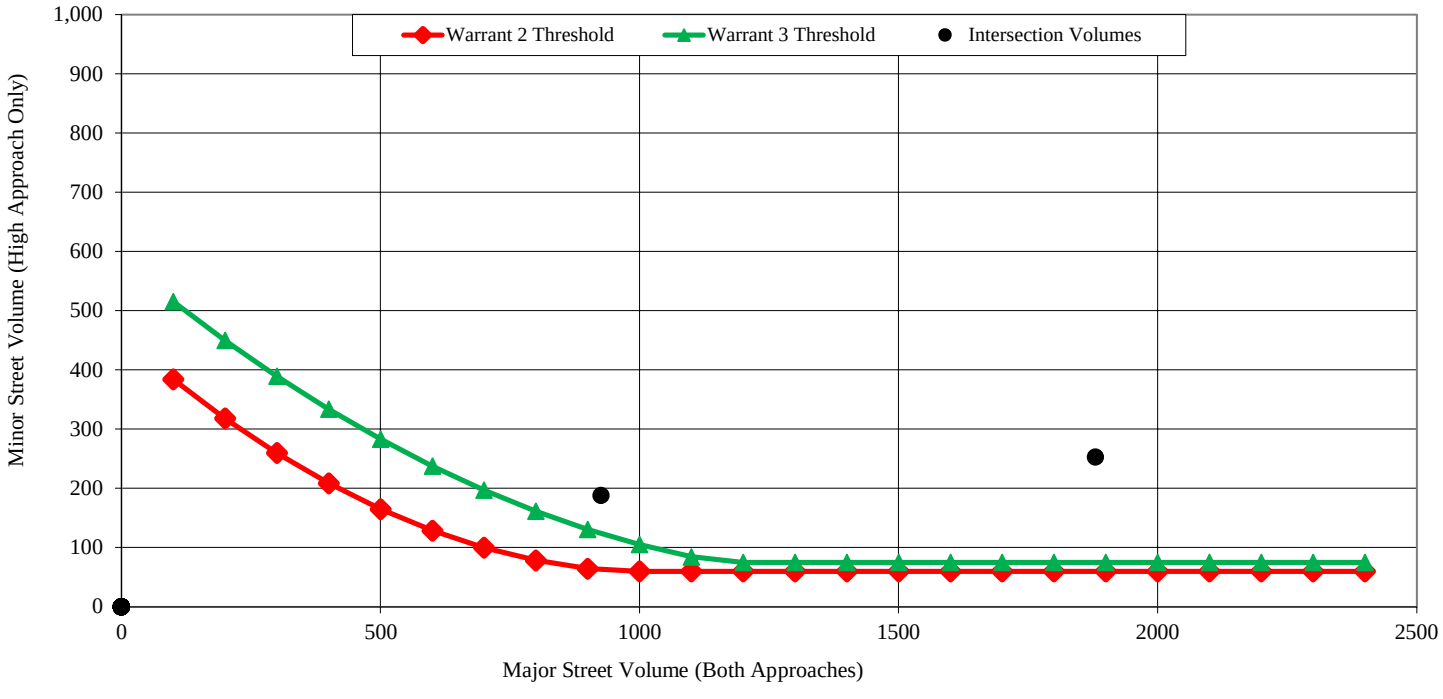
Warrant 1, Eight Hour Vehicular Volume			
	Condition A	Condition B	Condition A+B*
Condition Satisfied?	Not Satisfied	Not Satisfied	Not Satisfied
Required values reached for	2 hours	2 hours	2 (Cond. A) & 2 (Cond. B)
Criteria - Major Street (veh/hr)	420	630	336 (Cond. A) & 504 (Cond. B)
Criteria - Minor Street (veh/hr)	105	53	84 (Cond. A) & 42 (Cond. B)

* Should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

Warrant 2, Four Hour Vehicular Volume	
Condition Satisfied?	Not Satisfied
Required values reached for	2 hours
Criteria	See Figure Below

Warrant 3, Peak Hour Vehicular Volume		
	Condition A	Condition B
Condition Satisfied?	Not Satisfied	Satisfied
Required values reached for	2133 total, 253 minor, 0 delay	2 hours
Criteria - Total Approach Volume (veh in one hour)	650	See Figure Below
Criteria - Minor Street High Side Volume (veh in one hour)	100	
Criteria - Minor Street High Side Delay (veh-hrs)	4	

Figure 4C-2 (Warrant 2 - 70% Factor) & Figure 4C-4 (Warrant 3 - 70% Factor)



Traffic Signal Warrant Analysis

Warrants 1 - 3 (Volume Warrants)

Project Name	Harris Creek Farm
Project/File #	20498 - 09
Scenario	2022 Existing

Intersection Information			
Major Street (E/W Road)	Mitchell Mill Road	Minor Street (N/S Road)	Jonesville Road
Analyzed with	1 approach lane	Analyzed with	1 Approach Lane
Total Approach Volume	1031 vehicles	Total Approach Volume	469 vehicles
Total Ped/Bike Volume	0 crossings	Total Ped/Bike Volume	0 crossings
Right turn reduction of	0 percent applied	Right turn reduction of	0 percent applied

No high speed or isolated community reduction applied to the Volume Warrant thresholds.

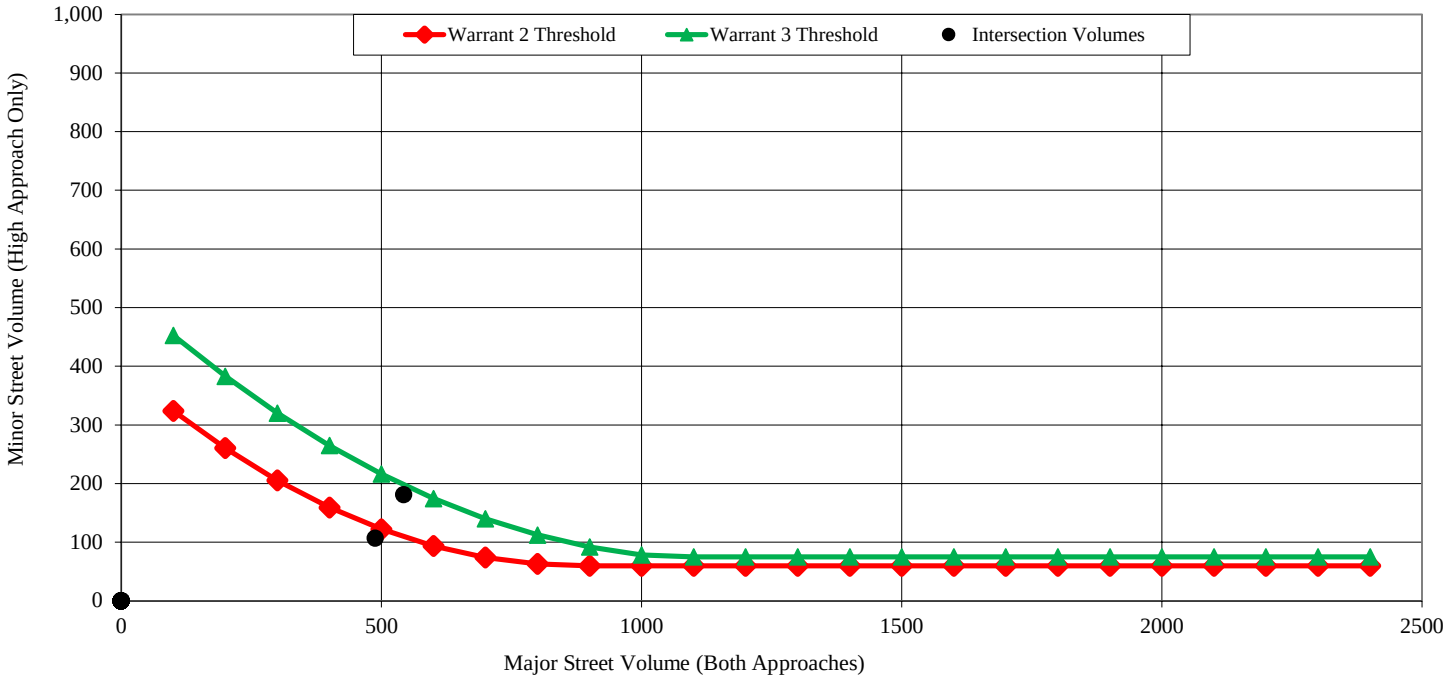
Warrant 1, Eight Hour Vehicular Volume			
	Condition A	Condition B	Condition A+B*
Condition Satisfied?	Not Satisfied	Not Satisfied	Not Satisfied
Required values reached for	2 hours	1 hour	2 (Cond. A) & 2 (Cond. B)
Criteria - Major Street (veh/hr)	350	525	280 (Cond. A) & 420 (Cond. B)
Criteria - Minor Street (veh/hr)	105	53	84 (Cond. A) & 42 (Cond. B)

* Should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

Warrant 2, Four Hour Vehicular Volume	
Condition Satisfied?	Not Satisfied
Required values reached for	1 hour
Criteria	See Figure Below

Warrant 3, Peak Hour Vehicular Volume		
	Condition A	Condition B
Condition Satisfied?	Not Satisfied	Not Satisfied
Required values reached for	817 total, 181 minor, 0 delay	0 hours
Criteria - Total Approach Volume (veh in one hour)	800	See Figure Below
Criteria - Minor Street High Side Volume (veh in one hour)	100	
Criteria - Minor Street High Side Delay (veh-hrs)	4	

Figure 4C-2 (Warrant 2 - 70% Factor) & Figure 4C-4 (Warrant 3 - 70% Factor)



Traffic Signal Warrant Analysis

Warrants 1 - 3 (Volume Warrants)

Project Name	Harris Creek Farm
Project/File #	20498 - 09
Scenario	2027 No-Build

Intersection Information			
Major Street (E/W Road)	Mitchell Mill Road	Minor Street (N/S Road)	Jonesville Road
Analyzed with	1 approach lane	Analyzed with	1 Approach Lane
Total Approach Volume	2171 vehicles	Total Approach Volume	818 vehicles
Total Ped/Bike Volume	0 crossings	Total Ped/Bike Volume	0 crossings
Right turn reduction of	0 percent applied	Right turn reduction of	0 percent applied

No high speed or isolated community reduction applied to the Volume Warrant thresholds.

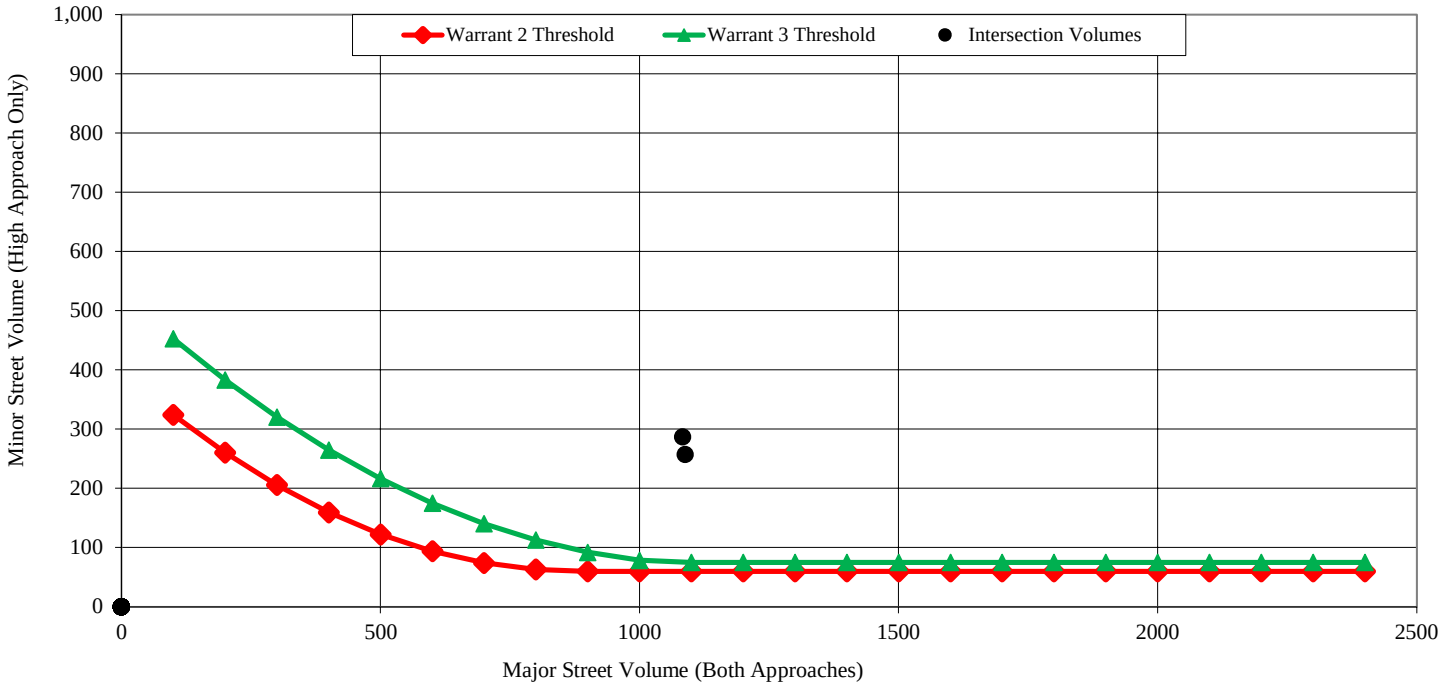
Warrant 1, Eight Hour Vehicular Volume			
	Condition A	Condition B	Condition A+B*
Condition Satisfied?	Not Satisfied	Not Satisfied	Not Satisfied
Required values reached for	2 hours	2 hours	2 (Cond. A) & 2 (Cond. B)
Criteria - Major Street (veh/hr)	350	525	280 (Cond. A) & 420 (Cond. B)
Criteria - Minor Street (veh/hr)	105	53	84 (Cond. A) & 42 (Cond. B)

* Should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

Warrant 2, Four Hour Vehicular Volume	
Condition Satisfied?	Not Satisfied
Required values reached for	2 hours
Criteria	See Figure Below

Warrant 3, Peak Hour Vehicular Volume		
	Condition A	Condition B
Condition Satisfied?	Not Satisfied	Satisfied
Required values reached for	1488 total, 287 minor, 0 delay	2 hours
Criteria - Total Approach Volume (veh in one hour)	800	See Figure Below
Criteria - Minor Street High Side Volume (veh in one hour)	100	
Criteria - Minor Street High Side Delay (veh-hrs)	4	

Figure 4C-2 (Warrant 2 - 70% Factor) & Figure 4C-4 (Warrant 3 - 70% Factor)



Traffic Signal Warrant Analysis

Warrants 1 - 3 (Volume Warrants)

Project Name	Harris Creek Farm
Project/File #	20498 - 09
Scenario	2027 Build

Intersection Information			
Major Street (E/W Road)	Mitchell Mill Road	Minor Street (N/S Road)	Jonesville Road
Analyzed with	1 approach lane	Analyzed with	1 Approach Lane
Total Approach Volume	2212 vehicles	Total Approach Volume	887 vehicles
Total Ped/Bike Volume	0 crossings	Total Ped/Bike Volume	0 crossings
Right turn reduction of	0 percent applied	Right turn reduction of	0 percent applied

No high speed or isolated community reduction applied to the Volume Warrant thresholds.

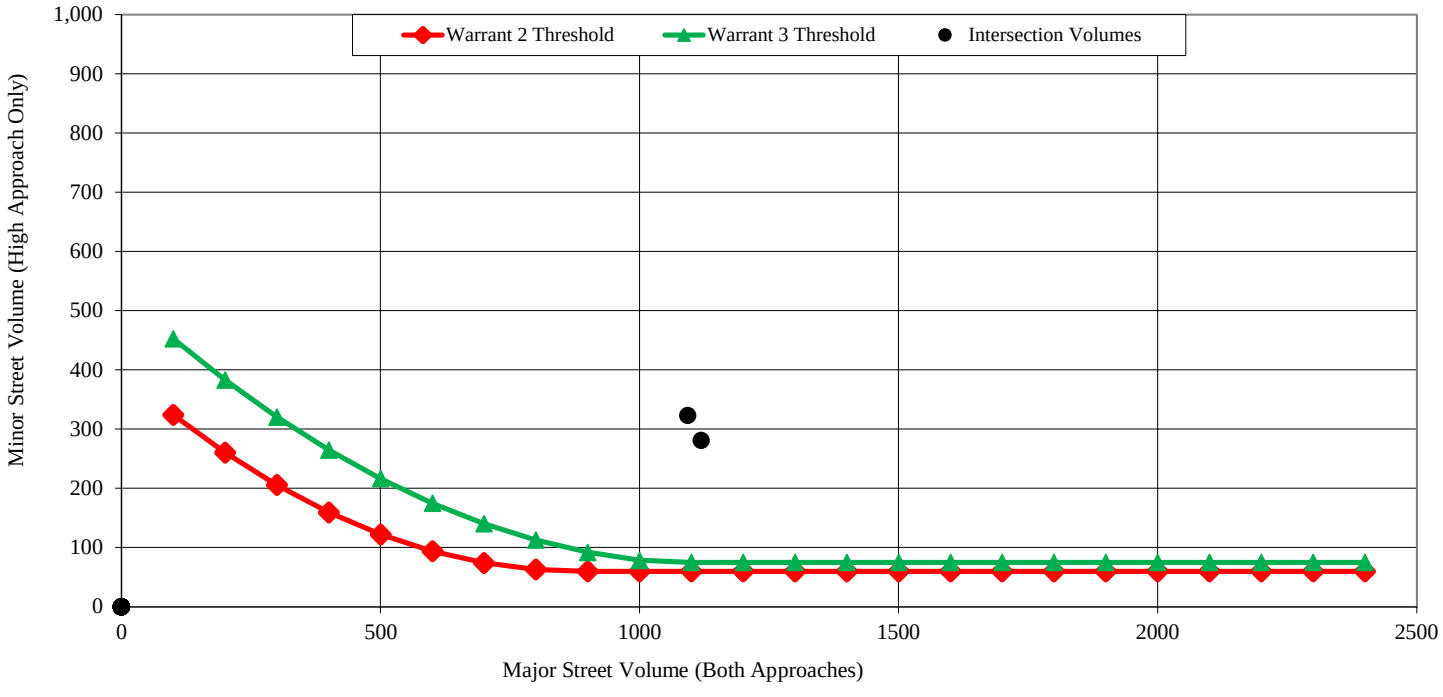
Warrant 1, Eight Hour Vehicular Volume			
	Condition A	Condition B	Condition A+B*
Condition Satisfied?	Not Satisfied	Not Satisfied	Not Satisfied
Required values reached for	2 hours	2 hours	2 (Cond. A) & 2 (Cond. B)
Criteria - Major Street (veh/hr)	350	525	280 (Cond. A) & 420 (Cond. B)
Criteria - Minor Street (veh/hr)	105	53	84 (Cond. A) & 42 (Cond. B)

* Should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

Warrant 2, Four Hour Vehicular Volume	
Condition Satisfied?	Not Satisfied
Required values reached for	2 hours
Criteria	See Figure Below

Warrant 3, Peak Hour Vehicular Volume		
	Condition A	Condition B
Condition Satisfied?	Not Satisfied	Satisfied
Required values reached for	1536 total, 323 minor, 0 delay	2 hours
Criteria - Total Approach Volume (veh in one hour)	800	See Figure Below
Criteria - Minor Street High Side Volume (veh in one hour)	100	
Criteria - Minor Street High Side Delay (veh-hrs)	4	

Figure 4C-2 (Warrant 2 - 70% Factor) & Figure 4C-4 (Warrant 3 - 70% Factor)



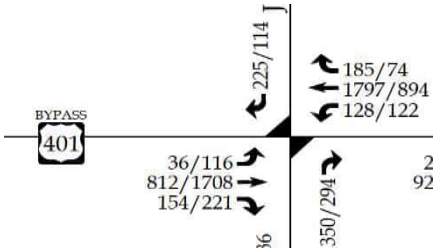
US 401 Bypass & Jonesville Road [Minor-Street Right-Turn] **[No-Build]**

AM Peak Hour				
vph	g/c	a	b	c
720	0.7	0.00004	0.0108	0.2587
812	0.7	3.5E-05	0.010033	0.310936
900	0.7	0.00003	0.0093	0.3609

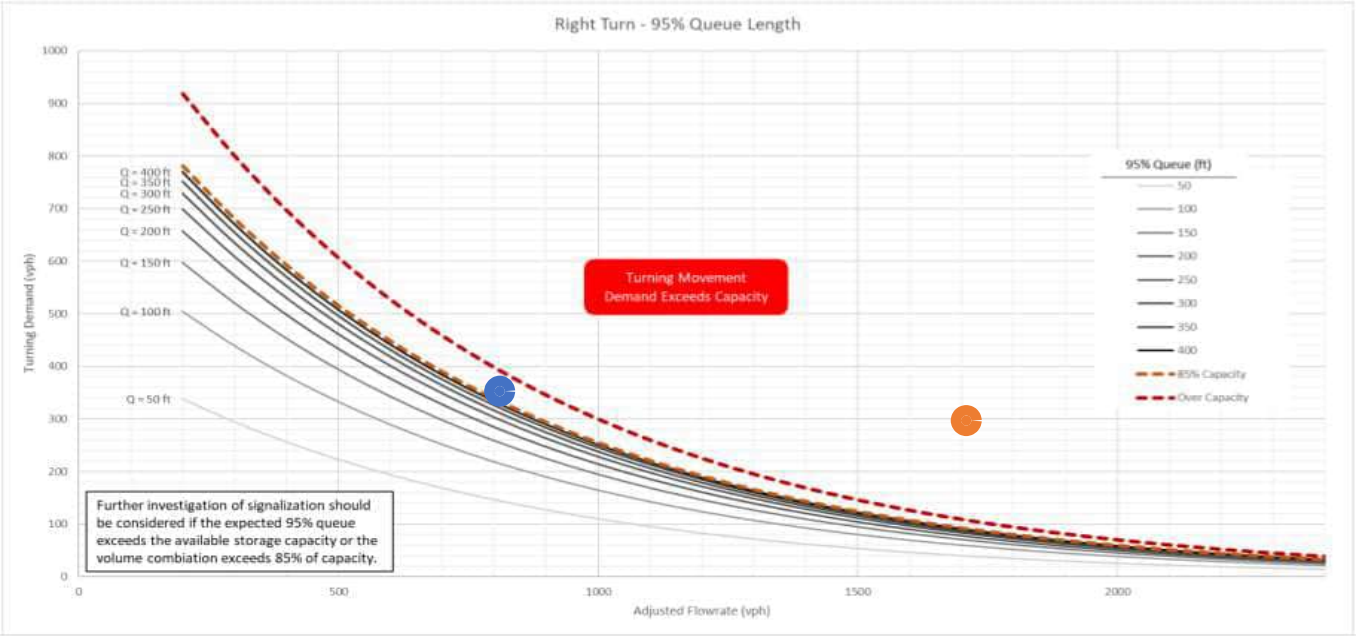
CVAF	1
Conflicting Volume (vph)	812
Adjusted Conflicting (vph)	812
Turning Volume (vph)	350

PM Peak Hour				
vph	g/c	a	b	c
1620	0.7	0.00004	0.0108	0.2587
1708	0.7	3.5E-05	0.010067	0.308664
1800	0.7	0.00003	0.0093	0.3609

CVAF	1
Conflicting Volume (vph)	1708
Adjusted Conflicting (vph)	1708
Turning Volume (vph)	294



Distance to Upstream Signal	8800	ft
Posted Speed Limit	55	mph
Travel Time	109.09	s



US 401 Bypass & Jonesville Road [Minor-Street Right-Turn] **[Build]**

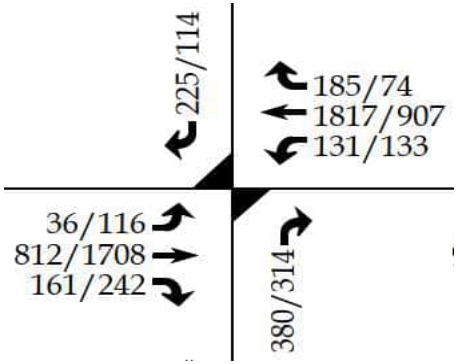
AM Peak Hour				
vph	g/c	a	b	c
720	0.7	0.00004	0.0108	0.2587
812	0.7	3.5E-05	0.010033	0.310936
900	0.7	0.00003	0.0093	0.3609

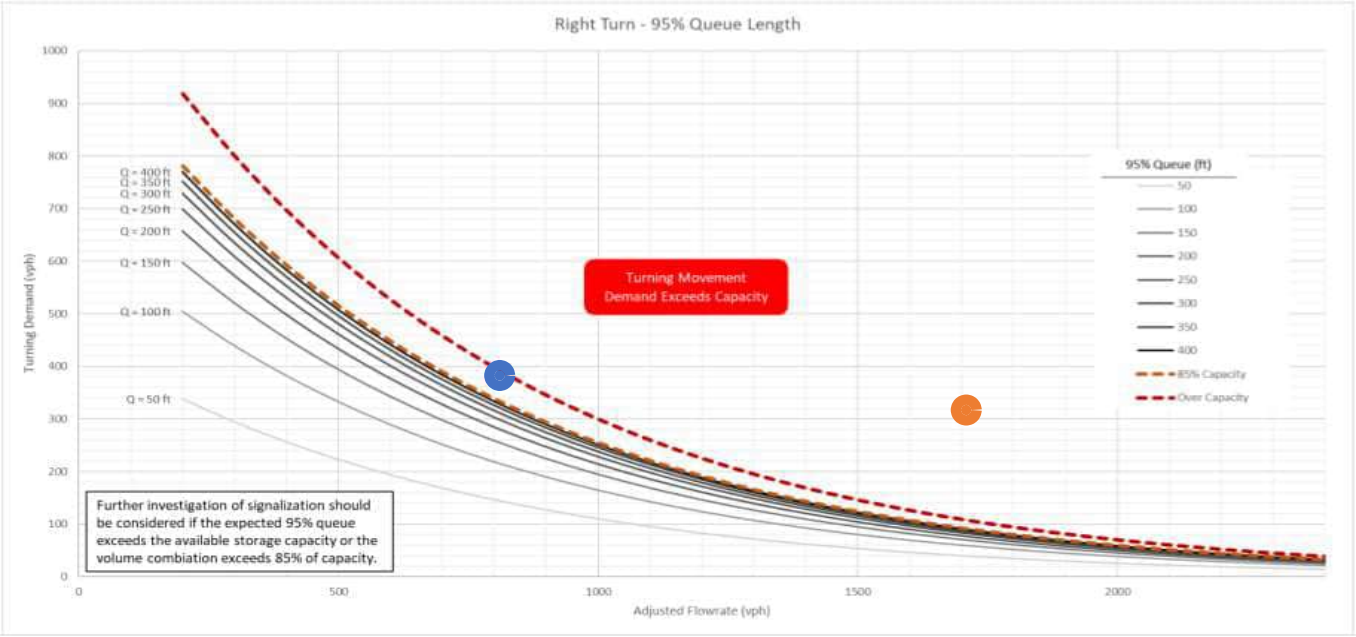
CVAF	1
Conflicting Volume (vph)	812
Adjusted Conflicting (vph)	812
Turning Volume (vph)	380

PM Peak Hour				
vph	g/c	a	b	c
1620	0.7	0.00004	0.0108	0.2587
1708	0.7	3.5E-05	0.010067	0.308664
1800	0.7	0.00003	0.0093	0.3609

CVAF	1
Conflicting Volume (vph)	1708
Adjusted Conflicting (vph)	1708
Turning Volume (vph)	314

Distance to Upstream Signal	8800	ft
Posted Speed Limit	55	mph
Travel Time	109.09	s





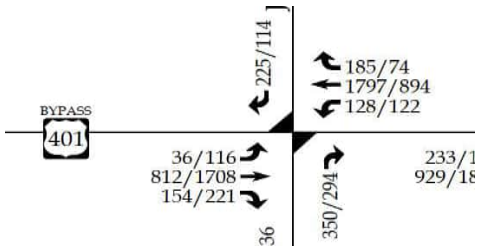
US 401 Bypass & Jonesville Road [Major-Street Left-Turn] **[No-Build]**

AM Peak Hour				
vph	g/c	a	b	c
900	0.7	0.00004	0.0097	0.4284
966	0.7	4.0E-05	0.00915	0.46261
1080	0.7	0.00004	0.0082	0.5217

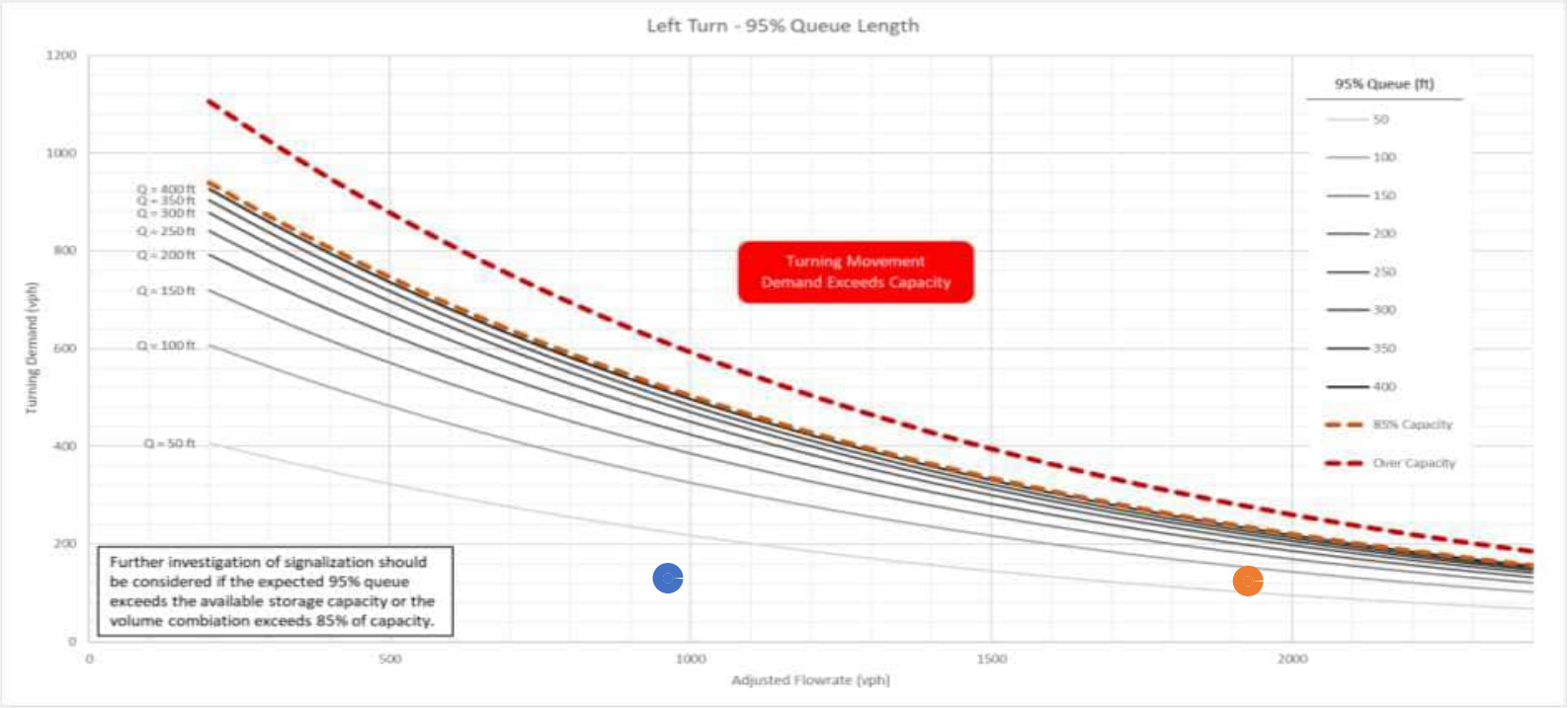
CVAF	1
Conflicting Volume (vph)	966
Adjusted Conflicting (vph)	966
Turning Volume (vph)	128

PM Peak Hour				
vph	g/c	a	b	c
1800	0.7	0.00004	0.0097	0.4284
1929	0.7	4.0E-05	0.008625	0.495265
1980	0.7	0.00004	0.0082	0.5217

CVAF	1
Conflicting Volume (vph)	1929
Adjusted Conflicting (vph)	1929
Turning Volume (vph)	122



Distance to Upstream Signal	8800	ft
Posted Speed Limit	55	mph
Travel Time	109.09	s



US 401 Bypass & Jonesville Road [Major-Street Left-Turn] **[Build]**

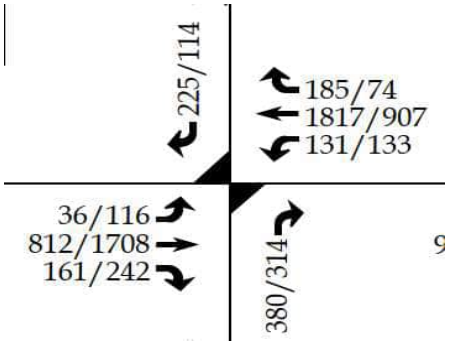
AM Peak Hour				
vph	g/c	a	b	c
900	0.7	0.00004	0.0097	0.4284
973	0.7	4.0E-05	0.009092	0.466238
1080	0.7	0.00004	0.0082	0.5217

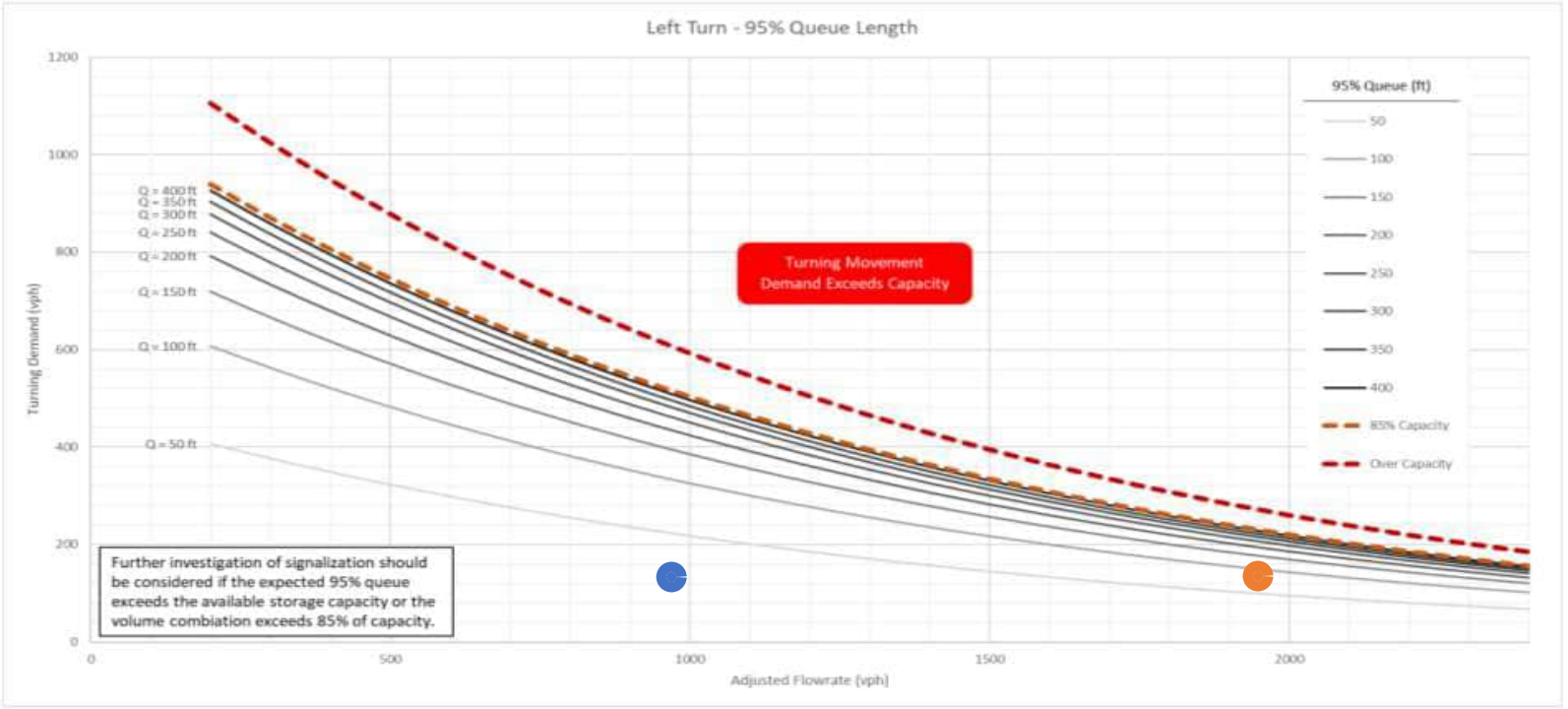
PM Peak Hour				
vph	g/c	a	b	c
1800	0.7	0.00004	0.0097	0.4284
1950	0.7	4.0E-05	0.00845	0.50615
1980	0.7	0.00004	0.0082	0.5217

Distance to Upstream Signal	8800	ft
Posted Speed Limit	55	mph
Travel Time	109.09	s

CVAF	1
Conflicting Volume (vph)	973
Adjusted Conflicting (vph)	973
Turning Volume (vph)	131

CVAF	1
Conflicting Volume (vph)	1950
Adjusted Conflicting (vph)	1950
Turning Volume (vph)	133





US 401 Bypass & Eastern U-Turn Location [Major-Street U-Turn] **[No-Build]**

AM Peak Hour				
vph	g/c	a	b	c
1800	0.7	0.00003	0.0072	0.5106
1877	0.7	3.0E-05	0.007114	0.522064
1980	0.7	0.00003	0.007	0.5374

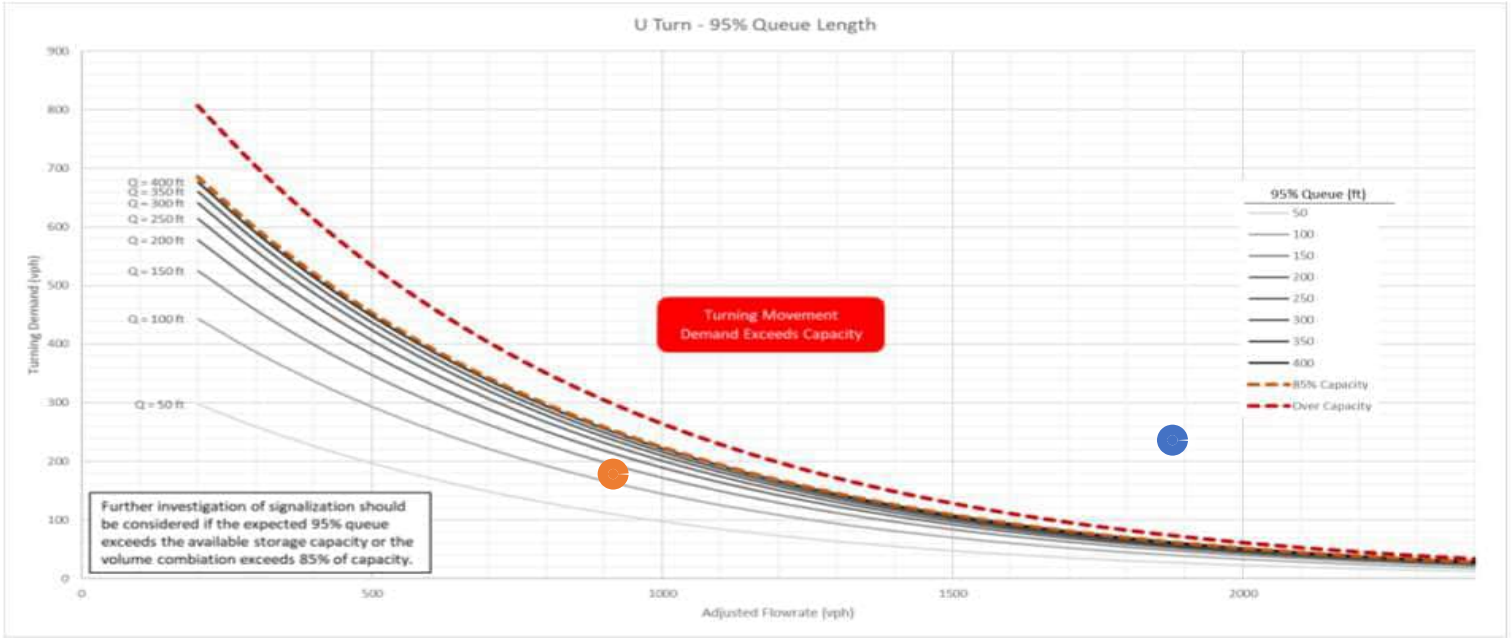
CVAF	1
Conflicting Volume (vph)	1877
Adjusted Conflicting (vph)	1877
Turning Volume (vph)	233

894
22
1877/915
233/175
929/1827

PM Peak Hour				
vph	g/c	a	b	c
900	0.7	0.00003	0.0072	0.5106
915	0.7	3.0E-05	0.007183	0.512833
1080	0.7	0.00003	0.007	0.5374

CVAF	1
Conflicting Volume (vph)	915
Adjusted Conflicting (vph)	915
Turning Volume (vph)	175

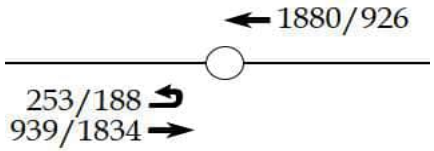
Distance to Upstream Signal	10000	ft
Posted Speed Limit	55	mph
Travel Time	123.97	s



US 401 Bypass & Eastern U-Turn Location [Major-Street U-Turn] **[Build]**

AM Peak Hour				
vph	g/c	a	b	c
1800	0.7	0.00003	0.0072	0.5106
1880	0.7	3.0E-05	0.007111	0.522511
1980	0.7	0.00003	0.007	0.5374

CVAF	1
Conflicting Volume (vph)	1880
Adjusted Conflicting (vph)	1880
Turning Volume (vph)	253



PM Peak Hour				
vph	g/c	a	b	c
900	0.7	0.00003	0.0072	0.5106
926	0.7	3.0E-05	0.007171	0.514471
1080	0.7	0.00003	0.007	0.5374

CVAF	1
Conflicting Volume (vph)	926
Adjusted Conflicting (vph)	926
Turning Volume (vph)	188

Distance to Upstream Signal	10000	ft
Posted Speed Limit	55	mph
Travel Time	123.97	s