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

To: Board of Commissioners
Planning Board

From: Randy Hawkins, Zoning Administrator

Date: October 11, 2019

Re: CUP #412
Circle K Stores, Inc.
Parcel ID# 02472, 02475 and 57407

The following information is for use by the Lincoln County Board of Commissioners and Planning Board at their joint meeting/public hearing on November 4, 2019.

REQUEST

The applicant is requesting a conditional use permit to allow a gas station/convenience store with an automatic car wash in the B-N (Neighborhood Business) district in the Eastern Lincoln Development District (ELDD). A portion of the proposed site is zoned B-G (General Business). A gas station/convenience store and a car wash are conditional uses in the B-N district and in the ELDD and permitted uses in the B-G district. A site plan and a traffic impact analysis have been submitted as part of the application. The site plan and traffic study take into account NCDOT's planned improvements to the intersection where the site is located.

SITE AREA AND DESCRIPTION

The proposed 2.35-acre site is located on the northeast corner of N.C. 16 Business and Unity Church Road. It is adjoined by property zoned B-G, B-N, I-G (General Industrial) and R-SF (Residential Single-Family. Land uses in this area include business, industrial and residential. The subject property is part of an area designated by the Land Use Plan as a Suburban Commercial Center, suitable for general commercial services.

County Of Lincoln, North Carolina

Planning Board

Applicant **Circle K Stores, Inc.** Application No. **CUP #412**

Parcel ID# **02472, 02475 and 57407** Zoning District **B-N, B-G, ELDD**

Proposed Conditional Uses **gas station/convenience store with automatic car wash**

FINDINGS OF FACT

1. The use will not materially endanger the public health or safety if located where proposed and developed according to plan. YES_____ NO_____

   FACTUAL REASONS CITED: _____
   _____
   _____

2. The use meets all required conditions and specifications. YES _____ NO _____

   FACTUAL REASONS CITED: _____
   _____
   _____

3. The use will not substantially injure the value of adjoining or abutting property unless the use is a public necessity. YES _____ NO _____

   FACTUAL REASONS CITED: _____
   _____
   _____

4. The location and character of use, if developed according to the plan as submitted and approved, will be in harmony with the area in which it is to be located and will be in general conformity with the Land Use Plan for the area in question. YES _____ NO _____

   FACTUAL REASONS CITED: _____
   _____
   _____

After having held a Public Hearing on _____ and in light of the Findings of Facts listed herein, the following action was taken by the Lincoln County Planning Board:

_____
_____

In recommending such Conditional Use, the following conditions were recommended by the Lincoln County Planning Board:

_____
_____

Conditional Use Permit Application

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

PART I

Applicant Name Circle K Stores Inc.

Applicant Address 2550 W. Tyvola Road, Suite 200, Charlotte, NC 28217

Applicant Phone Number (478) 494-1828

Property Owner Name Statesville Road Land Company LLC

Property Owner Address 8430 Double Eagle Gate Way, Charlotte NC 28210

Property Owner Phone Number 704-756-6963

PART II

Property Location NE corner NC 16 Business and Unity Church Road

Property ID (10 digits) 4603750889, 4603657556, 6603656377 Property size 4.987 ac, 1.526 ac, .336 ac (total 6.849 ac)

Parcel # (5 digits) 02472, 02475, 57407 Deed Book(s) 2630 Page(s) 357

PART III

Existing Zoning District ELDD B-N, ELDD B-G, ELDD B-G

Briefly describe how the property is being used and any existing structures.
Currently these properties are vacant.

Briefly explain the proposed use and/or structure which would require a Conditional Use Permit.
Gas station with convenience retail.

APPLICATION FEE (less than 2 acres $250, 2+ acres $500)
MUST BE RECEIVED BEFORE PROCESSING.

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

Applicant's Signature 8/19/19 Date

APPLICANT'S PROPOSED FINDINGS OF FACT

Application No. **CUP #412** Applicant **Circle K Stores Inc.**

Property Location **NE corner NC 16 Business and Unity Church Road**

Parcel ID# **02472, 02475, 57407** Zoning District **ELDD, B-N**

Proposed Conditional Use **Gas Station with Convenience Retail**

PROPOSED FINDINGS

1. The use will not materially endanger the public health of safety if located where proposed and developed according to plan.

   The proposed development will meet all applicable stormwater, sedimentation control and environmental regulations, and the underground fuel tanks will comply with all applicable regulations so that the proposed development will not materially endanger the public health and safety from a stormwater or environmental standpoint.

   Regarding access to the site, the access point on N.C. Highway 16 Business will restrict the left-out movement. This left-out movement is typically the most dangerous movement associated with an access and will cause the most delay and stacking interior to the site. Additionally, to alleviate delays in the through travel lanes, a right-turn lane into the site will be provided at this access as well as a dedicated left-turn lane into the site. Access to the site on Unity Church Road will be provided by a right-in, right-out access approximately 400 feet east of the intersection and a full-movement access further east on Unity Church Road approximately 800 feet east of the intersection. A full-movement access on Unity Church Road will allow a left-in and left-out of the site on Unity Church Road; this access is further east on Unity Church Road to allow for safer turning movements. Due to planned improvements at this intersection, these access points were identified through collaboration with the North Carolina Department of Transportation, the County, and the Applicant's traffic engineers. The Applicant's Traffic Impact Analysis of these access points has determined that the proposed development will generate only a minor amount of new daily vehicular trips on adjacent and nearby roadways and the study intersection. Therefore, the proposed development will not materially endanger the public health and safety from a transportation and traffic standpoint.

2. The use meets all required conditions and specifications.

   The site consists of three parcels. All three parcels are located in the East Lincoln Development District (ELDD) overlay district. In addition, one parcel is zoned Neighborhood Business (B-N). The proposed development, which is gas station with convenience retail, is a use permitted in both the ELDD and B-N districts upon issuance of a conditional use permit by

the Board of Commissioners. The Applicant's site plan complies with all applicable regulations, standards, conditions and provisions of the Unified Development Ordinance.

3. The use will not substantially injure the value of adjoining or abutting property unless the use is a public necessity.

   The proposed development will not substantially injure the value of adjoining or abutting property. Similar uses are currently in operation at this intersection, as well as additional commercial businesses. Most of the parcels in this vicinity are zoned as business districts.

4. The location and character of use, if developed according to the plan as submitted and approved, will be in harmony with the area in which it is to be located and will be in general conformity with the Land Use Plan for the area in question.

   The site is located on a minor arterial (N.C. Highway 16 Business) in an existing commercial area. The site is part of an area designated by the Land Use Plan as Suburban Commercial Center which is intended to serve the daily needs of surrounding residential neighborhoods. General commercial services is listed as a primary land use in the Suburban Commercial Center; therefore, the proposed development, if developed in accordance with the site plan submitted, will be in harmony with the area in which it is to be located and it will be in general conformity with the Land Use Plan for the area.

Lincoln County, NC

Office of the Tax Administrator, GIS Mapping Division

Date: 9/25/2019 Scale: 1 Inch = 200 Feet

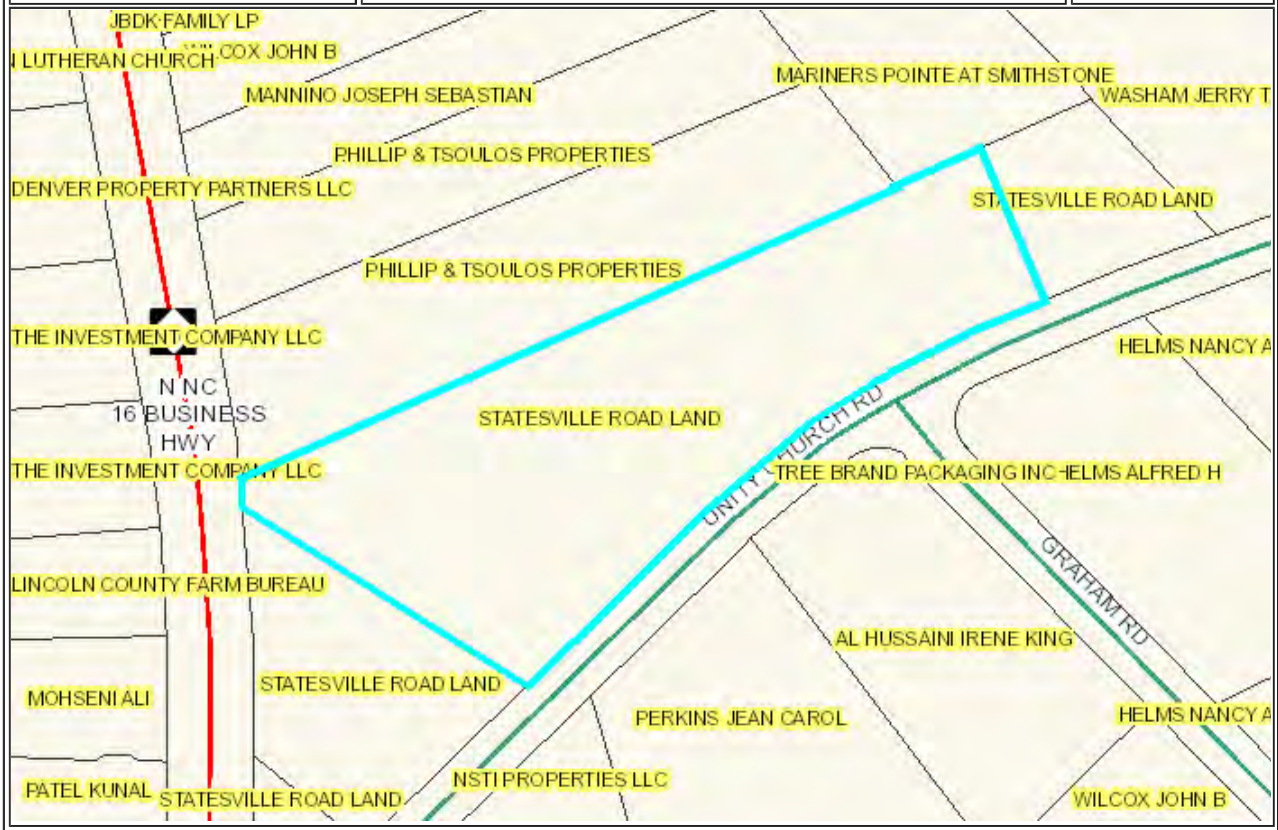


Photo Not Available

Parcel ID	02472	**Owner**	STATESVILLE ROAD LAND COMPANY LLC		
Map	4603	**Mailing**	ATTN: JAMES S KING 8430 DOUBLE EAGLE GATE WAY		
Account	0256864	**Address**	CHARLOTTE, NC 28210		
Deed	2630 357	**Last Transaction Date**	11/28/2016	**Sale Price**	$1,846,000
Plat		**Subdivision**		**Lot**	
Land Value	$359,220	**Improvement Value**	$0	**Total Value**	$359,220
Previous Parcel					

-----All values for Tax Year 2019 -----

Description	S J KING LAND			**Deed Acres**	5.24
Address	UNITY CHURCH RD			**Tax Acres**	4.987
Township	CATAWBA SPRINGS		**Tax/Fire District**	EAST LINCOLN	
Main Improvement				**Value**	
Main Sq Feet		**Stories**		**Year Built**	

Zoning District	Calc Acres	Voting Precinct	Calc Acres
B-N	4.99	WP32	4.99

Watershed		Sewer District	
	3.85	SEWER	4.99
	1.14		

Census County	Tract	Block	
109	071202	1018	4.99

Flood	Zone Description	Panel	
X	NO FLOOD HAZARD	3710460300	4.99

Lincoln County, NC

Office of the Tax Administrator, GIS Mapping Division

Date: 9/25/2019 Scale: 1 Inch = 200 Feet

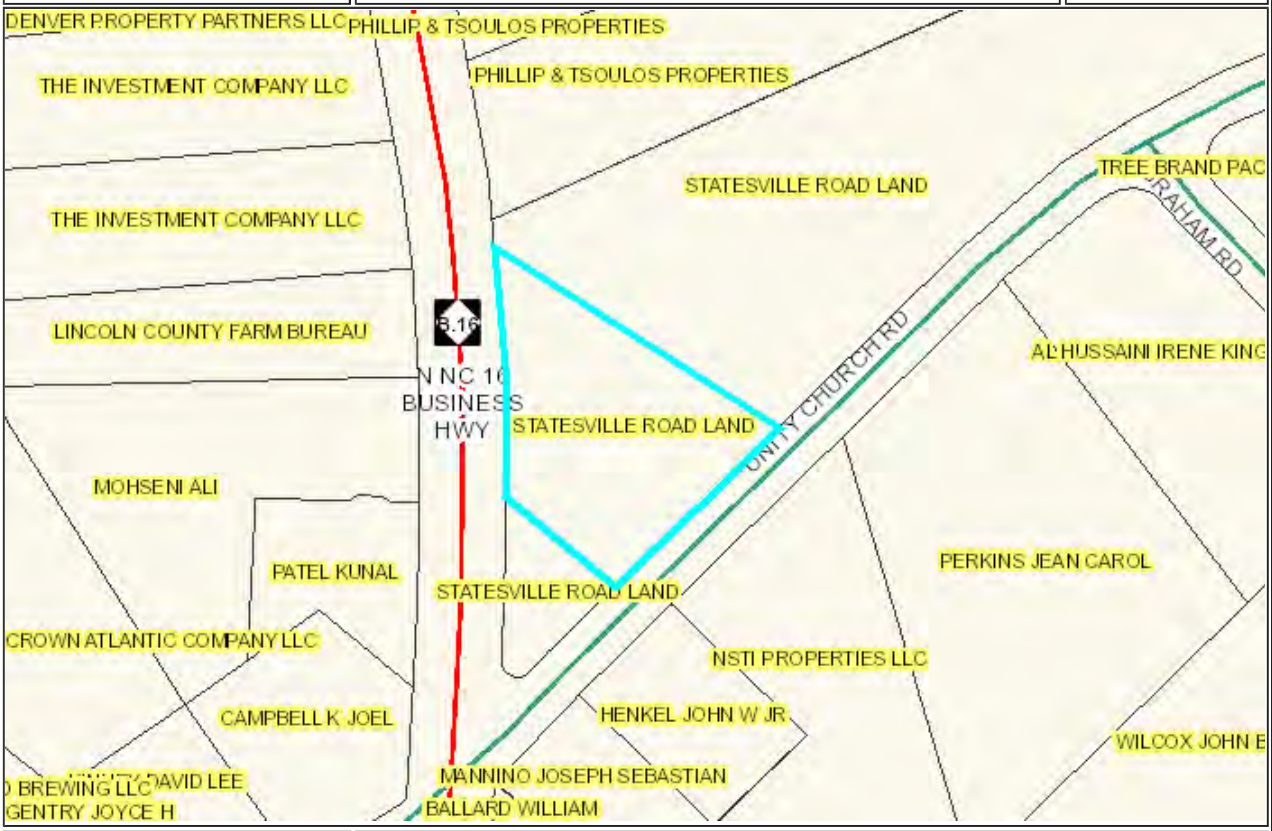


Photo Not Available

Parcel ID	02475	**Owner**	STATESVILLE ROAD LAND COMPANY LLC		
Map	4603	**Mailing**	ATTN: JAMES S KING 8430 DOUBLE EAGLE GATE WAY		
Account	0256864	**Address**	CHARLOTTE, NC 28210		
Deed	2630 357	**Last Transaction Date**	11/28/2016	**Sale Price**	$1,846,000
Plat		**Subdivision**		**Lot**	
Land Value	$435,735	**Improvement Value**	$0	**Total Value**	$435,735
Previous Parcel	02471				

-----All values for Tax Year 2019 -----

Description	2 ACRES UNITY CHURCH RD			**Deed Acres**	2
Address	UNITY CHURCH RD			**Tax Acres**	1.526
Township	CATAWBA SPRINGS		**Tax/Fire District**	EAST LINCOLN	
Main Improvement				**Value**	
Main Sq Feet		**Stories**		**Year Built**	

Zoning District	**Calc Acres**	**Voting Precinct**	**Calc Acres**
B-G	1.53	WP32	1.53

Watershed		**Sewer District**	
	0.02	SEWER	1.53
	1.51		

Census County	**Tract**	**Block**	
109	071202	1018	1.53

Flood	**Zone Description**	**Panel**	
X	NO FLOOD HAZARD	3710460300	1.53

Lincoln County, NC

Office of the Tax Administrator, GIS Mapping Division

Date: 9/25/2019 Scale: 1 Inch = 200 Feet

Photo Not Available

Parcel ID	57407	**Owner**	STATESVILLE ROAD LAND COMPANY LLC		
Map	4603	**Mailing**	ATTN: JAMES S KING 8430 DOUBLE EAGLE GATE WAY		
Account	0256864	**Address**	CHARLOTTE, NC 28210		
Deed	2630 357	**Last Transaction Date**	11/28/2016	**Sale Price**	$1,846,000
Plat	D 94	**Subdivision**		**Lot**	14
Land Value	$59,875	**Improvement Value**	$0	**Total Value**	$59,875
Previous Parcel					

-----All values for Tax Year 2019 -----

Description	ROBERT NIXON # 14	**Deed Acres**	0.74
Address	UNITY CHURCH RD	**Tax Acres**	0.336
Township	CATAWBA SPRINGS	**Tax/Fire District**	EAST LINCOLN
Main Improvement		**Value**	
Main Sq Feet	**Stories**	**Year Built**	

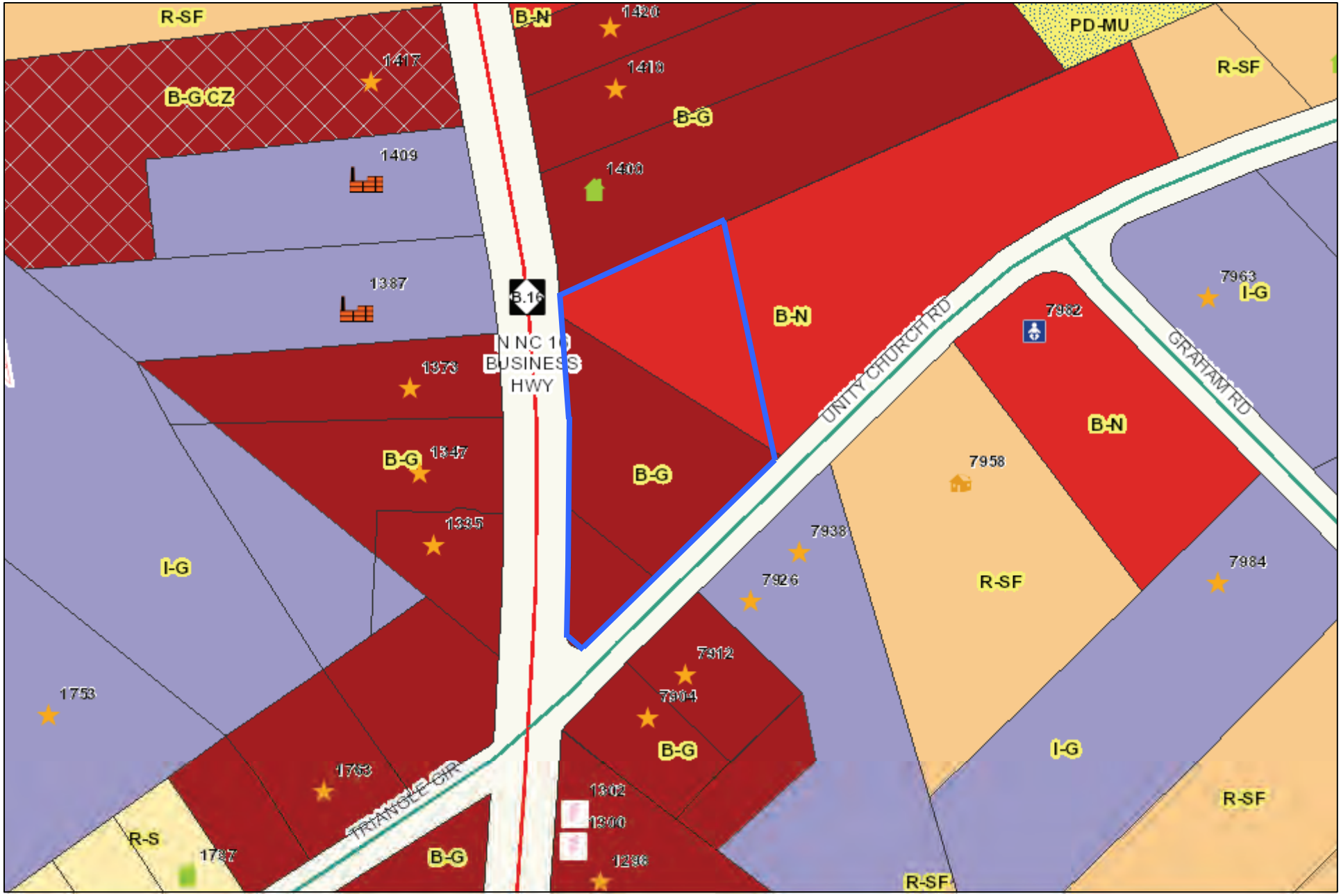
Zoning District	Calc Acres	Voting Precinct	Calc Acres
B-G	0.34	WP32	0.34

Watershed		Sewer District	
	0.34	SEWER	0.34

Census County	Tract	Block	
109	071202	1018	0.34

Flood	Zone Description	Panel	
X	NO FLOOD HAZARD	3710460300	0.34

Conditional Use Permit #412
subject property is outlined in blue

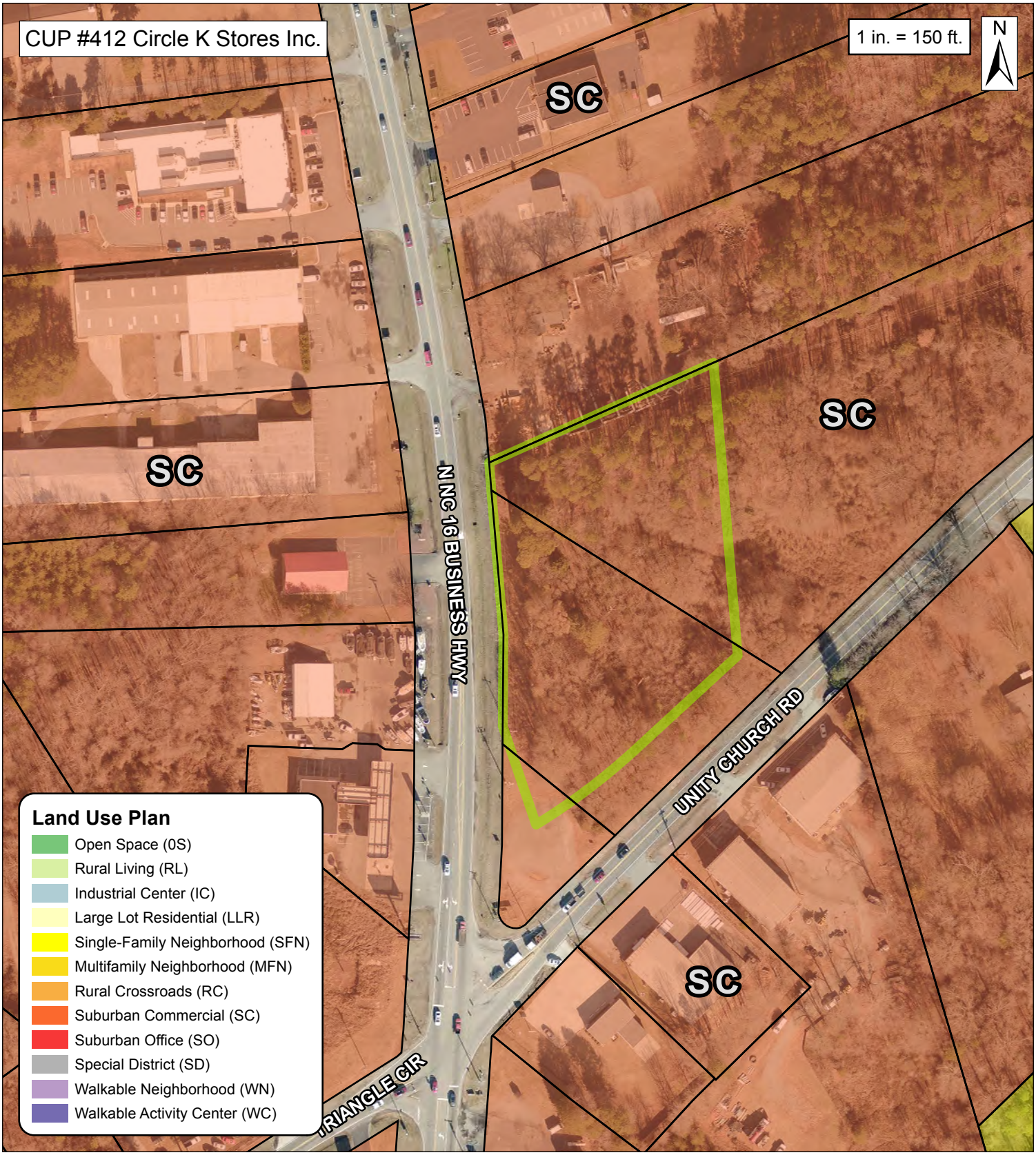


September 25, 2019

Esri., Inc., Lincoln County, NC

0 100 200 Feet

1 inch = 200 feet



Lincoln County
Planning & Inspections
302 N. Academy St.
Suite A
Lincolnton, NC 28092

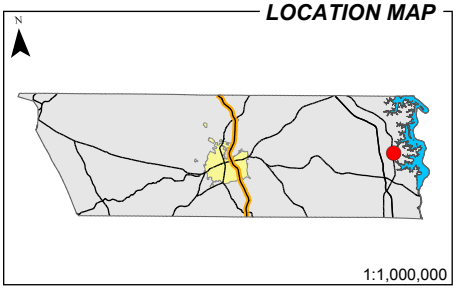
Parcel ID# 02472
02475 & 57406

- Property Location(s)

See Attached Application for Parcel Information

Property Location(s) Outlined in Green

LOCATION MAP



Property Location(s)

GRAPHIC SCALE

0 30' 60' 120'

(IN FEET)

SCALE: 1" = 60'

North Carolina One-Call Center

811 S. Buchanan Blvd, Suite 107

Kingsville, North Carolina 27887

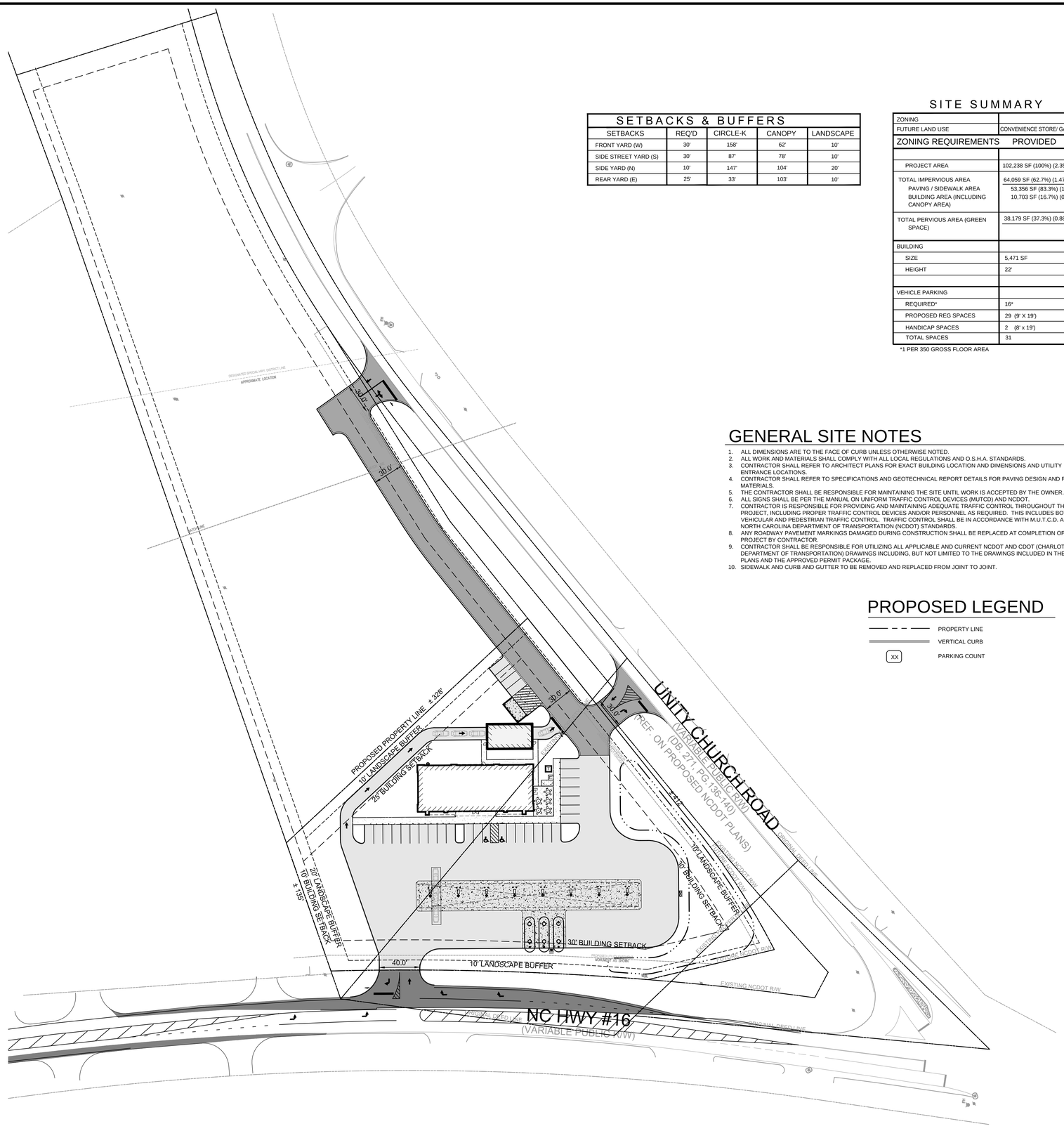
(800) 632-4949

CALL 1-800-632-4949

CONTRACTOR SHALL CONTACT ONE-CALL CENTER TO HAVE UNDERGROUND UTILITIES FIELD LOCATED PRIOR TO ANY EXCAVATION

Call BEFORE you DIG!

"It's The Law"



SETBACKS & BUFFERS

SETBACKS	REQ'D	CIRCLE-K	CANOPY	LANDSCAPE
FRONT YARD (W)	30'	158'	62'	10'
SIDE STREET YARD (S)	30'	87'	78'	10'
SIDE YARD (N)	10'	147'	104'	20'
REAR YARD (E)	25'	33'	103'	10'

SITE SUMMARY

ZONING	
FUTURE LAND USE	CONVENIENCE STORE/ GAS STATION
ZONING REQUIREMENTS	**PROVIDED**
PROJECT AREA	102,238 SF (100%) (2.35AC)
TOTAL IMPERVIOUS AREA	64,059 SF (62.7%) (1.47 AC)
PAVING / SIDEWALK AREA	53,356 SF (83.3%) (1.22 AC)
BUILDING AREA (INCLUDING CANOPY AREA)	10,703 SF (16.7%) (0.25 AC)
TOTAL PERVIOUS AREA (GREEN SPACE)	38,179 SF (37.3%) (0.88 AC)
BUILDING	
SIZE	5,471 SF
HEIGHT	22'
VEHICLE PARKING	
REQUIRED*	16*
PROPOSED REG SPACES	29 (9' X 19')
HANDICAP SPACES	2 (8' x 19')
TOTAL SPACES	31

*1 PER 350 GROSS FLOOR AREA

GENERAL SITE NOTES

1. ALL DIMENSIONS ARE TO THE FACE OF CURB UNLESS OTHERWISE NOTED.
2. ALL WORK AND MATERIALS SHALL COMPLY WITH ALL LOCAL REGULATIONS AND O.S.H.A. STANDARDS.
3. CONTRACTOR SHALL REFER TO ARCHITECT PLANS FOR EXACT BUILDING LOCATION AND DIMENSIONS AND UTILITY ENTRANCE LOCATIONS.
4. CONTRACTOR SHALL REFER TO SPECIFICATIONS AND GEOTECHNICAL REPORT DETAILS FOR PAVING DESIGN AND PROPER MATERIALS.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE SITE UNTIL WORK IS ACCEPTED BY THE OWNER.
6. ALL SIGNS SHALL BE PER THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND NCDOT.
7. CONTRACTOR IS RESPONSIBLE FOR PROVIDING AND MAINTAINING ADEQUATE TRAFFIC CONTROL THROUGHOUT THE PROJECT, INCLUDING PROPER TRAFFIC CONTROL DEVICES AND/OR PERSONNEL AS REQUIRED. THIS INCLUDES BOTH VEHICULAR AND PEDESTRIAN TRAFFIC CONTROL. TRAFFIC CONTROL SHALL BE IN ACCORDANCE WITH M.U.T.C.D. AND THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (NCDOT) STANDARDS.
8. ANY ROADWAY PAVEMENT MARKINGS DAMAGED DURING CONSTRUCTION SHALL BE REPLACED AT COMPLETION OF PROJECT BY CONTRACTOR.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR UTILIZING ALL APPLICABLE AND CURRENT NCDOT AND CDOT (CHARLOTTE DEPARTMENT OF TRANSPORTATION) DRAWINGS INCLUDING, BUT NOT LIMITED TO THE DRAWINGS INCLUDED IN THESE PLANS AND THE APPROVED PERMIT PACKAGE.
10. SIDEWALK AND CURB AND GUTTER TO BE REMOVED AND REPLACED FROM JOINT TO JOINT.

PROPOSED LEGEND

PROPERTY LINE

VERTICAL CURB

XX PARKING COUNT

CAD file name: V:\120003 - Circle K\120003-01-045 (ENG) - Denver (Unity Church Rd), NC\Engineering\Engineering Plans\C2.0 SITE PLAN.DWG 10/4/2019

Bowman
CONSULTING
Certificate of Authorization No. C-3556

Bowman Consulting Group, Ltd.
950 North Point Parkway
Suite 200
Alpharetta, GA 30005
Phone: (678) 374-6687
bowmanconsulting.com

OVERALL SITE PLAN

CIRCLE K C-STORE

DENVER (HWY 16), NC

NE CORNER N.C. HIGHWAY 16 AND UNITY CHURCH ROAD

LINCOLN COUNTY, NC

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043463 KAI BURK 10/3/19

KAI BURK
LICENSE NO. 043463

PLAN STATUS

DATE	DESCRIPTION

PL	BG	KB
DESIGN	DRAWN	CHKD

SCALE 1" = 20'

JOB No. 120003-01-045

DATE

FILE C2.1 - OVERALL SITE PLAN

SHEET C2.1

GRAPHIC SCALE

0 10' 20' 40'

(IN FEET)

SCALE: 1" = 20'

North Carolina One-Call Center
811 S. Buchanan Blvd, Ste. 107
Kinston, N.C. 28504
CALL 1-800-632-4949
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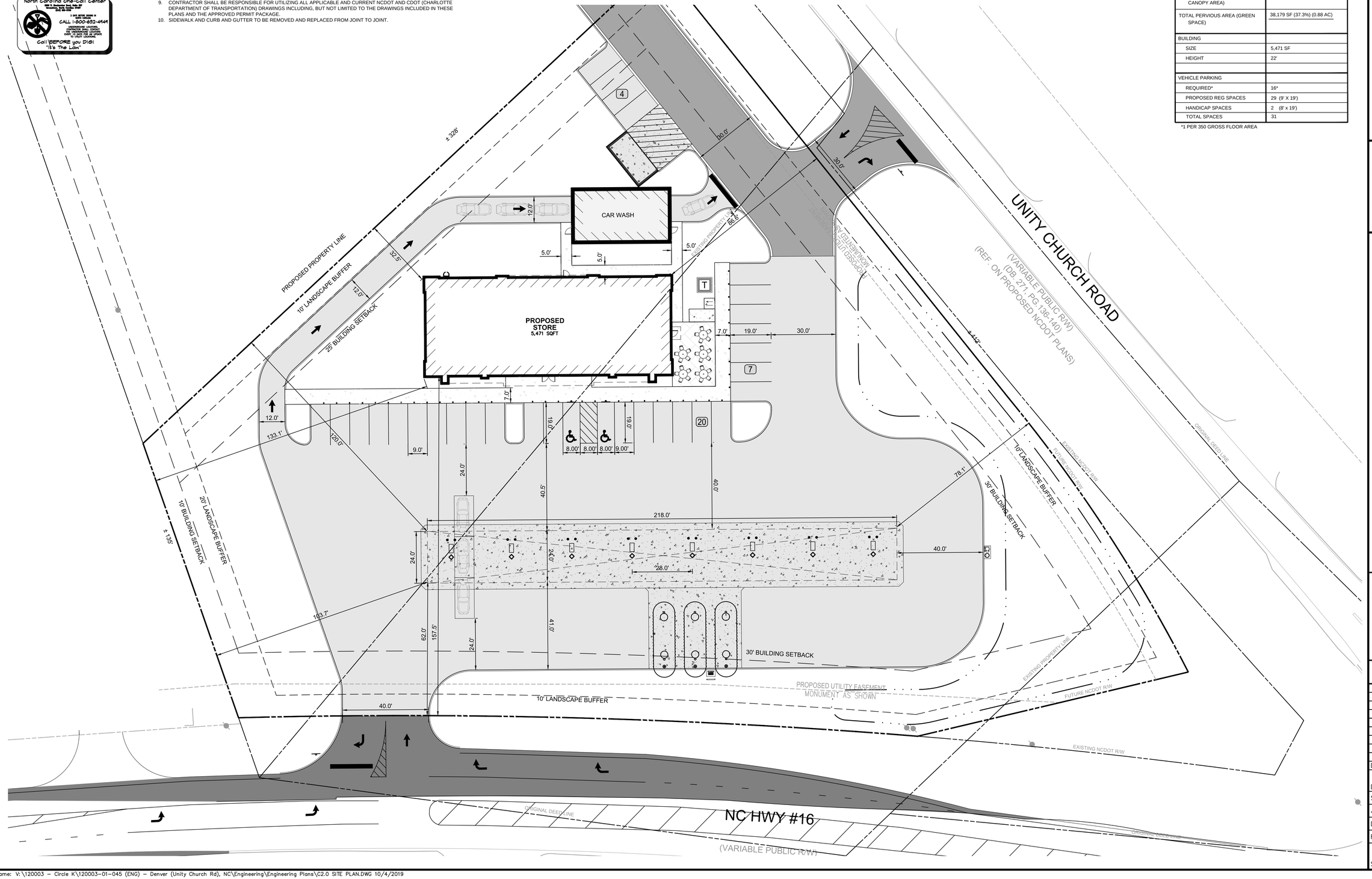

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Certificate of Authorization No. C-3556

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Alpharetta, GA 30005
Phone: (678) 374-6687
bowmanconsulting.com

SITE PLAN

CIRCLE K C-STORE

DENVER (HWY 16), NC

NE CORNER N.C. HIGHWAY 16 AND UNITY CHURCH ROAD

LINCOLN COUNTY, NC

NORTH CAROLINA PROFESSIONAL SEAL 043463 ENGINEER KAI BURK
10/4/19

KAI BURK
LICENSE NO. 043463

PLAN STATUS

DATE	DESCRIPTION	
PL	BG	KB
DESIGN	DRAWN	CHKD

SCALE 1" = 20'

JOB No. 120003-01-045

DATE

FILE C2.0 - SITE PLAN

SHEET C2.0

TRAFFIC IMPACT ANALYSIS
NC16 BUSINESS CIRCLE K
LINCOLN COUNTY, NORTH CAROLINA

RAMEY KEMP & ASSOCIATES

TRAFFIC IMPACT ANALYSIS

FOR THE

NC 16 Business Circle K

LOCATED
IN
LINCOLN COUNTY, NORTH CAROLINA

Prepared For:
Taylor Seeloff
Circle K Stores, Inc.
2550 West Tyvola Road, Suite 200,
Charlotte, NC 28217

Prepared By:
Ramey Kemp & Associates, Inc.
8307 University Executive Park Drive, Suite 260
Charlotte, NC 28262
License #C-0910

August 2019
RKA Project #19281

RAMEY KEMP & ASSOCIATES

TABLE OF CONTENTS

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TECHNICAL APPENDIX

TRAFFIC IMPACT ANALYSIS

NC 16 BUSINESS CIRCLE K
LINCOLN COUNTY, NORTH CAROLINA

1. EXECUTIVE SUMMARY

This report summarizes the findings of the Traffic Impact Analysis (TIA) that was performed for the proposed Circle K to be located along the east side of NC 16 Business and north of Unity Church Road in Lincoln County, North Carolina. The purpose of this study is to determine the potential impact to the surrounding transportation system caused by the traffic generated by the proposed development.

The site is proposed to consist of a 5,200 square feet gas station with a super convenience market. Access to the site will be via one full access driveway on Unity Church Road, a right-in/right-out driveway on Unity Church Road, and a leftover on NC 16 Business. The site is expected to be fully built by the year 2020.

The study area for the TIA was determined through coordination with the North Carolina Department of Transportation (NCDOT) and Lincoln County and consists of the following intersections:

1. NC 16 Business and Triangle Circle/Unity Church Road (Signalized)
2. NC 16 Business and Triangle Circle (Unsignalized)
3. NC 16 Business and Access A (Unsignalized)
4. Unity Church Road and Access B (Unsignalized)
5. Unity Church Road and Access C (Unsignalized)

Based on coordination with NCDOT and Lincoln County, one offsite development was determined to have an impact on the project study area. The following adjacent development was included:

- Rivercross Residential – consists of 135 single family homes and 133 townhomes to be located west of the intersection of NC 16 Business and Cherry Point Drive.

There are improvements proposed with the construction of the NCDOT State Improvement Program R-5712. These improvements are set to undergo construction in 2020.

Several scenarios were analyzed using traffic analysis software, Synchro 10. Traffic operations during the AM and PM peak hours were modeled for each scenario. The results of each scenario were compared in order to determine impacts from the proposed development. The intersection of NC 16 Business and Unity Church Road/Triangle Circle was analyzed with and without R-5712 STIP improvements in future scenarios. The following scenarios were modeled:

- 2019 Existing
- 2020 No-Build
- 2020 Build

Based on the analysis results, the following improvements are recommended to be constructed by the developer:

NC 16 Business and Unity Church Road/Triangle Circle

- Extend the westbound left turn lane from 250’ of storage to 300’ and the appropriate taper.

NC 16 Business and Access A

- Construct Access A as a leftover with one ingress lane and one egress lane (1 right).
- Construct a NC 16 Business northbound right turn lane with a 100’ feet of storage and the appropriate taper.
- Construct a NC 16 Business southbound left turn lane with a 100’ feet of storage and the appropriate taper.

Unity Church Road and Access B

- Construct Access B as a right-in/right-out with one ingress lane and one egress lane (1 right).

Unity Church Road and Access C

- Construct Access C as full access with one ingress lane and two egress lanes (1 left and 1 right).

2. INTRODUCTION

2.1. Purpose of Report

This report summarizes the findings of the Traffic Impact Analysis (TIA) that was performed for the proposed Circle K to be located along the east side of NC 16 Business and north of Unity Church Road in Lincoln County, North Carolina. The purpose of this study is to determine the potential impact to the surrounding transportation system caused by the traffic generated by the proposed development.

2.2. Study Objectives

The site is proposed to consist of a 5,200 square feet gas station with a super convenience market. Access to the site will be via one full access driveway on Unity Church Road, a right-in/right-out driveway on Unity Church Road, and a leftover on NC 16 Business. The site is expected to be fully built by the year 2020.

Refer to Figure 1 in Appendix A for an illustration of the site location map and to Figure 2 for the preliminary site plan. Refer to Appendix A for all figures. The objective of this report is to determine what geometric improvements are necessary to mitigate traffic conditions on the transportation network surrounding the site with the proposed development fully built out.

3. AREA CONDITIONS

3.1. Transportation Network Study Area

3.1.1. Area Roadway System

The project study area for this TIA was determined through coordination with NCDOT and Lincoln County. Table 1 summarizes the characteristics of the roadways within the study area. The NCDOT Functional Class map was used to determine the classification of each road. Traffic Volume maps from NCDOT (count station 5401622, 5403402, and 5400009) were used to find the average daily traffic (ADT) volumes in vehicles per day (vpd) for the roadways.

TABLE 1
STUDY AREA ROADS

ROADWAY	CLASSIFICATION	CROSS-SECTION	ADT (vpd)	SPEED LIMIT
NC 16 Business	Minor Arterial	Three-Lane	18,000	45
Triangle Circle	Local Road	Two-Lane	4,400	45
Unity Church Road	Local Road	Two-Lane	6,000	45

3.1.1.1. Existing Roadway Conditions

Existing lane configurations (number of traffic lanes on the intersection approach), storage capacities, and other intersection and roadway information within the study area was collected by Ramey Kemp and Associates, Inc. (RKA). Refer to Figure 3A for the existing lane configurations and traffic control at the study intersections.

3.1.1.2. Future Roadway Conditions

The NCDOT STIP project R-5712 is expected to start construction in 2020 and would have an impact on the project study area. STIP project R-5712 will consist of turn lane improvements at the intersection of NC 16 Business and Unity Church Road/Triangle Circle. Refer to Figure 3B for the 2020 No-Build lane configurations and traffic control at the study intersections. The future roadway improvements documents can be found in Appendix B. The following improvements are assumed to be in place for the future scenarios:

<u>NC 16 Business and Unity Church Road/Triangle Circle</u>

- Extension of the northbound NC 16 Business left turn lane to provide 250’ of storage and the appropriate taper.
- Construction of a northbound NC 16 Business right turn lane to provide 175’ of storage and the appropriate taper.
- Extension of the southbound NC 16 Business left turn lane to provide 200’ of storage and the appropriate taper.
- Construction of a southbound NC 16 Business right turn lane to provide 175’ of storage and the appropriate taper.
- Construction of an eastbound Triangle Circle left turn lane to provide 500’ of storage and the appropriate taper.

- Construction of a westbound NC 16 Business left turn lane to provide 250' of storage and the appropriate taper.
- Construction of a westbound NC 16 Business right turn lane to provide 225' of storage and the appropriate taper.

3.1.2. Study Area and Existing Traffic Volumes

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

1. NC 16 Business and Triangle Circle/Unity Church Road (Signalized)
2. NC 16 Business and Triangle Circle (Unsignalized)
3. NC 16 Business and Access A (Unsignalized)
4. Unity Church Road and Access B (Unsignalized)
5. Unity Church Road and Access C (Unsignalized)

Existing traffic volumes were determined through traffic counts conducted during the AM peak period (7:00-9:00 AM) and the PM peak period (4:00-6:00 PM). Traffic counts were performed in November 2018 and then projected to 2019 using a 2% growth rate as confirmed by NCDOT. A copy of the traffic count data can be found in Appendix C of this report. Figure 4 shows the 2019 existing peak hour volumes.

3.2. Study Area – Adjacent Land Use

3.2.1. Existing Land Uses

The existing site is undeveloped. The surrounding land is primarily commercial and residential.

3.2.2. Anticipated or Approved Future Development

Based on coordination with NCDOT and Lincoln County, one offsite development was determined to have an impact on the project study area. The approved Transportation Technical Memorandum for the Rivercross Residential development was used to determine appropriate adjacent development volumes. The Rivercross Residential development is expected to be built out for the future scenarios. Rivercross Residential consists of 135 single family homes and 133 townhomes

to be located west of the intersection of NC 16 Business and Cherry Point Drive. Table 2 shows the Rivercross Residential trip generation.

TABLE 2
RIVERCROSS RESIDENTIAL TRIP GENERATION

LAND USE	SIZE	DAILY TRIPS (VPD)	PEAK HOUR TRIPS (VPH)			
			AM		PM	
			ENTER	EXIT	ENTER	EXIT
Single Family Homes (210)	135 DU	1,384	26	78	87	51
Townhomes (230)	133 DU	824	11	54	51	25
Total New External Trips		2,208	37	132	138	76

Appendix D contains excerpts from a previous traffic study regarding the trip generation and trip assignments for this development. Refer to Figures 5-6 for the trip distribution and trip assignments for the Rivercross Residential site.

4. PROJECTED TRAFFIC

4.1. Site Traffic

In order to determine the future traffic conditions after the proposed development is completed, an estimate of traffic projected to travel to/from the proposed development is required. The average weekday daily, AM peak hour, and PM peak hour site trips for this study were calculated based on the ITE *Trip Generation Manual, 10th Edition*.

4.1.1. Trip Generation

The site is proposed to consist of a 5,200 square feet gas station with a super convenience market. Table 3 presents a summary of the trip generation calculations for the proposed development.

TABLE 3
PROPOSED SITE TRIP GENERATION

LAND USE	SIZE	DAILY TRIPS (VPD)	PEAK HOUR TRIPS (VPH)			
			AM		PM	
			ENTER	EXIT	ENTER	EXIT
Super Convenience Market/Gas Station (960)	5.2 KSF	4,356	216	216	180	180
Pass-By Trips (Limited to 10% of Adjacent Street Traffic)			-104	-104	-101	-101
Total External Trips		4,356	112	112	79	79

(1) Based on *ITE Trip Generation – 10th Edition*

4.1.2. Trip Distribution and Assignment

Trip distribution percentages were developed based on existing traffic patterns, nearby land uses, location of population/employment centers, and engineering judgment. Figure 7 illustrates the site trip distribution percentages. These trip distribution percentages were applied to the trip generation data in Table 3 to determine the site trip assignments shown in Figure 8.

The pass-by assignment for the proposed site was based on existing traffic volumes along the roadways adjacent to the site and was limited to 10% of the volumes on the adjacent streets. Figures 9 and 10 illustrate the pass-by trip distribution and assignments, respectively.

The summation of the primary and pass-by trip assignment equals the total site trips generated by the proposed site. Refer to Figure 11 for an illustration of the total trip assignment for the proposed site.

5. TRAFFIC ANALYSIS

5.1. Traffic Analysis Scenarios

Several scenarios were analyzed using traffic analysis software, Synchro 10. Traffic operations during the AM and PM peak hours were modeled for each scenario. The results of each scenario were compared in order to determine impacts from background traffic growth and the proposed development. The intersection of NC 16 Business and Unity Church Road/Triangle Circle was analyzed with and without R-5712 STIP improvements in future scenarios. The following scenarios were modeled:

- 2019 Existing
- 2020 No-Build
- 2020 Build

The following Congestion Management guidelines were followed in the capacity analysis:

- PHF of 0.90 was used in the analysis.
- Right-turn on red (RTOR) was not allowed in the analysis.
- Protected-Only left turn treatment was used for left turn movements in future scenarios.

- Total lost time adjustment was kept to 5 seconds for each movement.
- Volume movements less than 4 per hour were rounded up to 4 per hour in the analysis.

The 2019 Existing scenario included the traffic characteristics that currently exist in the study area. Existing peak hour traffic volumes were used from the intersection counts (Figure 4). The signal phasing and timing data can be found in Appendix E. No changes to the existing lane configurations were made.

The 2020 No-Build scenario was analyzed to determine the expected future traffic operations. Existing peak hour traffic counts were projected to the year 2020 using a compounded growth rate of 2% per year. Refer to Figure 12 for the 2020 projected peak hour traffic volumes. The 2020 projected volumes were added to the traffic from the offsite development (Figure 6) to determine the 2020 No-Build peak hour traffic volumes. The 2020 No-Build peak hour traffic volumes are illustrated in Figure 13. The splits at the signalized intersection were optimized. Congestion Management minimum cycle lengths were met. Improvements to the intersection of NC 16 Business and Unity Church Road/Triangle Circle were included as they are expected to undergo construction in 2020.

The 2020 Build scenario was compared to the 2020 No-Build scenario to determine expected impacts caused by the proposed site. This scenario included the same assumptions as the 2020 No-Build scenario. The trips expected to be generated by the proposed site (Figure 11) were added to the 2020 No-Build peak hour volumes (Figure 13) to determine the 2020 Build peak hour traffic volumes. Refer to Figure 14 for the 2020 Build peak hour traffic volumes. The splits at the signalized intersection were optimized. Congestion Management minimum cycle lengths were met. Site Access A, B, and C were added to the existing lane configurations.

5.2. Traffic Analysis Procedure

All study intersections (both unsignalized and roundabouts) were analyzed using the methodology outlined in the Highway Capacity Manual (HCM) published by the Transportation Research Board. The computer software packages, Synchro 10 and SimTraffic 10, were used to complete the analyses for all the study area intersections. Synchro was developed by Trafficware

Corporation and allows the user to input data into the Synchro software and calculate the output based on methodologies in the HCM. SimTraffic creates a traffic simulation model from the Synchro inputs. SimTraffic was used in this study to determine expected queue lengths.

Analysis results for signalized intersections provide delay and level of service (LOS) for all movements and approaches. The overall intersection delay and LOS is also provided. The capacity analysis for an unsignalized intersection does not provide an overall LOS for the intersection, rather a LOS for movements and/or approaches that have 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". 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". LOS varies from Level "A" representing free flow, to Level "F" where greater vehicle delays 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". As shown in Table 4, an average control delay of 40 seconds at a signalized intersection results in a LOS D.

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

5.3. Mitigation Requirements

NCDOT has guidelines for determining when improvements are needed by the developer. The District Engineer is responsible for the final determination of the improvements. NCDOT typically requires mitigation to be identified when developments are expected to impact the traffic operations as described below:

- Overall intersection or intersection approach delay increases by 25% or more.
- LOS degrades by at least one level
- LOS is F
- Synchro 95th or SimTraffic maximum queue results are greater than the existing turn lane storage length

5.4. Capacity and Level of Service at Study Intersections

5.4.1. NC 16 Business and Unity Church Road/Triangle Circle

The intersection of NC 16 Business and Unity Church Road/Triangle Circle was analyzed as a four-leg signalized intersection with existing lane configurations. Future scenarios were analyzed with and without STIP project R-5712 improvements. Table 5 summarizes the capacity analysis results. Impacts requiring mitigation are highlighted in yellow. Refer to Appendix F for the Synchro reports for this intersection. All SimTraffic reports can be found in Appendix K.

Analysis indicates that the intersection is expected to operate at LOS D during the AM peak hour and LOS E during the PM peak hour of the 2019 Existing scenario. Without R-5712 improvements, the intersection is expected to operate at LOS D in the AM peak hour and LOS E during the PM peak hour of the 2020 No-Build scenario. Adding in the site traffic, the intersection is expected to degrade to LOS E in AM peak hour and LOS F in the PM peak hour of the 2020 Build scenario. Without R-5712 improvements, delay is expected to increase more than 25% during both peak hours. Although there are technical impacts at the intersection without the R-5712 improvements between the 2020 No-Build and 2020 Build, R-5712 is a funded project that is expected to start construction in 2020 to fix many of the poor conditions.

With R-5712 improvements, the intersection is expected to operate at LOS C in the AM and PM peak hours of the 2020 No-Build scenario. Adding in the site traffic, the intersection is expected to degrade to LOS C in the AM peak hour and LOS D in the PM peak hour of the 2020 Build scenario. The northbound approach delay increases by 25% or more in the AM peak hour of the 2020 Build scenario. No queue issues were identified on the northbound approach. The westbound left 95th queue goes from 197’ in the AM peak hour of 2020 No-Build scenario to 288’ in the AM peak hour of the 2020 Build scenario. A 2020 Build with Improvements and R-5712 scenario was analyzed.

The 2020 Build with Improvements and R-5712 scenario provided the same delay and LOS results as the 2020 Build with R-5712. Additional lanes were considered but are not recommended. Construction of an eastbound right turn lane would not decrease intersection delays due to the low volume of traffic making this right turn movement. Construction of any other turn lanes would require the construction of an additional departure lane. The extent of this type of improvement should be considered beyond the scope of this development. The 2020 Build with Improvements analysis included extension of the westbound left turn lane. This improvement addresses all queue issues at the intersection. Based on the results, it is recommended that the developer provide the following improvements:

- Extend the westbound left turn lane from 250' of storage to 300' and the appropriate taper.

TABLE 5
ANALYSIS SUMMARY OF
NC 16 BUSINESS AND UNITY CHURCH ROAD/TRIANGLE CIRCLE

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	AM PEAK HOUR		PM PEAK HOUR	
			Approach LOS (Delay)	Overall LOS (Delay)	Approach LOS (Delay)	Overall LOS (Delay)
2019 Existing	EB WB NB SB	1 LT-TH-RT 1 LT-TH-RT 1 LT, 1 TH-RT 1 LT, 1 TH-RT	E (68.0) E (73.3) D (45.8) D (36.1)	D (49.6)	F (105.6) F (114.7) E (67.2) D (36.6)	E (67.8)
2020 No-Build without R-5712	EB WB NB SB	1 LT-TH-RT 1 LT-TH-RT 1 LT, 1 TH-RT 1 LT, 1 TH-RT	E (68.3) E (69.5) D (48.3) D (44.2)	D (53.0)	F (114.8) F (123.0) F (81.4) D (36.4)	E (75.1)
2020 Build without R-5712	EB WB NB SB	1 LT-TH-RT 1 LT-TH-RT 1 LT, 1 TH-RT 1 LT, 1 TH-RT	F (95.9) F (82.8) E (67.4) D (44.2)	E (66.4)	F (157.2) F (161.5) F (107.1) D (35.7)	F (99.2)
2020 No-Build with R-5712	EB WB NB SB	**1 LT**, 1 TH-RT **1 LT**, 1 TH, **1 RT** **1 LT**, 1 TH, **1 RT** **1 LT**, 1 TH, **1 RT**	D (45.0) D (43.4) C (23.9) C (22.0)	C (29.5)	D (45.4) D (48.1) C (28.9) C (25.7)	C (32.7)
2020 Build with R-5712	EB WB NB SB	1 LT, 1 TH-RT 1 LT, 1 TH, 1 RT 1 LT, 1 TH, 1 RT 1 LT, 1 TH, 1 RT	D (47.7) D (46.9) C (30.8) C (24.5)	C (34.3)	D (48.9) D (54.9) C (34.2) C (25.4)	D (36.7)
2020 Build with R-5712 and Improvements	EB WB NB SB	1 LT, 1 TH-RT **1 LT**, 1 TH, 1 RT 1 LT, 1 TH, 1 RT 1 LT, 1 TH, 1 RT	D (47.7) D (46.9) C (30.8) C (24.5)	C (34.3)	D (48.9) D (54.9) C (34.2) C (25.4)	D (36.7)

Bold denotes improvement on approach.

5.4.2. NC 16 Business and Triangle Circle

The intersection of NC 16 Business and Triangle Circle was analyzed as a three-leg unsignalized intersection with existing lane configurations. Table 6 summarizes the capacity analysis results. Impacts requiring mitigation are highlighted in yellow. Refer to Appendix G for the Synchro reports for this intersection. All SimTraffic reports can be found in Appendix K.

Analysis indicates that the eastbound approach is expected to operate at LOS D or better during the peak hours of the 2019 Existing scenario. The eastbound approach of the intersection degrades to LOS E in the AM peak hour of the 2020 No-Build and 2020 Build scenarios. The increase in delay for the eastbound approach is a result of the increased through traffic on NC 16 Business. The site does not add traffic to the eastbound approach. No improvements by the developer are recommended.

TABLE 6
ANALYSIS SUMMARY OF
NC 16 BUSINESS AND TRIANGLE CIRCLE

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	AM PEAK HOUR		PM PEAK HOUR	
			Approach LOS (Delay)	Overall LOS (Delay)	Approach LOS (Delay)	Overall LOS (Delay)
2019 Existing	EB[2] NB[1] SB	1 LT-RT 1 LT, 1 TH 1 TH-RT	D (29.6) B (10.3) -	NA[3]	C (19.7) B (10.7) -	NA[3]
2020 No-Build	EB[2] NB[1] SB	1 LT-RT 1 LT, 1 TH 1 TH-RT	E (35.1) B (10.9) -	NA[3]	D (25.7) B (11.3) -	NA[3]
2020 Build	EB[2] NB[1] SB[1]	1 LT-RT 1 LT, 1 TH 1 TH-RT	E (41.4) B (11.2) -	NA[3]	D (28.0) B (11.6) -	NA[3]

1. Major street left-turn movement for unsignalized intersection.
2. Stop controlled approach for unsignalized intersection.
3. Overall intersection LOS is not provided for unsignalized intersections

5.4.3. NC 16 Business and Access A

The intersection of NC 16 Business and Access A was analyzed as a three-leg unsignalized intersection where Access A is a leftover. Table 7 summarizes the capacity analysis results. Impacts requiring mitigation are highlighted in yellow. Refer to Appendix H for the Synchro reports and turn lane warrants for this intersection. All SimTraffic reports can be found in Appendix K.

Analysis indicates that the westbound approach is expected to operate at LOS C during both the AM and PM peak hours of the 2020 Build scenario. There is a 116' queue in the AM peak hour and 173' queue in the PM peak hour on the northbound approach. NCDOT turn lane warrants were checked for the southbound left and northbound right movements. A NC 16 Business northbound right and southbound left turn lane are warranted. No queue was observed on the northbound approach with a northbound right turn lane included. The following improvements are recommended by the developer:

- Construct Access A as a leftover with one ingress lane and one egress lane (1 right).
- Construct a NC 16 Business northbound right turn lane with a 100' feet of storage and the appropriate taper.
- Construct a NC 16 Business southbound left turn lane with a 100' feet of storage and the appropriate taper.

TABLE 7
ANALYSIS SUMMARY OF
NC 16 BUSINESS AND ACCESS A

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	AM PEAK HOUR		PM PEAK HOUR	
			Approach LOS (Delay)	Overall LOS (Delay)	Approach LOS (Delay)	Overall LOS (Delay)
2020 Build	WB[2] NB SB[1]	1 RT 1 TH-RT 1 LT, 1 TH	C (16.0) - A (9.7)	NA[3]	C (20.0) - B (10.5)	NA[3]
2020 Build with Improvements	WB[2] NB SB[1]	1 RT 1 TH, **1 RT** 1 LT, 1 TH	C (16.0) - A (9.7)	NA[3]	C (20.0) - B (10.5)	NA[3]

1. Major street left-turn movement for unsignalized intersection.
2. Stop controlled approach for unsignalized intersection.
3. Overall intersection LOS is not provided for unsignalized intersections

Bold denotes improvement on approach.

5.4.4. Unity Church Road and Access B

The intersection of Unity Church Road and Access B will form a three-leg intersection where Access B is right-in/right-out (RIRO). Table 8 summarizes the capacity analysis results. Refer to Appendix I for the Synchro reports and turn lane warrants for this section. All SimTraffic reports can be found in Appendix K.

Analysis indicates that the southbound approach is expected to operate at LOS B during both the AM and PM peak hours of the 2020 Build scenario. NCDOT turn lane warrants were checked for the westbound right movement. A westbound right turn lane was not warranted. The following improvements are recommended by the developer:

- Construct Access B as a right-in/right-out with one ingress lane and one egress lane (1 right).

TABLE 8
ANALYSIS SUMMARY OF
UNITY CHURCH ROAD AND ACCESS B

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	AM PEAK HOUR		PM PEAK HOUR	
			Approach LOS (Delay)	Overall LOS (Delay)	Approach LOS (Delay)	Overall LOS (Delay)
2020 Build	EB WB SB[2]	1 TH 1 TH-RT 1 RT	- - B (10.7)	NA[3]	- - B (10.2)	NA[3]

1. Major street left-turn movement for unsignalized intersection.
2. Stop controlled approach for unsignalized intersection.
3. Overall intersection LOS is not provided for unsignalized intersections

5.4.5. Unity Church Road and Access C

The intersection of Unity Church Road and Access C will form a three-leg intersection where Access C is full access. Table 9 summarizes the capacity analysis results. Refer to Appendix J for the Synchro reports and turn lane warrants for this section. All SimTraffic reports can be found in Appendix K.

Analysis indicates that the southbound approach is expected to operate at LOS B during both the AM and PM peak hours of the 2020 Build scenario. NCDOT turn lane warrants were checked for the eastbound left and westbound right movements. A NC 16 Business eastbound left and westbound right turn lane are not warranted. The following improvements are recommended by the developer:

- Construct Access C as full access with one ingress lane and two egress lanes (1 left and 1 right).

TABLE 9
ANALYSIS SUMMARY OF
UNITY CHURCH ROAD AND ACCESS C

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	AM PEAK HOUR		PM PEAK HOUR	
			Approach LOS (Delay)	Overall LOS (Delay)	Approach LOS (Delay)	Overall LOS (Delay)
2020 Build	EB[1] WB SB[2]	1 LT-TH 1 TH-RT 1 LT, 1 RT	A (8.0) - B (11.3)	NA[3]	A (7.8) - B (10.8)	NA[3]

1. Major street left-turn movement for unsignalized intersection.
2. Stop controlled approach for unsignalized intersection.
3. Overall intersection LOS is not provided for unsignalized intersections

6. CONCLUSIONS

This report summarizes the findings of the Traffic Impact Analysis (TIA) that was performed for the proposed Circle K to be located along the east side of NC 16 Business and north of Unity Church Road in Lincoln County, North Carolina. The purpose of this study is to determine the potential impact to the surrounding transportation system caused by the traffic generated by the proposed development.

The site is proposed to consist of a 5,200 square feet gas station with a super convenience market. Access to the site will be via one full access driveway on Unity Church Road, a right-in/right-out driveway on Unity Church Road, and a leftover on NC 16 Business. The site is expected to be fully built by the year 2020.

6.1 Summary of Recommended Improvements

Based on the analysis results, minimal impacts are expected by the proposed development. Figure 15 illustrates the improvements recommended to be completed by the developer. Based on the analysis results, the following improvements are recommended to be constructed by the developer:

<u>NC 16 Business and Unity Church Road/Triangle Circle</u>

- Extend the westbound left turn lane from 250’ of storage to 300’ and the appropriate taper.

<u>NC 16 Business and Access A</u>

- Construct Access A as a leftover with one ingress lane and one egress lane (1 right).
- Construct a NC 16 Business northbound right turn lane with a 100’ feet of storage and the appropriate taper.
- Construct a NC 16 Business southbound left turn lane with a 100’ feet of storage and the appropriate taper.

<u>Unity Church Road and Access B</u>

- Construct Access B as a right-in/right-out with one ingress lane and one egress lane (1 right).

Unity Church Road and Access C

- Construct Access C as full access with one ingress lane and two egress lanes (1 left and 1 right).