ZEBULON

NORTH CAROLINA

TOWN OF ZEBULON
PLANNING BOARD MEETING
April 10, 2023
Following 6:00 Joint Public Hearing

I. CALL TO ORDER

II. APPROVAL OF THE AGENDA

III. APPROVAL OF MINUTES

A. December 12, 2022

IV. OLD BUSINESS

A. **CZ -2023-02 0 Weavers Pond Dr (Wall Purdy Tract) –** Conditional rezoning request for a 43.61-acre parcel from R-40W (Wake County zoning) to Residential Neighborhood - Conditional (R4-C) District for the development of an 87-lot residential subdivision.

V. NEW BUSINESS

A. **TA-2023-04 Transportation Impact Analysis Amendments –** Text amendments to Section 6.13 of the Zebulon Unified Development Ordinance to lower the thresholds and expand the study areas of a required Transportation Impact Analysis.

B. **Utility Allocation Policy –** Proposed Amendments to the Zebulon Utility Allocation Policy to address point structure issues preventing some types of development.

VI. DEVELOPMENT UPDATES

VII. ADJOURNMENT

Zebulon
Planning Board
Minutes
December 12, 2022

Present: David Lowry, Laura Johnson Michael Germano, Domenick Schilling, Stephanie Jenkins, Genia Newkirk, Peggy Alexander, Joe Moore-Town Manager, Michael Clark-Planning, Lisa Markland-Town Clerk, Stacie Paratore- Deputy Town Clerk, Sam Slater-Attorney

David Lowry called the meeting to order.

APPROVAL OF AGENDA

Laura Johnson made a motion, second by Stephanie Jenkins to approve the agenda. There was no discussion and the motion passed unanimously.

APPROVAL OF MINUTES

Domenick Schilling made a motion, second by Stephanie Jenkins to approve the November 14, 2022 Planning Board minutes. There was no discussion and the motion passed unanimously.

NEW BUSINESS

A. PD 2022-01 – Wakelon Mills

Michael Clark stated this was a planned development request to rezone a section of 1015 N. Arendell Avenue from Light Industrial and 409 Judd Street from R4 Residential to PD – Planned Development for the development of a mixed product residential neighborhood of 293 residential dwelling units. The site map, vicinity map, zoning map and future land use plan were shown.

The request included 175 townhomes, 118 detached single family homes, road extensions, guest parking, amenity center, pool, recreation areas and private greenways. Mr. Clark explained the road improvements included a two-lane median divided road on Judd Street, an extension on Wedgewood with curb, gutter and sidewalks and improvements on Worth Hinton Road and were part of the Town's transportation plan. Staff still had traffic concerns with the intersection of N. Arendell and Judd Street.

Michael Clark explained under UDO Section 2.2.24.J a Planned Development: 1) advances the public health, safety or welfare, 2) appropriate for its proposed location and consistent with Town guidance and regulations, 3) reasonable and in the public interest and 4) other relevant factors as deemed appropriate by the Planning Board. The second set of standards for Planned Developments was found in UDO Section 3.5.5: 1) creates flexibility, 2) better than regulations, 3) consistent with adopted policy guidance, 4) compatible with surrounding uses and 5) established master plan for development.

Michael Germano stated based on the comments from the Joint Public Hearing and his concerns regarding infrastructure, there were a lack of amenities in the area and asked the developer to consider creating a more mixed-use development. Mr. Marsh stated the development was not a viable location for successful commercial businesses and the development was a way to bring more rooftops to the area which would bring more businesses.

There was discussion about the types of businesses that could be built in the light industrial zoning district and the traffic congestion on Green Pace Road and Worth Hinton.

Stephanie Jenkins stated there were a lot of concerns raised from the community and felt the development was not right for Zebulon at this time.

Domenick Schilling wanted assurances that the developer would install the traffic light. Collier Marsh stated the traffic impacts of the development were addressed in the traffic study that was performed and the developer was agreeable to make those changes. The developer would have NCDOT do a study at Arendell and Judd at the appropriate time to warrant a traffic signal and would work with the Town to determine that time.

Domenick Schilling stated he recently walked the area and had concerns about runoff in the area. Mr. Marsh stated the ponds throughout the site met the Town's standards for retention and treatment.

Genia Newkirk asked if the Planning Board was serving the residents of Zebulon by allowing the development and was concerned the new developments were taking away the small-town feel.

Mr. Marsh spoke about the growth of the Town and encouraged the Planning Board to have the growth be centrally located close to the core of the Town. Having development built on the outskirts of Town would add to the traffic issues.

Michael Clark explained the creation process of the Comprehensive Land Use Plan and that it was created to guide the development of the Town by the voice of the citizens.

Mr. Germano asked staff for specific ways to make the development more pedestrian oriented. Staff showed modifications of changing the pitch of the roof lines and adding additional pedestrian connections to make the development more pedestrian oriented. Mr. Germano did not see the townhomes as having a pedestrian oriented façade and suggested more architectural conditions with movement and variations.

Ms. Johnson asked about the price range of the homes. Mark Shekels stated the townhomes would be $300,000 to $400,00 and the single-family homes would be $400,000 to $600,000. Mr. Shekels worked on the development of Riverwood and provided his opinion about why a similar design would not work in this area.

Peggy Alexander asked if there was a way to avoid clear cutting the trees. Mr. Marsh explained most of the area would need to be clear cut due to the Judd Street extension and the lots would need to be graded.

David Lowry stated an industrial use could be brought in under the current zoning and the proposed development could bring in a nice development for young professionals to the community.

Stephanie Jenkins stated the community came out and spoke about what they wanted Zebulon to be, and the Planning Board needed to listen to their comments and vision.

Mr. Germano stated Light Industrial (LI) zoning also allowed indoor recreational spaces, live/work units, cocktail lounges, gymnasiums, medical office buildings, hotels and stated the Town could be limiting itself with the development. The next proposed use could be a better option for the citizens and the Planning Board should not just approve something just because it comes before them.

Domenick Schilling stated he felt different and thought the development would be good for the Town explaining 300 new families moving into Town generating new growth, businesses and schools would be serving the Town. This was the Planning Board's chance to approve a nice development instead of leaving it up to chance of what could be proposed. Mr. Schilling's largest concern was traffic and stated he felt the developer addressed the traffic as best they could.

Staff was asked about the total number of new homes that had been approved. Michael Clark said there were 1,700 homes with vested rights that have not begun construction, 300 homes in review or under construction, and 2 residential subdivisions in review.

Laura Johnson made a motion, second by David Lowry to recommend approval of PD 2022-01. There was not further discussion and the motion passed with a vote 4 to 3 with Laura Johnson, David Lowry, Domenick Schilling and Peggy Alexander voting in favor and Genia Newkirk, Michael Germano and Stephanie Jenkins voting in opposition.

DEVELOPMENT UPDATES

Michael Clark stated there would be a Joint Public Hearing meeting on January 23 and provided development updates.

David Lowry welcomed Peggy Alexander to the Planning Board and thanked staff for their work.

Michael Germano made a motion, second by Laura Johnson to adjourn. There was no discussion and the motion passed unanimously.

Adopted this the 13th day of February 2023.

_____

David Lowry—Chair

SEAL

_____

Stacie Paratore, CMC—Deputy Town Clerk

ZEBULON
NORTH CAROLINA

STAFF REPORT
CONDITIONAL ZONING 2023-02
0 WEAVERS POND DR
APRIL 10, 2023

Topic: **CZ 2023-02 - 0 Weavers Pond Dr (The Wall Purdy Tract)**
Speaker: Michael J. Clark, CZO, AICP, Planning Director
From: Michael J. Clark, CZO, AICP, Planning Director
Prepared by: Aaron H. Chalker, CZO, Planner II
Approved by: Joseph M. Moore II, PE, Town Manager

Executive Summary:
The Board of Commissioners will consider a Conditional Zoning Map Amendment for 0 Weavers Pond Dr (PIN# 1797701367).

Background:
The Applicant, Weaver's Pond Development Company, LLC, requests rezoning a 43.61-acre parcel from R-40W (Wake County zoning) to Residential Neighborhood - Conditional (R4-C) District for the development of an 87-lot residential subdivision. This property is currently outside of the Town's Planning Jurisdiction and is seeking annexation simultaneously with this rezoning application. The property is adjacent to the Weaver's Pond subdivision and proposes connection through the extension of two Town-maintained stub streets (Weavers Pond Dr and Yulee Dr).

A joint public hearing was held on March 13, 2023 regarding this request and a presentation was provided to the Planning Board. The applicant requested to address some of the public comments before the Planning Board makes a recommendation.

Discussion:
Unified Development Ordinance (UDO) Section 2.2.6.K provides the following standards for
the Board to base their decision on the rezoning request:

1. Whether the proposed conditional rezoning advances the public health, safety, or welfare;
2. Whether and the extent to which the proposed conditional rezoning is appropriate for its proposed location, and is consistent with the purposes, goals, objectives, and policies of the Town's adopted policy guidance;
3. Whether an approval of the conditional rezoning is reasonable and in the public interest;
4. Whether and the extent to which the concept plan associated with the conditional rezoning is consistent with this Ordinance; and
5. Any other factors as the Board of Commissioners may determine to be relevant.

Policy Analysis:
Comprehensive Land Use Plan:
The Future Land Use and Character Map designates the future use of the property as Rural Conservation (RC) because part of the original tract of land is within the watershed protection area designated for the Little River Reservoir. The property was subdivided and the area requesting rezoning is not within the watershed protection area.

ZEBULON
NORTH CAROLINA

STAFF REPORT
CONDITIONAL ZONING 2023-02
0 WEAVERS POND DR
APRIL 10, 2023

Approval of this rezoning application would amend the Future Land Use and Character Map for this parcel to Suburban Residential (SR) which is intended to be less dense and preserve more open space than what is typical in an urban residential setting.

Unified Development Ordinance:
The Applicant proposes limiting the uses to single-family detached dwelling, community garden, park (public or private) and utility, minor. The Applicant has proposed site design and architecture conditions for the Board to consider (see Attachments).

All conditions and details on the concept plan meet the spirit and intent of the UDO. If approved, the applicant would proceed with Technical Review Committee (TRC) review of final site plan and construction drawings before development can begin.

Financial Analysis:
Rezoning the property to R4-C will allow the applicant to develop 87 single-family detached homes. Based on data from the Wake County Tax Administration, the median tax value of a single-family residence in Zebulon as of January 1, 2022 is $216,181. Under this assumption, each home would generate $1,243.04 in tax revenue a year, or a total of $108,144.48 for 87 homes.

The subject property is contiguous to the Town's corporate boundaries. If approved, the 87 new homes would require the extension of Town services outside the current service boundary for Public Works, Police, and Code Enforcement. The proposed development is currently within the Fire service boundary. For Public Works, extended services include residential trash and recycling, street light electricity, and street maintenance. For Police, every 150 new homes generate the need for a new officer, priced at approximately $125,000 including salary and equipment. This development proposal equals 58% of the demand for a new officer. Additionally, response times for Police and Code Enforcement will increase.

Any infrastructure extension and connection costs would be paid by the developer when the property is developed.

Staff Recommendation:
Staff recommends the Planning Board recommend the Board of Commissioners approve the proposed conditional rezoning request as amended by the applicant finding that the request is consistent with the Standards of Section 2.2.6.K of the UDO and the Housing Section of the Comprehensive Land Use Plan.

Attachments:
1. Application, Site Plan, Renderings, and TIA
2. Future Land Use and Character Map
3. Aerial Map
4. Zoning Map
5. Little River Watershed Map
6. Site Pictures

Attachment 1
CZ 2023-02

APPLICATION FOR CONDITIONAL REZONING MAP AMENDMENT

PART 1. DESCRIPTION OF REQUEST/PROPERTY

Street Address of the Property:		Acreage:
0 Weavers Pond Dr		43.61
Parcel Identification Number (NC PIN):	Deed Book:	Deed Page(s):
1797701367	014676	00016
Existing Zoning of the Property:	Proposed Zoning of the Property:	
R40W (Wake County)	R4-C	
Existing Use of the Property:	Proposed Use of the Property:	
Vacant Parcel	Single family detached	

Reason for Conditional Rezoning:

The purpose of the rezoning is to facilitate a single family detached residential community containing up to 2.0 dwelling units per acre with associated amenities and open space consistent with the requirements of the Town of Zebulon Unified Development Ordinance.

PART 2. APPLICANT/AGENT INFORMATION

Name of Applicant/Agent:		
Weaver's Pond Development Company, LLC		
Street Address of Applicant/Agent:		
4020 Wake Forest Rd, STE 102F		
City:	State:	Zip Code:
Raleigh	North Carolina	27609-5221
Email of Applicant/Agent:	Telephone Number of Applicant/Agent:	Fax Number of Applicant/Agent:
jbarron@morningstarlawgroup.com	919-590-0371	

Are you the owner of the property?	Are you the owner's agent?	
☐ Yes ☑ No	☑ Yes ☐ No	**Note: If you are not the owner of the property, you must obtain the Owner's consent and signature giving you permission to submit this application.**

PART 3. PROPERTY OWNER INFORMATION

Name of Property Owner:		
Wall Purdy Family LLC		
Street Address of Property Owner:		
3309 Felton Pl.		
City:	State:	Zip Code:
Raleigh	North Carolina	27612-5001
Email of Property Owner:	Telephone Number of Property Owner:	Fax Number of Property Owner:
jbblack3@gmail.com	919-880-2029	

I hereby state that the facts related in this application and any documents submitted herewith are complete, true, correct, and accurate to the best of my knowledge.

Signature of Applicant:	*Print Name:*	*Date:*
	Weaver's Pond Development Company, LLC; Grey Berry, Agent	
Signature of Owner: Phyllis Purdy	*Print Name:* Phyllis Purdy	*Date:* 9.2.25

Attachment 1
CZ 2023-02

APPLICATION FOR
CONDITIONAL REZONING MAP AMENDMENT
LEGISLATIVE CONSIDERATIONS – CONDITIONAL REZONING

The applicant shall propose site-specific standards and conditions that take into account the following considerations, which are considerations that are relevant to the legislative determination of whether or not the proposed conditional zoning district rezoning is in the public interest. Therese considerations do not exclude the legislative consideration of any other factor that is relevant to the public interest. Failure to adequately address the findings below may result in denial of the application. Please attach additional pages if necessary. The petition is justified based on the facts as they relate to the Standards in Section 2.2.6.K of the UDO as follows:

1. Please explain how the proposed Conditional Rezoning advances the public health, safety, or welfare
The subject property is currently zoned R40W in Wake County. The proposed conditional rezoning to R4-C will bring much needed housing to the area while conserving the rural aesthetics of the district as designated in the Future Land Use an Character map.
2. Please explain how the proposed conditional rezoning is appropriate for its proposed location, and is consistent with the purposes, goals, objectives, and policies of the town's adopted policy guidance;
The Zebulon Comprehensive Plan Future Land Use and Character map designates the subject property as a Rural Conservation (RC) district. The applicant acknowledges that the proposed rezoning requires an amendment to the Comprehensive Plan. However, the applicant submits the change is reasonable and in the public interest. First, the subject property abuts Weaver's Pond to the south and east. Weaver's Pond has been developed to include single family detached dwellings on lots that are of complimentary size to those proposed in this R4-C rezoning request
3. Please explain how an approval of the conditional rezoning is reasonable and in the public interest;
The proposed conditional rezoning will bring much needed housing to the area and will do so in a manner that is complimentary to the existing Weaver's Pond community, which borders the subject property to the south and the east.
4. Please explain how the concept plan associated with the conditional rezoning is consistent with this Ordinance; and
The concept plan associated with the conditional rezoning is consistent with the provisions of Chapter 5 and Chapter 6 of the UDO, along with the other relevant provisions. The plan has been developed to include access and circulation consistent with the ordinance requirements. Further, the concept plan will ensure a high quality development that addresses the open space, design and other key features of the UDO.
5. Please explain how the proposed conditional rezoning addresses any other factors as the Board of Commissioners may determine to be relevant. These include but are not limited to the proposed uses requested and any requested deviations and proposed alternative means of compliance.
The proposed rezoning provides conditions that require the proposed development to meet or exceed the requirements of the Town of Zebulon's Unified Development Ordinance. The conditions can be found on the attached conditions page.

APPLICATION FOR CONDITIONAL REZONING MAP AMENDMENT

PROPOSED CONDITIONAL USES

An application has been duly filed requesting that the property described in this application be rezoned from R40W (Wake County) to R4-C. It is understood and acknowledged that if the property is rezoned as requested, the property described in this request will be perpetually bound to the use(s) authorized and subject to such conditions as imposed, unless subsequently changed or amended as provided for in the Unified Development Ordinance. It is further understood and acknowledged that final plans for any specific development to be made pursuant to any such Conditional Zoning shall be submitted for site or subdivision plan approval. Use additional pages as needed.

The Rezoned Lands may be used for, and only for, the uses listed immediately below. The permitted uses are subject to the limitations and regulations stated in the Use Table and any additional limitations or regulations stated below. For convenience, some relevant sections of the Unified Development may be referenced; such references do not imply that other sections of the Unified Development Ordinance do not apply.

1.	single family detached dwelling	25.	
2.	community garden	26.	
3.	park (public or private)	27.	
4.	utility, minor	28.	
5.		29.	
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21.		45.	
22.		46.	
23.		47.	
24.		48.	

APPLICATION FOR CONDITIONAL REZONING MAP AMENDMENT

OWNER'S CONSENT FORM

Name of Project: The Wall Purdy Tract Submittal Date: _____

OWNER'S AUTHORIZATION

I hereby give CONSENT to Weaver's Pond Development Company, LLC; Grey Berry, Agent (type, stamp or print clearly full name of agent) to act on my behalf, to submit or have submitted this application and all required material and documents, and to attend and represent me at all meetings and public hearings pertaining to the application(s) indicated above. Furthermore, I hereby give consent to the party designated above to agree to all terms and conditions which may arise as part of the approval of this application.

I hereby certify I have full knowledge the property I have an ownership interest in is the subject of this application. I acknowledge and agree that, pursuant to Section 2.2.6 M. of the Town of Zebulon Unified Development Ordinance, that lands subject to a conditional rezoning shall be subject to all the standards, conditions, and plans approved as part of that application. These standards, plans, and approved conditions are perpetually binding on the land as an amendment to this Ordinance and the Official Zoning Map, and may only be changed in accordance with the procedures established in this Ordinance. Development located outside the Town of Zebulon's corporate limits shall comply with all Town policies related to annexation and the extension of utilities. I understand that all other applicable standards and regulations of the UDO will remain applicable to the subject lands unless specifically listed as conditions or deviations as part of this request. I understand that any false, inaccurate or incomplete information provided by me or my agent will result in the denial, revocation or administrative withdrawal of this application, request, approval or permits. I acknowledge that additional information may be required to process this application. I further consent to the Town of Zebulon to publish, copy or reproduce any copyrighted document submitted as a part of this application for any third party. I further agree to all terms and conditions, which may be imposed as part of the approval of this application.

Phyllis Purdy — *Signature of Owner*

Phyllis Purdy — *Print Name*

7-28-2022 — *Date*

CERTIFICATION OF PROPERTY OWNER

I hereby certify the statements or information made in any paper or plans submitted herewith are true and correct to the best of my knowledge. I understand this application, related material and all attachments become official records of the Planning Department of the Town of Zebulon, North Carolina, and will not be returned.

Phyllis Purdy — *Signature of Owner*

Phyllis Purdy — *Print Name*

7-28-2022 — *Date*

*Owner of record as shown by the Wake County Revenue Department (www.wakegov.com). An option to purchase does not constitute ownership. If ownership has been recently transferred, a copy of the deed must accompany this form.

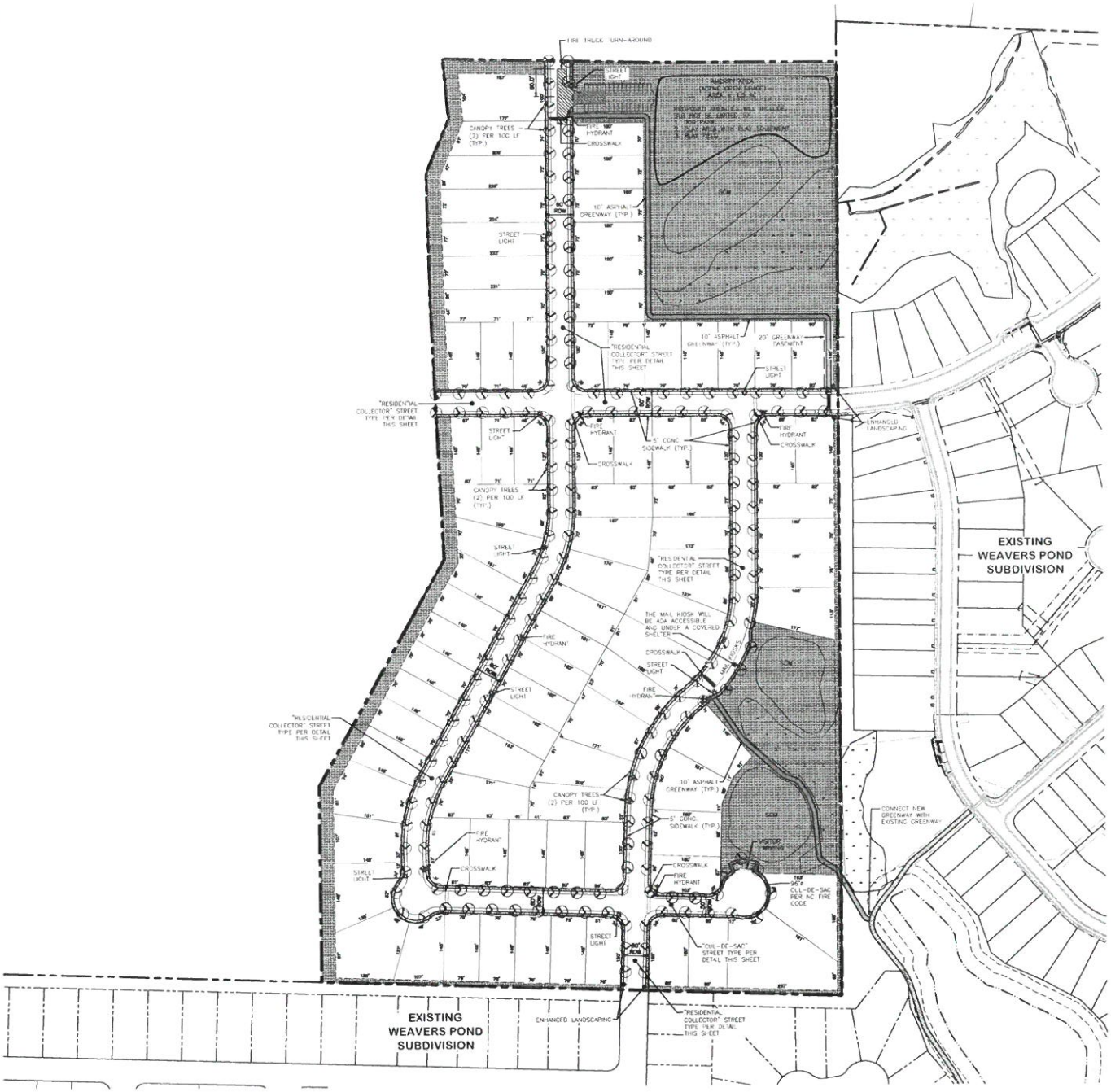
Attachment 1 - CZ 2023-02 - REVISED CONDITIONS

1. ALL LOTS SHALL BE A MINIMUM OF 8,700 SQUARE FEET.
2. ALL LOT WIDTHS SHALL BE A MINIMUM OF 70'.
3. ALL DWELLINGS WILL HAVE A MINIMUM TWO-CAR GARAGE.
4. GARAGE DOORS WILL HAVE WINDOWS AND CARRIAGE HARDWARE.
5. GARAGES: GARAGE DOORS SHALL BE RECESSED BEHIND THE FRONT PLAIN OF THE HOME A MINIMUM OF 8". WHERE A HOME PROVIDES A FRONT PORCH, THE GARAGE MAY EXTEND BEYOND THE FRONT PLAIN OF THE HOME, PROVIDED THE FRONT PORCH EXTENDS BEYOND THE FRONT PLAIN OF THE GARAGE A MINIMUM OF 1'.
6. SIDE LOADED GARAGES SHALL BE REQUIRED ON A MINIMUM OF 20% OF THE HOMES CONSTRUCTED. SIDE LOADED GARAGES AND "J" DRIVEWAYS SHALL BE ALLOWED A SIDE SETBACK OF 5'.
7. FOR ALL LOTS, THE ENTIRE YARD WILL BE SODDED.
8. EXTERIOR BUILDING MATERIALS: EXTERIOR SIDING WILL BE PRIMARILY FIBER CEMENT WITH BRICK OR STONE ACCENTS. THE USE OF VINYL SIDING SHALL BE PROHIBITED, EXCEPT FOR TRIM ELEMENTS OF THE DWELLING UNIT FACADE. SIDING STYLES WILL INCLUDE HORIZONTAL, SHAKE, OR BOARD AND BATTEN DESIGN. AT LEAST TWO (2) OF THE FOLLOWING MATERIALS SHALL BE USED ON EACH UNIT FIBER-CEMENT, MASONRY BRICK, BRICK VENEER, MASONRY STONE, STONE VENEER. OR SYNTHETIC STONE.
9. FOUNDATIONS: FOUNDATIONS SHALL BE RAISED ABOVE THE FINISHED GRADE – AS MEASURED ALONG THE FRONT, STREET FACING FINISHED GRADE OF THE BUILDING PAD - A MINIMUM OF 18". FOUNDATION TYPES TO BE MAY INCLUDE, STEM WALL, RAISED SLAB, OR CRAWL SPACE.
10. AMENITIES WILL INCLUDE A DOG PARK, WALKING TRAILS, AND MAINTAINED OPEN SPACE. ALL OPEN SPACE AND AMENITIES WILL BE MAINTAINED BY THE HOA
11. A MINIMUM OF 8" ROOF OVERHANG SHALL BE PROVIDED ALONG THE FRONT AND BACK OF EACH DWELLING UNIT.
12. A 10-FOOT UNDISTURBED BUFFER WILL BE MAINTAINED AROUND THE DEVELOPMENT. WHERE EXISTING PLANTS DO NOT MEET THE REQUIREMENTS OF THE UDO, PLANTINGS WILL BE SUPPLEMENTED TO MEET THE REQUIREMENT.
13. REQUIRED DECORATIVE FEATURES EACH UNIT SHALL UTILIZE AT LEAST ONE OF THE FOLLOWING: A DECORATIVE FRONT DOOR (MINIMUM 25% GLAZING); WINDOW TRANSOM, DOOR SIDELIGHTS, OR DOOR TRANSOM.
14. WINDOW TREATMENTS: WINDOWS ON FRONT ELEVATIONS SHALL OFFER EITHER TRIM OR SHUTTERS. TRIM ALONG HEADERS AND SILLS SHALL BE A MINIMUM OF 3" WIDE. SHUTTERS ARE DECORATIVE AND

MAY OR MAY NOT BE "OPERATIONAL". SHUTTERS SHALL HAVE A MINIMUM WIDTH OF 18".

15. PORCHES: FRONT PORCHES SHALL EXTEND BEYOND THE FRONT PLAIN OF THE GARAGE ON 20% OF THE HOMES CONSTRUCTED. FRONT PORCHES SHALL BE ALLOWED TO EXTEND BEYOND THE FRONT SETBACK OF THE BUILDING ENVELOP A MAXIMUM OF 10'.
16. FRONT PORCHES SHALL WRAP AROUND THE CORNER OF THE FRONT FAÇADE ON A MINIMUM OF 20% OF THE HOMES CONSTRUCTED.
17. ALL HOMES WILL HAVE A REAR PATIO OR DECK OF AT LEAST 100 SQUARE FEET.
18. ACCESSORY BUILDINGS SHALL BE CONSTRUCTED OF MATERIALS THAT MATCH THE SINGLE-FAMILY DWELLING.
19. IN ORDER TO PROMOTE VARIATION IN HOME APPEARANCE, NO FRONT ELEVATION OR PRIMARY SIDING COLOR SHALL BE CONSTRUCTED WITHIN TWO HOUSES OF AN IDENTICAL ELEVATION OR PRIMARY SIDING COLOR ON THE SAME SIDE OF THE STREET OR ACROSS THE STREET. FOR CORNER LOTS, NO IDENTICAL ELEVATION OR PRIMARY SIDING COLOR WILL BE CONSTRUCTED DIAGONALLY ACROSS AN INTERSECTION.
20. HOMEOWNERS ASSOCIATION WILL LIMIT THE NUMBER OF RENTAL HOMES TO A MAXIMUM OF 10%. THIS RESTRICTION SHALL BE RECORED IN HOA COVENATS, CONDITIONS AND RESTRICTIONS.
21. ALL HOME DESIGN AND CONSTRUCTION SHALL CONFORM TO SECTION 5.2 OF THE TOWN OF ZEBULON'S UNIFIED DEVELOPEMNT ORDINACE.

Attachment 1
CZ 2023-02



SITE DATA

OWNER/DEVELOPER:	WALL PURDY FAMILY LLC JAMES B. BLACK II (AGENT) 1508 FELTON PL RALEIGH NC 27612-5001
STREET ADDRESS:	2620 ZEBULON RD ZEBULON, NC
PROPOSED PROJECT AREA:	43.61 AC
CURRENT ZONING:	R40W
PARCEL IDENTIFICATION NUMBER:	1797613206
MINIMUM REQUIRED LOT WIDTH:	70'
TOTAL # LOTS:	87

OPEN SPACE CALCULATIONS

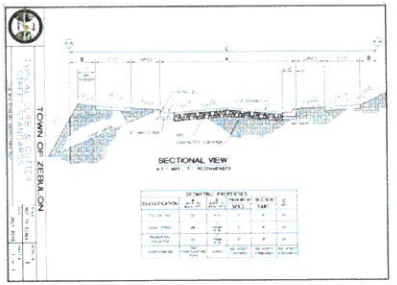
OPEN SPACE

TOTAL REQUIRED O.S. = 10% OF THE PROJECT AREA
= 10% x 43.61 AC = 4.36 AC

TOTAL O.S. PROVIDED = 10.59 AC

TOTAL ACTIVE O.S. REQUIRED = 25% OF THE TOTAL REQUIRED O.S.
= 25% x 4.36 AC = 1.09 AC

TOTAL ACTIVE O.S. PROVIDED = 1.5 AC



NOTES:
1. SIDEWALK TO BE PROVIDED ON BOTH SIDES OF THE STREET PER DETAIL ABOVE.

NORTH

0 100 200 300

SCALE IN FEET

PLD
PIEDMONT LAND DESIGN, LLP
8522-204 SIX FORKS ROAD
RALEIGH, NORTH CAROLINA 27615
919.845.7600 PHONE
919.845.7703 FAX
ENGR. FIRM LICENSE NO. F-0843

PRELIMINARY
NOT FOR CONSTRUCTION

PURDY FAMILY, LLC PROPERTY

2620 ZEBULON RD
ZEBULON, NC

ISSUED: 01 AUG 2022

REVISIONS:
1 20 SEPT 2022
PER TOWN COMMENTS
2 7 NOV 2022
PER TOWN COMMENTS
3 28 NOV 2022
PER TOWN COMMENTS
4 13 JAN 2023
PER TOWN COMMENTS

DRAWN BY: JET
CHECKED BY: MLS

PROJECT: FDCWP9

CONCEPTUAL LOT LAYOUT EXHIBIT

DWG. NO. **EX 1.1**

F:\Projects\FDCWP9\Drawings\Site\FDCWP9_Base.dwg - EX 1.0 - CONCEPTUAL LAYOUT Feb 02, '23 - 2:55pm

Attachment 1
CZ 2023-02

NORTH

0 100 200 300
SCALE IN FEET

PLD
PIEDMONT LAND DESIGN, LLP
8522-204 SIX FORKS ROAD
RALEIGH, NORTH CAROLINA 27615
919.845.7600 PHONE
919.845.7703 FAX
ENGR. FIRM LICENSE NO. F-0843

PRELIMINARY
NOT FOR CONSTRUCTION

PURDY FAMILY, LLC PROPERTY

2620 ZEBULON RD
ZEBULON, NC

ISSUED: 24 OCT 2022

REVISIONS:
1 7 NOV 2022
PER TOWN COMMENTS
2 28 NOV 2022
PER TOWN COMMENTS
3 13 JAN 2023
PER TOWN COMMENTS

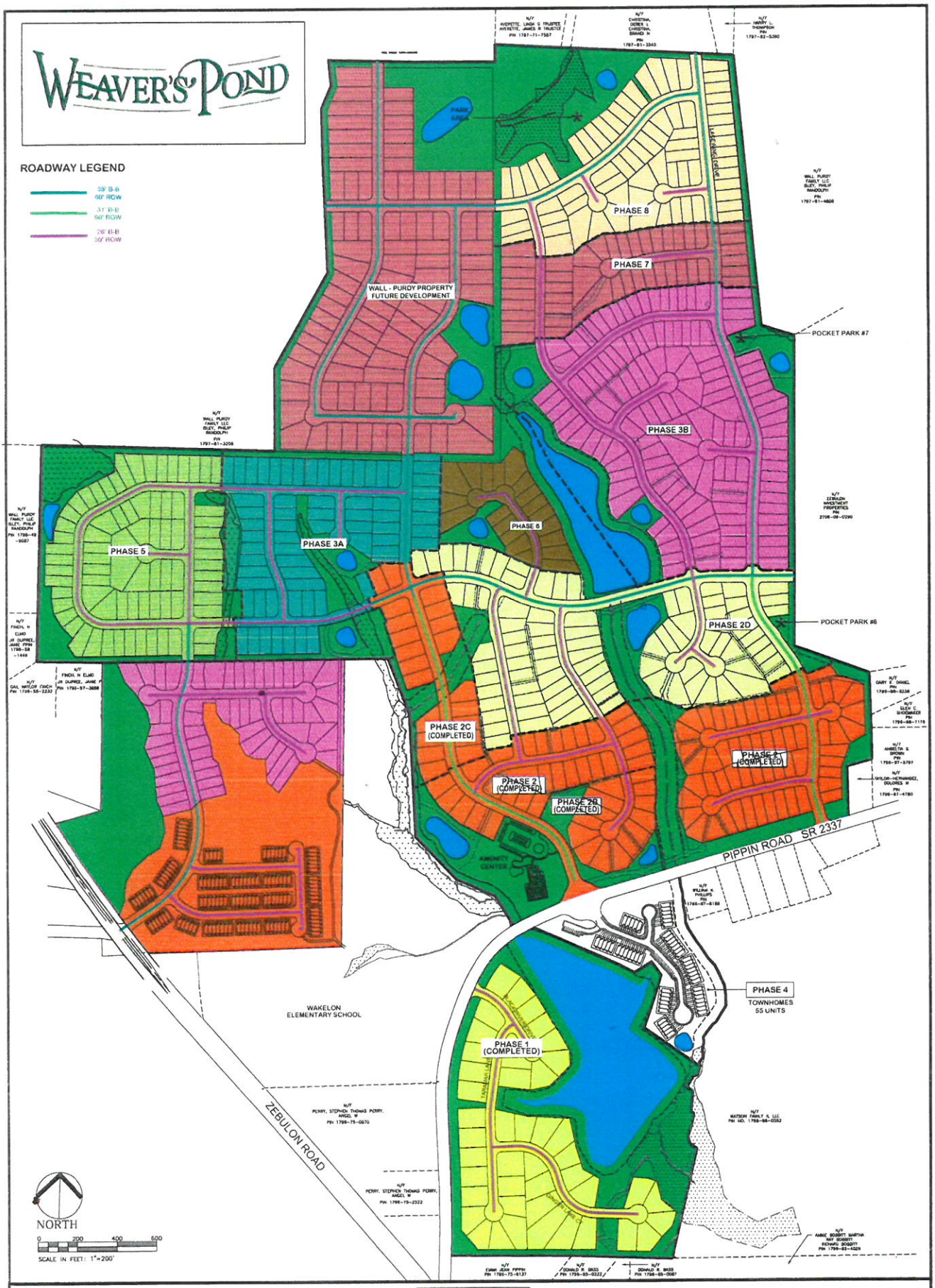
DRAWN BY: JET
CHECKED BY: MLS

PROJECT: FDCWP9

CONCEPTUAL STORM DRAINAGE PLAN

DWG. NO. **EX 2.0**

F:\Projects\FDCWP9\Drawings\Site\FDCWP9_Base.dwg - EX 2.0 - CONCEPTUAL STORM PLAN Jan 13, '23 - 1:27pm



PLD
PIEDMONT LAND DESIGN, PLLP

WEAVER'S POND
MASTER PLAN

PROJECT: FDCWPSUP
ISSUED: 24 MARCH 2023
DWG. NO: MP.1

Attachment 1
CZ 2023-02

Attachment 1
CZ 2023-02

JDAVIS

PRELIMINARY AMENITY
CONCEPT PLAN
FOR FUTRELL DEVELOPMENT, LLC
2620 ZEBULON ROAD, ZEBULON NC, 27597

PROJECT	PJS	DATE
ISSUE	SUBMITTAL PACKAGE	11/15/2022
REVISIONS		
DRAWN BY	PJS	
CHECKED BY	JEA	
CONTENT	AMENITY AREA ENLARGEMENT	

LA1.01

Attachment 1
CZ 2023-02

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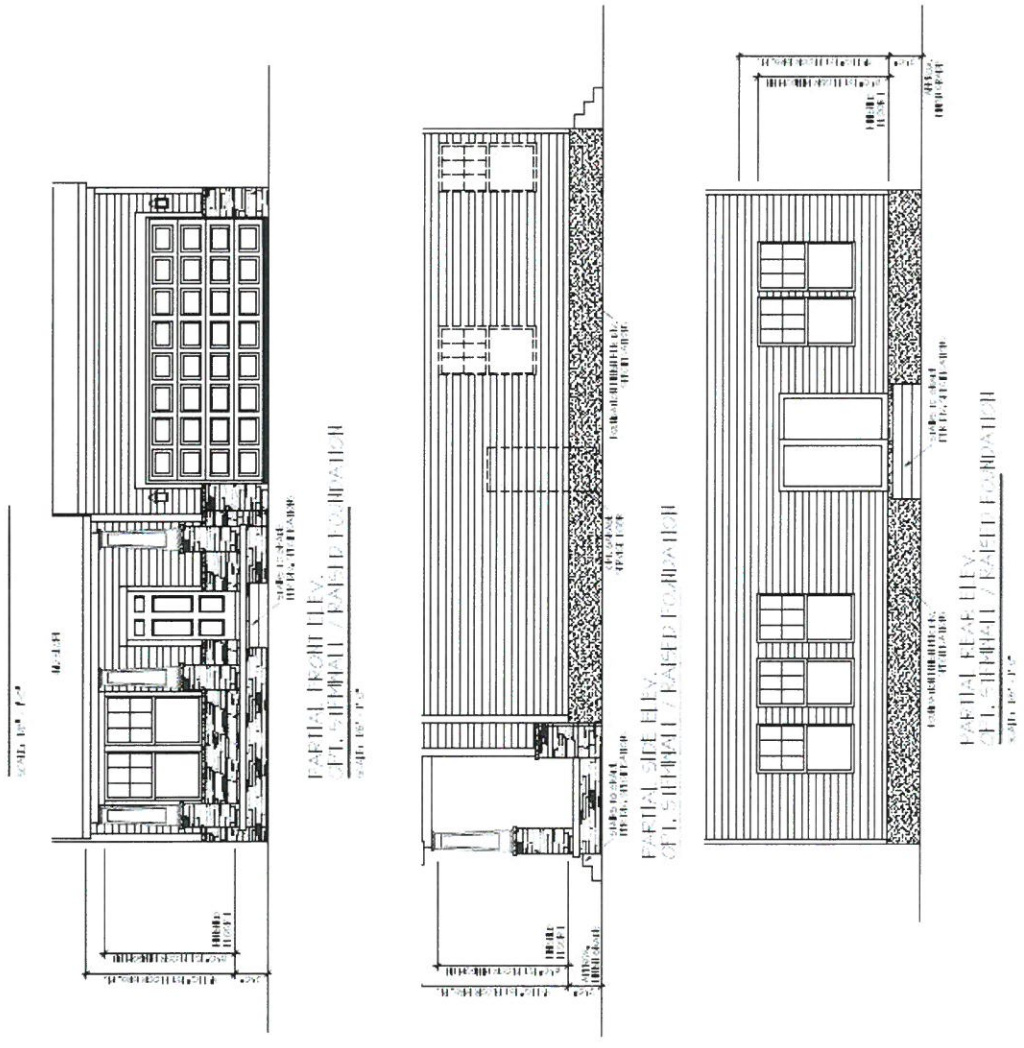

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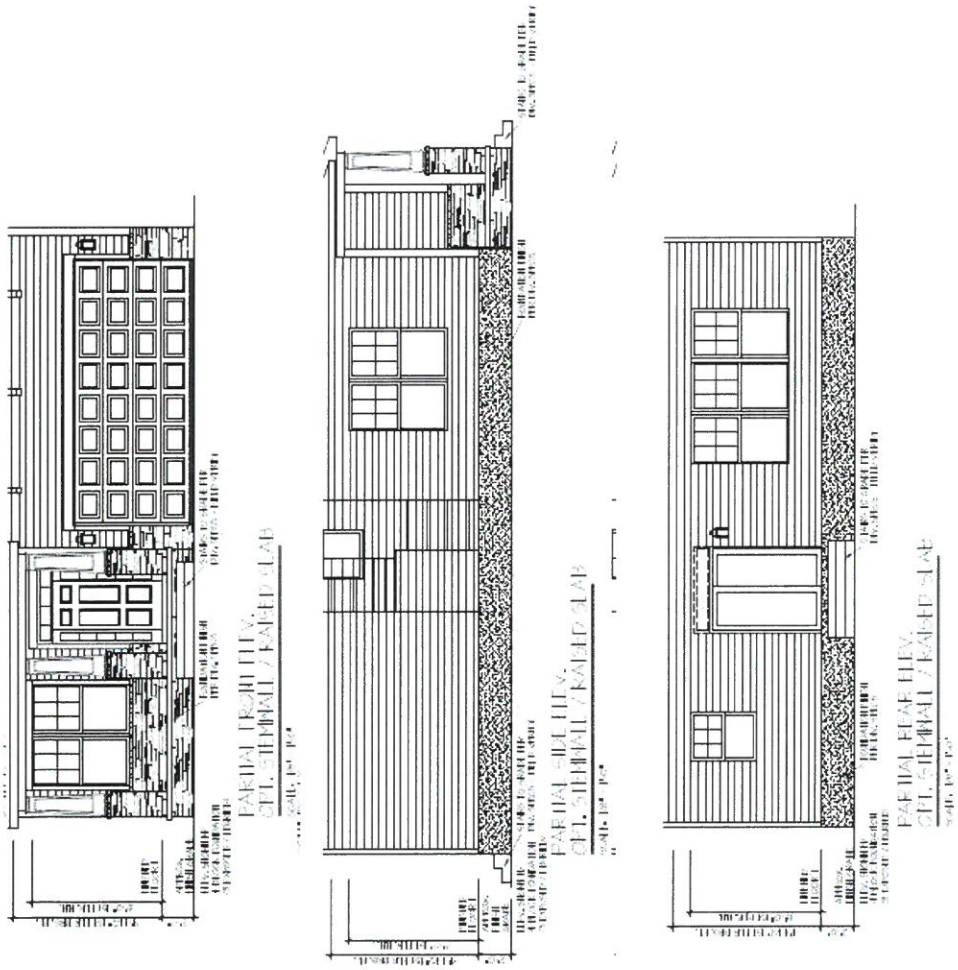

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RAMEY KEMP ASSOCIATES
TOGETHER WE ARE LIMITLESS

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

July 29, 2022

Mr. Meade Bradshaw
Assistant Planning Director
Town of Zebulon
1003 N. Arendell Avenue
Zebulon, NC 27597
P: (919) 269-7455
E: mbradshaw@townofzebulon.org

Subject: **Traffic Assessment**
Weaver's Pointe – Zebulon, North Carolina

Dear Mr. Bradshaw:

This letter provides a summary of a Traffic Assessment prepared for the Weaver's Pointe residential development located north of Pippin Road and east of NC 96 (Zebulon Road) in Zebulon, North Carolina. Refer to the attachments for the site location map. The purpose of the study is to determine how traffic generated by the proposed development is expected to impact the surrounding roadways and intersections.

The proposed additional phase is expected to consist of 105 single-family homes and is anticipated to be completed by 2024. Site access will be provided via connections to the existing Weaver's Pond and Weaver's Ridge developments via Yulee Drive and Golden Plum Lane.

Refer to the attachments for a copy of the preliminary site plan and for an illustration of the existing lane configurations within the study area.

Study Area

Based on coordination with the Town of Zebulon (Town) and the North Carolina Department of Transportation (NCDOT), the study area consists of the following intersections:

- NC 96 (Zebulon Road) & Pippin Road
- NC 96 (Zebulon Road) & Glory Road
- Pippin Road & Pearces Road

Analysis Scenarios

All capacity analyses were performed utilizing Synchro (Version 10.3). All study intersections were analyzed during the weekday AM and PM peak hours and PM school peak hours under the following proposed traffic scenarios:

- 2022 Existing Traffic Conditions
- 2025 (Build +1) No-Build Traffic Conditions
- 2025 (Build +1) Build Traffic Conditions

2022 Existing Traffic Volumes

Through coordination with the Town and NCDOT, existing peak hour traffic volumes were determined based on previously conducted turning movement counts collected as part of the Weaver's Pond and Weaver's Ridge traffic studies. Previously collected turning movement counts were grown from the year collected to the 2022 existing analysis year using a 3% annual growth rate.

Peak hour turning movement counts were conducted at the following study intersections during the weekday AM and PM peak hours at the listed dates:

- NC 96 (Zebulon Road) & Pippin Road – August 30th, 2017
- NC 96 (Zebulon Road) & Glory Road – April 10th, 2019
- Pippin Road & Pearces Road – October 3rd, 2017

It should be noted that the Weaver's Pond development is currently fully build-out with the exception of Phase 5 (73 single-family homes). Therefore, the traffic associated with the currently built portion of the development was added to the grown traffic counts to accurately model existing traffic conditions. Refer to Table 1 below, for a breakdown of the expected trip generation of Weaver's Pond and how the expected development trips were applied in this study.

Table 1: Weaver's Pond Development Traffic

Land Use (ITE Code)	Intensity	Daily Traffic (vpd)	AM Peak Hour Trips (vph)		PM Peak Hour Trips (vph)	
			Enter	Exit	Enter	Exit
Weaver's Pond Full Buildout (From Weaver's Pond TIA)						
Single-Family Housing (210)	525 DU	5,000	99	295	331	194
Townhouse (230)	55 DU	400	4	20	19	10
Total		**5,400**	**103**	**315**	**350**	**204**
Weaver's Pond Phase 5 (To Be Built)						
Single-Family Housing (210) (Approx. 14% of Total SFH)	73 DU	695	14	41	46	27
Existing Development (Currently Built)						
Existing Weaver's Pond Development (As of 2022)		**4,705**	**89**	**274**	**304**	**177**

Volumes were balanced along NC 96 (Zebulon Road) to account for any variance associated with the different count dates. Volumes were not balanced along Pippin Road due to the reasonable imbalance in comparison to the land uses between the intersections along Pippin Road. A copy of the count data is attached to this report. Refer to the attachments for an illustration of the 2022 existing weekday AM and PM peak hour traffic volumes.

Background Traffic Volumes

Based on a review of traffic growth patterns and adjacent development information, background traffic volumes were determined by projecting 2022 existing traffic volumes to the 2025 build-out year using a 3% annual growth rate. It should be noted that the balanced 2022 existing traffic volumes were not rebalanced after the growth rate was applied for the 2025 projected traffic volumes, which can result in minor vehicles imbalances due to rounding. Refer to the attachments for an illustration of the 2025 projected peak hour traffic volumes. Through coordination with the Town and NCDOT, the following adjacent developments were identified to be included in this study:

- Weaver's Pond (Phase 5)
- Weaver's Ridge
- Taryn Lake & Taryn Creek
- Pearces Road

Refer to the attachments for an illustration of the adjacent development peak hour traffic volumes.

It should be noted that per the completed traffic study for Weaver's Ridge, it was assumed that a portion of the Weaver's Pond development site traffic would be rerouted to utilize the future site driveway along NC 96 (Zebulon Road). Refer to the attachments for an illustrations of this rerouted development traffic.

Future Improvements

Through coordination with the Town and NCDOT, it was determined that the future improvements associated with Weaver's Ridge should be considered in the analysis of future conditions. Geometric improvements are expected at both study intersections along NC 96 by these developments.

2025 No-Build Traffic Volumes

The 2025 no-build traffic volumes were determined by projecting the 2022 existing peak hour traffic to the year 2025, and adding the adjacent development trips. Refer to the attachments for an illustration of the 2025 no-build peak hour traffic volumes.

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 2, for a detailed breakdown of the proposed site trip generation.

Table 2: Trip Generation Summary

Land Use (ITE Code)	Intensity	Daily Traffic (vpd)	AM Peak Hour Trips (vph)		PM Peak Hour Trips (vph)	
			Enter	Exit	Enter	Exit
Single-Family Housing (210)	105 units	1,055	20	58	66	38

It is estimated that the proposed development will generate approximately 1,055 total site trips on the roadway network during a typical 24-hour weekday period. Of the daily traffic volume, it is anticipated that 78 trips (20 entering and 58 exiting) will occur during the weekday AM peak hour and 104 trips (66 entering and 38 exiting) will occur during the weekday PM peak hour.

Trip Distribution and Assignment

The primary 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:

- 50% to/from the south via NC 96 (Zebulon Road)
- 25% to/from the south via NC 96 (Zebulon Road)
- 20% to/from the north via Pearces Road
- 5% to/from the south via Pearces Road

It should be noted that the regional distributions were based on the approved distributions from the Weaver's Pond and Weaver's Ridge traffic studies. Refer to the attachments for illustrations of the site trip distribution and site trip assignment, respectively.

2025 Build Traffic

To estimate the 2025 build traffic conditions with the site fully built-out, the total site trips were added to the 2025 no-build traffic volumes. Refer to the attachments for an illustration of the 2025 build peak hour traffic volumes.

Capacity Analysis

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 10.3), 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 3 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 3 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

The study intersections were analyzed under 2022 existing, 2025 no-build, and 2025 build traffic conditions with lane configurations and traffic control shown in Tables 4-6. Refer to Tables 4-6 for a summary of the analysis results. The Synchro capacity analysis reports are attached to this report.

Table 4: Analysis Summary of NC 96 (Zebulon Road) and Pippin 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 Conditions	WB NB SB	1 LT-RT 1 TH, 1 RT 1 LT, 1 TH	C B B	B (18)	D C B	C (22)
2025 No-Build Conditions	WB NB SB	1 LT-RT 1 TH, 1 RT 1 LT, 1 TH	C B B	C (21)	D C B	C (26)
2025 Build Conditions	WB NB SB	1 LT-RT 1 TH, 1 RT 1 LT, 1 TH	C C B	C (22)	D C B	C (27)

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

Capacity analysis of 2022 existing, 2025 no-build, and 2025 build traffic conditions indicates that this intersection is expected to operate at an overall LOS C or better during the weekday AM and PM peak hours under all analysis scenarios. Additionally, all intersection approaches are expected to operate at LOS D or better during the weekday AM and PM peak hours. Due to the expected acceptable operation of this intersection upon buildout of the proposed development, no improvements are recommended at this intersection by the development.

Table 5: Analysis Summary of NC 96 (Zebulon Road) and Glory Road / Weaver's Ridge 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)
2022 Existing Conditions	EB NB SB	1 LT-RT 1 LT-TH 1 TH-RT	C[2] A[1] -	N/A	C[2] A[1] -	N/A
2025 No-Build Conditions	EB WB NB SB	1 LT-TH-RT 1 LT, 1 TH-RT 1 LT-TH, 1 RT 1 LT-TH-RT	D[2] F[2] A[1] A[1]	N/A	E[2] F[2] A[1] A[1]	N/A
2025 Build Conditions	EB WB NB SB	1 LT-TH-RT 1 LT, 1 TH-RT 1 LT-TH, 1 RT 1 LT-TH-RT	D[2] F[2] A[1] A[1]	N/A	F[2] F[2] A[1] A[1]	N/A
2025 Build Conditions **Signalized to meet UDO**	EB WB NB SB	1 LT-TH-RT 1 LT, 1 TH-RT 1 LT-TH, 1 RT 1 LT-TH-RT	D D B B	B (17)	D D A B	B (13)

Improvements and/or revised lane configurations by Weaver's Ridge are shown underlined.
Improvements and/or revised lane configurations by the development are shown in bold.
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 movement on NC 96 (Zebulon Road) are expected to operate at LOS A during the weekday AM and PM peak hours and that the minor-street approach of Glory Road are expected to operate at LOS C during the weekday AM and PM peak hours.

Under future traffic conditions, the Weaver's Ridge development is expected to construct the westbound approach of this intersection and provide a dedicated northbound right-turn lane on NC 96 (Zebulon Road). Under 2025 no-build and 2025 build traffic conditions, the major-street left-turn movement on NC 96 (Zebulon Road) are expected to operate at LOS A during the weekday AM and PM peak hours. The eastbound minor-street approach of Glory Road is expected to operate at LOS D during the weekday AM peak hour and at LOS E/F during the weekday PM peak hour. The westbound minor-street approach of Weaver's Ridge Site Drive is expected to operate at LOS F during both the weekday AM and PM peak hours.

Per the Town's UDO, if a site access operates at LOS D or worse, additional site access points may need to be considered. It should be noted that the proposed Weaver's Pointe development has interconnectivity with the northern section of the Weaver's Pond development which two (2) site access points along Pippin Road. Drivers will likely use an alternative site access if they experience significant delay at the more convenient site access.

In order to meet the Town's UDO, improvements must be identified to improve the intersection to an acceptable level-of-service. Signalization and/or additional capacity along NC 96 (Zebulon Road) would be necessary for significant improvement at the intersection. A traffic signal was considered at this intersection and 2025 build peak hour traffic volumes were analyzed utilizing the criteria contained in the *Manual on Uniform Traffic Control Devices* (MUTCD). A traffic signal was warranted during both the weekday AM and PM peak hours under 2025 build traffic conditions; however, it is not expected that this intersection would satisfy the 8-hour and 4-hour warrants, which NCDOT favors for installation of a traffic signal. These longer period warrants are not typically met for residential and school areas due to the distinct peak traffic periods for these types of development. For these reasons, signalization is not recommended at this intersection. A traffic signal was analyzed at the intersection to meet the Town's UDO requirements. With a signal, the intersection is expected to operate at LOS D with all approaches operating at LOS D or better during the weekday AM and PM peak hours.

Based on a review of SimTraffic simulations, queues for the westbound minor-street approach are expected to be fairly minor and excessive queueing is not expected on this approach upon buildout of the proposed development without signalization. Therefore, no improvements are recommended at this intersection by the proposed development.

Table 6: Analysis Summary of Pippin Road and Pearces 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 Conditions	EB	1 LT-TH-RT	B[2]	N/A	C[2]	N/A
	WB	1 LT-TH-RT	B[2]		C[2]	
	NB	1 LT-TH-RT	A[1]		A[1]	
	SB	1 LT-TH-RT	A[1]		A[1]	
2025 No-Build Conditions	EB	1 LT-TH-RT	C[2]	N/A	C[2]	N/A
	WB	1 LT-TH-RT	C[2]		C[2]	
	NB	1 LT-TH-RT	A[1]		A[1]	
	SB	1 LT-TH-RT	A[1]		A[1]	
2025 Build Conditions	EB	1 LT-TH-RT	C[2]	N/A	D[2]	N/A
	WB	1 LT-TH-RT	C[2]		C[2]	
	NB	1 LT-TH-RT	A[1]		A[1]	
	SB	1 LT-TH-RT	A[1]		A[1]	

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

Capacity analysis of 2022 existing, 2025 no-build, and 2025 build traffic conditions indicates that the major-street left-turn movements on Pearces Road are expected to operate at LOS A during the weekday AM and PM peak hours and that the minor-street approaches of Pippin Road are expected to operate at LOS D or better during the weekday AM and PM peak hours under all analysis scenarios. Due to the expected acceptable operation of this intersection upon buildout of the proposed development, no improvements are recommended at this intersection by the development.

Recommendations

Based on the findings of this study, the planned future geometric improvements committed by other developments are expected to accommodate future traffic conditions upon buildout of the proposed development. See a more detailed description of the recommended improvements below. Refer to the attachments for an illustration of the committed roadway improvements by other developments and future lane configurations expected within the study area.

Improvements by Weaver's Ridge

NC 96 (Zebulon Road) and Glory Road / Weaver's Ridge Site Drive

- Provide site access via westbound approach with one ingress lane and two egress lanes striped as one left-turn lane and one shared through/right-turn lane.
- Provide designated northbound right-turn lane with at least 100 feet of storage and appropriate decel and taper.
- Provide designated southbound left-turn lane with at least 50 feet of storage and appropriate decel and taper.
- Monitor intersection for signalization.

Improvements by Weaver's Pointe

NC 96 (Zebulon Road) and Glory Road / Weaver's Ridge Site Drive

- Monitor intersection for signalization.

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Findings and Summary

Based on the findings of this study, specific geometric improvements have been identified and are recommended to accommodate future traffic conditions and to mitigate the development's proportional impact on the surround transportation network.

If you should have any questions, please feel free to contact me at (919) 872-5115.

Sincerely,

Caroline Cheeves

NORTH CAROLINA PROFESSIONAL SEAL 050578 ENGINEER CAROLINE A. CHEEVES

7/29/2022

Caroline Cheeves, P.E.
Traffic Engineering Project Manager
Infrastructure Consulting Services, Inc.
dba
Ramey Kemp Associates
License # F-1489

Attachments: Figures
Traffic Counts
Adjacent Development Information
Synchro Reports
MUTCD Signal Warrant Analysis

RKA

Intersection	Approach	TIA 2022 Volumes		3/23/2023		Difference		Percentages	
		AM	PM	AM	PM	AM	PM	AM	PM
Pippin Rd & NC 96	SB	624	607	414	578	-210	-29	-34%	-5%
	WB	270	218	217	147	-53	-71	-20%	-33%
	NB	497	776	510	644	13	-132	3%	-17%
	EB	0	0	0	0	0	0		
	Total	1391	1601	1141	1369	-250	-232	-18%	-14%
NC 96 & Glory Rd	SB	619	604	334	548	-285	-56	-46%	-9%
	WB	0	0	32	18	32	18		
	NB	452	617	500	438	48	-179	11%	-29%
	EB	5	4	4	9	-1	5	-20%	125%
	Total	1076	1225	870	1013	-206	-212	-19%	-17%
Pearces Rd & Pippin Rd	SB	346	256	237	175	-109	-81	-32%	-32%
	WB	79	96	83	112	4	16	5%	17%
	NB	82	349	130	275	48	-74	59%	-21%
	EB	106	87	65	83	-41	-4	-39%	-5%
	Total	613	788	515	645	-98	-143	-16%	-18%

Attachment 1
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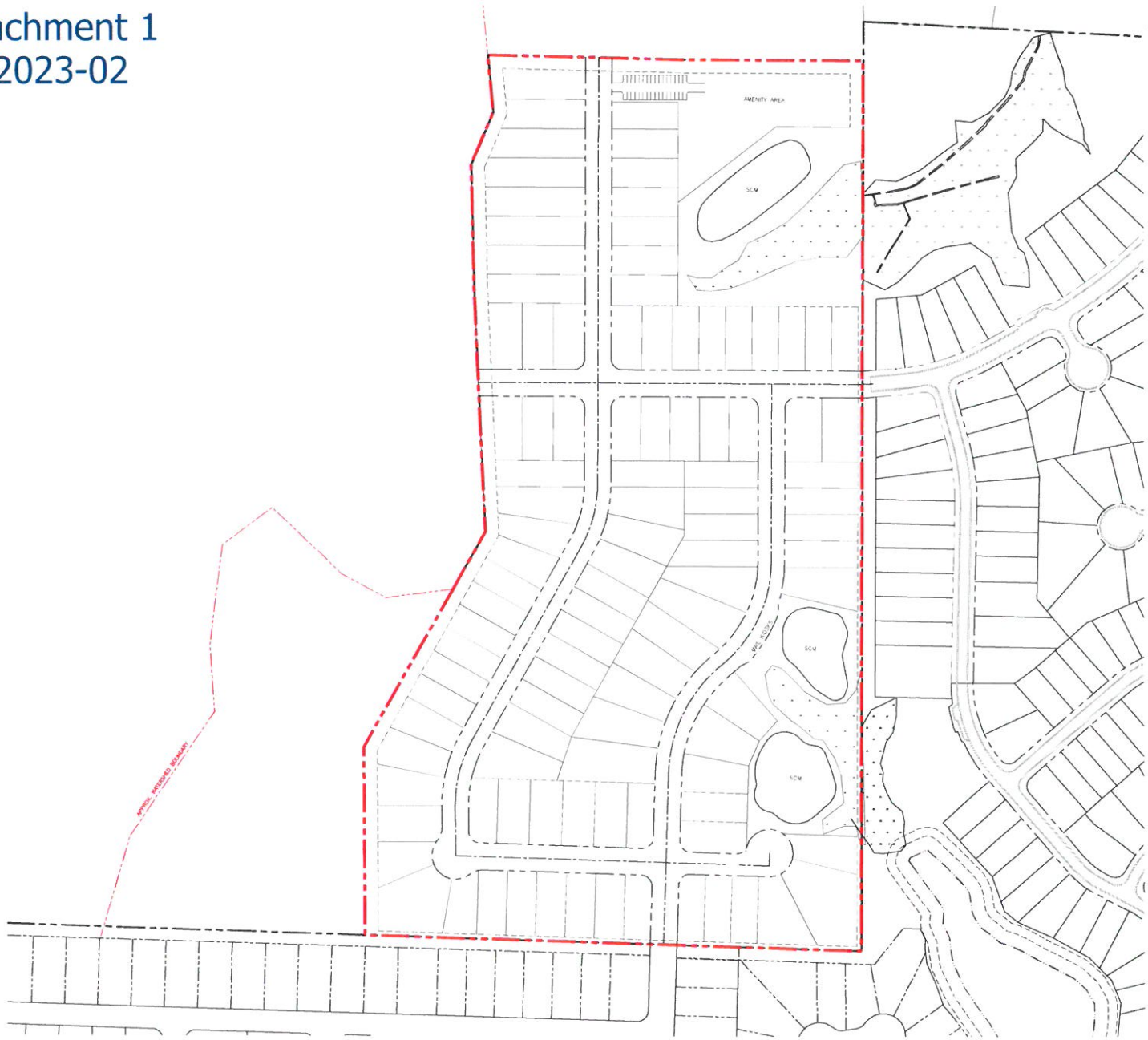
LEGEND

- Study Intersection
- Proposed Site Access
- Study Area

RKA RAMEY KEMP ASSOCIATES	Weaver's Pointe Zebulon, NC	Site Location Map Scale: Not to Scale

Attachment 1
CZ 2023-02



SITE DATA

OWNER/DEVELOPER:	WALL PURDY FAMILY LLC JAMES B. BLACK III (AGENT) 3309 FELTON PL RALEIGH NC 27612-5001
STREET ADDRESS:	2620 ZEBULON RD ZEBULON, NC
PROPOSED PROJECT AREA:	45.61 AC
CURRENT ZONING:	R40A
PROPOSED ZONING:	UNKNOWN
PARCEL IDENTIFICATION NUMBER:	1797613206
TOTAL NUMBER OF LOTS PROPOSED:	105 LOTS
MINIMUM LOT SIZE:	8,700 SF
MINIMUM LOT WIDTH:	60'

NOTE: THIS LAYOUT ASSUMES A REZONING WILL BE APPROVED, ALLOWING 60' WIDE LOTS AND 8,700 SF MINIMUM LOT AREA.

NORTH

0 100 200 300

SCALE IN FEET

PLD
PIEDMONT LAND DESIGN, LLP
8522-204 SIX FORKS ROAD
RALEIGH, NORTH CAROLINA 27615
919.845.7600 PHONE
919.845.7703 FAX
ENGR. FIRM LICENSE NO. F-0843

PRELIMINARY
NOT FOR CONSTRUCTION

PURDY FAMILY, LLC PROPERTY

2620 ZEBULON RD
ZEBULON, NC

ISSUED: 15 JULY 2022

REVISIONS:

DRAWN BY: JET
CHECKED BY: MLS

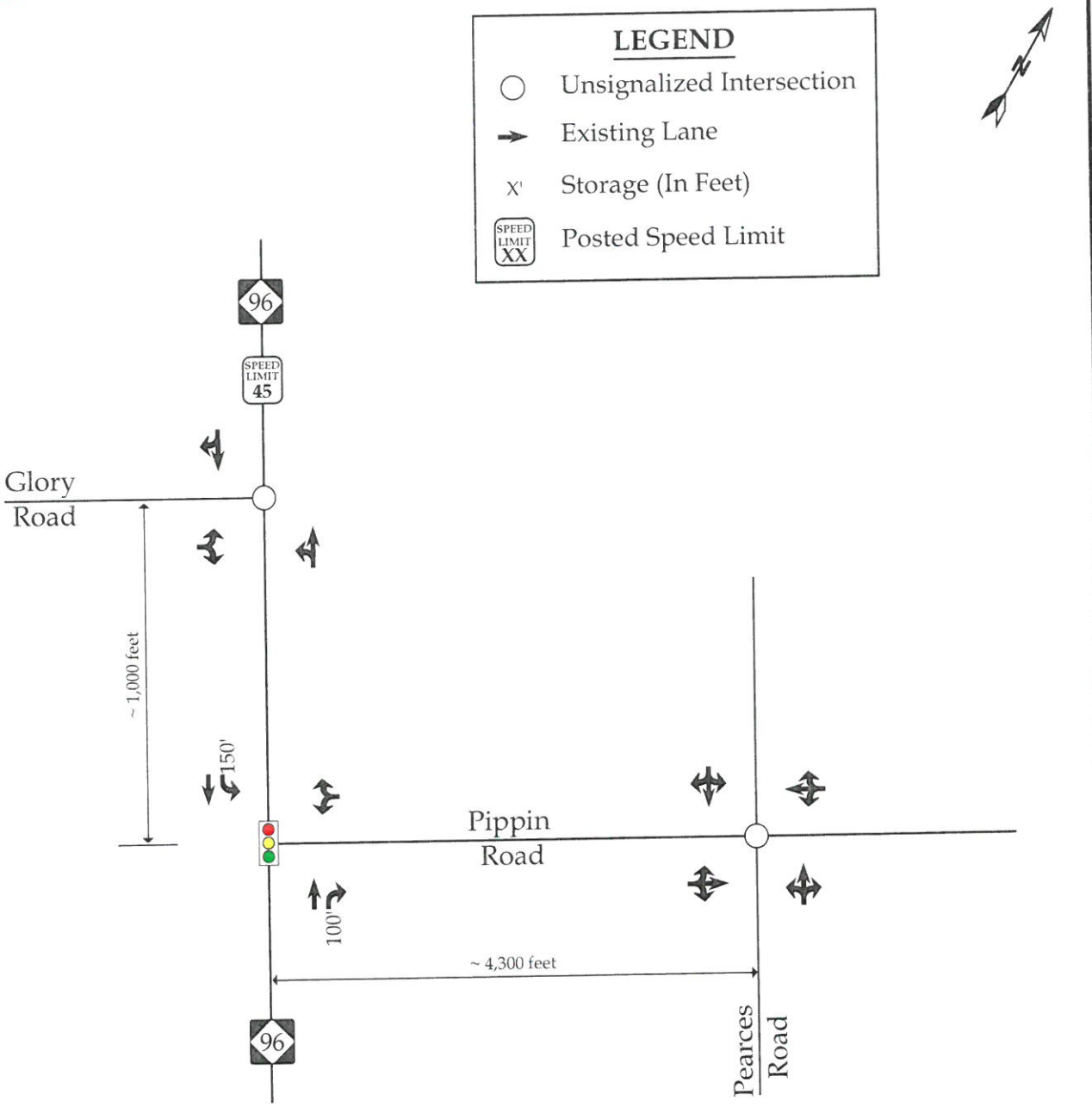
PROJECT: FDCWP9

CONCEPTUAL LOT LAYOUT EXHIBIT

DWG. NO. **EX 1.0**

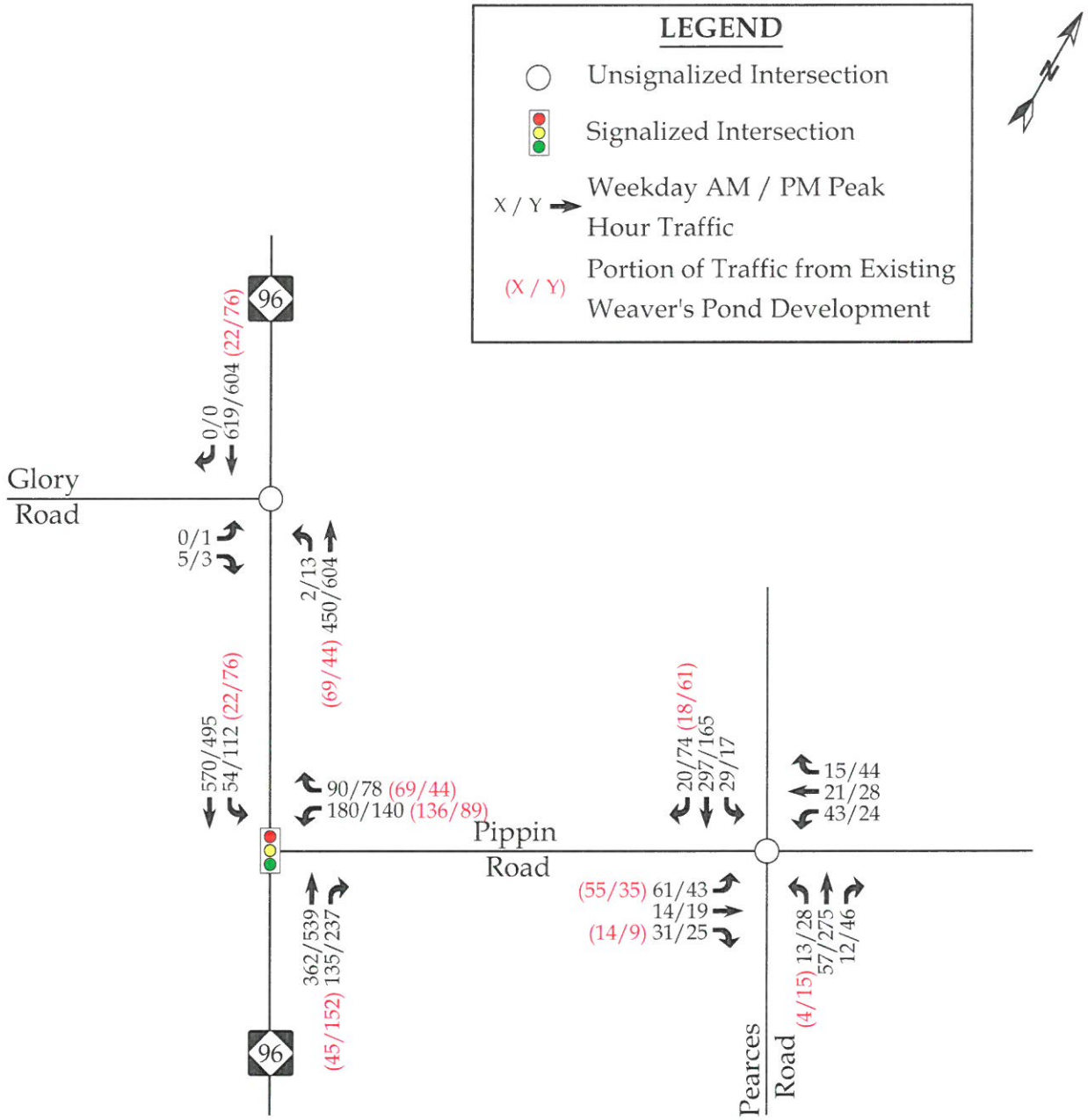
F:\Projects\FDCWP9\Drawings\Site\FDCWP9_Base.dwg - EX 1.0 - CONCEPTUAL LAYOUT Jul 15, '22 - 8:41am

Attachment 1
CZ 2023-02



RKA RAMEY KEMP ASSOCIATES	Weaver's Pointe Zebulon, NC	2022 Existing Lane Configurations Scale: Not to Scale

Attachment 1
CZ 2023-02



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	Weaver's Pointe Zebulon, NC	2022 Existing Peak Hour Traffic Scale: Not to Scale

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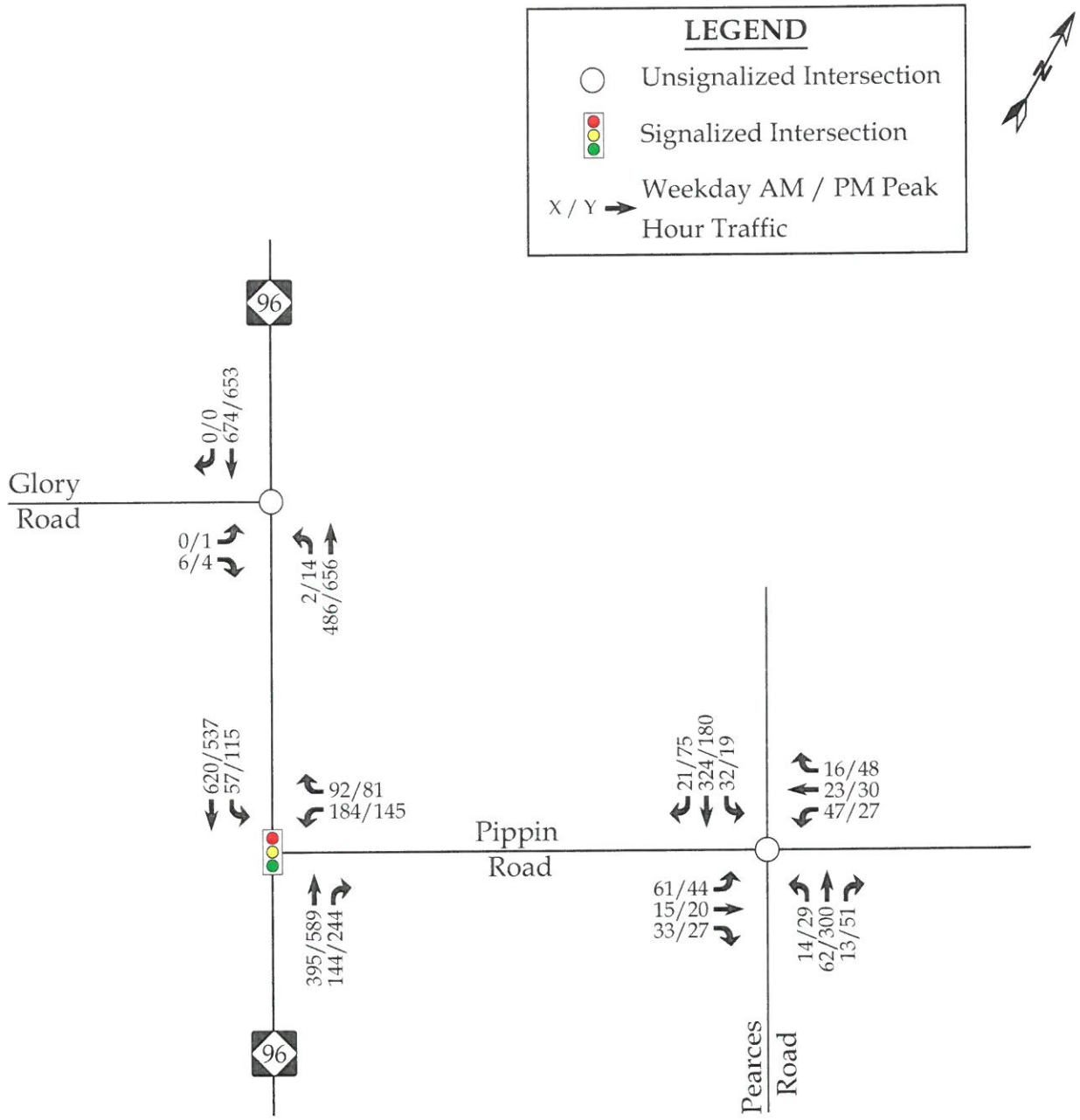
CZ 2023-02



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.

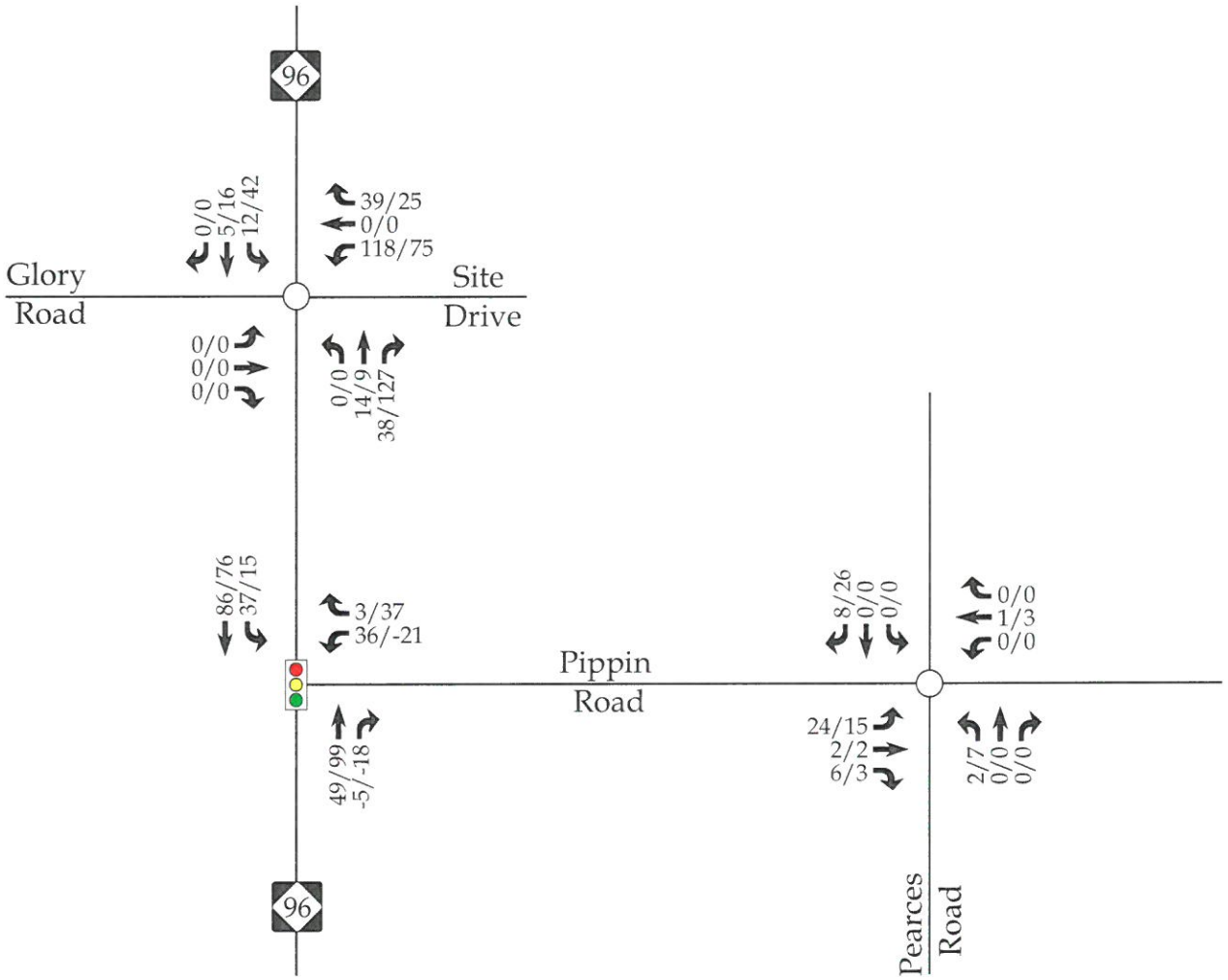
RKA RAMEY KEMP ASSOCIATES	Weaver's Pointe Zebulon, NC	2025 Projected Peak Hour Traffic Scale: Not to Scale

Attachment 1
CZ 2023-02

LEGEND

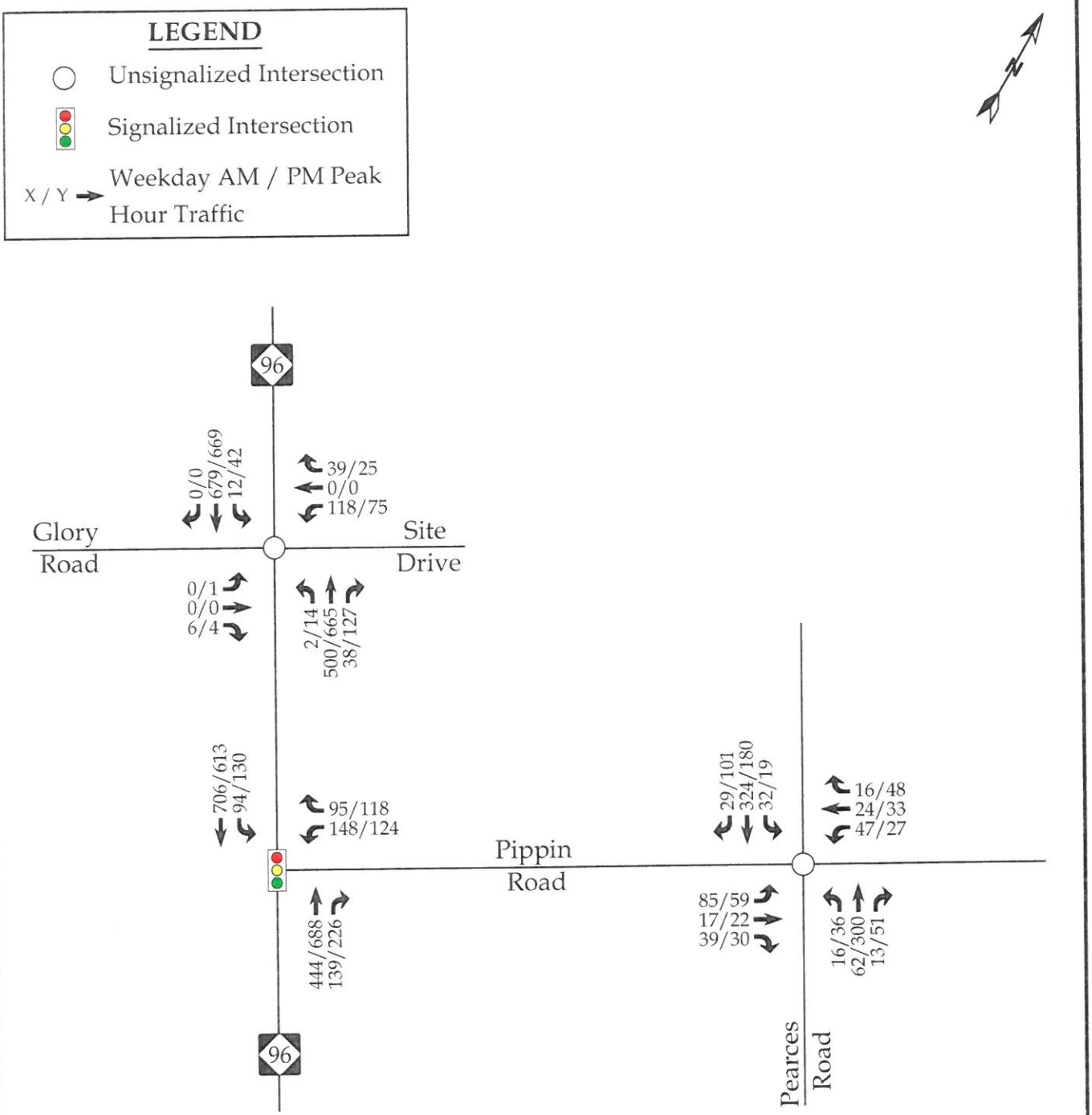
- ○ Unsignalized Intersection
- Signalized Intersection
- X / Y → Weekday AM / PM Peak Hour Adjacent Development Trips

*Note: Negative numbers are the result of rerouted Weaver's Pond traffic with the addition of the Weaver's Ridge site driveway on NC 96



RKA RAMEY KEMP ASSOCIATES	Weaver's Pointe Zebulon, NC	Peak Hour Adjacent Development Trips
		Scale: Not to Scale

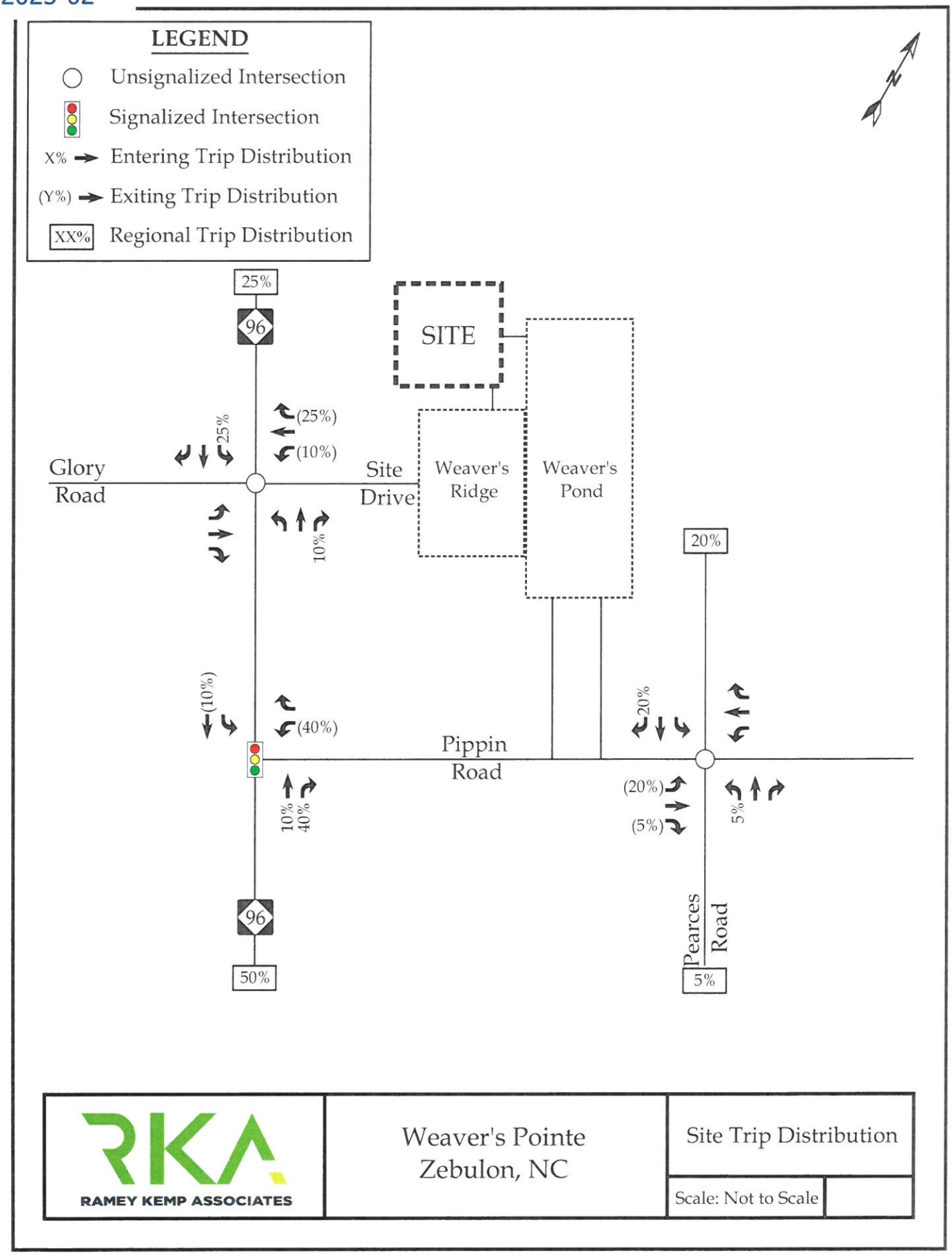
Attachment 1
CZ 2023-02



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	Weaver's Pointe Zebulon, NC	2025 No-Build Peak Hour Traffic Scale: Not to Scale

Attachment 1
CZ 2023-02



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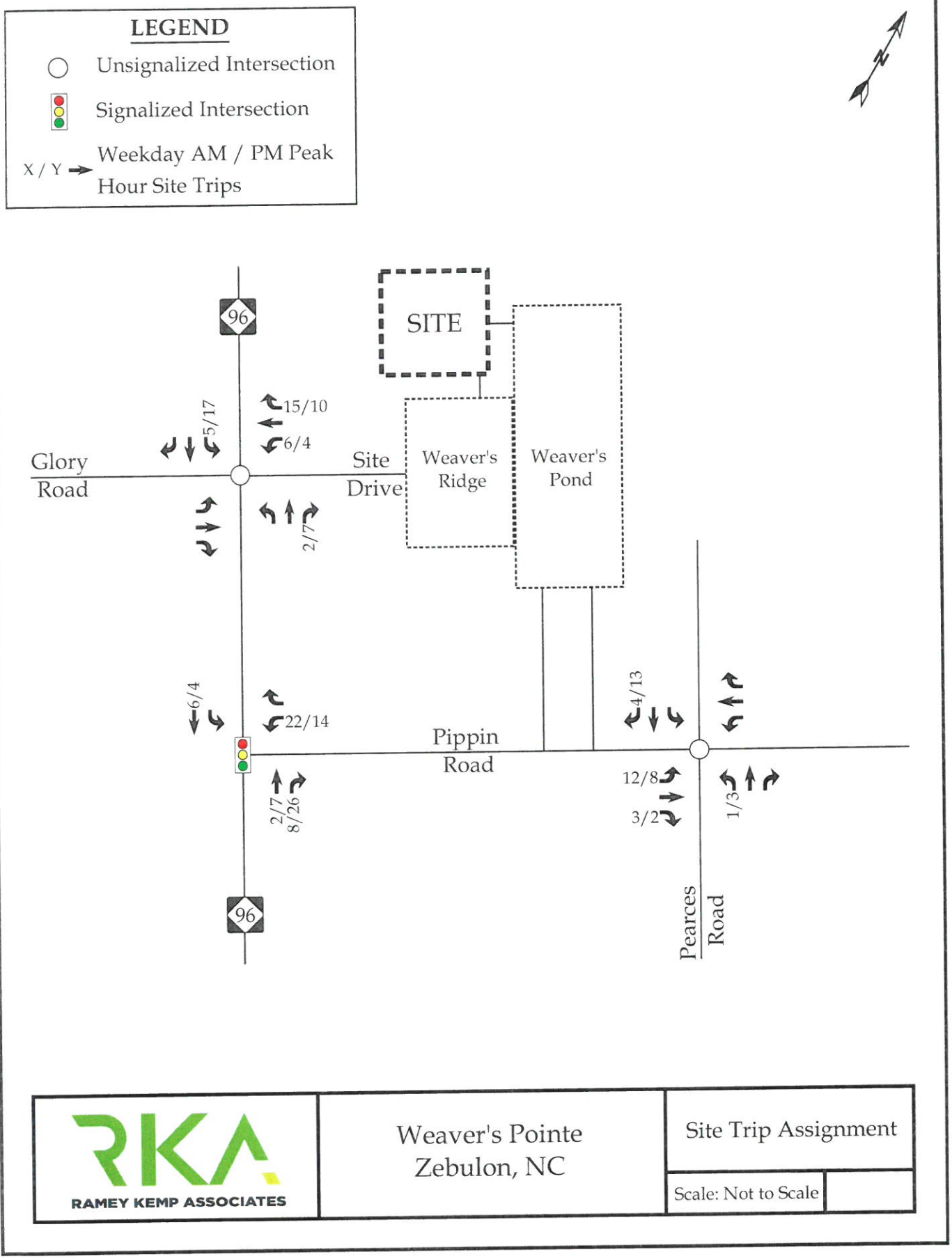
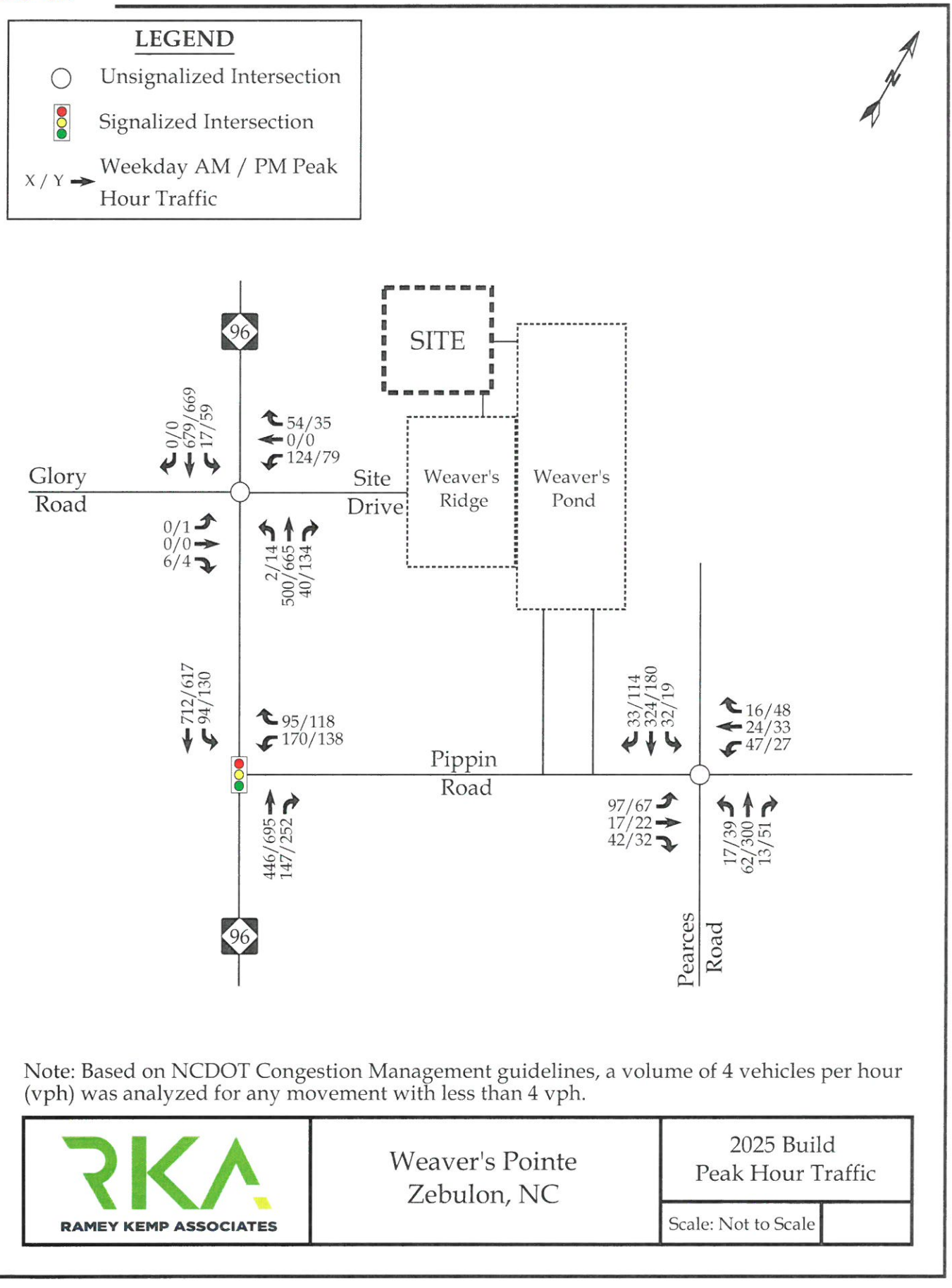


RKA RAMEY KEMP ASSOCIATES	Weaver's Pointe Zebulon, NC	Site Trip Assignment Scale: Not to Scale

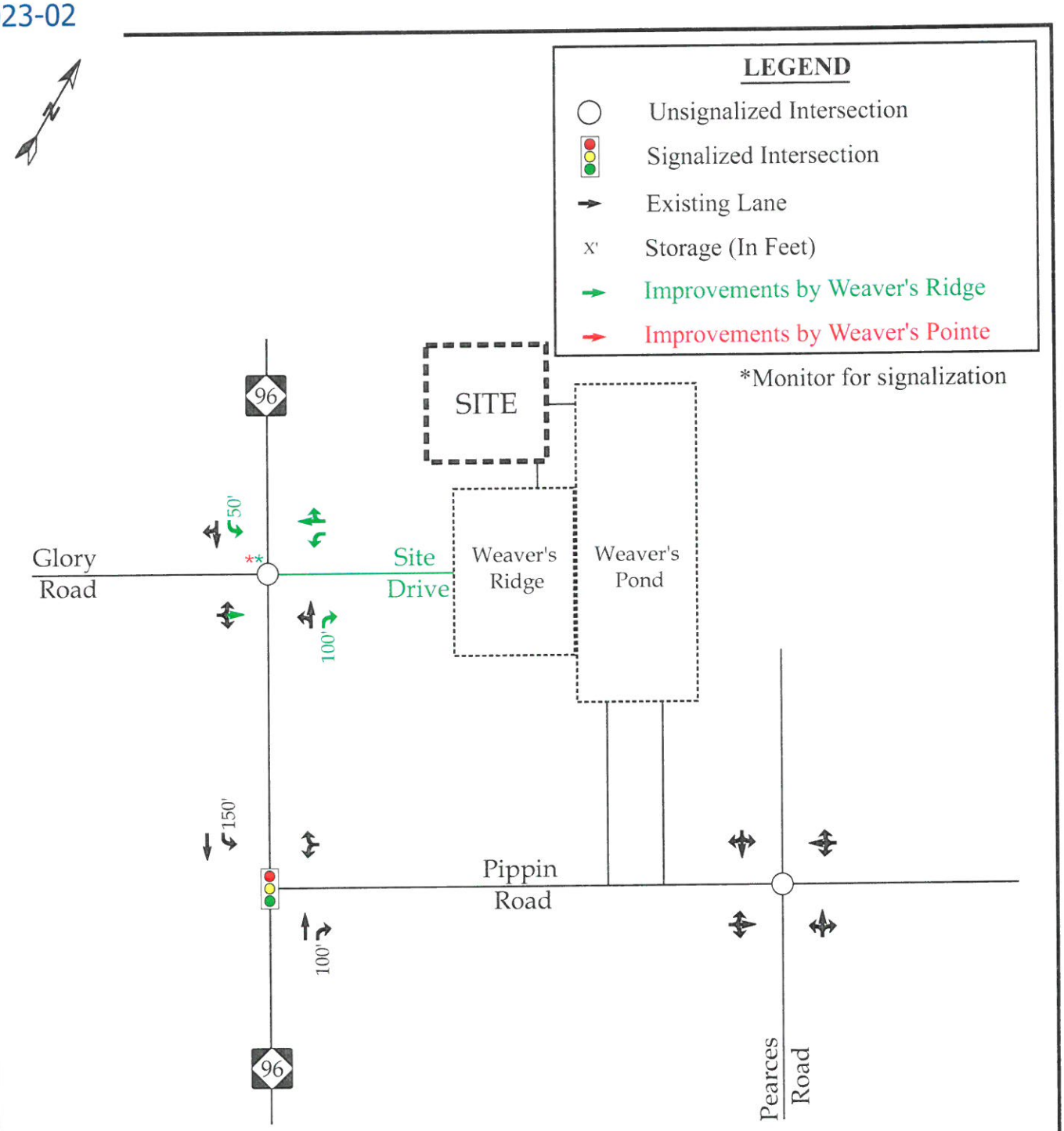
Attachment 1
CZ 2023-02



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	Weaver's Pointe Zebulon, NC	2025 Build Peak Hour Traffic
		Scale: Not to Scale

Attachment 1
CZ 2023-02



RKA RAMEY KEMP ASSOCIATES	Weaver's Pointe Zebulon, NC	Recommended Lane Configurations
		Scale: Not to Scale

Attachment 1
CZ 2023-02

RAMEY KEMP & ASSOCIATES
TRANSPORTATION ENGINEERS
5808 Faringdon Place, Suite 100
Raleigh, NC 27609
PH: 919 872-5115

File Name : NC 96 and Pippin Road
Site Code : 00083017
Start Date : 8/30/2017
Page No : 1

Groups Printed- Cars & Trucks

	Pippin Road From North					NC 96 From East					From South					NC 96 From West							
Start Time	Right	Thru	Left	TRKS	App Total	Right	Thru	Left	TRKS	App Total	Right	Thru	Left	TRKS	App Total	Right	Thru	Left	TRKS	App Total	Exclu Total	Inclu Total	Int. Total
06:00 AM	3	0	4	0	7	1	50	0	2	51	0	0	0	0	0	0	41	1	8	42	10	100	110
06:15 AM	3	0	3	0	6	5	55	0	0	60	0	0	0	0	0	0	52	0	2	52	2	118	120
06:30 AM	1	0	12	0	13	3	84	0	3	87	0	0	0	0	0	0	82	2	1	84	4	184	188
06:45 AM	6	2	17	1	25	6	90	0	3	96	0	0	0	0	0	0	91	1	4	92	8	213	221
Total	13	2	36	1	51	15	279	0	8	294	0	0	0	0	0	0	266	4	15	270	24	615	639
07:00 AM	9	0	22	0	31	16	70	3	1	89	0	0	0	0	0	0	81	8	6	89	7	209	216
07:15 AM	11	0	21	0	32	6	75	0	0	81	0	0	0	0	0	0	71	4	2	75	2	188	190
07:30 AM	5	0	14	0	19	22	89	1	3	112	0	0	0	0	0	0	121	6	1	127	4	258	262
07:45 AM	5	0	7	0	12	9	62	0	3	71	0	0	0	0	0	0	152	6	5	158	8	241	249
Total	30	0	64	0	94	53	296	4	7	353	0	0	0	0	0	0	425	24	14	449	21	896	917
08:00 AM	4	0	8	0	12	20	86	0	5	106	0	0	0	0	0	0	107	8	8	115	13	233	246
08:15 AM	4	0	9	0	13	27	70	0	2	97	0	0	0	0	0	0	89	8	5	97	7	207	214
08:30 AM	4	0	9	0	13	27	57	0	2	84	0	0	0	0	0	0	86	16	5	102	7	199	206
08:45 AM	4	0	16	1	20	38	62	0	4	100	0	0	0	0	0	0	72	11	4	83	9	203	212
Total	16	0	42	1	58	112	275	0	13	387	0	0	0	0	0	0	354	43	22	397	36	842	878
09:00 AM	8	1	70	0	79	50	56	0	9	106	0	0	0	0	0	0	77	11	6	88	15	273	288
09:15 AM	9	0	34	0	43	17	43	0	1	60	0	0	0	0	0	0	80	12	4	92	5	195	200
09:30 AM	5	0	13	0	18	13	64	0	4	77	0	0	0	0	0	0	56	3	4	59	8	154	162
09:45 AM	3	0	4	0	7	7	45	0	6	52	0	0	0	0	0	0	72	1	5	73	11	132	143
Total	25	1	121	0	147	87	208	0	20	295	0	0	0	0	0	0	285	27	19	312	39	754	793
10:00 AM	4	0	6	1	10	10	40	0	3	50	0	0	0	0	0	0	55	4	4	59	8	119	127
10:15 AM	4	0	6	0	10	4	54	0	3	58	0	0	0	0	0	0	36	2	4	38	7	106	113
10:30 AM	7	0	13	0	20	4	48	0	3	52	0	0	0	0	0	0	56	4	1	60	4	132	136
10:45 AM	6	0	6	0	12	6	45	0	6	51	0	0	0	0	0	0	54	5	2	59	8	122	130
Total	21	0	31	1	52	24	187	0	15	211	0	0	0	0	0	0	201	15	11	216	27	479	506
11:00 AM	0	0	9	0	9	9	43	0	3	52	0	0	0	0	0	0	54	6	5	60	8	121	129
11:15 AM	2	0	7	1	9	7	43	0	4	50	0	0	0	0	0	0	52	6	3	58	8	117	125
11:30 AM	5	0	12	1	17	9	45	0	2	54	0	0	0	0	0	0	49	3	2	52	5	123	128
11:45 AM	4	0	10	0	14	10	45	0	4	55	0	0	0	0	0	0	42	3	6	45	10	114	124
Total	11	0	38	2	49	35	176	0	13	211	0	0	0	0	0	0	197	18	16	215	31	475	506
12:00 PM	3	0	10	2	13	12	52	0	5	64	0	0	0	0	0	0	50	1	3	51	10	128	138
12:15 PM	6	0	10	1	16	9	65	0	5	74	0	0	0	0	0	0	48	3	2	51	8	141	149
12:30 PM	3	0	12	0	15	13	50	0	3	63	0	0	0	0	0	0	44	4	3	48	6	126	132
12:45 PM	3	0	12	0	15	11	46	0	3	57	0	0	0	0	0	0	43	0	3	43	6	115	121
Total	15	0	44	3	59	45	213	0	16	258	0	0	0	0	0	0	185	8	11	193	30	510	540

Attachment 1
CZ 2023-02

RAMEY KEMP & ASSOCIATES
TRANSPORTATION ENGINEERS
5808 Faringdon Place, Suite 100
Raleigh, NC 27609
PH: 919 872-5115

File Name : NC 96 and Pippin Road
Site Code : 00083017
Start Date : 8/30/2017
Page No : 2

Groups Printed- Cars & Trucks

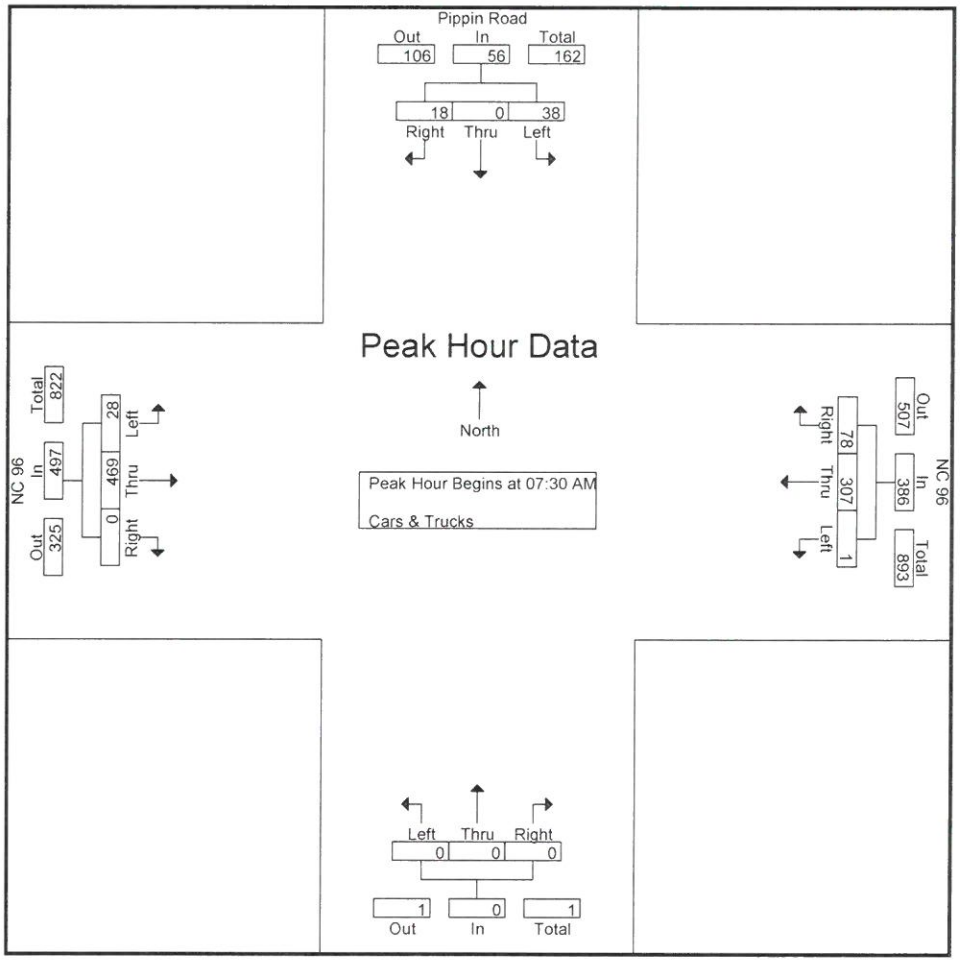
	Pippin Road From North					NC 96 From East					From South					NC 96 From West							
Start Time	Right	Thru	Left	TRKS	App Total	Right	Thru	Left	TRKS	App Total	Right	Thru	Left	TRKS	App Total	Right	Thru	Left	TRKS	App Total	Exclu Total	Inclu Total	Int. Total
01:00 PM	5	0	2	0	7	3	59	0	4	62	0	0	0	0	0	0	54	3	5	57	9	126	135
01:15 PM	3	0	5	1	8	3	62	0	2	65	0	0	0	0	0	0	48	5	6	53	9	126	135
01:30 PM	1	0	5	1	6	16	73	0	12	89	0	0	0	0	0	0	56	3	2	59	15	154	169
01:45 PM	3	0	5	0	8	6	61	0	6	67	0	0	0	0	0	0	36	5	5	41	11	116	127
Total	12	0	17	2	29	28	255	0	24	283	0	0	0	0	0	0	194	16	18	210	44	522	566
02:00 PM	3	0	11	1	14	9	78	0	6	87	0	0	0	0	0	0	65	4	4	69	11	170	181
02:15 PM	6	0	8	0	14	7	63	0	5	70	0	0	0	0	0	0	72	3	6	75	11	159	170
02:30 PM	6	0	6	1	12	5	71	0	3	76	0	0	0	0	0	0	67	3	8	70	12	158	170
02:45 PM	8	0	8	1	16	12	79	0	2	91	0	0	0	0	0	0	89	3	7	92	10	199	209
Total	23	0	33	3	56	33	291	0	16	324	0	0	0	0	0	0	293	13	25	306	44	686	730
03:00 PM	5	0	10	0	15	15	82	0	1	97	0	0	0	0	0	0	68	7	3	75	4	187	191
03:15 PM	2	0	12	1	14	31	93	0	4	124	0	0	0	0	0	0	79	5	6	84	11	222	233
03:30 PM	6	0	9	0	15	26	77	0	3	103	0	0	0	0	0	0	79	6	7	85	10	203	213
03:45 PM	6	0	25	1	31	20	75	0	1	95	0	0	0	0	0	0	72	6	0	78	2	204	206
Total	19	0	56	2	75	92	327	0	9	419	0	0	0	0	0	0	298	24	16	322	27	816	843
04:00 PM	12	0	48	1	60	17	90	0	4	107	0	0	0	0	0	0	97	9	7	106	12	273	285
04:15 PM	4	0	11	0	15	12	114	0	2	126	0	0	0	0	0	0	90	4	5	94	7	235	242
04:30 PM	11	0	18	1	29	9	119	0	4	128	0	0	0	0	0	0	81	6	2	87	7	244	251
04:45 PM	8	0	20	0	28	11	123	0	2	134	0	0	0	0	0	0	73	10	3	83	5	245	250
Total	35	0	97	2	132	49	446	0	12	495	0	0	0	0	0	0	341	29	17	370	31	997	1028
05:00 PM	4	0	4	0	8	13	94	0	4	107	0	0	0	0	0	0	83	6	2	89	6	204	210
*** BREAK ***																							
05:30 PM	4	0	7	1	11	18	125	0	1	143	0	0	0	0	0	0	95	6	1	101	3	255	258
05:45 PM	12	0	14	0	26	24	125	0	3	149	0	0	0	0	0	0	127	9	1	136	4	311	315
Total	20	0	25	1	45	55	344	0	8	399	0	0	0	0	0	0	305	21	4	326	13	770	783
06:00 PM	7	0	10	0	17	18	107	0	0	125	0	0	0	0	0	0	95	8	3	103	3	245	248
06:15 PM	6	0	13	2	19	13	108	0	3	121	0	0	0	0	0	0	76	8	2	84	7	224	231
06:30 PM	7	0	7	0	14	9	86	0	2	95	0	0	0	0	0	0	104	4	1	108	3	217	220
*** BREAK ***																							
Total	20	0	30	2	50	40	301	0	5	341	0	0	0	0	0	0	275	20	6	295	13	686	699
Grand Total	260	3	634	20	897	668	3598	4	166	4270	0	0	0	0	0	0	3619	262	194	3881	380	9048	9428
Apprch %	29	0.3	70.7			15.6	84.3	0.1			0	0	0			0	93.2	6.8					
Total %	2.9	0	7		9.9	7.4	39.8	0		47.2	0	0	0		0	0	40	2.9		42.9	4	96	

Attachment 1
CZ 2023-02

RAMEY KEMP & ASSOCIATES
TRANSPORTATION ENGINEERS
5808 Faringdon Place, Suite 100
Raleigh, NC 27609
PH: 919 872-5115

File Name : NC 96 and Pippin Road
Site Code : 00083017
Start Date : 8/30/2017
Page No : 3

	Pippin Road From North				NC 96 From East				From South				NC 96 From West				
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 06:00 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	5	0	14	19	22	89	1	112	0	0	0	0	0	121	6	127	258
07:45 AM	5	0	7	12	9	62	0	71	0	0	0	0	0	152	6	158	241
08:00 AM	4	0	8	12	20	86	0	106	0	0	0	0	0	107	8	115	233
08:15 AM	4	0	9	13	27	70	0	97	0	0	0	0	0	89	8	97	207
Total Volume	18	0	38	56	78	307	1	386	0	0	0	0	0	469	28	497	939
% App. Total	32.1	0	67.9		20.2	79.5	0.3		0	0	0		0	94.4	5.6		
PHF	.900	.000	.679	.737	.722	.862	.250	.862	.000	.000	.000	.000	.000	.771	.875	.786	.910

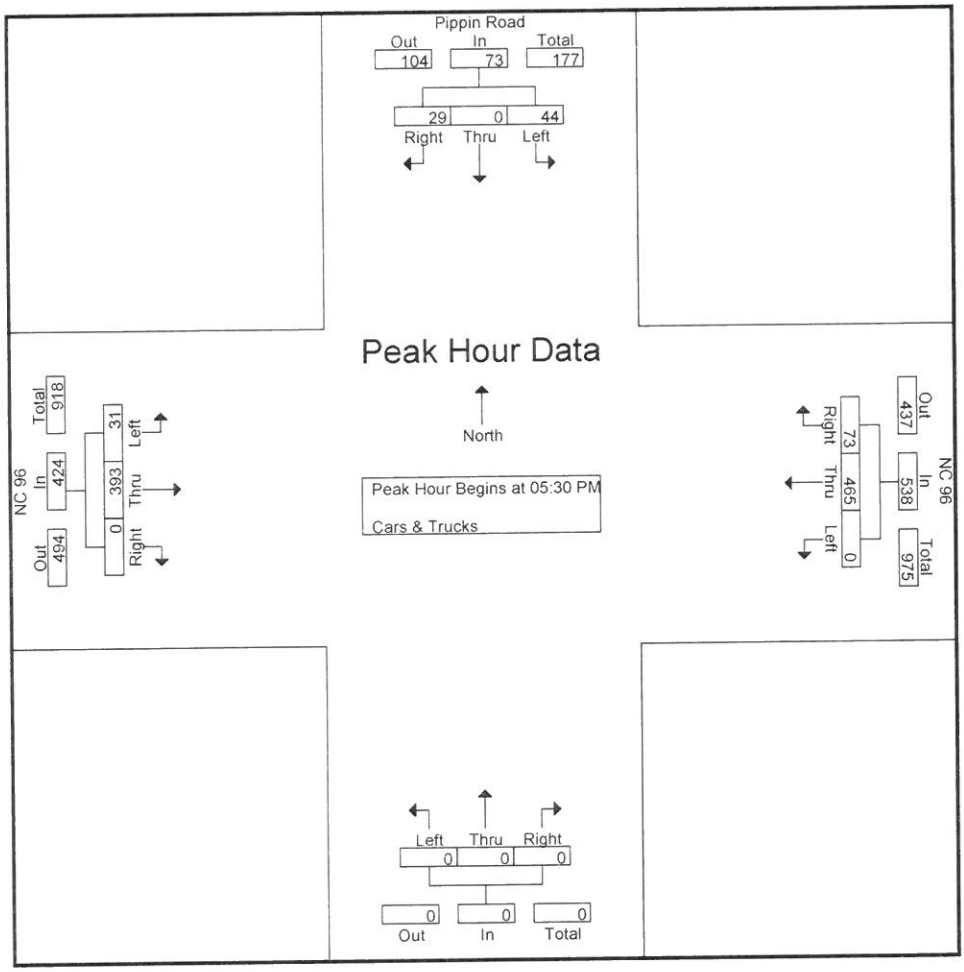


Attachment 1
CZ 2023-02

RAMEY KEMP & ASSOCIATES
TRANSPORTATION ENGINEERS
5808 Faringdon Place, Suite 100
Raleigh, NC 27609
PH: 919 872-5115

File Name : NC 96 and Pippin Road
Site Code : 00083017
Start Date : 8/30/2017
Page No : 4

	Pippin Road From North				NC 96 From East				From South				NC 96 From West				
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 12:00 PM to 06:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:30 PM																	
05:30 PM	4	0	7	11	18	125	0	143	0	0	0	0	0	95	6	101	255
05:45 PM	12	0	14	26	24	125	0	149	0	0	0	0	0	127	9	136	311
06:00 PM	7	0	10	17	18	107	0	125	0	0	0	0	0	95	8	103	245
06:15 PM	6	0	13	19	13	108	0	121	0	0	0	0	0	76	8	84	224
Total Volume	29	0	44	73	73	465	0	538	0	0	0	0	0	393	31	424	1035
% App. Total	39.7	0	60.3		13.6	86.4	0		0	0	0		0	92.7	7.3		
PHF	.604	.000	.786	.702	.760	.930	.000	.903	.000	.000	.000	.000	.000	.774	.861	.779	.832



Attachment 1
CZ 2023-02

RAMEY KEMP & ASSOCIATES
5808 Faringdon Place, Suite 100
Raleigh, NC 27609
PH: 919 872-5115

File Name : NC 96 and Glory Road
Site Code : 00041019
Start Date : 4/10/2019
Page No : 1

Groups Printed- Cars & Trucks

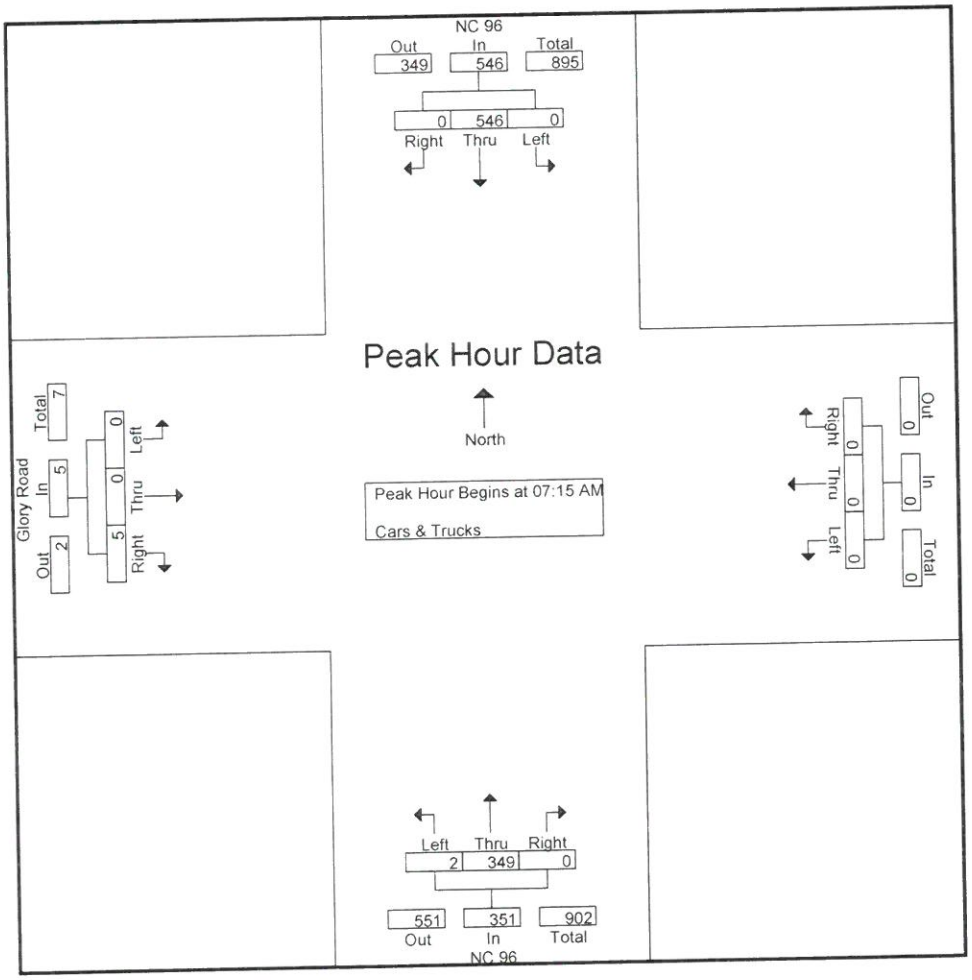
	NC 96 From North					From East					NC 96 From South					Glory Road From West							
Start Time	Right	Thru	Left	TRKS	App. Total	Right	Thru	Left	TRKS	App. Total	Right	Thru	Left	TRKS	App. Total	Right	Thru	Left	TRKS	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	92	0	3	92	0	0	0	0	0	0	90	2	4	92	0	0	1	0	1	7	185	192
07:15 AM	0	114	0	5	114	0	0	0	0	0	0	107	0	2	107	1	0	0	0	1	7	222	229
07:30 AM	0	153	0	1	153	0	0	0	0	0	0	82	1	3	83	1	0	0	0	1	4	237	241
07:45 AM	0	151	0	6	151	0	0	0	0	0	0	83	0	4	83	2	0	0	0	2	10	236	246
Total	0	510	0	15	510	0	0	0	0	0	0	362	3	13	365	4	0	1	0	5	28	880	908
08:00 AM	0	128	0	4	128	0	0	0	0	0	0	77	1	1	78	1	0	0	0	1	5	207	212
08:15 AM	0	110	0	7	110	0	0	0	0	0	0	78	1	4	79	2	0	1	0	3	11	192	203
08:30 AM	1	78	0	5	79	0	0	0	0	0	0	85	1	4	86	2	0	0	0	2	9	167	176
*** BREAK ***																							
Total	1	316	0	16	317	0	0	0	0	0	0	240	3	9	243	5	0	1	0	6	25	566	591
*** BREAK ***																							
04:00 PM	0	89	0	1	89	0	0	0	0	0	0	98	0	1	98	2	0	0	0	2	2	189	191
04:15 PM	0	90	0	1	90	0	0	0	0	0	0	98	0	0	98	1	0	0	0	1	1	189	190
04:30 PM	0	95	0	4	95	0	0	0	0	0	0	117	1	1	118	2	0	0	0	2	5	215	220
04:45 PM	0	106	0	5	106	0	0	0	0	0	0	104	1	2	105	2	0	0	0	2	7	213	220
Total	0	380	0	11	380	0	0	0	0	0	0	417	2	4	419	7	0	0	0	7	15	806	821
05:00 PM	0	107	0	4	107	0	0	0	0	0	0	129	3	6	132	1	0	0	0	1	10	240	250
05:15 PM	0	119	0	3	119	0	0	0	0	0	0	100	1	1	101	1	0	0	0	1	4	221	225
05:30 PM	0	140	0	3	140	0	0	0	0	0	0	160	4	5	164	1	0	1	0	2	8	306	314
05:45 PM	0	117	0	2	117	0	0	0	0	0	0	121	4	0	125	0	0	0	0	0	2	242	244
Total	0	483	0	12	483	0	0	0	0	0	0	510	12	12	522	3	0	1	0	4	24	1009	1033
Grand Total	1	1689	0	54	1690	0	0	0	0	0	0	1529	20	38	1549	19	0	3	0	22	92	3261	3353
Apprch %	0.1	99.9	0			0	0	0			0	98.7	1.3			86.4	0	13.6					
Total %	0	51.8	0		51.8	0	0	0		0	0	46.9	0.6		47.5	0.6	0	0.1		0.7	2.7	97.3	

Attachment 1
CZ 2023-02

RAMEY KEMP & ASSOCIATES
5808 Faringdon Place, Suite 100
Raleigh, NC 27609
PH: 919 872-5115

File Name : NC 96 and Glory Road
Site Code : 00041019
Start Date : 4/10/2019
Page No : 2

	NC 96 From North				From East				NC 96 From South				Glory Road From West				
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 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	114	0	114	0	0	0	0	0	107	0	107	1	0	0	1	222
07:30 AM	0	153	0	153	0	0	0	0	0	82	1	83	1	0	0	1	237
07:45 AM	0	151	0	151	0	0	0	0	0	83	0	83	2	0	0	2	236
08:00 AM	0	128	0	128	0	0	0	0	0	77	1	78	1	0	0	1	207
Total Volume	0	546	0	546	0	0	0	0	0	349	2	351	5	0	0	5	902
% App. Total	0	100	0		0	0	0		0	99.4	0.6		100	0	0		
PHF	.000	.892	.000	.892	.000	.000	.000	.000	.000	.815	.500	.820	.625	.000	.000	.625	.951

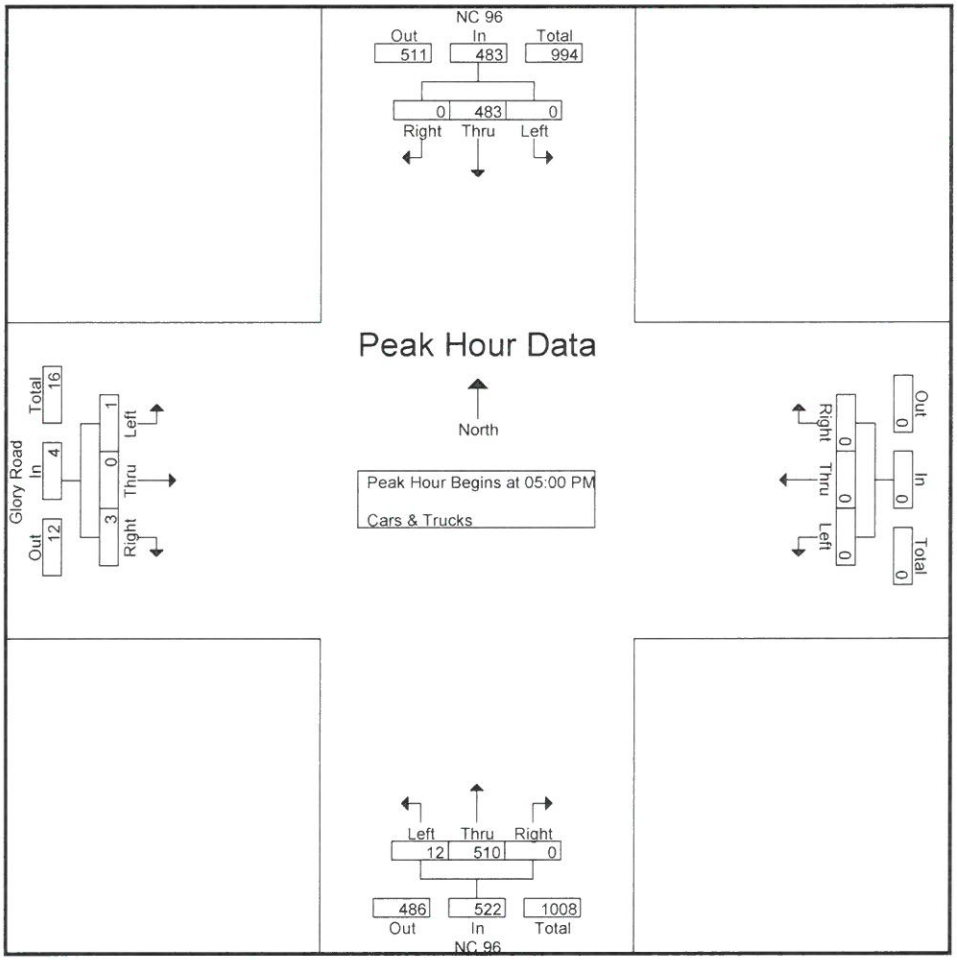


Attachment 1
CZ 2023-02

RAMEY KEMP & ASSOCIATES
5808 Faringdon Place, Suite 100
Raleigh, NC 27609
PH: 919 872-5115

File Name : NC 96 and Glory Road
Site Code : 00041019
Start Date : 4/10/2019
Page No : 3

	NC 96 From North				From East				NC 96 From South				Glory Road From West				
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 12:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	107	0	107	0	0	0	0	0	129	3	132	1	0	0	1	240
05:15 PM	0	119	0	119	0	0	0	0	0	100	1	101	1	0	0	1	221
05:30 PM	0	140	0	140	0	0	0	0	0	160	4	164	1	0	1	2	306
05:45 PM	0	117	0	117	0	0	0	0	0	121	4	125	0	0	0	0	242
Total Volume	0	483	0	483	0	0	0	0	0	510	12	522	3	0	1	4	1009
% App. Total	0	100	0		0	0	0		0	97.7	2.3		75	0	25		
PHF	.000	.863	.000	.863	.000	.000	.000	.000	.000	.797	.750	.796	.750	.000	.250	.500	.824



Attachment 1
CZ 2023-02

Burns Service Inc.

1202Langdon Terace Drive
Indian Trail, NC, 28079

File Name : Zebulon(Pearces and Pippin) AM Peak
Site Code :
Start Date : 10/3/2017
Page No : 1

Groups Printed- Cars + - Trucks

	Pearces Road Southbound				Pippin Road Westbound				Pearces Road Northbound				Pippin Road 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	0	73	5	78	2	3	11	16	0	10	4	14	1	0	0	1	109
07:15	1	62	6	69	1	7	12	20	4	11	3	18	5	4	3	12	119
07:30	1	50	9	60	4	2	8	14	2	19	1	22	6	3	1	10	106
07:45	0	71	5	76	6	6	6	18	4	9	0	13	3	5	1	9	116
Total	2	256	25	283	13	18	37	68	10	49	8	67	15	12	5	32	450
08:00	1	51	10	62	6	9	4	19	1	17	3	21	4	1	2	7	109
08:15	1	48	6	55	1	1	9	11	5	17	1	23	5	2	1	8	97
08:30	4	47	2	53	2	6	8	16	1	16	0	17	6	3	0	9	95
08:45	2	48	4	54	3	6	13	22	3	19	2	24	2	5	2	9	109
Total	8	194	22	224	12	22	34	68	10	69	6	85	17	11	5	33	410
Grand Total	10	450	47	507	25	40	71	136	20	118	14	152	32	23	10	65	860
Apprch %	2	88.8	9.3		18.4	29.4	52.2		13.2	77.6	9.2		49.2	35.4	15.4		
Total %	1.2	52.3	5.5	59	2.9	4.7	8.3	15.8	2.3	13.7	1.6	17.7	3.7	2.7	1.2	7.6	
Cars +	10	448	47	505	25	40	71	136	20	118	14	152	32	23	10	65	858
% Cars +	100	99.6	100	99.6	100	100	100	100	100	100	100	100	100	100	100	100	99.8
Trucks	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
% Trucks	0	0.4	0	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0.2

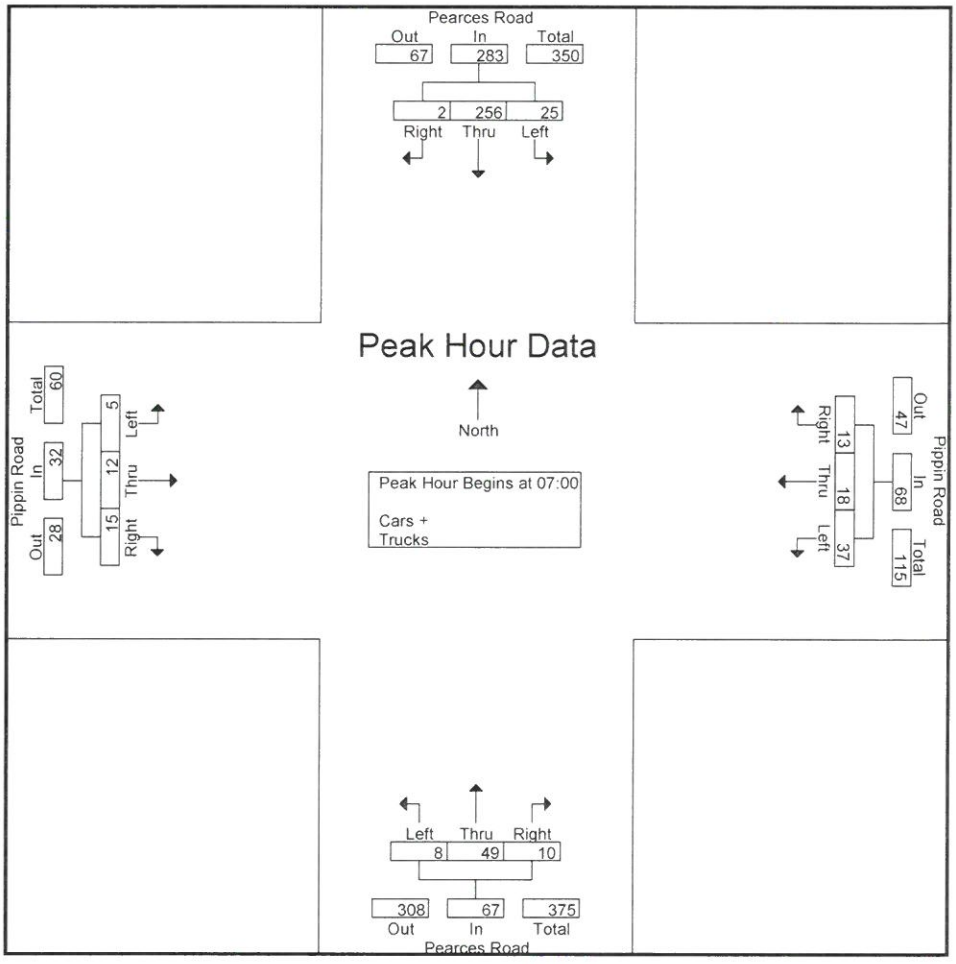
Attachment 1
CZ 2023-02

Burns Service Inc.

1202Langdon Terace Drive
Indian Trail, NC, 28079

File Name : Zebulon(Pearces and Pippin) AM Peak
Site Code :
Start Date : 10/3/2017
Page No : 2

	Pearces Road Southbound				Pippin Road Westbound				Pearces Road Northbound				Pippin Road 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 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00																	
07:00	**0**	73	5	78	2	3	11	16	0	10	4	14	1	0	0	1	109
07:15	1	62	6	69	1	**7**	**12**	**20**	**4**	11	3	18	5	4	**3**	**12**	**119**
07:30	1	50	**9**	60	4	2	8	14	2	**19**	1	**22**	**6**	3	1	10	106
07:45	0	71	5	76	**6**	6	6	18	4	9	0	13	3	**5**	1	9	116
Total Volume	2	256	25	283	13	18	37	68	10	49	8	67	15	12	5	32	450
% App. Total	0.7	90.5	8.8		19.1	26.5	54.4		14.9	73.1	11.9		46.9	37.5	15.6		
PHF	.500	.877	.694	.907	.542	.643	.771	.850	.625	.645	.500	.761	.625	.600	.417	.667	.945



Attachment 1
CZ 2023-02

Burns Service Inc.

1202Langdon Terace Drive
Indian Trail, NC, 28079

File Name : Zebulon(Pearces and Pippin) PM Peak
Site Code :
Start Date : 10/3/2017
Page No : 1

Groups Printed- Cars + - Trucks

	Pearces Road Southbound				Pippin Road Westbound				Pearces Road Northbound				Pippin Road 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
16:00	1	25	3	29	6	4	4	14	10	44	4	58	3	14	2	19	120
16:15	0	28	5	33	4	4	7	15	9	45	5	59	2	6	3	11	118
16:30	1	28	6	35	14	8	3	25	11	63	2	76	4	2	3	9	145
16:45	1	30	6	37	11	3	5	19	15	56	0	71	3	3	2	8	135
Total	3	111	20	134	35	19	19	73	45	208	11	264	12	25	10	47	518
17:00	1	31	7	39	12	3	1	16	9	53	3	65	3	5	1	9	129
17:15	1	35	3	39	8	8	6	22	8	49	1	58	0	3	2	5	124
17:30	2	31	2	35	7	4	6	17	12	69	4	85	3	4	4	11	148
17:45	7	45	3	55	11	9	8	28	11	66	3	80	8	4	0	12	175
Total	11	142	15	168	38	24	21	83	40	237	11	288	14	16	7	37	576
Grand Total	14	253	35	302	73	43	40	156	85	445	22	552	26	41	17	84	1094
Apprch %	4.6	83.8	11.6		46.8	27.6	25.6		15.4	80.6	4		31	48.8	20.2		
Total %	1.3	23.1	3.2	27.6	6.7	3.9	3.7	14.3	7.8	40.7	2	50.5	2.4	3.7	1.6	7.7	
Cars +	14	252	34	300	73	43	40	156	85	445	22	552	26	41	17	84	1092
% Cars +	100	99.6	97.1	99.3	100	100	100	100	100	100	100	100	100	100	100	100	99.8
Trucks	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	2
% Trucks	0	0.4	2.9	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0.2

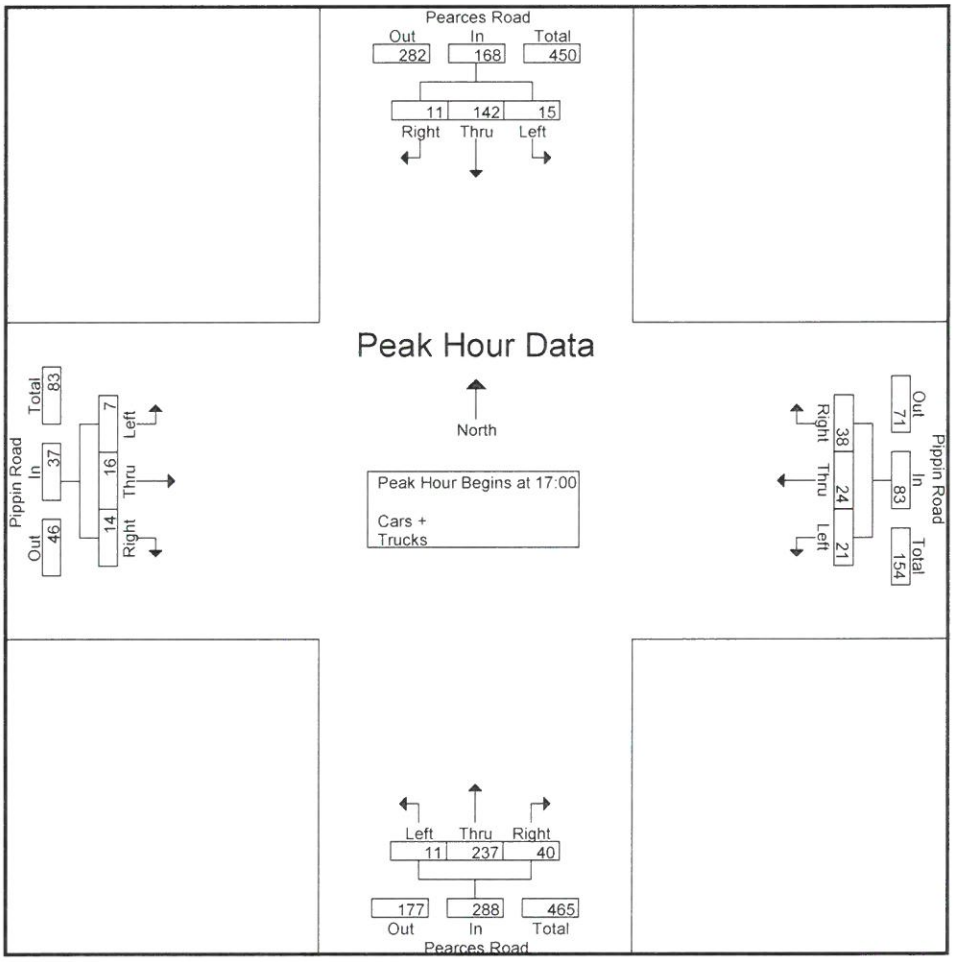
Attachment 1
CZ 2023-02

Burns Service Inc.

1202Langdon Terace Drive
Indian Trail, NC, 28079

File Name : Zebulon(Pearces and Pippin) PM Peak
Site Code :
Start Date : 10/3/2017
Page No : 2

	Pearces Road Southbound				Pippin Road Westbound				Pearces Road Northbound				Pippin Road 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 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 17:00																	
17:00	**1**	**31**	7	39	12	3	1	16	9	53	3	65	3	5	1	9	129
17:15	1	35	3	39	8	8	6	22	8	49	1	58	0	3	2	5	124
17:30	2	31	2	35	7	4	6	17	12	**69**	**4**	**85**	3	4	**4**	11	148
17:45	**7**	**45**	3	**55**	11	**9**	**8**	**28**	11	66	3	80	**8**	4	0	**12**	**175**
Total Volume	11	142	15	168	38	24	21	83	40	237	11	288	14	16	7	37	576
% App. Total	6.5	84.5	8.9		45.8	28.9	25.3		13.9	82.3	3.8		37.8	43.2	18.9		
PHF	.393	.789	.536	.764	.792	.667	.656	.741	.833	.859	.688	.847	.438	.800	.438	.771	.823



Attachment 1
CZ 2023-02

TRAFFIC IMPACT ANALYSIS

FOR

WEAVER'S POND UPDATE

LOCATED

IN

ZEBULON, NORTH CAROLINA

Prepared For:
Weavers Pond Development Co., LLC
9407 Bartons Creek Road
Raleigh, NC 27615

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

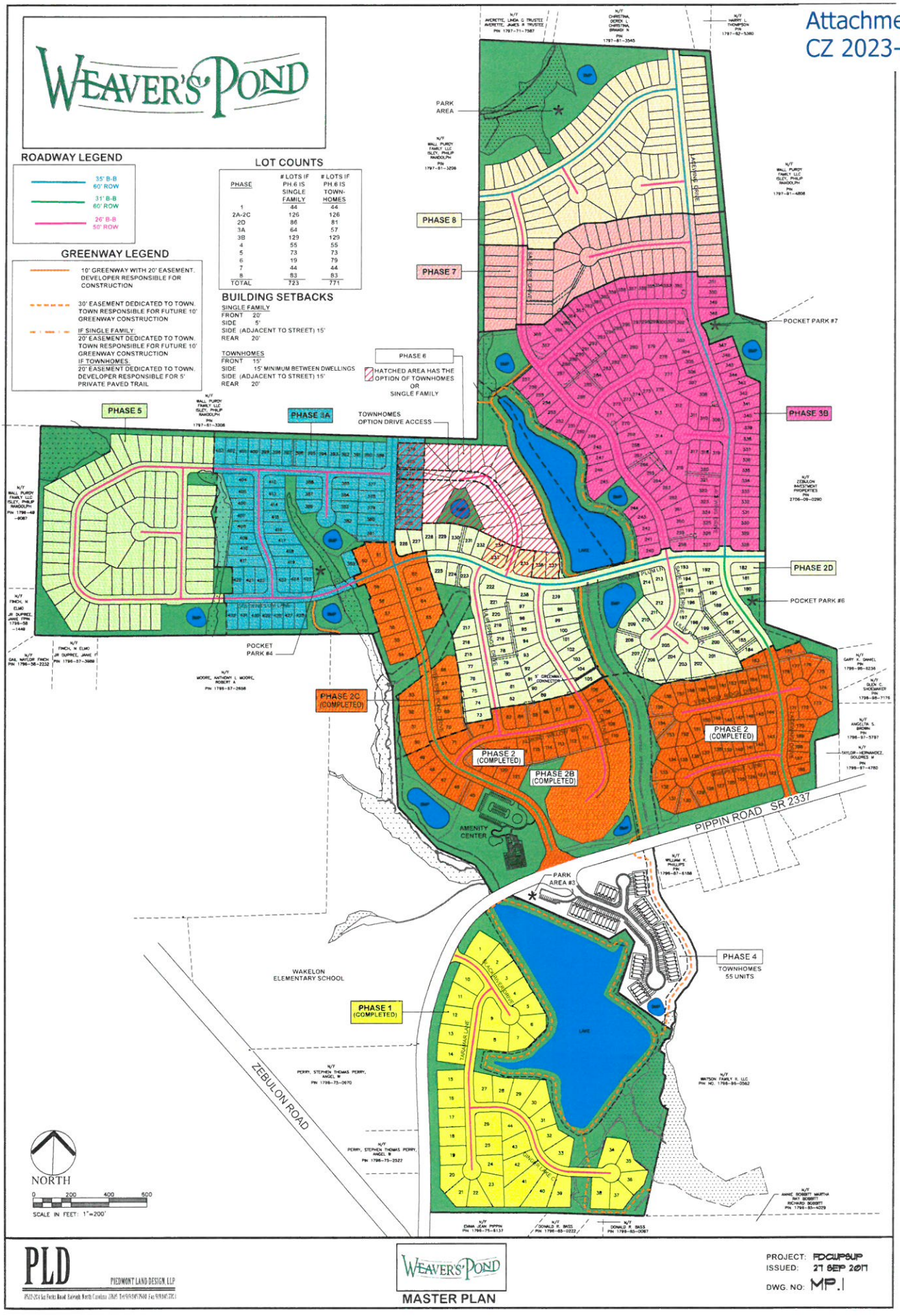
MARCH 2018

RKA Project No. 17162

Prepared By: CAB

Reviewed By: JTR

Attachment 1
CZ 2023-02



PLD
PIEDMONT LAND DESIGN, LLP

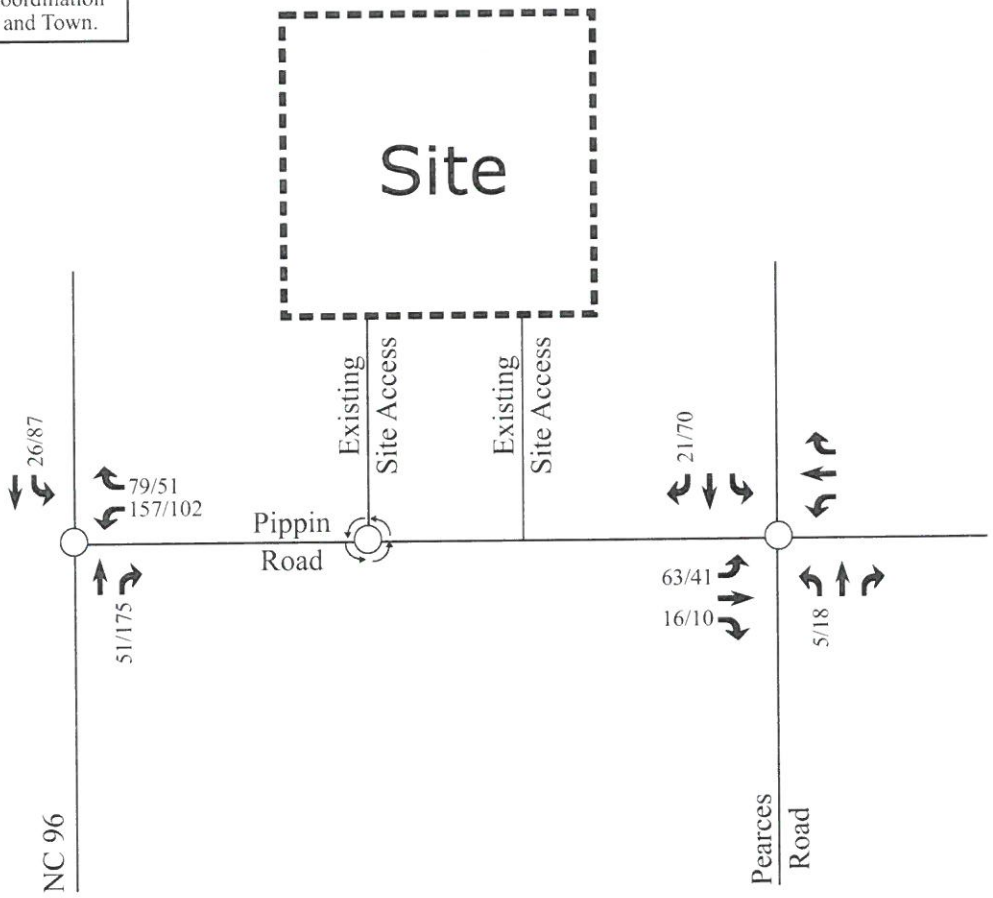
WEAVER'S POND
MASTER PLAN

PROJECT: FDCUPSUP
ISSUED: 27 SEP 2017
DWG. NO: MP.1

LEGEND

- ○ Unsignalized Intersection
- X / Y → AM / PM Peak Hour Site Trips
- Roundabout

* The existing site drives were not included in the study area for this TIA through coordination with the NCDOT and Town.

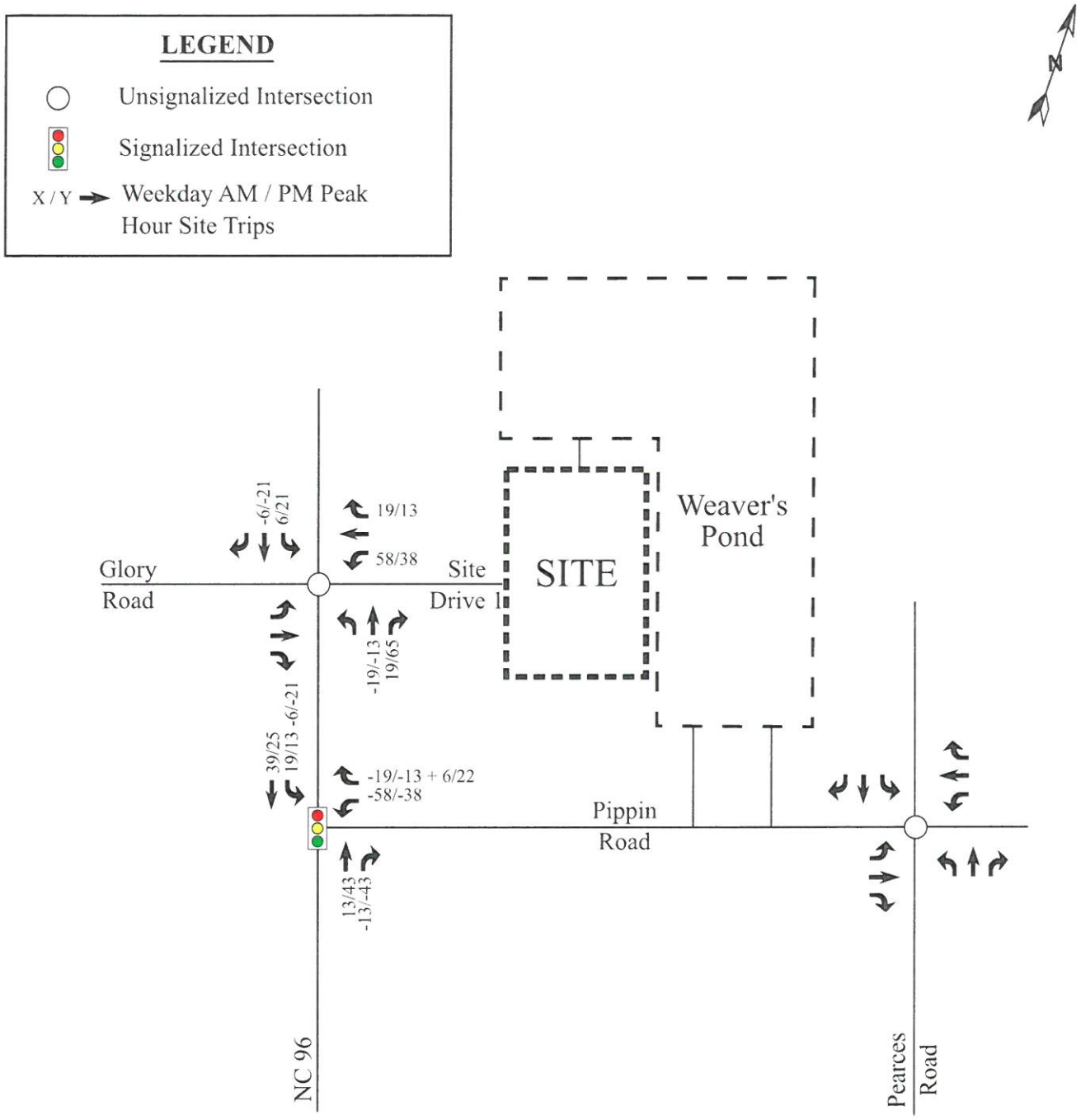


RAMEY KEMP & ASSOCIATES
TRANSPORTATION ENGINEERS

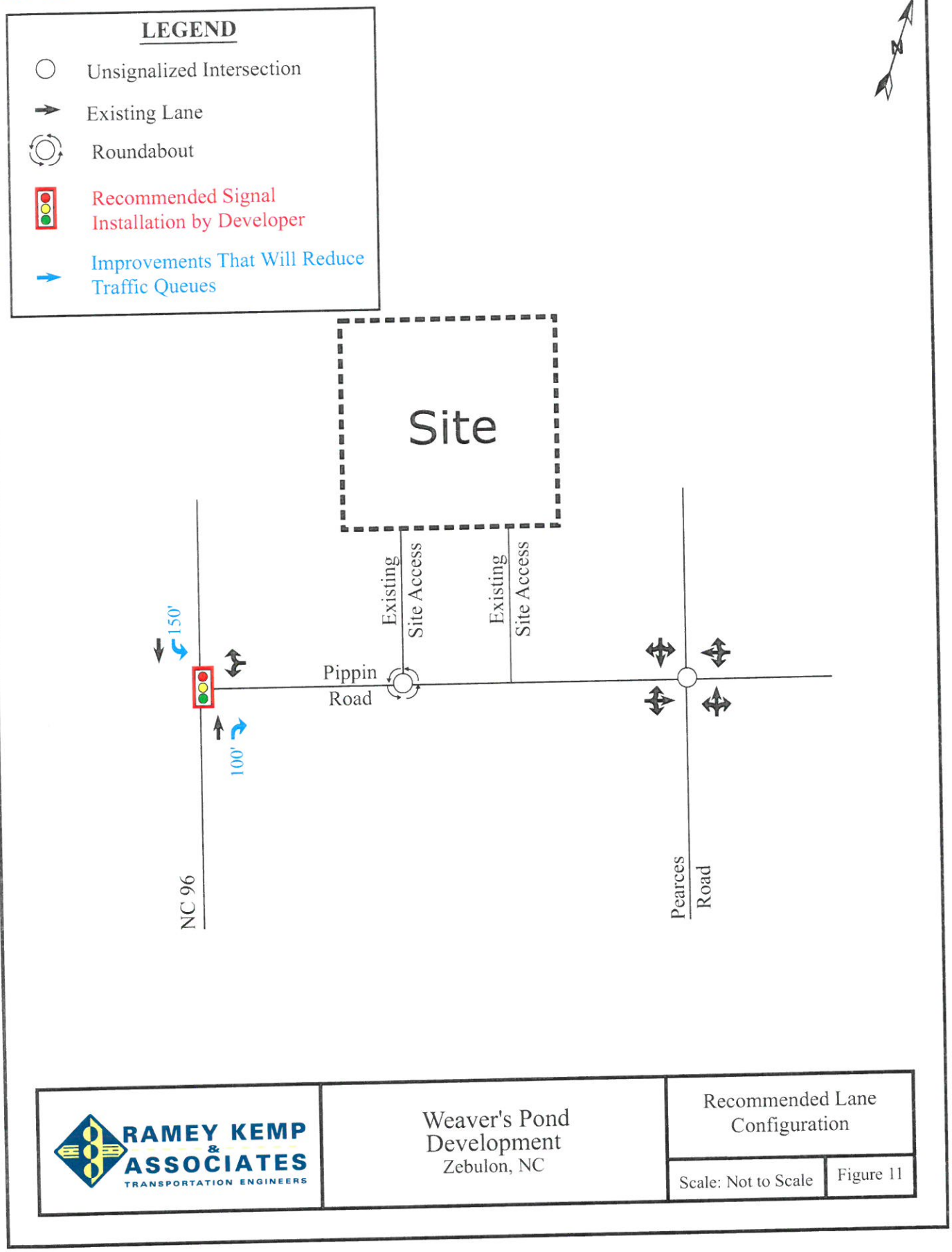
Weaver's Pond Development
Zebulon, NC

Primary Site Trip Assignment - Option 1

Scale: Not to Scale | Figure 9A



RAMEY KEMP & ASSOCIATES TRANSPORTATION ENGINEERS	Weaver's Ridge Zebulon, NC	Rerouted Weaver's Pond Phases 3A and 5 Site Traffic Scale: Not to Scale | Figure 10

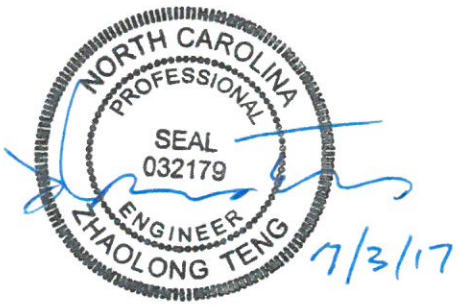

LEGEND
Unsignalized Intersection
Existing Lane
Roundabout
Recommended Signal Installation by Developer
Improvements That Will Reduce Traffic Queues
Site
Existing Site Access
Existing Site Access
150'
100'
Pippin Road
NC 96
Pearces Road
RAMEY KEMP & ASSOCIATES
TRANSPORTATION ENGINEERS
Weaver's Pond Development
Zebulon, NC
Recommended Lane Configuration
Scale: Not to Scale
Figure 11

Attachment 1
CZ 2023-02

Traffic Impact Analysis
Taryn Lake & Taryn Creek
Zebulon, NC

Prepared for:
DR Horton Inc.
2000 Aerial Center Parkway
Suite 110
Morrisville, NC 27560

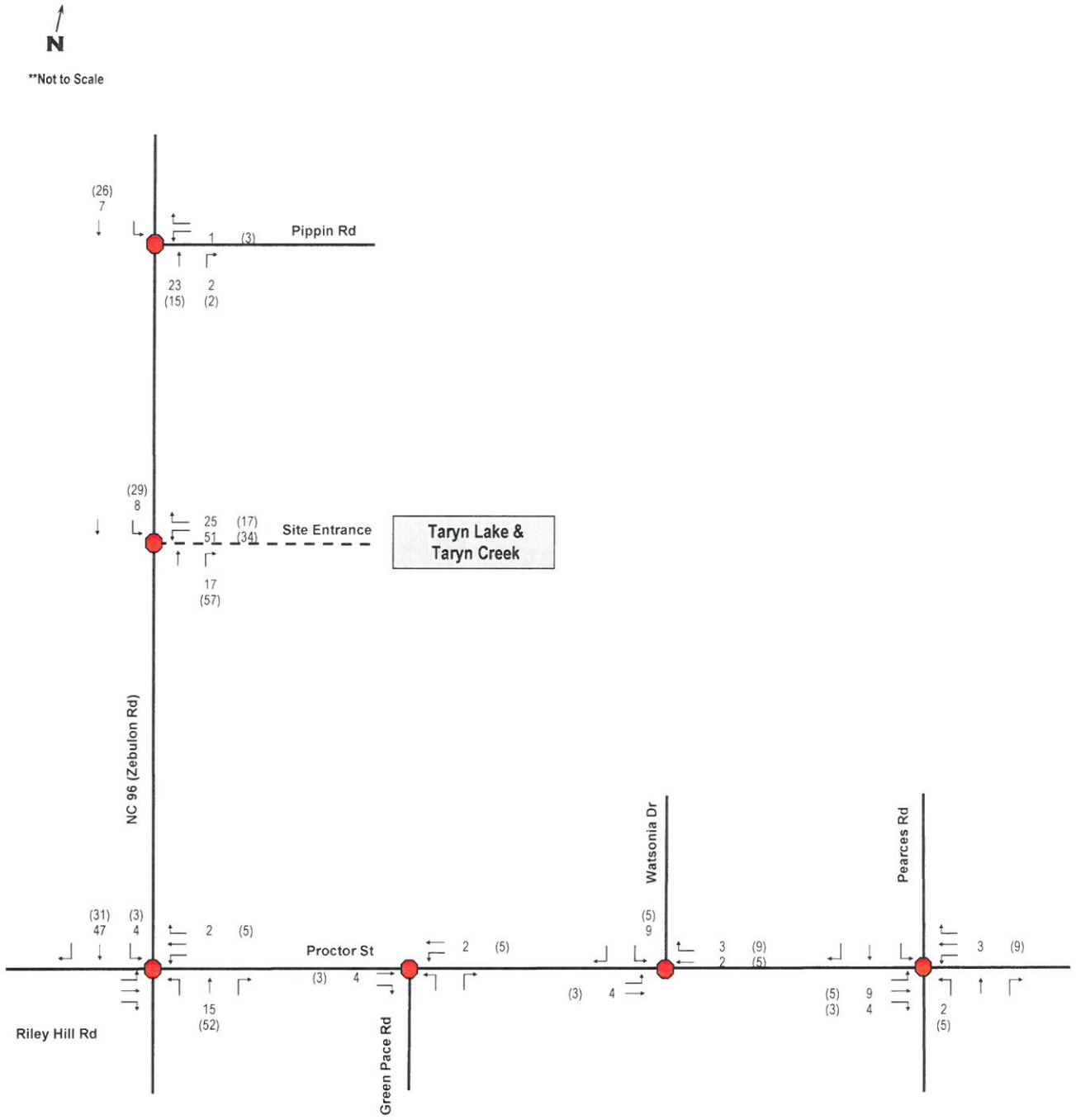
Prepared by:
Accelerate Engineering, PLLC
July 3, 2017



Accelerate Engineering, PLLC
License No. P-1442

140 Preston Executive Drive, Suite 100D, Cary, NC 27513
(919) 263-5678 | (704) 666-5811 www.AccelerateEng.com

Attachment 1
CZ 2023-02



Legend	
—	Existing Roadway
- -	Proposed Roadway
	Signalized Intersection
	Unsignalized Intersection
XX	AM Peak Hour Traffic Volume
(XX)	PM Peak Hour Traffic Volume

Accelerate Engineering, PLLC
140 Preston Executive Dr, Suite 100 D
Cary, NC 27513
Tel: (919) 263-5678 Fax: (919) 263-5687
www.AccelerateEng.com

Taryn Lake & Taryn Creek TIA
Zebulon, NC

Figure 8
Peak Hour Site Trips

Table 1: Trip Generation Summary

Land Use (ITE Code)	Intensity	Daily Traffic (vpd)	AM Peak Hour Trips (vph)		PM Peak Hour Trips (vph)	
			Enter	Enter	Enter	Exit
Single-Family Detached Housing (210)	58 units	630	11	35	38	22
Multifamily Housing (Low-Rise) (Townhomes) (220)	124 units	900	14	45	45	27
Total Trips		**1,530**	**25**	**80**	**83**	**49**

It is estimated that the proposed development will generate approximately 1,530 total site trips on the roadway network during a typical 24-hour weekday period. Of the daily traffic volume, it is anticipated that 105 trips (25 entering and 80 exiting) will occur during the weekday AM peak hour and 132 trips (83 entering and 49 exiting) will occur during the weekday PM peak hour.

Site Trip Distribution and Assignment

Trip distribution percentages used in assigning site traffic for this development were estimated based on a combination of existing traffic patterns, population centers adjacent to the study area, and engineering judgment. All trip distributions were approved by the Town and NCDOT during the scoping process. It is estimated that trips will be regionally distributed as follows:

- 20% to/from the north via Pearces Road
- 5% to/from the south via Pearces Road
- 50% to/from the south via Zebulon Road (NC 96)
- 25% to/from the north via Zebulon Road (NC 96)

It should be noted that based on engineering judgement it was determined that 100% of site trips will exit the site using the full movement site driveway located along Zebulon Road (NC 96). The site trip distribution is shown in Figure 8. Refer to Figure 9 for the site trip assignment.

It should be noted that based on the layout of the site and the surrounding roadways it was determined that 100% of the new site trips will exit the site using the full movement site driveway to be located along Zebulon Road (NC 96) as the majority (75%) of the Weaver's Pond development was assigned to Zebulon Road (NC 96).

It is not expected that the traffic from the proposed development will utilize the Weaver's Pond access; however, it is expected that a portion of the Weaver's Pond development will utilize the new site drive along Zebulon Road (NC 96). Based on coordination with the NCDOT and Town, Phases 3A and 5 of the Weaver's Pond Master Plan are proposed to be rerouted from the Weaver's Pond access on Pippin Road to the new Zebulon Road (NC 96) site drive aligned with Glory Road. Phases 3A and 5 include 137 homes combined, or

Conclusions

This traffic study was conducted to determine the potential traffic impacts for the proposed Weaver's Ridge residential development located east of Zebulon Road (NC 96) across from Glory Road in Zebulon, North Carolina.

The proposed residential development is assumed to consist of 124 townhomes and 58 single-family homes. The study analyzes traffic conditions during the weekday AM and PM peak hours for the following scenarios:

- Existing (2019) Traffic Conditions
- Background (2023) Traffic Conditions
- Combined (2023) Traffic Conditions
- Combined (2023) Traffic Conditions with Improvements

It is estimated that the proposed development will generate approximately 1,530 total site trips on the roadway network during a typical 24-hour weekday period. Of the daily traffic volume, it is anticipated that 105 trips (25 entering and 80 exiting) will occur during the weekday AM peak hour and 132 trips (83 entering and 49 exiting) will occur during the weekday PM peak hour.

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 12 for an illustration of the recommended lane configuration for the proposed development.

Committed Improvements by Weaver's Pond

Zebulon Road (NC 96) and Pippin Road

- Provide designated northbound right-turn lane with at least 100 feet of storage and appropriate decel and taper.
- Provide designated southbound left-turn lane with at least 150 feet of storage and appropriate decel and taper.
- Install traffic signal at intersection when warranted.

Recommended Improvements by Developer

Zebulon Road (NC 96) and Glory Road / Site Drive 1

- Provide site access via westbound approach with one ingress lane and two egress lanes striped as one left-turn lane and one shared through/right-turn lane.
- Provide designated northbound right-turn lane with at least 100 feet of storage and appropriate decel and taper.
- Provide designated southbound left-turn lane with at least 50 feet of storage and appropriate decel and taper.
- Monitor intersection for signalization.

If you should have any questions, please feel free to contact me at (919) 872-5115.

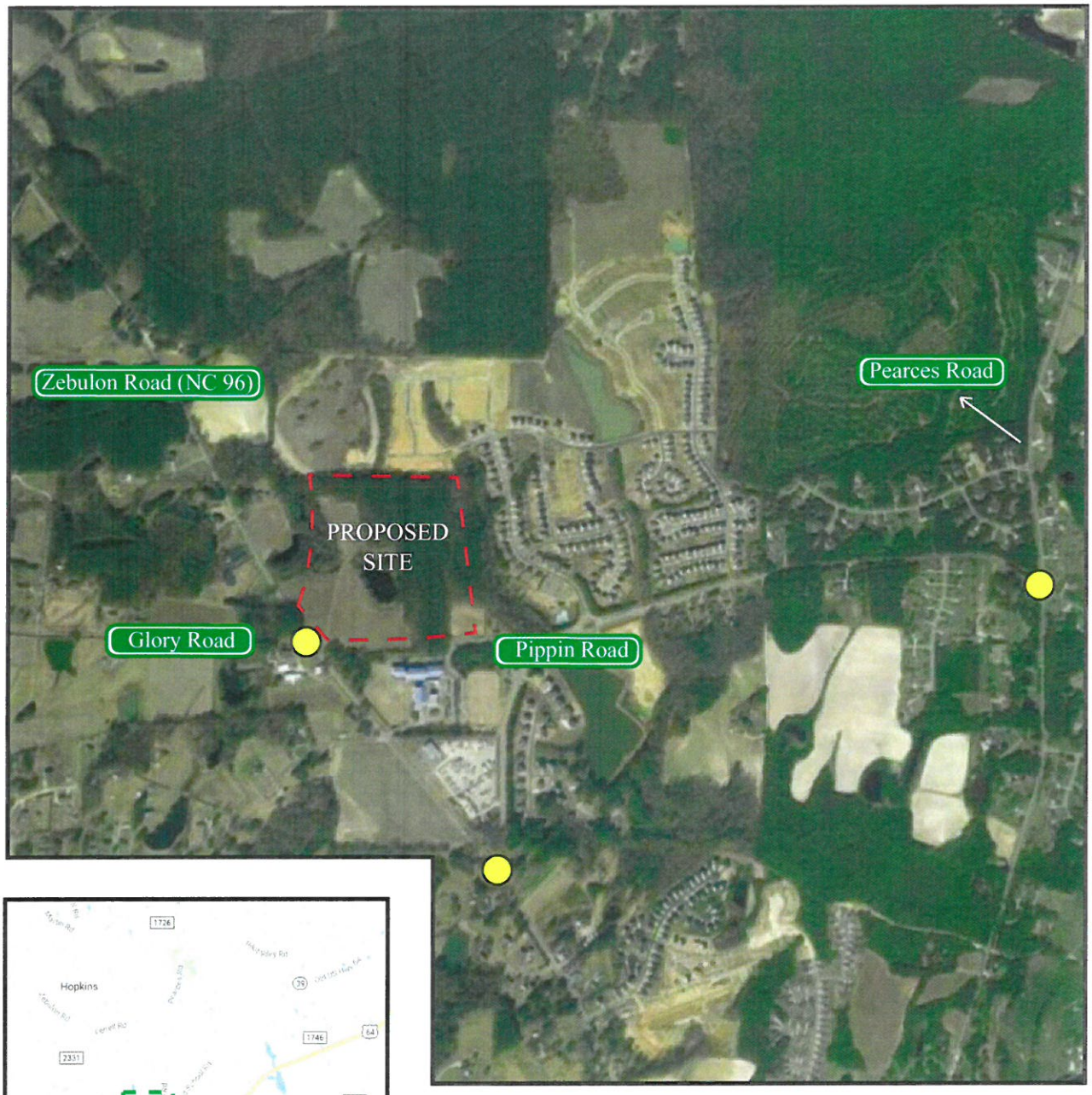
Sincerely,

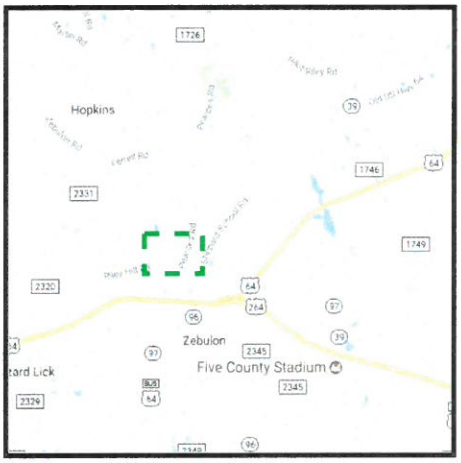
NORTH CAROLINA PROFESSIONAL SEAL 039251 ENGINEER JOSHUA T. REINKE

Joshua Reinke, P.E.
Transportation Engineer 5-23-19
Ramey Kemp & Associates, Inc.

NC Corporate License # C-0910

Attachments: Appendix





N

LEGEND

- Proposed Site Location
- Study Intersection
- Study Area

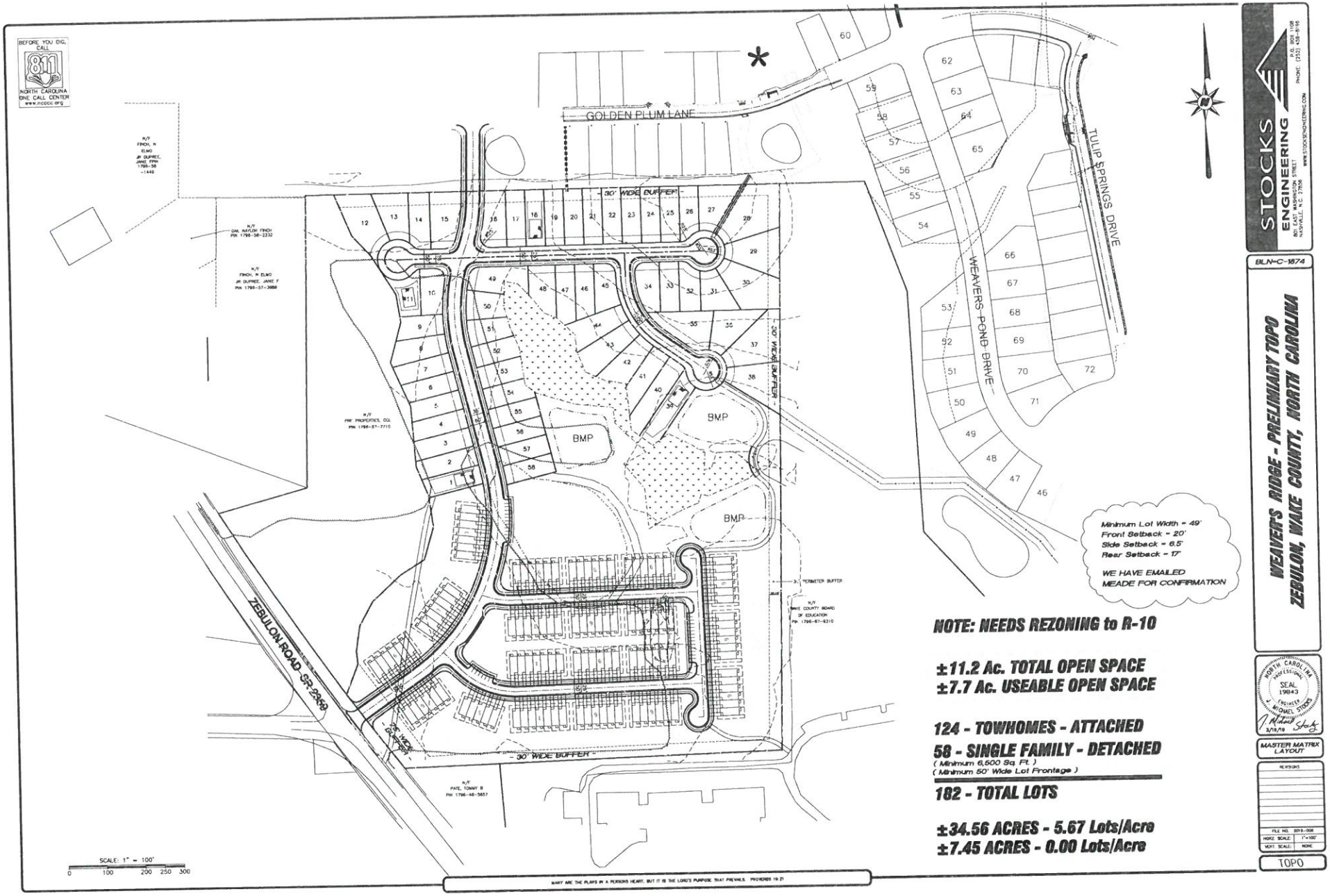
RAMEY KEMP & ASSOCIATES
TRANSPORTATION ENGINEERS

Weaver's Ridge
Zebulon, NC

Site Location Map

Scale: Not to Scale | Figure 1

Attachment 1
CZ 2023-02



STOCKS ENGINEERING
P.O. BOX 1108
801 EAST WASHINGTON STREET
NASHVILLE, N.C. 27856
PHONE: (252) 459-9195
WWW.STOCKSENGINEERING.COM

BLN-C-1874

WEAVER'S RIDGE - PRELIMINARY TOPO
ZEBULON, WAKE COUNTY, NORTH CAROLINA

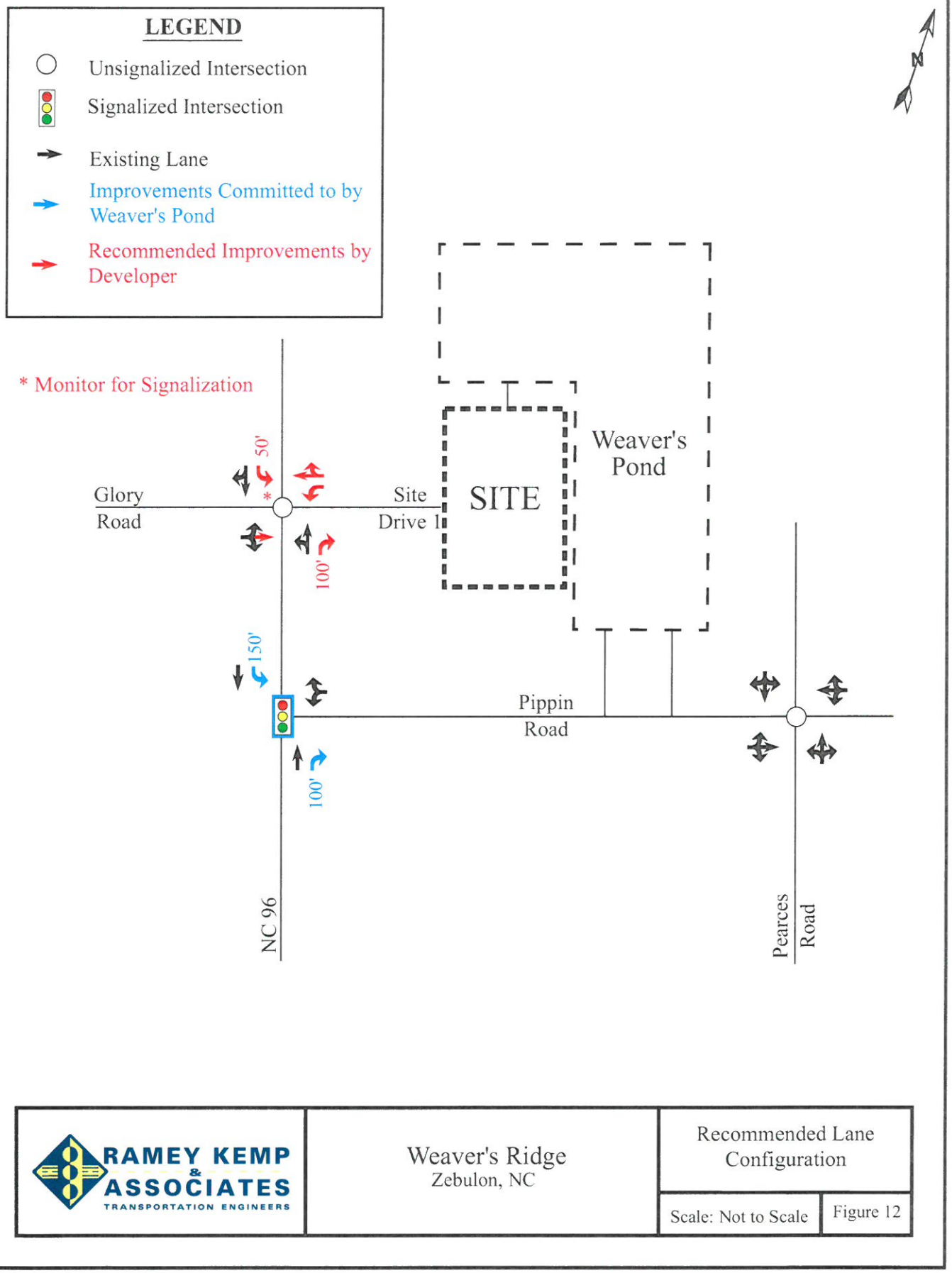
NORTH CAROLINA PROFESSIONAL SEAL 19843 ENGINEER J. MICHAEL STOCKS 3/19/19

MASTER MATRIX LAYOUT

REVISIONS

FILE NO. 2019-008
HORZ. SCALE: 1"=100'
VERT. SCALE: NONE

TOPO



RAMEY KEMP & ASSOCIATES TRANSPORTATION ENGINEERS	Weaver's Ridge Zebulon, NC	Recommended Lane Configuration Scale: Not to Scale | Figure 12

Lanes, Volumes, Timings
1: Zebulon Road (NC 96) & Pippin Road

07/28/2022

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	180	90	362	135	54	570
Future Volume (vph)	180	90	362	135	54	570
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		100	150	
Storage Lanes	1	0		1	1	
Taper Length (ft)	25				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.955			0.850		
Flt Protected	0.968				0.950	
Satd. Flow (prot)	1722	0	1863	1583	1770	1863
Flt Permitted	0.968				0.950	
Satd. Flow (perm)	1722	0	1863	1583	1770	1863
Right Turn on Red		No		No		
Satd. Flow (RTOR)						
Link Speed (mph)	35		45			45
Link Distance (ft)	1250		1120			2533
Travel Time (s)	24.4		17.0			38.4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	200	100	402	150	60	633
Shared Lane Traffic (%)						
Lane Group Flow (vph)	300	0	402	150	60	633
Turn Type	Prot		NA	pm+ov	Prot	NA
Protected Phases	4		2	4	1	6
Permitted Phases				2		
Detector Phase	4		2	4	1	6
Switch Phase						
Minimum Initial (s)	7.0		12.0	7.0	7.0	12.0
Minimum Split (s)	14.0		19.0	14.0	14.0	19.0
Total Split (s)	45.0		59.0	45.0	16.0	75.0
Total Split (%)	37.5%		49.2%	37.5%	13.3%	62.5%
Maximum Green (s)	38.0		52.0	38.0	9.0	68.0
Yellow Time (s)	5.0		5.0	5.0	5.0	5.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0		-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0		5.0	5.0	5.0	5.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	Min		Min	Min	None	Min
Act Effct Green (s)	20.0		25.9	54.2	10.6	33.8
Actuated g/C Ratio	0.31		0.40	0.84	0.16	0.52
v/c Ratio	0.56		0.54	0.11	0.21	0.65
Control Delay	25.9		21.1	2.9	32.2	14.9
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	25.9		21.1	2.9	32.2	14.9
LOS	C		C	A	C	B
Approach Delay	25.9		16.1			16.4
Approach LOS	C		B			B

Lanes, Volumes, Timings
1: Zebulon Road (NC 96) & Pippin Road 07/28/2022

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Queue Length 50th (ft)	106		137	16	22	157
Queue Length 95th (ft)	218		267	31	69	328
Internal Link Dist (ft)	1170		1040			2453
Turn Bay Length (ft)				100	150	
Base Capacity (vph)	1156		1533	1530	327	1752
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.26		0.26	0.10	0.18	0.36

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 64.6			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.65			
Intersection Signal Delay: 18.1		Intersection LOS: B	
Intersection Capacity Utilization 53.8%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Zebulon Road (NC 96) & Pippin Road

Lanes, Volumes, Timings
1: Zebulon Road (NC 96) & Pippin Road

07/28/2022

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	148	95	444	139	94	706
Future Volume (vph)	148	95	444	139	94	706
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		100	150	
Storage Lanes	1	0		1	1	
Taper Length (ft)	25				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.947			0.850		
Flt Protected	0.971				0.950	
Satd. Flow (prot)	1713	0	1863	1583	1770	1863
Flt Permitted	0.971				0.950	
Satd. Flow (perm)	1713	0	1863	1583	1770	1863
Right Turn on Red		No		No		
Satd. Flow (RTOR)						
Link Speed (mph)	35		45			45
Link Distance (ft)	1250		1120			2533
Travel Time (s)	24.4		17.0			38.4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	164	106	493	154	104	784
Shared Lane Traffic (%)						
Lane Group Flow (vph)	270	0	493	154	104	784
Turn Type	Prot		NA	pm+ov	Prot	NA
Protected Phases	4		2	4	1	6
Permitted Phases				2		
Detector Phase	4		2	4	1	6
Switch Phase						
Minimum Initial (s)	7.0		12.0	7.0	7.0	12.0
Minimum Split (s)	14.0		19.0	14.0	14.0	19.0
Total Split (s)	39.0		61.0	39.0	20.0	81.0
Total Split (%)	32.5%		50.8%	32.5%	16.7%	67.5%
Maximum Green (s)	32.0		54.0	32.0	13.0	74.0
Yellow Time (s)	5.0		5.0	5.0	5.0	5.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0		-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0		5.0	5.0	5.0	5.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	Min		Min	Min	None	Min
Act Effct Green (s)	20.5		31.2	58.9	12.6	44.5
Actuated g/C Ratio	0.27		0.41	0.78	0.17	0.59
v/c Ratio	0.58		0.64	0.13	0.36	0.72
Control Delay	32.6		24.9	3.8	38.0	15.8
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	32.6		24.9	3.8	38.0	15.8
LOS	C		C	A	D	B
Approach Delay	32.6		19.9			18.4
Approach LOS	C		B			B

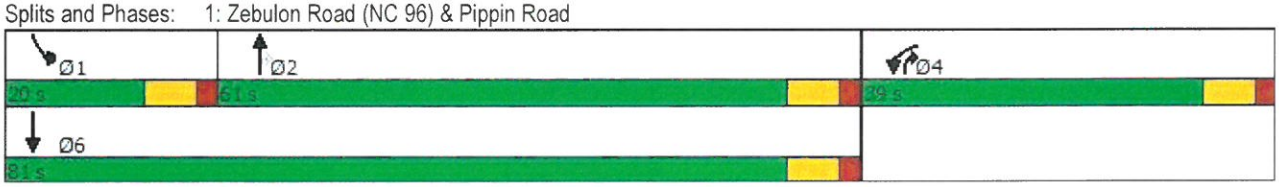
Lanes, Volumes, Timings
1: Zebulon Road (NC 96) & Pippin Road

07/28/2022

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Queue Length 50th (ft)	111		191	19	44	224
Queue Length 95th (ft)	238		365	38	119	463
Internal Link Dist (ft)	1170		1040			2453
Turn Bay Length (ft)				100	150	
Base Capacity (vph)	832		1404	1420	379	1707
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.32		0.35	0.11	0.27	0.46

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 75.9			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.72			
Intersection Signal Delay: 21.0		Intersection LOS: C	
Intersection Capacity Utilization 59.5%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Zebulon Road (NC 96) & Pippin Road



Attachment 1
CZ 2023-02

Lanes, Volumes, Timings
1: Zebulon Road (NC 96) & Pippin Road

07/28/2022

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	170	95	446	147	94	712
Future Volume (vph)	170	95	446	147	94	712
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		100	150	
Storage Lanes	1	0		1	1	
Taper Length (ft)	25				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.951			0.850		
Flt Protected	0.969				0.950	
Satd. Flow (prot)	1717	0	1863	1583	1770	1863
Flt Permitted	0.969				0.950	
Satd. Flow (perm)	1717	0	1863	1583	1770	1863
Right Turn on Red		No		No		
Satd. Flow (RTOR)						
Link Speed (mph)	35		45			45
Link Distance (ft)	1250		1120			2533
Travel Time (s)	24.4		17.0			38.4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	189	106	496	163	104	791
Shared Lane Traffic (%)						
Lane Group Flow (vph)	295	0	496	163	104	791
Turn Type	Prot		NA	pm+ov	Prot	NA
Protected Phases	4		2	4	1	6
Permitted Phases				2		
Detector Phase	4		2	4	1	6
Switch Phase						
Minimum Initial (s)	7.0		12.0	7.0	7.0	12.0
Minimum Split (s)	14.0		19.0	14.0	14.0	19.0
Total Split (s)	40.0		61.0	40.0	19.0	80.0
Total Split (%)	33.3%		50.8%	33.3%	15.8%	66.7%
Maximum Green (s)	33.0		54.0	33.0	12.0	73.0
Yellow Time (s)	5.0		5.0	5.0	5.0	5.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0		-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0		5.0	5.0	5.0	5.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	Min		Min	Min	None	Min
Act Effct Green (s)	21.9		32.2	61.2	12.4	45.3
Actuated g/C Ratio	0.28		0.41	0.78	0.16	0.58
v/c Ratio	0.61		0.65	0.13	0.37	0.73
Control Delay	33.2		25.5	3.6	40.2	17.0
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	33.2		25.5	3.6	40.2	17.0
LOS	C		C	A	D	B
Approach Delay	33.2		20.0			19.7
Approach LOS	C		C			B

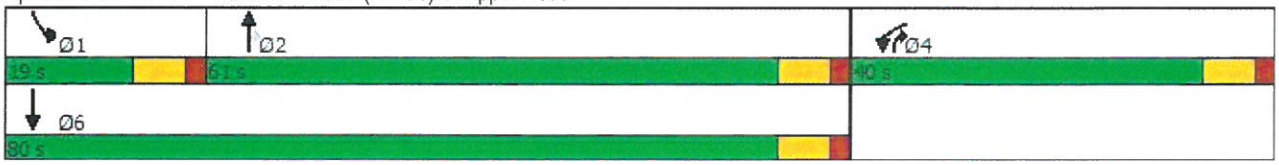
Lanes, Volumes, Timings
1: Zebulon Road (NC 96) & Pippin Road

07/28/2022

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Queue Length 50th (ft)	125		199	21	45	240
Queue Length 95th (ft)	264		377	38	125	503
Internal Link Dist (ft)	1170		1040			2453
Turn Bay Length (ft)				100	150	
Base Capacity (vph)	835		1376	1419	344	1671
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.35		0.36	0.11	0.30	0.47

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 78.1			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.73			
Intersection Signal Delay: 22.0		Intersection LOS: C	
Intersection Capacity Utilization 61.0%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Zebulon Road (NC 96) & Pippin Road



Attachment 1
CZ 2023-02

Lanes, Volumes, Timings
1: Zebulon Road (NC 96) & Pippin Road

07/28/2022

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	140	78	539	237	112	495
Future Volume (vph)	140	78	539	237	112	495
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		100	150	
Storage Lanes	1	0		1	1	
Taper Length (ft)	25				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.952			0.850		
Flt Protected	0.969				0.950	
Satd. Flow (prot)	1718	0	1863	1583	1770	1863
Flt Permitted	0.969				0.950	
Satd. Flow (perm)	1718	0	1863	1583	1770	1863
Right Turn on Red		No		No		
Satd. Flow (RTOR)						
Link Speed (mph)	35		45			45
Link Distance (ft)	1250		1120			2533
Travel Time (s)	24.4		17.0			38.4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	156	87	599	263	124	550
Shared Lane Traffic (%)						
Lane Group Flow (vph)	243	0	599	263	124	550
Turn Type	Prot		NA	pm+ov	Prot	NA
Protected Phases	4		2	4	1	6
Permitted Phases				2		
Detector Phase	4		2	4	1	6
Switch Phase						
Minimum Initial (s)	7.0		12.0	7.0	7.0	12.0
Minimum Split (s)	14.0		19.0	14.0	14.0	19.0
Total Split (s)	34.0		65.0	34.0	21.0	86.0
Total Split (%)	28.3%		54.2%	28.3%	17.5%	71.7%
Maximum Green (s)	27.0		58.0	27.0	14.0	79.0
Yellow Time (s)	5.0		5.0	5.0	5.0	5.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0		-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0		5.0	5.0	5.0	5.0
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	Min		Min	Min	None	Min
Act Effct Green (s)	19.8		36.0	61.1	13.3	54.6
Actuated g/C Ratio	0.23		0.42	0.72	0.16	0.64
v/c Ratio	0.61		0.76	0.23	0.45	0.46
Control Delay	38.8		28.5	4.4	43.3	9.4
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	38.8		28.5	4.4	43.3	9.4
LOS	D		C	A	D	A
Approach Delay	38.8		21.1			15.7
Approach LOS	D		C			B

Lanes, Volumes, Timings
1: Zebulon Road (NC 96) & Pippin Road

07/28/2022

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Queue Length 50th (ft)	115		259	39	60	129
Queue Length 95th (ft)	242		463	67	148	250
Internal Link Dist (ft)	1170		1040			2453
Turn Bay Length (ft)				100	150	
Base Capacity (vph)	621		1376	1137	353	1673
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.39		0.44	0.23	0.35	0.33

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 85.1			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 21.5		Intersection LOS: C	
Intersection Capacity Utilization 59.6%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Zebulon Road (NC 96) & Pippin Road

Attachment 1
CZ 2023-02

Lanes, Volumes, Timings
1: Zebulon Road (NC 96) & Pippin Road

07/28/2022

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	124	118	688	226	130	613
Future Volume (vph)	124	118	688	226	130	613
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		100	150	
Storage Lanes	1	0		1	1	
Taper Length (ft)	25				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.934			0.850		
Flt Protected	0.975				0.950	
Satd. Flow (prot)	1696	0	1863	1583	1770	1863
Flt Permitted	0.975				0.950	
Satd. Flow (perm)	1696	0	1863	1583	1770	1863
Right Turn on Red		No		No		
Satd. Flow (RTOR)						
Link Speed (mph)	35		45			45
Link Distance (ft)	1250		1120			2533
Travel Time (s)	24.4		17.0			38.4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	138	131	764	251	144	681
Shared Lane Traffic (%)						
Lane Group Flow (vph)	269	0	764	251	144	681
Turn Type	Prot		NA	pm+ov	Prot	NA
Protected Phases	4		2	4	1	6
Permitted Phases				2		
Detector Phase	4		2	4	1	6
Switch Phase						
Minimum Initial (s)	7.0		12.0	7.0	7.0	12.0
Minimum Split (s)	14.0		19.0	14.0	14.0	19.0
Total Split (s)	32.0		68.0	32.0	20.0	88.0
Total Split (%)	26.7%		56.7%	26.7%	16.7%	73.3%
Maximum Green (s)	25.0		61.0	25.0	13.0	81.0
Yellow Time (s)	5.0		5.0	5.0	5.0	5.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0		-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0		5.0	5.0	5.0	5.0
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	Min		Min	Min	None	Min
Act Effct Green (s)	22.1		48.5	75.8	13.8	67.6
Actuated g/C Ratio	0.22		0.48	0.76	0.14	0.68
v/c Ratio	0.72		0.85	0.21	0.59	0.54
Control Delay	50.4		32.9	3.8	55.6	10.4
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	50.4		32.9	3.8	55.6	10.4
LOS	D		C	A	E	B
Approach Delay	50.4		25.7			18.3
Approach LOS	D		C			B

Lanes, Volumes, Timings
1: Zebulon Road (NC 96) & Pippin Road 07/28/2022

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Queue Length 50th (ft)	168		431	40	92	208
Queue Length 95th (ft)	291		633	61	#188	318
Internal Link Dist (ft)	1170		1040			2453
Turn Bay Length (ft)				100	150	
Base Capacity (vph)	477		1223	1193	276	1536
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.56		0.62	0.21	0.52	0.44

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 100.1			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.85			
Intersection Signal Delay: 26.0		Intersection LOS: C	
Intersection Capacity Utilization 70.0%		ICU Level of Service C	
Analysis Period (min) 15			

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Zebulon Road (NC 96) & Pippin Road

Attachment 1
CZ 2023-02

Lanes, Volumes, Timings
1: Zebulon Road (NC 96) & Pippin Road

07/28/2022

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	138	118	695	252	130	617
Future Volume (vph)	138	118	695	252	130	617
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		100	150	
Storage Lanes	1	0		1	1	
Taper Length (ft)	25				100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.938			0.850		
Flt Protected	0.974				0.950	
Satd. Flow (prot)	1702	0	1863	1583	1770	1863
Flt Permitted	0.974				0.950	
Satd. Flow (perm)	1702	0	1863	1583	1770	1863
Right Turn on Red		No		No		
Satd. Flow (RTOR)						
Link Speed (mph)	35		45			45
Link Distance (ft)	1250		1120			2533
Travel Time (s)	24.4		17.0			38.4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	153	131	772	280	144	686
Shared Lane Traffic (%)						
Lane Group Flow (vph)	284	0	772	280	144	686
Turn Type	Prot		NA	pm+ov	Prot	NA
Protected Phases	4		2	4	1	6
Permitted Phases				2		
Detector Phase	4		2	4	1	6
Switch Phase						
Minimum Initial (s)	7.0		12.0	7.0	7.0	12.0
Minimum Split (s)	14.0		19.0	14.0	14.0	19.0
Total Split (s)	32.0		68.0	32.0	20.0	88.0
Total Split (%)	26.7%		56.7%	26.7%	16.7%	73.3%
Maximum Green (s)	25.0		61.0	25.0	13.0	81.0
Yellow Time (s)	5.0		5.0	5.0	5.0	5.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0		-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0		5.0	5.0	5.0	5.0
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	Min		Min	Min	None	Min
Act Effct Green (s)	22.9		49.5	77.6	13.8	68.5
Actuated g/C Ratio	0.22		0.49	0.76	0.14	0.67
v/c Ratio	0.74		0.85	0.23	0.60	0.55
Control Delay	52.0		33.7	3.9	56.9	10.7
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	52.0		33.7	3.9	56.9	10.7
LOS	D		C	A	E	B
Approach Delay	52.0		25.7			18.7
Approach LOS	D		C			B

Lanes, Volumes, Timings
1: Zebulon Road (NC 96) & Pippin Road

07/28/2022

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Queue Length 50th (ft)	182		453	45	95	222
Queue Length 95th (ft)	#323		644	68	#188	323
Internal Link Dist (ft)	1170		1040			2453
Turn Bay Length (ft)				100	150	
Base Capacity (vph)	468		1198	1196	270	1514
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.61		0.64	0.23	0.53	0.45

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 101.8
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 26.5 Intersection LOS: C
Intersection Capacity Utilization 71.2% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Zebulon Road (NC 96) & Pippin Road

HCM 6th TWSC
2: Zebulon Road (NC 96) & Glory Road

07/28/2022

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	5	4	450	619	4
Future Vol, veh/h	4	5	4	450	619	4
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	4	6	4	500	688	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1198	690	692	0	-	0
Stage 1	690	-	-	-	-	-
Stage 2	508	-	-	-	-	-
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	205	445	903	-	-	-
Stage 1	498	-	-	-	-	-
Stage 2	604	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	204	445	903	-	-	-
Mov Cap-2 Maneuver	204	-	-	-	-	-
Stage 1	495	-	-	-	-	-
Stage 2	604	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.8	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	903	-	292	-	-
HCM Lane V/C Ratio	0.005	-	0.034	-	-
HCM Control Delay (s)	9	0	17.8	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

HCM 6th TWSC
2: Zebulon Road (NC 96) & Glory Road/Weaver's Ridge Site Drive 07/28/2022

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	4	4	6	118	4	39	4	500	38	12	679	4
Future Vol, veh/h	4	4	6	118	4	39	4	500	38	12	679	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	-	-	100	50	-	-
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	4	4	7	131	4	43	4	556	42	13	754	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1391	1388	756	1352	1348	556	758	0	0	598	0	0
Stage 1	782	782	-	564	564	-	-	-	-	-	-	-
Stage 2	609	606	-	788	784	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	120	143	408	~ 127	151	531	853	-	-	979	-	-
Stage 1	387	405	-	510	508	-	-	-	-	-	-	-
Stage 2	482	487	-	384	404	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	106	140	408	~ 120	148	531	853	-	-	979	-	-
Mov Cap-2 Maneuver	106	140	-	~ 120	148	-	-	-	-	-	-	-
Stage 1	384	400	-	506	504	-	-	-	-	-	-	-
Stage 2	436	484	-	369	399	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	27.9	135.1	0.1	0.2
HCM LOS	D	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	853	-	-	173	120	428	979	-	-
HCM Lane V/C Ratio	0.005	-	-	0.09	1.093	0.112	0.014	-	-
HCM Control Delay (s)	9.2	0	-	27.9	179.1	14.5	8.7	-	-
HCM Lane LOS	A	A	-	D	F	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.3	7.7	0.4	0	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 6th TWSC
2: Zebulon Road (NC 96) & Glory Road/Weaver's Ridge Site Drive

07/28/2022

Intersection	
Int Delay, s/veh	18.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	4	6	124	4	54	4	500	40	17	679	4
Future Vol, veh/h	4	4	6	124	4	54	4	500	40	17	679	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	-	-	100	50	-	-
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	4	4	7	138	4	60	4	556	44	19	754	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1412	1402	756	1364	1360	556	758	0	0	600	0	0
Stage 1	794	794	-	564	564	-	-	-	-	-	-	-
Stage 2	618	608	-	800	796	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	116	140	408	~ 125	148	531	853	-	-	977	-	-
Stage 1	381	400	-	510	508	-	-	-	-	-	-	-
Stage 2	477	486	-	379	399	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	98	136	408	~ 118	144	531	853	-	-	977	-	-
Mov Cap-2 Maneuver	98	136	-	~ 118	144	-	-	-	-	-	-	-
Stage 1	378	392	-	506	504	-	-	-	-	-	-	-
Stage 2	416	483	-	361	391	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	29.1	144.5	0.1	0.2
HCM LOS	D	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	853	-	-	165	118	448	977	-	-
HCM Lane V/C Ratio	0.005	-	-	0.094	1.168	0.144	0.019	-	-
HCM Control Delay (s)	9.2	0	-	29.1	205.3	14.4	8.8	-	-
HCM Lane LOS	A	A	-	D	F	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.3	8.5	0.5	0.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lanes, Volumes, Timings
2: Zebulon Road (NC 96) & Glory Road/Weaver's Ridge Site Drive 07/28/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	4	6	124	4	54	4	500	40	17	679	4
Future Volume (vph)	4	4	6	124	4	54	4	500	40	17	679	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		100	50		0
Storage Lanes	0		0	1		0	0		1	1		0
Taper Length (ft)	25			25			25			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		0.937			0.859				0.850		0.999	
Flt Protected		0.987		0.950						0.950		
Satd. Flow (prot)	0	1723	0	1770	1600	0	0	1863	1583	1770	1861	0
Flt Permitted		0.987		0.950				0.996		0.950		
Satd. Flow (perm)	0	1723	0	1770	1600	0	0	1855	1583	1770	1861	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		55			30			45			45	
Link Distance (ft)		1719			1308			2533			1115	
Travel Time (s)		21.3			29.7			38.4			16.9	
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)	4	4	7	138	4	60	4	556	44	19	754	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	15	0	138	64	0	0	560	44	19	758	0
Turn Type	Split	NA		Split	NA		Perm	NA	pm+ov	Prot	NA	
Protected Phases	4	4		8	8			2	8	1	6	
Permitted Phases							2		2			
Detector Phase	4	4		8	8		2	2	8	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		12.0	12.0	7.0	7.0	12.0	
Minimum Split (s)	14.0	14.0		14.0	14.0		19.0	19.0	14.0	14.0	19.0	
Total Split (s)	14.0	14.0		23.0	23.0		69.0	69.0	23.0	14.0	83.0	
Total Split (%)	11.7%	11.7%		19.2%	19.2%		57.5%	57.5%	19.2%	11.7%	69.2%	
Maximum Green (s)	7.0	7.0		16.0	16.0		62.0	62.0	16.0	7.0	76.0	
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	Lead		Lag		
Lead-Lag Optimize?							Yes	Yes		Yes		
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		C-Min	C-Min	None	None	C-Min	
Act Effct Green (s)		9.3		16.6	16.6			81.5	106.0	9.5	87.5	
Actuated g/C Ratio		0.08		0.14	0.14			0.68	0.88	0.08	0.73	
v/c Ratio		0.11		0.57	0.29			0.44	0.03	0.14	0.56	
Control Delay		53.3		56.8	48.4			11.0	0.4	53.5	11.6	
Queue Delay		0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay		53.3		56.8	48.4			11.0	0.4	53.5	11.6	
LOS		D		E	D			B	A	D	B	
Approach Delay		53.3			54.2			10.2			12.6	
Approach LOS		D			D			B			B	

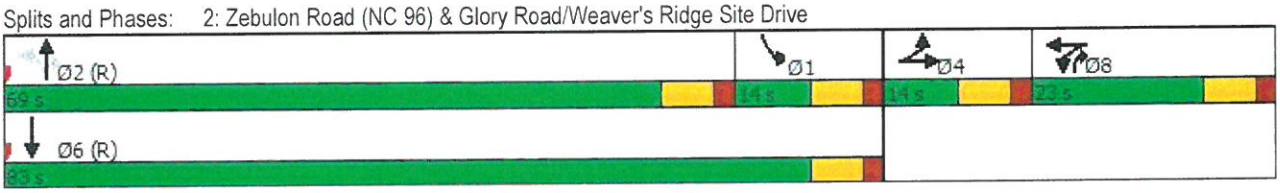
Lanes, Volumes, Timings
2: Zebulon Road (NC 96) & Glory Road/Weaver's Ridge Site Drive 07/28/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		11		101	45			3	0	14	183	
Queue Length 95th (ft)		33		161	84			494	m1	38	504	
Internal Link Dist (ft)		1639			1228			2453			1035	
Turn Bay Length (ft)									100	50		
Base Capacity (vph)		133		279	252			1285	1385	139	1376	
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		0.11		0.49	0.25			0.44	0.03	0.14	0.55	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.57
Intersection Signal Delay: 17.4 Intersection LOS: B
Intersection Capacity Utilization 60.1% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Zebulon Road (NC 96) & Glory Road/Weaver's Ridge Site Drive



HCM 6th TWSC
2: Zebulon Road (NC 96) & Glory Road 07/28/2022

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	4	13	604	604	4
Future Vol, veh/h	4	4	13	604	604	4
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	4	4	14	671	671	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1372	673	675	0	-	0
Stage 1	673	-	-	-	-	-
Stage 2	699	-	-	-	-	-
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	161	455	916	-	-	-
Stage 1	507	-	-	-	-	-
Stage 2	493	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	157	455	916	-	-	-
Mov Cap-2 Maneuver	157	-	-	-	-	-
Stage 1	495	-	-	-	-	-
Stage 2	493	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	21.1	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	916	-	233	-	-
HCM Lane V/C Ratio	0.016	-	0.038	-	-
HCM Control Delay (s)	9	0	21.1	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

HCM 6th TWSC
2: Zebulon Road (NC 96) & Glory Road/Weaver's Ridge Site Drive 07/28/2022

Intersection	
Int Delay, s/veh	12.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	4	4	75	4	25	14	665	127	42	669	4
Future Vol, veh/h	4	4	4	75	4	25	14	665	127	42	669	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	-	-	100	50	-	-
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	4	4	4	83	4	28	16	739	141	47	743	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1697	1751	745	1614	1612	739	747	0	0	880	0	0
Stage 1	839	839	-	771	771	-	-	-	-	-	-	-
Stage 2	858	912	-	843	841	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	73	86	414	84	104	417	861	-	-	768	-	-
Stage 1	360	381	-	393	410	-	-	-	-	-	-	-
Stage 2	352	353	-	358	380	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	61	78	414	~ 74	94	417	861	-	-	768	-	-
Mov Cap-2 Maneuver	61	78	-	~ 74	94	-	-	-	-	-	-	-
Stage 1	346	358	-	378	394	-	-	-	-	-	-	-
Stage 2	313	340	-	328	357	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	49	179.6	0.2	0.6
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	861	-	-	95	74	283	768	-	-
HCM Lane V/C Ratio	0.018	-	-	0.14	1.126	0.114	0.061	-	-
HCM Control Delay (s)	9.3	0	-	49	241.6	19.3	10	-	-
HCM Lane LOS	A	A	-	E	F	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.5	6.2	0.4	0.2	-	-

Notes
~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 6th TWSC

2: Zebulon Road (NC 96) & Glory Road/Weaver's Ridge Stie Drive

07/28/2022

Intersection	
Int Delay, s/veh	15.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	4	4	79	4	35	14	665	134	59	669	4
Future Vol, veh/h	4	4	4	79	4	35	14	665	134	59	669	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	-	-	100	50	-	-
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	4	4	4	88	4	39	16	739	149	66	743	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1744	1797	745	1652	1650	739	747	0	0	888	0	0
Stage 1	877	877	-	771	771	-	-	-	-	-	-	-
Stage 2	867	920	-	881	879	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	68	80	414	~ 79	99	417	861	-	-	763	-	-
Stage 1	343	366	-	393	410	-	-	-	-	-	-	-
Stage 2	348	350	-	341	365	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	54	70	414	~ 68	87	417	861	-	-	763	-	-
Mov Cap-2 Maneuver	54	70	-	~ 68	87	-	-	-	-	-	-	-
Stage 1	330	334	-	378	394	-	-	-	-	-	-	-
Stage 2	300	337	-	304	333	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	55.1	214.2	0.2	0.8
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	861	-	-	85	68	300	763	-	-
HCM Lane V/C Ratio	0.018	-	-	0.157	1.291	0.144	0.086	-	-
HCM Control Delay (s)	9.3	0	-	55.1$	310.6	19	10.2	-	-
HCM Lane LOS	A	A	-	F	F	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.5	7.1	0.5	0.3	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lanes, Volumes, Timings
2: Zebulon Road (NC 96) & Glory Road/Weaver's Ridge Site Drive 07/28/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	4	4	79	4	35	14	665	134	59	669	4
Future Volume (vph)	4	4	4	79	4	35	14	665	134	59	669	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		100	50		0
Storage Lanes	0		0	1		0	0		1	1		0
Taper Length (ft)	25			25			25			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		0.955			0.864				0.850		0.999	
Flt Protected		0.984		0.950				0.999		0.950		
Satd. Flow (prot)	0	1750	0	1770	1609	0	0	1861	1583	1770	1861	0
Flt Permitted		0.984		0.950				0.979		0.950		
Satd. Flow (perm)	0	1750	0	1770	1609	0	0	1824	1583	1770	1861	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		55			30			45			45	
Link Distance (ft)		1719			1404			2533			1320	
Travel Time (s)		21.3			31.9			38.4			20.0	
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)	4	4	4	88	4	39	16	739	149	66	743	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	12	0	88	43	0	0	755	149	66	747	0
Turn Type	Split	NA		Split	NA		Perm	NA	pm+ov	Prot	NA	
Protected Phases	4	4		8	8			2	8	1	6	
Permitted Phases							2		2			
Detector Phase	4	4		8	8		2	2	8	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		12.0	12.0	7.0	7.0	12.0	
Minimum Split (s)	14.0	14.0		14.0	14.0		19.0	19.0	14.0	14.0	19.0	
Total Split (s)	14.0	14.0		23.0	23.0		69.0	69.0	23.0	14.0	83.0	
Total Split (%)	11.7%	11.7%		19.2%	19.2%		57.5%	57.5%	19.2%	11.7%	69.2%	
Maximum Green (s)	7.0	7.0		16.0	16.0		62.0	62.0	16.0	7.0	76.0	
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							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
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		C-Min	C-Min	None	None	C-Min	
Act Effct Green (s)		9.0		13.4	13.4			78.1	95.5	10.7	91.0	
Actuated g/C Ratio		0.08		0.11	0.11			0.65	0.80	0.09	0.76	
v/c Ratio		0.09		0.45	0.24			0.64	0.12	0.42	0.53	
Control Delay		53.5		56.2	50.5			6.2	1.0	60.3	9.3	
Queue Delay		0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay		53.5		56.2	50.5			6.2	1.0	60.3	9.3	
LOS		D		E	D			A	A	E	A	
Approach Delay		53.5			54.4			5.4			13.4	
Approach LOS		D			D			A			B	

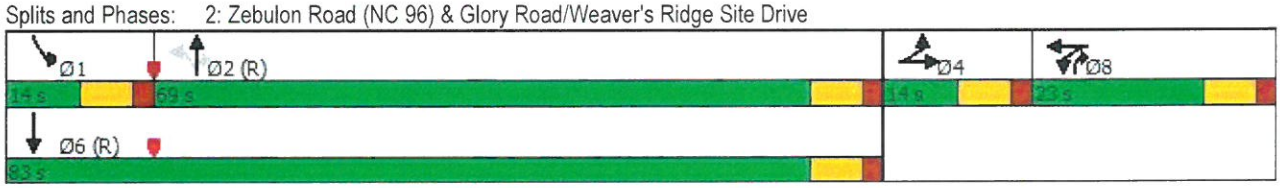
Lanes, Volumes, Timings
2: Zebulon Road (NC 96) & Glory Road/Weaver's Ridge Site Drive 07/28/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		9		65	31			74	0	49	150	
Queue Length 95th (ft)		29		114	65			169	m13	98	431	
Internal Link Dist (ft)		1639			1324			2453			1240	
Turn Bay Length (ft)									100	50		
Base Capacity (vph)		131		265	241			1191	1297	157	1411	
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		0.09		0.33	0.18			0.63	0.11	0.42	0.53	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.64
Intersection Signal Delay: 12.7 Intersection LOS: B
Intersection Capacity Utilization 68.3% ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Zebulon Road (NC 96) & Glory Road/Weaver's Ridge Site Drive



HCM 6th TWSC
3: Pearces Road & Pippin Road

07/28/2022

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	61	14	31	43	21	15	13	57	12	29	297	20
Future Vol, veh/h	61	14	31	43	21	15	13	57	12	29	297	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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	300	2	2	2	2
Mvmt Flow	68	16	34	48	23	17	14	63	13	32	330	22

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	523	509	341	528	514	70	352	0	0	76	0	0
Stage 1	405	405	-	98	98	-	-	-	-	-	-	-
Stage 2	118	104	-	430	416	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	465	467	701	461	464	993	1207	-	-	1523	-	-
Stage 1	622	598	-	908	814	-	-	-	-	-	-	-
Stage 2	887	809	-	603	592	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	426	449	701	414	446	993	1207	-	-	1523	-	-
Mov Cap-2 Maneuver	426	449	-	414	446	-	-	-	-	-	-	-
Stage 1	615	582	-	897	804	-	-	-	-	-	-	-
Stage 2	837	799	-	544	577	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.8	14.3	1.3	0.6
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1207	-	-	485	476	1523	-	-
HCM Lane V/C Ratio	0.012	-	-	0.243	0.184	0.021	-	-
HCM Control Delay (s)	8	0	-	14.8	14.3	7.4	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.9	0.7	0.1	-	-

HCM 6th TWSC
3: Pearces Road & Pippin Road

07/28/2022

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	85	17	39	47	24	16	16	62	13	32	324	29
Future Vol, veh/h	85	17	39	47	24	16	16	62	13	32	324	29
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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	94	19	43	52	27	18	18	69	14	36	360	32

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	583	567	376	591	576	76	392	0	0	83	0	0
Stage 1	448	448	-	112	112	-	-	-	-	-	-	-
Stage 2	135	119	-	479	464	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	424	433	670	419	428	985	1167	-	-	1514	-	-
Stage 1	590	573	-	893	803	-	-	-	-	-	-	-
Stage 2	868	797	-	568	564	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	382	413	670	365	408	985	1167	-	-	1514	-	-
Mov Cap-2 Maneuver	382	413	-	365	408	-	-	-	-	-	-	-
Stage 1	581	555	-	879	790	-	-	-	-	-	-	-
Stage 2	810	784	-	497	547	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.7	15.9	1.4	0.6
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1167	-	-	438	427	1514	-	-
HCM Lane V/C Ratio	0.015	-	-	0.358	0.226	0.023	-	-
HCM Control Delay (s)	8.1	0	-	17.7	15.9	7.4	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	1.6	0.9	0.1	-	-

Attachment 1
CZ 2023-02

HCM 6th TWSC
3: Pearces Road & Pippin Road

07/28/2022

Intersection	
Int Delay, s/veh	6.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	97	17	42	47	24	16	17	62	13	32	324	33
Future Vol, veh/h	97	17	42	47	24	16	17	62	13	32	324	33
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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	108	19	47	52	27	18	19	69	14	36	360	37

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	588	572	379	598	583	76	397	0	0	83	0	0
Stage 1	451	451	-	114	114	-	-	-	-	-	-	-
Stage 2	137	121	-	484	469	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	421	430	668	414	424	985	1162	-	-	1514	-	-
Stage 1	588	571	-	891	801	-	-	-	-	-	-	-
Stage 2	866	796	-	564	561	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	378	410	668	358	404	985	1162	-	-	1514	-	-
Mov Cap-2 Maneuver	378	410	-	358	404	-	-	-	-	-	-	-
Stage 1	578	553	-	876	787	-	-	-	-	-	-	-
Stage 2	808	782	-	491	544	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18.8	16.1	1.5	0.6
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1162	-	-	432	420	1514	-	-
HCM Lane V/C Ratio	0.016	-	-	0.401	0.23	0.023	-	-
HCM Control Delay (s)	8.1	0	-	18.8	16.1	7.4	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1.9	0.9	0.1	-	-

HCM 6th TWSC
3: Pearces Road & Pippin Road

07/28/2022

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	43	19	25	24	28	44	28	275	46	17	165	74
Future Vol, veh/h	43	19	25	24	28	44	28	275	46	17	165	74
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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	48	21	28	27	31	49	31	306	51	19	183	82

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	696	681	224	681	697	332	265	0	0	357	0	0
Stage 1	262	262	-	394	394	-	-	-	-	-	-	-
Stage 2	434	419	-	287	303	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	356	373	815	364	365	710	1299	-	-	1202	-	-
Stage 1	743	691	-	631	605	-	-	-	-	-	-	-
Stage 2	600	590	-	720	664	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	298	355	815	323	347	710	1299	-	-	1202	-	-
Mov Cap-2 Maneuver	298	355	-	323	347	-	-	-	-	-	-	-
Stage 1	721	678	-	612	587	-	-	-	-	-	-	-
Stage 2	513	572	-	661	651	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.6	15.7	0.6	0.5
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1299	-	-	381	442	1202	-	-
HCM Lane V/C Ratio	0.024	-	-	0.254	0.241	0.016	-	-
HCM Control Delay (s)	7.8	0	-	17.6	15.7	8	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1	0.9	0	-	-

HCM 6th TWSC
3: Pearces Road & Pippin Road

07/28/2022

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	59	22	30	27	33	48	36	300	51	19	180	101
Future Vol, veh/h	59	22	30	27	33	48	36	300	51	19	180	101
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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	66	24	33	30	37	53	40	333	57	21	200	112

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	785	768	256	769	796	362	312	0	0	390	0	0
Stage 1	298	298	-	442	442	-	-	-	-	-	-	-
Stage 2	487	470	-	327	354	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	310	332	783	318	320	683	1248	-	-	1169	-	-
Stage 1	711	667	-	594	576	-	-	-	-	-	-	-
Stage 2	562	560	-	686	630	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	247	311	783	273	300	683	1248	-	-	1169	-	-
Mov Cap-2 Maneuver	247	311	-	273	300	-	-	-	-	-	-	-
Stage 1	682	652	-	570	552	-	-	-	-	-	-	-
Stage 2	464	537	-	618	616	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	23.2	18.4	0.7	0.5
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1248	-	-	319	387	1169	-	-
HCM Lane V/C Ratio	0.032	-	-	0.387	0.31	0.018	-	-
HCM Control Delay (s)	8	0	-	23.2	18.4	8.1	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1.8	1.3	0.1	-	-

HCM 6th TWSC
3: Pearces Road & Pippin Road

07/28/2022

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	67	22	32	27	33	48	39	300	51	19	180	114
Future Vol, veh/h	67	22	32	27	33	48	39	300	51	19	180	114
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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	74	24	36	30	37	53	43	333	57	21	200	127

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	799	782	264	784	817	362	327	0	0	390	0	0
Stage 1	306	306	-	448	448	-	-	-	-	-	-	-
Stage 2	493	476	-	336	369	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	304	326	775	311	311	683	1233	-	-	1169	-	-
Stage 1	704	662	-	590	573	-	-	-	-	-	-	-
Stage 2	558	557	-	678	621	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	240	304	775	265	290	683	1233	-	-	1169	-	-
Mov Cap-2 Maneuver	240	304	-	265	290	-	-	-	-	-	-	-
Stage 1	672	647	-	563	547	-	-	-	-	-	-	-
Stage 2	458	532	-	609	607	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	25.4	18.9	0.8	0.5
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1233	-	-	308	378	1169	-	-
HCM Lane V/C Ratio	0.035	-	-	0.437	0.317	0.018	-	-
HCM Control Delay (s)	8	0	-	25.4	18.9	8.1	0	-
HCM Lane LOS	A	A	-	D	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	2.1	1.3	0.1	-	-

Attachment 1
CZ 2023-02

Traffic Signal Warrant Analysis

Warrants 1 - 3 (Volume Warrants)

Project Name	Weaver's Pointe
Project/File #	22390
Scenario	2025 Build

Intersection Information			
Major Street (N/S Road)	NC 96 (Zebulon Road)	Minor Street (E/W Road)	Glory Road / Site Access
Analyzed with	1 approach lane	Analyzed with	2 or more approach lanes
Total Approach Volume	2779 vehicles	Total Approach Volume	303 vehicles
Total Ped/Bike Volume	0 crossings	Total Ped/Bike Volume	0 crossings
Right turn reduction of	100 percent applied	Right turn reduction of	0 percent applied

No high speed or isolated community reduction applied to the Volume Warrant thresholds.

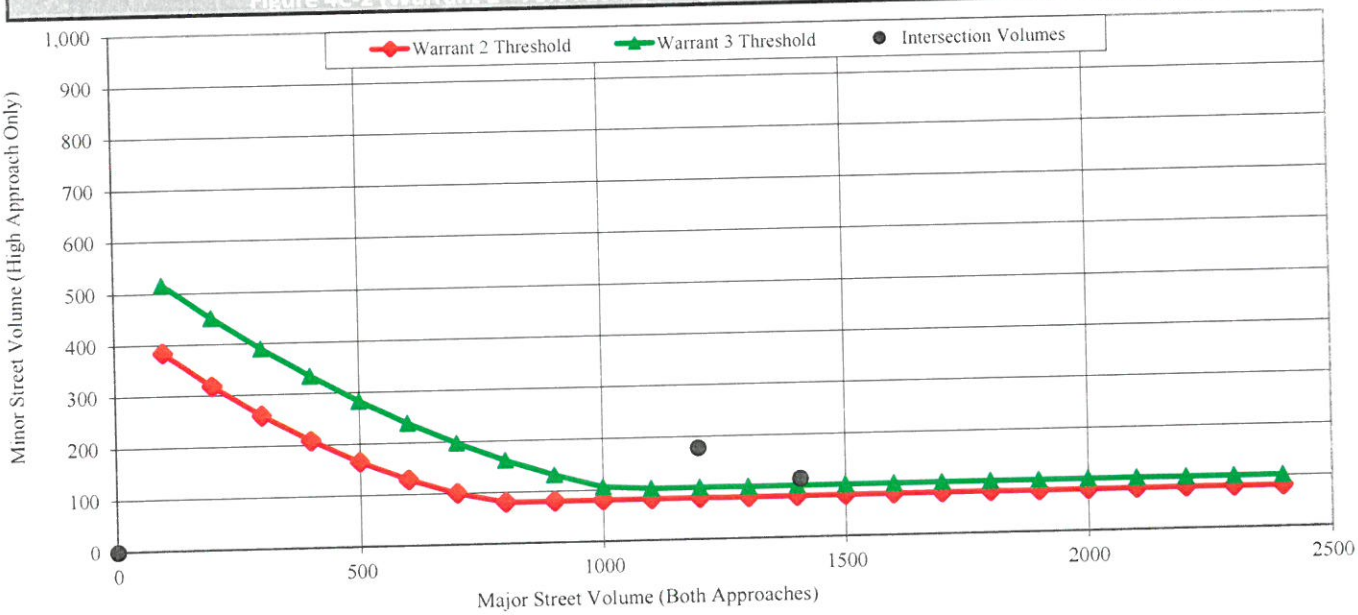
Warrant 1, Eight Hour Vehicular Volume			
	Condition A	Condition B	Condition A+B*
Condition Satisfied?	Not Satisfied	Not Satisfied	Not Satisfied
Required values reached for	1 hour	2 hours	2 (Cond. A) & 2 (Cond. B)
Criteria - Major Street (veh/hr)	350	525	280 (Cond. A) & 420 (Cond. B)
Criteria - Minor Street (veh/hr)	140	70	112 (Cond. A) & 56 (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

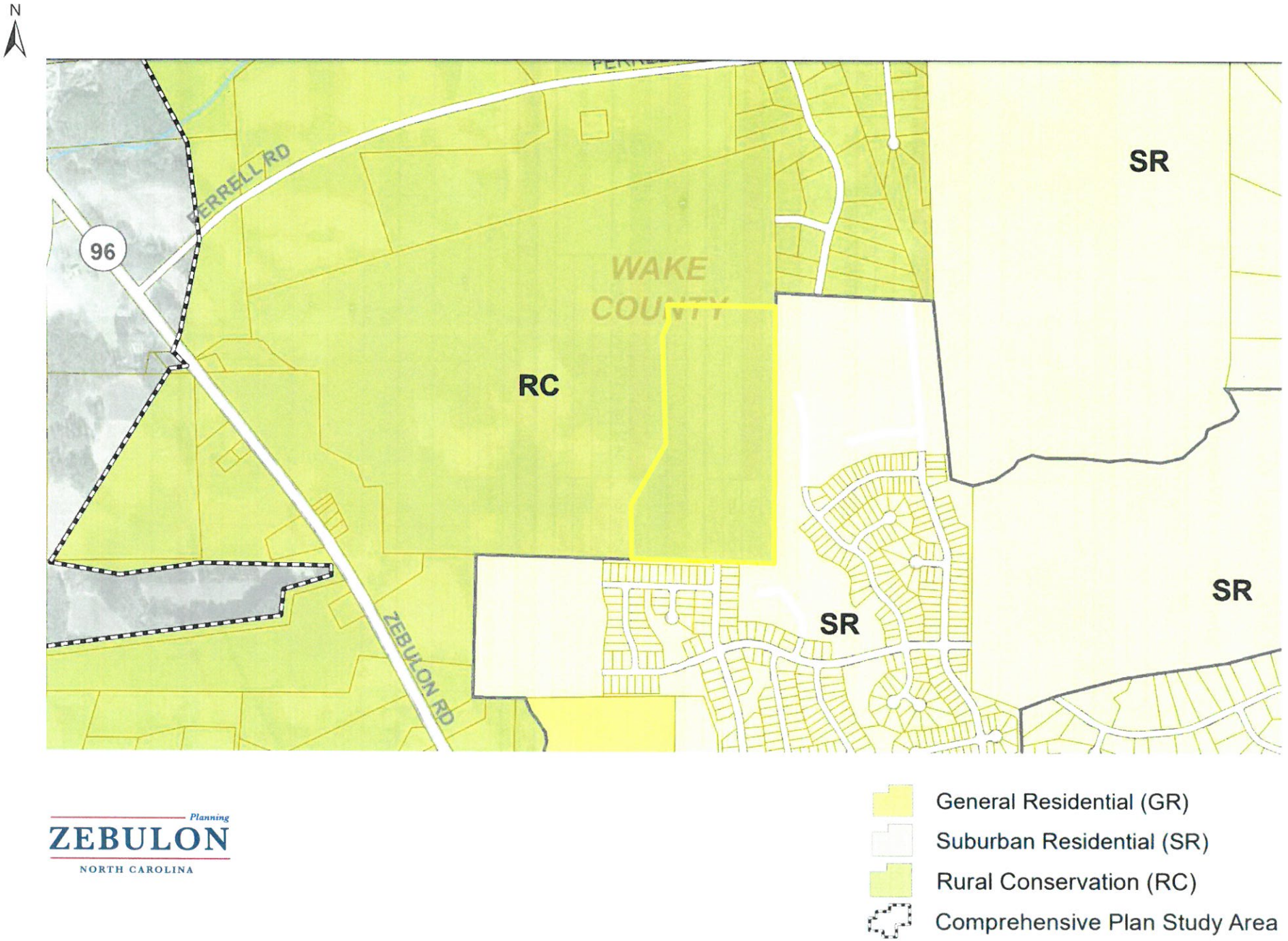
Warrant 3, Peak Hour Vehicular Volume		
	Condition A	Condition B
Condition Satisfied?	Not Satisfied	Satisfied
Required values reached for	1422 total, 178 minor, 0 delay	2 hours
Criteria - Total Approach Volume (veh in one hour)	800	See Figure Below
Criteria - Minor Street High Side Volume (veh in one 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)

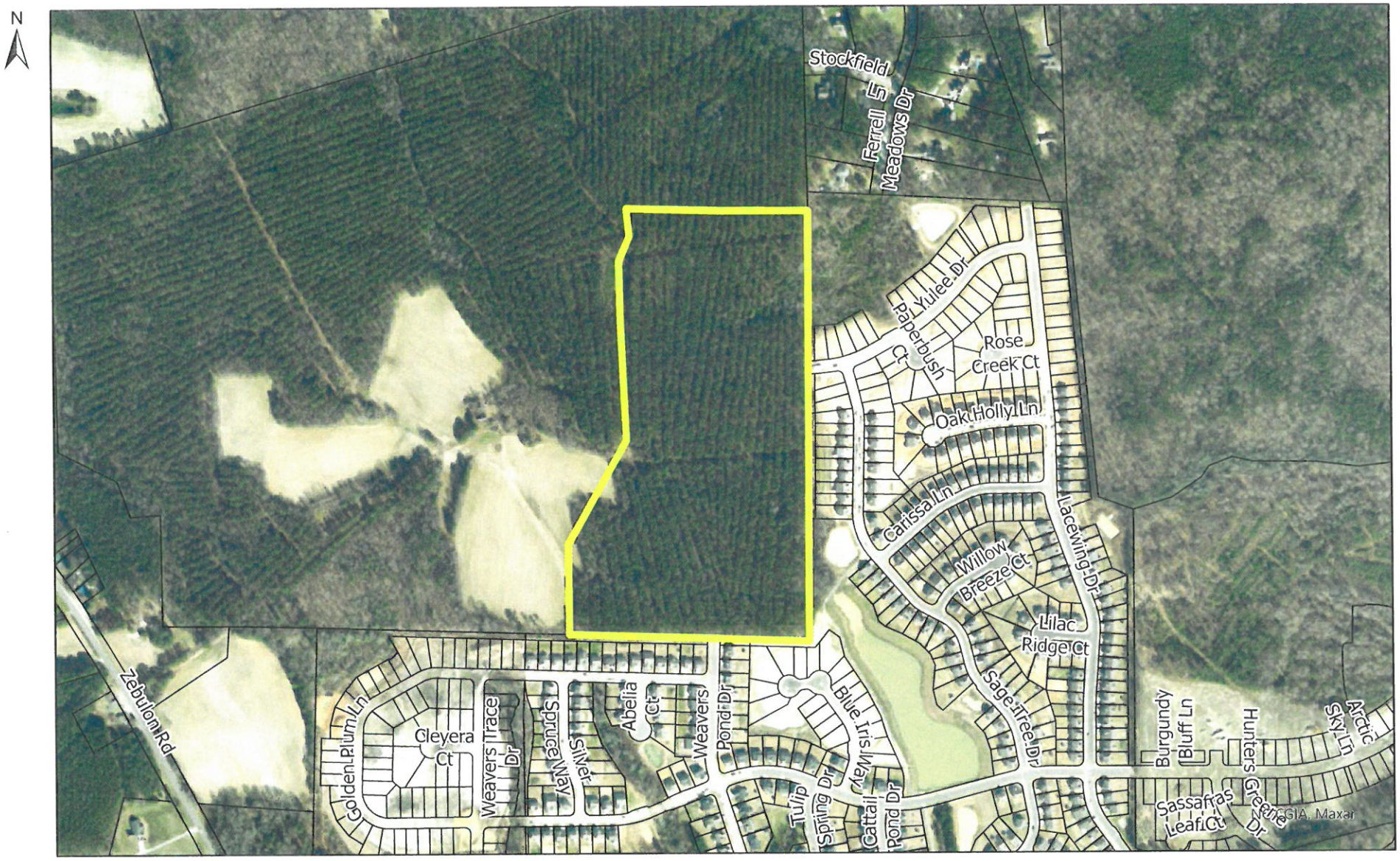


Reduction Crossing Volume

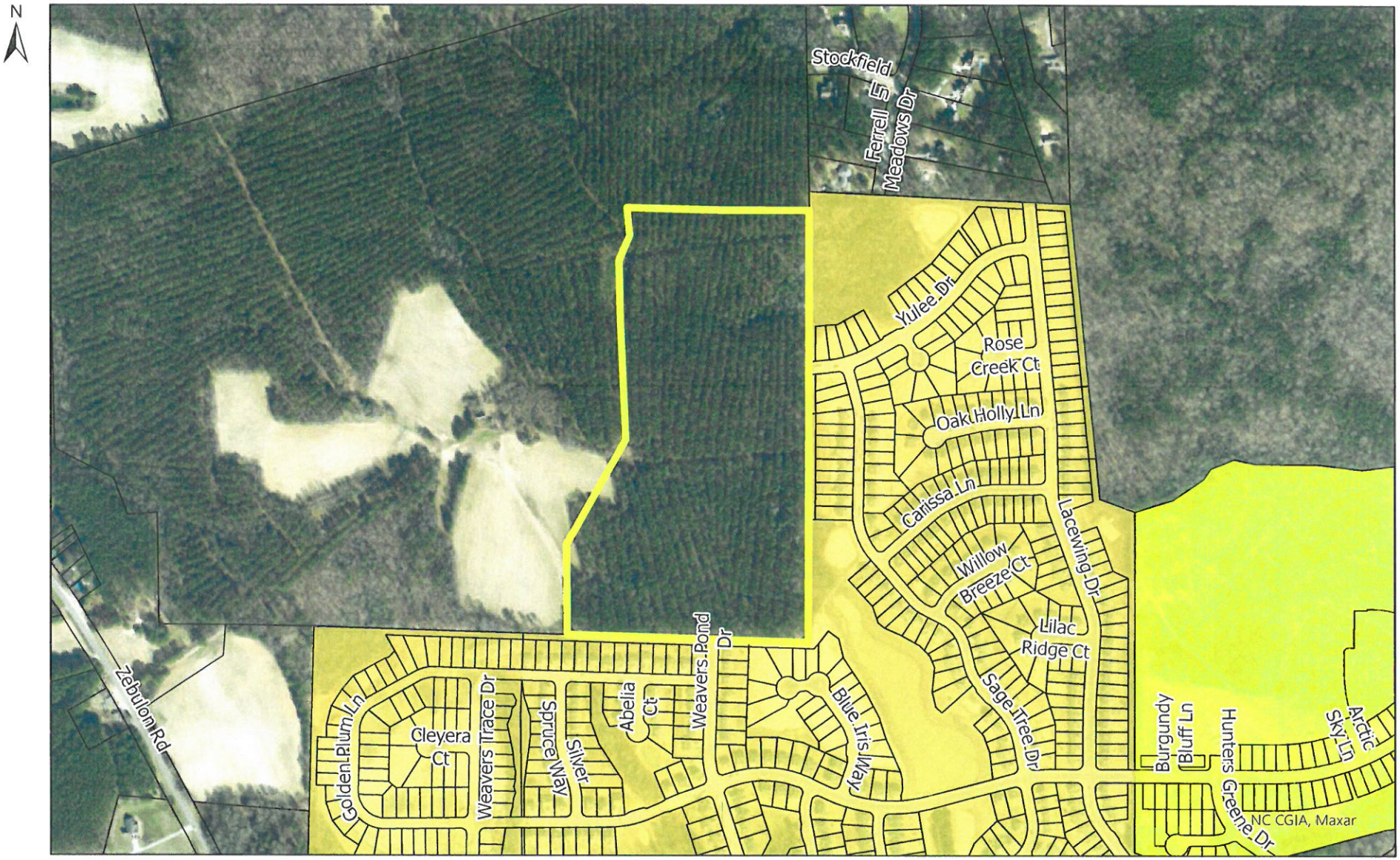
Attachment 2 - Future Land Use and Character Map



Attachment 3 - Aerial Map



Attachment 4 - Zoning Map



Planning
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0 200 400 800 1,200 1,600 Feet

Subject Property (0 Weavers Pond Dr)

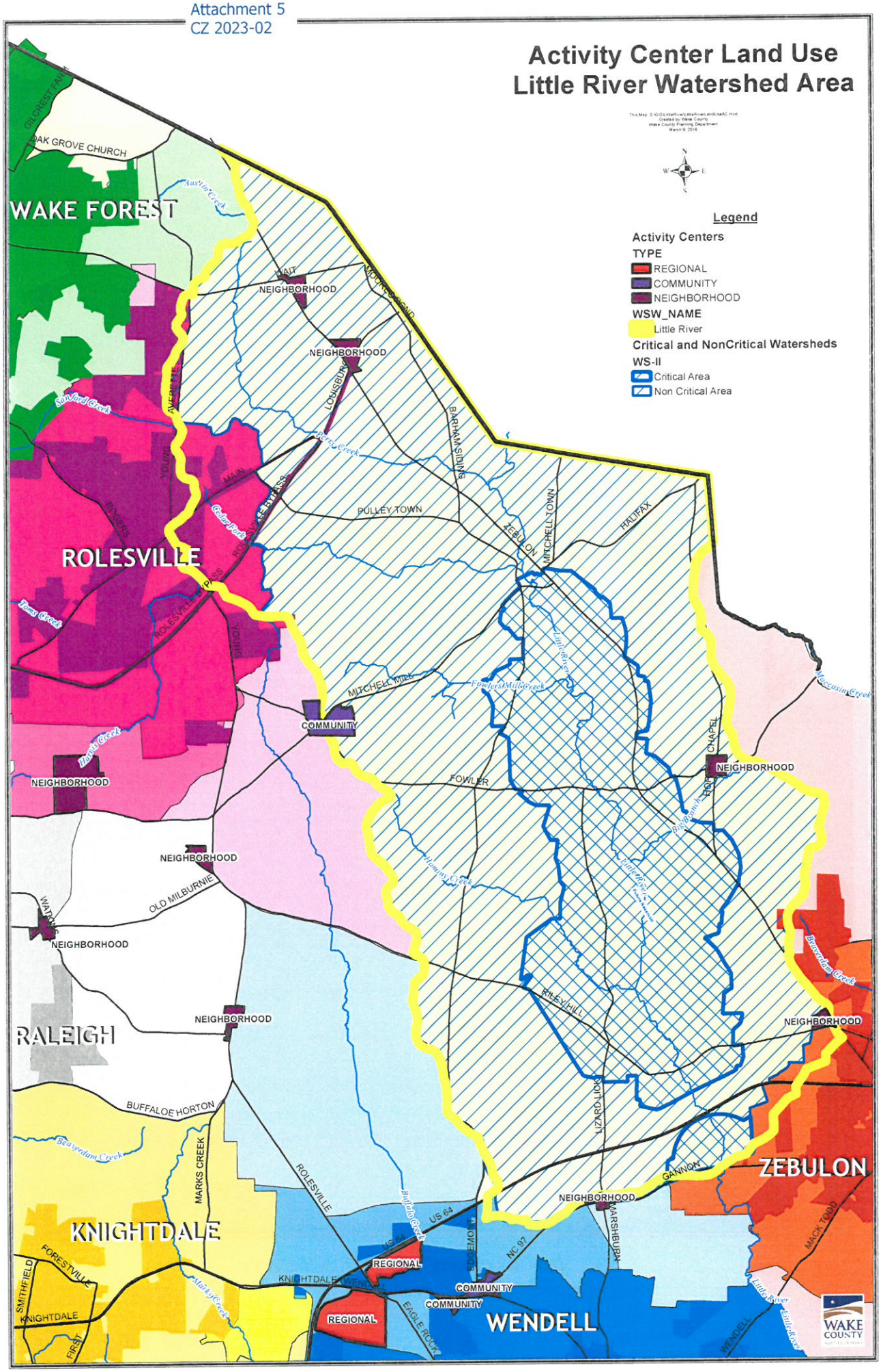
Parcels

Zoning Districts

R4, Residential Neighborhood

R-13 SUD, Residential 13 - Special Use Districts

Attachment 5
CZ 2023-02



Attachment 6 - Site Pictures

View of property at the end of Yulee Dr

Attachment 6 - Site Pictures

View north on property near Yulee Dr

Attachment 6 - Site Pictures

View west on property

Attachment 6 - Site Pictures

View south on property (remaining trees on the left)

Attachment 6 - Site Pictures

Existing buffer between Weaver's Pond and Subject Property

ZEBULON
NORTH CAROLINA

STAFF REPORT
TRANSPORTATION IMPACT ASSESSMENT
TEXT AMENDMENT
APRIL 10, 2023

Topic: **TA 2023-04 – Section 6.13 - TIA Text Amendment**
Speaker: Michael J. Clark, CZO, AICP, Planning Director
From: Michael J. Clark, CZO, AICP, Planning Director
Prepared by: Michael J. Clark, CZO, AICP, Planning Director
Approved by: Joseph M. Moore II, PE, Town Manager

Executive Summary:
The Board of Commissioners will consider text amendments to Section 6.13 of the Zebulon Unified Development Ordinance regarding Transportation Impact Analysis regulations.

Background:
As part of the development process, the Town requires applicants to conduct a Transportation Impact Analysis (TIA) on projects anticipated to generate traffic above a defined threshold. A TIA examines how the proposed traffic impacts surrounding intersections and road segments and identifies if any improvements are required to mitigate the additional traffic.

The proposed text amendments will lower the thresholds for when a TIA is required and will automatically require TIAs to be performed based on particular uses, regardless of traffic generation. It further broadens the radius of intersections to be studied to assure that full traffic patterns are being considered.

Discussion:
The discussion before the Board involves the following proposed changes to the Town's Transportation Impact Analysis (UDO § 6.13):

1. Thresholds

   Lowering the peak hour trips from 100 down to 50 and including 150 average daily trips (ADT) as an additional threshold.

2. Applicability Metrics

   Inclusion of metrics beyond trips, such as acreage, building lots, people, square footage, proximity to intersections, and pre-existing traffic conditions.

3. Study Area Boundary

   Increasing the study area of surrounding intersections from ¼ miles up to ½ mile (and within 1-mile radius for higher traffic generating projects).

Policy Analysis:
TIAs are a key tool in effectively coordinating land use and transportation and the proposed revisions are in keeping with the goals of the Town's Comprehensive Land Use Plan and Comprehensive Transportation Plan.

Financial Analysis:
In accordance with Chapter 6 of the Unified Development Ordinance, the developer is responsible for the construction of infrastructure improvements, including roadway and intersection improvements, as part of the development. The TIA provides a systematic approach, backed by quantitative data, to justify requiring developers to address those road improvements. This transfers the costs of these road improvements from the Town to the developer.

Staff Recommendation:
Staff recommends seeking public input during a joint public hearing and referring the matter to the Planning Board for recommendation.

Attachments:
1. Text Amendments for UDO Section 6.13

6.13. TRANSPORTATION IMPACT ANALYSIS

6.13.1. INTRODUCTION

The Town of Zebulon requires that the traffic and circulation impacts of proposed development projects be analyzed. The traffic impacts of proposed developments are to be analyzed through the preparation of a traffic impact analysis (TIA) prepared in conformance with the Town of Zebulon requirements. The TIA must be prepared, signed and sealed by a traffic engineer or a civil engineer registered in the State of North Carolina, qualified to practice traffic engineering. This section identifies the required format and methodology that is generally required to be utilized in the study preparation, subject to the review and approval of the Town of Zebulon.

6.13.2. PURPOSE

The purpose of the TIA is to identify the impacts on capacity, level of service (LOS), and safety, which are likely to be created by a proposed development. A TIA report should identify the improvements needed to:

A. Ensure safe ingress to and egress from a site;

B. Maintain adequate street capacity on adjacent public streets;

C. Ensure safe and reasonable traffic operating conditions on streets and at intersections in the vicinity of a proposed development;

D. Avoid creation of or mitigate existing hazardous traffic conditions;

E. Minimize the impact of nonresidential traffic on residential neighborhoods in the community; and

F. Protect the substantial public investment in the existing street system.

6.13.3. APPLICABILITY

A. A TIA shall be required for any new development projects utilizing a development plan, site plan, and preliminary plat that can be anticipated to generate at least ~~100~~ 50 vehicle trips in either the a.m. or p.m. peak hour, or exceeding 150 average daily trips (as determined by Institute of Transportation Engineers Standards).

B. Any redevelopment projects to an existing building that involve a rezoning of the property or a special use permit shall be required to provide a TIA if the projects are anticipated to generate at least ~~2~~50 vehicle trips in either the a.m. or p.m. peak hour (as determined by Institute of Transportation Engineers Standards). ~~and would require a special use permit.~~

C. A TIA shall be required for any new school development or school redevelopment projects utilizing a development plan, site plan, and preliminary plat that can be anticipated to generate at least 100 vehicle trips in either the a.m. or p.m. peak hour. Trip generation calculations shall be determined using the North Carolina Department of Transportation (NCDOT) Municipal and School Transportation Assistance (MSTA) Traffic Calculator. Final approval of such developments may require comments, recommendations, and approval from the NCDOT Division Office based on an analysis and evaluation of the capacity and efficiency of the anticipated development's roadway network. Any roadway modifications or improvements necessitated by the proposed development should be designed and constructed in conformance with the current NCDOT design and construction guidelines.

D. Town staff reserves the right to require a TIA if operational or safety concerns exist. Some additional factors for determination may include any nonresidential use meeting one or more of the following:

1. covering more than two (2) acres;
2. including more than three (3) building lots;
3. providing an assembly area for more than four hundred (400) persons;
4. involving office or sales floor area over twenty thousand (20,000) square feet;
5. within one hundred fifty (150) lineal feet of any intersection of two (2) designated Thoroughfares
6. within five hundred (500) lineal feet of any public road intersection currently operating as a Level of Service D, E or F;

~~C.~~**7.** and/or involving service or delivery vehicles in excess of one (1) ton.

~~D.~~E. Whenever a TIA is required and meets the standards set forth in this section pursuant to division ~~(D)(1), (2) and (3)~~A, B, C, or D above, the TIA report shall be incorporated and included as part of the Technical Review Committee (TRC) submittal packet.

6.13.4. PRE-APPLICATION CONFERENCE

The applicant shall schedule a pre-application meeting with the Planning Director to discuss procedures, standards, and regulations required for TIA submittal and approval.

6.13.5. MEMORANDUM OF UNDERSTANDING

The traffic engineer shall submit a memorandum of understanding (MOU) to the Planning Director to document the agreements made during the pre-application conference which discusses the criteria used in the analysis of the TIA. The MOU may be received by the town via email, fax, or mail. The traffic engineer shall not begin work on the TIA until the Town has approved the MOU.

6.13.6. PERIOD OF VALIDITY

A TIA report and traffic counts shall be valid for a specific site for no more than one year, so long as no significant modifications to the development proposed for the site that substantially increase the traffic impact are made.

6.13.7. TRAFFIC IMPACT ANALYSIS REPORT ELEMENTS

The TIA shall follow standard transportation engineering processes for determining trip generation and distribution including trip generation category, diversion assumptions, distribution assumptions, the adequacy of the road network to serve the proposed development, and whether off-site road dedication and improvements should be made to mitigate the effects of the development proposed in the application. The data and methods used in the TIA shall be based upon the latest editions of Institute of Transportation Engineers (ITE) manuals. A TIA shall address the factors listed below:

A. EXECUTIVE SUMMARY

At the beginning of the TIA, the executive summary shall summarize the analysis and conclusions and identify recommended transportation improvements.

B. SITE DESCRIPTION

The TIA shall contain reports, graphics, illustrations, narratives, and a site plan that describe the characteristics of the site and adjacent land uses as well as expected development in the vicinity that will influence future traffic conditions. A description of potential uses and traffic generation to be evaluated shall be provided. A description of the proposed development, including access plans, staging plans, and an indication of land use and intensity, shall be provided.

C. STUDY AREA

The study area shall include all proposed access points, all signalized intersections and all non-signalized intersections having side-street average daily traffic counts of ~~4,000~~2,000 vehicles per day or more within ~~one-quarter~~one-half mile of the property lines on all streets adjoining the site in accordance with Table 6.13.7.C: Study Area Boundaries. If the estimated trip generation for the project is over ~~5,000~~ 2,500 trips per day, then the study area shall include all proposed access points, all signalized intersections, and all non-signalized intersections having side-street average daily traffic counts of ~~4,000~~2,000 vehicles per day or more within ~~one-half~~one mile of the property lines on all adjoining streets. The potential traffic from any approved project shall be considered in the study as determined by the Planning Director. The Planning Director has the right to add or subtract study area intersections based on specific study area characteristics, and local traffic patterns.

TABLE 6.13.7.C: STUDY AREA BOUNDARIES

ELEMENT	< ~~5,000~~2,500 TRIPS PER DAY	> ~~5,000~~ 2,500 TRIPS PER DAY
All proposed access points	Yes	Yes
All signalized intersections within ~~1/4~~1/2 mile	Yes	Yes

All signalized intersections more than ~~1/4~~1/2 mile but within ~~1/2~~one mile of site	No	Yes
All non-signalized intersections within ~~1/4~~1/2 mile of the site with at least ~~4,000~~2,500 average daily trips	Yes	Yes
All non-signalized intersections more than ~~1/4~~1/2 mile but within ~~1/2~~one mile of the site with at least ~~4,000~~2,500 average daily trip	No	Yes

D. INTERSECTIONS SHALL BE ANALYZED UNDER FOUR SCENARIOS

1. Existing.
2. No-build: (existing + annual growth + approved developments).
3. Build: (existing + annual growth + approved developments + site traffic).
4. Build improved: (existing + annual growth + approved developments + site traffic + necessary improvements).
5. Scenario 4 may be eliminated if improvements are not necessary to satisfy any queuing problems or the LOS criteria listed herein. Overall LOS and delay must be provided for all signalized intersections and worst movement LOS and delay must be provided for all unsignalized intersections. Intersection analysis shall include queue analysis. The analysis year for all future scenarios is one year following the development's scheduled completion year (build + 1).

E. EXISTING TRAFFIC CONDITIONS

The TIA shall contain a summary of the data utilized in the study and an analysis of existing traffic conditions, including:

1. Traffic count and turning movement information, including the source of and date when traffic count information was collected;
2. Correction factors that were used to convert collected traffic data into representative design-hour traffic volumes;
3. Roadway characteristics, including the design configuration of existing or proposed roadways, existing traffic control measures (e.g., speed limits and traffic signals), and existing driveways and turning movement conflicts in the vicinity of the site; and
4. Identification of the existing level of service for roadways and intersections without project development traffic using accepted methods of evaluation. Level of service should be calculated for the weekday peak hour and, in the case of uses generating high levels of weekend traffic, the Saturday peak hour.

F. LEVEL OF SERVICE

For corridors, including mainline, merging areas, and ramp junctions, a LOS C shall be maintained on any expressway, freeway, or arterial, and an LOS D on any other designated nonlocal street on the thoroughfare plan. At all intersections, an LOS C shall be maintained on any arterial or higher-order street and an LOS D on any other nonresidential street. Where the existing level of service is below these standards, the traffic impact analysis report shall identify those improvements or transportation demand management techniques needed to maintain the existing level of service, and what additional improvements would be needed to raise the level of service to the standards indicated.

G. NUMBER OF ACCESS POINTS

The number of access points provided shall be the minimum needed to provide adequate access capacity for the site. Evidence of LOS D operations for individual public street movements at access locations is a primary indication of the need for additional access points. However, the spacing and geometric design of all access points shall be consistent with the access management criteria of the ordinance.

H. TRAFFIC FLOW AND PROGRESSION

The location of new traffic signals or proposed changes to cycle lengths or timing patterns of existing signals to meet level of service standards shall not interfere with the goal of achieving adequate traffic progression on major public streets in the vicinity of the development.

I. VEHICLE STORAGE

The capacity of storage bays and auxiliary lanes for turning traffic shall be adequate to ensure that turning traffic will not interfere with through traffic flows on any public street.

J. INTERNAL CIRCULATION

On-site vehicle circulation and parking patterns shall be designed so as not to interfere with the flow of traffic on any public street and shall accommodate all anticipated types of site traffic.

K. SAFETY

Access points shall be designed to provide for adequate sight distance and appropriate facilities to accommodate acceleration and deceleration of site traffic. Where traffic from the proposed development will impact any location with an incidence of high accident frequency (defined as one of the five to ten highest accident locations in the area), the accident history should be evaluated and a determination made that the proposed site access or additional site traffic will not further aggravate the situation.

L. HORIZON YEAR(S) AND BACKGROUND TRAFFIC GROWTH

The TIA shall identify the horizon year(s) that were analyzed in the study, the background traffic growth factors for each horizon year, and the method and assumptions used to develop the background traffic growth. Background growth rates should be developed using historical traffic counts and/or population and employment growth in the area, with a maximum of 6% per year. Unless otherwise approved by the Planning Director, the impact of development shall be analyzed for the build out year plus one year into the future after the development is completed.

M. TIME PERIODS TO BE ANALYZED

For each defined horizon year, specific time periods are to be analyzed. For most land uses, this time period will be the average peak hour a.m. and p.m. However, certain uses (e.g., major retail centers, schools, or recreational uses) will have characteristic peak hours different than that found for adjacent streets, and these unique peak hours may need to be analyzed to determine factors, such as proper site access and turn lane storage requirements.

N. TRIP GENERATION, REDUCTION, AND DISTRIBUTION

The TIA shall summarize the projected peak hour and average daily trip generation for the proposed development and illustrate the projected trip distribution of trips to and from the site, and should identify the basis of the trip generation, reduction, and distribution factors used in the study. Trip distribution assumptions should be based on existing traffic patterns and employment and population centers in the area.

O. TRAFFIC ASSIGNMENT

The TIA shall identify projected design-hour traffic volumes for roadway segments, intersections, or driveways in the study area, with and without the proposed development, for the horizon year(s) of the study.

P. IMPACT ANALYSIS

The TIA shall address the impact of traffic volumes of the projected horizon year(s) relative to each of the applicable traffic service standards and shall identify the methodology utilized to evaluate the impact. The weekday a.m. and p.m. peak hour impact shall be evaluated as well as the Saturday peak hour for those uses exhibiting high levels of weekend traffic generation.

Q. MITIGATION/ALTERNATIVES

In situations where the traffic levels of service standards are exceeded, the traffic impact report shall evaluate each of the following alternatives for achieving the traffic service standards by:

1. Identifying where additional rights-of-way are needed to implement mitigation strategies; and
2. Identifying suggested phasing of improvements where needed to maintain compliance with traffic service standards.

R. RECOMMENDATIONS

The TIA shall clearly state the mitigation measures recommended by the analysis and shall summarize how the recommended mitigations are roughly proportional to the identified impacts. The recommended street and highway mitigation measures shall be shown on a drawing that depicts existing and recommended improvements.

S. OTHER

Other items may be required at the discretion of the Town Manager, Planning Director, or Public Works Director depending upon the type and scale of the project. These may include, but are not limited to: queue length analysis, pedestrian counts, accident data, traffic speeds, stopping sight distances, and signal warrant analyses.

6.13.8. SAFETY AND OPERATIONAL ANALYSIS

The TIA shall examine existing roadway conditions to determine if safety and/or operational improvements are necessary due to increase in traffic from the project or cumulative projects. The types of improvements to be identified may include, but are not limited to:

A. Need for turning lanes;
B. Intersections needing sight distance studies;
C. Parking restrictions;
D. Measures to reduce cut-through project traffic in adjacent residential areas;
E. Potential impacts to adjacent schools;
F. Queue lengths and impacts to adjacent intersections;
G. Need for signal interconnect systems.

6.13.9. DEFERRAL OF OBLIGATION

Upon request of the applicant or property owner to the hearing body, the obligation to dedicate or improve thoroughfare rights-of-way or to make intersection improvements imposed on an application may be deferred to a later stage of the development process. As a condition of deferring the obligation to dedicate rights-of-way for or to improve thoroughfares, which deferral shall be in the sole discretion of the town, the town shall require the developer to execute a subdivision or site development improvement agreement specifying the amount and timing of the rights-of-way dedication or improvements to thoroughfares, including the posting or depositing of a bond, letter of credit, or other fiscal surety, in a form and under terms acceptable to the town, in advance of approval of the development application.

6.13.10. WAIVER

A. The Board of Commissioners is empowered to hear and decide waiver exemptions from the terms of this section. A request for a waiver shall be heard at a quasi-judicial hearing. All appropriate fees shall be paid at the time of application for a waiver.
B. The Board of Commissioners may waive the requirements for a TIA if a previously prepared traffic study or transportation plan, not older than ten years clearly shows that no capacity or safety issues exist that might be compounded as a result of the proposed development, and thereby, no adverse impacts of unsafe or hazardous conditions would be created on the transportation system.
C. Developments in the central business districts that are not required to provide on-site or off-street parking are exempt from the requirements of this section.
D. After completion of the TIA, the Board of Commissioners may waive suggested improvements upon determining the spirit and intent of this section will still be met through alternative standards.

6.13.11. FORMAT AND SUBMITTAL OF REPORT

A. Five copies of the final printed report must be bound and submitted to the Planning Department.
B. The report should contain discussion of all of the major facets of the study including background data, traffic data collected, trip generation, trip distribution and assignment, analysis of conditions with and without the proposed project, recommended mitigation measures, and appendices with pertinent data.
C. Renderings of the proposed development are recommended for inclusion in the report.
D. If necessary, copies relating to projects impacting state roads should be submitted to the North Carolina Department of Transportation (NCDOT) District Office as well as the NCDOT Traffic Engineering Branch.
E. The report must be signed and sealed by a traffic engineer registered in the State of North Carolina on the cover or table of contents page.
~~E.~~F. The report shall include a graphic map with aerial photo of the studied intersections with labels showing the different LOS scenarios listed in subsection D above and a list of recommended improvements.

ZEBULON
NORTH CAROLINA

STAFF REPORT
UTILITY ALLOCATION
POLICY AMENDMENT
APRIL 10, 2023

Topic:	**Utility Allocation Policy Amendment**
Speaker:	Michael J. Clark, CZO, AICP, Planning Director
From:	Michael J. Clark, CZO, AICP, Planning Director
Prepared by:	Michael J. Clark, CZO, AICP, Planning Director
Approved by:	Joseph M. Moore II, PE, Town Manager

Executive Summary:
The Board of Commissioners will consider Amendments to the Utility Allocation Policy (UAP) to address concerns regarding uses being unable to obtain the required points.

Background:
In June 2022, the Town Board approved a Utility Allocation Policy (UAP) which leverages the Town's ownership of water and sewer allocation for higher quality development. As part of that process the Board requested the minimum threshold for connection be increased, while also decreasing many of the base points for several uses. The spirit was to require a greater level of development than what would otherwise be provided.

Staff analyzed the UAP's current point structure over the past several months as they apply to possible applications and determined that it results in obtaining the required 60 minimum points financially unobtainable, especially for smaller commercial uses and activities. The proposed amendments to the UAP provide revisions to the base point structure that while still lower than adjacent municipalities, allows for these projects to be more obtainable, added in additional base point structures for in-fill development, and expanded the bonus point options.

Discussion:
While not a statutory requirement, a policy of this nature has significant land use implications, and a Planning Board recommendation is recommended before the Board renders a final decision.

Policy Analysis:
The proposed policy amendment is fine-tuning a tool to achieve the 2030 Strategic Plan's Growing Smart goal, and directly addresses the Comprehensive Land Use Plan's further refined strategy of using utilities as leverage to obtain high quality developments.

Financial Analysis:
The current point structure if continued will result in delay or no development, especially with smaller non-residential options. This results in roadway improvements not being constructed, loss of tax income from property taxes, and potential loss of sales taxes if those customers shop/eat in other counties.

As proposed, the UAP will continue to require higher quality of development but provides for a much more expansive range of opportunities to obtain additional points. It also introduces elements such as traffic/security cameras to aid in safety enhancements for neighborhoods.

ZEBULON
NORTH CAROLINA

STAFF REPORT
UTILITY ALLOCATION
POLICY AMENDMENT
APRIL 10, 2023

Staff Recommendation:
Staff recommends the Planning Board recommend the Board of Commissioners approve the proposed amendments to the utility allocation policy.

Attachments:
1. Utility Allocation Policy Amendments

ZEBULON
NORTH CAROLINA

MUNICIPAL UTILITY ALLOCATION POLICY

Statement of Purpose and Goals

Introduction

Drinking water supplies throughout the greater City of Raleigh distribution system are finite, subject to disruption by drought and/or other calamity and Zebulon's allocation is contractually limited. The Town staff, the Planning Board, and the Board of Commissioners have given a great deal of thought and study as to the best utilization of this valuable resource to benefit current and future citizens.

The Town of Zebulon's municipal water and sewer capacity is a valuable resource that must be conserved and apportioned to new development projects that promote the Town's policy of ensuring a diversified tax base and housing supply. Such an allocation policy will tend to promote diversity of housing available to a wide cross section of citizens of diverse socio-economic backgrounds and promote economic viability and sustainability by providing for retail and other commercial development within the Town of Zebulon.

In order to preserve and enhance property values, manage its limited water supply as a vital natural resource, promote economic development, and incentivize smart growth practices, the allocation of Zebulon's potable water capacity shall hereafter be in accordance with this policy.

Land Use and the Tax Base

The local government expense of providing fire and police protection, schools, parks, social services, water and sewage systems and other essential public services to residential neighborhoods is generally greater than the ad valorem tax revenue generated by such neighborhoods. On the other hand, the cost of providing services to commercial and industrial development is generally less than the tax revenue accruing to the local government. Having a predominantly residential tax base would require the Town of Zebulon over time to assess a higher tax levy to raise funds to provide essential services or to reduce the level of public services provided. This is one reason among many why local governments including Zebulon strive to achieve a balance of both residential and non-residential growth.

Zebulon's historical development is transitioning from industrial to residential, leading to a current tax base of approximately 40% residential and 60% commercial/industrial. The following table shows Zebulon's tax base over the past five years [1]

Zebulon Tax Base (Past Five Years)

Fiscal Year	Commercial	Residential
2021-2022	60%	40%
2020-2021	65%	35%
2019-2020	72%	28%
2018-2019	73%	27%
2017-2018	71%	29%

[1] "Tax Base Components | Wake County Government," *Wake County North Carolina*, https://www.wakegov.com/departments-government/tax-administration/data-files-statistics-and-reports/tax-base-components

As shown in the table above, the residential tax base has steadily increased proportionally over the past five years. This trend in the tax base data, combined with the vested planned residential development in the coming years, demonstrates the need for the Town to address this shift through policy. The Zebulon Board of Commissioners believes that it is fiscally responsible and otherwise in the public interest to promote and encourage non-residential development in the jurisdiction as an alternative to rapid residential development to keep the ratio between the two development types well balanced. A goal of maintaining a tax base of 60% residential and 40% commercial/industrial is hereby established.

Development Goals for the Full Build-Out of Zebulon

Communities without a wide variety of housing types and styles also put pressure on the Wake County Public School System which remains committed to having students of a wide range of socio-economic backgrounds attend each local school. In addition to the goal of maintaining a balanced tax base, the Town of Zebulon is committed to achieving a balance of housing types within its jurisdiction.

This commitment is consistent with both the Town's Strategic Plan and Comprehensive Plan. The *Town of Zebulon: Vision 2030 Strategic Plan* lists "Growing Smart" as one of its three focus areas, calling for the planning of appropriate land uses and affordability of the community. The *Grow Zebulon Comprehensive Land Use Plan* identifies six guiding principles for the town. Two of those principles are "Zebulon will be BALANCED" and "Zebulon will be PRUDENT." A balance should be achieved for the Town's tax base, its land uses, and its housing types to allow for an affordable community with employment and business opportunities that will help the community prosper. The achievement of balance in Zebulon will contribute to the Town being prudent. As stated previously, a local government's cost of providing services to commercial properties is generally less than that of residential properties. Having a balanced tax base that is not proportionally over-saturated with residential properties will contribute to keeping the Town financially sound.

Below are three development goals that are integral to the utility allocation policy and the future of the Town. These development goals apply to the entire, future Zebulon jurisdiction including the ETJ, short-range and long-range urban service areas.

GOAL #1: Maintain 60%-40% ratio of residential to non-residential tax values.

Upon Adoption-January 2021
60% Residential - 40% Non-Residential

GOAL #2: Residential Housing Percentage Breakdown
SFD|TH|MF – 75%|10%|15% (Note – Duplex counted as MF)

Upon Adoption-January 2021
80.5% | 0.5% | 19%

GOAL #3: Encourage Mixed Use Development to improve pedestrian connectivity to non-residential activity.

Policy and Procedures

Water Allocation

All existing parcels of real property within the corporate limits of Zebulon, regardless of proposed acreage, shape, or location as of the adoption of this ordinance are entitled to **115 gallons per day** of water allocation to build and sustain a single family or a limited business or commercial use. No additional water allocation will be awarded for proposed development except in accordance with the requirements of this policy.

Wastewater Connection

All projects considered for utility allocation must provide a wastewater system connection with adequate receiving capacity, as determined by the Wake County Health Department and/or City of Raleigh Public Utilities Department and approved by the Town of Zebulon Planning Director.

General Conditions & Requirements

- All proposed projects must be within the existing corporate limits or have filed a valid and complete petition for Voluntary Annexation.
- All proposed projects under consideration must have a complete application submitted for the appropriate Master Plan, Subdivision, Site Plan, Special Use Permit, Conditional Zoning Request, Zoning Compliance Permit, Building Permit, or any other necessary approval.
- All projects are subject to a Utility Allocation or Developer's Agreement approved by the Town's Board of Commissioners. If the Developer/Applicant fails to meet all terms of that agreement the unused allocation will be reclaimed, no new building permits will be issued, and no new connections to the water or wastewater systems will be permitted. Active building permits will have certificates of occupancy held until mitigating measures are agreed to by all parties.
- Projects with proven vested rights upon adoption of this ordinance will be permitted to finish their projects as previously approved.
- Public water may be utilized for irrigation purposes so long as the Primary Use associated with the site has previously gained water allocation through the Town.
- Any third parties who buy land to build upon are bound by the approved Utility Allocation Agreement or Development Agreement for that property. If the agreement is not fulfilled, the above terms and conditions still apply regardless of who owns the land.

Compliance Required

This policy allocates municipal water in gallons per day for new development proposals, master plans, site plans, building plans, and/or structures seeking construction approval. Each phase of a phased development must comply with the terms and development schedule of an approved Utility Allocation Agreement before the next phase can begin or the development risks loss of previously reserved allocation.

Previously dedicated but unused allocation can be reclaimed by the Town's Board of Commissioners for:

(1) the lack of compliance with any existing Utility Allocation or Developer's Agreement;

(2) violation of applicable town policy provision, ordinance standard, condition of approval;

(3) violation of federal or state regulation; or

(4) other good cause.

Utility Allocation Application Process

Upon receiving a new development proposal requesting water capacity, the Planning Staff shall direct the Developer/Applicant to demonstrate the project's qualifications. A Developer/Applicant shall state on the appropriate application, and stipulate within an approved Utility Allocation Agreement, the use or uses proposed to be built as part of the project along with the construction design and materials. Town action on the request will be deferred until the application is complete and the requested information has been provided.

Proposed projects shall complete the UTILITY ALLOCATION WORKSHEET according to its instructions to determine the total number of points achieved. The Utility Allocation Application package will be reviewed for completeness and compliance by the Technical Review Committee (TRC) in conjunction with the applicable development approval for the subject property (conditional rezoning, planned development, site plan, etc.).

Qualification for water allocation is judged by:

- The level of developer investment
- Anticipated increases in the Town's ad valorem tax base
- Construction and dedication of public infrastructure
- Provision of employment opportunities for Zebulon citizens
- Provisions of diversified housing stock
- Preservation of open space
- Protection of existing tree canopy
- Conservation of existing habitat
- The provision of recreational amenities for current or future Zebulon residents

Projects must be awarded **60 TOTAL POINTS** or more to merit water allocation.

Points are awarded in two categories, BASE POINTS and BONUS POINTS. BONUS POINTS are broken down into ~~four~~ six categories.

1. Nonconformity Abatement and Public Infrastructure Improvements
2. Green Development Standards
3. Gateway and Transit Improvements
4. Amenities ~~(Only for Projects with Residential Components)~~
5. Affordable Housing
6. Other

Unless a project can gain all necessary BONUS POINTS from a single improvement identified in the approved list, improvements must be made from at least two of the categories of BONUS POINTS.

All features and/or improvements that earn a projects BONUS POINTS must be clearly shown on a development plan for each application type.

Expiration of Allocation Award

A developer/applicant who has secured allocation according to this policy and hasn't progressed in construction plan approval, building permit approval, or on-site construction for a period of 12 months will lose the award of allocation without benefit.

Annual Review of Policy & Appeals

This policy shall be reviewed in January of each year and, when appropriate, readjusted by the Town's Board of Commissioners. The Town's overall progress on policy goals will be considered and the multipliers and/or point thresholds readjusted accordingly.

Appeals of any provision of this ordinance shall be decided upon by the Town's Board of Commissioners upon receiving a recommendation from the Planning Board.

BASE POINTS: List of Preferred Land Uses and Required Characteristics:

The uses listed below have been determined to be the most desirable and important uses for the Town of Zebulon to promote and maintain economic and housing diversity. Only projects that completely meet the stated performance characteristics will be considered for utility allocation. Please select one of the following Base Point classifications.

630 Base Points	**Single Family Homes (Expedited Subdivision or Recombination)** Newly constructed Single Family Homes built upon new lots created via the minor subdivision, exempt subdivision, expedited subdivision (3 or fewer lots) or recombination process.
6030 Base Points	**Change of Use** This category captures renovation, rehabilitation, up-fit or retrofit of existing buildings or portions of buildings that pre-date this policy and require a code summary sheet, change in building occupancy, certificate of occupancy, building permit and/or building inspections and do not increase the utility demand from the previous use of the building.
450 Base Points	**Business Office/Finance/ Insurance / Professional Services Center - Large** Qualifying projects must exceed 100,000 square feet of heated floor space and create at least 150 employment positions that exceed the average annual Wake County salary according to Wake County Economic Development or the Employment Security Commission. Employees perform professional, scientific, and technical services for others. Such services require a high degree of expertise and training and provide high salaried employment opportunities. Examples include software engineering, legal, medical, accounting, consulting, architectural, biomedical, chemical, research and development, and administrative services. Finance or Insurance Centers shall also pool financial risks by underwriting insurance and annuities. Some establishments support employee benefit programs. Examples include bank or credit union headquarters, brokerages, investments, insurance, financing, and data processing establishments.
4450 Base Points	**Manufacturing/Industrial Employment Center** Manufacturing or Industrial establishments in this category exceed 200,000 square feet of floor space located in plants, factories, or mills and employ power-

	driven machines and materials-handling equipment. They may also employ workers who assemble or create new products by hand, without the characteristic machinery-intensive enterprise. Many manufacturing establishments process products of agriculture, forestry, fishing, mining, or quarrying as well as products of other manufacturing establishments. Most manufacturing establishments have some form of captive services (e.g., research and development, and administrative operations, such as accounting, payroll, or management) in conjunction on-site.
~~40~~45 Base Points	**Governmental Uses/Public Administration** This category encompasses centers for all government functions; it includes federal, state, and local government agencies that administer, oversee, and manage public programs and budgets and have executive, legislative, or judicial authority. Establishments develop policy, create laws, adjudicate civil and criminal legal cases, and provide for public safety and national defense.
40~~20~~ Base Points	**Single Use Retail** Newly constructed single use, stand-alone building used primarily for retail, restaurant, or similar commercial use.
40~~38~~ Base Points	**Hotels, Motels, or other Accommodation Service Establishments** This category serves lodging and short-term accommodations for travelers. They may offer a wide range of services, from overnight sleeping space to full-service hotel suites. They may offer these services in conjunction with other activities, such as entertainment or recreation. Stays in these establishments are generally less than one month. This classification does not include boarding or rooming houses.
40~~38~~ Base Points	**Arts/Entertainment/Museums** These establishments operate facilities or provide services for a variety of cultural, entertainment, and performing art functions. Establishments include those that produce, promote, or participate in live performances, events, or exhibits intended for public viewing; those that preserve and exhibit objects and sites of historical, cultural, or educational interest; and those that operate facilities or provide services to serve activities associated with the aforementioned.
40~~38~~ Base Points	**Amusement, Sports or Recreational Establishment** Establishments in this category operate either indoor or outdoor facilities offering family activities (i.e. sports, recreation, or amusement) and provide services, such as facilitating amusement in places operated by others, operating recreational sports groups and leagues. Examples include golf courses, indoor sports venues, bowling alleys, miniature golf courses, athletic clubs, skating rinks and arcades. This category may be used in conjunction with a commercial or residential development as a mixed use development.
40~~38~~ Base Points	**Mixed Use Development (Transit Oriented)** Newly constructed or substantially rehabilitated collection of vertically mixed retail, office and residential uses in multi-story buildings centered within a one-~~quarter~~ half mile radius of an existing rail or bus transit station or the intersection

	of Horton Street and North Arendell Avenue in Downtown Zebulon. In order to qualify as mixed use, developments must dedicate at least one-third of the total heated square footage to residential use and the remainder to a mix of retail and office uses. All three use types must be represented and at least 10% of the heated square footage must be dedicated to street level, storefront retail uses.
40~~38~~ Base Points	**Mixed Use Development (Urban Infill)** Newly constructed or substantially rehabilitated collection of ~~vertically~~ mixed retail, office and residential uses in a multi-story building on a previously developed parcel within the corporate limits. In order to qualify as mixed use, developments must dedicate at least one-third of the total heated square footage to residential use and the remainder to a mix of retail and office uses. All three use types must be represented and at least 10% of the heated square footage must be dedicated to street level, storefront retail uses.
40~~35~~ Base Points	**Mixed Use Development (Greenfield)** Newly constructed collection of ~~vertically~~ mixed retail, office and residential uses in a multi-story building or buildings on a previously undeveloped parcel. In order to qualify as mixed use, developments must dedicate at least one-third of the total heated square footage to residential use and the remainder to a mix of retail and office uses. All three use types must be represented and at least 10% of the heated square footage must be dedicated to street level, storefront retail uses.
~~30~~35 Base Points	**Housing Services for the Elderly Establishments** This category offers housing services for the aged, not requiring a license from the North Carolina Department of Health and Human Services, such as independent retirement housing, multi-unit assisted housing with services (MAHS), and continuing care retirement centers. All facilities must provide, but not necessarily be limited to, the following services/facilities: On-site laundry facilities, on site management, guaranteed transportation services at least four days per week, on-site exercise facilities, on-site computer access, and a clubhouse/common lounge area for all residents.
~~28~~35 Base Points	**Mixture of Use Development (Retail/Office-Institutional/Commercial)** Newly constructed collection of horizontally arranged uses including retail, office-institutional and commercial within a master planned project on a previously undeveloped parcel or parcels totaling at least 10 acres. Mixture of use projects must include at least two (2) use types with at least 25% of the space devoted to each use type included in the development.
~~28~~30 Base Points	**Retail/Commercial Center** Newly constructed center of at least 50,000 square feet, typically containing an anchor such as a grocery store and other smaller spaces and/or outparcels for subordinate uses. Uses are entirely consumer-driven and include all manner of retail, service and office possibilities.
~~28~~30 Base Points	**Business Office/Finance/ Insurance / Professional Services Center – Medium** Qualifying projects must exceed 50,000 square feet of heated floor space and create at least 75 employment positions that exceed the average annual Wake County salary according to Wake County Economic Development or the

	Employment Security Commission. Employees perform professional, scientific, and technical services for others. Such services require a high degree of expertise and training and provide high salaried employment opportunities. Examples include software engineering, legal, medical, accounting, consulting, architectural, biomedical, chemical, research and development, and administrative services. Finance or Insurance Centers shall also pool financial risks by underwriting insurance and annuities. Some establishments support employee benefit programs. Examples include bank or credit union headquarters, brokerages, investments, insurance, financing, and data processing establishments.
30~~25~~ Base Points	**Business Office/Finance/ Insurance / Professional Services Center – Small** Qualifying projects 50,000 square feet of heated floor space or less. Employees perform professional, scientific, and technical services for others. Such services require a high degree of expertise and training and provide high salaried employment opportunities. Examples include software engineering, legal, medical, accounting, consulting, architectural, biomedical, chemical, research and development, and administrative services. Finance or Insurance Centers shall also pool financial risks by underwriting insurance and annuities. Some establishments support employee benefit programs. Examples include bank or credit union headquarters, brokerages, investments, insurance, financing, and data processing establishments.
30~~25~~ Base Points	**Multi-Tenant Retail Center** Newly constructed center 50,000 square feet or less, typically containing a more than one tenant space within a single structure. Uses are entirely consumer-driven and include all manner of retail, service and office possibilities.
30~~20~~ Base Points	**Single Use Office** Newly constructed single use, stand-alone building used primarily for office and professional.
30 Base Points	**Bungalow Court or Pocket Neighborhood** Newly constructed Bungalow Court or Pocket Neighborhood per the standards of the Unified Development Ordinance.
30 Base Points	**Distribution/Trucking Center** Newly constructed center of at least 500,000 square feet where products and resources are transported to and delivered from via truck or rail.
25 Base Points	**Warehouse** Newly constructed center of at least 500,000 square feet where products and resources are stored.
25 Base Points	**Religious Institutions** Any facility such as a church, temple, synagogue, mosque or monastery used for worship by a non-profit organization and their customarily related uses.
20~~15~~ Base Points	**Intensive Industrial Uses:** Uses classified as Special Land Uses within the Industrial Classification.

2~~1~~0 Base Points	**Multi-Family Residential & Condo Units**
20 Base Points	**Major Subdivision 4- 25 Lots** Any subdivision of land of four (4) – 25 Lots.
10 Base Points	**Major Subdivision 26 lots or more** Any subdivision of land of ~~five (5~~26~~)~~ or more lots.
Board Determination	**All Other Uses Not Categorized** This category of use captures all other uses not categorized elsewhere. Allocations for such uses are left to the discretion of the Town's Board of Commissioners upon recommendation of the Planning Board and acted on a case-by-case basis.

BONUS POINTS

Proposed projects can gain BONUS POINTS by agreeing to provide any of the following items over and above the UDO or Standard Specification requirements for their development proposal.

NOTE: No bonus points are given for UDO requirements.

CATEGORY 1 – Non-Conformity Abatement and Public Infrastructure Improvements ~~(Max 20 Points)~~

Section 1A - Abatement of Nonconformities		(Max - 3 points)
	Abatement of any existing non-conforming structures	3
	Abatement of any existing non-conforming use of land	2
	Abatement of any existing non-conforming lots	1

Section 1B - Roadway Infrastructure Not Warranted by TIA/UDO/CTP		(Max - 10 points)
	Construction of full cross section of existing off-site public street	5
	Nearby intersection improvements	5
	Traffic signal improvements	4
	Signage or striping improvements	1

Section 1C - Off-Site Public Greenway Improvements		(Max - 10 points)
	Construct more than 4000 linear feet of 10-foot-wide path	10
	Construct more than 3000 linear feet of 10-foot-wide path	8
	Construct more than 2000 linear feet of 10-foot-wide path	6
	Construct more than 1000 linear feet of 10-foot-wide path	4
	Construct 500 to 1000 linear feet of 10-foot-wide path	2

Section 1D – Off-Site Bike-Ped Improvements		
	Construction of off-site sidewalk improvements (Subject to TRC Approval)	2
	Construction of off-site bike lane improvements (Subject to TRC Approval)	3

CATEGORY 2. Green Development Standards/ Building & Site Design ~~(Max 20 Points)~~

Section 2A - Conservation of Natural Habitat Meeting Active Open Space Requirements as Defined in the UDO		(Max - 10 points)
	One point per acre up to 10 acres	1 - 10

Section 2B - Parking ~~and Stormwater SCM's~~		(Max – 15~~0~~ points)
	Structured Parking Facilities - must reduce footprint by 20%	10
	EV Charging Stations (two-port)	5~~3~~
	Provision of on-street public parking (1 point per stall up to 10~~5~~ Max)	1 - 10~~5~~

Section 2C - Stormwater SCM's		(Max – 10 points)
	Stormwater - Restored Riparian Buffer	10
	Construct a fountain or other stormwater amenity within the BMP/SCM (as approved by Staff)	4
	Stormwater - Landscaped Green Roof	5
	Stormwater - Underground capture system for on-site irrigation	5
	Stormwater - Bioretention	5
	Stormwater - Wetland	5
	Exclusive use of porous pavement in parking areas where suitable	2

Section 2D~~C~~ - Building/Site Design		(Max - 20 points)
	Compliance with residential design guidelines per Section 5.2 of the UDO~~House & Townhouse (respectively)*~~	10
	Non-Residential building design that incorporates an active upper story.	5
	Pedestrian oriented and walkable site design which promotes alternatives to vehicular travel within the development. (Subject to TRC Approval)	5

Section 2E - Infill/Redevelopment		(Max – 16 points)
	Development or Redevelopment within DTC	10
	Development or Redevelopment within ~~Downtown Overlay District~~DTP	6
	Redevelopment of previously vacant building space over 20,000 square feet	6
	Redevelopment of previously vacant building space under 20,000 square feet	5

Section 2F - Historic Preservation		
	Historic Structure Preservation via Deed Restriction (Determined by TRC)	10

Section 2G – LEED Certification		(Max – 10 points)
	~~Neighborhood/Subdivision~~ LEED Certification for Neighborhood Development (LEED ND)	~~5~~10
	Platinum LEED Certification	10
	Gold LEED Certification	8
	Silver LEED Certification	6
	Bronze LEED Certification	4
	~~Green Homes~~ LEED Certified Certification	2~~5~~
~~*Building Types are defined in Article 5 of the Town of Zebulon Unified Development Ordinance.~~		

CATEGORY 3 – Outdoor Enhancement and Transit Improvements

~~(Max 20 Points)~~

Section 3A – Outdoor Enhancement		(Max – 1~~2~~0 points)
	Construction of a Parkway Street Section on a Collector level street	5
	Construction or Preservation of Gateway Landscaping or Structure (Subject to Comprehensive Plan Consistency and TRC approval)	5
	Restoration of Historic Structure (Must be approved by TRC)	5
	~~Installation of Fountain or mechanical ariation in stormwater pond~~	~~5~~
	Outdoor Display of Public Art (Subject to TRC Approval)	4
	Public Facing Outdoor Mural (Subject to TRC Approval)	4
	Maintenance of Roadside Gateway Plant Bed (requires maintenance agreement)	3
	Planting Pollinator Garden (225 Square Foot Minimum)	3
	Exclusive use of xeriscaping techniques and drought tolerant species	3
	Enhanced Roadside Landscaping (Subject to TRC Approval)	2
	Enhanced Buffer Landscaping (Subject to TRC Approval)	2
	Construction of a Parkway Street Section on a Local level street	2
	Installation of Native Shade Tree Species (per Tree up to 10 Trees)	1

Section 3B – Transit (Pursuant to location being adjacent to a planned or active transit route)		(Max - 8 points)
	Provision of more than 50 designated Park & Ride Stalls	8
	Provision of 25 designated Park & Ride Stalls	5
	Provision of 10 designated Park & Ride Stalls	3
	Provision of mass transit easement w/ structure (bus stop with shelter & bench)	2

CATEGORY 4 - Amenities (~~Only for Projects with Residential Components~~)

~~(Max 20 Points)~~

Section 4A - Private Greenway		(Max - 3 points)
	Construction of more than 3000 linear feet private greenway meeting Town of Zebulon standards	3
	Construction of more than 2000 linear feet of private greenway meeting Town of Zebulon standards	2
	Construction of more than 1000 linear feet of private greenway meeting Town of Zebulon standards	1

Section 4B – Pool (Combinations may be approved by TRC)		(Max - 8 points)
	Olympic Pool and Aquatic Center	8
	Junior Olympic Pool	5
	Lap Pool (four lane minimum)	3
	Resort Style Pool	2
	Any Other Pool	1

Section 4C - Outdoor Deck/Patio		(Max - 3 points)
	Deck/Patio - More than 3000 square feet	3
	Deck/Patio - More than 2000 square feet	2
	Deck/Patio - More than 1000 square feet	1

Section 4D - Pool Amenities		(Max - 2 points)
	Jacuzzi/Hot Tub/Whirlpool	2
	Water Playground with apparatus	2
	Sauna/Steam room	2

Section 4E - Clubhouse		(Max - 10 points)
	Commercial Coffee Shop with at least 10 designated public seating spaces.	10
	With full kitchen and over 4000 square feet of meeting space	10
	With full kitchen and less than 4000 square feet of meeting space	9
	Meeting space without kitchen more than 3500 square feet	8
	Meeting space without kitchen 2500 - 3499 square feet	7
	Meeting Space without kitchen 1500 - 2499 square feet	5
	Meeting Space without kitchen less than 1500 square feet	4
	No meeting space, bathrooms and changing rooms only	3
	Outdoor Kitchen or Grills	2

Section 4F - Additional Active Recreation		(Max - 10 points)
	Gymnasium (regulation size indoor basketball court)	10
	Baseball/Softball Field (regulation size)	5
	Football/Soccer Field (regulation size)	5
	Skate Park	5
	Tennis Courts (two regulation courts, fenced)	5
	Multi-Use Hardcourt (two regulation basketball courts, street hockey, fenced)	5
	Pickleball Court (three regulation courts, fenced)	5
	Pocket Park – 58,000 square feet	35
	IPEMA Certified Playground Equipment	4
	Lighted Field of Play for nighttime use	3
	Electronic Scoreboard or Covered Dugouts or Bleachers	3
	Community Garden – 15-foot by 15-foot, with water access and potting shed.	3

Section 4G – Additional Urban Open Space Enhancements (Within Non Residential Zoning Districts)		(Max – 10 points)
	Fountain	2
	Canopy Including Fixed Permanent Seating	2
	Drinking Fountain with Pet Fountain	2
	Permanent Game Tables	1
	Permanent Tables with Shade Cover	1
	All Weather Bulletin Board	1

	Covered or Internal Bicycle Parking	1
	Artist-Design Bicycle Racks	1
	Little Free Library	1
	Drinking Fountain	1
	Public Work Bike Stand With Tools	1

CATEGORY 5 – Affordable Housing

Inclusion of a percentage of the provided housing stock of a proposed development cost no more than 30% of a household income not exciding 80% of the Area Median Income (AMI)		(Max – 10 Points
	15% Affordable Housing	10
	10% Affordable Housing	5

CATEGORY 6 – Other

(Max 5 Points)

	Integrated public safety operation systems (EX. Flock Safety or others as approved by the Police Department)	3
	Smart Waste and Recycling Stations	2