Holly Springs

Traffic Impact Analysis Update

W Catawba Avenue
Gaston County, North Carolina

Prepared for:
Thomas W. Springs III
Mount Holly, North Carolina

October 2023

Kimley»Horn

Traffic Impact Analysis Update for
Holly Springs (Hunter's Ridge)
W Catawba Avenue
Gaston County, North Carolina

Prepared for:

Thomas W. Springs III
Mount Holly, North Carolina

Prepared by:

Kimley-Horn and Associates, Inc.
NC License #F - 0102
580 Kingsley Park Drive, Suite 125
Fort Mill, South Carolina 29715
(803) 728-4756

October 2023
019689000

TABLE OF CONTENTS

List of Figures

List of Tables

1.0 Executive Summary

The purpose of this Traffic Impact Analysis (TIA) Update is to review vehicular traffic impacts as a result of the proposed Holly Springs residential development. The primary objectives of the study are:

- To estimate trip generation and distribution for the proposed development.
- To perform vehicular operations analyses for each of the identified study intersections.
- To determine the potential traffic impacts of the proposed development.
- To identify improvements to mitigate the proposed development's traffic impacts.

This study serves as an update to the *Hunter's Ridge TIA* (Kimley-Horn, January 2019). The scope of this study is based on discussion with Gaston County and North Carolina Department of Transportation (NCDOT) staff.

The proposed Holly Springs residential development is located northwest of the W Catawba Avenue/Rankin Avenue intersection in Gaston County, North Carolina. Based on the site plan provided by the applicant, the proposed development is currently envisioned to include 191 single-family homes and 84 townhomes, totaling 275 residential units. For the purposes of this TIA Update, the trip generation data from the 2019 TIA was used in this analysis as noted in the approved TIA Scoping Checklist included in the **Appendix**. The trip generation from the 2019 TIA was based on 272 single-family homes and 100 townhomes, totaling 372 residential units. Using this prior trip generation provides for a more conservative analysis. The 138-acre site is currently undeveloped and is currently zoned R-1; however, based on input from the applicant, the site has been submitted for a proposed Conditional District rezoning.

For the purposes of this TIA, the development is assumed to be completed (built-out) in 2028. Changes from the 2019 TIA include the removal of access to Howie Street and aligning Access #1 with Riddle Street instead of Legion Road. Based on the provided updated site plan, the proposed development will be accessed via the following access points:

- Access #1 – A full-movement connection to W Catawba Avenue aligned with Riddle Street
- Access #2 (Main Access) – A full-movement connection to W Catawba Avenue aligned with Rankin Avenue

The TIA Scoping Checklist was developed based on discussions with Gaston County and NCDOT staff that documented all scoping parameters to be used for the TIA and was reviewed and agreed upon by Gaston County, NCDOT and the applicant.

The following AM and PM peak-hour scenarios were analyzed to determine the proposed development's transportation impacts on the surrounding network:

- 2023 Existing Conditions
- 2028 Background Conditions
- 2028 Build-out Conditions

Based on coordination with Gaston County and NCDOT, this TIA evaluated the vehicular operations under each of the AM and PM peak-hour scenarios above for the following study area intersections:

1. Old Hickory Grove Road and W Catawba Avenue
2. W Catawba Avenue and Riddle Street/Access #1
3. W Catawba Avenue and Rankin Avenue/Access #2
4. NC 273 and Rankin Ave/Tuckaseegee Road
5. W Catawba Avenue and S Hawthorne Street
6. W Catawba Avenue and S Main Street
7. NC 273 (Highland Street) and W Catawba Avenue
8. NC 27 (Charlotte Avenue) and NC 273 (Highland Street)

For the purposes of this study, the orientation of W Catawba Avenue and NC 27 (Charlotte Avenue) was established to be east-west, and NC 273 (Highland Street) was established to be north-south. Rankin Avenue is oriented north-south at its intersection with W Catawba Avenue and east-west at its intersection with NC 273.

Kimley-Horn was retained to determine the potential traffic impacts of this development (in accordance with the traffic study guidelines in the *NCDOT Policy on Street and Driveway Access to North Carolina Highways*) and to identify traffic improvements that may be required to mitigate these impacts. This report presents trip generation, distribution, vehicular analyses, and identified traffic improvements required to mitigate anticipated traffic demands produced by the subject development.

Based on the vehicular analyses performed at each of the identified study intersections contained herein, the following improvements are identified to mitigate the impact of the proposed development on the surrounding transportation infrastructure:

W Catawba Avenue and Riddle Street/Access #1

- Single southbound egress and single ingress lane with stop control along Access #1
- 100-foot internal protected stem (IPS) along Access #1

W Catawba Avenue and Rankin Avenue/Access #2

- Construction of a single lane roundabout
- Single southbound egress and single ingress lane along Access #2
- Maximize the IPS along Access #2

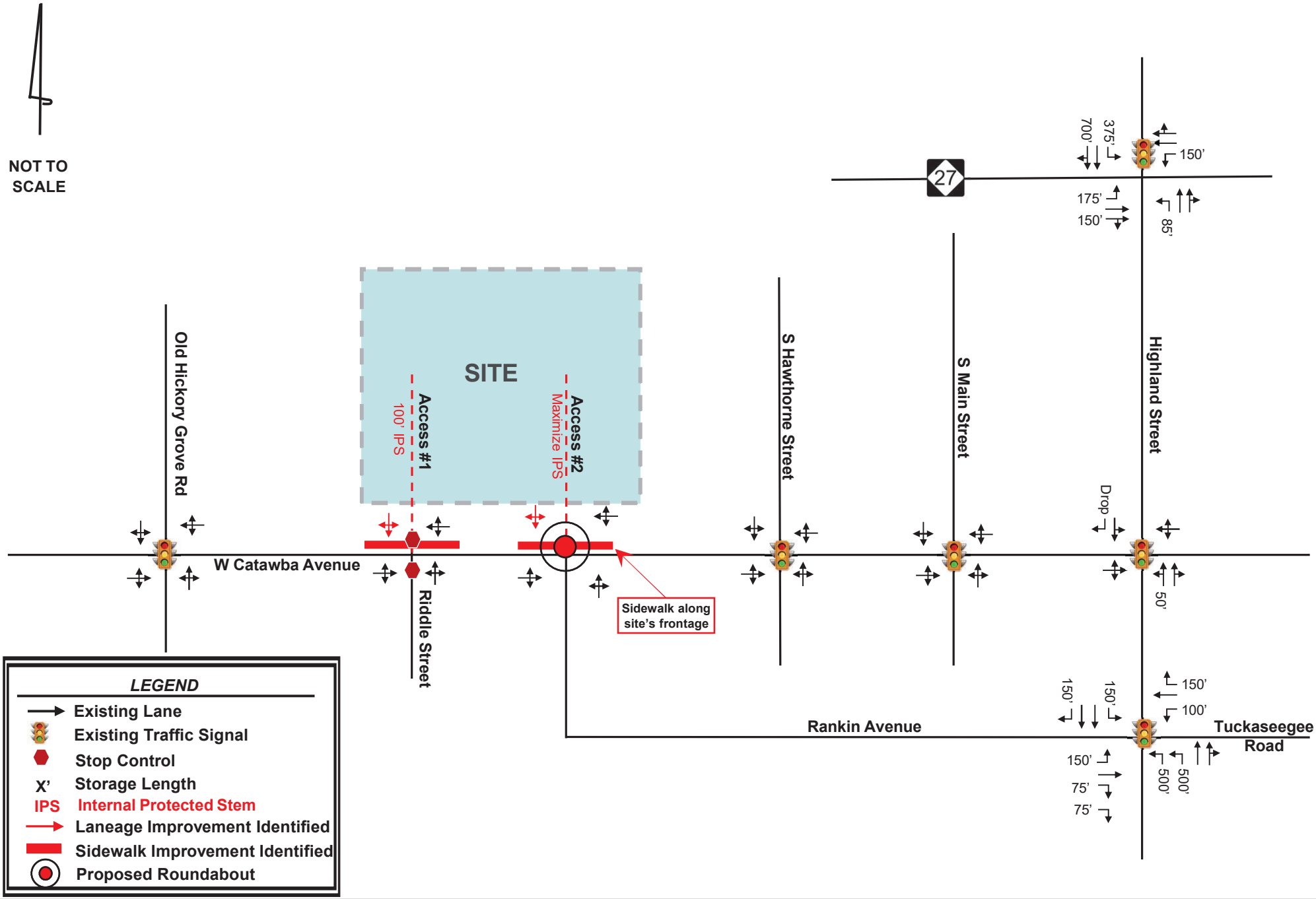
Rankin Avenue is planned to be extended from W Catawba Avenue to the north to ultimately connect to NC 27 by passing through the proposed site. When the planned Rankin Avenue Extension is constructed and extended north of Access #2, the Access #2 internal connection will be realigned on the adjacent property (by others) to achieve a 100-foot IPS, and a new connection from the site will be constructed at that time (by others) to connect to Rankin Avenue Extension approximately 1,900 feet north of W Catawba Avenue. The rezoning plan has been reviewed by Gaston-Cleveland-Lincoln Metropolitan Planning Organization (GCLMPO) staff per the provided letter included in the **Appendix**. A sketch showing the anticipated realignment is also included in the **Appendix**.

Study Area Pedestrian and Bicycle Improvements

- Sidewalk on the north side of W Catawba Avenue along the site's property frontage.
- Greenway/multi-use path through proposed site to stub and connect to future greenway/multi-use path connections.

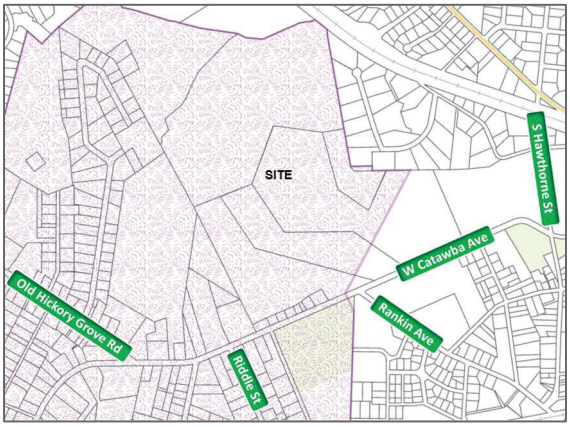
The mitigation improvements identified within the study area are shown in **Figure 1.1**. The improvements shown on this figure are subject to approval by NCDOT and Gaston County. All additions and attachments to the public roadway system shall be properly permitted, designed, and constructed in conformance to standards maintained by the appropriate agencies.

The site-civil engineer is responsible for confirming that the proposed access points meet current sight distance standards.



Kimley»Horn	Holly Springs Traffic Impact Analysis Update	Identified Mitigation Improvements	Figure 1.1

2.0 Introduction



The proposed Holly Springs residential development is located northwest of the W Catawba Avenue/Rankin Avenue intersection in Gaston County, North Carolina. Based on the site plan provided by the applicant, the proposed development is currently envisioned to include 181 single-family homes and 84 townhomes, totaling 275 residential units. For the purposes of the TIA Update, the trip generation data from the 2019 TIA was used in this analysis as noted in the approved TIA Scoping Checklist included in the **Appendix**. The trip generation from the 2019 TIA was based on 272 single-family homes and 100 townhomes, totaling 372 residential units. Using this prior trip generation provides for a more conservative estimate for analysis. The 138-acre site is currently undeveloped and is currently zoned R-1; however, based on input from the applicant, the site has been submitted for a proposed Conditional District rezoning.

For the purposes of this TIA, the development is assumed to be completed (built-out) in 2028. Changes from the 2019 TIA include the removal of access to Howie Street and aligning Access #1 with Riddle Street instead of Legion Road. Based on the provided updated site plan, the proposed development will be accessed via the following access points:

- Access #1 – A full-movement connection to W Catawba Avenue aligned with Riddle Street
- Access #2 (Main Access) – A full-movement connection to W Catawba Avenue aligned with Rankin Avenue

The TIA Scoping Checklist was developed based on discussions with Gaston County and NCDOT staff that documented all scoping parameters to be used for the TIA and was reviewed and agreed upon by Gaston County, NCDOT and the applicant.

For the purposes of this study, the orientation of W Catawba Avenue and NC 27 (Charlotte Avenue) was established to be east-west, and NC 273 (Highland Street) was established to be north-south. Rankin Avenue is oriented north-south at its intersection with W Catawba Avenue and east-west at its intersection with NC 273.

Kimley-Horn was retained to determine the potential traffic impacts of this development (in accordance with the traffic study guidelines in the *NCDOT Policy on Street and Driveway Access to North Carolina Highways*) and to identify traffic improvements that may be required to mitigate these impacts. This report presents trip generation, distribution, vehicular analyses, and identified traffic improvements required to mitigate anticipated traffic demands produced by the subject development.

3.0 Existing Traffic Conditions

Existing traffic conditions were coordinated with Gaston County and NCDOT staff and turning-movement counts to establish the existing conditions baseline analysis.

3.1 STUDY AREA

Based on coordination with Gaston County and NCDOT staff, the study area for this TIA includes the following existing intersections:

1. Old Hickory Grove Road and W Catawba Avenue
2. W Catawba Avenue and Riddle Street
3. W Catawba Avenue and Rankin Avenue
4. NC 273 and Rankin Ave/Tuckaseegee Road
5. W Catawba Avenue and S Hawthorne Street
6. W Catawba Avenue and S Main Street
7. NC 273 (Highland Street) and W Catawba Avenue
8. NC 27 (Charlotte Avenue) and NC 273 (Highland Street)

Figure 3.1 shows the study area intersections and the site location, **Figure 3.2** shows the proposed site plan for the development as provided by the applicant, and **Figure 3.3** shows the existing roadway geometry at the study intersections. A full-sized site plan to scale is provided in the **Appendix**.

The primary roadways in the vicinity of the site are NC 27 (Charlotte Avenue), NC 273 (S Main Street/Highland Street), Catawba Avenue, Rankin Avenue, and Old Hickory Grove Road. The information below describes existing conditions for portions of these roadways within the vicinity of the site.

NC 27 (Charlotte Avenue) is a two-lane, undivided highway west of NC 273 (Highland Street) and a five-lane highway with a center two-way left-turn lane east of NC 273 (Highland Street). NC 27 (Charlotte Avenue) is classified by NCDOT's functional classification system as a minor arterial and classified as a major thoroughfare by Gaston-Cleveland-Lincoln Metropolitan Planning Organization (GCLMPO). This state highway has a posted speed limit of 35 mph in the vicinity of NC 273 (Highland Street). Based on 2022 NCDOT annual average daily traffic (AADT) maps, NC 27 (Charlotte Avenue) carries an AADT volume of 14,348 vehicles per day (vpd) west of NC 273 and 21,009 vpd east of NC 273. There is currently sidewalk located along the north side of NC 27 (Charlotte Avenue) in downtown Mount Holly between Main Street and the Catawba River bridge.

NC 273 is currently a two-lane, undivided highway south of E Catawba Avenue and transitions to a four-lane undivided highway north of E Catawba Avenue. NC 273 is classified by NCDOT's functional classification system as a minor arterial and classified as a boulevard by GCLMPO. This state highway has a posted speed limit of 35 mph throughout the study area. Based on 2022 NCDOT AADT maps, NC 273 carries an AADT volume of 15,071 vpd north of NC 27 (E Charlotte Avenue), 17,910 vpd just south of NC 27 (E Charlotte Avenue), 18,379 vpd just north of Rankin Avenue and 23,472 vpd south of Rankin Avenue. Just north of Rankin Avenue, S Main Street turns north/west, while the NC 273 designation carries through the S Main Street intersection and transitions to be named Highland Street. There is currently sidewalk located along NC 273 (Highland Street) between Summit Avenue and NC 27 (E Charlotte Avenue). There is currently sidewalk at the S Main Street (NC 273)/Rankin Avenue intersection at each approach.

North of NC 273 (Highland Street), S Main Street is a two-lane, undivided roadway with a posted speed limit of 20 mph in the vicinity of W Catawba Avenue. Based on 2022 NCDOT AADT maps, S Main Street carries an AADT of 4,363 vpd north of W Catawba Avenue and 4,124 vpd south of W Catawba Avenue. There is currently sidewalk located along both sides of S Main Street north of the railroad tracks. South of the railroad tracks, sidewalk is located only along the eastern side.

Catawba Avenue is a two-lane, undivided roadway throughout the study area with a posted speed limit of 35 mph west of Oakland Street and 25 mph east of Oakland Street. W Catawba Avenue is classified by NCDOT's functional classification system as a minor arterial west of S Main Street and a local roadway east of S Main Street. Based on 2022 NCDOT AADT maps, Catawba Avenue carries an AADT of 5,199 vpd west of Old Hickory Grove Road, 6,970 (2020) vpd between Old Hickory Grove Road and Rankin Avenue, 4,467 vpd between S Hawthorne Street and S Main Street, and 3,453 vpd between S Main Street and NC 273 (Highland Street). The bump in AADT between Old Hickory Grove Road and Rankin Avenue shows that a significant number of drivers perform the "z"-movement from Old Hickory Grove Road to/from Rankin Avenue. There is currently sidewalk located along the south side of Catawba Avenue between S Hawthorne Street and S Main Street and located along both sides between S Main Street and NC 273 (Highland Street).

Rankin Avenue is a two-lane, undivided major collector with a posted speed limit of 35 mph and an AADT of 3,171 vpd based on 2022 NCDOT AADT maps. There is currently sidewalk located along one side of Rankin Avenue. The sidewalk location crosses from the north side of Rankin Avenue east of Scott Street to the south side just north of Scott Street.

Old Hickory Grove Road is a two-lane, undivided minor arterial with a posted speed limit of 35 mph and an AADT of 5,165 vpd based on 2022 NCDOT AADT maps. Old Hickory Grove Road currently lacks sidewalk and/or bicycle accommodations within the vicinity of the site.

3.2 EXISTING INTERSECTION VOLUME DEVELOPMENT

AM (6:30-8:30) and PM (2:00-7:00) intersection turning-movement, heavy-vehicle, pedestrian and bicycle counts were performed by Quality Counts on Thursday, May 19, 2022, at the following intersections:

1. Old Hickory Grove Road and W Catawba Avenue
2. W Catawba Avenue and Legion Road
3. W Catawba Avenue and Rankin Avenue
4. NC 273 and Rankin Ave/Tuckaseegee Road
5. W Catawba Avenue and S Hawthorne Street
6. W Catawba Avenue and S Main Street
7. NC 273 (Highland Street) and W Catawba Avenue
8. NC 27 (Charlotte Avenue) and NC 273 (Highland Street)

A 2022 count was not performed at W Catawba Avenue and Riddle Street but was collected at W Catawba Avenue and Legion Road. Considering the proximity of the intersections, and both roadways terminate with dead ends, the Legion counts were used at Riddle Street as noted in the approved TIA Scoping Checklist.

The AM peak hour was consistently found to begin between 7:00 and 7:15 AM at all eight existing intersections; however, the specific PM peak hour differed amongst some of the study intersections. The specific peak hour of each individual intersection was used as the baseline data to represent the highest collected traffic volumes within the specified count timeframes. The peak hours for each of the intersections are shown in **Table 3.1.**

Table 3.1 – AM & PM Intersection Peak Hours

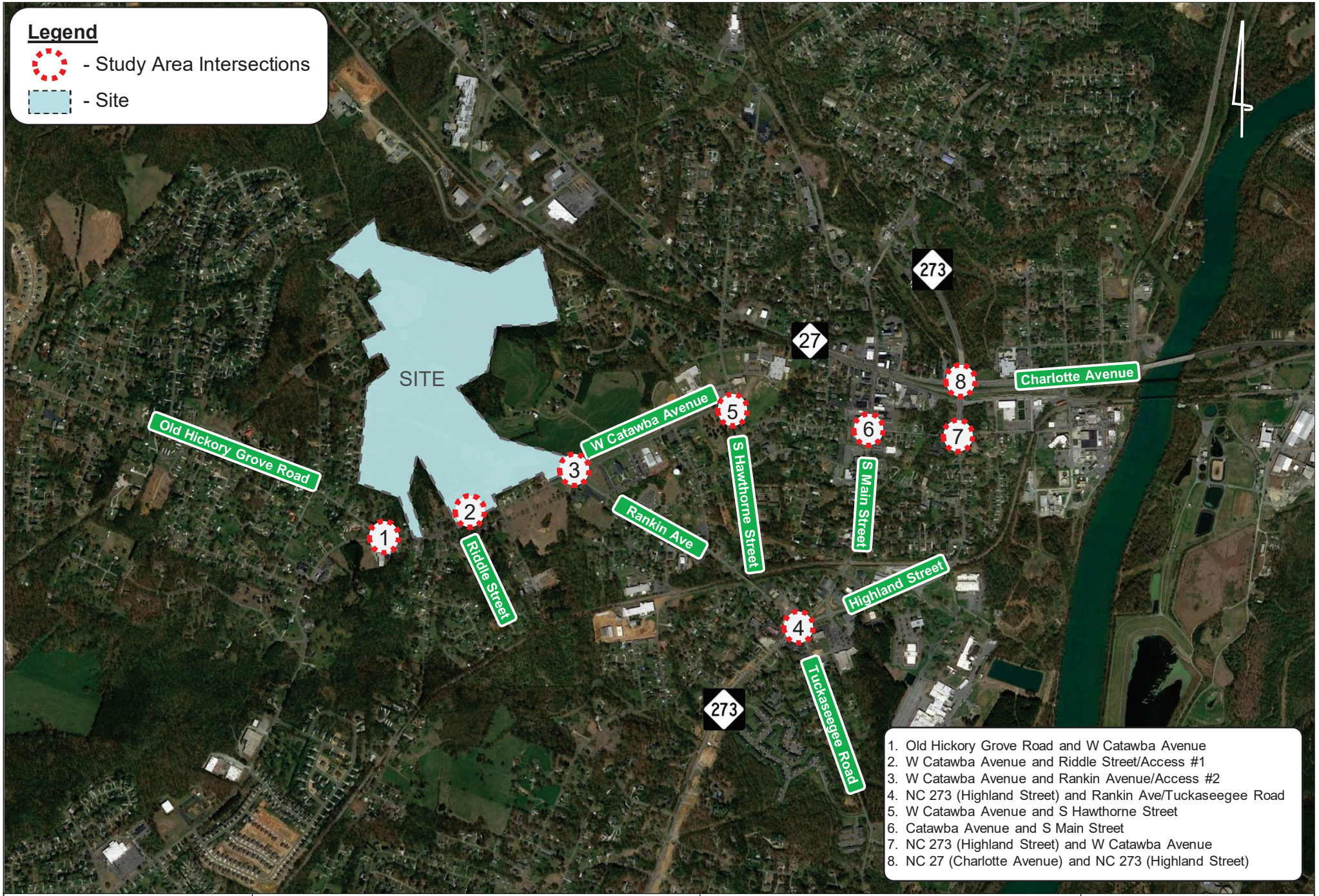
Intersection	AM Peak Hour	PM Peak Hour
1. Old Hickory Grove Road and W Catawba Avenue	7:00 AM - 8:00 AM	4:30 PM - 5:30 PM
2. W Catawba Avenue and Legion (Riddle) Street	7:00 AM - 8:00 AM	4:30 PM - 5:30 PM
3. W Catawba Avenue and Rankin Avenue	7:00 AM - 8:00 AM	4:30 PM - 5:30 PM
4. NC 273 and Rankin Ave/Tuckaseegee Rd	7:15 AM - 8:15 AM	4:45 PM - 5:45 PM
5. W Catawba Avenue and S Hawthorne Street	7:15 AM - 8:15 AM	3:30 PM - 4:30 PM
6. W Catawba Avenue and S Main Street	7:15 AM - 8:15 AM	3:30 PM - 4:30 PM
7. NC 273 (Highland Street) and W Catawba Avenue	7:15 AM - 8:15 AM	4:45 PM - 5:45 PM
8. NC 27 (Charlotte Avenue) and NC 273 (Highland Street)	7:00 AM - 8:00 AM	4:45 PM - 5:45 PM

As shown in the image to the right, a left-turn prohibition sign is located at the intersection of S Hawthorne Street and W Catawba Avenue restricting the southbound S Hawthorne Street left-turn movement between 7:30-8:30 AM and 2:30-4:00 PM on school days. This was not reflected in the counts collected; furthermore, it is not as evident in the peak hour traffic volumes since, as shown in **Table 3.1**, the AM peak hour only overlapped with 45 minutes of this turn restriction, and the PM peak hour only overlapped with 30 minutes of this turn restriction.

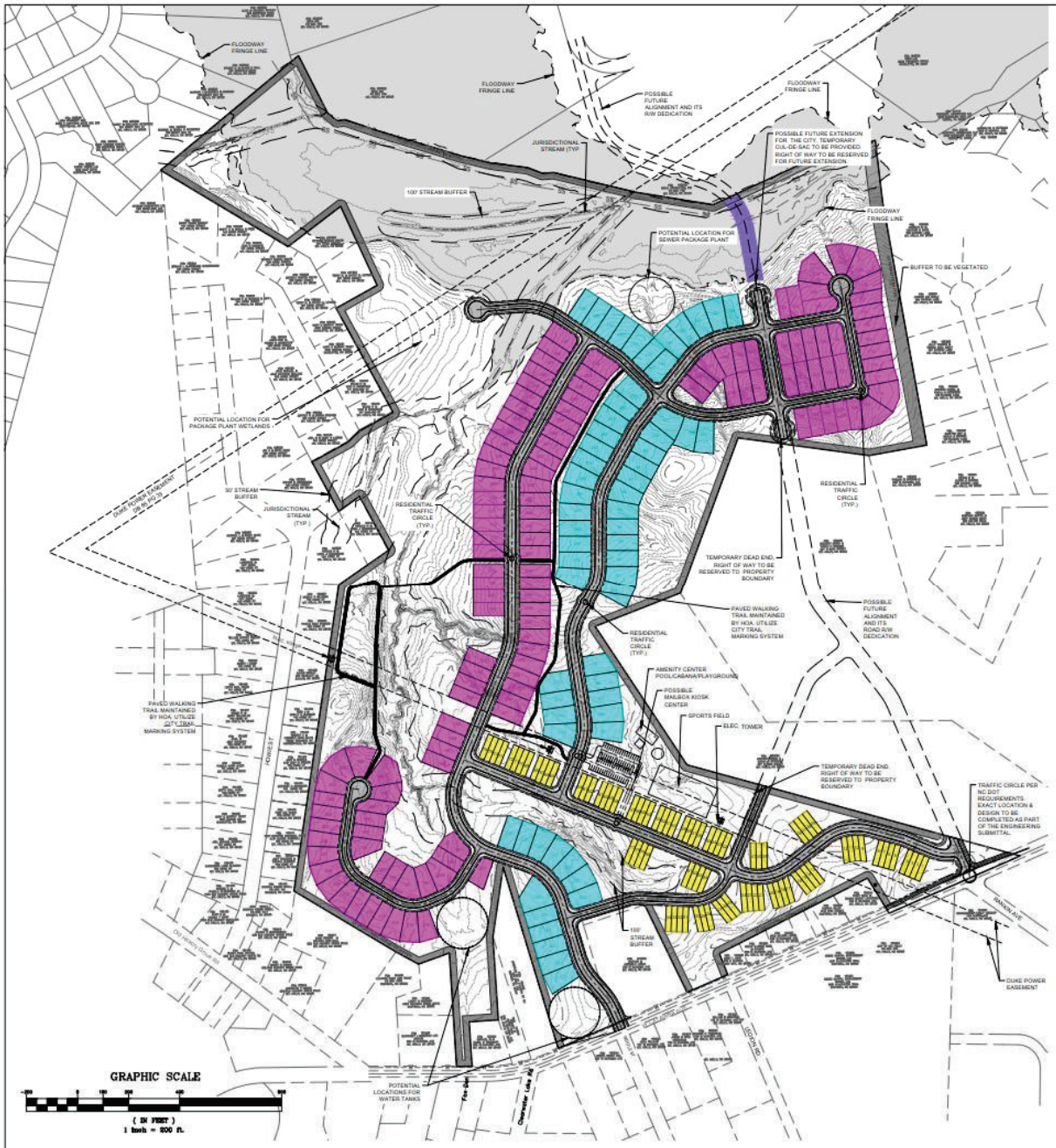
2022 peak-hour traffic volumes were grown by 2% for one year to represent existing 2023 traffic per the approved TIA

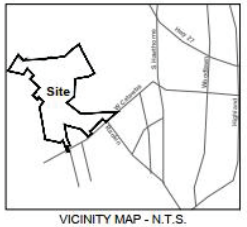
Scoping Checklist. No volume balancing was performed throughout the study area due to the presence of multiple commercial and residential driveways between each of the study intersections. Peak-hour intersection turning-movement count data is provided in the **Appendix**.

Figure 3.4 shows the 2023 existing AM and PM peak-hour traffic volumes.



Kimley»Horn	**Holly Springs** **Traffic Impact Analysis Update**	**Study Area/Site Location**	**Figure 3.1**





VICINITY MAP - N.T.S.

SITE DATA

TAX PARCEL NO:	181214, 180092, 202690, 181227, 202122, 225889, 199264 181225, 210290
TOTAL SITE AREA:	138.0+/- AC.
ADDRESS:	W. CATAWBA AVENUE, MT. HOLLY, NC
EXIST. ZONING:	R-1 (COUNTY)
PROPOSED ZONING:	CONDITIONAL DISTRICT – PRD

DEVELOPMENT DATA

WATERSHED DISTRICT:	LAKE WYLIE WATERSHED (MTH WSIV PROTECTED – AUG07)		
MAXIMUM ALLOWED BUILD AREA:	24% (33.12 ACRES, 1,442,707 SF)		
PAVEMENT:	306,262 SF		
CURB AND GUTTER:	49,831 SF		
SIDEWALK:	119,533 SF		
WALKING TRAILS:	34,127 SF		
PACKAGE PLANT:	25,000 SF		
TOTAL IMPERVIOUS:	509,753 SF		
REMAINDER:	908,020 SF		
	AVE IMPERVIOUS	TOTAL IMPERVIOUS	
TH'S (22'x60' PAD, DRIVE, SW)	1,738 SF	145,992 SF	
52' LOTS (40'x60' PAD, DRIVE, SW)	3,170 SF	412,100 SF	
62' LOTS (50'x60' PAD, DRIVE, SW)	3,770 SF	229,970 SF	
ALL HOUSE TYPES	2,865 SF	788,062 SF	
		119,958 SF	(REMAINDER)
TOTAL LOTS SHOWN:	SF 52' WIDE (MIN) – 130 LOTS SF 62' WIDE (MIN) – 61 LOTS TH 20' WIDE (MIN) – 84 LOTS TOTAL 275 LOTS		
DENSITY PROPOSED:	1.99 LOTS/AC.		
AREA IN COS/ENVIRONMENTAL:	65+/- AC.		
USABLE ACREAGE:	73+/- AC.		
LOT SIZING:			
DETACHED PRODUCT:			
LOT WIDTH:	52 FT. (MEASURED AT SETBACK LINE)		
MIN. LOT SIZE:	6,200 SF MIN.		
NUMBER OF LOTS:	130 (47% OF TOTAL)		
LOT WIDTH:	62 FT. (MEASURED AT SETBACK LINE)		
MIN. LOT SIZE:	7,200 SF MIN.		
NUMBER OF LOTS:	61 (22% OF TOTAL)		
ATTACHED PRODUCT:			
MIN. BLDG WIDTH:	20 FT.		
MIN. LOT SIZE:	1,800 SF MIN.		
NUMBER OF LOTS:	84 (31% OF TOTAL)		
MINIMUM SETBACKS AND YARDS DETACHED PRODUCT:			
FRONT SETBACK:	20 FT. (FROM ROW)		
SIDE YARD:	6 FT.		
CORNER SETBACK:	10 FT. (FROM ROW)		
REAR YARD:	25 FT.		
BUILDING HEIGHT:	35 FT. (MEASURED AT FRONT SETBACK)** **35' (TO THE HIGHEST POINT OF STRUCTURE MEASURED AT THE FRONT SETBACK) IF BUILDING HEIGHT IS MORE THAN 35' THEN FRONT AND SIDE YARD SETBACKS WILL HAVE TO BE INCREASED A MINIMUM OF 1' FOR EVERY 2' VERTICAL ABOVE 35' IN HEIGHT.		
MINIMUM SETBACKS AND YARDS ATTACHED PRODUCT:			
FRONT SETBACK:	20 FT. (FROM ROW)		
SIDE YARD:	20 FT. BETWEEN BUILDINGS		
CORNER SETBACK:	10 FT. (FROM ROW)		
REAR YARD:	10 FT.		
BUILDING HEIGHT:	35 FT. (MEASURED AT FRONT SETBACK)** **35' (TO THE HIGHEST POINT OF STRUCTURE MEASURED AT THE FRONT SETBACK) IF BUILDING HEIGHT IS MORE THAN 35' THEN FRONT AND SIDE YARD SETBACKS WILL HAVE TO BE INCREASED A MINIMUM OF 1' FOR EVERY 2' VERTICAL ABOVE 35' IN HEIGHT.		
TOTAL COS REQUIRED:	20% (27.6 AC.)		
TOTAL COS SHOWN:	COMBINATION OF ACTIVE AND PASSIVE OPEN SPACE OF 75.86 AC. (54.97%)		
EXIST. TREE AREA:	91.04 AC.		
TREE SAVE REQUIRED:	30% (27.31 ac.)		

SEE SHEET C-2.0 FOR TECHNICAL NOTES & CONDITIONS

SURVEY INFORMATION:
1. SITE SURVEY PROVIDED BY CHRIS FAULK, PLS.
2. SITE CONSTRUCTION DOCUMENTS PROVIDED ARE BASED UPON THE ACCURACY OF THE SURVEY INFORMATION FURNISHED BY THE OWNER.
3. CONTRACTOR TO FIELD VERIFY ALL POINTS OF CONNECTION FOR DRIVES, PARKING LOTS, STORM DRAINAGE, ETC. PRIOR TO CONSTRUCTION. IN THE EVENT ANY DISCREPANCIES ARE NOTED IN THE FIELD, PLEASE CONTACT THE PROJECT ENGINEER IMMEDIATELY PRIOR TO CONTINUING WITH ANY CONSTRUCTION.

LEGEND:
Floodway Fringe Line
Project Boundary
TOWNHOMES
52 FOOT LOTS
62 FOOT LOTS
FUTURE ROW RESERVATION

DATE	ISSUED FOR	REV
07/06/2023	First Rezoning Submittal to Gaston County	0

NORTH CAROLINA 811 — 811 Know what's below. Call before you dig.

Engineer:
RJH
R. Joe Harris & Associates, Inc.
Engineering • Land Surveying • Planning Management
www.rjoeharris.com

FOR INFORMATION ONLY

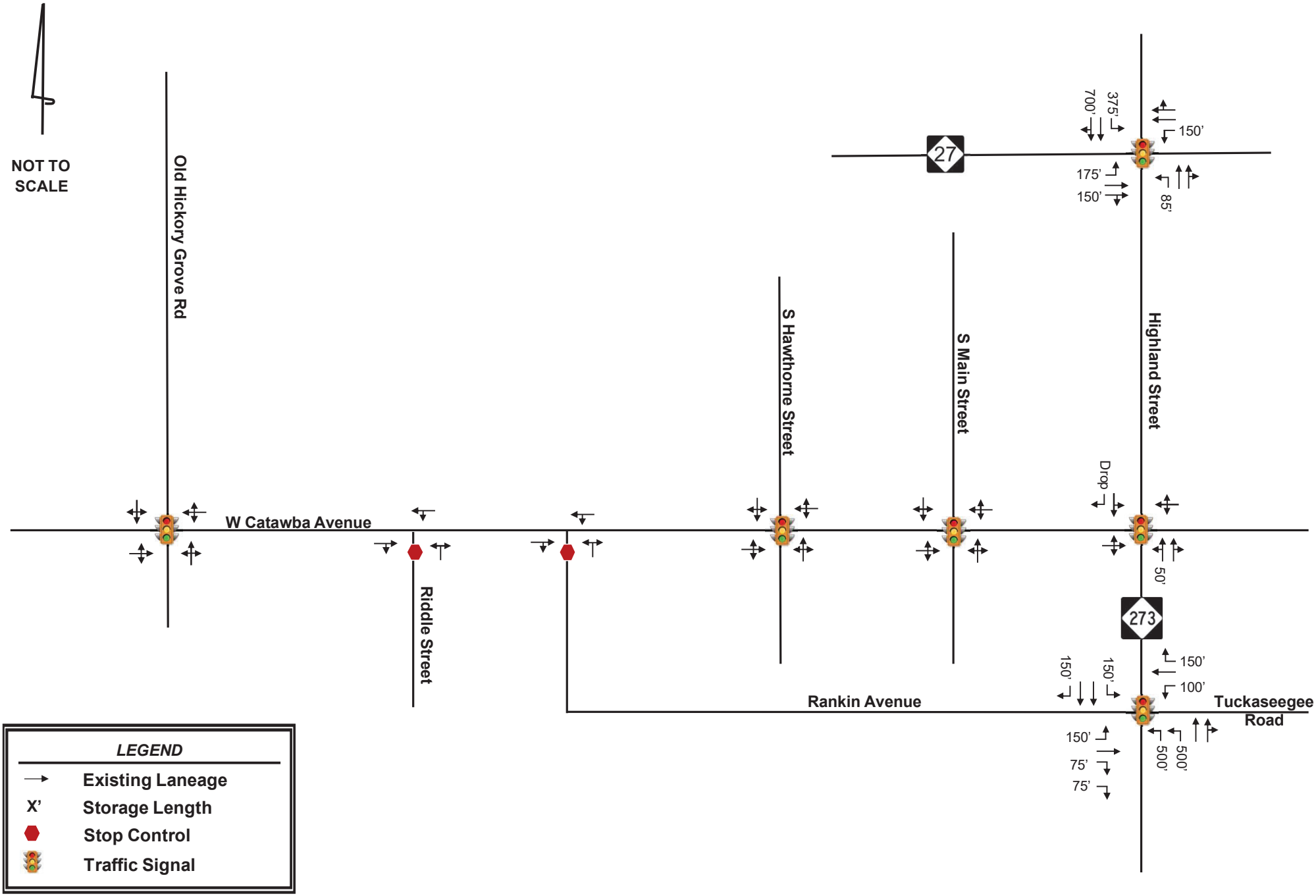
Project Manager	Drawn
Department Manager	Checked
Print/Plot Date	July 7, 2023
Submit Drawn	Submit Date

Client:
Tom Springs
400 W. CATAWBA AVE
MT. HOLLY, NORTH CAROLINA 28120
P: (704) 827-7791

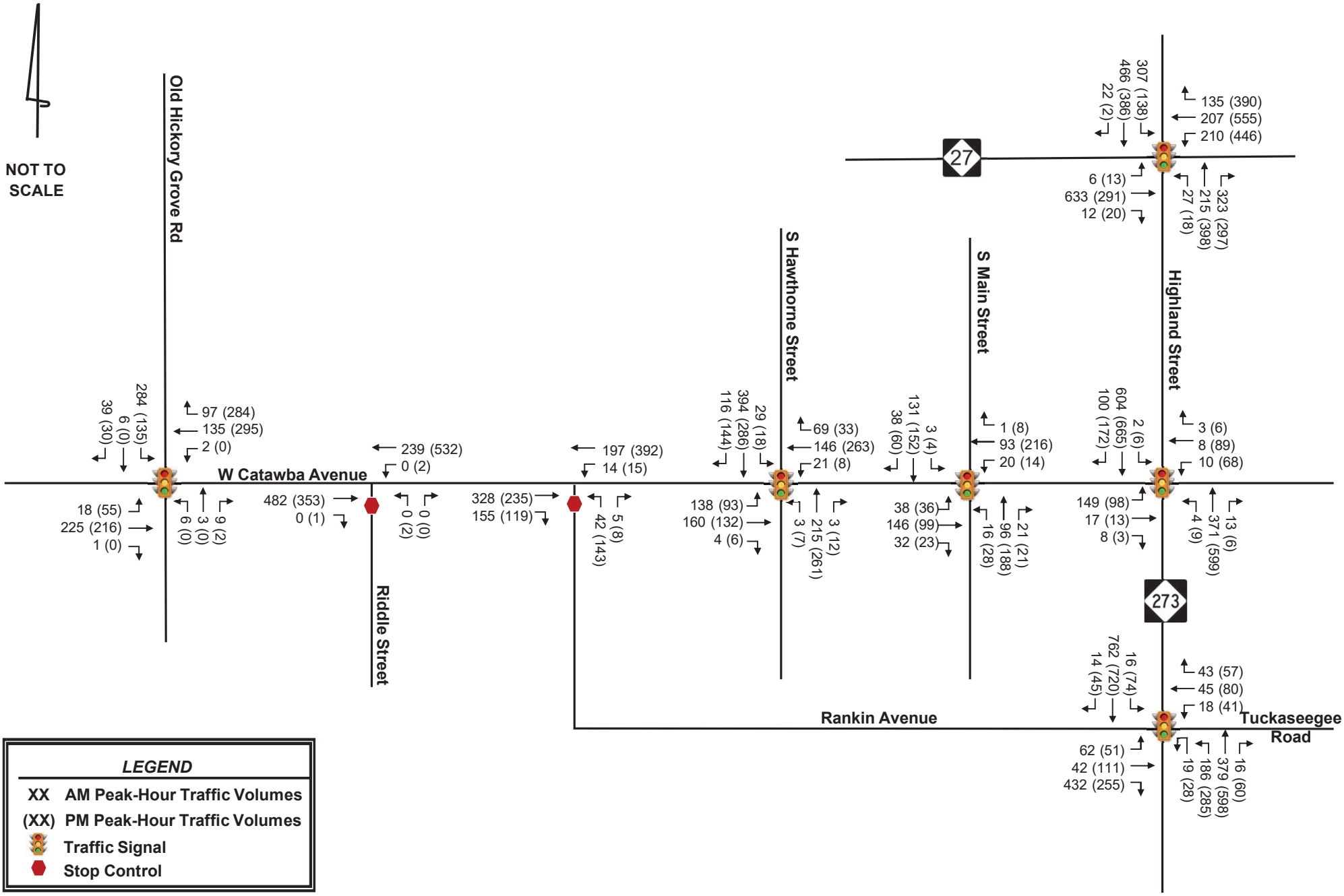
Project:
Holly Springs

Drawing Title:
Rezoning Site Plan

Project No.	Drawing No.
4710	C-2.0
DWG File Name: 4710-Holly Springs Rezoning Concept Plan	



Kimley»Horn	Holly Springs Traffic Impact Analysis Update	Existing Roadway Laneage	Figure 3.3



Kimley»Horn	Holly Springs Traffic Impact Analysis Update	2023 Existing Traffic Volumes	Figure 3.4

4.0 Background Intersection Volume Development

Projected background (non-project) traffic is defined as the expected growth or change in traffic volumes on the surrounding roadway network between the year the existing counts were collected (2022) and the expected build-out year (2028) absent the construction and opening of the proposed project. This includes both non-specific general growth based on historical increase in local traffic volumes (historical background growth), along with specific growth and/or change in traffic volumes caused by future off-site developments that are not yet fully-constructed and/or planned transportation projects specifically identified within the vicinity of the proposed development.

Figure 4.1 shows the projected 2028 background AM and PM peak-hour traffic volumes.

4.1 HISTORICAL BACKGROUND GROWTH TRAFFIC

Historical background growth is the increase in existing traffic volumes due to usage increases and non-specific growth throughout the area, and accounts for growth that is independent of specific off-site developments or planned transportation projects. Historical background growth traffic is calculated using an annual growth rate, which is applied to the existing traffic volumes up to the future horizon years. As shown in the approved TIA Scoping Document, an annual growth rate of two percent (2%) was applied to the 2023 existing peak-hour traffic volumes to calculate base 2028 background traffic volumes. This growth rate was determined based on review of the 2019 TIA, in coordination with NCDOT and Gaston County staff.

4.2 FUTURE OFF-SITE DEVELOPMENTS AND PLANS

Based on input from the Gaston County and NCDOT staff, no future off-site developments that are expected to significantly impact traffic volumes within the study area were included in the background traffic volumes for this TIA. Planned Transportation Projects

Based on review of the adopted transportation plans for the area, ten future multimodal transportation projects have been identified within the study area:

1. Rankin Avenue Extension (H170836)
2. Clearwater Lake Extension
3. Highland Street (NC 273) Widening (H171317)
4. S Hawthorne Street and W Catawba Avenue Intersection Improvements (H150212)
5. Proposed greenway through proposed site
6. Proposed greenway just east of proposed site (opposite Rankin Avenue)
7. Proposed intersection crossing improvements at S Hawthorne Street/W Catawba Avenue, Highland Street/Rankin Avenue/Tuckaseegee Road, Highland Street/W Catawba Avenue, and Highland Street/Charlotte Avenue
8. Recommended sidewalks along W Catawba Avenue, NC 273, Old Hickory Grove Road, and Rankin Avenue

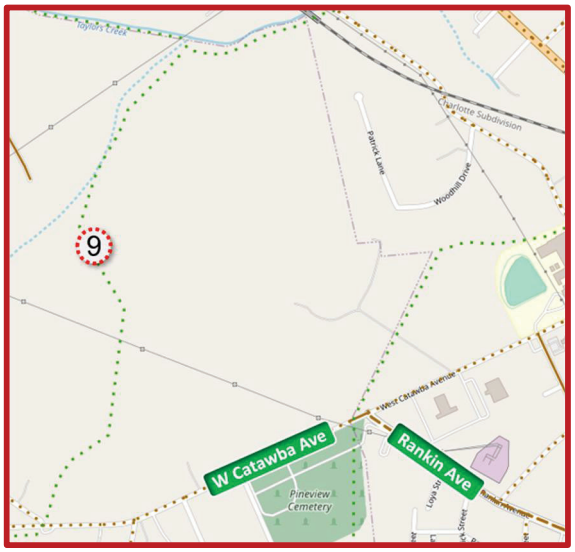
Note that these projects were not included in the operations analyses discussed in **Section 6** since funding nor schedule have been identified.

Rankin Avenue has been identified for a future extension north of W Catawba Avenue in both GCLMPO's 2050 Metropolitan Transportation Plan (MTP) for the 2045 Horizon Year and in GCLMPO's Comprehensive Transportation Plan (CTP) as a recommended minor thoroughfare. The intent for this extension is to alleviate congestion around the nearby elementary and middle

schools by providing a more direct connection from W Catawba Avenue to NC 27 (Charlotte Avenue). The Rankin Avenue Extension (H170836) are planned to be reviewed for funding as part of NCDOT's strategic prioritization process in the future, which will be used to update the STIP for the years 2036-2045. Therefore, the extension was not considered in the volume development and operations analyses of this TIA. However, the planned alignment has been identified through multiple planning documents to be constructed through a portion of the proposed Holly Springs site. Note that some of documents show differences in the specific alignment of this extension. The 2050 MTP shows the alignment passing through the proposed site in two locations, with one of those being a small segment (approximately 150 feet) located at the beginning of the extension at W Catawba Avenue, where Access #2 is proposed. The site plan in **Figure 3.2** reflects this future alignment in dashed lines, which has been reviewed by GCLMPO as a three-lane minor roadway with a typical 80-foot right-of-way with accommodations for bicycle and pedestrians per the letter included in the **Appendix**. Prior to construction of the future Rankin Avenue Extension, the site proposes to provide an access (Access #2) as the fourth leg of the W Catawba Avenue/Rankin Avenue intersection). However, once the planned Rankin Avenue Extension is constructed and extended north of Access #2, the Access #2 internal connection will be realigned on the adjacent property (by others) to achieve a 100-foot internal protected stem (IPS), and a new connection from the site will be constructed at that time (by others) to connect to Rankin Avenue Extension approximately 1,900 feet north of W Catawba Avenue. The rezoning plan has been reviewed by GCLMPO staff per the provided letter included in the **Appendix**. A sketch showing the anticipated realignment is also included in the **Appendix**.

The NC 273 (Highland Street) widening project (H171317) and the S Hawthorne Street/W Catawba Avenue Intersection Improvements (H150212) are planned to be reviewed for funding as part of NCDOT's strategic prioritization process in the future. Therefore, at the time of this TIA, neither project was included in the operations analyses of this TIA.

A greenway or multi-use path has also been identified with an alignment shown to traverse the proposed site based on Mount Holly's *Comprehensive Pedestrian Plan* and GCLMPO's CTP. An image from GCLMPO's CTP 2022 is shown to the right. The green-dotted line labeled as "9" represents a proposed greenway connector trail. A paved walking trail is shown within the site plan to accommodate this, which has been reviewed by GCLMPO staff as referenced by a path along Taylor's Creek.

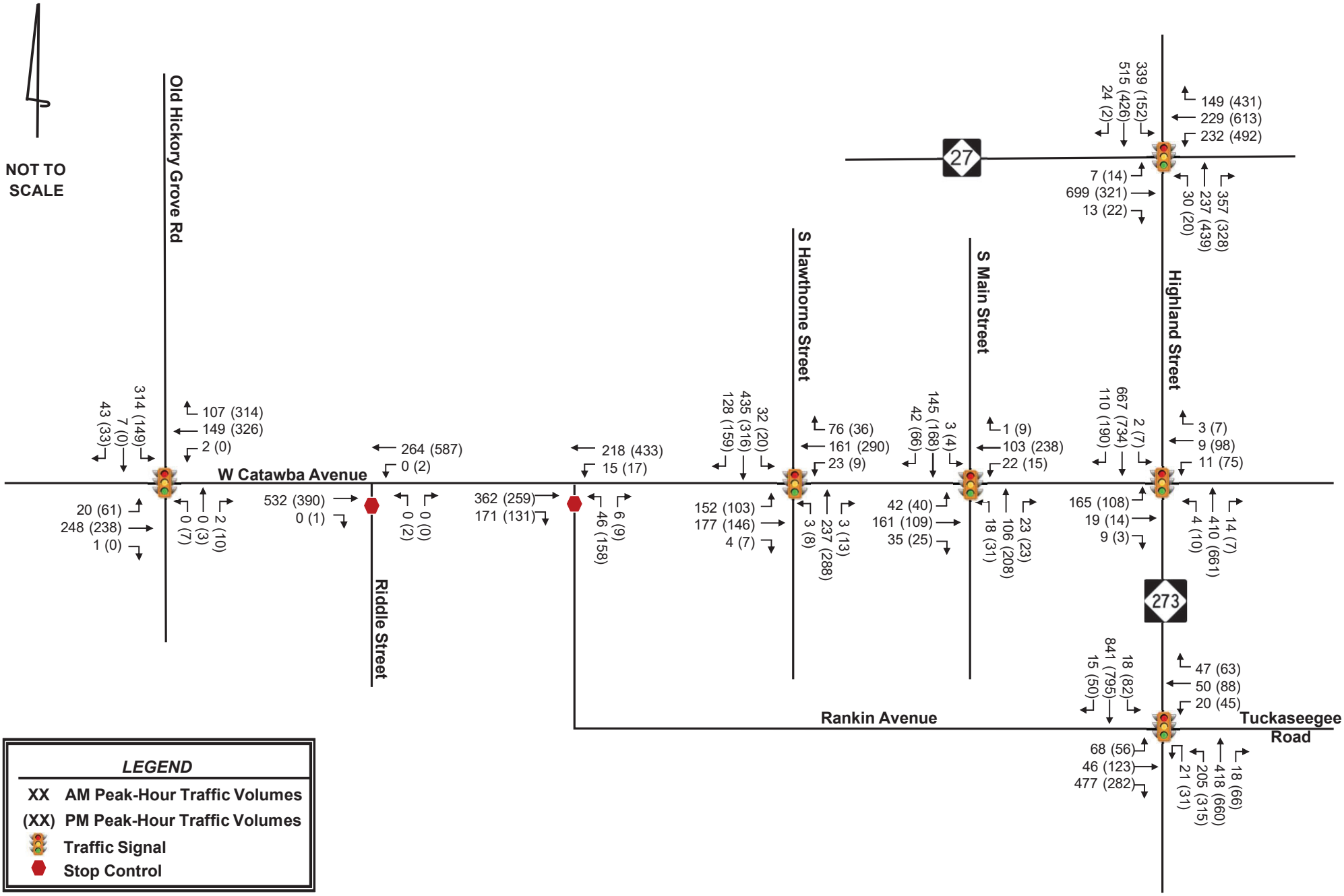


Below is additional information found in the adopted transportation planning documents relative to the other unfunded projects:

- **Clearwater Lake Extension**
  - Minor thoroughfare that extends Clearwater Lake Road from W Catawba Avenue to NC 27 (Charlotte Avenue).
  - Not accommodated in the site plan reviewed by GCLMPO; comment not provided since the Rankin Extension is planned to provide connectivity between W Catawba Avenue and NC 27.
  - Currently included in the GCLMPO CTP.

- **NC 273 (Highland Street) widening (H171317)**
  - Identified the need to widen NC 273 (Highland Street) from a two-lane facility to a four-lane divided facility with sidewalks and bike lanes on both sides between A & E Drive through downtown to Lanier Avenue.
  - Included in the following transportation planning documents:
    - GCLMPO 2050 MTP
    - GCLMPO CTP
- **S Hawthorne Street & W Catawba Ave Intersection Improvements (H150212)**
  - Identified the need to install a roundabout at W Catawba Ave and S Hawthorne Street including pedestrian accommodations.
  - Included in the following transportation planning documents:
    - GCLMPO 2050 MTP – 2035 Horizon Year

- **Proposed Greenway just east of proposed site (opposite Rankin Ave)**
  - Recommended greenway/multi-use path just east of proposed site (opposite Rankin Ave).
  - Included in the following transportation planning documents:
    - *Mount Holly Comprehensive Pedestrian Plan* (2013)
    - GCLMPO CTP
- **Proposed Intersection Crossing Improvements (included in the Mt Holly Pedestrian Plan)**
  - S Hawthorne Street and W Catawba Ave
  - Highland Street (NC 273) and Rankin Ave/Tuckaseegee Road
  - Highland Street (NC 273) and W Catawba Ave
  - Highland Street (NC 273) and E Charlotte Avenue (NC 27)
- **Recommended Sidewalks (included in the Mt Holly Pedestrian Plan & GCLMPO CTP)**
  - W Catawba Ave from Rankin Ave to S Hawthorne St
  - NC 273 between Summit Ave and Tuckaseegee Road
  - Old Hickory Grove Road
  - Rankin Ave



Kimley»Horn	Holly Springs Traffic Impact Analysis Update	2028 Background Traffic Volumes	Figure 4.1

5.0 Site Traffic Volume Development

Site traffic developed for this TIA is defined as the site-generated trips expected to be added to the study area by the construction of the proposed development, and the distribution and assignment of that traffic throughout the surrounding network.

5.1 SITE ACCESS

Changes from the 2019 TIA include the removal of access to Howie Stret and aligning Access #1 with Riddle Street instead of Legion Road. Based on the site plan provided by the applicant, the proposed development will be accessed via the following access points:

- Access #1 – A full-movement connection to W Catawba Avenue aligned with Riddle Street
- Access #2 (Main Access) – A full-movement connection to W Catawba Avenue aligned with Rankin Avenue

As discussed in **Section 4.3**, Rankin Avenue is planned to be extended from W Catawba Avenue to the north to ultimately connect to W Charlotte Avenue (NC 27) by passing through the proposed site in two locations, one of those being a small segment (approximately 150 feet) located at the beginning of the extension at W Catawba Avenue, where Access #2 is proposed. Based on input from the applicant, previous coordination with NCDOT indicated that this proposed driveway connection at W Catawba Avenue/Rankin Avenue would potentially be constructed as a roundabout. However, given the short distance between Access #2 and W Catawba Avenue, when the planned Rankin Avenue Extension is constructed and extended north of Access #2, the Access #2 connection will be realigned on the adjacent property (by others) to achieve a 100-foot IPS, and a new connection from the site will be constructed at that time (by others) to connect to Rankin Avenue Extension approximately 1,900 feet north of W Catawba Avenue. The rezoning plan has been reviewed by Gaston-Cleveland-Lincoln Metropolitan Planning Organization (GCLMPO) staff per the provided letter included in the **Appendix**. A sketch showing the anticipated realignment is also included in the **Appendix**.

5.2 TRAFFIC GENERATION

The traffic generation potential of the proposed development was determined using the trip generation rates published in *Trip Generation* (Institute of Transportation Engineers, Tenth Edition, 2017) for all land uses. Based on the 2019 TIA, the proposed development was previously envisioned to include 272 single-family homes and 100 townhomes, totaling 372 residential units. Based on the site plan provided by the applicant, the proposed development is now envisioned to include 191 single-family homes and 84 townhomes, totaling 275 residential units. Using the prior trip generation provides for a more conservative analysis.

Table 5.1 summarizes the projected trip generation, taken directly from the 2019 TIA.

Table 5.1 - Trip Generation

Land Use	Intensity	Daily	AM Peak Hour			PM Peak Hour		
			Total	In	Out	Total	In	Out
Single-Family Homes	272 DU	2,611	198	50	148	265	167	98
Multifamily Housing Low-Rise - (Townhomes)	100 DU	715	48	11	37	59	37	22
Net New External Trips		**3,326**	**246**	**61**	**185**	**324**	**204**	**120**

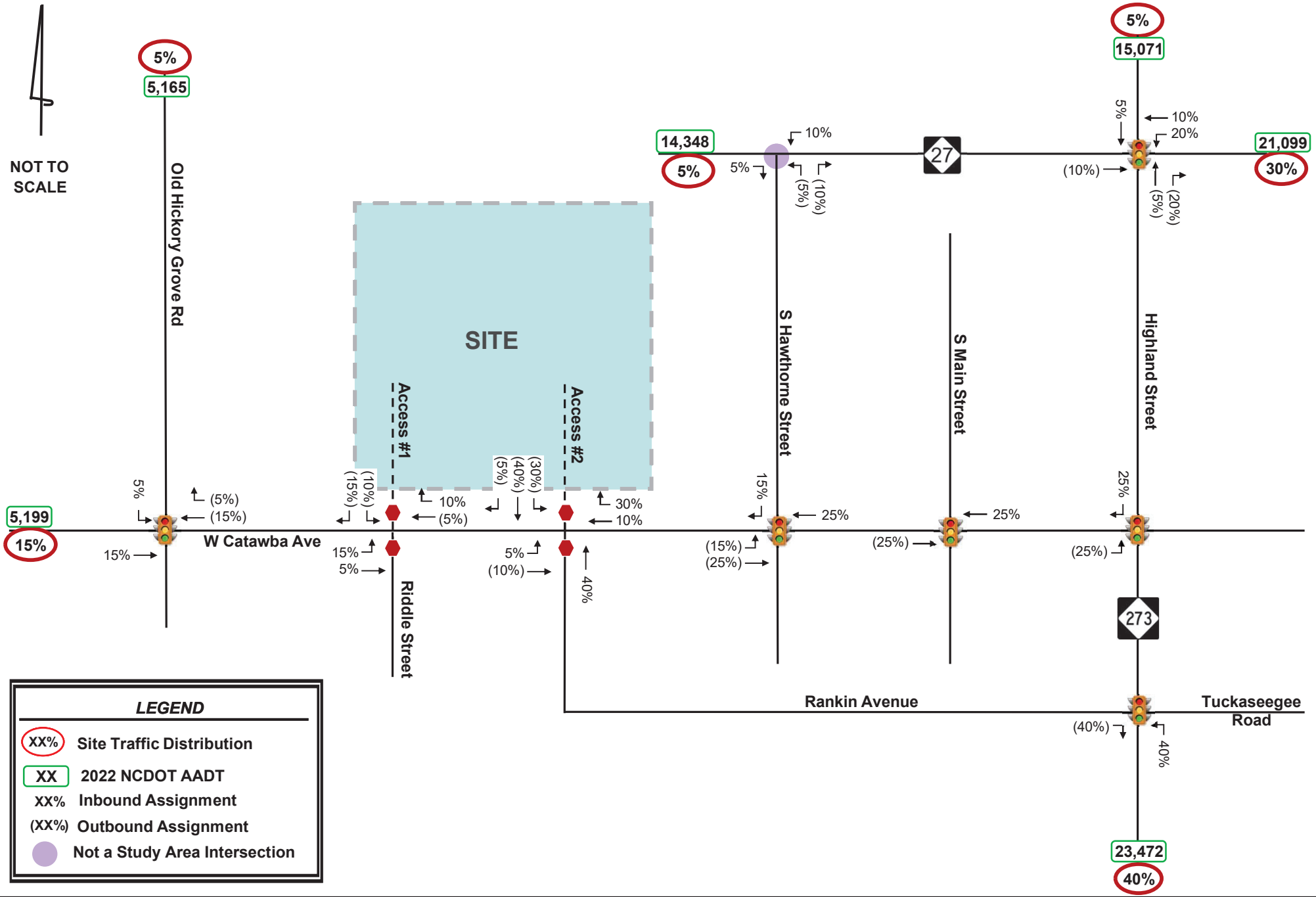
5.3 SITE TRAFFIC DISTRIBUTION AND ASSIGNMENT

The proposed development's trips were assigned to the surrounding network based on existing peak-hour turning movements, surrounding land uses, locations of similar land use and population densities in the area. The following site traffic distribution was reviewed and approved as part of the TIA Scoping Checklist by Gaston County, NCDOT and the applicant. The overall site traffic distribution was taken directly from the TIA, and the assignment was updated to reflect the latest access plan as shown in **Figure 5.1**.

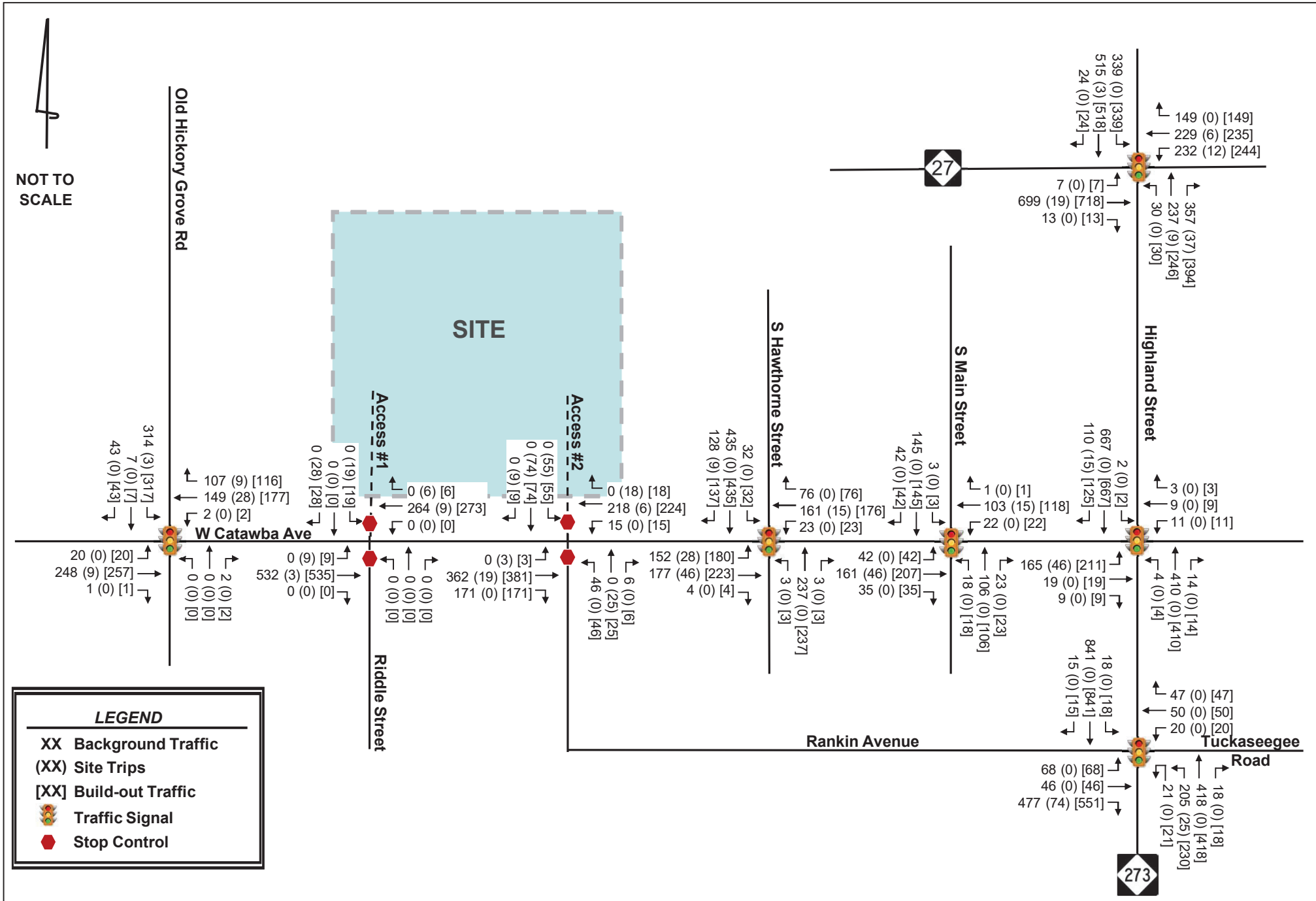
5.4 2028 BUILD-OUT TRAFFIC VOLUMES

The 2028 build-out traffic volumes include the assignment of the projected site traffic generation added to the 2028 background traffic volumes. **Figures 5.2** and **5.3** show the projected 2028 build-out traffic volumes for the AM and PM peak hours, respectively.

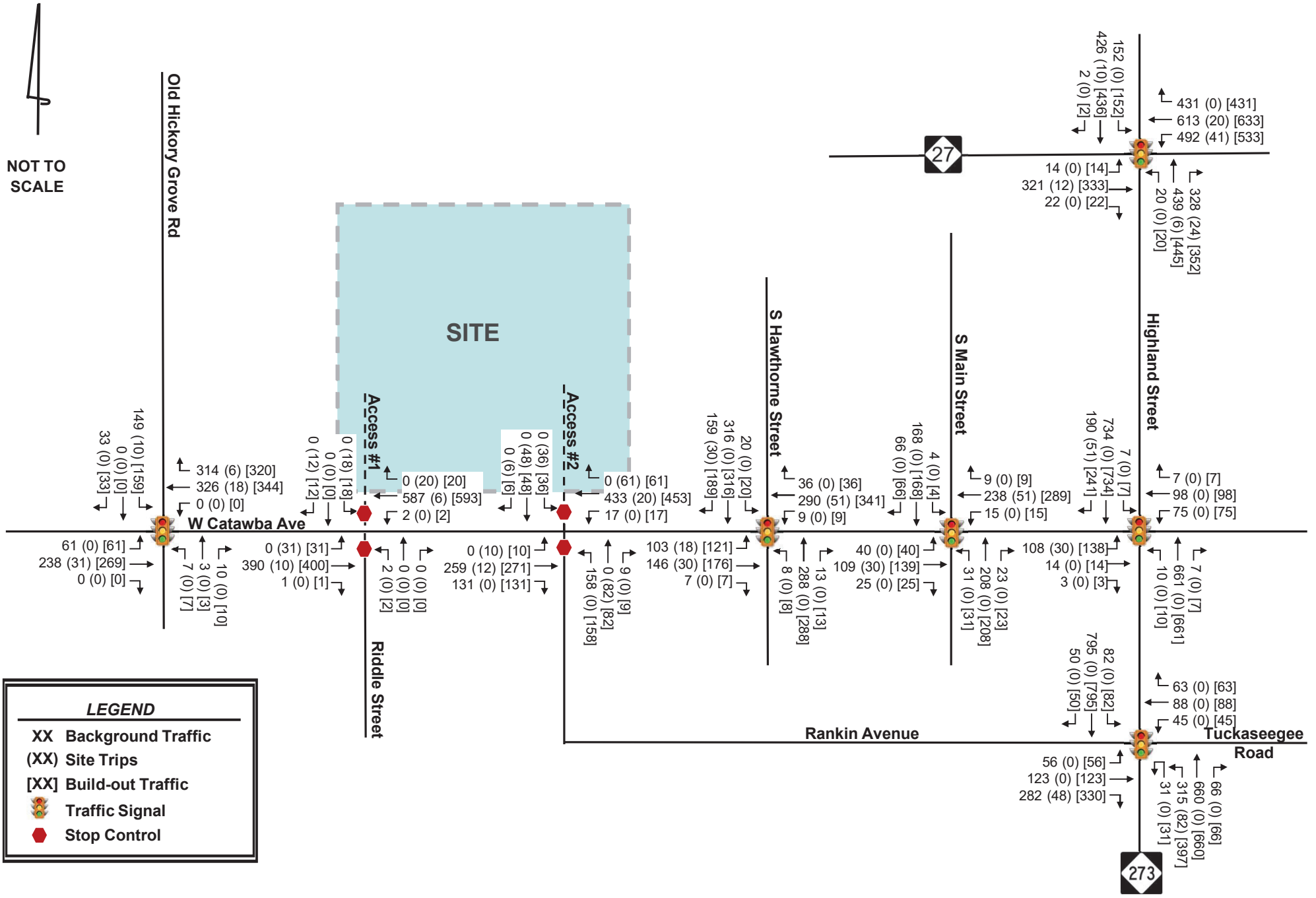
Intersection volume development worksheets for all intersections and driveways within the study network are provided in the **Appendix**.



Kimley»Horn	Holly Springs Traffic Impact Analysis Update	Site Traffic Distribution and Assignment	Figure 5.1



Kimley»Horn	Holly Springs Traffic Impact Analysis Update	2028 Build-out AM Peak-Hour Traffic Volumes	Figure 5.2



Kimley»Horn	Holly Springs Traffic Impact Analysis Update	2028 Build-out PM Peak-Hour Traffic Volumes	Figure 5.3

6.0 Vehicular Capacity Analysis

In accordance with the traffic study guidelines in the *NCDOT Policy on Street and Driveway Access to North Carolina Highways*, vehicular capacity analyses were performed at the study area intersections for each of the following AM and PM peak-hour scenarios:

- 2023 Existing Conditions
- 2028 Background Conditions
- 2028 Build-out Conditions

Vehicular capacity analyses were performed for the AM and PM peak hours using the Synchro Version 11 software to determine the operating characteristics at the signalized and stop-controlled intersections of the adjacent street network and to evaluate the impacts of the proposed development. Capacity is defined as the maximum number of vehicles that can pass over a particular road segment, or through a particular intersection, within a specified period of time under prevailing operational, geometric and controlling conditions within a set time duration. SIDRA 9 software was used to determine operating characteristics, level-of-service (LOS) and delay for the proposed roundabout at the W Catawba Avenue/Rankin Avenue/Access #2 intersection. SIDRA is typically used to analyze roundabout operations using a macroscopic model that uses gap acceptance and lane utilization to determine capacity, where capacity is based on the size of time gaps between vehicles that motorists choose when entering a roundabout. These software programs use methodologies contained in the *Highway Capacity Manual* (HCM) to determine the operating characteristics of an intersection.

The HCM defines LOS as a "quantitative stratification of a performance measure or measures representing quality of service" and is used to "translate complex numerical performance results into a simple A-F system representative of travelers' perceptions of the quality of service provided by a facility or service". The HCM defines six levels of service, LOS A through LOS F, with A having the best operating conditions from the traveler's perspective and F having the worst. However, it must be understood that "the LOS letter result hides much of the complexity of facility performance", and that "the appropriate LOS for a given system element in the community is a decision for local policy makers". According to the HCM, "for cost, environmental impact, and other reasons, roadways are typically designed not to provide LOS A conditions during peak periods but instead to provide some lower LOS that balances individual travelers' desires against society's desires and financial resources. Nevertheless, during low-volume periods of the day, a system element may operate at LOS A."

LOS for a two-way stop-controlled (TWSC) intersection is determined by the control delay and is reported for the side-street approaches, typically during the highest volume periods of the day, the AM and PM peak periods. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. With respect to field measurements, control delay is defined as the total elapsed time from the time a vehicle stops at the end of the queue to the time the vehicle departs from the stop line. It is typical for stop sign-controlled side streets and driveways intersecting major streets to experience long delays during peak hours, particularly for left-turn movements. The majority of the traffic moving through the intersection on the major street experiences little or no delay.

LOS for signalized intersections is reported for the intersection as a whole, and typically during the highest volume periods of the day, the AM and PM peak periods. One or more movements at an

intersection may experience a low level-of-service, while the intersection as a whole may operate acceptably.

LOS for roundabout intersections is also reported for the intersection as a whole, but uses the same control delay thresholds as the stop-controlled intersections. However, if the volume-to-capacity ratio on an approach of the intersection is greater than 1.0, that approach or intersection is reported as LOS F regardless of the reported control delay.

Table 6.0-A and **6.0-B** list the LOS control delay thresholds published in the HCM for unsignalized (TWSC and roundabout) and signalized intersections, respectively, as well as the unsignalized operational descriptions assumed herein.

Table 6.0-A
Vehicular LOS Control Delay Thresholds for Unsignalized Intersections

Level-of-Service	Average Control Delay per Vehicle [sec/veh]	
A	≤ 10	Short Delays
B	> 10 – 15	
C	> 15 – 25	
D	> 25 – 35	Moderate Delays
E	> 35 – 50	
F	> 50	Long Delays

Table 6.0-B
Vehicular LOS Control Delay Thresholds for Signalized Intersections

Level-of-Service	Average Control Delay per Vehicle [sec/veh]
A	≤ 10
B	> 10 – 20
C	> 20 – 35
D	> 35 – 55
E	> 55 – 80
F	> 80

NCDOT staff provided the signal geometric plans for the signalized study area intersections, which were used in the development of the existing conditions Synchro network. The cycle lengths and splits were optimized given the timing inputs in the existing conditions network and in accordance with NCDOT Congestion Management guidelines. Cycle lengths and splits were optimized under background conditions and build-out conditions. Signal geometric plans are included in the **Appendix.**

The following modifications from the background data collected were applied to the capacity analyses to meet NCDOT *Congestion Management Capacity Analysis Guidelines:*

- Right turn on red (RTOR) operations were not allowed (except as noted for the eastbound right-turn and northbound U-turn conflict, in which the right-turn overlap was eliminated and RTOR was allowed to avoid a conflict).

- Protected-only left-turn phasing was used for analysis of future operations where protected/permitted left-turn phasing exists.
- Lost time adjust was added to the yellow and all-red times provided in the existing signal plans to maintain a total lost time of 5 seconds for each movement.
- A minimum of 4 vehicles per hour were used for permissible movements excluding movements into and out of the proposed site.

A peak hour factor of 0.9 was assumed for all scenarios. Heavy-vehicle percentages collected with the counts were used for all scenarios, subject to a two-percent minimum.

Mitigation for vehicular traffic impacts caused by the proposed development were noted and identified based on NCDOT mitigation requirements. When determining the proposed development's traffic impact to the study area intersections, the 2028 build-out conditions were compared to the 2028 background conditions. Based on the *NCDOT Policy on Street and Driveway Access to North Carolina Highways*, "the applicant shall be required to identify mitigation improvements to the roadway network if at least one of the following conditions exists when comparing base network conditions to project conditions:

a) the total average delay at an intersection or individual approach increases by 25% or greater, while maintaining the same LOS,
b) the LOS degrades by at least one level,
c) or LOS is F

Capacity analysis reports generated by Synchro Version 11 software are included in the **Appendix**. Additionally, queuing and blocking reports generated by the SimTraffic microsimulation model are included in the **Appendix**.

6.1 OLD HICKORY GROVE ROAD AND W CATAWBA AVENUE

Table 6.1 summarizes the LOS, control delay (seconds) and 95th percentile queue lengths at the signalized intersection of Old Hickory Grove Road and W Catawba Avenue.

Table 6.1 - Old Hickory Grove Road and W Catawba Avenue						
Condition	Measure	EB	WB	NB	SB	Intersection
		EBLTR	WBLTR	NBLTR	SBLTR	LOS (Delay)
AM Peak Hour						
2023 Existing	LOS (Delay)	B (13.9)	B (13.8)	B (10.2)	B (18.4)	B (15.6)
	Synchro 95th Q	126'	121'	8'	148'	
2028 Background	LOS (Delay)	B (15.5)	B (15.4)	B (11.1)	B (19.9)	B (17.2)
	Synchro 95th Q	148'	142'	9'	180'	
2028 Build-out	LOS (Delay)	B (15.3)	B (16.0)	B (12.2)	C (21.3)	B (17.8)
	Synchro 95th Q	148'	159'	9'	192'	
PM Peak Hour						
2023 Existing	LOS (Delay)	A (7.0)	B (10.1)	B (18.1)	C (24.0)	B (11.7)
	Synchro 95th Q	86'	220'	21'	#119	
2028 Background	LOS (Delay)	A (8.0)	B (13.4)	B (19.7)	C (30.2)	B (14.8)
	Synchro 95th Q	98'	261'	22'	#148	
2028 Build-out	LOS (Delay)	A (8.3)	B (14.0)	C (20.3)	C (33.1)	B (15.6)
	Synchro 95th Q	110'	280'	22'	#159	

95th percentile volume exceeds capacity, queue may be longer

As shown in **Table 6.1**, the overall intersection is expected to operate at LOS B under all conditions analyzed. Therefore, no improvements are recommended.

It should be noted that based on the provided signal plans, the Mac Fab Machining and Fabrication Company driveway, which forms the northbound approach of this intersection, is not incorporated into the traffic signal. However, for the purposes of the capacity analyses, the northbound approach was modeled as a permitted phase in the traffic signal.

6.2 W CATAWBA AVENUE AND RIDDLE STREET/ACCESS #1

Table 6.2 summarizes the LOS, control delay (seconds) and 95th percentile queue lengths at the existing unsignalized, tee-intersection of W Catawba Avenue and Riddle Street. Access #1 is proposed to be constructed to create the fourth leg (southbound approach) of this intersection.

Table 6.2 - W Catawba Avenue and Riddle Street/Access #1

Condition	Measure	EB		WB		NB	SB
		EBL*	EBTR	WBL*	WBTR	NBLTR	SBLTR
AM Peak Hour							
2023 Existing	LOS (Delay)	-	A (0.0)	A (8.5)	A (0.0)	B (13.7)	-
	Synchro 95th Q	-	0'	0'	0'	3'	-
2028 Background	LOS (Delay)	-	A (0.0)	A (8.7)	A (0.0)	B (14.6)	-
	Synchro 95th Q	-	0'	0'	0'	3'	-
2028 Build-out	LOS (Delay)	A (7.9)	A (0.0)	A (8.7)	A (0.0)	C (16.8)	C (15.3)
	Synchro 95th Q	0'	0'	0'	0'	3'	10'
PM Peak Hour							
2023 Existing	LOS (Delay)	-	A (0.0)	A (8.1)	A (0.0)	B (14.6)	-
	Synchro 95th Q	-	0'	0'	0'	3'	-
2028 Background	LOS (Delay)	-	A (0.0)	A (8.2)	A (0.0)	C (15.8)	-
	Synchro 95th Q	-	0'	0'	0'	3'	-
2028 Build-out	LOS (Delay)	A (9.1)	A (0.0)	A (8.2)	A (0.0)	C (20.8)	C (21.1)
	Synchro 95th Q	3'	0'	0'	0'	3'	10'

*Conflicting left-turn movements are broken out per NCDOT guidelines under unsignalized conditions

As shown in **Table 6.2,** the stop-controlled northbound approach is expected to operate with short delays during both peak hours under all conditions analyzed. The proposed stop-controlled southbound approach is expected to operate with short delays during both peak hours under 2028 build-out conditions. Therefore, no improvements beyond the construction of Access #1 with a single egress lane and a single ingress lane with stop control are recommended for capacity purposes.

Based on review of SimTraffic maximum queues and NCDOT minimum requirements, a 100-foot IPS is recommended along Access #1. This appears to be provided in the site plan as shown in **Figure 3.2**.

Review of auxiliary turn-lane warrants at this intersection is included in **Section 7.0**.

6.3 W CATAWBA AVENUE AND RANKIN AVENUE/ACCESS #2

Table 6.3 summarizes the LOS, control delay (seconds) and 95th percentile queue lengths at the existing unsignalized tee-intersection of W Catawba Avenue and Rankin Avenue. Access #2 is proposed to be constructed to create the fourth leg (southbound approach) of this intersection.

Table 6.3 - W Catawba Avenue and Rankin Avenue/Access #2

Condition	Measure	EB			WB			NB		SB		Intersection	
		EBL*	EBT	EBR	WBL*	WBT	WBR	NBL	NBTR	SBL	SBTR	LOS (Delay)	V/C
AM Peak Hour													
2023 Existing	LOS (Delay)	-	A (0.0)		A (8.5)	A (0.0)	-	C (15.1)		-		-	-
	Synchro 95th Q	-	0'	-	0'	0'	-	-	10'	-	-		
2028 Background	LOS (Delay)	-	A (0.0)		A (8.7)	A (0.0)	-	C (16.4)		-		-	-
	Synchro 95th Q	-	0'	-	3'	0'	-	-	13'	-	-		
2028 Build-out	LOS (Delay)	A (7.8)	A (0.0)		A (8.8)	A (0.0)	-	D (28.2)		D (33.4)		-	-
	Synchro 95th Q	0'	0'	-	3'	0'	-	-	0'	-	78'		
2028 Build-out IMP Roundabout	LOS (Delay)	A (9.3)			A (4.9)			A (5.8)		A (5.2)		A (7.4)	0.54
	SIDRA 95th Q	-	102'	-	-	31'	-	-	12'	-	18'		
PM Peak Hour													
2023 Existing	LOS (Delay)	-	A (0.0)		A (8.1)	A (0.0)	-	C (23.5)		-		-	-
	Synchro 95th Q	-	0'	-	0'	0'	-	-	60'	-	-		
2028 Background	LOS (Delay)	-	A (0.0)		A (8.3)	A (0.0)	-	D (30.7)		-		-	-
	Synchro 95th Q	-	0'	-	3'	0'	-	-	85'	-	-		
2028 Build-out	LOS (Delay)	A (8.6)	A (0.0)		A (8.3)	A (0.0)	-	F (264.7)		E (44.8)		-	-
	Synchro 95th Q	0'	0'	-	3'	0'	-	-	0'	-	70'		
2028 Build-out IMP Roundabout	LOS (Delay)	A (6.6)			B (11.2)			A (6.9)		A (7.4)		A (8.6)	0.59
	SIDRA 95th Q	-	60'	-	-	144'	-	-	37'	-	16'		
2028 Build-out IMP Turn Lanes	LOS (Delay)	A (8.6)	A (0.0)		A (8.3)	A (0.0)		F (66.8)		D (28.9)		-	-
	Synchro 95th Q	0'	0'	0'	3'	0'	0'	175'	40'	25'	23'		

*Conflicting left-turn movements are broken out per NCDOT guidelines under unsignalized conditions

As shown in **Table 6.3,** the stop-controlled northbound approach of Rankin Avenue is expected to operate with short delays during the AM peak hour and moderate delays during the PM peak hour under background conditions.

The Holly Springs development plans to construct Access #2 to create the fourth leg of intersection. With the addition of this fourth leg and associated site traffic, the stop-controlled northbound approach of Rankin Avenue is expected to operate with moderate to long delays during both peak hours and the stop-controlled southbound approach of Access #2 is expected to operate with moderate delays during both peak hours. Note that these results under 2028 build-out reflect a single-lane southbound approach added to the existing intersection. Given the increase in delay expected to be caused by the proposed residential site, identification of mitigation improvements is required. The following options for laneage improvements were evaluated at this intersection to mitigate the increase in delay and accommodate the added leg and associated site traffic:

- Option 1 – TWSC with Turn Lanes
- Option 2 – Single-Lane Roundabout

Option 1 – TWSC with Turn Lanes

Given the long delays expected on the stop-controlled northbound approach in the PM peak hour, the following improvements were considered:

- Northbound left-turn lane along Rankin Avenue
- Southbound left-turn lane along Access #2
- Eastbound right-turn lane along W Catawba Avenue
- Westbound right-turn lane along W Catawba Avenue

With these improvements in place, the northbound approach of Rankin Avenue is expected to continue to operate with long delays during the controlling PM peak hour. Therefore, Option 2 was evaluated.

Option 2 – Single-Lane Roundabout

Based on input from the applicant (and shown on the site plan in **Figure 3.2**), previous coordination with NCDOT indicated that this proposed driveway connection would potentially be constructed as a single-lane roundabout upon build-out of the site. Therefore, a single-lane roundabout was also evaluated to mitigate the increase in delay and accommodate the added site traffic. With the conversion of the intersection to a single-lane roundabout, the overall intersection is expected to operate at LOS A during both peak hours with each approach operating at LOS B or better.

Therefore, it is recommended that a single-lane roundabout be constructed at this intersection.

Rankin Avenue is planned to be extended from W Catawba Avenue to the north to ultimately connect to NC 27 (Charlotte Avenue) by passing through the proposed site. When the planned Rankin Avenue Extension is constructed and extended north of Access #2, the Access #2 internal connection will be realigned on the adjacent property (by others) to achieve a 100' IPS, and a new connection from the site will be constructed at that time (by others) to connect to Rankin Avenue Extension approximately 1,900 feet north of W Catawba Avenue. This is shown in the sketch included in the **Appendix**.

6.4 NC 273 AND RANKIN AVENUE/TUCKASEEGEE ROAD

Table 6.4 summarizes the LOS, control delay (seconds) and 95th percentile queue lengths at the signalized intersection of NC 273 and Rankin Avenue/Tuckaseegee Road.

Table 6.4 - NC 273 (Highland Street) and Rankin Avenue/Tuckaseegee Road

Condition	Measure	EB			WB			NB		SB			Intersection
		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBTR	SBL	SBT	SBR	LOS (Delay)
AM Peak Hour													
2023 Existing	LOS (Delay)	C (28.5)			D (43.0)			C (23.5)		B (12.8)			C (21.7)
	Synchro 95th Q	94'	67'	113	36'	70'	58'	124'	97'	38'	245'	16'	
2028 Background	LOS (Delay)	C (33.3)			D (38.4)			C (24.8)		B (16.4)			C (24.5)
	Synchro 95th Q	95'	67'	157	37'	71'	57'	135'	124'	41'	317'	19'	
2028 Build-out	LOS (Delay)	C (33.0)			D (35.7)			C (26.7)		B (18.9)			C (26.0)
	Synchro 95th Q	91'	64'	185	35'	69'	54'	146'	134'	41'	344'	21'	
PM Peak Hour													
2023 Existing	LOS (Delay)	C (27.1)			D (47.0)			C (24.3)		B (18.1)			C (24.3)
	Synchro 95th Q	81'	148'	42'	69'	112'	68'	175'	190'	111'	245'	40'	
2028 Background	LOS (Delay)	C (26.8)			D (46.5)			C (25.0)		B (19.8)			C (25.1)
	Synchro 95th Q	86'	160'	43'	75'	119'	72'	190'	223'	119'	291'	45'	
2028 Build-out	LOS (Delay)	C (25.0)			D (46.5)			C (26.6)		C (21.7)			C (26.1)
	Synchro 95th Q	86'	160'	45'	75'	119'	72'	226'	223'	119'	311'	48'	
Background Storage		150'		75'	100'		150'	500'		150'		150'	

Exceeds storage

As shown in **Table 6.4,** the overall intersection is expected to operate at LOS C under all conditions analyzed. Therefore, no improvements are recommended for capacity purposes.

It is noted that the eastbound right-turn queue exceeds the available storage during the AM peak-hour under all studied scenarios. Given the queues are expected to exceed the available storage with and without the proposed development, and the addition of site traffic does not significantly impact queues, extension of this turn lane is not recommended as a developer improvement.

6.5 W CATAWBA AVENUE AND S HAWTHORNE STREET

Table 6.5 summarizes the LOS, control delay (seconds) and 95th percentile queue lengths at the signalized intersection of W Catawba Avenue and S Hawthorne Street.

Table 6.5 - W Catawba Avenue and S Hawthorne Street						
Condition	Measure	EB	WB	NB	SB	Intersection
		EBLTR	WBLTR	NBLTR	SBLTR	LOS (Delay)
AM Peak Hour						
2023 Existing	LOS (Delay)	C (23.6)	B (16.3)	B (11.2)	C (21.6)	B (19.3)
	Synchro 95th Q	177'	122'	96'	#333'	
2028 Background	LOS (Delay)	C (30.4)	B (17.2)	B (11.7)	C (26.3)	C (23.1)
	Synchro 95th Q	#238'	135'	106'	#388'	
2028 Build-out	LOS (Delay)	D (37.1)	B (16.4)	B (13.7)	C (34.4)	C (28.6)
	Synchro 95th Q	#317'	145'	119'	#436'	
PM Peak Hour						
2023 Existing	LOS (Delay)	B (18.4)	B (17.3)	B (11.7)	B (16.3)	B (15.9)
	Synchro 95th Q	132'	161'	120'	213'	
2028 Background	LOS (Delay)	C (20.5)	B (18.0)	B (12.8)	B (19.1)	B (17.7)
	Synchro 95th Q	148'	174'	138'	255'	
2028 Build-out	LOS (Delay)	C (27.9)	B (18.9)	B (13.8)	C (23.4)	C (21.2)
	Synchro 95th Q	#216'	200'	143'	#332'	

95th percentile volume exceeds capacity, queue may be longer

Table 6.5 shows the overall intersection is expected to operate at LOS C or better under all conditions analyzed. Therefore, no improvements are recommended.

6.6 CATAWBA AVENUE AND S MAIN STREET

Table 6.6 summarizes the LOS, control delay (seconds) and 95th percentile queue lengths at the signalized intersection of Catawba Avenue and S Main Street.

Table 6.6 - W Catawba Avenue and S Main Street						
Condition	Measure	EB	WB	NB	SB	Intersection
		EBLTR	WBLTR	NBLTR	SBLTR	LOS (Delay)
AM Peak Hour						
2023 Existing	LOS (Delay)	B (12.4)	A (9.1)	A (8.5)	A (8.8)	B (10.0)
	Synchro 95th Q	60'	34'	42'	52'	
2028 Background	LOS (Delay)	B (12.7)	A (9.2)	A (9.1)	A (9.5)	B (10.5)
	Synchro 95th Q	71'	39'	50'	62'	
2028 Build-out	LOS (Delay)	B (13.0)	A (9.0)	B (10.1)	B (10.5)	B (11.1)
	Synchro 95th Q	88'	44'	55'	68'	
PM Peak Hour						
2023 Existing	LOS (Delay)	B (10.2)	B (11.3)	A (9.0)	A (8.7)	A (9.8)
	Synchro 95th Q	55'	78'	77'	70'	
2028 Background	LOS (Delay)	B (11.1)	B (12.5)	B (11.4)	B (10.6)	B (11.5)
	Synchro 95th Q	65'	93'	93'	83'	
2028 Build-out	LOS (Delay)	B (11.2)	B (13.2)	B (12.4)	B (11.5)	B (12.2)
	Synchro 95th Q	76'	115'	103'	91'	

As shown in **Table 6.6,** the overall intersection is expected to operate at LOS B or better under all conditions analyzed. Therefore, no improvements are recommended.

6.7 NC 273 (HIGHLAND STREET) AND W CATAWBA AVENUE

Table 6.7 summarizes the LOS, control delay (seconds) and 95th percentile queue lengths at the signalized intersection of NC 273 (Highland Street) and W Catawba Avenue.

Table 6.7 - NC 273 (Highland Street) at W Catawba Avenue							
Condition	Measure	EB	WB	NB	SB		Intersection
		EBLTR	WBLTR	NBLTR	SBLT	SBR	LOS (Delay)
AM Peak Hour							
2023 Existing	LOS (Delay)	C (20.2)	B (13.8)	A (7.0)	B (12.5)		B (11.9)
	Synchro 95th Q	105'	20'	66'	#310'	42'	
2028 Background	LOS (Delay)	C (23.8)	B (14.4)	A (7.6)	B (17.5)		B (15.3)
	Synchro 95th Q	116'	21'	75'	#421'	47'	
2028 Build-out	LOS (Delay)	C (26.6)	B (14.2)	A (8.4)	B (19.9)		B (17.6)
	Synchro 95th Q	147'	21'	75'	#421'	53'	
PM Peak Hour							
2023 Existing	LOS (Delay)	B (19.1)	B (19.1)	A (6.7)	B 12.0)		B (11.3)
	Synchro 95th Q	72'	95'	95'	#381'	61'	
2028 Background	LOS (Delay)	C (23.7)	C (23.1)	A (7.6)	B (16.8)		B (14.6)
	Synchro 95th Q	88'	116'	115'	#475'	72'	
2028 Build-out	LOS (Delay)	C (25.5)	C (21.6)	A (7.3)	B (13.7)		B (13.2)
	Synchro 95th Q	109'	115'	121'	#490'	96'	

95th percentile volume exceeds capacity, queue may be longer

As shown in **Table 6.7**, the overall intersection is expected to operate at LOS B under all conditions analyzed. Therefore, no improvements are recommended.

6.8 NC 27 (CHARLOTTE AVENUE) AND NC 273 (HIGHLAND STREET)

Table 6.8 summarizes the LOS, control delay and 95th percentile queue lengths at the signalized intersection of NC 27 (Charlotte Avenue) and NC 273 (Highland Street).

Table 6.8 - NC 27 (Charlotte Avenue) and NC 273 (Highland Street)										
Condition	Measure	EB		WB		NB		SB		Intersection
		EBL	EBTR	WBL	WBTR	NBL	NBTR	SBL	SBTR	LOS (Delay)
AM Peak Hour										
2023 Existing	LOS (Delay)	D (54.9)		D (36.1)		D (49.2)		D (39.6)		D (44.8)
	Synchro 95th Q	14'	#401'	#280'	151'	55'	283'	#429'	191'	
2028 Background	LOS (Delay)	E (74.7)		E (57.7)		E (63.2)		D (51.6)		E (61.3)
	Synchro 95th Q	15'	#491'	#402'	167'	63'	#362'	#530'	241'	
2028 Build-out	LOS (Delay)	F (84.5)		D (53.7)		E (71.7)		E (57.6)		E (66.8)
	Synchro 95th Q	14'	#511'	#406'	165'	63'	#432'	#542'	249'	
PM Peak Hour										
2023 Existing	LOS (Delay)	E (56.4)		C (33.1)		D (45.2)		D (35.7)		D (39.0)
	Synchro 95th Q	21'	#205'	#484'	419'	41'	362'	#214'	172'	
2028 Background	LOS (Delay)	E (75.4)		D (40.9)		E (57.3)		D (47.7)		D (49.8)
	Synchro 95th Q	23'	#252'	#633'	452'	44'	#451'	#267'	201'	
2028 Build-out	LOS (Delay)	F (85.7)		D (43.3)		E (62.5)		D (54.6)		D (54.6)
	Synchro 95th Q	23'	#264'	#699'	457'	44'	#481'	#278'	208'	
Background Storage		175'		150'		85'		375'		

Exceeds storage

95th percentile volume exceeds capacity, queue may be longer

As shown in **Table 6.8,** the overall intersection is expected to operate at LOS E during the AM peak hour and LOS D during the PM peak hour under background conditions. When the proposed site traffic is added to the background volumes, the overall intersection is expected to continue to operate at LOS E during the AM peak hour and LOS D during the PM peak hour under build-out conditions. However, the delay is expected to increase, and several approaches are shown to be negatively impacted by the proposed site with either an expected degradation in LOS or an increase in delay when comparing background to build-out conditions. Given the operational impacts caused by the proposed residential site, consideration of mitigation improvements is required.

Figures 5.2 and **5.3** show 394 and 352 northbound right-turn vehiles from NC 273 (Highland Street) onto NC 27 (Charlotte Avenue) during the AM and PM peak hours, respecitviely, without an exclusive right-turn lane. Given this, the construction of a northbound right-turn lane was considered. With this improvement in place, the site traffic impact is mitigated with all approaches expected to operate at LOS E or better during both peak hours. However, as shown in the image to the right which is a view looking northbound towards the signalized intersection, widening of the northbound approach of NC 273 (Highland Street) is constrained by the existing railroad bridge just south of the intersection.

Figures 5.2 and **5.3** also show that the site traffic comprises of less than 4% of the intersection volume and Table 6.8 shows an overall delay increase of approximately 5 seconds during both peak hours. Considering the relatively small portion of the traffic volumes at this intersection contributable to the proposed site and delay increase with the extent of impacts required to install this improvement, a northbound right-turn lane is not recommended to be installed at this intersection as mitigation.

7.0 Auxiliary Turn-Lane Warrants

Warrants for additional turn-lane improvements for unsignalized intersections beyond those necessary for capacity were determined based on a review of the figure titled 'Warrant for Left and Right-Turn Lanes' found on page 80 in the *NCDOT Policy On Street And Driveway Access to North Carolina Highways*. Based on review of turn-lane warrant figures, no turn-lane improvements are warranted for site specific movements at the study intersections of W Catawba Avenue/Riddle Street/Access #1 or W Catawba Avenue/Rankin Avenue/Access #2. NCDOT turn-lane warrant graphs are included in the **Appendix**.

8.0 Mitigation Improvements

Based on the vehicular analyses performed at each of the identified study intersections, along with review of the auxiliary turn-lane warrants contained herein, the following improvements are identified to mitigate the impact of the proposed development on the surrounding transportation infrastructure:

W Catawba Avenue and Riddle Street/Access #1

- Single southbound egress and single ingress lane with stop control along Access #1
- 100-foot IPS along Access #1

W Catawba Avenue and Rankin Avenue/Access #2

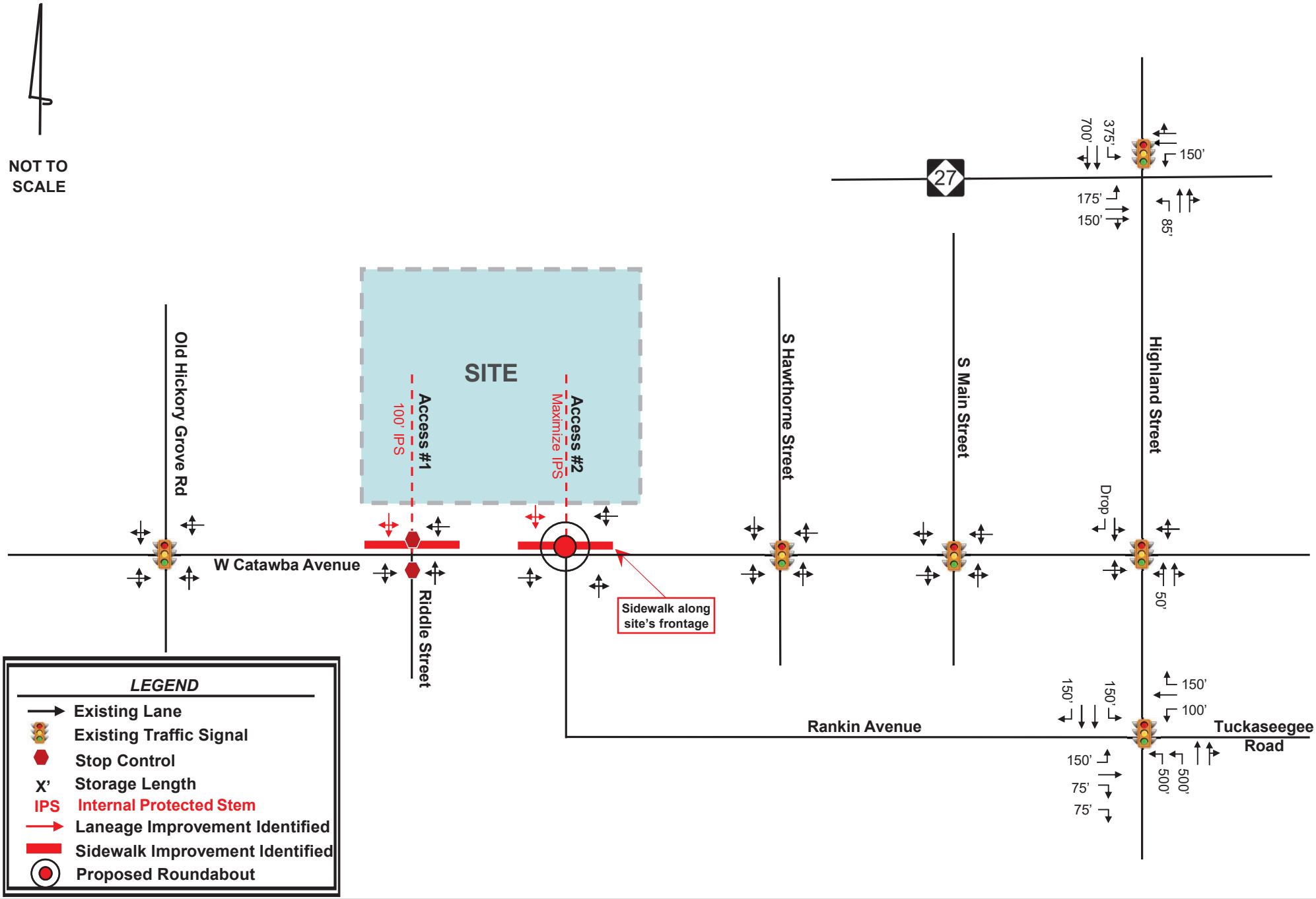
- Construction of a single lane roundabout
- Single southbound egress and single ingress lane along Access #2
- Maximize the IPS along Access #2

Rankin Avenue is planned to be extended from W Catawba Avenue to the north to ultimately connect to NC 27 by passing through the proposed site. When the planned Rankin Avenue Extension is constructed and extended north of Access #2, the Access #2 internal connection will be realigned on the adjacent property (by others) to achieve a 100-foot IPS, and a new connection from the site will be constructed at that time (by others) to connect to Rankin Avenue Extension approximately 1,900 feet north of W Catawba Avenue. The rezoning plan has been reviewed by Gaston-Cleveland-Lincoln Metropolitan Planning Organization (GCLMPO) staff per the provided letter included in the **Appendix**. A sketch showing the anticipated realignment is also included in the **Appendix**.

Study Area Pedestrian and Bicycle Improvements

- Sidewalk along the north side of W Catawba Avenue along the site's property frontage.
- Greenway/multi-use path through proposed site to stub and connect to future greenway/multi-use path connections.

The mitigation improvements identified within the study area are shown in **Figure 8.1**. The improvements shown on this figure are subject to approval by NCDOT and Gaston County. All additions and attachments to the public roadway system shall be properly permitted, designed and constructed in conformance to standards maintained by the agencies. The site-civil engineer is responsible for confirming that the proposed access points meet current sight distance standards.



Kimley»Horn	Holly Springs Traffic Impact Analysis Update	Identified Mitigation Improvements	Figure 8.1

Appendix

NCDOT Scoping Checklist

NCDOT Traffic Impact Analysis Need Screening / Scoping Request

TIA Need Screening → TIA Scoping → TIA Submittal

A Traffic Impact Analysis (TIA) may be required for developments based on the site trip generation estimates, site context, or at the discretion of the NCDOT District Engineer. The Applicant or the TIA Consultant shall submit this form along with the site plan to the District Engineer to determine the TIA need and, if a TIA is required, initiate the TIA scoping process. Without an approved scope, the TIA is incomplete and will be rejected until the study is revised to conform to NCDOT's TIA requirements.

Project Name: Holly Springs TIA Update **Previous Name:** If Applicable Hunter's Ridge
Location: NE of W Catawba/Old Hickory Grove Road **County:** Gaston **Municipality:**
Project Description: TIA update using 2019 trip generation with 372 total homes: 272 single-family and 100 townhomes (2023 updated density of 275 total homes: 191 single-family and 84 townhomes).

Project Contact:	Applicant	TIA Consultant
Company Name		Kimley-Horn
Contact Person	Thomas W. Springs III	Amy Massey
Phone Number	704-827-7791	704-287-3304
Email		amy.massey@kimley-horn.com
Mailing Address	400 W. Catawba Ave	580 Kingsley Park Drive Suite 125
	Mt. Holly, NC 28210	Fort Mill, SC 27915

Site Plan Prepared By: R. Joe Harris & Associates, Inc. **Site Plan Date:** July 7, 2023
See site plan/vicinity map requirements on page 2.
Parcel Size: 138.0 Acre(s) **Anticipated Build-Out Year:** 2028

Weekday Site Trip Generation - Do NOT adjust for mode split, pass-by, internal capture, or diverted trips.

ITE LUC	Proposed Land Use	Size	Unit	Daily Trips	Peak Hour Type	AM Peak Hour Trips			PM Peak Hour Trips			Data Source
						Enter	Exit	Total	Enter	Exit	Total	
210	Single-Family	272	DU	2611	Adj. Street	50	148	198	167	98	265	ITE Equation
221	Townhomes	100	DU	715	Adj. Street	11	37	48	37	22	59	ITE Equation
Total		372	DU	3326		61	185	246	204	120	324	

Refer to the current *NCDOT Congestion Management Capacity Analysis Guidelines* for acceptable trip calculation methods and data sources.
**Explain local or other data sources, if used: ITE 10th Edition data from 2019 TIA

☒ The estimated site trips meet NCDOT's TIA trip threshold of 3,000 daily trips.
☒ The estimated site trips meet the municipal TIA trip threshold of 1,000 daily trips, 100 peak hour trips
☐ This project is located in a known STIP and/ or local CIP project #
☒ This project includes a rezoning request.

☐ The proposed site access is located within 1,000 feet of an interchange.

☐ The Applicant requests for a new or modified control-of-access break.

☐ The Applicant requests for a new or modified median break.

Applicant's Signature	Print Name	Date

Site Plan/Vicinity Map Requirement for TIA Need Screening: While the site plan may not be finalized during the TIA scoping stage, the graphic representation of the proposed development shall provide adequate details on the development scope and context. More specifically, the site plan/map shall clearly show the location and type of each access point, spacing to adjacent and opposing driveways or intersections, internal street network, proposed buildings/parcels with their anticipated uses and sizes at full build-out and, if applicable, any nearby interstate, US, NC or Secondary Roads (SR).

Project Name: Holly Springs TIA Update **Project Reference Number:** _____

☒ **A TIA is Required by the Local Government.** In addition, the study area is expected to include NCDOT maintained transportation facilities.

☒ **A TIA is Required by NCDOT,** per the *Policy on Street and Driveway Access to North Carolina Highways*.

If either or both of the boxes above are checked, the Applicant/TIA Consultant is hereby requested to fill out as much as possible of the following TIA scoping checklist, and return it along with the supporting documents to NCDOT prior to the scoping meeting.

☐ **A TIA is NOT required**. This decision is based on the development information presented above. Changes in the development plan will require re-evaluation of the TIA need, and may necessitate a TIA. The Applicant should inform the District Engineer of any significant changes in a timely fashion to avoid delays or rejections of the driveway permit / encroachment agreement applications.

Additional Comments:

The TIA need decision is made by the NCDOT Division ____ District____ on _____.

_____ _____

NCDOT District Representative's Signature | Print Name

Email concurrence may be used in lieu of the signature.

NCDOT TIA Scoping Checklist

TIA Need Screening → TIA Scoping → TIA Submittal

Project Name: Holly Springs TIA Update **TIA Scoping Date:** 8/17/23

☒ **TIA Need Screening Forms are Attached.** Project Reference #: _____ Decision Date: _____

☒ **Site Plan and Access**

☒ Provide a site plan illustrating site access, internal and external roadways, buildings and land uses.
Refer to NCDOT's *Policy on Street and Driveway Access to North Carolina Highways* pages 14 and 15 for site plan requirements.

☒ Identify site access.

New Access	On Road	Access Type		Driveway Spacing		
	Road Name	Permitted Movements	Traffic Control	Distance (ft)	Direction	Nearest Intersection / Access
Access A	W Catawba Ave	Conventional Full-Mvmt	2-Way Stop	0		Riddle St
Access B	W Catawba Ave	Conventional Full-Mvmt	2-Way Stop	0		Rankin Ave
Access C						
Access D						
Access E						
Access F						
Access G						
Access H						

Existing Access	Existing Intersection of		Access Modification	**Proposed Interconnectivity** (If Applicable)		
	Road A	Road B		Connector #	Road Connected	Adjacent Development
Access 1				Connector 1		
Access 2				Connector 2		
Access 3				Connector 3		
Access 4				Connector 4		

☐ Additional access clarifications and provisions (e.g., proposed control-of-access or median breaks, modifications of existing access, loading/unloading area access, bike/pedestrian accommodation).

☐

Proposed K-12 School Site

☐ NCDOT MSTA School Traffic Calculator for _____ shall be used.

☐ Peak Hour Factors (PHFs) shall be adjusted/weighted for new school trips (0.5 PHF by default).

☐ Internal school circulation analysis is required, and should be submitted in advance or concurrent with the TIA submittal.

☐ Clarify traffic operation plans (e.g. traffic circulation pattern, pedestrian access, drop-off/pick-up zone location and configuration, queue storage area and, if applicable, staggered start times).

☒ Trip Generation

The TIA Consultant shall prepare trip generation estimates following the current *NCDOT Congestion Management Capacity Analysis Guidelines*, and submit the calculation sheets and supporting information to the District Engineer for approval prior to capacity analysis.

ITE LUC	Proposed Land Use	Size	Unit	Daily Trips	Peak Hour Type	AM Peak Hour Trips			PM Peak Hour Trips			Data Source
						Enter	Exit	Total	Enter	Exit	Total	
210	Single-Family	272	DU	2611	Adj. Street	50	148	198	167	98	265	ITE Equation
221	Townhomes	100	DU	715	Adj. Street	11	37	48	37	22	59	ITE Equation
Unadjusted Site Trips				3326		61	185	246	204	120	324	
Internal Capture Trips (Attach Calculation Sheets)												
Internal Capture % of Unadjusted Site Trips				%		%			%			
LUC	Proposed Land Use	Any Internal Trips?		Pass-By % of External Trips								
				%		%			%			
				%		%			%			
				%		%			%			
				%		%			%			
				%		%			%			
Pass-By Trips (Attach Calculation Sheets)												
Adjacent Street Volumes												
Non-Pass-By Primary Trips				3326		61	185	246	204	120	324	
Diverted Trips, if Applicable and Justifiable												

**Explain local or other data sources, if used:

ITE 10th Edition data from 2019 TIA

☐ Existing Site Trip Information for Redevelopment Projects (Attach separate sheets as needed)

ITE LUC	Existing Land Use	Size	Unit	Daily Trips	Peak Hour Type	AM Peak Hour Trips			PM Peak Hour Trips			Data Source
						Enter	Exit	Total	Enter	Exit	Total	
Total Existing Site Trips												

☒ **Trip Distribution**

☒ Trip distribution diagrams are submitted concurrently with this document (attach separate sheets).

☐ Trip distribution diagrams will be submitted separately, along with supporting information, to the District Engineer for review and approval prior to capacity analysis. The trip distribution shall be based on the current and anticipated traffic patterns, as well as instructions noted below.

If required by the District Engineer, the following additional diagrams shall also be submitted:

☐ Mixed-Use Developments (separate diagrams for residential, commercial, and office trips)

☐ Inter-Development Trips (if 'internal" trips cross public streets)

☐ Pass-By Trips

☐ Diverted Trips

☐ Each Analysis Period

☐ **Mode Split**

☐ Provide Data Source and Justification

Mode / Period	Auto		
AM Peak	%	%	%
PM Peak	%	%	%
Daily	%	%	%
	%	%	%

☐ Identify proper infrastructure and accommodation for other modes of travel.

☒ **Analysis Peak Periods:**

☒ Weekday AM Peak 6:30-8:30

☒ Weekday PM Peak 2:00-7:00

☐ Weekday Midday Peak _____

☐ Weekday PM School Peak _____

☐ Weekend _____ Peak _____

☐ Other _____

☒ Study Area Intersections and Data Collection

The study area shall include the site access intersections (both new and existing) identified under "Site Plan and Access" on page 1, as well as the following external and, if applicable, internal intersections.

External Intersection	Intersection of		Traffic Control	Intersection Turning Movement Counts			Notes
	Road A	Road B		New / Existing	Date of Counts	Growth Adjustment	
#1	Old Hickory	W Catawba Ave	Signal	Use Existing Counts	05/19/22	2%	
#2	W Catawba Ave	Riddle St	2-Way Stop	Use Existing Counts	05/19/22	2%	*
#3	W Catawba Ave	Rankin Ave	2-Way Stop	Use Existing Counts	05/19/22	2%	
#4	NC 273	Rankin Ave	Signal	Use Existing Counts	05/19/22	2%	
#5	S Hawthorne St	W Catawba Ave	Signal	Use Existing Counts	05/19/22	2%	
#6	S Main St	W Catawba Ave	Signal	Use Existing Counts	05/19/22	2%	
#7	NC 273	W Catawba Ave	Signal	Use Existing Counts	05/19/22	2%	
#8	NC 273	NC 27	Signal	Use Existing Counts	05/19/22	2%	
#9							
#10							
#11							
#12							

Internal Intersection	Intersection of		Access Type		Intersection Spacing		
	Road A	Road B	Traffic Control	Permitted Movements	Distance (ft)	Direction	Nearest Intersection
#101							
#102							
#103							
#104							
#105							

The following data will be collected:

☐ New traffic turning movement counts in ☐ 15-min intervals ☐ 5-min intervals (near schools)
Unless otherwise noted above, new traffic counts shall be collected at the existing study intersections during the analysis periods. Weekday counts shall avoid Mondays, Fridays, holidays, school breaks, road closures, and major weather events.

☐ To account for the impact of existing and/or proposed school traffic, PHFs will be adjusted for:

intersections numbered: _____

and access points numbered: _____

☐ Traffic Forecast Data for TIP: _____

☒ Roadway/Intersection Configuration & Traffic Control

☒ Traffic Signal Phasing & Timing Data

☐ Crash Data: _____ Period: _____

☒ Other:

*A 2022 TMC was not collected at W Catawba Ave/Riddle St but was collected at W Catawba Ave/Legion Rd. Considering the close proximity of the intersections, and both roadways terminate with dead ends, the Legion Rd counts are to be used at Riddle St.

☒ Future Year Conditions

☒ Project Build-Out Year: 2028

☒ Future Analysis Year(s): 2028

☐ Identify below any funded/committed future transportation improvements, as well as any approved but incomplete developments near the site.

Funded STIP / Local CIP Project	Project Description	Year Complete
None		

Nearby Approved Development	Location	Future Land Use (exclude any completed phases)	Committed Improvements
None			

☒ Annual Growth Factor: 2 %

Justification/Data Source: 2019 TIA

☐ Local Comprehensive Transportation Plan Compliance

☐ Identify Applicable Local Transportation Planning Documents

☐ Identify Applicable Roadways inside the Study Area

Road Name	Classification	Speed Limit	Proposed Cross-Section	Proposed Right-of-Way	Compliance Requirements	Affect Study Intersection #

☒ Study Method

The traffic analysis shall follow the current *NCDOT Congestion Management Capacity Analysis Guidelines*, *Policy on Street and Driveway Access to North Carolina Highways*, and use the current approved version of analysis software (e.g. Synchro/SimTraffic, HCS, Sidra Intersection, TransModeler).

The study shall include the following analysis scenarios for each analysis period.

1. Existing Conditions
2. Future No-Build Conditions (existing + background growth + approved developments + committed or funded improvements)
3. Future Build Conditions (future no-build + site trips)
4. Future Build with Improvements Conditions (future build traffic with improvements to mitigate the proposed development's impacts) and, if applicable:

☐ 5. TIP Design Year Analysis _____

☐ 6. Alternative Access Scenario (without proposed control-of-access or median break / modification)

The following additional analysis/outputs should be provided as warranted:

☐ Signal Warrant Analysis for accesses/intersections _____
☐ Multi-Modal Level of Service Analysis
☐ School Loading Zone Traffic Simulation
☐ Phasing Analysis (scope separately as needed)
☐ Safety/Crash Analysis
☐ Control-of-Access Modification Justification
☐ Median Break / Modification Justification
☐ Other _____

☒ Submittals

In addition to the hardcopies required below, the TIA Consultant shall provide the District Engineer and, if required, the local government an electronic copy of the study documents, including the latest site plan, figures and appendices, in searchable PDF files and the original traffic analysis files (e.g., Synchro, HCS). To expedite review, the NCDOT electronic submittals shall also be delivered concurrently to:

☐ Div. Traffic Engr ☐ Regional Traffic Engr ☐ Congestion Management ☐ Other _____

Submittals	NCDOT		Local Government	
	Electronic	Hardcopy	Electronic	Hardcopy
Trip Generation & Distribution	Required			
Draft TIA Report	Required			
Final Sealed TIA Report	Required			

☐ **Additional Comments (**municipal TIA requirements, approved variations from NCDOT guidelines)

Agreement by All Parties

The undersigned agree to the contents and methodology described above for completing the required traffic impact analysis for the proposed development identified herein. Any changes to the above methodology contemplated by the Applicant or the TIA Consultant must be submitted to the District Engineer in writing. If approved by NCDOT, then such changes may be accepted for the TIA report. Subsequent revisions to the development plan (e.g. land use, density, site access, or schedule) may require additional scoping and analysis, and may modify the TIA requirements.

This agreement shall become effective on the date approved by NCDOT, and shall expire____ months after the effective date or upon significant changes to the roadway network and/or development assumptions, whichever occurs first. Once expired, renewal or re-scoping will be required for subsequent TIA submittals.

APPLICANT

_____	_____	_____
Signature	Print Name	Date

TIA CONSULTANT

_____	_____	_____
Signature	Print Name	Date

LOCAL GOVERNMENT REPRESENTATIVE (If Applicable)

_____	_____	_____
Signature	Print Name	Date

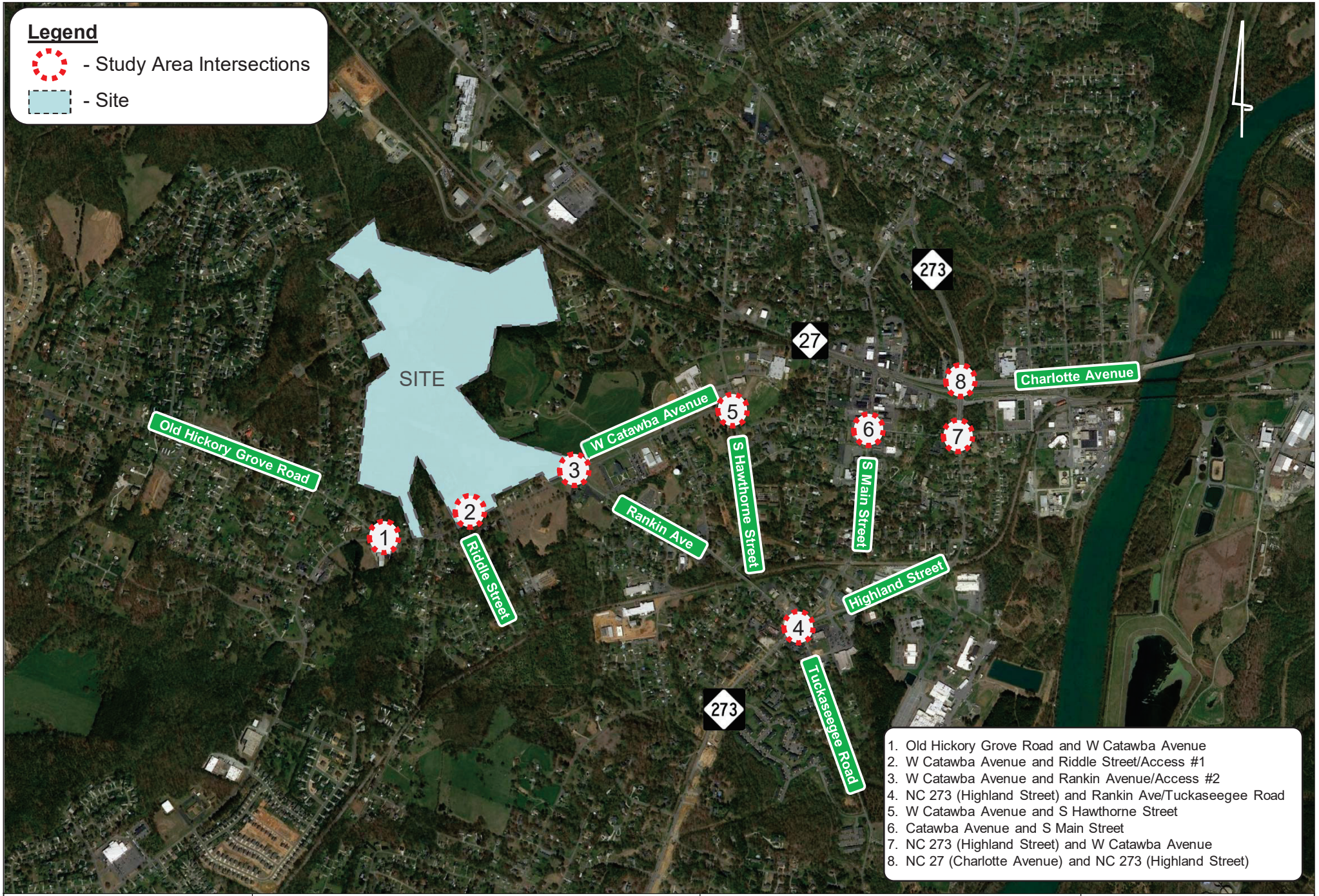
Email concurrence may be used in lieu of the signature.

NCDOT DISTRICT REPRESENTATIVE

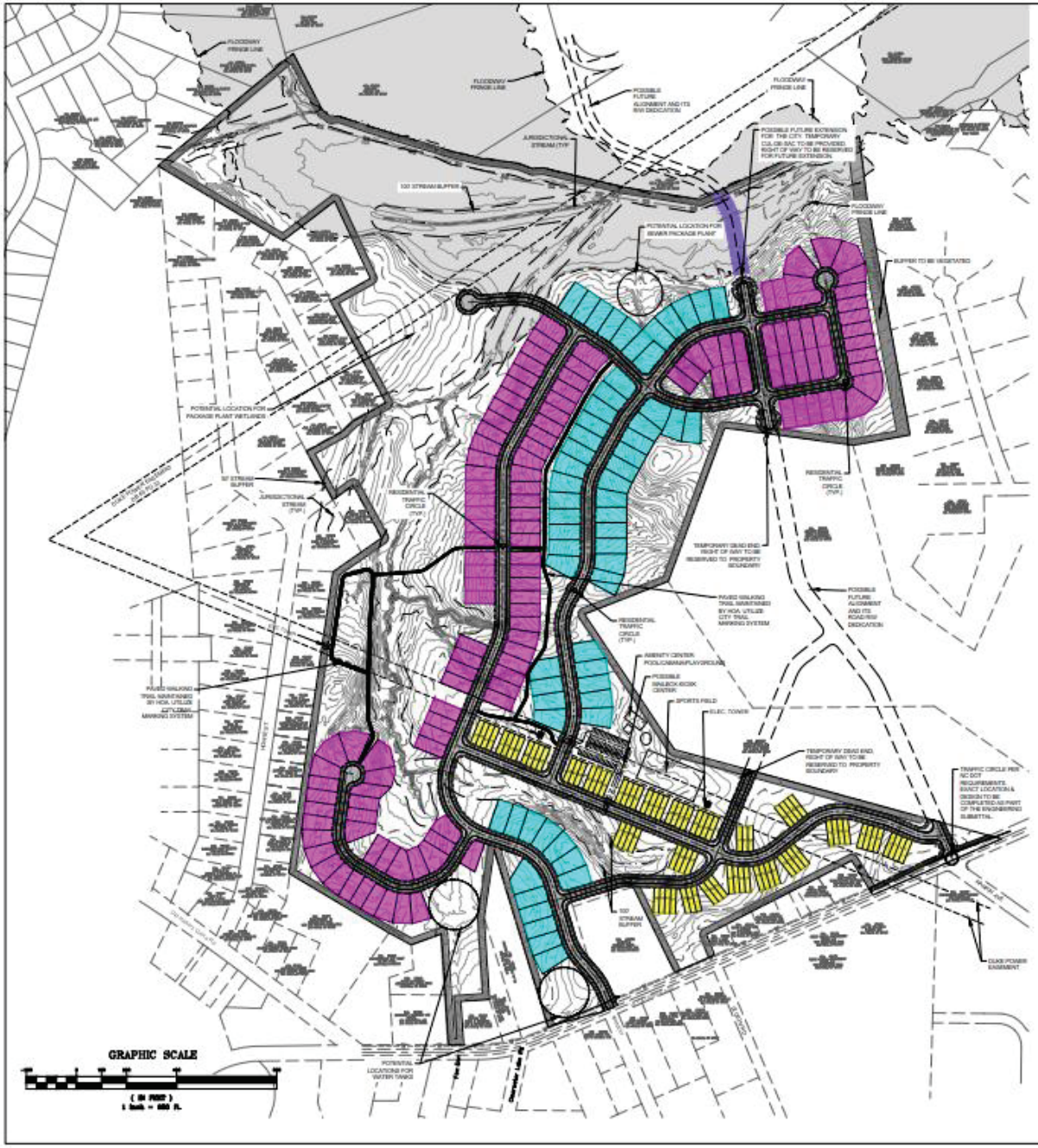
Reviewed and approved by the NCDOT Division ____District ____ on _____.

_____	_____
Signature	Print Name

Email concurrence may be used in lieu of the signature.



Kimley»Horn	**Holly Springs** **Traffic Impact Analysis Update**	**Study Area/Site Location**	**Figure 1**



VICINITY MAP - N.T.S.

SITE DATA

TAX PARCEL NOs:	181314, 180592, 202690, 181227, 202122, 226686, 199264, 181225, 210290
TOTAL SITE AREA:	138.0+/- AC.
ADDRESS:	W. CATAWBA AVENUE, MT. HOLLY, NC
EXIST. ZONING:	R-1 (COUNTY)
PROPOSED ZONING:	CONDITIONAL DISTRICT – PRD

DEVELOPMENT DATA

WATERSHED DISTRICT:	LAKE WYLIE WATERSHED (WITH WSIV PROTECTED – AU07)	
MAXIMUM ALLOWED BUILD AREA:	24% (33.12 ACRES, 1,442,707 SF)	
PAVEMENT:	304,262 SF	
CURB AND GUTTER:	49,831 SF	
SIDEWALK:	119,533 SF	
WALKING TRAILS:	34,127 SF	
PACKAGE PLANT:	25,000 SF	
TOTAL IMPERVIOUS:	509,753 SF	
REMAINDER:	908,020 SF	
	AVE IMPERVIOUS	TOTAL IMPERVIOUS
TH'S (22'x80' PAD, DRIVE, SW)	1,738 SF	145,992 SF
52' LOTS (40'x60' PAD, DRIVE, SW)	3,170 SF	412,100 SF
62' LOTS (50'x60' PAD, DRIVE, SW)	3,770 SF	228,970 SF
ALL HOUSE TYPES	2,865 SF	788,063 SF
		119,658 SF (REMAINDER)
TOTAL LOTS SHOWN:	5F 52' WIDE (MIN) – 130 LOTS 5F 62' WIDE (MIN) – 61 LOTS TH 20' WIDE (MIN) – 84 LOTS TOTAL 275 LOTS	
DENSITY PROPOSED:	1.99 LOTS/AC.	
AREA IN COS/ENVIRONMENTAL:	65+/- AC.	
USABLE ACREAGE:	73+/- AC.	

LOT SIZING:

DETACHED PRODUCT:	
LOT WIDTH:	52 FT. (MEASURED AT SETBACK LINE)
MIN. LOT SIZE:	6,200 SF MIN.
NUMBER OF LOTS:	130 (47% OF TOTAL)
LOT WIDTH:	62 FT. (MEASURED AT SETBACK LINE)
MIN. LOT SIZE:	7,200 SF MIN.
NUMBER OF LOTS:	61 (22% OF TOTAL)
ATTACHED PRODUCT:	
MIN. BLDG WIDTH:	20 FT.
MIN. LOT SIZE:	1,800 SF MIN.
NUMBER OF LOTS:	84 (31% OF TOTAL)

MINIMUM SETBACKS AND YARDS DETACHED PRODUCT:

FRONT SETBACK:	20 FT. (FROM ROW)
SIDE YARD:	6 FT.
CORNER SETBACK:	10 FT. (FROM ROW)
REAR YARD:	25 FT.
BUILDING HEIGHT:	35 FT. (MEASURED AT FRONT SETBACK)** **35' (TO THE HIGHEST POINT OF STRUCTURE MEASURED AT THE FRONT SETBACK) IF BUILDING HEIGHT IS MORE THAN 35' THEN FRONT AND SIDE YARD SETBACKS WILL HAVE TO BE INCREASED A MINIMUM OF 1' FOR EVERY 2' VERTICAL ABOVE 35' IN HEIGHT.

MINIMUM SETBACKS AND YARDS ATTACHED PRODUCT:

FRONT SETBACK:	20 FT. (FROM ROW)
SIDE YARD:	20 FT. BETWEEN BUILDINGS
CORNER SETBACK:	10 FT. (FROM ROW)
REAR YARD:	10 FT.
BUILDING HEIGHT:	35 FT. (MEASURED AT FRONT SETBACK)** **35' (TO THE HIGHEST POINT OF STRUCTURE MEASURED AT THE FRONT SETBACK) IF BUILDING HEIGHT IS MORE THAN 35' THEN FRONT AND SIDE YARD SETBACKS WILL HAVE TO BE INCREASED A MINIMUM OF 1' FOR EVERY 2' VERTICAL ABOVE 35' IN HEIGHT.

TOTAL COS REQUIRED:	20% (27.6 AC.)
TOTAL COS SHOWN:	COMBINATION OF ACTIVE AND PASSIVE OPEN SPACE OF 75.86 AC. (54.97%)
EXIST. TREE AREA:	91.04 AC.
TREE SAVE REQUIRED:	30% (27.31 ac.)

SEE SHEET C-2.0 FOR TECHNICAL NOTES & CONDITIONS

SURVEY INFORMATION:
1. SITE SURVEY PROVIDED BY CHRIS FAULK, PLS.
2. SITE CONSTRUCTION DOCUMENTS PROVIDED ARE BASED UPON THE ACCURACY OF THE SURVEY INFORMATION FURNISHED BY THE OWNER.
3. CONTRACTOR TO FIELD VERIFY ALL POINTS OF CONNECTION FOR DRIVES, PARKING LOTS, STORM DRAINAGE, ETC. PRIOR TO CONSTRUCTION. IN THE EVENT ANY DISCREPANCIES ARE NOTED IN THE FIELD, PLEASE CONTACT THE PROJECT ENGINEER IMMEDIATELY PRIOR TO CONTINUING WITH ANY CONSTRUCTION.

LEGEND:
Floodway/Fringe Line
Project Boundary
TOWNHOMES
62 FOOT LOTS
52 FOOT LOTS
FUTURE ROW RESERVATION

DATE	ISSUED FOR	REV
07/06/2023	First Rezoning Submittal to Gaston County	0

NORTH CAROLINA 811 — Know what's below. Call before you dig.

Engineer:
R. Joe Harris & Associates, Inc.
Engineering ■ Land Surveying ■ Planning Management
www.rjoeharris.com

This drawing shall not be used for construction purposes until the seal and signature of the responsible registered engineer on the drawing, and proper permit forms and related files are transmitted by the Owner, Owner's Agent or Contractor to the Authority having jurisdiction.

FOR INFORMATION ONLY

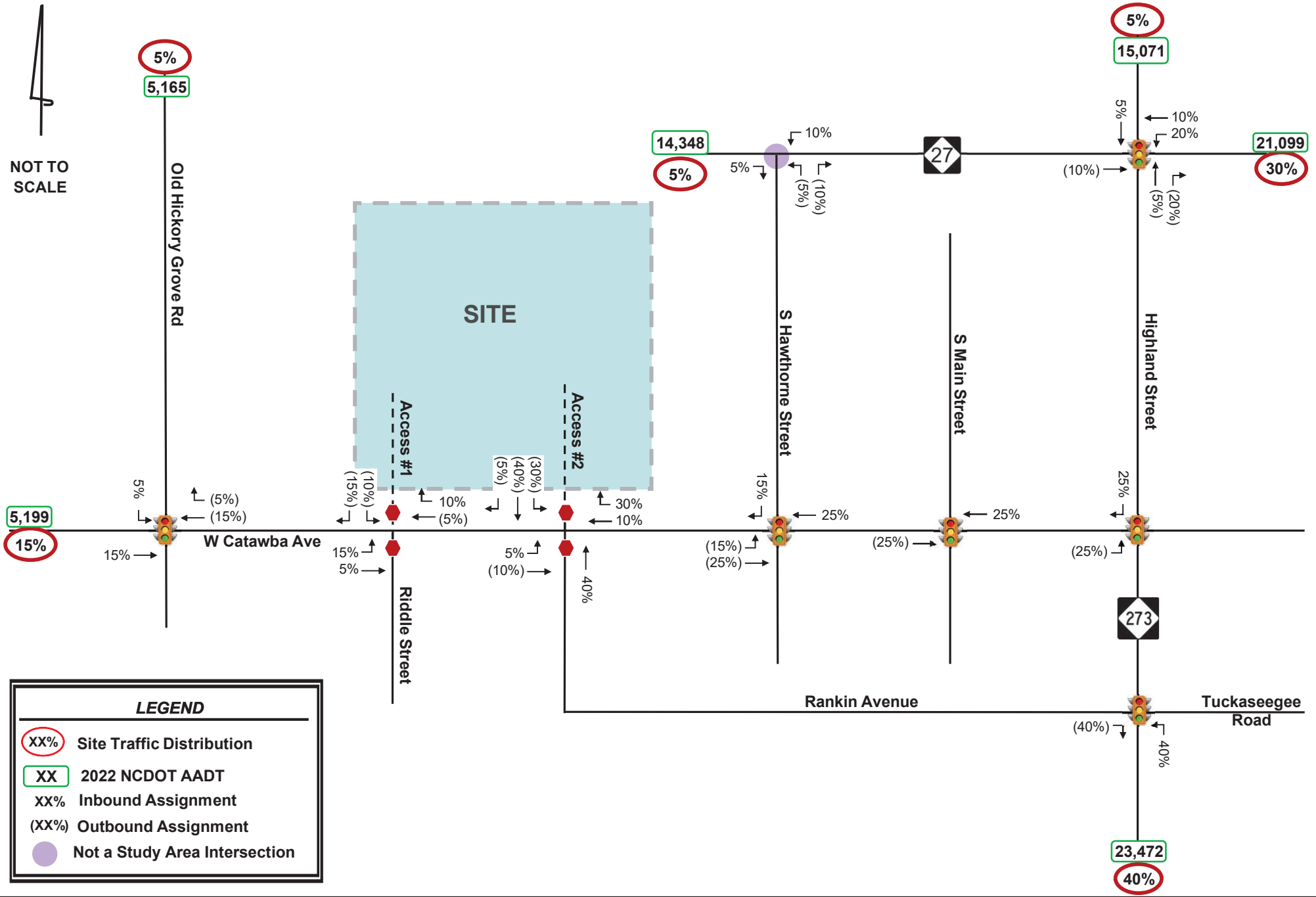
Project Manager | Drawn
Department Manager | Checked
Print Plot Date: July 7, 2023
Submit Drawn | Submit Date

Client:
Tom Springs
400 W. CATAWBA AVE
MT. HOLLY, NORTH CAROLINA 28120
P: (704) 827-7791

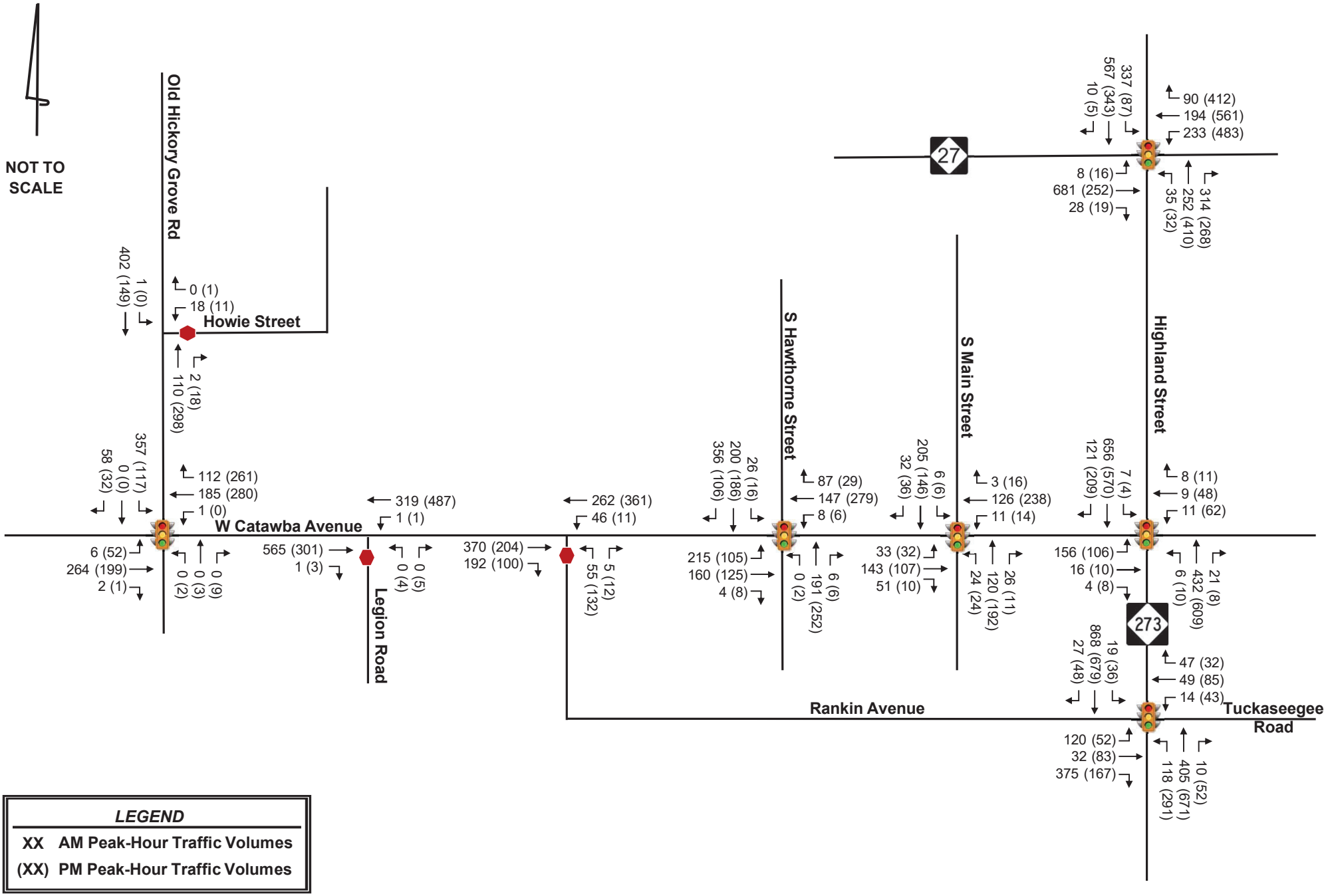
Project:
Holly Springs

Drawing Title:
Rezoning Site Plan

Project No.: 4793
Drawing No.: C-2.0



Kimley»Horn	Holly Springs Traffic Impact Analysis Update	Site Traffic Distribution and Assignment	Figure 3



Kimley»Horn	Hunter's Ridge Traffic Impact Analysis	2018 Existing Traffic Volumes	Figure 4

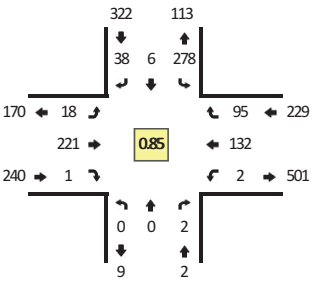
Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

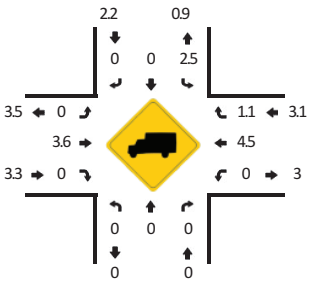
LOCATION: Old Hickory Grove Rd -- W Catawba Ave
CITY/STATE: Gaston, NC

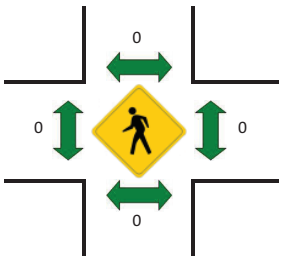
QC JOB #: 15825803
DATE: Thu, May 19 2022

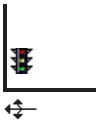
Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:15 AM -- 7:30 AM

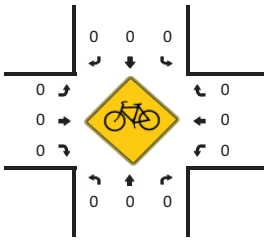


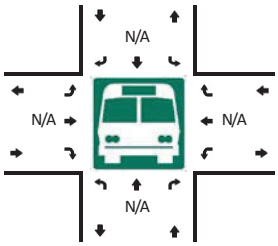
Quality Counts
DATA THAT DRIVES COMMUNITIES

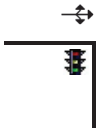


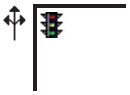


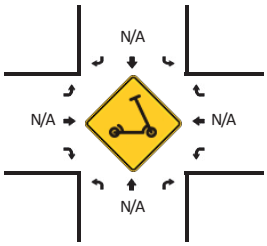












15-Min Count Period Beginning At	Old Hickory Grove Rd (Northbound)				Old Hickory Grove Rd (Southbound)				W Catawba Ave (Eastbound)				W Catawba Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:30 AM	0	0	1	0	56	1	10	0	1	38	2	0	1	17	8	0	135	
6:45 AM	0	0	0	0	74	1	11	0	2	43	1	0	0	18	5	0	155	
7:00 AM	0	0	1	0	71	1	13	0	5	58	1	0	0	27	8	0	185	
7:15 AM	0	0	1	0	85	3	10	0	5	58	0	0	0	35	36	0	233	708
7:30 AM	0	0	0	0	71	1	5	0	4	54	0	0	1	42	32	0	210	783
7:45 AM	0	0	0	0	51	1	10	0	4	51	0	0	1	28	19	0	165	793
8:00 AM	1	0	0	0	63	1	11	0	5	38	2	0	0	33	27	0	181	789
8:15 AM	0	0	0	0	35	0	9	0	6	52	0	0	0	34	22	0	158	714

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	4	0	340	12	40	0	20	232	0	0	0	140	144	0	932
Heavy Trucks	0	0	0		12	0	0		0	4	0		0	8	0		24
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 5/30/2022 9:41 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

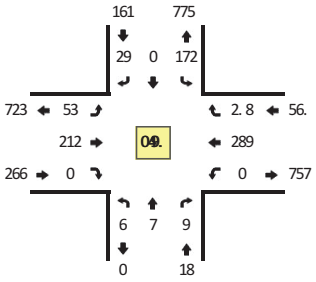
Type of peak hour being reported: Intersection Peak

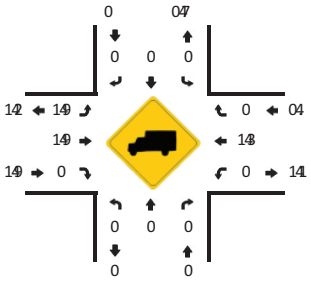
Method for determining peak hour: Total Entering Volume

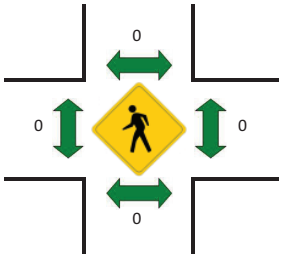
LOCATION: Old Hickory Grove Rd -- W Catawba Ave
CITY/STATE: Gaston, NC

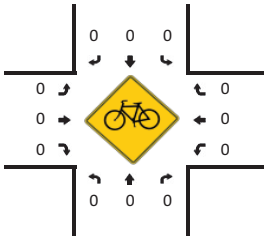
QC JOB #: 15825803
DATE: Thu, May 19 2022

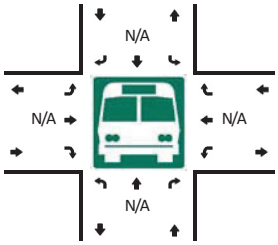
Peak-Hour: 3:70 PM -- 5:70 PM
Peak 15-Min: 3:70 PM -- 3:35 PM

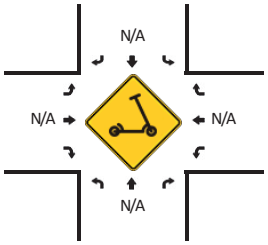












15-Min Count Period Beginning At	Old Hickory Grove Rd (Northbound)				Old Hickory Grove Rd (Southbound)				W Catawba Ave (Eastbound)				W Catawba Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
2:00 PM	0	0	1	0	7.	1	6	0	8	73	0	0	0	28	72	0	13.	
2:15 PM	0	0	1	0	76	0	8	0	16	78	0	0	1	7.	75	0	1. 2	
2:70 PM	0	0	0	0	28	0	9	0	17	50	0	0	0	56	6.	0	227	
2:35 PM	0	0	1	0	75	0	1	0	9	37	0	0	2	59	37	0	197	. 75
7:00 PM	1	0	2	0	78	0	6	0	9	77	0	0	2	67	33	0	198	. 86
7:15 PM	0	1	0	0	70	0	11	0	13	56	0	0	1	52	75	0	200	813
7:70 PM	0	0	0	0	75	0	.	0	13	63	0	0	0	. 7	69	0	262	857
7:35 PM	0	0	0	0	30	0	6	0	13	38	0	0	0	6.	. 6	0	251	911
3:00 PM	1	0	1	0	71	0	11	0	19	25	0	0	0	66	52	0	206	919
3:15 PM	2	1	2	0	28	0	12	0	5	51	1	0	2	60	35	0	209	928
3:70 PM	5	2	.	0	70	0	9	0	1.	60	0	0	0	6.	67	0	260	926
3:35 PM	1	1	1	0	75	0	6	0	12	50	0	0	0	69	80	0	255	970
5:00 PM	0	0	1	0	71	0	.	0	11	5.	0	0	0	. .	. 0	0	253	9. 8
5:15 PM	0	0	0	0	76	0	.	0	13	35	0	0	0	. 6	65	0	237	1012
5:70 PM	0	0	1	0	79	0	.	0	8	33	0	0	1	58	. 1	0	229	981
5:35 PM	0	0	2	0	50	0	8	0	12	7.	0	0	1	6.	60	0	27.	967
6:00 PM	0	0	0	0	32	0	.	0	8	32	0	0	0	66	57	0	218	92.
6:15 PM	0	0	0	0	78	0	6	0	.	39	0	0	0	32	37	0	185	869
6:70 PM	0	0	0	0	33	0	10	0	11	28	0	0	0	79	36	0	1. 8	818
6:35 PM	1	0	0	0	29	0	10	0	5	70	1	0	0	76	59	0	1. 1	. 52

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	20	8	28	0	120	0	76	0	68	230	0	0	0	268	252	0	1030
Heavy Trucks	0	0	0		0	0	0		0	3	0		0	0	0		3
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 5/70/2022 9:31 AM

SOURCE: Quality Counts, LLC (http://www4ualitycounts4net) 1-8. . -580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: Legion Hd G6v CataR ba Hd

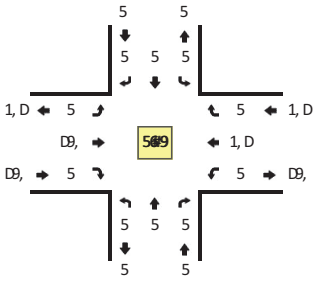
CIT820TATE: 3astonYNC

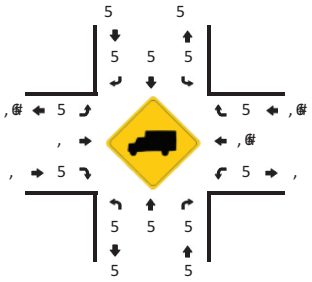
- C WOwQ: J B#1B#5B

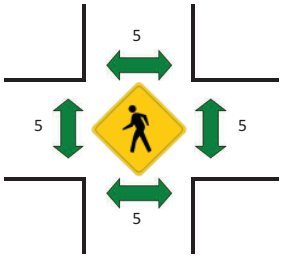
/ ATE: ThuYMay J S 1511

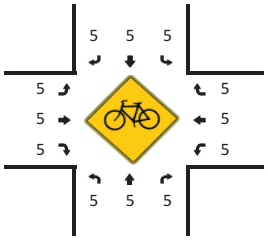
PeakG7 our: 9:55 AM GG#:55 AM

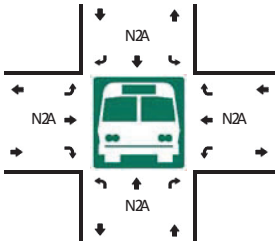
Peak J BGMin: 9:J B AM GG9:, 5 AM

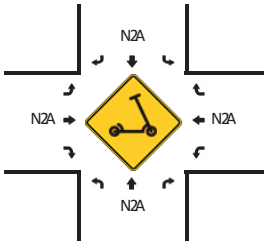












J BGMin Count Period weginning At	Legion Hd .Northbound4				Legion Hd .0outhbound4				v CataR ba Hd .Eastbound4				v CataR ba Hd .v estbound4				Total	7 ourly Totals
	Left	Thru	Hight	(	Left	Thru	Hight	(	Left	Thru	Hight	(	Left	Thru	Hight	(		
) :, 5 AM	5	5	J	5	5	5	5	5	5	SB	5	5	5	19	5	5	J 1,	
) :DB AM	5	5	5	5	5	5	5	5	5	J J 1	5	5	5	11	5	5	J , D	
9:55 AM	5	5	5	5	5	5	5	5	5	J 1D	5	5	5	, B	5	5	J BS	
9:J B AM	5	5	5	5	5	5	5	5	5	J , ,	5	5	5	95	5	5	15,	) J S
9:, 5 AM	5	5	5	5	5	5	5	5	5	J 1,	5	5	5	9)	5	5	J SS	) SB
9:DB AM	5	5	5	5	5	5	5	5	5	S,	5	5	5	B,	5	5	J D)	959
#:55 AM	5	5	5	5	5	5	5	5	5	#9	5	5	5	) J	5	5	J D#	) S)
#:J B AM	5	5	5	5	5	5	5	5	5	##	5	5	5	BD	5	5	J D1	) , B

Peak J BGMin UloR rates	Northbound				0outhbound				Eastbound				v estbound				Total
	Left	Thru	Hight	(	Left	Thru	Hight	(	Left	Thru	Hight	(	Left	Thru	Hight	(	
All Vehicles	5	5	5	5	5	5	5	5	5	B, 1	5	5	5	1#5	5	5	#J 1
7 eaFy Trucks	5	5	5		5	5	5		5	J)	5		5	J 1	5		1#
wuses																	
Pedestrians		5				5				5				5			5
wicycles	5	5	5		5	5	5		5	5	5		5	5	5		5
0cooters																	

Comments:

Heport generated on B2, 521511 S:DJ AM

0O(HCE: - uality CountsYLLC .http:22R R R 6quality counts6net4J G#99GB#5G11J 1

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: Legion Hd G&v CataR ba Hd

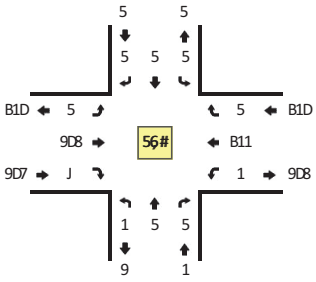
CIT203TATE: Y aston/NC

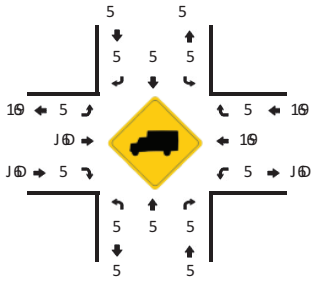
- C W0wQ: J B#1B#58

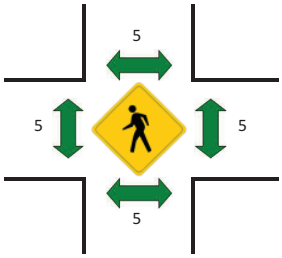
S ATE: Thu/May J , 1511

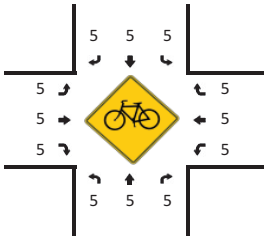
PeakG our: D:95 PM GGB:95 PM

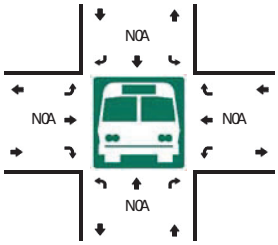
Peak J BGMin: D:95 PM GGD:DB PM

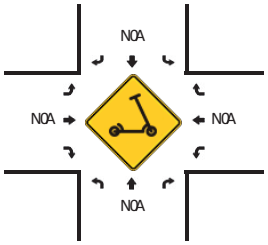












J BGMin Count Period weginning At	Legion Hd 4Northbound(				Legion Hd 4Bouthbound(				v CataR ba Hd 4Eastbound(				v CataR ba Hd 4v estbound(				Total	. ourly Totals
	Left	Thru	Hight	)	Left	Thru	Hight	)	Left	Thru	Hight	)	Left	Thru	Hight	)		
1:55 PM	5	5	5	5	5	5	5	5	5	75	5	5	5	B#	5	5	J 1#	
1:J B PM	5	5	5	5	5	5	5	5	5	8B	J	5	5	8D	5	5	J 95	
1:95 PM	5	5	J	5	5	5	5	5	5	7,	J	5	5	J J J	5	5	J , 1	
1:DB PM	5	5	5	5	5	5	5	5	5	88	5	5	J	, 7	5	5	J 8D	8J D
9:55 PM	5	5	5	5	5	5	5	5	5	7J	5	5	5	J J J	5	5	J #1	88#
9:J B PM	5	5	5	5	5	5	5	5	5	#5	5	5	5	#B	5	5	J 8B	759
9:95 PM	J	5	5	5	5	5	5	5	5	, #	5	5	5	J B1	5	5	1BJ	781
9:DB PM	5	5	5	5	5	5	5	5	5	7,	5	5	5	J 98	5	5	1J B	#J 9
D:55 PM	5	5	5	5	5	5	5	5	5	B8	5	5	5	J J #	5	5	J 7D	#5B
D:J B PM	5	5	5	5	5	5	5	5	5	7B	5	5	5	J 58	5	5	J #J	#1J
D:95 PM	5	5	5	5	5	5	5	5	5	J 5D	5	5	J	J J #	5	5	119	7, 9
D:DB PM	5	5	5	5	5	5	5	5	5	#5	J	5	5	J 97	5	5	1J #	7, 8
B:55 PM	J	5	5	5	5	5	5	5	5	#B	5	5	J	J 98	5	5	119	#DB
B:J B PM	J	5	5	5	5	5	5	5	5	77	5	5	5	J 9J	5	5	15,	#79
B:95 PM	5	5	5	5	5	5	5	5	5	#J	5	5	5	J 18	5	5	157	#B7
B:DB PM	J	5	5	5	5	5	5	5	5	#7	J	5	5	J J ,	5	5	15#	#D7
8:55 PM	5	5	5	5	5	5	5	5	5	#1	5	5	5	J J 9	5	5	J , B	#J ,
8:J B PM	5	5	5	5	5	5	5	5	5	#J	J	5	5	#9	5	5	J 8B	77B
8:95 PM	J	5	5	5	5	5	5	5	5	8B	5	5	1	7,	5	5	J D7	7J B
8:DB PM	J	5	5	5	5	5	5	5	5	8J	5	5	5	#5	5	5	J D1	8D,

Peak J BGMin UoR rates	Northbound				3outhbound				Eastbound				v estbound				Total
	Left	Thru	Hight	)	Left	Thru	Hight	)	Left	Thru	Hight	)	Left	Thru	Hight	)	
All Vehicles	5	5	5	5	5	5	5	5	5	DJ 8	5	5	D	D71	5	5	#, 1
. eaFy Trucks wuses	5	5	5		5	5	5		5	D	5		5	J 1	5		J 8
Pedestrians		5				5				5				5			5
wicycles 3cooters	5	5	5		5	5	5		5	5	5		5	5	5		5

Comments:

Heport generated on B09501511 , :DJ AM

3O) HCE: - uality Counts/LLC 4http:00R R R 6qualitycounts6net(J G#77GB#5G11J 1

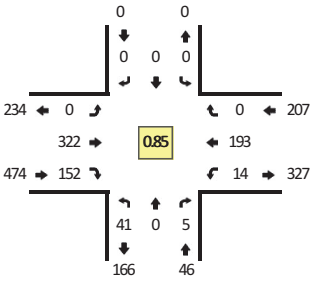
Type of peak hour being reported: Intersection Peak

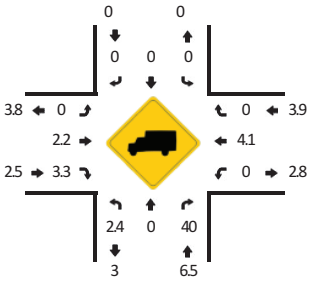
Method for determining peak hour: Total Entering Volume

LOCATION: Rankin Ave -- W Catawba Ave
CITY/STATE: Mount Holly, NC

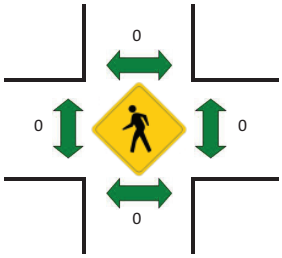
QC JOB #: 15825807
DATE: Thu, May 19 2022

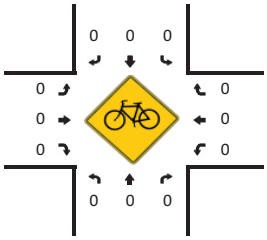
Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:15 AM -- 7:30 AM

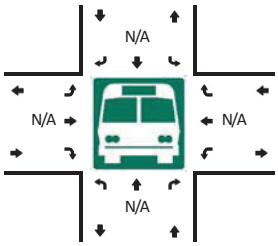


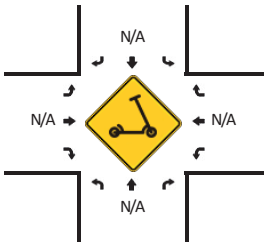


Quality Counts
DATA THAT DRIVES COMMUNITIES









15-Min Count Period Beginning At	Rankin Ave (Northbound)				Rankin Ave (Southbound)				W Catawba Ave (Eastbound)				W Catawba Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:30 AM	10	0	2	0	0	0	0	0	0	45	48	0	1	17	0	0	123	
6:45 AM	7	0	2	0	0	0	0	0	0	70	43	0	0	16	0	0	138	
7:00 AM	9	0	3	0	0	0	0	0	0	93	33	0	0	25	0	0	163	
7:15 AM	10	0	0	0	0	0	0	0	0	90	45	0	5	65	0	0	215	639
7:30 AM	13	0	2	0	0	0	0	0	0	76	44	0	4	60	0	0	199	715
7:45 AM	9	0	0	0	0	0	0	0	0	63	30	0	5	43	0	0	150	727
8:00 AM	11	0	2	0	0	0	0	0	0	62	27	0	1	49	0	0	152	716
8:15 AM	14	0	1	0	0	0	0	0	0	64	20	0	1	40	0	0	140	641

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	40	0	0	0	0	0	0	0	0	360	180	0	20	260	0	0	860
Heavy Trucks	0	0	0		0	0	0		0	8	8		0	12	0		28
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 5/30/2022 9:41 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: Rankin Ave -- W Catawba Ave

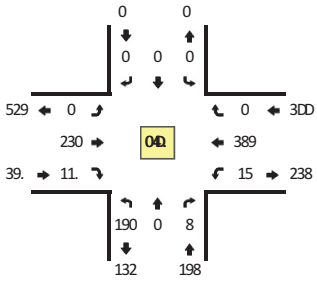
QC JOB #: 15825808

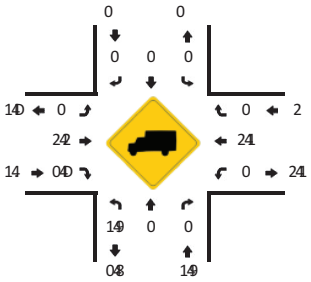
CIT7Y/TATE: Mount S ollyHNC

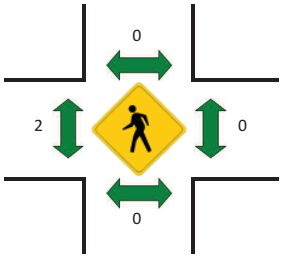
, ATE: ThuHMay 1D 2022

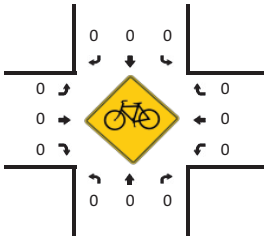
Peak-S our: 9:30 PM -- 5:30 PM

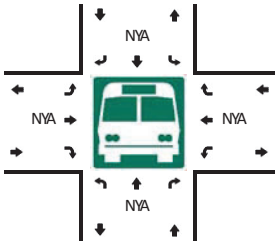
Peak 15-Min: 5:00 PM -- 5:15 PM

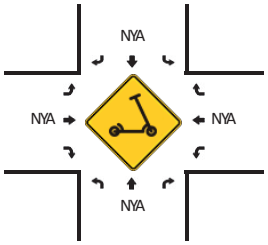












15-Min Count Period Beginning At	Rankin Ave 6Northbound(			)	Rankin Ave 6/outhbound(			)	W Catawba Ave 6Eastbound(			)	W Catawba Ave 6Westbound(			)	Total	S ourly Totals
	Left	Thru	Right		Left	Thru	Right		Left	Thru	Right		Left	Thru	Right			
2:00 PM	19	0	3	0	0	0	0	0	0	9.	25	0	2	99	0	0	135	
2:15 PM	12	0	0	0	0	0	0	0	0	9.	1D	0	2	53	0	0	133	
2:30 PM	23	0	2	0	0	0	0	0	0	U0	1D	0	5	D0	0	0	1DD	
2:95 PM	21	0	0	0	0	0	0	0	0	90	25	0	3	. U	0	0	1U5	U32
3:00 PM	33	0	1	1	0	0	0	0	0	59	18	0	5	81	0	0	1D3	UD0
3:15 PM	2.	0	3	0	0	0	0	0	0	U0	20	0	1	U0	0	0	1. 1	. 28
3:30 PM	3.	0	3	1	0	0	0	0	0	. 1	25	0	U	11.	0	0	2U0	. 8D
3:95 PM	92	0	1	0	0	0	0	0	0	53	25	0	2	D1	0	0	219	838
9:00 PM	25	0	1	0	0	0	0	0	0	38	20	0	9	DU	0	0	189	82D
9:15 PM	20	0	1	0	0	0	0	0	0	53	20	0	2	83	0	0	1. D	83.
9:30 PM	33	0	2	0	0	0	0	0	0	. 5	31	0	2	8U	0	0	22D	80U
9:95 PM	3U	0	0	0	0	0	0	0	0	52	28	0	U	102	0	0	229	81U
5:00 PM	90	0	9	0	0	0	0	0	0	59	39	0	3	DU	0	0	231	8U3
5:15 PM	31	0	2	0	0	0	0	0	0	9D	29	0	9	100	0	0	210	8D9
5:30 PM	39	0	2	0	0	0	0	0	0	5.	2U	0	5	D1	0	0	215	880
5:95 PM	31	0	2	0	0	0	0	0	0	51	33	0	2	8.	0	0	20U	8U2
U:00 PM	32	0	U	0	0	0	0	0	0	92	90	0	2	89	0	0	20U	83.
U:15 PM	30	0	5	0	0	0	0	0	0	99	3U	0	1	59	0	0	1. 0	. D.
U:30 PM	29	0	0	0	0	0	0	0	0	3U	32	0	3	53	0	0	198	. 30
U:95 PM	39	0	2	0	0	0	0	0	0	25	39	0	2	59	0	0	151	U. 5

Peak 15-Min Flowrates	Northbound			)	/outhbound			)	Eastbound			)	Westbound			)	Total
	Left	Thru	Right		Left	Thru	Right		Left	Thru	Right		Left	Thru	Right		
All Vehicles	1U0	0	1U	0	0	0	0	0	0	21U	13U	0	12	389	0	0	D29
S eavy Trucks	0	0	0		0	0	0		0	0	9		0	8	0		12
Buses																	
Pedestrians		0				0				0				0			0
Bicycles /cooters	0	0	0		0	0	0		0	0	0		0	0	0		0

Comments:

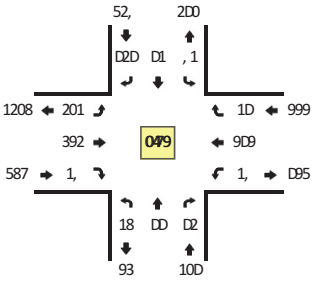
Report generated on 5Y30Y2022 D:91 AM

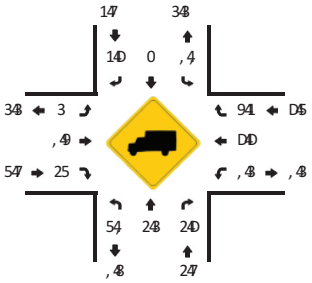
/O) RCE: Quality CountsHLLC 6http:YYwww4quality counts4net(1-8. . -580-2212

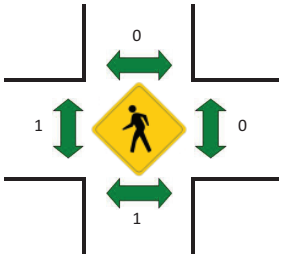
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

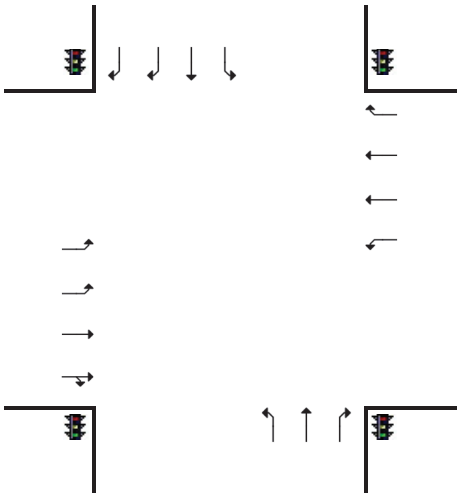
LOCATION: Rankin Ave-Tuckaseege Rd WwMain wt | **QC JOB #:** 15825807
CITY-wTATE: Mount / ollySNC | **HATE:** ThuSMay 17 2022

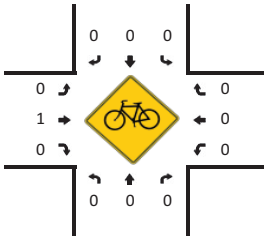
PeakW/our: 9:15 AM W8:15 AM
Peak 15WMin: 9:D5 AM W8:00 AM

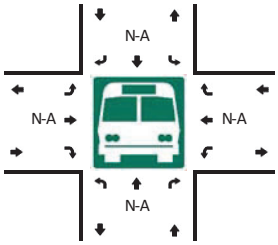


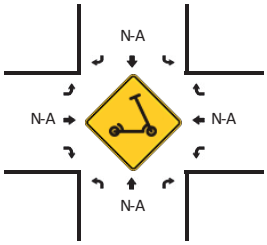












15WMin Count Period Beginning At	Rankin Ave-Tuckaseege Rd .Northbound6				Rankin Ave-Tuckaseege Rd .wouthbound6				wMain wt .Eastbound6				wMain wt .(estbound6				Total	/ ourly Totals
	Left	Thru	Right	)	Left	Thru	Right	)	Left	Thru	Right	)	Left	Thru	Right	)		
, :30 AM	,	2	5	0	13	2	85	0	20	81	5	12	2	10,	D	0	3D3	
, :D5 AM	3	3	8	0	13	,	8D	0	35	112	1	,	2	70	3	0	3, ,	
9:00 AM	3	5	3	0	11	9	9,	0	3D	9,	2	13	D	118	D	0	35,	
9:15 AM	5	9	1D	0	1D	7	71	0	5,	103	D	3	D	19,	2	0	D88	1553
9:30 AM	9	,	5	0	19	10	12,	0	D2	71	,	5	1	188	D	0	508	1918
9:D5 AM	2	15	10	0	19	12	111	0	D3	7,	3	5	D	171	5	0	51D	18, ,
8:00 AM	D	1,	13	0	13	10	7,	0	D1	82	3	,	9	172	3	0	D8,	177,
8:15 AM	9	,	12	0	1,	5	85	0	3,	73	1	D	12	1D3	1	0	D21	1727

Peak 15WMin UoF rates	Northbound				wouthbound				Eastbound				(estbound				Total
	Left	Thru	Right	)	Left	Thru	Right	)	Left	Thru	Right	)	Left	Thru	Right	)	
All Vehicles	8	, 0	D0	0	, 8	D8	DDD	0	192	38D	12	20	1,	9, D	20	0	205,
/ eavy Trucks	0	0	D		0	0	D		8	28	D		0	D8	D		100
Buses																	
Pedestrians		D				0				D				0			8
Bicycles wcooters	0	0	0		0	0	0		0	0	0		0	0	0		0

Comments:

Report generated on 5-30-2022 7:D1 AM | wO) RCE: Quality CountsSLLC .http:--F F F 4qualitycounts4net61W899W580W212

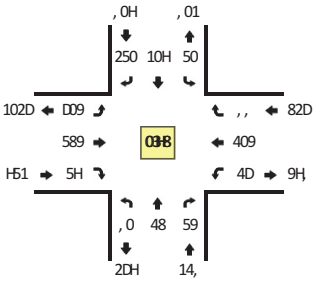
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

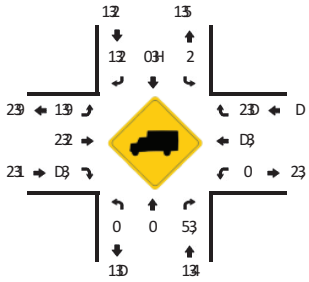
LOCATION: Rankin Ave-Tuckaseege Rd WwMain wt | **QC JOB #:** 15825810

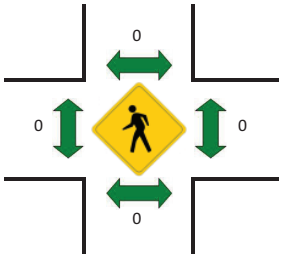
CIT7-wTATE: Mount Yolly/NC | **SATE:** Thu/May 1H 2022

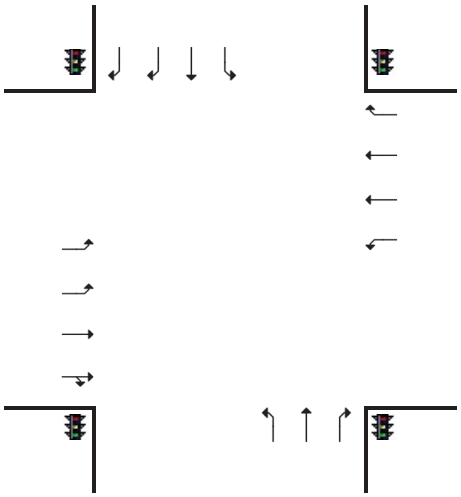
PeakWour: , :, 5 PM WW5:, 5 PM

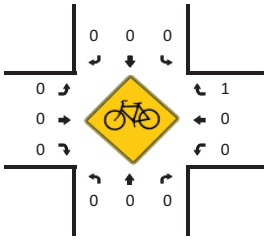
Peak 15WMin: 5:D0 PM WW5:, 5 PM

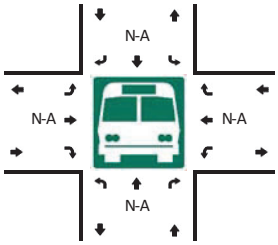


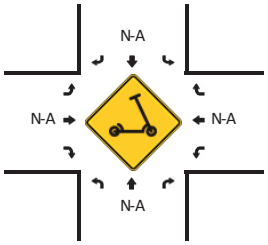












15WMin Count Period Beginning At	Rankin Ave-Tuckaseege Rd .Northbound6				Rankin Ave-Tuckaseege Rd .wouthbound6				wMain wt .Eastbound6				wMain wt .(estbound6				Total	Yourly Totals
	Left	Thru	Right	)	Left	Thru	Right	)	Left	Thru	Right	)	Left	Thru	Right	)		
2:00 PM	10	11	10	0	14	12	54	0	5D	159	4	,	8	1, 1	11	0	, H4	
2:15 PM	15	4	8	0	15	12	, 5	0	59	191	4	8	,	1, ,	9	1	, 8H	
2:D0 PM	H	1D	10	0	14	1D	91	0	52	144	4	,	5	208	D	0	54H	
2:, 5 PM	8	18	19	0	1H	1,	59	0	, 8	158	10	,	12	221	11	0	5H5	2190
D:00 PM	8	12	H	0	10	19	51	0	, 9	1, 8	9	,	8	211	19	0	5, 5	2208
D:15 PM	9	1,	11	0	19	11	50	0	9,	12H	8	9	H	189	4	0	514	22D9
D:D0 PM	4	18	8	0	1H	2D	99	0	94	1, D	8	9	1,	1H9	12	0	584	22, ,
D:, 5 PM	H	20	4	0	21	18	5D	0	45	150	1,	4	4	211	10	0	902	2251
, :00 PM	4	1D	H	0	19	15	54	0	90	151	11	8	15	19D	8	0	5DD	22DH
, :15 PM	H	1D	25	0	11	18	5D	0	9,	1, 4	11	5	8	190	4	0	5D1	225D
, :D0 PM	1D	1,	1H	0	11	18	94	0	9D	1, D	4	9	12	149	10	0	55H	2225
, :, 5 PM	10	1H	12	0	19	21	95	0	9,	195	15	9	12	191	1,	0	580	220D
5:00 PM	5	2,	9	0	19	24	91	0	41	1, 2	10	,	21	18,	1D	0	58,	225,
5:15 PM	10	22	19	0	11	25	99	0	99	150	1,	4	12	18,	4	1	5H1	2D1,
5:D0 PM	15	1D	22	0	4	D9	58	0	48	12H	20	10	29	144	10	1	902	2D54
5:, 5 PM	10	20	15	0	15	, D	DH	0	94	12H	15	,	24	1, 8	,	1	5D4	2D1,
9:00 PM	10	20	14	0	1D	28	54	0	92	1, 9	19	8	2D	194	11	0	548	2D08
9:15 PM	10	1,	15	0	19	29	, 4	0	, H	121	19	,	1H	15,	1D	0	50,	2221
9:D0 PM	1,	1H	21	0	1D	2,	91	0	D8	1D5	11	9	DH	1, 0	9	0	524	21, 9
9:, 5 PM	20	24	14	0	11	D0	5D	0	54	H8	1D	9	2D	1, 0	10	0	505	211,

Peak 15WMin UoF rates	Northbound				wouthbound				Eastbound				(estbound				Total
	Left	Thru	Right	)	Left	Thru	Right	)	Left	Thru	Right	)	Left	Thru	Right	)	
All Vehicles	90	52	88	0	28	1, ,	2D2	0	D12	519	80	, 0	10,	408	, 0	,	2, 08
Yeavy Trucks	0	0	,		0	,	,		,	12	,		0	2,	,		90
Buses																	
Pedestrians		0				0				0				0			0
Bicycles wcooters	0	0	0		0	0	0		0	0	0		0	0	0		0

Comments:

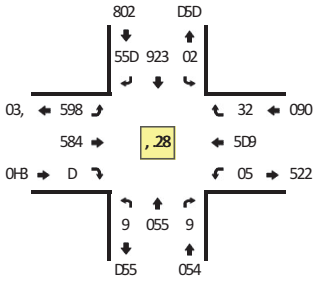
Report generated on 5-D0-2022 H:, 1 AM

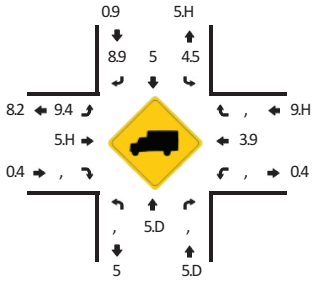
wO) RCE: Quality Counts/LLC .http:--F F F 3qualitycounts3net61W844W580W2212

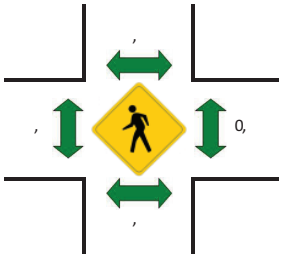
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

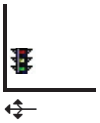
LOCATION: R v a- thorne Rt W w Cata- ba AQe | **J C BO# 1:** 58208255
CIT7YRTATE: Mount v olly/NC | **S ATE:** Thu/May 5H 0, 00

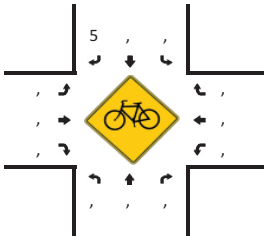
PeakW our: 4:58 AM W2:58 AM
Peak 58W in: 4:9, AM W4:D8 AM

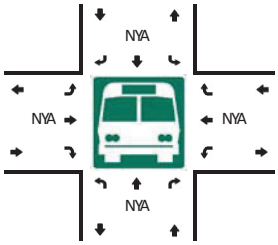


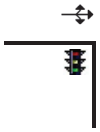


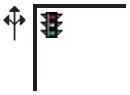


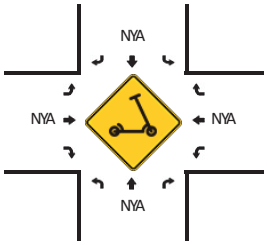












58W in Count Period #eginning At	R v a- thorne Rt 6Northbound(				R v a- thorne Rt 6Routhbound(				w Cata- ba AQe 6Eastbound(				w Cata- ba AQe 6w estbound(				Total	v ourly Totals
	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U		
3:9, AM	,	0,	0	,	5	DH	50	,	55	93	,	,	,	59	5	,	5D8	
3:D8 AM	,	9D	,	,	,	35	H	,	03	D2	5	,	5	5,	3	,	5H3	
4:, , AM	,	D0	,	,	5	DD	5,	,	9H	D8	,	,	,	05	5,	,	050	
4:58 AM	5	82	5	,	4	38	58	,	D4	D0	,	,	5,	84	04	,	99,	229
4:9, AM	5	D3	5	,	2	59D	9H	,	04	D4	0	,	5,	94	09	,	948	5559
4:D8 AM	5	8D	5	,	4	2H	0H	,	04	D5	5	,	5	9,	D	,	028	50, 0
2:, , AM	,	89	,	,	3	H2	95	,	9D	04	5	,	,	5H	5D	,	029	5049
2:58 AM	,	D9	5	,	H	HD	0H	,	94	90	5	,	,	53	5D	,	043	505H

Peak 58W in Flo- rates	Northbound				Routhbound				Eastbound				w estbound				Total
	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U	
All Vehicles	D	52D	D	,	90	893	583	,	5, 2	522	2	,	D,	5D2	H0	,	58, ,
v eaC y Trucks #uses	,	,	,		,	D	D		D	,	,		,	2	,		0,
Pedestrians #icycles Rcooters	,	,	,		,	,	,		,	,	,		,	0D	,		0D ,

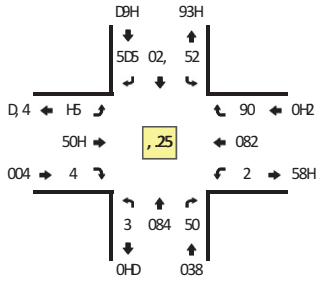
Comments:

) eport generated on 8Y9, Y0, 00 H:D5 AM

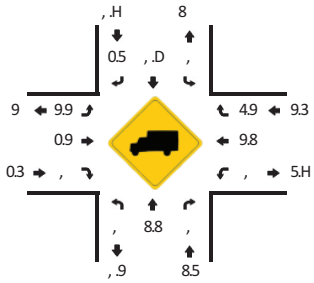
ROU) CE: J uality Counts/LLC 6http:YY- - - .qualitycounts.net(5W244W2, W0050

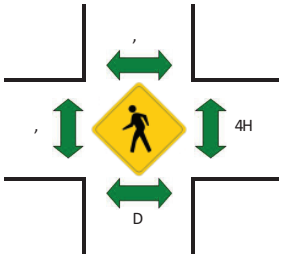
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

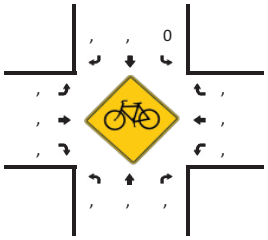
LOCATION: R v a- thorne Rt W w Cata- ba AQe | **J C BO# 1:** 58208250
CIT7YRTATE: Mount v olly/NC | **S ATE:** Thu/May 5H 0, 00

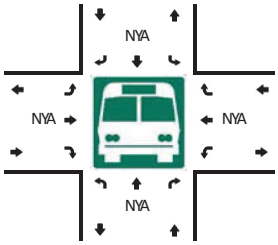


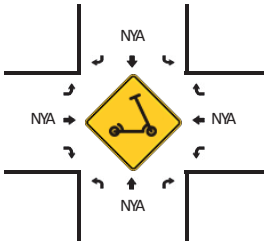
PeakW our: 9:9, PM W D:9, PM
Peak 58W in: 9:9, PM W 9:D8 PM











58W in Count Period #eginning At	R v a- thorne Rt 6Northbound(				R v a- thorne Rt 6Routhbound(				w Cata- ba AQe 6Eastbound(				w Cata- ba AQe 6w estbound(				Total	v ourly Totals
	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U		
0:, , PM	5	8D	0	,	D	D3	08	,	99	54	0	,	9	04	3	,	00,	
0:58 PM	5	8D	,	,	D	DD	00	,	09	9,	,	,	D	9D	2	,	00D	
0:9, PM	,	83	0	,	D	D8	05	,	0H	93	0	,	3	3H	59	,	0H4	
0:D8 PM	5	94	0	,	9	D9	00	,	54	09	9	,	3	83	8	,	052	H82
9:, , PM	5	D4	9	,	0	D8	08	,	0D	08	0	,	,	40	3	,	0D0	H2,
9:58 PM	5	DH	0	,	,	80	5D	,	94	9,	5	,	5	D3	59	,	0D4	5, , 0
9:9, PM	,	39	3	,	D	5, ,	4D	,	08	95	D	,	D	8H	59	,	92D	5, H,
9:D8 PM	9	40	9	,	3	42	05	,	99	9D	,	,	5	40	5,	,	9, D	5534
D:, , PM	9	89	,	,	D	44	0H	,	58	08	,	,	0	2,	8	,	020	5054
D:58 PM	5	42	0	,	9	D4	03	,	52	9H	0	,	5	83	D	,	042	5092
D:9, PM	,	8,	D	,	8	8H	04	,	98	8,	5	,	9	3D	50	,	95H	5539
D:D8 PM	0	83	9	,	D	45	0H	,	5H	95	5	,	5	2,	8	,	0H9	5540
8:, , PM	0	38	5	,	D	8,	0D	,	08	93	D	,	0	43	5D	,	9, 8	5528
8:58 PM	9	44	8	,	5	48	D5	,	58	0H	,	,	9	42	H	,	9, 8	5000
8:9, PM	D	4D	5	,	9	88	5H	,	02	98	D	,	9	33	8	,	0H2	50, 5
8:D8 PM	0	4D	0	,	,	8H	00	,	53	95	0	,	5	80	9	,	088	5549
4:, , PM	0	85	0	,	D	D8	0D	,	5H	93	5	,	9	4,	9	,	085	55, H
4:58 PM	,	D8	5	,	,	D2	52	,	05	95	5	,	8	9H	4	,	058	5, 5H
4:9, PM	5	9D	9	,	5	8D	5D	,	50	09	,	,	0	D5	9	,	522	H, H
4:D8 PM	5	D,	5	,	9	D2	52	,	5,	5D	4	,	,	99	5	,	538	20H

Peak 58W in Flo- rates	Northbound				Routhbound				Eastbound				w estbound				Total
	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U	
All Vehicles	,	0H0	02	,	54	D, ,	084	,	5, ,	50D	54	,	54	094	80	,	5894
v eaQy Trucks #uses	,	2	,		,	,	,		D	D	,		,	50	D		90
Pedestrians #icycles Rcooters	,	54 , ,	,		D	, ,	,		,	, ,	,		,	042 , ,	,		02D D

Comments:

) eport generated on 8Y9, Y0, 00 H:D5 AM

ROU) CE: J uality Counts/LLC 6http:YY- - - .qualitycounts.net(5V233V82, V0050

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: R Main Rt w- CataWba Awe

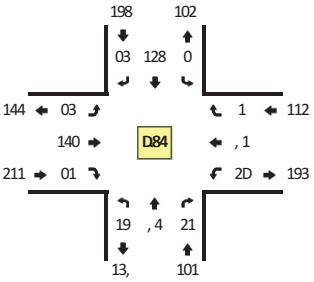
QC JOB #: 15825810

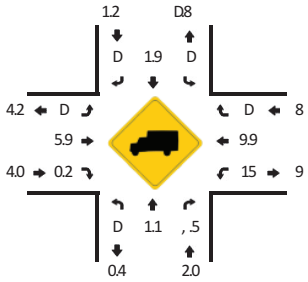
CIT7YRTATE: Mount / ollySNC

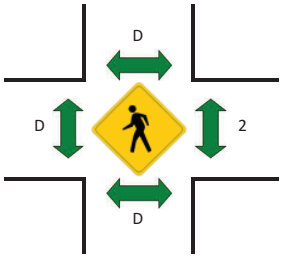
HATE: ThuSMay 1, 2D22

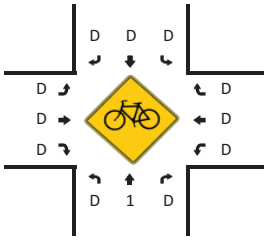
Peakv/ our: 3:15 AM w8:15 AM

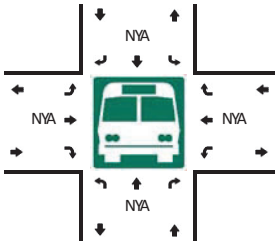
Peak 15vMin: 3:0D AM w3:45 AM

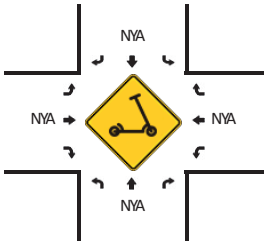












15vMin Count Period Beginning At	R Main Rt 6Northbound(				R Main Rt 6Routhbound(				- CataWba Awe 6Eastbound(				- CataWba Awe 6 estbound(				Total	/ ourly Totals
	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U		
9:0D AM	1	0	D	D	2	10	2	D	4	4D	1	D	2	11	D	D	3,	
9:45 AM	4	9	2	D	1	10	4	D	8	05	1	D	D	3	1	D	82	
3:DD AM	3	,	1	D	D	25	4	D	0	42	2	D	D	22	D	D	115	
3:15 AM	1D	19	4	D	2	08	,	D	4	45	,	D	4	21	D	D	192	408
3:0D AM	0	25	0	D	D	45	1D	D	10	45	,	D	5	23	D	D	185	544
3:45 AM	D	29	0	D	D	24	9	D	14	02	9	D	0	20	D	D	103	5, ,
8:DD AM	0	23	11	D	1	21	12	D	9	21	3	D	8	2D	1	D	108	922
8:15 AM	2	05	5	D	1	0D	4	D	0	02	0	D	4	22	D	D	141	9D1

Peak 15vMin FloWrates	Northbound				Routhbound				Eastbound				- estbound				Total
	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U	
All Vehicles	12	1DD	12	D	D	18D	4D	D	52	18D	09	D	2D	1D8	D	D	34D
/ eavy Trucks	D	D	D		D	D	D		D	8	D		4	4	D		19
Buses																	
Pedestrians		D				D				D				D			D
Bicycles Rcooters	D	4	D		D	D	D		D	D	D		D	D	D		4

Comments:

) eport generated on 5Y0DY2D22 , :41 AM

ROU) CE: Quality CountsSLLC 6http:YYWWW.qualitycounts.net(1v833v58Dv2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: R Main Rt w- CataWba Awe

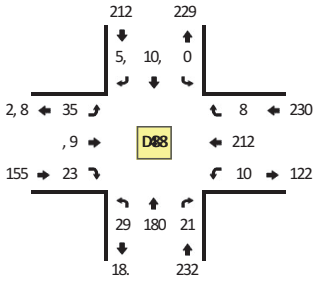
QC JOB #: 15825810

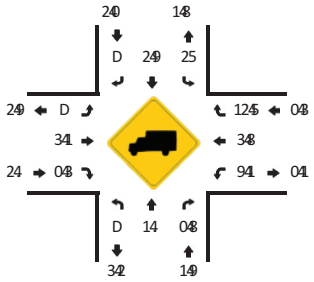
CIT7YRTATE: Mount / ollySNC

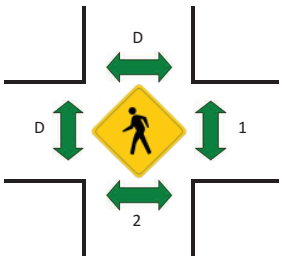
HATE: ThuSMay 1, 2D22

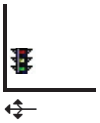
Peaky/ our: 3:3D PM w0:3D PM

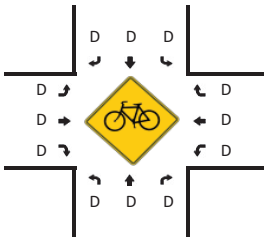
Peak 15vMin: 3:3D PM w3:05 PM

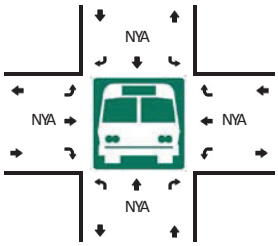


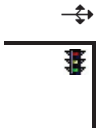


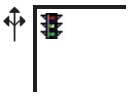


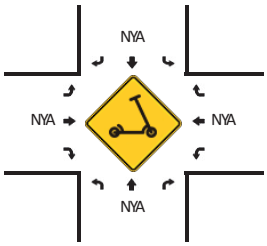












15vMin Count Period Beginning At	R Main Rt 6Northbound(				R Main Rt 6Routhbound(				- CataWba Awe 6Eastbound(				- CataWba Awe 6 estbound(				Total	/ourly Totals
	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U		
2:DD PM	,	28	3	D	2	25	9	D	,	12	.	D	2	18	1	D	122	
2:15 PM	8	35	0	D	3	3D	5	D	8	1,	0	D	2	3D	D	D	108	
2:3D PM	1	3D	0	D	2	53	13	D	12	2.	5	D	0	01	3	D	1, 0	
2:05 PM	2	30	1	D	2	0D	22	D	5	2D	11	D	9	35	2	D	181	. 05
3:DD PM	,	2,	1	D	D	38	1.	D	,	19	1	D	3	39	0	D	1. 0	. 89
3:15 PM	8	3,	0	D	1	01	18	D	10	1D	3	D	3	38	3	D	182	921
3:3D PM	11	52	0	D	1	52	1.	D	13	21	10	D	0	05	3	D	23.	9. 3
3:05 PM	0	03	,	D	2	33	15	D	.	32	1	D	5	55	1	D	2D.	988
0:DD PM	.	09	0	D	1	39	10	D	5	18	5	D	0	. 2	2	D	2D5	82,
0:15 PM	.	02	0	D	D	29	10	D	11	2.	3	D	1	5D	2	D	18.	833
0:3D PM	9	3,	3	D	3	23	18	D	13	31	11	D	2	08	1	D	1, ,	9, .
0:05 PM	9	2,	3	D	3	22	.	D	8	21	,	D	.	91	2	D	189	999
5:DD PM	.	35	1	D	3	3.	11	D	,	2.	5	D	.	50	2	D	1, 0	9. .
5:15 PM	12	38	.	D	2	02	9	D	9	2D	0	D	3	58	2	D	2D1	981
5:3D PM	3	01	0	D	D	02	1D	D	5	23	0	D	1	. 2	3	D	1, 8	98D
5:05 PM	0	39	3	D	1	31	,	D	13	20	5	D	0	52	1	D	180	999
. :DD PM	3	39	1	D	1	22	3	D	8	20	5	D	D	0.	1	D	151	930
. :15 PM	.	32	3	D	1	35	9	D	8	22	0	D	3	3.	1	D	158	. , 1
. :3D PM	5	3D	3	D	D	31	5	D	0	13	2	D	5	33	1	D	132	. 25
. :05 PM	3	2,	1	D	3	2,	12	D	0	11	2	D	3	21	1	D	11,	5. D

Peak 15vMin FloWrates	Northbound				Routhbound				Eastbound				- estbound				Total
	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U	
All Vehicles	00	2D8	1.	D	0	2D8	. 0	D	52	80	5.	D	1.	18D	12	D	, 00
/ eavy Trucks	D	0	D		D	D	D		D	0	D		0	12	D		20
Buses																	
Pedestrians		0				D				D				D			0
Bicycles	D	D	D		D	D	D		D	D	D		D	D	D		D
Rcooters																	

Comments:

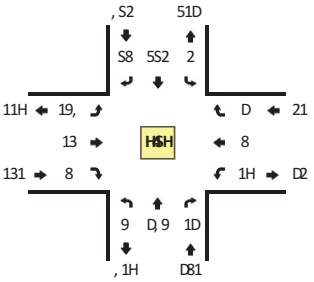
) eport generated on 5Y3DY2D22 , :01 AM

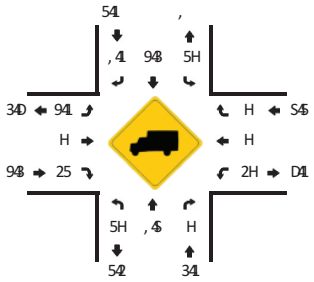
ROU) CE: Quality CountsSLLC 6http:YWWW4ualitycounts4net(1v899v58Dv2212

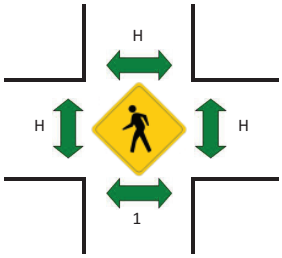
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

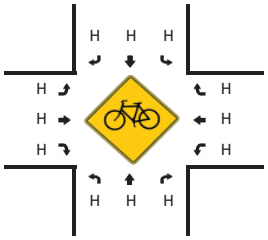
LOCATION: Righland vt -- E CataWba Awe | **QC JOB #:** 15825815
CIT07vTATE: Mount RollyYNC | **/ ATE:** ThuYMay 1S 2H22

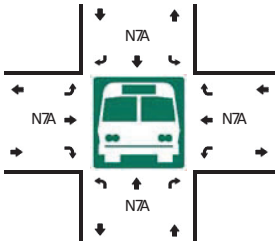
Peak-Rour: 3:15 AM -- 8:15 AM
Peak 15-Min: 3:DH AM -- 3:95 AM

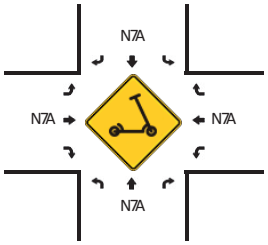












15-Min Count Period Beginning At	Righland vt .Northbound6				Righland vt .vouthbound6				E CataWba Awe .Eastbound6				E CataWba Awe .(estbound6				Total	Rourly Totals
	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U		
, :DH AM	H	31	D	H	D	S5	1H	H	D9	D	D	H	D	1	H	H	22,	
, :95 AM	H	3D	3	H	2	SD	8	H	91	H	2	H	D	H	H	H	22S	
3:HH AM	1	S5	D	H	D	1H9	1S	H	DS	2	H	H	D	D	D	H	235	
3:15 AM	2	1H9	1	H	1	12,	21	H	9,	9	H	H	1	1	1	H	DH8	1HD8
3:DH AM	1	1H2	2	H	1	15S	D1	H	9D	D	D	H	D	2	H	H	D5H	11, 2
3:95 AM	H	8S	,	H	H	19S	22	H	DH	1	D	H	2	D	2	H	DH3	129H
8:HH AM	1	, S	9	H	H	158	29	H	23	S	2	H	9	2	H	H	DHH	12, 5
8:15 AM	2	82	2	H	H	128	22	H	D5	H	9	H	2	1	H	H	238	12D5

Peak 15-Min FloWrates	Northbound				vouthbound				Eastbound				(estbound				Total
	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U	
All Vehicles	9	9H8	8	H	9	, D,	129	H	132	12	12	H	12	8	H	H	19HH
Reavy Trucks	9	28	H		9	98	9		8	H	H		H	H	H		S,
Buses																	
Pedestrians		H				H				H				H			H
Bicycles vcooters	H	H	H		H	H	H		H	H	H		H	H	H		H

Comments:

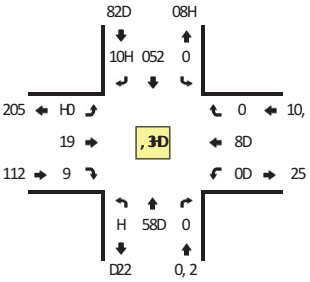
) eport generated on 57DH72H22 S:91 AM

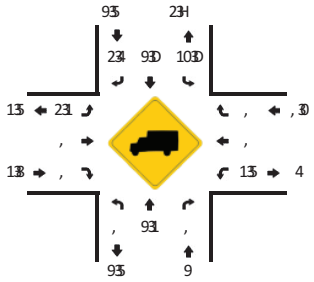
vOU) CE: Quality CountsYLLC .http:77WWW4quality counts4net61-833-58H-2212

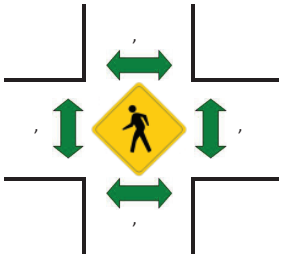
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

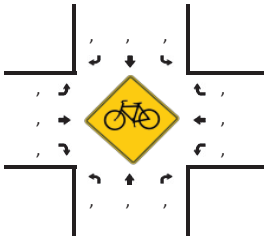
LOCATION: Righland vt -- E CataWba Awe | **QC JOB #:** 15825810
CIT7YvTATE: Mount Rolly/NC | **S ATE:** Thu/May 1H 2, 22

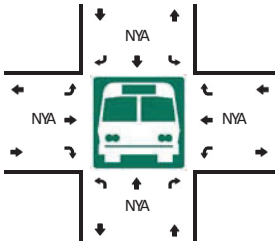
Peak-Rour: 4:45 PM -- 5:45 PM
Peak 15-Min: 4:45 PM -- 5:, , PM

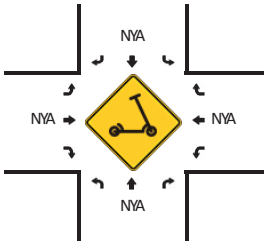












15-Min Count Period Beginning At	Righland vt .Northbound6				Righland vt .vouthbound6				E CataWba Awe .Eastbound6				E CataWba Awe .(estbound6				Total	Rourly Totals
	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U		
2:, , PM	,	140	2	,	,	194	22	,	15	,	,	,	9	2	9	,	92D	
2:15 PM	1	125	4	,	,	12,	24	,	22	1	2	,	5	,	0	,	91,	
2:9, PM	4	1D0	4	,	,	1HH	4,	,	91	,	2	,	8	4	,	,	408	
2:45 PM	1	145	2	,	,	2, 4	9H	,	1H	1	2	,	D	5	2	,	42D	1592
9:, , PM	2	18D	5	,	,	141	9H	,	15	9	1	,	4	4	1	,	4, 2	10, D
9:15 PM	9	114	2	,	,	109	94	,	12	1	,	,	0	0	2	,	949	104,
9:9, PM	,	192	2	,	,	185	45	,	1H	,	1	,	5	8	4	,	4, 1	15D9
9:45 PM	,	14D	2	,	,	100	52	,	48	1	9	,	5	0	4	,	494	158,
4:, , PM	1	148	2	,	1	15H	48	1	1H	9	2	,	0	15	1	,	4, 0	1584
4:15 PM	2	140	9	,	,	192	42	,	2H	1	1	,	H	11	2	,	9D8	101H
4:9, PM	1	115	4	,	1	159	98	,	94	1	,	,	2,	1D	1	,	985	10, 9
4:45 PM	2	15D	2	,	1	101	40	,	25	5	,	,	10	29	1	,	49H	10, 8
5:, , PM	2	150	1	,	9	105	40	,	25	4	1	,	19	10	2	,	494	1090
5:15 PM	9	195	2	,	1	1D5	9D	,	24	2	,	,	10	24	2	,	421	10DH
5:9, PM	2	19H	1	,	1	151	4,	,	22	2	2	,	22	24	1	,	4, D	1D, 1
5:45 PM	1	12H	2	,	,	149	9D	,	24	9	,	,	10	21	2	,	9D8	104,
0:, , PM	2	151	1	,	,	1DH	99	,	29	2	1	,	15	12	9	,	422	1028
0:15 PM	5	11,	1	,	,	150	99	,	25	,	,	,	1,	D	4	,	951	1558
0:9, PM	2	12D	2	,	,	105	9,	,	10	,	,	,	4	4	2	,	952	15, 9
0:45 PM	1	115	1	,	1	15,	21	,	12	9	1	,	1	9	1	,	91,	1495

Peak 15-Min FloWrates	Northbound				vouthbound				Eastbound				(estbound				Total
	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U	
All Vehicles	8	028	8	,	4	044	184	,	1, ,	2,	,	,	04	H2	4	,	1D50
Reavy Trucks	,	28	,		,	8	8		8	,	,		,	,	,		52
Buses																	
Pedestrians		,				,				,				,			,
Bicycles vcooters	,	,	,		,	,	,		,	,	,		,	,	,		,

Comments:

) eport generated on 5Y9, Y2, 22 H:41 AM

vOU) CE: Quality Counts/LLC .http:YWWWW3quality counts3net61-8DD-58, -2212

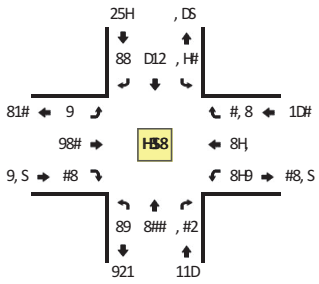
Type of peak hour being reported: Intersection Peak

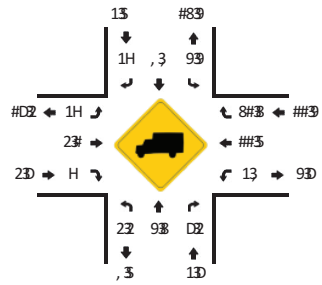
Method for determining peak hour: Total Entering Volume

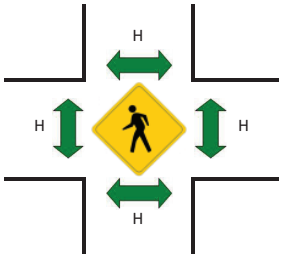
LOCATION: Righland vt -- E Charlotte AWe
CIT07vTATE: Mount RollyYNC

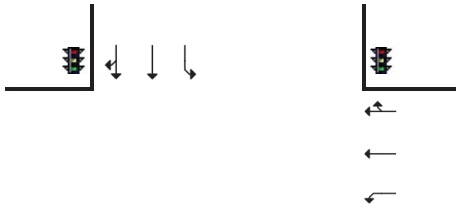
wC QQJ B: #15815#2
/ ATE: ThuYMay #S 8H88

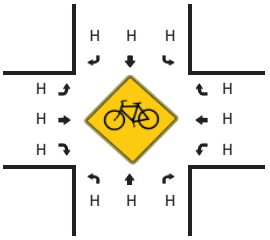
Peak-Rour: 2:HHAM -- 5:HHAM
Peak #1-Min: 2:, HAM -- 2:D1 AM

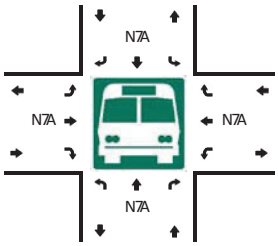


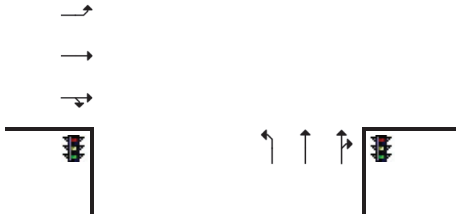


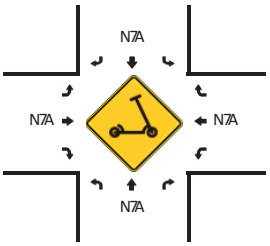












#1-Min Count Period J eginning At	Righland vt 4Northbound.				Righland vt 4vouthbound.				E Charlotte AWe 4Eastbound.				E Charlotte AWe 46 estbound.				Total	Rourly Totals
	Left	Thru	(ight	)	Left	Thru	(ight	)	Left	Thru	(ight	)	Left	Thru	(ight	)		
9:, HAM	,	85	2H	H	52	99	D	H	H	#91	5	H	, 2	DD	#1	H	182	
9:D1 AM	8	D5	99	H	9,	91	#	H	#	#D1	1	H	, H	DD	#S	H	D5S	
2:HHAM	#8	1H	2D	H	2H	29	#	H	D	#9S	D	H	1#	, 5	, H	H	12S	
2:#1 AM	D	15	58	H	S,	#85	D	H	H	#99	8	H	DD	D5	, ,	H	998	8812
2:, HAM	1	D5	#H2	H	2H	#, S	#H	H	H	#1H	,	H	9#	1,	, 5	H	95D	8D#D
2:D1 AM	1	11	1D	H	95	##D	2	H	8	#, 9	,	H	1H	9D	, #	H	15S	81#D
5:HHAM	8	, 2	15	H	9H	#82	,	H	D	##2	2	H	DS	2#	DH	H	121	81#H
5:#1 AM	D	1#	2H	H	9H	SD	1	H	H	##,	D	H	1D	9#	88	H	1, 5	8, 59

Peak #1-Min UoF rates	Northbound				vouthbound				Eastbound				6 estbound				Total
	Left	Thru	(ight	)	Left	Thru	(ight	)	Left	Thru	(ight	)	Left	Thru	(ight	)	
All Vehicles	8H	#S8	D85	H	85H	119	DH	H	H	9HH	#8	H	8DD	8#8	#18	H	82, 9
ReaW Trucks	H	#8	8D		, 9	5	#9		H	, 8	H		#8	8D	, 9		8HH
J uses																	
Pedestrians		H				H				H				H			H
J icycles	H	H	H		H	H	H		H	H	H		H	H	H		H
vcooters																	

Comments:

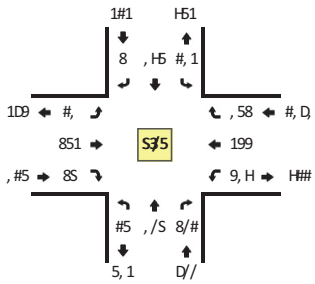
(eport generated on 17, H78H88 S:D# AM

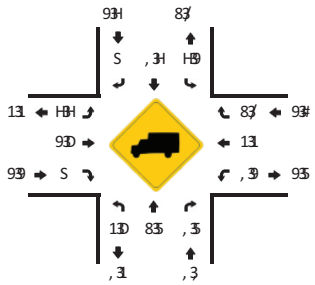
vO) (CE: wuality CountsYLLC 4http:77F F F 3qualitycounts3net. #-522-15H-88#8

Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

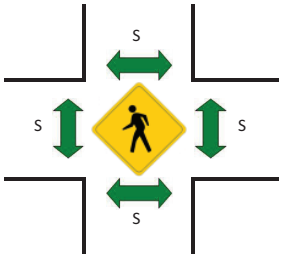
LOCATION: Righland vt -- E Charlotte AWe | **wC QQJ B:** #15815#5
CIT20vTATE: Mount Rolly7NC | **YATE:** Thu7May #/ 8S88

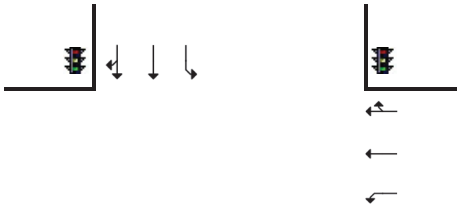
Peak-Rour: 9:91 PM -- 1:91 PM
Peak #1-Min: 9:91 PM -- 1:SS PM

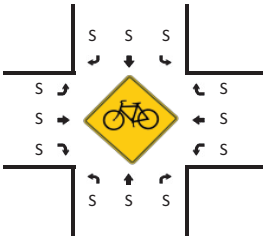


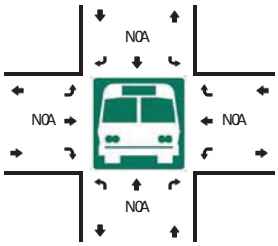


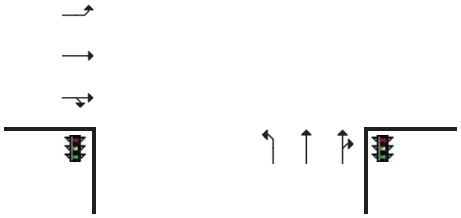
Quality Counts
DATA THAT DRIVES COMMUNITIES

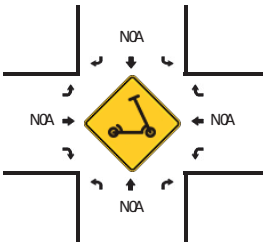












#1-Min Count Period J eginning At	Righland vt 4Northbound.				Righland vt 4vouthbound.				E Charlotte AWe 4Eastbound.				E Charlotte AWe 46 estbound.				Total	Rourly Totals
	Left	Thru	(ight	)	Left	Thru	(ight	)	Left	Thru	(ight	)	Left	Thru	(ight	)		
8:SS PM	D	#S#	1#	S	, 1	59	H	S	8	51	8	S	H8	D/	9S	S	119	
8:#1 PM	/	5D	19	S	, D	H/	8	S	,	DD	9	S	H#	/S	18	S	118	
8:, S PM	9	#88	H,	S	8/	#11	1	S	,	5#	H	S	H1	H/	1#	S	D59	
8:91 PM	5	###	1H	S	91	#5,	D	S	9	19	D	S	D5	/H	91	S	D59	89H9
, :SS PM	5	#88	D,	S	, 5	H5	8	S	#	D9	/	S	H/	#S9	19	S	D88	8198
, :#1 PM	#S	H8	9D	S	99	H,	9	S	#	H5	/	S	#SS	#SH	15	S	DS8	81/8
, :, S PM	5	5/	1H	S	, 5	##9	D	S	#S	D/	#S	S	###	#88	D9	S	D/5	8DSD
, :91 PM	#,	/#	H9	S	9#	//	,	S	#	5,	9	S	#S1	#8/	H,	S	H#D	8D, 5
9:SS PM	1	/S	5,	S	, D	#S#	9	S	,	D,	#1	S	#S#	#, D	5#	S	H#5	8H, 9
9:#1 PM	1	/H	HD	S	, /	HD	#	S	5	51	,	S	/#	#8S	H1	S	DHD	85S5
9:, S PM	D	D8	H1	S	8H	H5	9	S	8	5/	H	S	###	#, S	/8	S	D5,	8H/,
9:91 PM	,	#S9	H9	S	85	##8	#	S	1	D1	H	S	#S8	#8H	##S	S	H, 5	85#1
1:SS PM	9	/S	HD	S	8/	HH	#	S	9	H#	5	S	#8#	#9#	/S	S	H#8	85S/
1:#1 PM	1	/1	HD	S	, 1	#S1	S	S	,	H#	,	S	#S8	#, D	/1	S	H8D	851/
1:, S PM	D	#S#	D1	S	9,	59	S	S	#	H5	8	S	##8	#9S	5H	S	H#/	85/1
1:91 PM	H	H5	D9	S	, D	H8	1	S	#	D/	9	S	/1	#, ,	/1	S	D1/	85#D
D:SS PM	H	#SD	HS	S	, 8	/1	#	S	S	H#	5	S	#SD	#8/	H1	S	HSS	85S9
D:#1 PM	5	H8	D1	S	, 5	51	#	S	#	1/	,	S	##,	#9#	1D	S	D98	8H8S
D:, S PM	5	H9	D#	S	8#	H1	8	S	#	D5	#S	S	#S5	##/	1,	S	DSS	8DS#
D:91 PM	8	H8	1,	S	8D	HD	#	S	9	1#	5	S	/S	/S	9D	S	1#/	89D#

Peak #1-Min UoF rates	Northbound				vouthbound				Eastbound				6 estbound				Total
	Left	Thru	(ight	)	Left	Thru	(ight	)	Left	Thru	(ight	)	Left	Thru	(ight	)	
All Vehicles	#8	9#D	8/D	S	##8	995	9	S	8S	8DS	85	S	9S5	1S5	99S	S	8/18
ReaW Trucks	S	#8	8S		#8	#8	S		S	8S	S		5	, D	89		#99
J uses																	
Pedestrians		S				S				S				S			S
J icycles vcooters	S	S	S		S	S	S		S	S	S		S	S	S		S

Comments:

(eport generated on 10, S08S88 / :9# AM | vO) (CE: wuality Counts7LLC 4http:00F F F 3qualitycounts3net. #-5HH-15S-88#8

Klich, Kailey

From: Guffey, Christopher B <cbguffey@ncdot.gov>
Sent: Wednesday, September 13, 2023 10:06 AM
To: Massey, Amy; Richard, Elizabeth; Juan Garcia
Cc: Peyton Ratchford; Clary, Wesley S; Klich, Kailey; pshriver@mtland.us
Subject: RE: [External] RE: {External}RE: {External}RE: {External}RE: Springs Property TIA Update- confirmation of scoping parameters

Categories: External

Amy,

I concur with the alignment.

Thanks,

C. Blake Guffey
District Supervisor
District 1, Division 12
North Carolina Department of Transportation

980 552 4100 Office
cbguffey@ncdot.gov

1702 East Marion Street
Shelby, NC 28150

From: Massey, Amy <Amy.Massey@kimley-horn.com>
Sent: Thursday, September 7, 2023 1:02 PM
To: Guffey, Christopher B <cbguffey@ncdot.gov>; Richard, Elizabeth <Elizabeth.Richard@kimley-horn.com>; Juan Garcia <Juan.Garcia@gastongov.com>
Cc: Peyton Ratchford <Peyton.Ratchford@gastongov.com>; Clary, Wesley S <wclary@ncdot.gov>; Klich, Kailey <Kailey.Klich@kimley-horn.com>; pshriver@mtland.us
Subject: RE: [External] RE: {External}RE: {External}RE: {External}RE: Springs Property TIA Update- confirmation of scoping parameters

Thanks Blake,

See the attached quick sketch. This shows a revised road alignment for Rankin Road and the access. Could something like this be workable if/when the connector comes through?

Juan,
Is Gaston County also in concurrence with the scoping checklist?

Thank you,
Amy

Amy Massey, PE
Kimley-Horn
704-287-3304

From: Guffey, Christopher B <cbguffey@ncdot.gov>
Sent: Friday, September 1, 2023 1:05 PM
To: Richard, Elizabeth <Elizabeth.Richard@kimley-horn.com>; Juan Garcia <Juan.Garcia@gastongov.com>; Massey, Amy <Amy.Massey@kimley-horn.com>
Cc: Peyton Ratchford <Peyton.Ratchford@gastongov.com>; Clary, Wesley S <wclary@ncdot.gov>; Klich, Kailey <Kailey.Klich@kimley-horn.com>
Subject: RE: [External] RE: {External}RE: {External}RE: {External}RE: Springs Property TIA Update- confirmation of scoping parameters

Elizabeth,

Please consider the scope approved. We still need to work the details of that connection out. The access proposed needs to be the mainline and the proposed future connection made into a Y-line, in stead of reverse. That may require a realignment of the driveway as shown.

Also I am attempting to pinpoint where the traffic circle required by NCDOT comment originated? Is that from another development offsite mitigation? I only mention that because I currently have a few traffic circles that developers are requesting a change of mitigation relief after due diligence.

Thanks,

C. Blake Guffey
District Supervisor
District 1, Division 12
North Carolina Department of Transportation

980 552 4100 Office
cbguffey@ncdot.gov

1702 East Marion Street
Shelby, NC 28150

GCLMPO Site Plan Review

GASTON-CLEVELAND-LINCOLN MPO
Metropolitan Planning Organization

Post Office Box 1748
Gastonia, North Carolina 28053
Phone (704) 866-6980

150 South York Street
Gastonia, North Carolina 28052
Fax (704) 869-1960

Memorandum

To: Mark Hamblin, Associate Attorney, Grimes Yeoman, PLLC.
From: Julio Paredes, Planner
Date: January 11, 2023
Subject: Holly Springs Conceptual Rezoning Plan – Rezoning Request - GCLMPO Site Plan Review

Thank you for the opportunity to provide comments on a proposed rezoning within the Gaston-Cleveland-Lincoln Metropolitan Planning Organization (GCLMPO) planning area. My comments are based on review of the site plan in accordance with the adopted Comprehensive Transportation Plan (CTP), the 2050 Metropolitan Transportation Plan (MTP), and the current State Transportation Improvement Program (STIP).

The site is located at Parcel ID# 181214, 180092, 202690, 181227, 202122, 225889, 199264, 181225, 210290. On behalf of the GCLMPO, I offer the following comments:

1. According to the 2020-2029 STIP, there are no funded transportation improvement projects in the immediate vicinity of this site.

2. A proposed 3-lane minor roadway between W. Charlotte Ave to W. Catawba Ave is included in the MPO's CTP. The typical cross section for a three-lane road with bicycle and pedestrian accommodations involves a minimum of 80 ft. right-of-way.

   The CTP does not include specific transportation projects or improvement schedules, but instead represents the status or completeness of the comprehensive transportation system that may be required to support anticipated growth and development.

   By establishing the region's future transportation needs, the CTP offers an organized way to identify, and eventually prioritize, the transportation projects that may be built in the communities within the GCLMPO area.

   CTP projects shown as "Needs Improvement" or "Recommended" could become a funded project in the future, part of a development project, or may never become a funded project.

3. The proposed minor roadway noted above is also included in the MPO's MTP, planned in the horizon year 2045.

GASTON-CLEVELAND-LINCOLN MPO
Metropolitan Planning Organization

Post Office Box 1748
Gastonia, North Carolina 28053
Phone (704) 866-6980

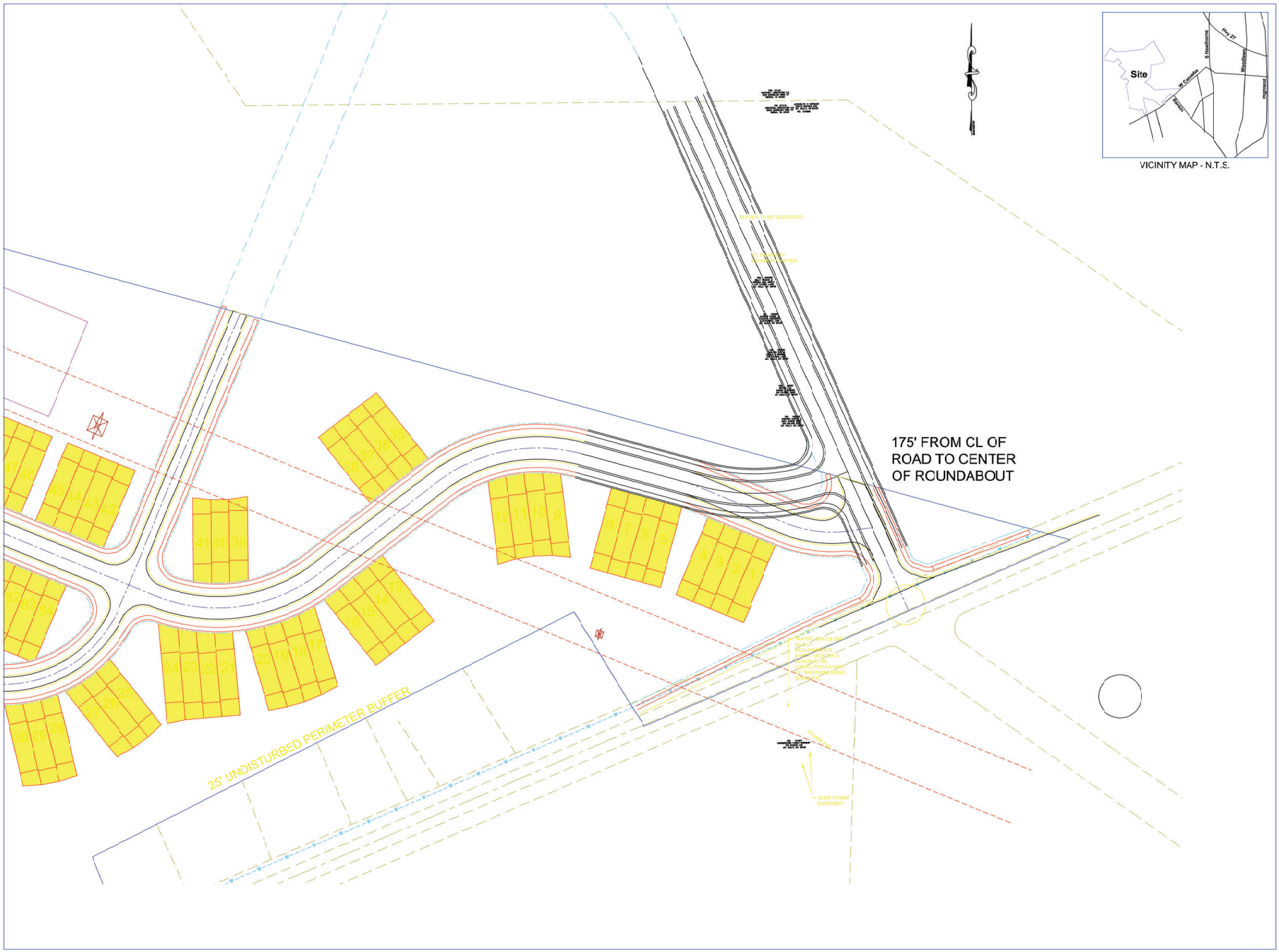
150 South York Street
Gastonia, North Carolina 28052
Fax (704) 869-1960

4. The CTP shows a recommended multi-use path along Taylor's Creek.

5. Please note that for any site plan that requires a driveway permit on an NCDOT roadway, or is adjacent to NCDOT roadways, the property owner/developer should work with NCDOT on any required driveway permits or any TIA requirements.

If you have any questions regarding my comments, please do not hesitate to contact me at 704-866-6980 or juliop@cityofgastonia.com.

Access 2 Realignment Concept



VICINITY MAP - N.T.S.

DATE	ISSUED FOR	REV
8/22/2022	Rezoning	0
10/21/2022	Second Submittal of Rezoning	1
01/30/2023	Third Submittal of Rezoning	2
03/31/2023	Fourth Submittal of Rezoning	3
04/18/2023	Fifth Submittal of Rezoning	4

J:\BLOCKS\North Carolina – General Notes & Logos\JC ONE CALL.jpg

Engineer:

R. Joe Harris & Associates, Inc.

Engineering • Land Surveying • Planning Management

106 Stonecrest Blvd., Tega Cay, S.C. 29708 F: (803) 802-1798

www.rjoeharris.com

FOR INFORMATION ONLY

Project Manager	Drawn
Department Manager	Checked
Print/Plot Date	April 18, 2023
Asbuilt Drawn	Asbuilt Date
-	-

Client

Tom Springs
400 W. CATAWBA AVE
MT. HOLLY, NORTH CAROLINA 28120
PH: (704) 827-7791

Project:

Holly Springs

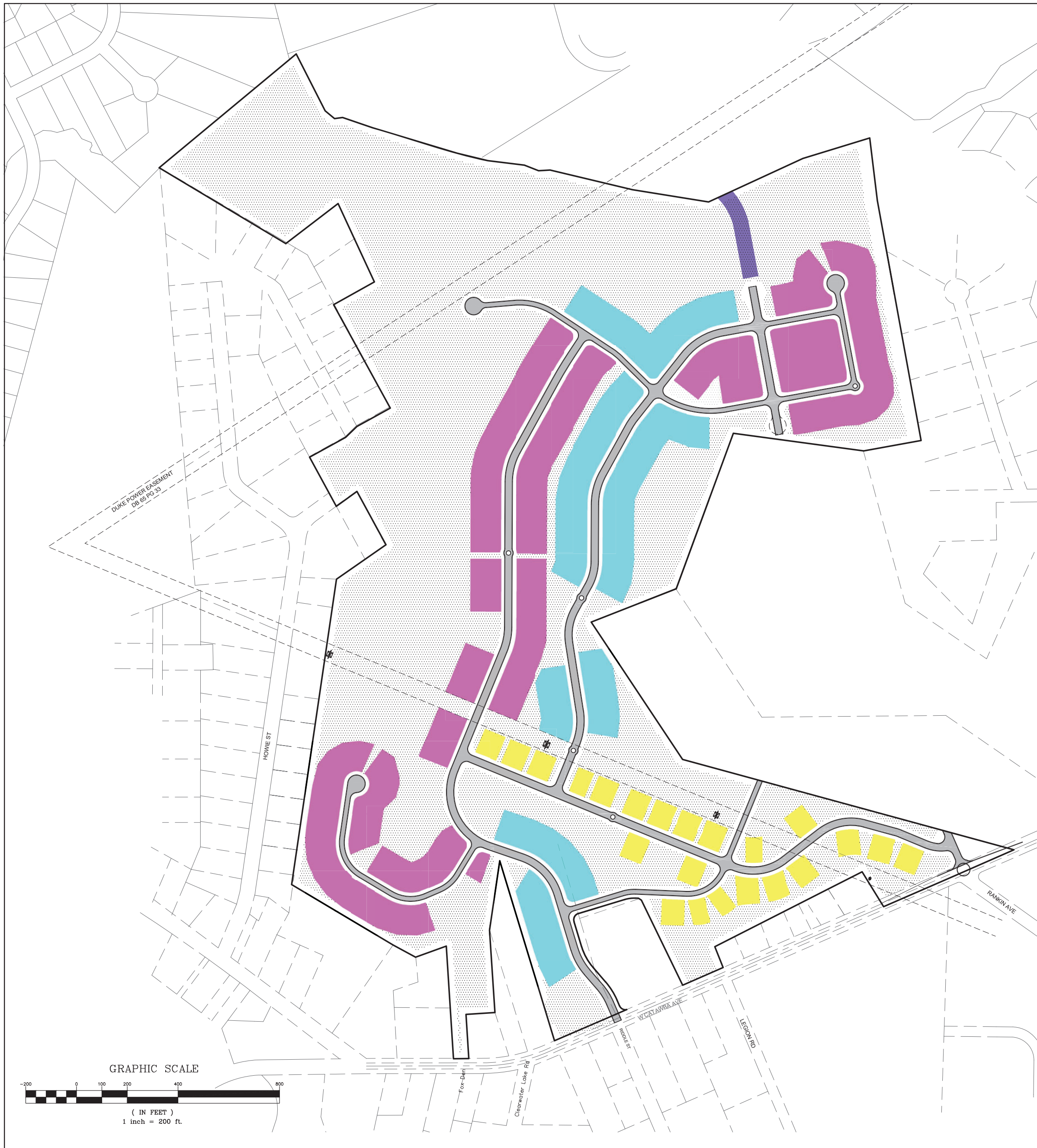
Drawing Title:

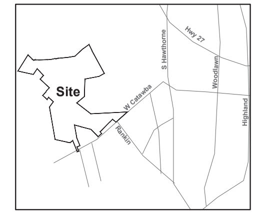
Rezoning

Project No.	Drawing No.
1710	C-1.0

DWG File Name:
New Rem Road For Future Extension of Rankin

Site Plan





VICINITY MAP - N.T.S.

LEGEND:

- AREA A - TOWNHOMES
- AREA B - 52 FOOT LOTS
- AREA C - 62 FOOT LOTS
- FUTURE ROW RESERVATION
- COMMON OPEN SPACE
- PROPOSED ROADS

DATE	ISSUED FOR	REV
07/06/2023	First Rezoning Submittal to Gaston County	0

Know what's below. Call before you dig.

Engineer:

R. Joe Harris & Associates, Inc.
Engineering • Land Surveying • Planning Management

www.rjoeharris.com

This drawing shall not be used for construction purposes until the seal and signature of the responsible registrant appears on the drawing, and proper permit forms and related fees are transmitted by the Owner, Owner's Agent or Contractor to the Authority having jurisdiction.

FOR INFORMATION ONLY

Project Manager | Drawn
Department Manager | Checked

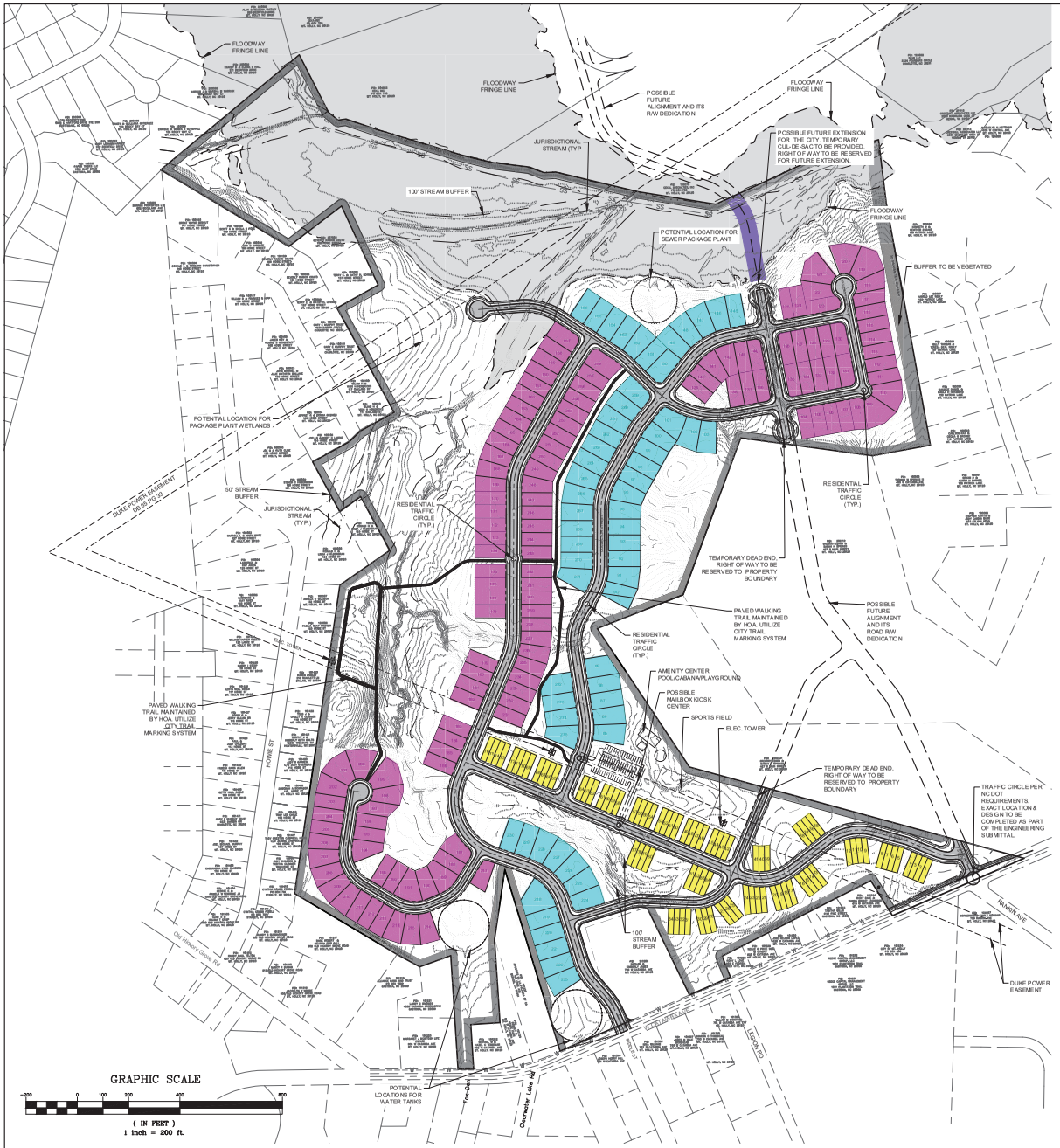
Print/Plot Date: July 7, 2023
Asbuilt Drawn: - | Asbuilt Date: -

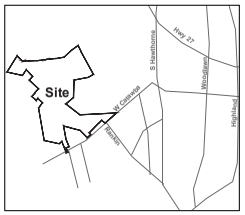
Client:
Tom Springs
400 W. CATAWBA AVE
MT. HOLLY, NORTH CAROLINA 28120
P: (704) 827-7791

Project:
Holly Springs

Drawing Title:
Rezoning

Project No.: 4710
DWG File Name: 4710-Holly Springs Rezoning Concept Plan
Drawing No.: C-1.0





VICINITY MAP - N.T.S.

SITE DATA

TAX PARCEL NO:	181214, 180092, 202690, 181227, 202122, 225889, 199264 181225, 210290
TOTAL SITE AREA:	138.0+/- AC.
ADDRESS:	W. CATAWBA AVENUE, MT. HOLLY, NC
EXIST. ZONING:	R-1 (COUNTY)
PROPOSED ZONING:	CONDITIONAL DISTRICT – PRD

DEVELOPMENT DATA

WATERSHED DISTRICT:	LAKE WYLIE WATERSHED (MTH WSIV PROTECTED – AUG07)	
MAXIMUM ALLOWED BUILD AREA:	24% (33.12 ACRES, 1,442,707 SF)	
PAVEMENT:	306,262 SF	
CURB AND GUTTER:	49,831 SF	
SIDEWALK:	119,533 SF	
WALKING TRAILS:	34,127 SF	
PACKAGE PLANT:	25,000 SF	
TOTAL IMPERVIOUS:	509,753 SF	
REMAINDER:	908,020 SF	
	AVE IMPERVIOUS	TOTAL IMPERVIOUS
TH'S (22'x60' PAD, DRIVE, SW)	1,738 SF	145,992 SF
52' LOTS (40'x60' PAD, DRIVE, SW)	3,170 SF	412,100 SF
62' LOTS (50'x60' PAD, DRIVE, SW)	3,770 SF	229,970 SF
ALL HOUSE TYPES	2,865 SF	788,062 SF
		119,958 SF (REMAINDER)

TOTAL LOTS SHOWN:	SF 52' WIDE (MIN) – 130 LOTS SF 62' WIDE (MIN) – 61 LOTS TH 20' WIDE (MIN) – 84 LOTS TOTAL 275 LOTS
DENSITY PROPOSED:	1.99 LOTS/AC.
AREA IN COS/ENVIRONMENTAL:	65+/- AC.
USABLE ACREAGE:	73+/- AC.

LOT SIZING:

DETACHED PRODUCT:	
LOT WIDTH:	52 FT. (MEASURED AT SETBACK LINE)
MIN. LOT SIZE:	6,200 SF MIN.
NUMBER OF LOTS:	130 (47% OF TOTAL)
LOT WIDTH:	62 FT. (MEASURED AT SETBACK LINE)
MIN. LOT SIZE:	7,200 SF MIN.
NUMBER OF LOTS:	61 (22% OF TOTAL)
ATTACHED PRODUCT:	
MIN. BLDG WIDTH:	20 FT.
MIN. LOT SIZE:	1,800 SF MIN.
NUMBER OF LOTS:	84 (31% OF TOTAL)

MINIMUM SETBACKS AND YARDS
DETACHED PRODUCT:

FRONT SETBACK:	20 FT. (FROM ROW)
SIDE YARD:	6 FT.
CORNER SETBACK:	10 FT. (FROM ROW)
REAR YARD:	25 FT.
BUILDING HEIGHT:	35 FT. (MEASURED AT FRONT SETBACK)** **35' (TO THE HIGHEST POINT OF STRUCTURE MEASURED AT THE FRONT SETBACK) IF BUILDING HEIGHT IS MORE THAN 35' THEN FRONT AND SIDE YARD SETBACKS WILL HAVE TO BE INCREASED A MINIMUM OF 1' FOR EVERY 2' VERTICAL ABOVE 35' IN HEIGHT.

MINIMUM SETBACKS AND YARDS
ATTACHED PRODUCT:

FRONT SETBACK:	20 FT. (FROM ROW)
SIDE YARD:	20 FT. BETWEEN BUILDINGS
CORNER SETBACK:	10 FT. (FROM ROW)
REAR YARD:	10 FT.
BUILDING HEIGHT:	35 FT. (MEASURED AT FRONT SETBACK)** **35' (TO THE HIGHEST POINT OF STRUCTURE MEASURED AT THE FRONT SETBACK) IF BUILDING HEIGHT IS MORE THAN 35' THEN FRONT AND SIDE YARD SETBACKS WILL HAVE TO BE INCREASED A MINIMUM OF 1' FOR EVERY 2' VERTICAL ABOVE 35' IN HEIGHT.

TOTAL COS REQUIRED:	20% (27.6 AC.)
TOTAL COS SHOWN:	COMBINATION OF ACTIVE AND PASSIVE OPEN SPACE OF 75.86 AC. (54.97%)
EXIST. TREE AREA:	91.04 AC.
TREE SAVE REQUIRED:	30% (27.31 ac.)

SEE SHEET C-2.0 FOR TECHNICAL NOTES & CONDITIONS

SURVEY INFORMATION:
1. SITE SURVEY PROVIDED BY CHRIS FAULK, PLS.
2. SITE CONSTRUCTION DOCUMENTS PROVIDED ARE BASED UPON THE ACCURACY OF THE SURVEY INFORMATION FURNISHED BY THE OWNER.
3. CONTRACTOR TO FIELD VERIFY ALL POINTS OF CONNECTION FOR DRIVES, PARKING LOTS, STORM DRAINAGE, ETC. PRIOR TO CONSTRUCTION. IN THE EVENT ANY DISCREPANCIES ARE NOTED IN THE FIELD, PLEASE CONTACT THE PROJECT ENGINEER IMMEDIATELY PRIOR TO CONTINUING WITH ANY CONSTRUCTION.

LEGEND:
- Floodway Fringe Line
- Project Boundary
- TOWNHOMES
- 52 FOOT LOTS
- 62 FOOT LOTS
- FUTURE ROW RESERVATION

DATE	ISSUED FOR	REV
07/06/2023	First Rezoning Submittal to Gaston County	0

NORTH CAROLINA 811 — North Carolina One-Call Center
811 — Know what's below. Call before you dig.

Engineer:

RJH

R. Joe Harris & Associates, Inc.
Engineering • Land Surveying • Planning Management
136 Stowe Court Blvd., Tega Cay, S.C. 29708 P: (803) 802-1709

www.rjoeharris.com

FOR INFORMATION ONLY

Project Manager	Drawn
Department Manager	Checked
Print/Plot Date: July 7, 2023	
Asbuilt Drawn: -	Asbuilt Date: -

Client:
Tom Springs
400 W. CATAWBA AVE
MT. HOLLY, NORTH CAROLINA 28120
P: (704) 827-7791

Project:
Holly Springs

Drawing Title:
Rezoning Site Plan

Project No.: 4710	Drawing No.: C-2.0
DWG File Name: 4710-Holly Springs Rezoning Concept Plan	

HOLLY SPRINGS
CONDITIONAL NOTES | GASTON COUNTY
(03/03/2023 – REVISED)

REZONING PETITION NO. REZ–23–??–??

1. DEVELOPMENT AREAS B AND C: SINGLE FAMILY DETACHED HOMES WILL BE LOCATED IN THIS AREA. LOT WIDTH/SIZES MUST NOT BE LESS THAN FIFTY (50) FEET. LOT WIDTH WILL BE MEASURED AS ALLOWED BY THE UDO. ALL LOTS WILL MEET THE MINIMUM LOT REQUIREMENTS REGARDLESS OF SCHEMATIC PLAN (SEE TYPICAL LOT PLAN ON SHEET RZ-2).

2. LOT STANDARDS AREAS B AND C ARE AS FOLLOWS:
a) 191 MAXIMUM UNITS
b) MINIMUM LOT SIZE DETACHED HOMES: 6,000 S.F.
c) FRONT YARD SETBACK SHALL BE TWENTY (20) FEET.
d) SIDE YARDS SHALL BE SIX (6) FEET. **NOTE: THE 6' SIDE YARD MAY NOT INCLUDE ANY PORTION OF THE BUILDING BUT MAY INCLUDE EAVES. FOR CORNER LOTS, SIDE YARDS SHALL BE TEN (10) FEET ON THE STREET SIDE.
e) REAR YARDS SHALL BE TWENTY-FIVE (25) FEET.
f) ALL STRUCTURES MUST MEET WATERSHED AND BUFFERING REQUIREMENTS FOR JURISDICTIONAL WATERCOURSES, AS VERIFIED BY THE USACE (UNITED STATES ARMY CORPS OF ENGINEERING).
g) TWO (2) PARKING SPACES REQUIRED PER LOT, IN ADDITION TO SPACES ACCOMMODATED BY GARAGES (OFF-STREET). DRIVEWAY AREA MAY BE USED TO MEET THIS REQUIREMENT.
3. DEVELOPMENT AREA A: TOWN HOMES AND/OR SINGLE-FAMILY DETACHED UNITS FOR SALE MAY BE LOCATED WITHIN THIS AREA.
a) 84 MAXIMUM UNITS
b) MINIMUM LOT SIZE DETACHED HOMES: 6,000 S.F.
c) MINIMUM LOT SIZE ATTACHED HOMES: 1,800 S.F.
d) FRONT YARD SETBACK SHALL BE TWENTY (20) FEET.
e) SIDE YARDS SHALL BE SIX (6) FEET. **NOTE: THE 6' SIDE YARD MAY NOT INCLUDE ANY PORTION OF THE BUILDING BUT MAY INCLUDE EAVES. FOR CORNER LOTS, SIDE YARDS SHALL BE TEN (10) FEET ON THE STREET SIDE.
f) REAR YARDS SHALL BE TWENTY-FIVE (25) FEET FOR DETACHED HOMES, FIFTEEN (15) FEET FOR ATTACHED HOMES.
g) ALL STRUCTURES MUST MEET WATERSHED AND BUFFERING REQUIREMENTS FOR JURISDICTIONAL WATERCOURSES, AS VERIFIED BY THE USACE (UNITED STATES ARMY CORPS OF ENGINEERING).
h) TWO (2) PARKING SPACES REQUIRED PER DETACHED HOME, ONE (1) PARKING SPACE PER ATTACHED HOME, IN ADDITION TO SPACES ACCOMMODATED BY GARAGES (OFF-STREET). DRIVEWAY AREA MAY BE USED TO MEET THIS REQUIREMENT.
4. ALL PROPOSED DEVELOPMENT ON THE SITE SHALL COMPLY WITH ORDINANCE REQUIREMENTS REGARDING THE NUMBER AND ARRANGEMENT OF OFF-STREET PARKING SPACES, YARD DIMENSIONS, BUFFERS, SCREENING, LANDSCAPE, ET CETERA, UNLESS OTHERWISE NOTED IN THE SITE DEVELOPMENT NOTES OR SCHEMATIC SITE PLAN.
5. OPEN SPACE CHARACTER: THE OPEN SPACES INDICATED ON THIS PLAN ARE SUBJECT TO CHANGE BASED ON FINAL CONSTRUCTION DOCUMENTATION. AGE APPROPRIATE AMENITIES TO BE PROVIDED AS PART OF THE OVERALL OPEN SPACE AND AMENITY STRATEGY.
a) COMMUNITY OPEN SPACES WILL BE OWNED AND MAINTAINED BY A HOME OWNERS ASSOCIATION ESTABLISHED BY THE DEVELOPER.
b) OPEN SPACES MAY BE MAINTAINED AS LAWNS WITH IMPROVEMENTS SUCH AS LANDSCAPING, PLAYGROUND EQUIPMENT, OR MAY REMAIN AS A NATURAL OPEN SPACE RETAINING EXISTING TREES AND VEGETATION WITH TRAILS, AS APPROPRIATE.
c) POTENTIAL AMENITY LOCATION(S) HAVE BEEN IDENTIFIED ON THE SCHEMATIC SITE PLAN. ALTHOUGH AT LEAST ONE AMENITY CENTER (CLUB, POOL, ETC) SHALL BE REQUIRED TO SERVE THIS PROJECT, AN AMENITY SHALL BE PLACED IN ONE OR MORE OF THE LOCATIONS INDICATED ON THE PLAN. THE LOCATION AND NUMBER OF AMENITIES TO SERVE THE RESIDENTIAL PROJECT SHALL BE REVIEWED AND APPROVED BY GASTON COUNTY PLANNING DEPARTMENT STAFF AS PART OF SITE PLAN APPROVAL.
6. RESIDENTIAL ARCHITECTURAL REQUIREMENTS:
a) AT LEAST 2 DIFFERENT BUILDING MATERIALS SHALL BE PROVIDED ON THE FRONT FAÇADE. ARCHITECTURAL PACKAGE SHALL BE SUBMITTED TO BUILDING AND DEVELOPMENT SERVICES STAFF FOR FINAL APPROVAL DURING THE FINAL SITE PLAN REVIEW PROCESS.
b) VINYL SIDING SHALL NOT BE USED WITHIN THE DEVELOPMENT. VINYL SOFFITS AND ALUMINUM COILED FASCIA/TRIM ARE ACCEPTABLE.
c) MAILBOX PLACEMENT (CLUSTER BOXES) WITHIN THE DEVELOPMENT MUST BE APPROVED BY THE UNITED STATES POSTAL SERVICE AND A STATEMENT PROVIDED BY THE USPS DURING THE MAJOR SUBDIVISION APPROVAL PROCESS.
d) HARD SURFACE DRIVEWAYS ARE REQUIRED TO SERVE RESIDENTIAL LOTS
e) INDIVIDUAL LOTS TO RECEIVE SOD OR SEED/STRAW TO SUPPORT FINAL STABILIZATION.
f) GARAGE DOOR(S) SHALL BE PANELED AND FRAMED WITH DECORATIVE TRIM. ATTACHED FRONT GARAGES OR FRONT LOADING GARAGES SHALL NOT EXTEND MORE THAN FIVE (5) FEET FROM THE FRONT ENTRANCE WALL OR IF ADJACENT TO THE PORCH SHALL NOT EXTEND MORE THAN THREE (3) FEET FROM THE PORCH FRONT.
7. STREETS AND SIDEWALKS WITHIN RESIDENTIAL AREAS: THIS PROJECT WILL BE SUBJECT TO REGULATION AND APPROVAL BY NCDOT AND WILL PROVIDE FOR NCDOT STANDARDS.
a) PROVIDE MULTIPLE ACCESSES IN ACCORDANCE WITH SECTION 13.23
b) COMPLY WITH GCLMPO COMMUNITY TRANSPORTATION PLAN.
c) ALL ROAD IMPROVEMENTS FOR EACH PHASE OF DEVELOPMENT (ON-SITE AND OFF-SITE) MUST BE APPROVED AS PART OF THE MAJOR SUBDIVISION APPROVAL PROCESS FOR EACH PHASE OF DEVELOPMENT, AND MUST BEGIN AND RUN CONCURRENTLY WITH PHASE ONE PAVING AND DEVELOPMENT PROCESS. PRIOR TO FINAL PLAT APPROVAL FOR PHASE ONE THE REQUIRED IMPROVEMENTS MUST BE IN PLACE OR A BOND OR LETTER OF CREDIT WILL BE POSTED FOR ANY IMPROVEMENTS NOT IN PLACE PRIOR TO THE APPROVAL OF THE PHASE ONE RECORD MAP. ALL FUTURE PHASES TO BE CONSTRUCTED MUST FOLLOW THE SAME PATTERN.
d) PRIOR TO FINAL PLATTING FOR EACH PHASE OF DEVELOPMENT, WATER AND SEWER SHALL BE APPROVED AND INSTALLED TO SERVE THAT SPECIFIC PHASE.
e) LIGHT FIXTURES WILL BE IN COMPLIANCE WITH SECTION 9.13, BUT WILL BE FULL CUT-OFF LIGHT FIXTURES ONLY. (CUT-OFF LIGHTING FIXTURES ARE LIGHTS THAT CAST LIGHT DOWNWARD.) LIGHTING PLAN AND PHOTOMETRIC PLAN TO BE INCLUDED DURING FINAL SITE PLAN REVIEW (INCLUDING SPECIALTY LIGHTING).
8. FINAL ROADWAY R/W WIDTHS AND STANDARDS ARE SUBJECT TO NCDOT AND WILL BE PROVIDED WITH FINAL ENGINEERING (MAJOR SUBDIVISION) OF THE SITE PLAN.
9. HOME OWNERS ASSOCIATION: A HOME OWNERS ASSOCIATION (HOA) WILL BE ESTABLISHED FOR THE RESIDENTIAL COMMUNITIES DEVELOPED ON THE SITE. DEVELOPMENT STANDARDS, ANY RESTRICTIONS, AND HOA DECLARATIONS WILL BE RECORDED WITH THE GASTON COUNTY REGISTER OF DEEDS OFFICE IN ADDITION TO A SUBDIVISION PLAT. THE DECLARATION WILL INCLUDE THE FOLLOWING:
a) ESTABLISHMENT OF HOA, ITS' OPERATION, AND ITS' RESPONSIBILITIES
i. MAINTENANCE OF OPEN SPACE/GREENWAYS (IMPROVED OR UNIMPROVED).
ii. MAINTENANCE OF FIXTURES WITHIN THE RIGHT-OF-WAY AREA, SUCH AS STREET TREES, SIGNS, LANDSCAPING, LIGHT FIXTURES, AND SIDEWALKS.
iii. PLANS FOR WASTE/GARBAGE PICK UP.
b) SUBDIVISION RESTRICTIONS AND COUNTY APPROVED CONDITIONS SET FORTH HEREIN
c) THE FINAL RECORDED PLAT(S) SHALL DELINEATE AND INCLUDE THE FOLLOWING:
i. OPEN AND COMMON AREAS
ii. ALL BUFFER YARDS STATING THE TYPE AND OPTION NUMBER
iii. ALL EASEMENTS AND RIGHT-OF-WAYS
d) STREETS, WILL BE SHOWN ON THE FINAL SUBDIVISION PLAT WHETHER PUBLIC OR PRIVATE. IF THEY ARE NOT ACCEPTED BY NCDOT, THEN THE PLATS WILL BE RE-RECORDED CHANGING THEM TO PRIVATE ROADS.
10. MITIGATION WILL BE PERFORMED BASED ON THE TIA REPORT PERFORMED BY KIMLEY HORN & ASSOCIATES ON AUGUST 7?, 2023, SO LONG AS PETITIONER IS ABLE TO ACQUIRE ALL NECESSARY RIGHT OF WAY AND/OR EASEMENTS NECESSARY FOR THE INSTALLATION OF SUCH IMPROVEMENTS. IF PETITIONER OR ITS DESIGNEES IS UNABLE TO OBTAIN NECESSARY EASEMENTS NEEDED TO CONSTRUCT ANY OF THE ROAD IMPROVEMENTS, A PAYMENT IN LIUE OF SUCH IMROVEMENTS SHALL BE PERMITTED.
11. A SEPARATE SIGNAGE DESIGN AND/OR SIGNAGE PACKAGE MAY BE SUBMITTED FOR THE PROJECT WHICH WILL BE REVIEWED AND APPROVED BY STAFF. THE PETITIONER WILL WORK WITH STAFF TO DETERMINE MINOR MODIFICATIONS THAT CAN BE ADDRESSED AT AN ADMINISTRATIVE LEVEL, AS IT RELATES TO UDO REQUIREMENTS. SIGNAGE TO SERVE THIS PROJECT MAY ALLOW UP TO 200 SQUARE FEET, LANDSCAPE LIGHTING, AND HEIGHT UP TO 10' TALL PER PRIMARY SIGNAGE. PLUS ALLOW UP TO 150 SQUARE FEET, LANDSCAPE LIGHTING, AND HEIGHT UP TO 8' TALL PER SECONDARY SIGNAGE.

OVERALL NOTES
1. THE SITE PLAN DEPICTS A DEVELOPMENT SCENARIO BASED UPON THE CONDITIONS DEFINED BY THESE SITE DEVELOPMENT NOTES. OTHER DEVELOPMENT SCENARIOS ARE PERMITTED AS A MATTER OF RIGHT, WHICH WILL ALLOW ALTERNATIVES TO THE NUMBER AND ARRANGEMENT OF BUILDINGS. IN NO EVENT, HOWEVER, SHALL BUFFER OR YARD SETBACK DIMENSIONS BE DECREASED OR THE MAXIMUM LEVEL OF DEVELOPMENT DENSITY FOR THE ENTIRE SITE BE INCREASED FROM THAT INDICATED ON THE SITE DEVELOPMENT SUMMARY.
2. LAND USES WILL BE LIMITED TO USES PERMITTED BY THE UNIFIED DEVELOPMENT ORDINANCE (UDO) AND/OR AS CONDITIONED WITH THIS REZONING PACKAGE.
3. CAROLINA THREAD TRAIL TO BE BUILT BY THE CAROLINA LANDS CONSERVANCY (CLC): THE PETITIONER WILL WORK WITH THE CATAWBA LANDS CONSERVANCY (CLC) ON THE DONATION OR A LEASED PORTION OF THE SITE TO ALLOW FOR THE CONSTRUCTION OF THE CAROLINA THREAD TRAIL. THE AREA TO BE LEASED TO THE CLC WILL BE DETERMINED DURING THE FINAL DESIGN AND MAJOR SUBDIVISION APPROVAL PROCESS FOR THE SITE. SUBJECT TO THE APPROVAL OF CLC THE CONSTRUCTION OF THE PORTION OF THE CAROLINA THREAD TRAIL PLAN WILL BE INCORPORATED INTO THE FINAL DESIGN OF THE SUBDIVISION, WITH THE FINAL LOCATION ON THE GROUND BEING DETERMINED BY THE CAROLINA THREAD TRAIL CLC, AND PETITIONER. THE SITE PLAN PROVIDED INDICATES A POTENTIAL ALIGNMENT FOR THE TRAIL, BUT WILL BE SUBJECT TO FINAL PLANNING AND ENGINEERING. DOCUMENTATION OF ANY AGREEMENT OR PLAN WITH/FOR THE CAROLINA THREAD TRAIL AND/OR CLC, MUST BE PROVIDED PRIOR TO THE FINAL APPROVAL OF ANY SUBDIVISION PLATS. THE SITE PLAN PROVIDED FOR SUBDIVISION APPROVAL MUST INCLUDE TYPICAL DETAIL OF THE GREENWAY TRAIL, IN ACCORDANCE WITH CLC.
4. UTILITIES: PUBLIC WATER AND SEWER UTILITIES SHALL BE PROVIDED BY WATE MANAGEMENT PROS OF THE CAROLINAS.
THE FOLLOWING SHOULD APPLY:
a) WATER METERS AND ANY OTHER DEVICES REQUIRING FREQUENT MAINTENANCE FOR ADEQUATE SERVICE WILL NOT BE INSTALLED IN A RESIDENTIAL DRIVEWAY AND BE EASILY ACCESSIBLE.
b) SANITARY SEWER CLEAN-OUTS AND DEVICES REQUIRING FREQUENT MAINTENANCE SHALL NOT BE INSTALLED IN A RESIDENTIAL DRIVEWAY AND BE EASILY ACCESSIBLE.
c) WATER TANK AND SEWER PACKAGE PLANT LOCATIONS WILL BE A MINIMUM OF ONE HUNDRED (100) FEET FROM ANY RESIDENTIAL LOT LINE.
5. SCHOOLS: PETITIONER WILL PROVIDE A PAYMENT AS FEE IN LIEU FOR A FUTURE SCHOOL SITE TO BE DETERMINED BY GASTON COUNTY SCHOOLS. THE FEE WILL BE CALCULATED AS FOLLOWS:
i. THE PETITIONER WILL CONTRIBUTE TO GASTON COUNTY A MINIMUM OF $1,000 FOR EACH DWELLING UNIT APPROVED FOR THE SITE AS PART OF THE MAJOR SUBDIVISION APPROVAL PROCESS;
ii. ONCE THE TOTAL AMOUNT OF THE FEE HAS BEEN CALCULATED AS DESCRIBED ABOVE THE FEE WILL BE DIVIDED BY THE TOTAL NUMBER OF SINGLE-FAMILY DETACHED HOMES APPROVED AS PART OF THE MAJOR SUBDIVISION APPROVAL (THE COST OF THE FEE WILL BE SHARED BY ALL THE PROPOSED SINGLE-FAMILY HOMES); AND
iii. THE FEE WILL BE PAID AT THE TIME OF THE ISSUANCE OF THE BUILDING PERMIT FOR EACH OF THE PROPOSED SINGLE-FAMILY HOMES.
6. WATERSHED/FLOODPLAIN DEVELOPMENT REQUIREMENTS (TO BE REVIEWED BY GASTON COUNTY NR AND TO BE COORDINATED/SHOWN DURING FINAL SITE PLAN REVIEW)
a) THE PROJECT SHALL ADHERE TO GASTON COUNTY WATER SUPPLY WATERSHED REGULATIONS AS REQUIRED OF DEVELOPMENT WITHIN THE LAKE WYLIE WATERSHED (WTH WSIV PROTECTED - AUG07) AND SHALL UTILIZE THE LOW DENSITY OPTION OF SAID ORDINANCE TO ALLOW FOR THE FOLLOWING BUILT UPON AREA LIMITS:
b) LAKE WYLIE WATERSHED (WITH WSIV PROTECTED - AUG07): 24% BUILT-UPON AREA
c) THE FOLLOWING ENHANCED STORMWATER MANAGEMENT CONTROLS WILL BE PROVIDED WITH THE PROJECT DEVELOPMENT:
i. CONSTRUCTION (EROSION CONTROL) CONTROLS
ii. SURFACE WATER DRAWDOWN DEVICES (SKIMMERS) SHALL BE INSTALLED IN ALL SEDIMENT BASINS
iii. INCREASED CAPACITY SEDIMENT BASINS; PROVIDE VOLUME SUFFICIENT TO ROUTE 25-YEAR STORM EVENT THROUGH SKIMMER OUTLET
iv. SKIMMER OUTLET DEVICES SHALL DISCHARGE THROUGH SILT BAG OUTLET
v. POLYACRYLAMIDES (PAM) MAY BE INCORPORATED INTO SEDIMENT BASIN DESIGN SPECIFICATIONS AND SEQUENCING FOR ENHANCED SETTLING EFFICIENCIES OF SEDIMENT BASINS IF NECESSARY. THIS ACTIVITY SHALL BE INSPECTED AND APPROVED BY GASTON COUNTY EROSION CONTROL INSPECTOR.
vi. HIGH HAZARD SILT FENCE SHALL BE DESIGNED TO BE INSTALLED AROUND ENVIRONMENTALLY SENSITIVE AREAS (STREAM BUFFERS, WETLANDS, FLOODPLAIN LIMITS) AS DETERMINED THROUGH THE REVIEW AND APPROVAL PROCESS PRIOR TO ISSUANCE OF GRADING PERMIT.
vii. STABILIZATION OF DENUDED AREAS SHALL BE WITHIN FIVE (5) DAYS AFTER AREAS ARE BROUGHT TO FINISHED GRADE OR WITHIN FIVE (5) DAYS OF LAST LAND-DISTURBING ACTIVITY.
viii. SLOPE DRAINS SHALL BE UTILIZED TO PROTECT SLOPES 10 FEET IN HEIGHT OR GREATER DURING EROSION CONTROL ACTIVITIES.
ix. SLOPES OVER 10 FEET IN HEIGHT SHALL BE DESIGNED TO A 3:1 SLOPE OR SHALL BE TERRACED.
7. PETITIONER TO PROVIDE AN AGREEMENT REGARDING ZONING, BUILDING INSPECTIONS, FLOODPLAIN REGULATIONS, AND WATERSHED WATER SUPPLY INSPECTIONS PRIOR TO ANY FINAL APPROVAL OF THE SITE PLAN BY GASTON COUNTY.
8. PETITIONER WILL PROVIDE AN ENVIRONMENTAL SITE ASSESSMENT, PHASE I. FURTHER, PETITIONER WILL ADHERE TO ANY RECOMMENDATIONS, IF ANY, WITHIN THE ENVIRONMENTAL SITE ASSESSMENT, PHASE I.
9. A DEVELOPMENT PHASING PLAN WILL BE PROVIDED AND APPROVED AT CONSTRUCTION PLAN REVIEW.
10. ALL SITE IMPROVEMENTS (UTILITIES, STREETS, SIDEWALKS, ET CETERA) WILL BE COMPLETED FOR EACH PHASE PRIOR TO THE FINAL PLAT APPROVAL FOR EACH PHASE OR A BOND SHALL BE ACCEPTED AND/OR APPROVED FOR THE SITE IMPROVEMENTS FOR EACH PHASE. SIDEWALKS MAY BE INCLUDED IN AN IMPROVEMENT BOND, BUT WATER AND SEWER ARE NOT SUBJECT TO BONDING.
11. FINAL DEVELOPMENT PLAN MUST ADHERE TO AND MEET ALL LOCAL, STATE, AND FEDERAL REQUIREMENTS AND GUIDELINES PRIOR TO THE ISSUANCE OF ANY PERMITS.

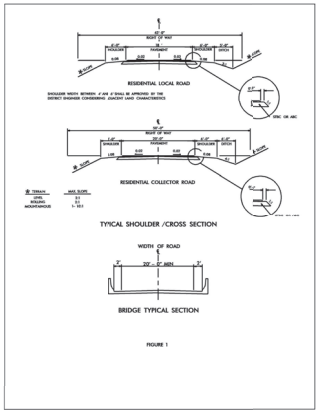


FIGURE 1

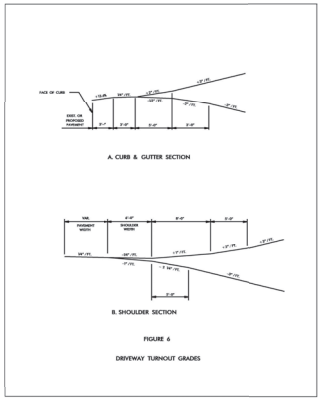


FIGURE 6
DRIVEWAY TURNOUT GRADES

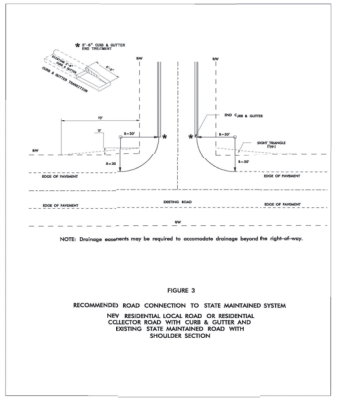


FIGURE 3
RECOMMENDED ROAD CONNECTION TO STATE MAINTAINED SYSTEM
NEW RESIDENTIAL LOCAL ROAD OR RESIDENTIAL COLLECTOR ROAD WITH CURB & GUTTER AND EXISTING STATE MAINTAINED ROAD WITH SHOULDER SECTION

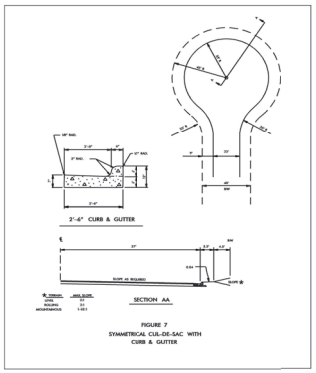
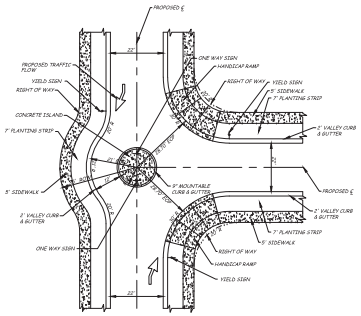
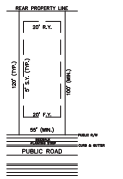
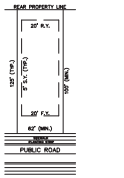


FIGURE 7
SYMMETRICAL CUL-DE-SAC WITH CURB & GUTTER

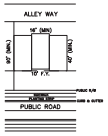




5.2' LOT DETAIL (TYP.)
MINIMUM LOT WIDTH = 52 FT
MINIMUM LOT SIZE = 6,200 SF
SETBACK – FRONT = 20 FT
SIDE = 5 FT
CORNER = 10 FT
REAR = 20 FT



62' LOT DETAIL (TYP.)
MINIMUM LOT WIDTH = 62 FT
MINIMUM LOT SIZE = 7,200 SF
SETBACK – FRONT = 20 FT
SIDE = 5 FT
CORNER = 10 FT
REAR = 20 FT



20'X45' TH FRONT LOT DETAIL (TYP.)
MINIMUM LOT WIDTH = 20 FT
MINIMUM LOT SIZE = 1,800 SF
SETBACK – FRONT = 10 FT
REAR = 16 FT

DATE	ISSUED FOR	REV
07/06/2023	First Rezoning Submittal to Gaston County	0

NORTH CAROLINA 811 — North Carolina One-Call Center
811 — Know what's below. Call before you dig.

Engineer:
RJH
R. Joe Harris & Associates, Inc.
Engineering • Land Surveying • Planning Management
3196 Stonecrest Blvd., Tega Cay, S.C. 29708 P: (803) 802-1769
www.rjoeharris.com

FOR INFORMATION ONLY

Project Manager: -	Drawn: -
Department Manager: -	Checked: -
Print/Plot Date: July 7, 2023	
Asbuilt Drawn: -	Asbuilt Date: -

Client:
Tom Springs
400 W. CATAWBA AVE
MT. HOLLY, NORTH CAROLINA 28120
P: (704) 827-7791

Project:
Holly Springs

Drawing Title:
Conceptual Rezoning Plan
Technical & Conditional Notes

Project No.	Drawing No.
4710	C-3.0
DWG File Name: Holly Springs Rezoning Concept	

Turning Movement Counts

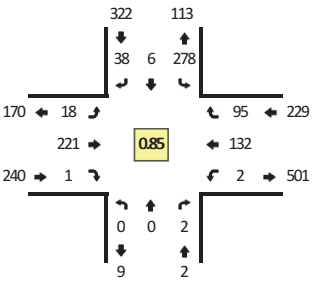
Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

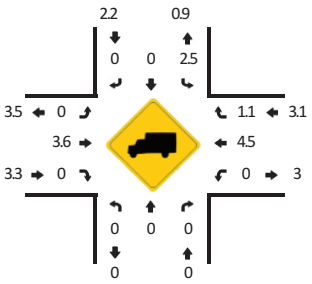
LOCATION: Old Hickory Grove Rd -- W Catawba Ave
CITY/STATE: Gaston, NC

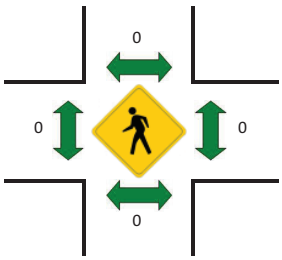
QC JOB #: 15825803
DATE: Thu, May 19 2022

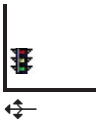
Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:15 AM -- 7:30 AM

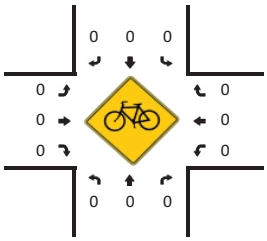


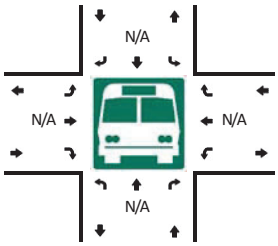
Quality Counts
DATA THAT DRIVES COMMUNITIES

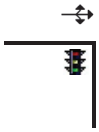


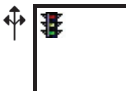


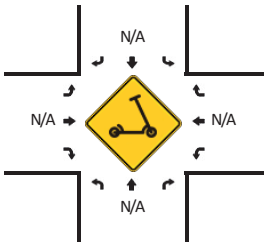












15-Min Count Period Beginning At	Old Hickory Grove Rd (Northbound)				Old Hickory Grove Rd (Southbound)				W Catawba Ave (Eastbound)				W Catawba Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:30 AM	0	0	1	0	56	1	10	0	1	38	2	0	1	17	8	0	135	
6:45 AM	0	0	0	0	74	1	11	0	2	43	1	0	0	18	5	0	155	
7:00 AM	0	0	1	0	71	1	13	0	5	58	1	0	0	27	8	0	185	
7:15 AM	0	0	1	0	85	3	10	0	5	58	0	0	0	35	36	0	233	708
7:30 AM	0	0	0	0	71	1	5	0	4	54	0	0	1	42	32	0	210	783
7:45 AM	0	0	0	0	51	1	10	0	4	51	0	0	1	28	19	0	165	793
8:00 AM	1	0	0	0	63	1	11	0	5	38	2	0	0	33	27	0	181	789
8:15 AM	0	0	0	0	35	0	9	0	6	52	0	0	0	34	22	0	158	714

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	4	0	340	12	40	0	20	232	0	0	0	140	144	0	932
Heavy Trucks	0	0	0		12	0	0		0	4	0		0	8	0		24
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 5/30/2022 9:41 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

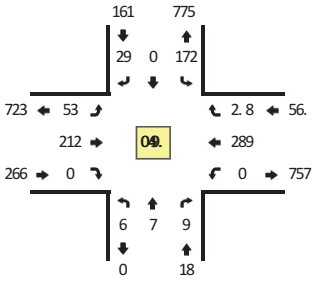
Type of peak hour being reported: Intersection Peak

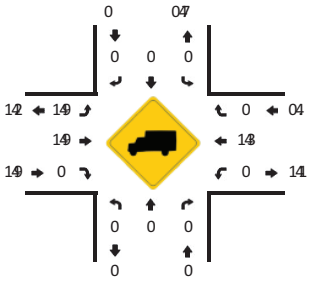
Method for determining peak hour: Total Entering Volume

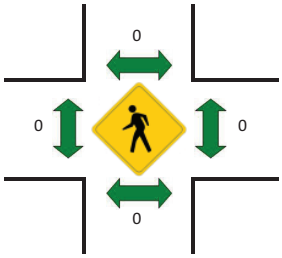
LOCATION: Old Hickory Grove Rd -- W Catawba Ave
CITY/STATE: Gaston, NC

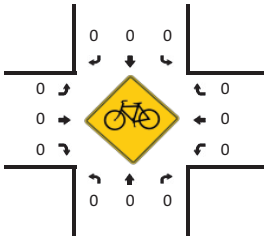
QC JOB #: 15825803
DATE: Thu, May 19 2022

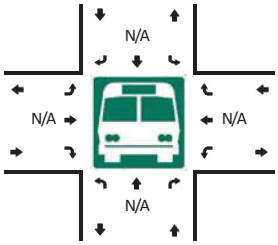
Peak-Hour: 3:70 PM -- 5:70 PM
Peak 15-Min: 3:70 PM -- 3:35 PM

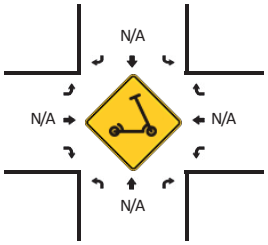












15-Min Count Period Beginning At	Old Hickory Grove Rd (Northbound)				Old Hickory Grove Rd (Southbound)				W Catawba Ave (Eastbound)				W Catawba Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
2:00 PM	0	0	1	0	7.	1	6	0	8	73	0	0	0	28	72	0	13.	
2:15 PM	0	0	1	0	76	0	8	0	16	78	0	0	1	7.	75	0	1. 2	
2:70 PM	0	0	0	0	28	0	9	0	17	50	0	0	0	56	6.	0	227	
2:35 PM	0	0	1	0	75	0	1	0	9	37	0	0	2	59	37	0	197	. 75
7:00 PM	1	0	2	0	78	0	6	0	9	77	0	0	2	67	33	0	198	. 86
7:15 PM	0	1	0	0	70	0	11	0	13	56	0	0	1	52	75	0	200	813
7:70 PM	0	0	0	0	75	0	.	0	13	63	0	0	0	. 7	69	0	262	857
7:35 PM	0	0	0	0	30	0	6	0	13	38	0	0	0	6.	. 6	0	251	911
3:00 PM	1	0	1	0	71	0	11	0	19	25	0	0	0	66	52	0	206	919
3:15 PM	2	1	2	0	28	0	12	0	5	51	1	0	2	60	35	0	209	928
3:70 PM	5	2	.	0	70	0	9	0	1.	60	0	0	0	6.	67	0	260	926
3:35 PM	1	1	1	0	75	0	6	0	12	50	0	0	0	69	80	0	255	970
5:00 PM	0	0	1	0	71	0	.	0	11	5.	0	0	0	. .	. 0	0	253	9. 8
5:15 PM	0	0	0	0	76	0	.	0	13	35	0	0	0	. 6	65	0	237	1012
5:70 PM	0	0	1	0	79	0	.	0	8	33	0	0	1	58	. 1	0	229	981
5:35 PM	0	0	2	0	50	0	8	0	12	7.	0	0	1	6.	60	0	27.	967
6:00 PM	0	0	0	0	32	0	.	0	8	32	0	0	0	66	57	0	218	92.
6:15 PM	0	0	0	0	78	0	6	0	.	39	0	0	0	32	37	0	185	869
6:70 PM	0	0	0	0	33	0	10	0	11	28	0	0	0	79	36	0	1. 8	818
6:35 PM	1	0	0	0	29	0	10	0	5	70	1	0	0	76	59	0	1. 1	. 52

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	20	8	28	0	120	0	76	0	68	230	0	0	0	268	252	0	1030
Heavy Trucks	0	0	0		0	0	0		0	3	0		0	0	0		3
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 5/70/2022 9:31 AM

SOURCE: Quality Counts, LLC (http://www4ualitycounts4net) 1-8. . -580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: Legion Hd G6v CataR ba Hd

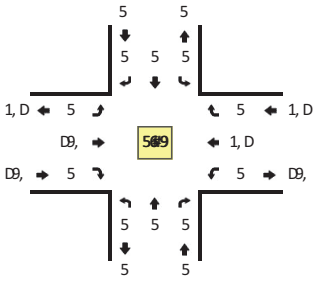
CIT820TATE: 3astonYNC

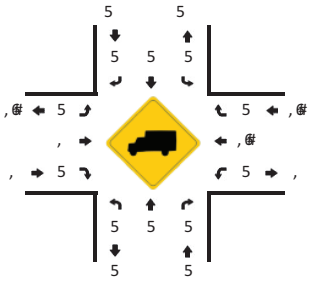
- C WOwQ: J B#1B#5B

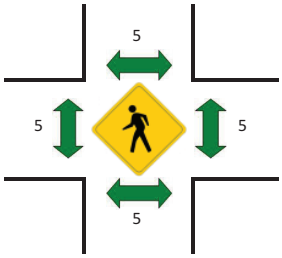
/ ATE: ThuYMay J S 1511

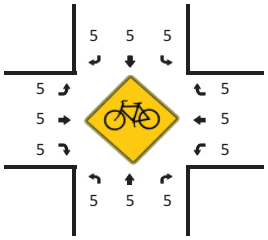
PeakG7 our: 9:55 AM GG#:55 AM

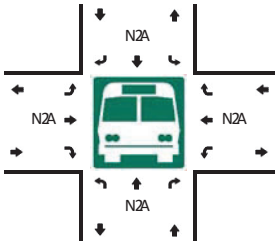
Peak J BGMin: 9:J B AM GG9:, 5 AM

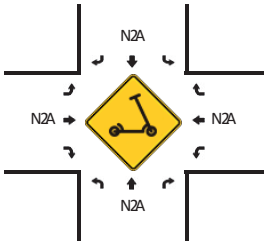












J BGMin Count Period weginning At	Legion Hd .Northbound4				Legion Hd .0outhbound4				v CataR ba Hd .Eastbound4				v CataR ba Hd .v estbound4				Total	7 ourly Totals
	Left	Thru	Hight	(	Left	Thru	Hight	(	Left	Thru	Hight	(	Left	Thru	Hight	(		
) :, 5 AM	5	5	J	5	5	5	5	5	5	SB	5	5	5	19	5	5	J 1,	
) :DB AM	5	5	5	5	5	5	5	5	5	J J 1	5	5	5	11	5	5	J , D	
9:55 AM	5	5	5	5	5	5	5	5	5	J 1D	5	5	5	, B	5	5	J BS	
9:J B AM	5	5	5	5	5	5	5	5	5	J , ,	5	5	5	95	5	5	15,	) J S
9:, 5 AM	5	5	5	5	5	5	5	5	5	J 1,	5	5	5	9)	5	5	J SS	) SB
9:DB AM	5	5	5	5	5	5	5	5	5	S,	5	5	5	B,	5	5	J D)	959
#:55 AM	5	5	5	5	5	5	5	5	5	#9	5	5	5	) J	5	5	J D#	) S)
#:J B AM	5	5	5	5	5	5	5	5	5	##	5	5	5	BD	5	5	J D1	) , B

Peak J BGMin UloR rates	Northbound				0outhbound				Eastbound				v estbound				Total
	Left	Thru	Hight	(	Left	Thru	Hight	(	Left	Thru	Hight	(	Left	Thru	Hight	(	
All Vehicles	5	5	5	5	5	5	5	5	5	B, 1	5	5	5	1#5	5	5	#J 1
7 eaFy Trucks	5	5	5		5	5	5		5	J)	5		5	J 1	5		1#
wuses																	
Pedestrians		5				5				5				5			5
wicycles	5	5	5		5	5	5		5	5	5		5	5	5		5
0cooters																	

Comments:

Heport generated on B2, 521511 S:DJ AM

0O(HCE: - uality CountsYLLC .http:22R R R 6quality counts6net4J G#99GB#5G11J 1

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: Legion Hd G&v CataR ba Hd

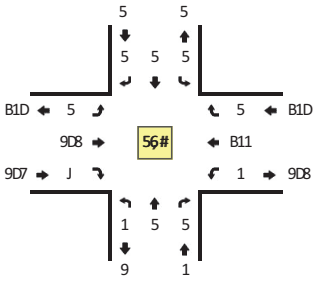
CIT203TATE: Y aston/NC

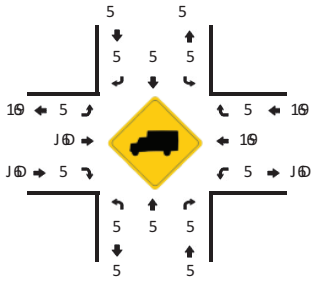
- C W0wQ: J B#1B#58

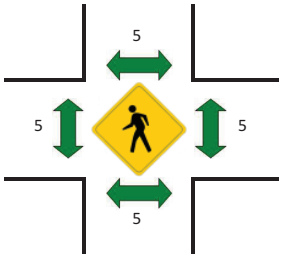
S ATE: Thu/May J , 1511

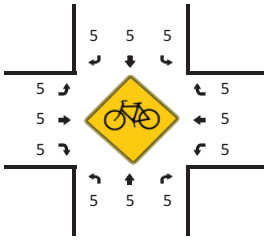
PeakG our: D:95 PM GGB:95 PM

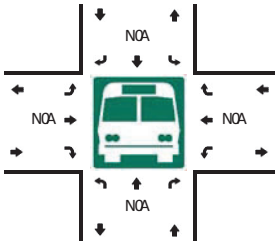
Peak J BGMin: D:95 PM GGD:DB PM

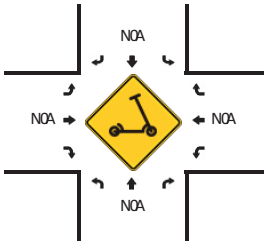












J BGMin Count Period weginning At	Legion Hd 4Northbound(				Legion Hd 4Bouthbound(				v CataR ba Hd 4Eastbound(				v CataR ba Hd 4v estbound(				Total	. ourly Totals
	Left	Thru	Hight	)	Left	Thru	Hight	)	Left	Thru	Hight	)	Left	Thru	Hight	)		
1:55 PM	5	5	5	5	5	5	5	5	5	75	5	5	5	B#	5	5	J 1#	
1:J B PM	5	5	5	5	5	5	5	5	5	8B	J	5	5	8D	5	5	J 95	
1:95 PM	5	5	J	5	5	5	5	5	5	7,	J	5	5	J J J	5	5	J , 1	
1:DB PM	5	5	5	5	5	5	5	5	5	88	5	5	J	, 7	5	5	J 8D	8J D
9:55 PM	5	5	5	5	5	5	5	5	5	7J	5	5	5	J J J	5	5	J #1	88#
9:J B PM	5	5	5	5	5	5	5	5	5	#5	5	5	5	#B	5	5	J 8B	759
9:95 PM	J	5	5	5	5	5	5	5	5	, #	5	5	5	J B1	5	5	1BJ	781
9:DB PM	5	5	5	5	5	5	5	5	5	7,	5	5	5	J 98	5	5	1J B	#J 9
D:55 PM	5	5	5	5	5	5	5	5	5	B8	5	5	5	J J #	5	5	J 7D	#5B
D:J B PM	5	5	5	5	5	5	5	5	5	7B	5	5	5	J 58	5	5	J #J	#1J
D:95 PM	5	5	5	5	5	5	5	5	5	J 5D	5	5	J	J J #	5	5	119	7, 9
D:DB PM	5	5	5	5	5	5	5	5	5	#5	J	5	5	J 97	5	5	1J #	7, 8
B:55 PM	J	5	5	5	5	5	5	5	5	#B	5	5	J	J 98	5	5	119	#DB
B:J B PM	J	5	5	5	5	5	5	5	5	77	5	5	5	J 9J	5	5	15,	#79
B:95 PM	5	5	5	5	5	5	5	5	5	#J	5	5	5	J 18	5	5	157	#B7
B:DB PM	J	5	5	5	5	5	5	5	5	#7	J	5	5	J J ,	5	5	15#	#D7
8:55 PM	5	5	5	5	5	5	5	5	5	#1	5	5	5	J J 9	5	5	J , B	#J ,
8:J B PM	5	5	5	5	5	5	5	5	5	#J	J	5	5	#9	5	5	J 8B	77B
8:95 PM	J	5	5	5	5	5	5	5	5	8B	5	5	1	7,	5	5	J D7	7J B
8:DB PM	J	5	5	5	5	5	5	5	5	8J	5	5	5	#5	5	5	J D1	8D,

Peak J BGMin UoR rates	Northbound				3outhbound				Eastbound				v estbound				Total
	Left	Thru	Hight	)	Left	Thru	Hight	)	Left	Thru	Hight	)	Left	Thru	Hight	)	
All Vehicles	5	5	5	5	5	5	5	5	5	DJ 8	5	5	D	D71	5	5	#, 1
. eaFy Trucks wuses	5	5	5		5	5	5		5	D	5		5	J 1	5		J 8
Pedestrians		5				5				5				5			5
wicycles 3cooters	5	5	5		5	5	5		5	5	5		5	5	5		5

Comments:

Heport generated on B09501511 , :DJ AM

3O) HCE: - uality Counts/LLC 4http:00R R R 6qualitycounts6net(J G#77GB#5G11J 1

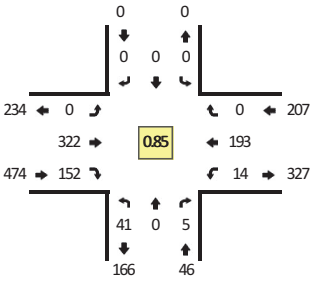
Type of peak hour being reported: Intersection Peak

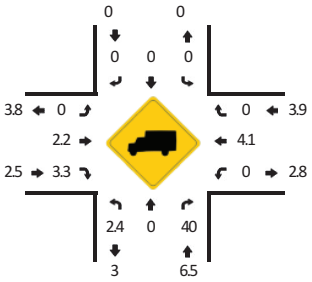
Method for determining peak hour: Total Entering Volume

LOCATION: Rankin Ave -- W Catawba Ave
CITY/STATE: Mount Holly, NC

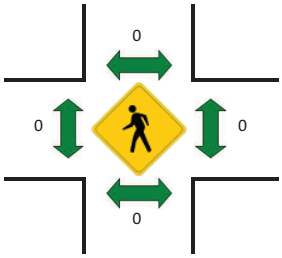
QC JOB #: 15825807
DATE: Thu, May 19 2022

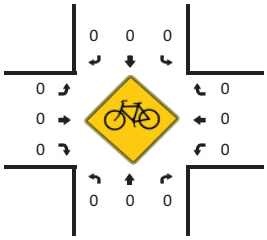
Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:15 AM -- 7:30 AM

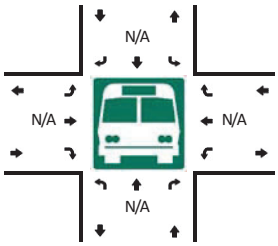


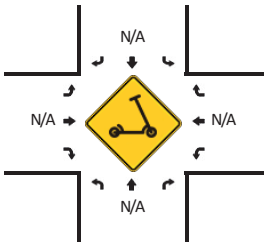


Quality Counts
DATA THAT DRIVES COMMUNITIES









15-Min Count Period Beginning At	Rankin Ave (Northbound)				Rankin Ave (Southbound)				W Catawba Ave (Eastbound)				W Catawba Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:30 AM	10	0	2	0	0	0	0	0	0	45	48	0	1	17	0	0	123	
6:45 AM	7	0	2	0	0	0	0	0	0	70	43	0	0	16	0	0	138	
7:00 AM	9	0	3	0	0	0	0	0	0	93	33	0	0	25	0	0	163	
7:15 AM	10	0	0	0	0	0	0	0	0	90	45	0	5	65	0	0	215	639
7:30 AM	13	0	2	0	0	0	0	0	0	76	44	0	4	60	0	0	199	715
7:45 AM	9	0	0	0	0	0	0	0	0	63	30	0	5	43	0	0	150	727
8:00 AM	11	0	2	0	0	0	0	0	0	62	27	0	1	49	0	0	152	716
8:15 AM	14	0	1	0	0	0	0	0	0	64	20	0	1	40	0	0	140	641

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	40	0	0	0	0	0	0	0	0	360	180	0	20	260	0	0	860
Heavy Trucks	0	0	0		0	0	0		0	8	8		0	12	0		28
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 5/30/2022 9:41 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: Rankin Ave -- W Catawba Ave

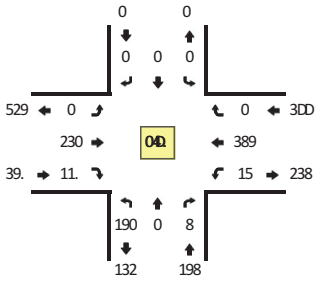
QC JOB #: 15825808

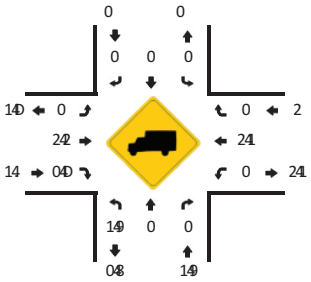
CIT7Y/TATE: Mount S ollyHNC

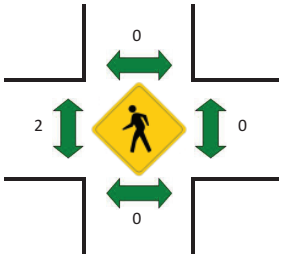
, ATE: ThuHMay 1D 2022

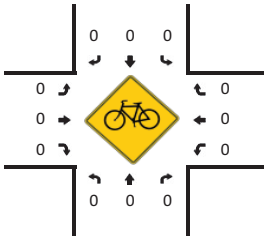
Peak-S our: 9:30 PM -- 5:30 PM

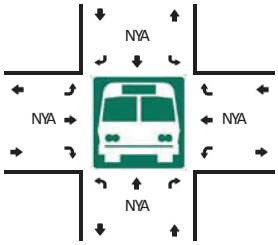
Peak 15-Min: 5:00 PM -- 5:15 PM

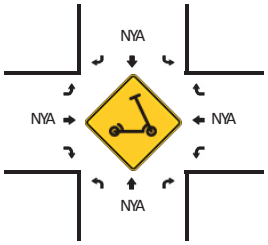












15-Min Count Period Beginning At	Rankin Ave 6Northbound(			)	Rankin Ave 6/outhbound(			)	W Catawba Ave 6Eastbound(			)	W Catawba Ave 6Westbound(			)	Total	S ourly Totals
	Left	Thru	Right		Left	Thru	Right		Left	Thru	Right		Left	Thru	Right			
2:00 PM	19	0	3	0	0	0	0	0	0	9.	25	0	2	99	0	0	135	
2:15 PM	12	0	0	0	0	0	0	0	0	9.	1D	0	2	53	0	0	133	
2:30 PM	23	0	2	0	0	0	0	0	0	U0	1D	0	5	D0	0	0	1DD	
2:95 PM	21	0	0	0	0	0	0	0	0	90	25	0	3	. U	0	0	1U5	U32
3:00 PM	33	0	1	1	0	0	0	0	0	59	18	0	5	81	0	0	1D3	UD0
3:15 PM	2.	0	3	0	0	0	0	0	0	U0	20	0	1	U0	0	0	1. 1	. 28
3:30 PM	3.	0	3	1	0	0	0	0	0	. 1	25	0	U	11.	0	0	2U0	. 8D
3:95 PM	92	0	1	0	0	0	0	0	0	53	25	0	2	D1	0	0	219	838
9:00 PM	25	0	1	0	0	0	0	0	0	38	20	0	9	DU	0	0	189	82D
9:15 PM	20	0	1	0	0	0	0	0	0	53	20	0	2	83	0	0	1. D	83.
9:30 PM	33	0	2	0	0	0	0	0	0	. 5	31	0	2	8U	0	0	22D	80U
9:95 PM	3U	0	0	0	0	0	0	0	0	52	28	0	U	102	0	0	229	81U
5:00 PM	90	0	9	0	0	0	0	0	0	59	39	0	3	DU	0	0	231	8U3
5:15 PM	31	0	2	0	0	0	0	0	0	9D	29	0	9	100	0	0	210	8D9
5:30 PM	39	0	2	0	0	0	0	0	0	5.	2U	0	5	D1	0	0	215	880
5:95 PM	31	0	2	0	0	0	0	0	0	51	33	0	2	8.	0	0	20U	8U2
U:00 PM	32	0	U	0	0	0	0	0	0	92	90	0	2	89	0	0	20U	83.
U:15 PM	30	0	5	0	0	0	0	0	0	99	3U	0	1	59	0	0	1. 0	. D.
U:30 PM	29	0	0	0	0	0	0	0	0	3U	32	0	3	53	0	0	198	. 30
U:95 PM	39	0	2	0	0	0	0	0	0	25	39	0	2	59	0	0	151	U. 5

Peak 15-Min Flowrates	Northbound			)	/outhbound			)	Eastbound			)	Westbound			)	Total
	Left	Thru	Right		Left	Thru	Right		Left	Thru	Right		Left	Thru	Right		
All Vehicles	1U0	0	1U	0	0	0	0	0	0	21U	13U	0	12	389	0	0	D29
S eavy Trucks	0	0	0		0	0	0		0	0	9		0	8	0		12
Buses																	
Pedestrians		0				0				0				0			0
Bicycles /cooters	0	0	0		0	0	0		0	0	0		0	0	0		0

Comments:

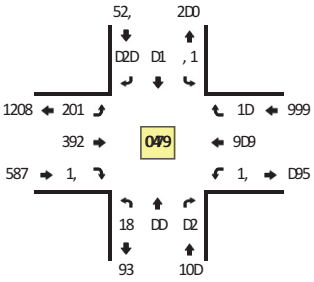
Report generated on 5Y30Y2022 D:91 AM

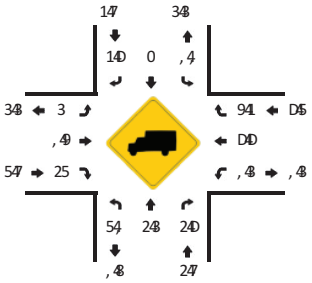
/O) RCE: Quality CountsHLLC 6http:YYwww4quality counts4net(1-8. . -580-2212

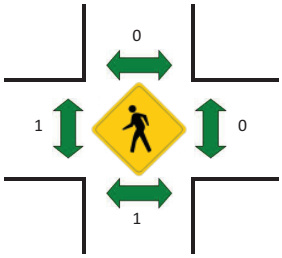
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

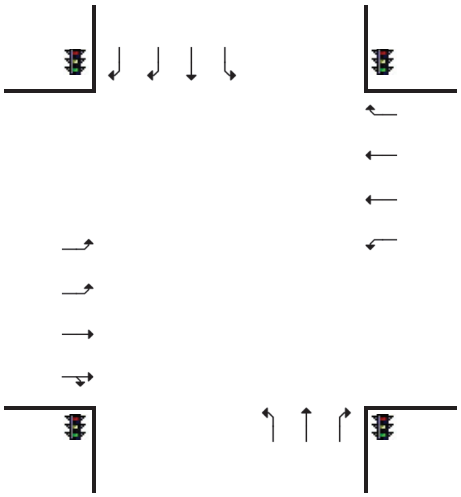
LOCATION: Rankin Ave-Tuckaseege Rd WwMain wt | **QC JOB #:** 15825807
CITY-wTATE: Mount / ollySNC | **HATE:** ThuSMay 17 2022

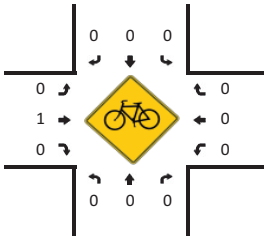
PeakW/our: 9:15 AM W8:15 AM
Peak 15WMin: 9:D5 AM W8:00 AM

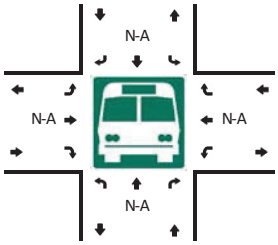


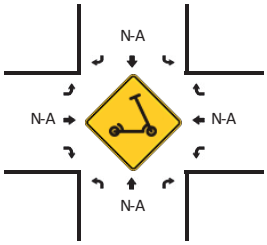












15WMin Count Period Beginning At	Rankin Ave-Tuckaseege Rd .Northbound6				Rankin Ave-Tuckaseege Rd .wouthbound6				wMain wt .Eastbound6				wMain wt .(estbound6				Total	/ ourly Totals
	Left	Thru	Right	)	Left	Thru	Right	)	Left	Thru	Right	)	Left	Thru	Right	)		
, :30 AM	,	2	5	0	13	2	85	0	20	81	5	12	2	10,	D	0	3D3	
, :D5 AM	3	3	8	0	13	,	8D	0	35	112	1	,	2	70	3	0	3, ,	
9:00 AM	3	5	3	0	11	9	9,	0	3D	9,	2	13	D	118	D	0	35,	
9:15 AM	5	9	1D	0	1D	7	71	0	5,	103	D	3	D	19,	2	0	D88	1553
9:30 AM	9	,	5	0	19	10	12,	0	D2	71	,	5	1	188	D	0	508	1918
9:D5 AM	2	15	10	0	19	12	111	0	D3	7,	3	5	D	171	5	0	51D	18, ,
8:00 AM	D	1,	13	0	13	10	7,	0	D1	82	3	,	9	172	3	0	D8,	177,
8:15 AM	9	,	12	0	1,	5	85	0	3,	73	1	D	12	1D3	1	0	D21	1727

Peak 15WMin UoF rates	Northbound				wouthbound				Eastbound				(estbound				Total
	Left	Thru	Right	)	Left	Thru	Right	)	Left	Thru	Right	)	Left	Thru	Right	)	
All Vehicles	8	, 0	D0	0	, 8	D8	DDD	0	192	38D	12	20	1,	9, D	20	0	205,
/ eavy Trucks	0	0	D		0	0	D		8	28	D		0	D8	D		100
Buses																	
Pedestrians		D				0				D				0			8
Bicycles wcooters	0	0	0		0	0	0		0	0	0		0	0	0		0

Comments:

Report generated on 5-30-2022 7:D1 AM | wO) RCE: Quality CountsSLLC .http:--F F F 4qualitycounts4net61W899W580W212

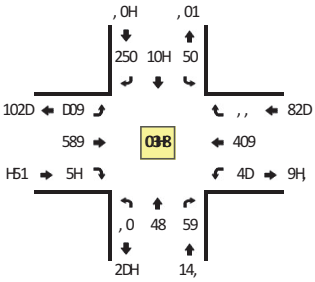
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

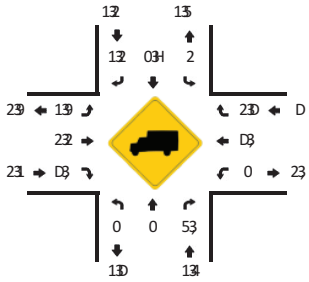
LOCATION: Rankin Ave-Tuckaseege Rd WwMain wt | **QC JOB #:** 15825810

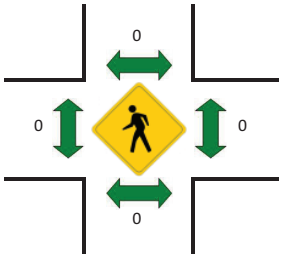
CIT7-wTATE: Mount Yolly/NC | **SATE:** Thu/May 1H 2022

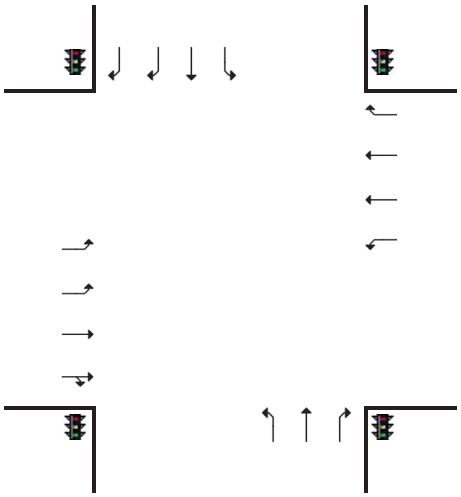
PeakWour: , :, 5 PM WW5:, 5 PM

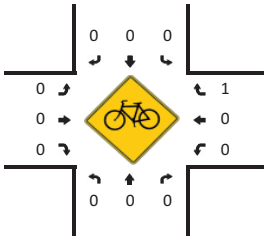
Peak 15WMin: 5:D0 PM WW5:, 5 PM

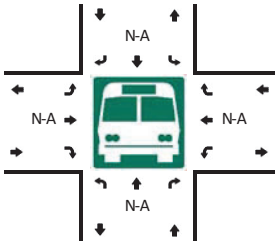


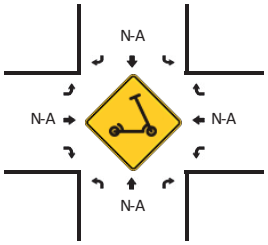












15WMin Count Period Beginning At	Rankin Ave-Tuckaseege Rd .Northbound6				Rankin Ave-Tuckaseege Rd .wouthbound6				wMain wt .Eastbound6				wMain wt .(estbound6				Total	Yourly Totals
	Left	Thru	Right	)	Left	Thru	Right	)	Left	Thru	Right	)	Left	Thru	Right	)		
2:00 PM	10	11	10	0	14	12	54	0	5D	159	4	,	8	1, 1	11	0	, H4	
2:15 PM	15	4	8	0	15	12	, 5	0	59	191	4	8	,	1, ,	9	1	, 8H	
2:D0 PM	H	1D	10	0	14	1D	91	0	52	144	4	,	5	208	D	0	54H	
2:, 5 PM	8	18	19	0	1H	1,	59	0	, 8	158	10	,	12	221	11	0	5H5	2190
D:00 PM	8	12	H	0	10	19	51	0	, 9	1, 8	9	,	8	211	19	0	5, 5	2208
D:15 PM	9	1,	11	0	19	11	50	0	9,	12H	8	9	H	189	4	0	514	22D9
D:D0 PM	4	18	8	0	1H	2D	99	0	94	1, D	8	9	1,	1H9	12	0	584	22, ,
D:, 5 PM	H	20	4	0	21	18	5D	0	45	150	1,	4	4	211	10	0	902	2251
, :00 PM	4	1D	H	0	19	15	54	0	90	151	11	8	15	19D	8	0	5DD	22DH
, :15 PM	H	1D	25	0	11	18	5D	0	9,	1, 4	11	5	8	190	4	0	5D1	225D
, :D0 PM	1D	1,	1H	0	11	18	94	0	9D	1, D	4	9	12	149	10	0	55H	2225
, :, 5 PM	10	1H	12	0	19	21	95	0	9,	195	15	9	12	191	1,	0	580	220D
5:00 PM	5	2,	9	0	19	24	91	0	41	1, 2	10	,	21	18,	1D	0	58,	225,
5:15 PM	10	22	19	0	11	25	99	0	99	150	1,	4	12	18,	4	1	5H1	2D1,
5:D0 PM	15	1D	22	0	4	D9	58	0	48	12H	20	10	29	144	10	1	902	2D54
5:, 5 PM	10	20	15	0	15	, D	DH	0	94	12H	15	,	24	1, 8	,	1	5D4	2D1,
9:00 PM	10	20	14	0	1D	28	54	0	92	1, 9	19	8	2D	194	11	0	548	2D08
9:15 PM	10	1,	15	0	19	29	, 4	0	, H	121	19	,	1H	15,	1D	0	50,	2221
9:D0 PM	1,	1H	21	0	1D	2,	91	0	D8	1D5	11	9	DH	1, 0	9	0	524	21, 9
9:, 5 PM	20	24	14	0	11	D0	5D	0	54	H8	1D	9	2D	1, 0	10	0	505	211,

Peak 15WMin UoF rates	Northbound				wouthbound				Eastbound				(estbound				Total
	Left	Thru	Right	)	Left	Thru	Right	)	Left	Thru	Right	)	Left	Thru	Right	)	
All Vehicles	90	52	88	0	28	1, ,	2D2	0	D12	519	80	, 0	10,	408	, 0	,	2, 08
Yeavy Trucks	0	0	,		0	,	,		,	12	,		0	2,	,		90
Buses																	
Pedestrians		0				0				0				0			0
Bicycles wcooters	0	0	0		0	0	0		0	0	0		0	0	0		0

Comments:

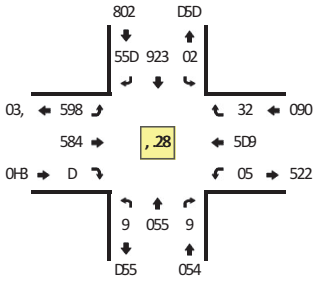
Report generated on 5-D0-2022 H:, 1 AM

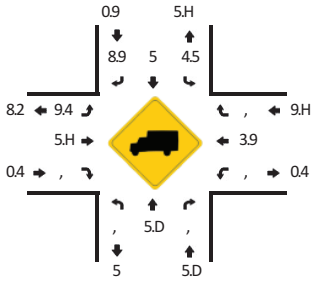
wO) RCE: Quality Counts/LLC .http:--F F F 3qualitycounts3net61W844W580W2212

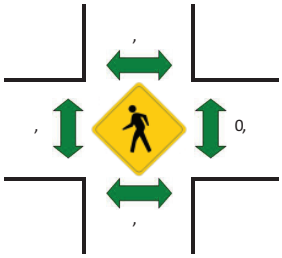
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

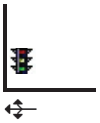
LOCATION: R v a- thorne Rt W w Cata- ba AQe | **J C BO# 1:** 58208255
CIT7YRTATE: Mount v olly/NC | **S ATE:** Thu/May 5H 0, 00

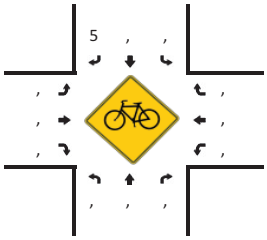
PeakW our: 4:58 AM W2:58 AM
Peak 58W in: 4:9, AM W4:D8 AM

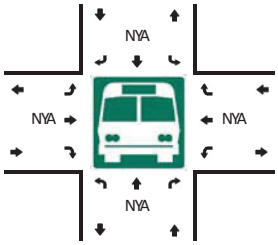


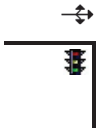


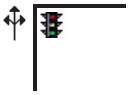


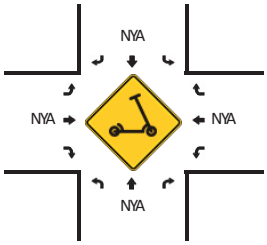












58W in Count Period #eginning At	R v a- thorne Rt 6Northbound(				R v a- thorne Rt 6Routhbound(				w Cata- ba AQe 6Eastbound(				w Cata- ba AQe 6w estbound(				Total	v ourly Totals
	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U		
3:9, AM	,	0,	0	,	5	DH	50	,	55	93	,	,	,	59	5	,	5D8	
3:D8 AM	,	9D	,	,	,	35	H	,	03	D2	5	,	5	5,	3	,	5H3	
4:, , AM	,	D0	,	,	5	DD	5,	,	9H	D8	,	,	,	05	5,	,	050	
4:58 AM	5	82	5	,	4	38	58	,	D4	D0	,	,	5,	84	04	,	99,	229
4:9, AM	5	D3	5	,	2	59D	9H	,	04	D4	0	,	5,	94	09	,	948	5559
4:D8 AM	5	8D	5	,	4	2H	0H	,	04	D5	5	,	5	9,	D	,	028	50, 0
2:, , AM	,	89	,	,	3	H2	95	,	9D	04	5	,	,	5H	5D	,	029	5049
2:58 AM	,	D9	5	,	H	HD	0H	,	94	90	5	,	,	53	5D	,	043	505H

Peak 58W in Flo- rates	Northbound				Routhbound				Eastbound				w estbound				Total
	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U	
All Vehicles	D	52D	D	,	90	893	583	,	5, 2	522	2	,	D,	5D2	H0	,	58, ,
v eaC y Trucks #uses	,	,	,		,	D	D		D	,	,		,	2	,		0,
Pedestrians #icycles Rcooters	,	,	,		,	,	,		,	,	,		,	0D	,		0D ,

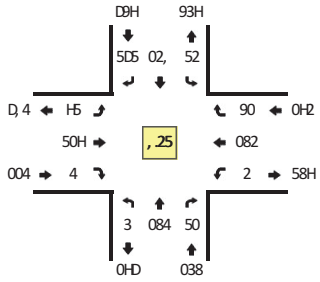
Comments:

) eport generated on 8Y9, Y0, 00 H:D5 AM

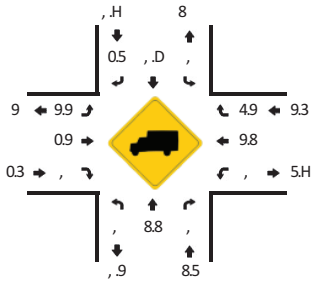
ROU) CE: J uality Counts/LLC 6http:YY- - - .qualitycounts.net(5W244W2, W0050

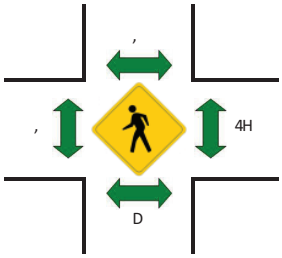
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

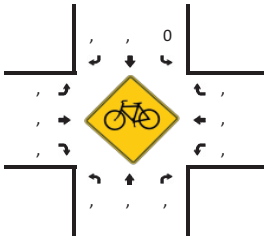
LOCATION: R v a- thorne Rt W w Cata- ba AQe | **J C BO# 1:** 58208250
CIT7YRTATE: Mount v olly/NC | **S ATE:** Thu/May 5H 0, 00

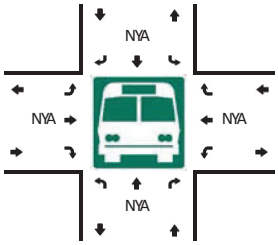


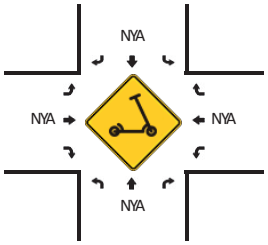
PeakW our: 9:9, PM W D:9, PM
Peak 58W in: 9:9, PM W 9:D8 PM











58W in Count Period #eginning At	R v a- thorne Rt 6Northbound(				R v a- thorne Rt 6Routhbound(				w Cata- ba AQe 6Eastbound(				w Cata- ba AQe 6w estbound(				Total	v ourly Totals
	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U		
0:, , PM	5	8D	0	,	D	D3	08	,	99	54	0	,	9	04	3	,	00,	
0:58 PM	5	8D	,	,	D	DD	00	,	09	9,	,	,	D	9D	2	,	00D	
0:9, PM	,	83	0	,	D	D8	05	,	0H	93	0	,	3	3H	59	,	0H4	
0:D8 PM	5	94	0	,	9	D9	00	,	54	09	9	,	3	83	8	,	052	H82
9:, , PM	5	D4	9	,	0	D8	08	,	0D	08	0	,	,	40	3	,	0D0	H2,
9:58 PM	5	DH	0	,	,	80	5D	,	94	9,	5	,	5	D3	59	,	0D4	5, , 0
9:9, PM	,	39	3	,	D	5, ,	4D	,	08	95	D	,	D	8H	59	,	92D	5, H,
9:D8 PM	9	40	9	,	3	42	05	,	99	9D	,	,	5	40	5,	,	9, D	5534
D:, , PM	9	89	,	,	D	44	0H	,	58	08	,	,	0	2,	8	,	020	5054
D:58 PM	5	42	0	,	9	D4	03	,	52	9H	0	,	5	83	D	,	042	5092
D:9, PM	,	8,	D	,	8	8H	04	,	98	8,	5	,	9	3D	50	,	95H	5539
D:D8 PM	0	83	9	,	D	45	0H	,	5H	95	5	,	5	2,	8	,	0H9	5540
8:, , PM	0	38	5	,	D	8,	0D	,	08	93	D	,	0	43	5D	,	9, 8	5528
8:58 PM	9	44	8	,	5	48	D5	,	58	0H	,	,	9	42	H	,	9, 8	5000
8:9, PM	D	4D	5	,	9	88	5H	,	02	98	D	,	9	33	8	,	0H2	50, 5
8:D8 PM	0	4D	0	,	,	8H	00	,	53	95	0	,	5	80	9	,	088	5549
4:, , PM	0	85	0	,	D	D8	0D	,	5H	93	5	,	9	4,	9	,	085	55, H
4:58 PM	,	D8	5	,	,	D2	52	,	05	95	5	,	8	9H	4	,	058	5, 5H
4:9, PM	5	9D	9	,	5	8D	5D	,	50	09	,	,	0	D5	9	,	522	H, H
4:D8 PM	5	D,	5	,	9	D2	52	,	5,	5D	4	,	,	99	5	,	538	20H

Peak 58W in Flo- rates	Northbound				Routhbound				Eastbound				w estbound				Total
	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U	
All Vehicles	,	0H0	02	,	54	D, ,	084	,	5, ,	50D	54	,	54	094	80	,	5894
v eaQy Trucks #uses	,	2	,		,	,	,		D	D	,		,	50	D		90
Pedestrians #icycles Rcooters	,	54 , ,	,		D	, ,	,		,	, ,	,		,	042 , ,	,		02D D

Comments:

) eport generated on 8Y9, Y0, 00 H:D5 AM

ROU) CE: J uality Counts/LLC 6http:YY- - - .qualitycounts.net(5V233V82, V0050

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: R Main Rt w- CataWba Awe

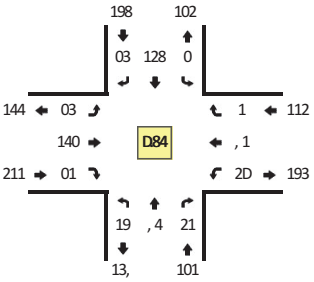
QC JOB #: 15825810

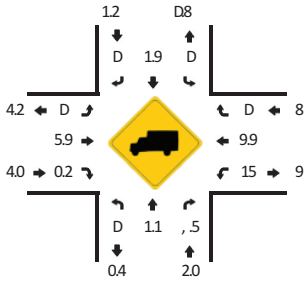
CIT7YRTATE: Mount / ollySNC

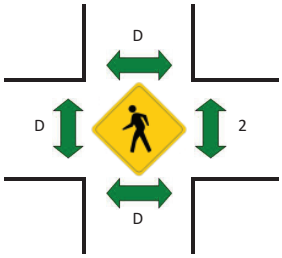
HATE: ThuSMay 1, 2D22

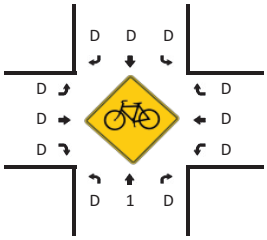
Peakv/ our: 3:15 AM w8:15 AM

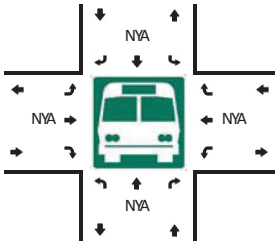
Peak 15vMin: 3:0D AM w3:45 AM

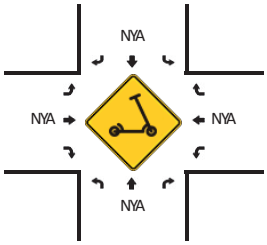












15vMin Count Period Beginning At	R Main Rt 6Northbound(				R Main Rt 6Routhbound(				- CataWba Awe 6Eastbound(				- CataWba Awe 6 estbound(				Total	/ ourly Totals
	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U		
9:0D AM	1	0	D	D	2	10	2	D	4	4D	1	D	2	11	D	D	3,	
9:45 AM	4	9	2	D	1	10	4	D	8	05	1	D	D	3	1	D	82	
3:DD AM	3	,	1	D	D	25	4	D	0	42	2	D	D	22	D	D	115	
3:15 AM	1D	19	4	D	2	08	,	D	4	45	,	D	4	21	D	D	192	408
3:0D AM	0	25	0	D	D	45	1D	D	10	45	,	D	5	23	D	D	185	544
3:45 AM	D	29	0	D	D	24	9	D	14	02	9	D	0	20	D	D	103	5, ,
8:DD AM	0	23	11	D	1	21	12	D	9	21	3	D	8	2D	1	D	108	922
8:15 AM	2	05	5	D	1	0D	4	D	0	02	0	D	4	22	D	D	141	9D1

Peak 15vMin FloWrates	Northbound				Routhbound				Eastbound				- estbound				Total
	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U	
All Vehicles	12	1DD	12	D	D	18D	4D	D	52	18D	09	D	2D	1D8	D	D	34D
/ eavy Trucks	D	D	D		D	D	D		D	8	D		4	4	D		19
Buses																	
Pedestrians		D				D				D				D			D
Bicycles Rcooters	D	4	D		D	D	D		D	D	D		D	D	D		4

Comments:

) eport generated on 5Y0DY2D22 , :41 AM

ROU) CE: Quality CountsSLLC 6http:YYWWW.qualitycounts.net(1v833v58Dv2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: R Main Rt w- CataWba Awe

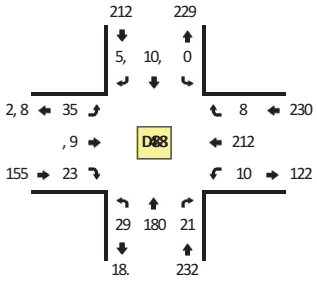
QC JOB #: 15825810

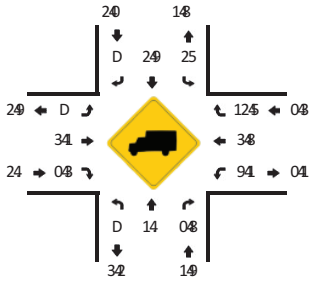
CIT7YRTATE: Mount / ollySNC

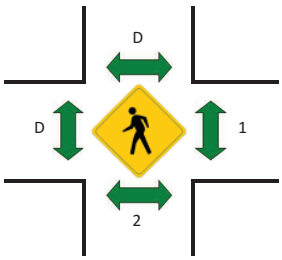
HATE: ThuSMay 1, 2D22

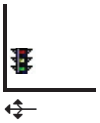
Peaky/ our: 3:3D PM w0:3D PM

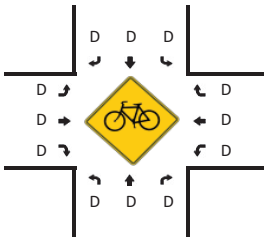
Peak 15vMin: 3:3D PM w3:05 PM

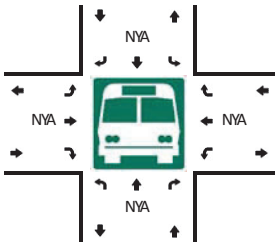


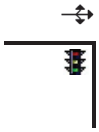


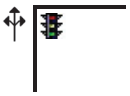


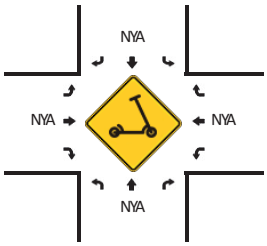












15vMin Count Period Beginning At	R Main Rt 6Northbound(				R Main Rt 6Routhbound(				- CataWba Awe 6Eastbound(				- CataWba Awe 6 estbound(				Total	/ourly Totals
	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U		
2:DD PM	,	28	3	D	2	25	9	D	,	12	.	D	2	18	1	D	122	
2:15 PM	8	35	0	D	3	3D	5	D	8	1,	0	D	2	3D	D	D	108	
2:3D PM	1	3D	0	D	2	53	13	D	12	2.	5	D	0	01	3	D	1, 0	
2:05 PM	2	30	1	D	2	0D	22	D	5	2D	11	D	9	35	2	D	181	. 05
3:DD PM	,	2,	1	D	D	38	1.	D	,	19	1	D	3	39	0	D	1. 0	. 89
3:15 PM	8	3,	0	D	1	01	18	D	10	1D	3	D	3	38	3	D	182	921
3:3D PM	11	52	0	D	1	52	1.	D	13	21	10	D	0	05	3	D	23.	9. 3
3:05 PM	0	03	,	D	2	33	15	D	.	32	1	D	5	55	1	D	2D.	988
0:DD PM	.	09	0	D	1	39	10	D	5	18	5	D	0	. 2	2	D	2D5	82,
0:15 PM	.	02	0	D	D	29	10	D	11	2.	3	D	1	5D	2	D	18.	833
0:3D PM	9	3,	3	D	3	23	18	D	13	31	11	D	2	08	1	D	1, ,	9, .
0:05 PM	9	2,	3	D	3	22	.	D	8	21	,	D	.	91	2	D	189	999
5:DD PM	.	35	1	D	3	3.	11	D	,	2.	5	D	.	50	2	D	1, 0	9. .
5:15 PM	12	38	.	D	2	02	9	D	9	2D	0	D	3	58	2	D	2D1	981
5:3D PM	3	01	0	D	D	02	1D	D	5	23	0	D	1	. 2	3	D	1, 8	98D
5:05 PM	0	39	3	D	1	31	,	D	13	20	5	D	0	52	1	D	180	999
. :DD PM	3	39	1	D	1	22	3	D	8	20	5	D	D	0.	1	D	151	930
. :15 PM	.	32	3	D	1	35	9	D	8	22	0	D	3	3.	1	D	158	. , 1
. :3D PM	5	3D	3	D	D	31	5	D	0	13	2	D	5	33	1	D	132	. 25
. :05 PM	3	2,	1	D	3	2,	12	D	0	11	2	D	3	21	1	D	11,	5. D

Peak 15vMin FloWrates	Northbound				Routhbound				Eastbound				- estbound				Total
	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U	
All Vehicles	00	2D8	1.	D	0	2D8	. 0	D	52	80	5.	D	1.	18D	12	D	, 00
/ eavy Trucks	D	0	D		D	D	D		D	0	D		0	12	D		20
Buses																	
Pedestrians		0				D				D				D			0
Bicycles	D	D	D		D	D	D		D	D	D		D	D	D		D
Rcooters																	

Comments:

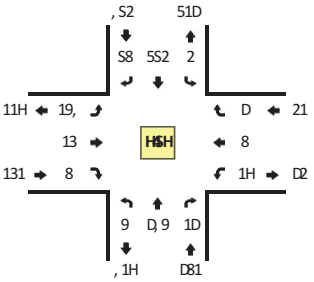
) eport generated on 5Y3DY2D22 , :01 AM

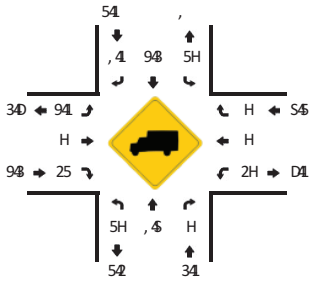
ROU) CE: Quality CountsSLLC 6http:YWWW4ualitycounts4net(1v899v58Dv2212

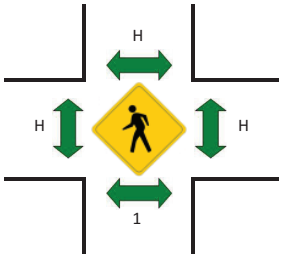
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

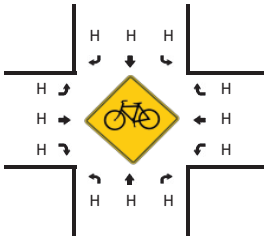
LOCATION: Righland vt -- E CataWba Awe | **QC JOB #:** 15825815
CIT07vTATE: Mount RollyYNC | **/ ATE:** ThuYMay 1S 2H22

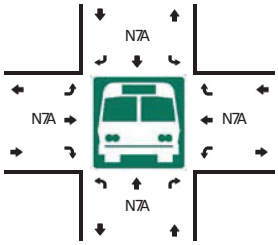
Peak-Rour: 3:15 AM -- 8:15 AM
Peak 15-Min: 3:DH AM -- 3:95 AM

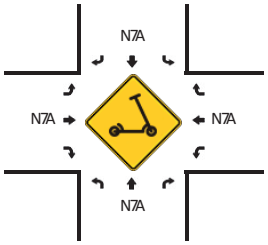












15-Min Count Period Beginning At	Righland vt .Northbound6				Righland vt .vouthbound6				E CataWba Awe .Eastbound6				E CataWba Awe .(estbound6				Total	Rourly Totals
	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U		
, :DH AM	H	31	D	H	D	S5	1H	H	D9	D	D	H	D	1	H	H	22,	
, :95 AM	H	3D	3	H	2	SD	8	H	91	H	2	H	D	H	H	H	22S	
3:HH AM	1	S5	D	H	D	1H9	1S	H	DS	2	H	H	D	D	D	H	235	
3:15 AM	2	1H9	1	H	1	12,	21	H	9,	9	H	H	1	1	1	H	DH8	1HD8
3:DH AM	1	1H2	2	H	1	15S	D1	H	9D	D	D	H	D	2	H	H	D5H	11, 2
3:95 AM	H	8S	,	H	H	19S	22	H	DH	1	D	H	2	D	2	H	DH3	129H
8:HH AM	1	, S	9	H	H	158	29	H	23	S	2	H	9	2	H	H	DHH	12, 5
8:15 AM	2	82	2	H	H	128	22	H	D5	H	9	H	2	1	H	H	238	12D5

Peak 15-Min FloWrates	Northbound				vouthbound				Eastbound				(estbound				Total
	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U	
All Vehicles	9	9H8	8	H	9	, D,	129	H	132	12	12	H	12	8	H	H	19HH
Reavy Trucks	9	28	H		9	98	9		8	H	H		H	H	H		S,
Buses																	
Pedestrians		H				H				H				H			H
Bicycles vcooters	H	H	H		H	H	H		H	H	H		H	H	H		H

Comments:

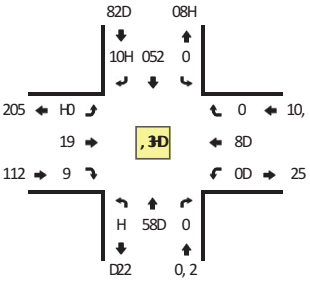
) eport generated on 57DH72H22 S:91 AM

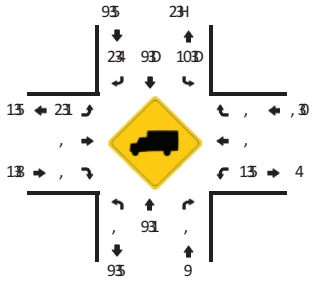
vOU) CE: Quality CountsYLLC .http:77WWW4quality counts4net61-833-58H-2212

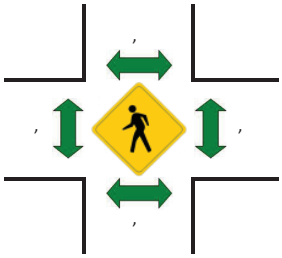
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

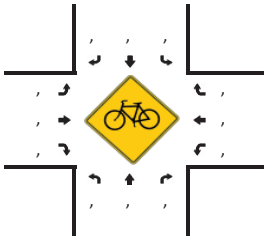
LOCATION: Righland vt -- E CataWba Awe | **QC JOB #:** 15825810
CIT7YvTATE: Mount Rolly/NC | **S ATE:** Thu/May 1H 2, 22

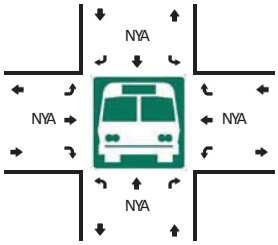
Peak-Rour: 4:45 PM -- 5:45 PM
Peak 15-Min: 4:45 PM -- 5:, , PM

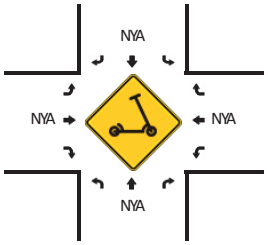












15-Min Count Period Beginning At	Righland vt .Northbound6				Righland vt .vouthbound6				E CataWba Awe .Eastbound6				E CataWba Awe .(estbound6				Total	Rourly Totals
	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U		
2:, , PM	,	140	2	,	,	194	22	,	15	,	,	,	9	2	9	,	92D	
2:15 PM	1	125	4	,	,	12,	24	,	22	1	2	,	5	,	0	,	91,	
2:9, PM	4	1D0	4	,	,	1HH	4,	,	91	,	2	,	8	4	,	,	408	
2:45 PM	1	145	2	,	,	2, 4	9H	,	1H	1	2	,	D	5	2	,	42D	1592
9:, , PM	2	18D	5	,	,	141	9H	,	15	9	1	,	4	4	1	,	4, 2	10, D
9:15 PM	9	114	2	,	,	109	94	,	12	1	,	,	0	0	2	,	949	104,
9:9, PM	,	192	2	,	,	185	45	,	1H	,	1	,	5	8	4	,	4, 1	15D9
9:45 PM	,	14D	2	,	,	100	52	,	48	1	9	,	5	0	4	,	494	158,
4:, , PM	1	148	2	,	1	15H	48	1	1H	9	2	,	0	15	1	,	4, 0	1584
4:15 PM	2	140	9	,	,	192	42	,	2H	1	1	,	H	11	2	,	9D8	101H
4:9, PM	1	115	4	,	1	159	98	,	94	1	,	,	2,	1D	1	,	985	10, 9
4:45 PM	2	15D	2	,	1	101	40	,	25	5	,	,	10	29	1	,	49H	10, 8
5:, , PM	2	150	1	,	9	105	40	,	25	4	1	,	19	10	2	,	494	1090
5:15 PM	9	195	2	,	1	1D5	9D	,	24	2	,	,	10	24	2	,	421	10DH
5:9, PM	2	19H	1	,	1	151	4,	,	22	2	2	,	22	24	1	,	4, D	1D, 1
5:45 PM	1	12H	2	,	,	149	9D	,	24	9	,	,	10	21	2	,	9D8	104,
0:, , PM	2	151	1	,	,	1DH	99	,	29	2	1	,	15	12	9	,	422	1028
0:15 PM	5	11,	1	,	,	150	99	,	25	,	,	,	1,	D	4	,	951	1558
0:9, PM	2	12D	2	,	,	105	9,	,	10	,	,	,	4	4	2	,	952	15, 9
0:45 PM	1	115	1	,	1	15,	21	,	12	9	1	,	1	9	1	,	91,	1495

Peak 15-Min FloWrates	Northbound				vouthbound				Eastbound				(estbound				Total
	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U	Left	Thru	) ight	U	
All Vehicles	8	028	8	,	4	044	184	,	1, ,	2,	,	,	04	H2	4	,	1D50
Reavy Trucks	,	28	,		,	8	8		8	,	,		,	,	,		52
Buses																	
Pedestrians		,				,				,				,			,
Bicycles vcooters	,	,	,		,	,	,		,	,	,		,	,	,		,

Comments:

) eport generated on 5Y9, Y2, 22 H:41 AM

vOU) CE: Quality Counts/LLC .http:YWWWW3quality counts3net61-8DD-58, -2212

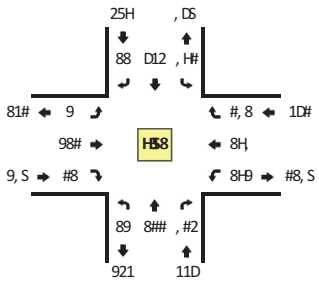
Type of peak hour being reported: Intersection Peak

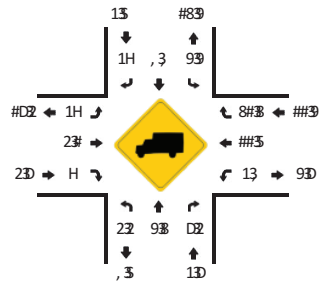
Method for determining peak hour: Total Entering Volume

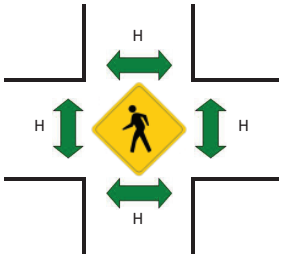
LOCATION: Righland vt -- E Charlotte AWe
CIT07vTATE: Mount RollyYNC

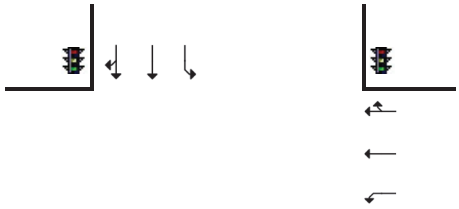
wC QQJ B: #15815#2
/ ATE: ThuYMay #S 8H88

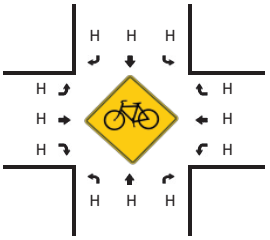
Peak-Rour: 2:HHAM -- 5:HHAM
Peak #1-Min: 2:, HAM -- 2:D1 AM

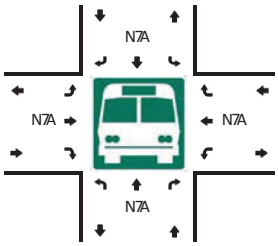


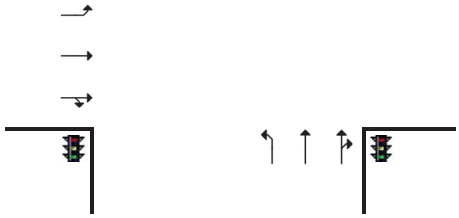


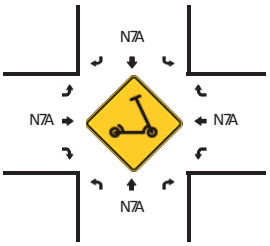












#1-Min Count Period J eginning At	Righland vt 4Northbound.				Righland vt 4vouthbound.				E Charlotte AWe 4Eastbound.				E Charlotte AWe 46 estbound.				Total	Rourly Totals
	Left	Thru	(ight	)	Left	Thru	(ight	)	Left	Thru	(ight	)	Left	Thru	(ight	)		
9:, HAM	,	85	2H	H	52	99	D	H	H	#91	5	H	, 2	DD	#1	H	182	
9:D1 AM	8	D5	99	H	9,	91	#	H	#	#D1	1	H	, H	DD	#S	H	D5S	
2:HHAM	#8	1H	2D	H	2H	29	#	H	D	#9S	D	H	1#	, 5	, H	H	12S	
2:#1 AM	D	15	58	H	S,	#85	D	H	H	#99	8	H	DD	D5	, ,	H	998	8812
2:, HAM	1	D5	#H2	H	2H	#, S	#H	H	H	#1H	,	H	9#	1,	, 5	H	95D	8D#D
2:D1 AM	1	11	1D	H	95	##D	2	H	8	#, 9	,	H	1H	9D	, #	H	15S	81#D
5:HHAM	8	, 2	15	H	9H	#82	,	H	D	##2	2	H	DS	2#	DH	H	121	81#H
5:#1 AM	D	1#	2H	H	9H	SD	1	H	H	##,	D	H	1D	9#	88	H	1, 5	8, 59

Peak #1-Min UoF rates	Northbound				vouthbound				Eastbound				6 estbound				Total
	Left	Thru	(ight	)	Left	Thru	(ight	)	Left	Thru	(ight	)	Left	Thru	(ight	)	
All Vehicles	8H	#S8	D85	H	85H	119	DH	H	H	9HH	#8	H	8DD	8#8	#18	H	82, 9
ReaW Trucks	H	#8	8D		, 9	5	#9		H	, 8	H		#8	8D	, 9		8HH
J uses																	
Pedestrians		H				H				H				H			H
J icycles	H	H	H		H	H	H		H	H	H		H	H	H		H
vcooters																	

Comments:

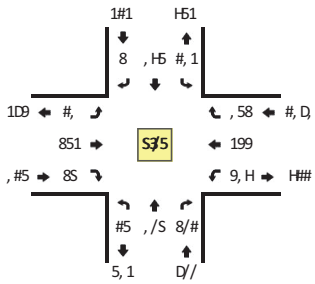
(eport generated on 17, H78H88 S:D# AM

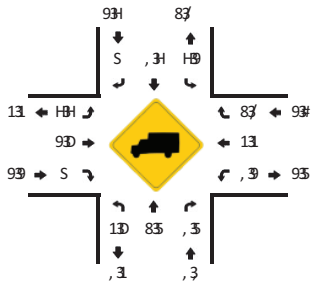
vO) (CE: wuality CountsYLLC 4http:77F F F 3qualitycounts3net. #-522-15H-88#8

Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

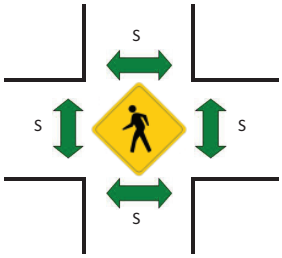
LOCATION: Righland vt -- E Charlotte AWe | **wC QQJ B:** #15815#5
CIT20vTATE: Mount Rolly7NC | **YATE:** Thu7May #/ 8S88

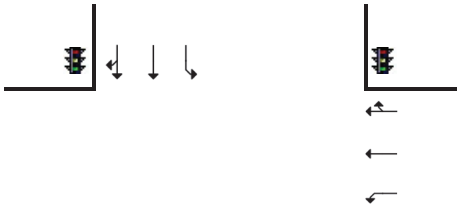
Peak-Rour: 9:91 PM -- 1:91 PM
Peak #1-Min: 9:91 PM -- 1:SS PM

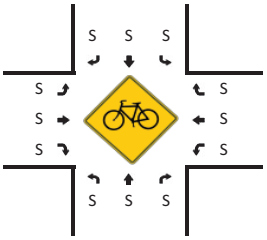


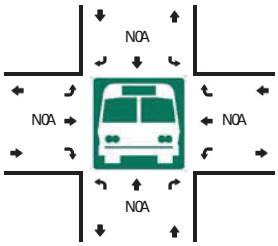


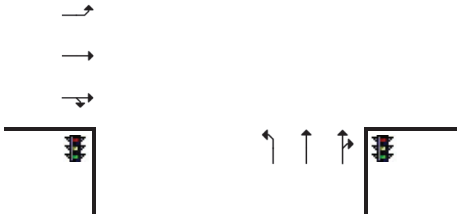
Quality Counts
DATA THAT DRIVES COMMUNITIES

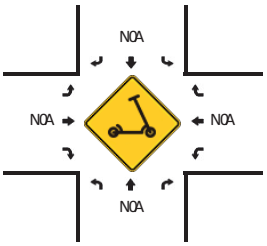












#1-Min Count Period J eginning At	Righland vt 4Northbound.				Righland vt 4vouthbound.				E Charlotte AWe 4Eastbound.				E Charlotte AWe 46 estbound.				Total	Rourly Totals
	Left	Thru	(ight	)	Left	Thru	(ight	)	Left	Thru	(ight	)	Left	Thru	(ight	)		
8:SS PM	D	#S#	1#	S	, 1	59	H	S	8	51	8	S	H8	D/	9S	S	119	
8:#1 PM	/	5D	19	S	, D	H/	8	S	,	DD	9	S	H#	/S	18	S	118	
8:, S PM	9	#88	H,	S	8/	#11	1	S	,	5#	H	S	H1	H/	1#	S	D59	
8:91 PM	5	###	1H	S	91	#5,	D	S	9	19	D	S	D5	/H	91	S	D59	89H9
, :SS PM	5	#88	D,	S	, 5	H5	8	S	#	D9	/	S	H/	#S9	19	S	D88	8198
, :#1 PM	#S	H8	9D	S	99	H,	9	S	#	H5	/	S	#SS	#SH	15	S	DS8	81/8
, :, S PM	5	5/	1H	S	, 5	##9	D	S	#S	D/	#S	S	###	#88	D9	S	D/5	8DSD
, :91 PM	#,	/#	H9	S	9#	//	,	S	#	5,	9	S	#S1	#8/	H,	S	H#D	8D, 5
9:SS PM	1	/S	5,	S	, D	#S#	9	S	,	D,	#1	S	#S#	#, D	5#	S	H#5	8H, 9
9:#1 PM	1	/H	HD	S	, /	HD	#	S	5	51	,	S	/#	#8S	H1	S	DHD	85S5
9:, S PM	D	D8	H1	S	8H	H5	9	S	8	5/	H	S	###	#, S	/8	S	D5,	8H/,
9:91 PM	,	#S9	H9	S	85	##8	#	S	1	D1	H	S	#S8	#8H	##S	S	H, 5	85#1
1:SS PM	9	/S	HD	S	8/	HH	#	S	9	H#	5	S	#8#	#9#	/S	S	H#8	85S/
1:#1 PM	1	/1	HD	S	, 1	#S1	S	S	,	H#	,	S	#S8	#, D	/1	S	H8D	851/
1:, S PM	D	#S#	D1	S	9,	59	S	S	#	H5	8	S	##8	#9S	5H	S	H#/	85/1
1:91 PM	H	H5	D9	S	, D	H8	1	S	#	D/	9	S	/1	#, ,	/1	S	D1/	85#D
D:SS PM	H	#SD	HS	S	, 8	/1	#	S	S	H#	5	S	#SD	#8/	H1	S	HSS	85S9
D:#1 PM	5	H8	D1	S	, 5	51	#	S	#	1/	,	S	##,	#9#	1D	S	D98	8H8S
D:, S PM	5	H9	D#	S	8#	H1	8	S	#	D5	#S	S	#S5	##/	1,	S	DSS	8DS#
D:91 PM	8	H8	1,	S	8D	HD	#	S	9	1#	5	S	/S	/S	9D	S	1#/	89D#

Peak #1-Min UoF rates	Northbound				vouthbound				Eastbound				6 estbound				Total
	Left	Thru	(ight	)	Left	Thru	(ight	)	Left	Thru	(ight	)	Left	Thru	(ight	)	
All Vehicles	#8	9#D	8/D	S	##8	995	9	S	8S	8DS	85	S	9S5	1S5	99S	S	8/18
ReaW Trucks	S	#8	8S		#8	#8	S		S	8S	S		5	, D	89		#99
J uses																	
Pedestrians		S				S				S				S			S
J icycles vcooters	S	S	S		S	S	S		S	S	S		S	S	S		S

Comments:

(eport generated on 10, S08S88 / :9# AM | vO) (CE: wuality Counts7LLC 4http:00F F F 3qualitycounts3net. #-5HH-15S-88#8

Intersection Volume Development

INTERSECTION VOLUME DEVELOPMENT

Driveway/Old Hickory Grove Road and W Catawba Ave
AM PEAK HOUR

	Driveway				Old Hickory Grove Road				W Catawba Ave				W Catawba Ave			
	Northbound				**Southbound**				**Eastbound**				**Westbound**			
Description	Left	Through	Right	U-turn	Left	Through	Right	U-turn	Left	Through	Right	U-turn	Left	Through	Right	U-turn
Observed Volumes	0	0	2	0	278	6	38	0	18	221	1	0	2	132	95	0
2023 Grown Volumes	0	0	2	0	284	6	39	0	18	225	1	0	2	135	97	0
Balanced Volumes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023 Existing Traffic	0	0	2	0	284	6	39	0	18	225	1	0	2	135	97	0
2023 Existng PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicle %	2%	2%	2%	2%	3%	2%	2%	2%	2%	4%	2%	2%	2%	5%	2%	2%
Annual Growth Rate	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Growth Factor #1	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020
Growth Factor #2	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104
2028 Background Traffic (No AD)	0	0	2	0	314	7	43	0	20	248	1	0	2	149	107	0
2028 Background Traffic	0	0	2	0	314	7	43	0	20	248	1	0	2	149	107	0
Percent Inbound Assignment	0%	0%	0%	0%	5%	0%	0%	0%	0%	15%	0%	0%	0%	0%	0%	0%
Percent Outbound Assignment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	15%	5%	0%
Project Trips	0	0	0	0	3	0	0	0	0	9	0	0	0	28	9	0
Project Trips (Total)	0	0	0	0	3	0	0	0	0	9	0	0	0	28	9	0
2028 Buildout Total	0	0	2	0	317	7	43	0	20	257	1	0	2	177	116	0

PM PEAK HOUR

	Driveway				Old Hickory Grove Road				W Catawba Ave				W Catawba Ave			
	Northbound				**Southbound**				**Eastbound**				**Westbound**			
Description	Left	Through	Right	U-turn	Left	Through	Right	U-turn	Left	Through	Right	U-turn	Left	Through	Right	U-turn
Observed Volumes	6	3	9	0	132	0	29	0	54	212	0	0	0	289	278	0
2023 Grown Volumes	6	3	9	0	135	0	30	0	55	216	0	0	0	295	284	0
Balanced Volumes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023 Existing Traffic	6	3	9	0	135	0	30	0	55	216	0	0	0	295	284	0
2023 PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicle %	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Annual Growth Rate	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Growth Factor #1	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020
Growth Factor #2	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104
2028 Background Traffic (No AD)	7	3	10	0	149	0	33	0	61	238	0	0	0	326	314	0
2028 Background Traffic	7	3	10	0	149	0	33	0	61	238	0	0	0	326	314	0
Percent Inbound Assignment	0%	0%	0%	0%	5%	0%	0%	0%	0%	15%	0%	0%	0%	0%	0%	0%
Percent Outbound Assignment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	15%	5%	0%
Project Trips	0	0	0	0	10	0	0	0	0	31	0	0	0	18	6	0
Project Trips (Total)	0	0	0	0	10	0	0	0	0	31	0	0	0	18	6	0
2028 Buildout Total	7	3	10	0	159	0	33	0	61	269	0	0	0	344	320	0

INTERSECTION VOLUME DEVELOPMENT

Riddle Street/Access #1 and W Catawba Ave
AM PEAK HOUR

Description	Riddle Street Northbound				Access #1 Southbound				W Catawba Ave Eastbound				W Catawba Ave Westbound			
	Left	Through	Right	U-turn	Left	Through	Right	U-turn	Left	Through	Right	U-turn	Left	Through	Right	U-turn
Observed Volumes	0	0	0	0	0	0	0	0	0	473	0	0	0	234	0	0
2023 Grown Volumes	0	0	0	0	0	0	0	0	0	482	0	0	0	239	0	0
Balanced Volumes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023 Existing Traffic	0	0	0	0	0	0	0	0	0	482	0	0	0	239	0	0
2023 Existng PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicle %	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	2%	2%	2%	4%	2%	2%
Annual Growth Rate	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Growth Factor #1	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020
Growth Factor #2	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104
2028 Background Traffic (No AD)	0	0	0	0	0	0	0	0	0	532	0	0	0	264	0	0
2028 Background Traffic	0	0	0	0	0	0	0	0	0	532	0	0	0	264	0	0
Percent Inbound Assignment	0%	0%	0%	0%	0%	0%	0%	0%	15%	5%	0%	0%	0%	0%	10%	0%
Percent Outbound Assignment	0%	0%	0%	0%	10%	0%	15%	0%	0%	0%	0%	0%	0%	5%	0%	0%
Project Trips	0	0	0	0	19	0	28	0	9	3	0	0	0	9	6	0
Project Trips (Total)	0	0	0	0	19	0	28	0	9	3	0	0	0	9	6	0
2028 Buildout Total	0	0	0	0	19	0	28	0	9	535	0	0	0	273	6	0

PM PEAK HOUR

Description	Riddle Street Northbound				Access #1 Southbound				W Catawba Ave Eastbound				W Catawba Ave Westbound			
	Left	Through	Right	U-turn	Left	Through	Right	U-turn	Left	Through	Right	U-turn	Left	Through	Right	U-turn
Observed Volumes	2	0	0	0	0	0	0	0	0	346	1	0	2	522	0	0
2023 Grown Volumes	2	0	0	0	0	0	0	0	0	353	1	0	2	532	0	0
Balanced Volumes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023 Existing Traffic	2	0	0	0	0	0	0	0	0	353	1	0	2	532	0	0
2023 PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicle %	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Annual Growth Rate	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Growth Factor #1	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020
Growth Factor #2	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104
2028 Background Traffic (No AD)	2	0	0	0	0	0	0	0	0	390	1	0	2	587	0	0
2028 Background Traffic	2	0	0	0	0	0	0	0	0	390	1	0	2	587	0	0
Percent Inbound Assignment	0%	0%	0%	0%	0%	0%	0%	0%	15%	5%	0%	0%	0%	0%	10%	0%
Percent Outbound Assignment	0%	0%	0%	0%	10%	0%	15%	0%	0%	0%	0%	0%	0%	5%	0%	0%
Project Trips	0	0	0	0	12	0	18	0	31	10	0	0	0	6	20	0
Project Trips (Total)	0	0	0	0	12	0	18	0	31	10	0	0	0	6	20	0
2028 Buildout Total	2	0	0	0	12	0	18	0	31	400	1	0	2	593	20	0

INTERSECTION VOLUME DEVELOPMENT

Rankin Ave/Access #2 and W Catawba Ave
AM PEAK HOUR

Description	Rankin Ave Northbound				Access #2 Southbound				W Catawba Ave Eastbound				W Catawba Ave Westbound			
	Left	Through	Right	U-turn	Left	Through	Right	U-turn	Left	Through	Right	U-turn	Left	Through	Right	U-turn
Observed Volumes	41	0	5	0	0	0	0	0	0	322	152	0	14	193	0	0
2023 Grown Volumes	42	0	5	0	0	0	0	0	0	328	155	0	14	197	0	0
Balanced Volumes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023 Existing Traffic	42	0	5	0	0	0	0	0	0	328	155	0	14	197	0	0
2023 Existng PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicle %	2%	2%	40%	2%	2%	2%	2%	2%	2%	2%	3%	2%	2%	4%	2%	2%
Annual Growth Rate	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Growth Factor #1	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020
Growth Factor #2	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104
2028 Background Traffic (No AD)	46	0	6	0	0	0	0	0	0	362	171	0	15	218	0	0
2028 Background Traffic	46	0	6	0	0	0	0	0	0	362	171	0	15	218	0	0
Percent Inbound Assignment	0%	40%	0%	0%	0%	0%	0%	0%	5%	0%	0%	0%	0%	10%	30%	0%
Percent Outbound Assignment	0%	0%	0%	0%	30%	40%	5%	0%	0%	10%	0%	0%	0%	0%	0%	0%
Project Trips	0	25	0	0	55	74	9	0	3	19	0	0	0	6	18	0
Project Trips (Total)	0	25	0	0	55	74	9	0	3	19	0	0	0	6	18	0
2028 Buildout Total	46	25	6	0	55	74	9	0	3	381	171	0	15	224	18	0

PM PEAK HOUR

Description	Rankin Ave Northbound				Access #2 Southbound				W Catawba Ave Eastbound				W Catawba Ave Westbound			
	Left	Through	Right	U-turn	Left	Through	Right	U-turn	Left	Through	Right	U-turn	Left	Through	Right	U-turn
Observed Volumes	140	0	8	0	0	0	0	0	0	230	117	0	15	384	0	0
2023 Grown Volumes	143	0	8	0	0	0	0	0	0	235	119	0	15	392	0	0
Balanced Volumes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023 Existing Traffic	143	0	8	0	0	0	0	0	0	235	119	0	15	392	0	0
2023 PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicle %	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Annual Growth Rate	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Growth Factor #1	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020
Growth Factor #2	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104
2028 Background Traffic (No AD)	158	0	9	0	0	0	0	0	0	259	131	0	17	433	0	0
2028 Background Traffic	158	0	9	0	0	0	0	0	0	259	131	0	17	433	0	0
Percent Inbound Assignment	0%	40%	0%	0%	0%	0%	0%	0%	5%	0%	0%	0%	0%	10%	30%	0%
Percent Outbound Assignment	0%	0%	0%	0%	30%	40%	5%	0%	0%	10%	0%	0%	0%	0%	0%	0%
Project Trips	0	82	0	0	36	48	6	0	10	12	0	0	0	20	61	0
Project Trips (Total)	0	82	0	0	36	48	6	0	10	12	0	0	0	20	61	0
2028 Buildout Total	158	82	9	0	36	48	6	0	10	271	131	0	17	453	61	0

INTERSECTION VOLUME DEVELOPMENT

NC 273 (Highland Street) and Rankin Ave/Tuckaseegee Road
AM PEAK HOUR

Description	NC 273 (Highland Street) Northbound				NC 273 (Highland Street) Southbound				Rankin Ave Eastbound				Tuckaseegee Road Westbound			
	Left	Through	Right	U-turn	Left	Through	Right	U-turn	Left	Through	Right	U-turn	Left	Through	Right	U-turn
Observed Volumes	182	372	16	19	16	747	14	0	61	41	424	0	18	44	42	0
2023 Grown Volumes	186	379	16	19	16	762	14	0	62	42	432	0	18	45	43	0
Balanced Volumes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023 Existing Traffic	186	379	16	19	16	762	14	0	62	42	432	0	18	45	43	0
2023 Existng PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicle %	3%	7%	25%	2%	6%	4%	7%	2%	7%	2%	2%	2%	6%	2%	2%	2%
Annual Growth Rate	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Growth Factor #1	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020
Growth Factor #2	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104
2028 Background Traffic (No AD)	205	418	18	21	18	841	15	0	68	46	477	0	20	50	47	0
2028 Background Traffic	205	418	18	21	18	841	15	0	68	46	477	0	20	50	47	0
Percent Inbound Assignment	40%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Percent Outbound Assignment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	40%	0%	0%	0%	0%	0%
Project Trips	25	0	0	0	0	0	0	0	0	0	74	0	0	0	0	0
Project Trips (Total)	25	0	0	0	0	0	0	0	0	0	74	0	0	0	0	0
2028 Buildout Total	230	418	18	21	18	841	15	0	68	46	551	0	20	50	47	0

PM PEAK HOUR

Description	NC 273 (Highland Street) Northbound				NC 273 (Highland Street) Southbound				Rankin Ave Eastbound				Tuckaseegee Road Westbound			
	Left	Through	Right	U-turn	Left	Through	Right	U-turn	Left	Through	Right	U-turn	Left	Through	Right	U-turn
Observed Volumes	279	586	59	27	73	706	44	0	50	109	250	0	40	78	56	0
2023 Grown Volumes	285	598	60	28	74	720	45	0	51	111	255	0	41	80	57	0
Balanced Volumes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023 Existing Traffic	285	598	60	28	74	720	45	0	51	111	255	0	41	80	57	0
2023 PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicle %	2%	2%	3%	2%	2%	3%	2%	2%	2%	2%	2%	2%	2%	2%	5%	2%
Annual Growth Rate	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Growth Factor #1	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020
Growth Factor #2	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104
2028 Background Traffic (No AD)	315	660	66	31	82	795	50	0	56	123	282	0	45	88	63	0
2028 Background Traffic	315	660	66	31	82	795	50	0	56	123	282	0	45	88	63	0
Percent Inbound Assignment	40%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Percent Outbound Assignment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	40%	0%	0%	0%	0%	0%
Project Trips	82	0	0	0	0	0	0	0	0	0	48	0	0	0	0	0
Project Trips (Total)	82	0	0	0	0	0	0	0	0	0	48	0	0	0	0	0
2028 Buildout Total	397	660	66	31	82	795	50	0	56	123	330	0	45	88	63	0

INTERSECTION VOLUME DEVELOPMENT

S Hawthorne Street and W Catawba Ave
AM PEAK HOUR

Description	S Hawthorne Street Northbound				S Hawthorne Street Southbound				W Catawba Ave Eastbound				W Catawba Ave Westbound			
	Left	Through	Right	U-turn	Left	Through	Right	U-turn	Left	Through	Right	U-turn	Left	Through	Right	U-turn
Observed Volumes	3	211	3	0	28	386	114	0	135	157	4	0	21	143	68	0
2023 Grown Volumes	3	215	3	0	29	394	116	0	138	160	4	0	21	146	69	0
Balanced Volumes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023 Existing Traffic	3	215	3	0	29	394	116	0	138	160	4	0	21	146	69	0
2023 Existng PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicle %	2%	2%	2%	2%	7%	2%	5%	2%	4%	2%	2%	2%	2%	6%	2%	2%
Annual Growth Rate	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Growth Factor #1	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020
Growth Factor #2	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104
2028 Background Traffic (No AD)	3	237	3	0	32	435	128	0	152	177	4	0	23	161	76	0
2028 Background Traffic	3	237	3	0	32	435	128	0	152	177	4	0	23	161	76	0
Percent Inbound Assignment	0%	0%	0%	0%	0%	0%	15%	0%	0%	0%	0%	0%	0%	25%	0%	0%
Percent Outbound Assignment	0%	0%	0%	0%	0%	0%	0%	0%	15%	25%	0%	0%	0%	0%	0%	0%
Project Trips	0	0	0	0	0	0	9	0	28	46	0	0	0	15	0	0
Project Trips (Total)	0	0	0	0	0	0	9	0	28	46	0	0	0	15	0	0
2028 Buildout Total	3	237	3	0	32	435	137	0	180	223	4	0	23	176	76	0

PM PEAK HOUR

Description	S Hawthorne Street Northbound				S Hawthorne Street Southbound				W Catawba Ave Eastbound				W Catawba Ave Westbound			
	Left	Through	Right	U-turn	Left	Through	Right	U-turn	Left	Through	Right	U-turn	Left	Through	Right	U-turn
Observed Volumes	7	256	12	0	18	280	141	0	91	129	6	0	8	258	32	0
2023 Grown Volumes	7	261	12	0	18	286	144	0	93	132	6	0	8	263	33	0
Balanced Volumes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023 Existing Traffic	7	261	12	0	18	286	144	0	93	132	6	0	8	263	33	0
2023 PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicle %	2%	5%	2%	2%	2%	2%	2%	2%	3%	2%	2%	2%	2%	3%	6%	2%
Annual Growth Rate	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Growth Factor #1	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020
Growth Factor #2	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104
2028 Background Traffic (No AD)	8	288	13	0	20	316	159	0	103	146	7	0	9	290	36	0
2028 Background Traffic	8	288	13	0	20	316	159	0	103	146	7	0	9	290	36	0
Percent Inbound Assignment	0%	0%	0%	0%	0%	0%	15%	0%	0%	0%	0%	0%	0%	25%	0%	0%
Percent Outbound Assignment	0%	0%	0%	0%	0%	0%	0%	0%	15%	25%	0%	0%	0%	0%	0%	0%
Project Trips	0	0	0	0	0	0	30	0	18	30	0	0	0	51	0	0
Project Trips (Total)	0	0	0	0	0	0	30	0	18	30	0	0	0	51	0	0
2028 Buildout Total	8	288	13	0	20	316	189	0	121	176	7	0	9	341	36	0

INTERSECTION VOLUME DEVELOPMENT

Main Street and W Catawba Ave
AM PEAK HOUR

Description	Main Street Northbound				Main Street Southbound				W Catawba Ave Eastbound				W Catawba Ave Westbound			
	Left	Through	Right	U-turn	Left	Through	Right	U-turn	Left	Through	Right	U-turn	Left	Through	Right	U-turn
Observed Volumes	16	94	21	0	3	128	37	0	37	143	31	0	20	91	1	0
2023 Grown Volumes	16	96	21	0	3	131	38	0	38	146	32	0	20	93	1	0
Balanced Volumes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023 Existing Traffic	16	96	21	0	3	131	38	0	38	146	32	0	20	93	1	0
2023 Existng PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicle %	2%	2%	**10%**	2%	2%	2%	2%	2%	2%	6%	3%	2%	**15%**	7%	2%	2%
Annual Growth Rate	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Growth Factor #1	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020
Growth Factor #2	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104
2028 Background Traffic (No AD)	18	106	23	0	3	145	42	0	42	161	35	0	22	103	1	0
2028 Background Traffic	18	106	23	0	3	145	42	0	42	161	35	0	22	103	1	0
Percent Inbound Assignment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%	0%
Percent Outbound Assignment	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%	0%	0%	0%	0%	0%
Project Trips	0	0	0	0	0	0	0	0	0	46	0	0	0	15	0	0
Project Trips (Total)	0	0	0	0	0	0	0	0	0	46	0	0	0	15	0	0
2028 Buildout Total	18	106	23	0	3	145	42	0	42	207	35	0	22	118	1	0

PM PEAK HOUR

Description	Main Street Northbound				Main Street Southbound				W Catawba Ave Eastbound				W Catawba Ave Westbound			
	Left	Through	Right	U-turn	Left	Through	Right	U-turn	Left	Through	Right	U-turn	Left	Through	Right	U-turn
Observed Volumes	27	184	21	0	4	149	59	0	35	97	23	0	14	212	8	0
2023 Grown Volumes	28	188	21	0	4	152	60	0	36	99	23	0	14	216	8	0
Balanced Volumes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023 Existing Traffic	28	188	21	0	4	152	60	0	36	99	23	0	14	216	8	0
2023 PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicle %	2%	2%	5%	2%	**25%**	3%	2%	2%	2%	3%	4%	2%	7%	4%	**13%**	2%
Annual Growth Rate	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Growth Factor #1	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020
Growth Factor #2	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104
2028 Background Traffic (No AD)	31	208	23	0	4	168	66	0	40	109	25	0	15	238	9	0
2028 Background Traffic	31	208	23	0	4	168	66	0	40	109	25	0	15	238	9	0
Percent Inbound Assignment	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%	0%
Percent Outbound Assignment	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%	0%	0%	0%	0%	0%
Project Trips	0	0	0	0	0	0	0	0	0	30	0	0	0	51	0	0
Project Trips (Total)	0	0	0	0	0	0	0	0	0	30	0	0	0	51	0	0
2028 Buildout Total	31	208	23	0	4	168	66	0	40	139	25	0	15	289	9	0

INTERSECTION VOLUME DEVELOPMENT

NC 273 (Highland Street) and W Catawba Ave
AM PEAK HOUR

Description	NC 273 (Highland Street) Northbound				NC 273 (Highland Street) Southbound				W Catawba Ave Eastbound				W Catawba Ave Westbound			
	Left	Through	Right	U-turn	Left	Through	Right	U-turn	Left	Through	Right	U-turn	Left	Through	Right	U-turn
Observed Volumes	4	364	13	0	2	592	98	0	146	17	8	0	10	8	3	0
2023 Grown Volumes	4	371	13	0	2	604	100	0	149	17	8	0	10	8	3	0
Balanced Volumes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023 Existing Traffic	4	371	13	0	2	604	100	0	149	17	8	0	10	8	3	0
2023 Existng PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicle %	50%	7%	2%	2%	50%	5%	6%	2%	4%	2%	25%	2%	20%	2%	2%	2%
Annual Growth Rate	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Growth Factor #1	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020
Growth Factor #2	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104
2028 Background Traffic (No AD)	4	410	14	0	2	667	110	0	165	19	9	0	11	9	3	0
2028 Background Traffic	4	410	14	0	2	667	110	0	165	19	9	0	11	9	3	0
Percent Inbound Assignment	0%	0%	0%	0%	0%	0%	25%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Percent Outbound Assignment	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%	0%	0%	0%	0%	0%	0%
Project Trips	0	0	0	0	0	0	15	0	46	0	0	0	0	0	0	0
Project Trips (Total)	0	0	0	0	0	0	15	0	46	0	0	0	0	0	0	0
2028 Buildout Total	4	410	14	0	2	667	125	0	211	19	9	0	11	9	3	0

PM PEAK HOUR

Description	NC 273 (Highland Street) Northbound				NC 273 (Highland Street) Southbound				W Catawba Ave Eastbound				W Catawba Ave Westbound			
	Left	Through	Right	U-turn	Left	Through	Right	U-turn	Left	Through	Right	U-turn	Left	Through	Right	U-turn
Observed Volumes	9	587	6	0	6	652	169	0	96	13	3	0	67	87	6	0
2023 Grown Volumes	9	599	6	0	6	665	172	0	98	13	3	0	68	89	6	0
Balanced Volumes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023 Existing Traffic	9	599	6	0	6	665	172	0	98	13	3	0	68	89	6	0
2023 PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicle %	2%	3%	2%	2%	17%	4%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Annual Growth Rate	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Growth Factor #1	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020
Growth Factor #2	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104
2028 Background Traffic (No AD)	10	661	7	0	7	734	190	0	108	14	3	0	75	98	7	0
2028 Background Traffic	10	661	7	0	7	734	190	0	108	14	3	0	75	98	7	0
Percent Inbound Assignment	0%	0%	0%	0%	0%	0%	25%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Percent Outbound Assignment	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%	0%	0%	0%	0%	0%	0%
Project Trips	0	0	0	0	0	0	51	0	30	0	0	0	0	0	0	0
Project Trips (Total)	0	0	0	0	0	0	51	0	30	0	0	0	0	0	0	0
2028 Buildout Total	10	661	7	0	7	734	241	0	138	14	3	0	75	98	7	0

INTERSECTION VOLUME DEVELOPMENT

NC 273 (Highland Street) and NC 27 (E Charlotte Ave)
AM PEAK HOUR

Description	NC 273 (Highland Street) Northbound				NC 273 (Highland Street) Southbound				NC 27 (E Charlotte Ave) Eastbound				NC 27 (E Charlotte Ave) Westbound			
	Left	Through	Right	U-turn	Left	Through	Right	U-turn	Left	Through	Right	U-turn	Left	Through	Right	U-turn
Observed Volumes	26	211	317	0	301	457	22	0	6	621	12	0	206	203	132	0
2023 Grown Volumes	27	215	323	0	307	466	22	0	6	633	12	0	210	207	135	0
Balanced Volumes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023 Existing Traffic	27	215	323	0	307	466	22	0	6	633	12	0	210	207	135	0
2023 Existng PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicle %	8%	6%	5%	2%	7%	3%	**50%**	2%	**50%**	7%	2%	2%	5%	**12%**	**21%**	2%
Annual Growth Rate	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Growth Factor #1	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020
Growth Factor #2	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104
2028 Background Traffic (No AD)	30	237	357	0	339	515	24	0	7	699	13	0	232	229	149	0
2028 Background Traffic	30	237	357	0	339	515	24	0	7	699	13	0	232	229	149	0
Percent Inbound Assignment	0%	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%	0%	20%	10%	0%	0%
Percent Outbound Assignment	0%	5%	20%	0%	0%	0%	0%	0%	0%	10%	0%	0%	0%	0%	0%	0%
Project Trips	0	9	37	0	0	3	0	0	0	19	0	0	12	6	0	0
Project Trips (Total)	0	9	37	0	0	3	0	0	0	19	0	0	12	6	0	0
2028 Buildout Total	30	246	394	0	339	518	24	0	7	718	13	0	244	235	149	0

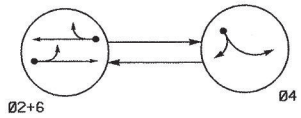
PM PEAK HOUR

Description	NC 273 (Highland Street) Northbound				NC 273 (Highland Street) Southbound				NC 27 (E Charlotte Ave) Eastbound				NC 27 (E Charlotte Ave) Westbound			
	Left	Through	Right	U-turn	Left	Through	Right	U-turn	Left	Through	Right	U-turn	Left	Through	Right	U-turn
Observed Volumes	18	390	291	0	135	378	2	0	13	285	20	0	437	544	382	0
2023 Grown Volumes	18	398	297	0	138	386	2	0	13	291	20	0	446	555	390	0
Balanced Volumes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023 Existing Traffic	18	398	297	0	138	386	2	0	13	291	20	0	446	555	390	0
2023 PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicle %	6%	3%	4%	2%	7%	4%	2%	2%	8%	5%	2%	2%	3%	6%	3%	2%
Annual Growth Rate	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Growth Factor #1	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020	1.020
Growth Factor #2	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104	1.104
2028 Background Traffic (No AD)	20	439	328	0	152	426	2	0	14	321	22	0	492	613	431	0
2028 Background Traffic	20	439	328	0	152	426	2	0	14	321	22	0	492	613	431	0
Percent Inbound Assignment	0%	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%	0%	20%	10%	0%	0%
Percent Outbound Assignment	0%	5%	20%	0%	0%	0%	0%	0%	0%	10%	0%	0%	0%	0%	0%	0%
Project Trips	0	6	24	0	0	10	0	0	0	12	0	0	41	20	0	0
Project Trips (Total)	0	6	24	0	0	10	0	0	0	12	0	0	41	20	0	0
2028 Buildout Total	20	445	352	0	152	436	2	0	14	333	22	0	533	633	431	0

Signal Plans

PROJECT REFEREN
N/A

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION			
SIGNAL FACE	PHASE Ø2+6	PHASE Ø4	PHASE FLASH
21, 22	G	R	Y
41,42	R	G	R
61, 62	G	R	Y

SIGNAL FACE I.D.

Denotes L.E.D.

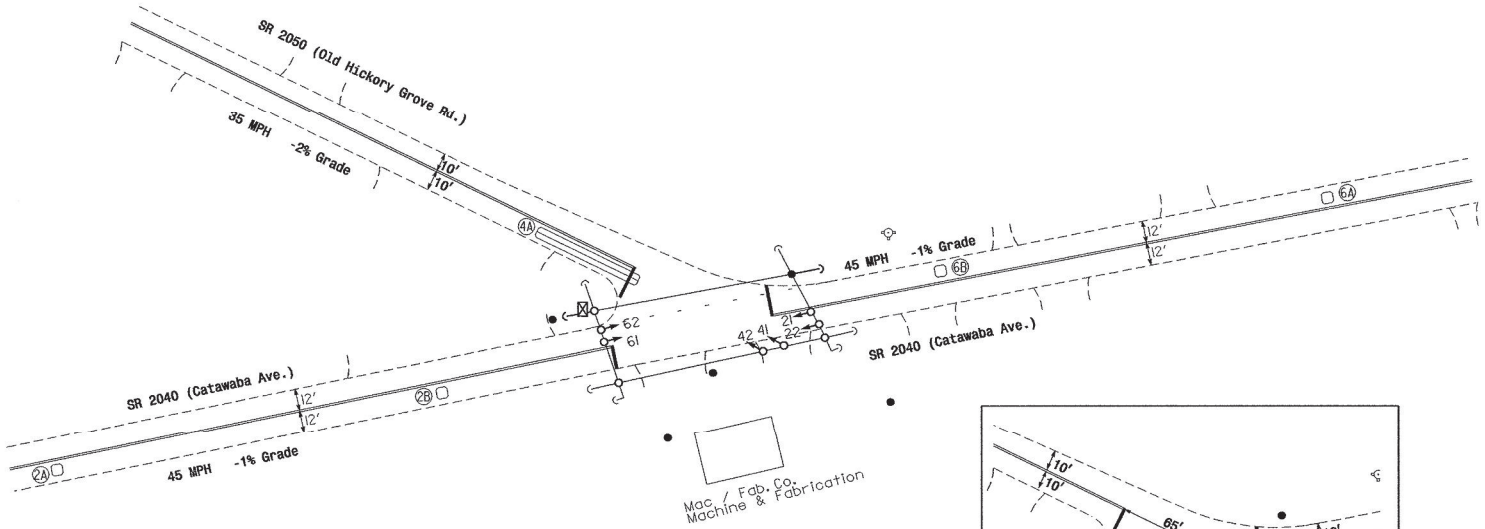
21, 22
41, 42
61, 62

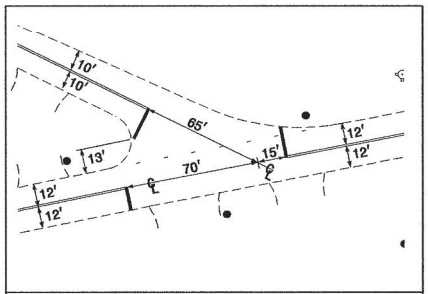
PLAN QUANTITIES	
Pay Item	Feet
Signal Cable	600
Messenger Cable	400
Lead-in Cable	2320

TWO PHASE
FULLY ACTUATED
(ISOLATED)

NOTES

1. Refer to "Roadway Standard Draw NCDOT" dated January 2002 and "Standard Specifications for Ro and Structures" dated January 2
2. Set all detector units to prese





STOPBAR LOCATIONS

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Metal Strain Pole	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way with Marker	
	Directional Arrow	
	Pavement Marking Arrow	
N/A	Fire Hydrant	

2070L TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 6
Min Green 1 *	12	7	12
Extension 1 *	2	1	2
Max Green 1 *	45	20	45
Yellow Clearance	4.7	4.0	4.7
Red Clearance	1.5	2.0	1.5
Walk 1 *	-	-	-
Don't Walk 1	-	-	-
Seconds Per Actuation *	-	-	-
Max Variable Initial *	-	-	-
Time Before Reduction *	-	-	-
Time To Reduction *	-	-	-
Minimum Gap	-	-	-
Recall Mode	MIN. RECALL	-	MIN. RECALL
Vehicle Call Memory	YELLOW	-	YELLOW
Dual Entry	-	-	-
Simultaneous Gap	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

2070L LOOP & DETECTOR INSTALLATION

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	TURNS	DISTANCE FROM STOPBAR (FT)	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	SYSTEM LOOP	STRETCH TIME	DELAY TIME	NEW CARD
2A	6x6	5	300	Y	2	Y	Y	–	–	1.8	–	Y
2B	6x6	4	90	Y	2	Y	Y	–	–	–	–	Y
4A	6x60	2-4-2	+5	Y	4	Y	Y	–	–	–	10	Y
6A	6x6	5	300	Y	6	Y	Y	–	–	1.8	–	Y
6B	6x6	4	90	Y	6	Y	Y	–	–	–	–	Y

NEW INSTALLATION Corr. File No. 12-01-217

Prepared in the Offices of:
Traffic Engineering and Safety Systems Branch
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signals and Geometrics Section
122 N. McDonald St., Raleigh, NC 27603

SR 2040 (Catawba Ave.)
at
SR 2050 (Old Hickory Grove Rd.)

Division 12 Gaston County in Spencer Mountain

PLAN DATE: July 2003 REVIEWED BY:
PREPARED BY: C. Pierce REVIEWED BY:

SCALE 0 40 1":40'

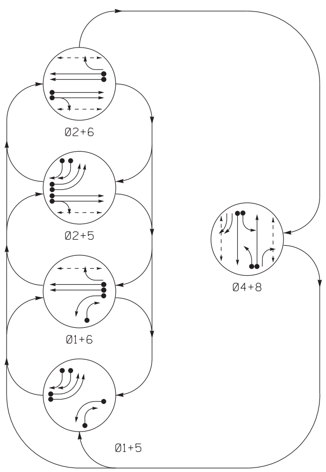
REVISIONS	INIT.	DATE

SIGNATURE
SIG. INVENT

PROJECT REFERENCE NO.	SHEET NO.
U-3633	SIG-15

5-PHASE FULLY-ACTUATED (NC 273 (Highland Street) CLS)

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

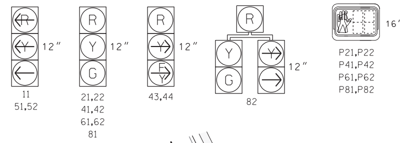
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø4+8	FLASH
11	←	←	←R	←R	←R	←R
21,22	R	R	G	G	R	Y
41,42	R	R	R	R	G	R
43,44	F/Y →	R	F/Y →	R	F/Y →	R
51,52	←	←R	←	←R	←R	←R
61,62	R	G	R	G	R	Y
81	R	R	R	R	G	R
82	R/→	R/→	R	R	G	R
P21,P22	DW	DW	W	W	DW	DRK
P41,P42	DW	DW	DW	DW	W	DRK
P61,P62	DW	W	DW	W	DW	DRK
P81,P82	DW	DW	DW	DW	W	DRK

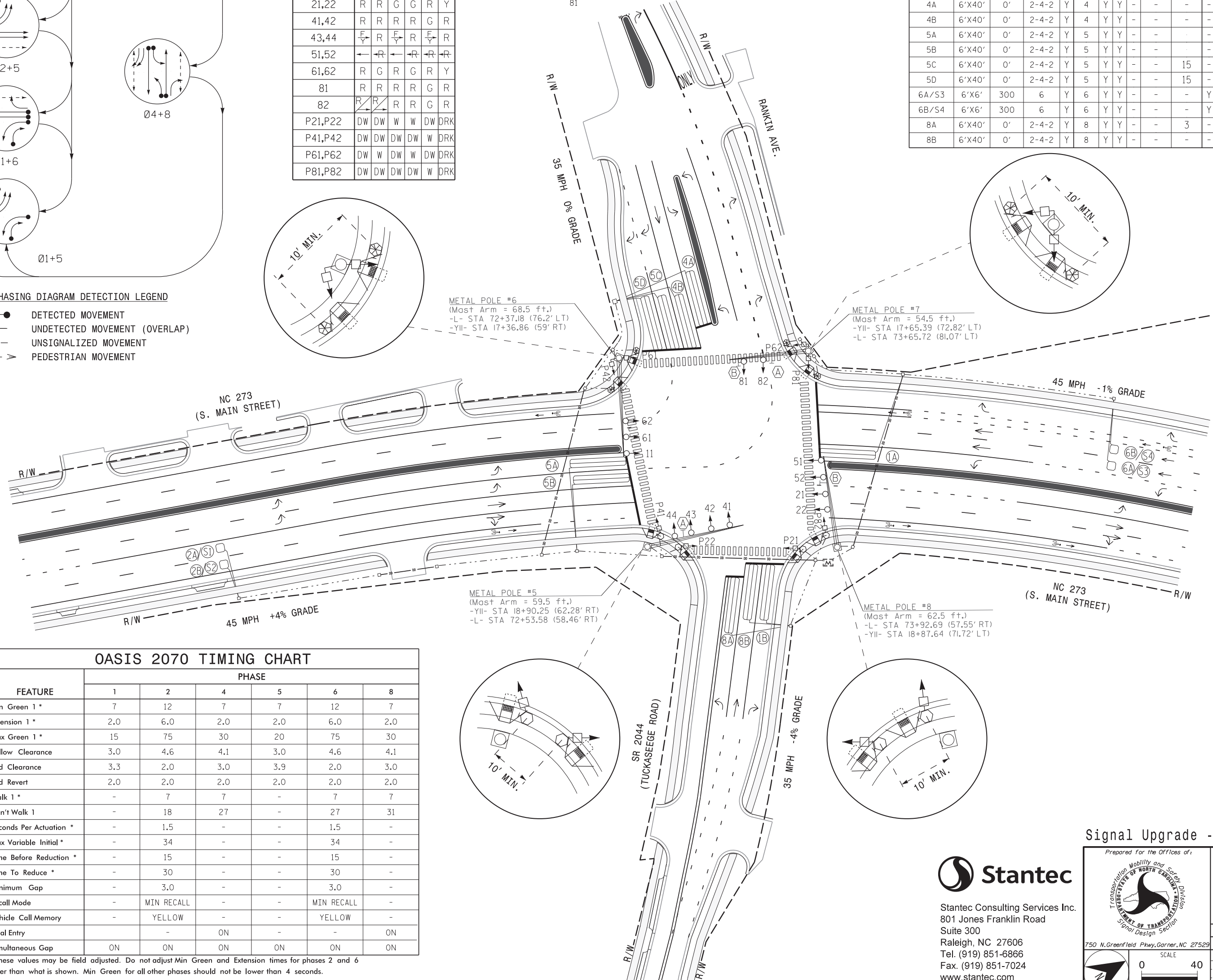
SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6'X40'	0'	2-4-2	Y	1	Y	Y	-	-	-	-	-
1B	6'X40'	0'	2-4-2	Y	1	Y	Y	-	-	15	-	-
2A/S1	6'X6'	300	6	Y	2	Y	Y	-	-	-	Y	-
2B/S2	6'X6'	300	6	Y	2	Y	Y	-	-	-	Y	-
4A	6'X40'	0'	2-4-2	Y	4	Y	Y	-	-	-	-	-
4B	6'X40'	0'	2-4-2	Y	4	Y	Y	-	-	-	-	-
5A	6'X40'	0'	2-4-2	Y	5	Y	Y	-	-		-	-
5B	6'X40'	0'	2-4-2	Y	5	Y	Y	-	-		-	-
5C	6'X40'	0'	2-4-2	Y	5	Y	Y	-	-	15	-	-
5D	6'X40'	0'	2-4-2	Y	5	Y	Y	-	-	15	-	-
6A/S3	6'X6'	300	6	Y	6	Y	Y	-	-	-	Y	-
6B/S4	6'X6'	300	6	Y	6	Y	Y	-	-	-	Y	-
8A	6'X40'	0'	2-4-2	Y	8	Y	Y	-	-	3	-	-
8B	6'X40'	0'	2-4-2	Y	8	Y	Y	-	-	-	-	-



NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or Phase 5 may be lagged.
4. Set all detector units to presence mode.
5. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
6. Program pedestrian heads to countdown the flashing "DON'T WALK" time only.
7. Refer to pavement marking plan for final pavement markings.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
9. Pedestrian pedestals are conceptual and shown for reference only. See Sheets P1-P3 for push button location details.
10. Closed Loop System Data: Master Asset #11224, Controller Asset #0538

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Type I Pushbutton Post	
	Type II Signal Pedestal	
	Ped Push Button w/Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Master Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Out of Pavement Detector	
	Video Detection Area	N/A
	Metal Pole with Mastarm	
N/A	Curb Ramp	
(A)	"Right Turn Yield To U-Turn"	(A)
(B)	"Left Turn Only"	(B)

OASIS 2070 TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green 1 *	7	12	7	7	12	7
Extension 1 *	2.0	6.0	2.0	2.0	6.0	2.0
Max Green 1 *	15	75	30	20	75	30
Yellow Clearance	3.0	4.6	4.1	3.0	4.6	4.1
Red Clearance	3.3	2.0	3.0	3.9	2.0	3.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	7	7	-	7	7
Don't Walk 1	-	18	27	-	27	31
Seconds Per Actuation *	-	1.5	-	-	1.5	-
Max Variable Initial *	-	34	-	-	34	-
Time Before Reduction *	-	15	-	-	15	-
Time To Reduce *	-	30	-	-	30	-
Minimum Gap	-	3.0	-	-	3.0	-
Recall Mode	-	MIN RECALL	-	-	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-
Dual Entry		-	ON	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade - Final Design

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Stantec

Stantec Consulting Services Inc.
801 Jones Franklin Road
Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

Prepared for the Offices of: Transportation Mobility and Safety Division, Signal Design Section, 750 N.Greenfield Pkwy,Garner,NC 27529

NC 273 (South Main Street) at SR 2044 (Tuckaseege Road)/ Rankin Avenue

Division 12	Gaston County	Mount Holly
PLAN DATE: JULY 2016	REVIEWED BY:	D. HARRIS
PREPARED BY: J. HAMBRIGHT	REVIEWED BY:	B. WATSON

SCALE 0 40, 1"=40'

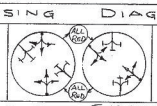
REVISIONS | INIT. | DATE

SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 29449 BETSY L. WATSON

DocuSigned by: Betsy L. Watson 7/26/2016 DATE

SIG. INVENTORY NO. 12-0538

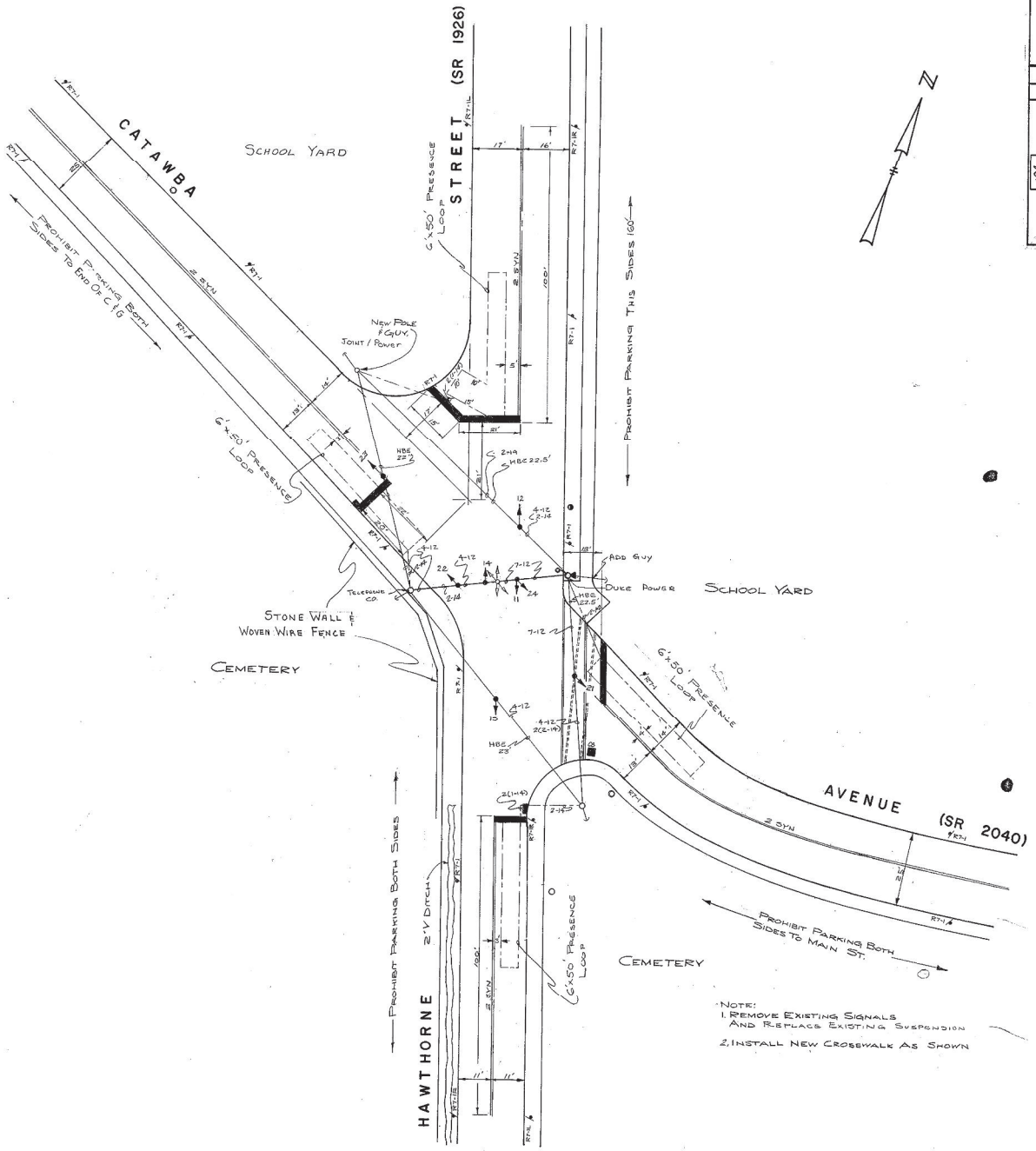
PHASING DIAGRAMS



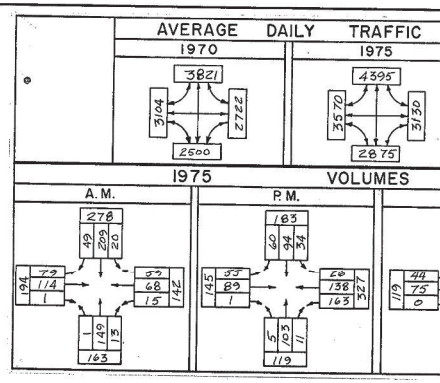
COLOR SEQUENCE & TIMING CHART

SIGNAL HEAD	ØA		ALL RED	ØB		ALL RED	FLASH
	R/W	CLR		R/W	CLR		
12,13,14	G	Y	R	R	R	R	Y
21,22,23,24	R	R	R	G	Y	R	R
SECONDS							
INITIAL	7.0			7.0			
VEHICLE	0.0			0.0			
MINIMUM							
MAXIMUM	30.0			30.0			
CLEAR		3.0	1.5		3.0	1.0	
RECALL	ON			OFF			

CONTROLLER: 2Ø FULLY-ACTUATED WITH AN ALL RED AFTER EACH PHASE AND WITH SWITCH CONTROLLED NON-LOCKING MEMORY FEATURE ON BOTH PHASES. NON-LOCKING MEMORY USED ON PHASE B.



NOTE:
1. REMOVE EXISTING SIGNALS AND REPLACE EXISTING SUSPENSION
2. INSTALL NEW CROSSWALK AS SHOWN



SHEET NO.	TOTAL SHEETS
30	30
STATE PROJ. NO.	
9.812.1810	
9.8120117	
9.8120208	
9.8122707	

ORIGINAL DESIGN REV
N. C. STATE ... COMM.
REVISED BY: WDG
APPROVED BY:

MOUNT HOLLY

HAWTHORNE ST. (SR 1926) AT CATAW

(12-549)

GASTON CO.

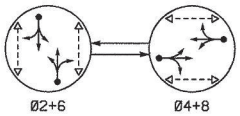
SCALE	N. C. STATE HIGHWAY COMMISSION
DATE	TRAFFIC ENGINEERIN
DWG. BY	DEPARTMENT
DESIGN BY	
APPROVED	DESIGN ENGR. SIGNAL ENGR.

NORTH CAROLINA REGISTERED PROFESSIONAL ENGINEER SEAL 1985 JOHN KIMLEY

KIMLEY-HORN AND ASSOCI
PROFESSIONAL ENGINEE
RALEIGH, NORTH CAROLINA — WEST PALM BEA

REVISIONS						DESIGNED	SCALE
DATE	BY	DATE	BY	DATE	BY	CHK'D BY	DATE
						DRAWN BY JMA	APP'D BY

PHASING DIAGRAM



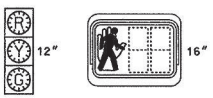
PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION			
SIGNAL FACE	PHASE Ø2+6	PHASE Ø4+8	FLASH
21,22	G	R	Y
41,42,43	R	G	R
61,62	G	R	Y
81,82,83	R	G	R
P21,P22	W	DW	DRK
P41,P42	DW	W	DRK
P61,P62	W	DW	DRK
P81,P82	DW	W	DRK

SIGNAL FACE I.D.

Denotes L.E.D.



21,22
41,42,43
61,62
81,82,83

P21,P22
P41,P42
P61,P62
P81,P82

2070L LOOP & DETECTOR INSTALLATION

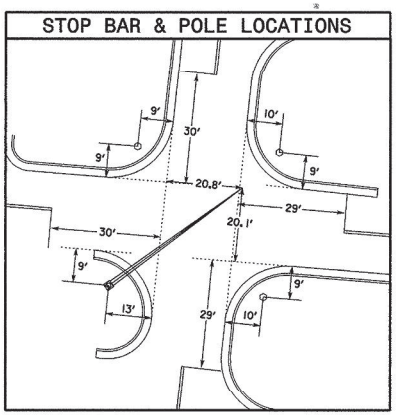
INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X40	0	2-4-2	Y	2	Y	Y	-	-	-	-	Y
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	-	-	Y
6A	6X40	0	2-4-2	Y	6	Y	Y	-	-	-	-	Y
8A	6X40	0	2-4-2	Y	8	Y	Y	-	-	-	-	Y

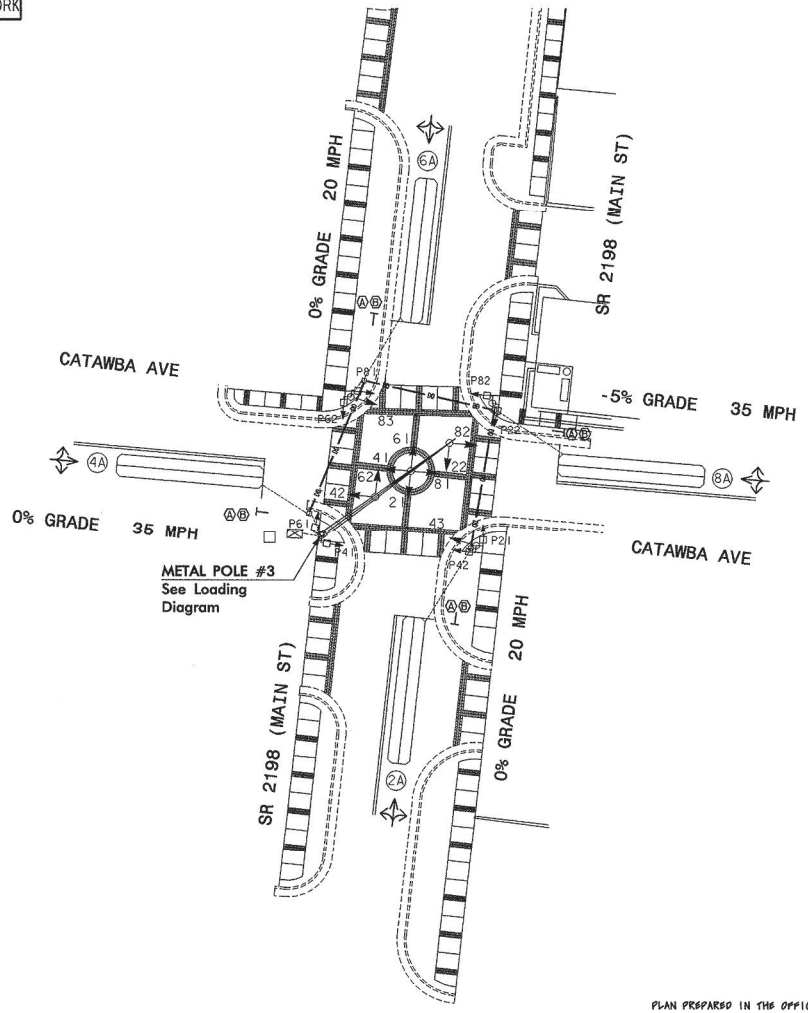
2 PHASE
FULLY ACTUATED
(ISOLATED)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT dated January 2002. "Standard Specificati Roads and Structures" dated January 2002.
2. Do not program signal for late night flas unless otherwise directed by the Engineer
3. Set all detector units to presence mode.
4. Locate new cabinet so as to not obstruct of vehicles turning right on red.
5. Omit "WALK" and flashing "DON'T WALK" wit pedestrian calls.
6. Program pedestrian heads to countdown the "Don't Walk" time only.

STOP BAR & POLE LOCATIONS





2070L TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 6	PHASE 8
Min Green 1 *	10	7	10	7
Extension 1 *	2.0	2.0	2.0	2.0
Max Green 1 *	40	20	40	20
Yellow Clearance	3.0	3.8	3.0	4.2
Red Clearance	1.9	1.1	1.9	1.1
Walk 1 *	7	7	7	7
Don't Walk 1	6	6	6	6
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MIN RECALL	-	MIN RECALL	-
Vehicle Call Memory	-	-	-	-
Dual Entry	-	ON	-	ON
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND

PROPOSED

- Traffic Signal Head
- Modified Signal Head
- Sign
- Pedestrian Signal Hea With Push Button & Si
- Signal Pole with Guy
- Signal Pole with Sidewal
- Inductive Loop Detect
- Controller & Cabinet
- Junction Box
- Directional Drill
- 2-in Underground Condu
- N/A Right of Way with Mark
- Directional Arrow
- Metal Pole with Masta
- Signal Pedestal
- (A) "NO TURN ON RED" Sign (R10-11)
- (B) "STOP HERE ON RED" Sign (R10-6)

SIGNAL UPGRADE

PLAN PREPARED IN THE OFFICE OF:

Kubilins
TRANSPORTATION GROUP, INC.
800 WEST HILL STREET, SUITE 202
CHARLOTTE, NC 28208
PH: (980)321-0202 FAX: (980) 321-0108

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Traffic Engineering and Safety Systems Branch
Signals and Geometrics Section
1722 N. MacDonell St., Raleigh, NC 27603

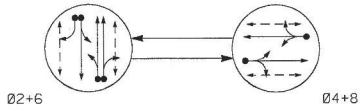
SR 2198 (MAIN STREET)
AT
CATAWBA AVENUE

DIVISION 12	GASTON COUNTY	MOUNT HOLLY
PLAN DATE: SEPTEMBER 2005	REVIEWED BY:	JBK
PREPARED BY: JLC	REVIEWED BY:	MAK

SCALE 0 20 1"=20'

REVISIONS	INIT.	DATE

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

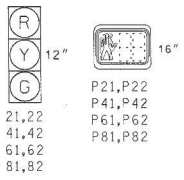
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION			
SIGNAL FACE	PHASE Ø2+6	PHASE Ø4+8	FLASH
21,22	G	R	Y
41,42	R	G	R
61,62	G	R	Y
81,82	R	G	R
P21,P22	W	DW	DRK
P41,P42	DW	W	DRK
P61,P62	W	DW	DRK
P81,P82	DW	W	DRK

W - Walk
DW - Don't Walk
DRK - Dark

SIGNAL FACE I.D.

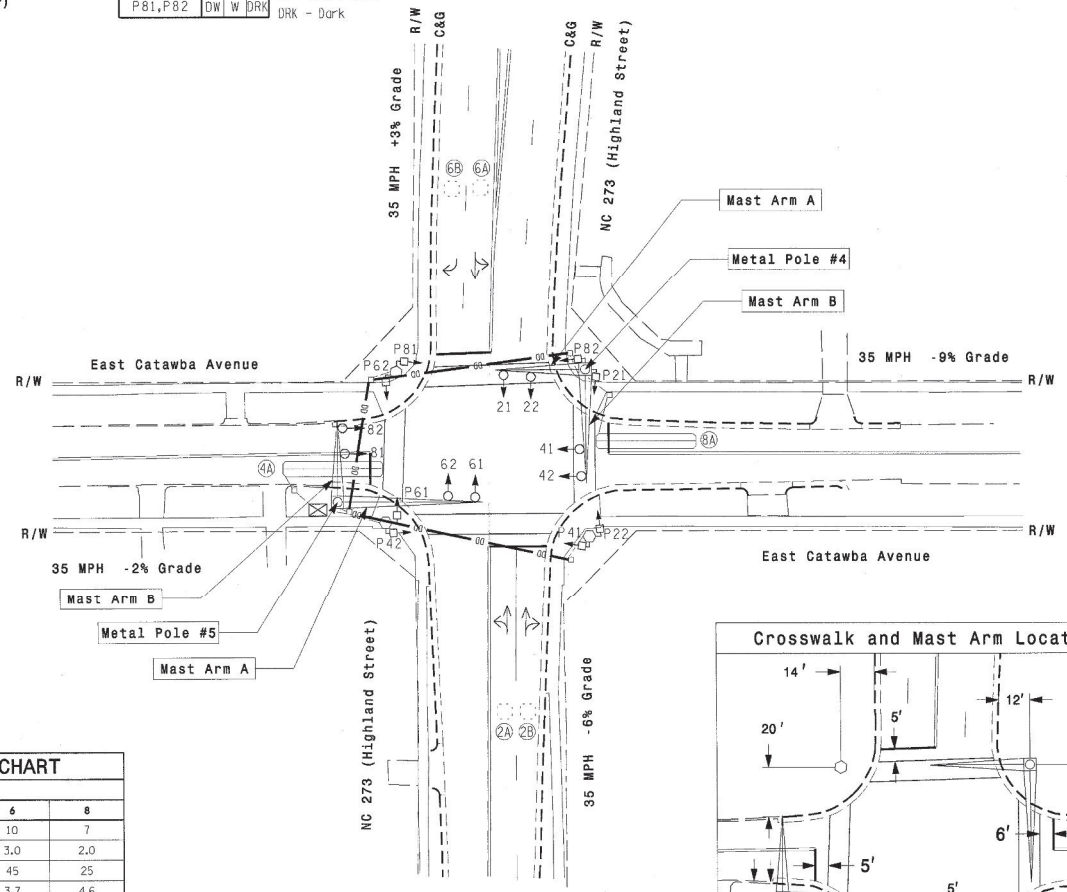
All Heads L.E.D.

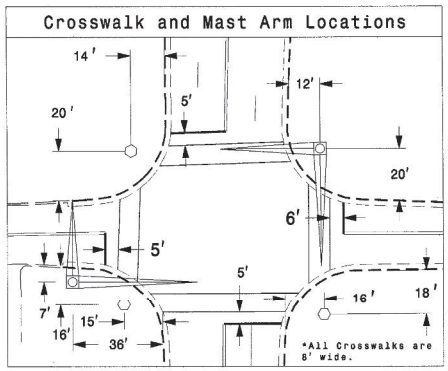


21,22
41,42
61,62
81,82

P21,P22
P41,P42
P61,P62
P81,P82

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X6	64	4	-	2	Y	Y	-	-	-	-	Y
2B	6X6	64	4	-	2	Y	Y	-	-	-	-	Y
4A	6X40	+5	2-4-2	Y	4	Y	Y	-	-	10	-	Y
6A	6X6	64	4	-	6	Y	Y	-	-	-	-	Y
6B	6X6	64	4	-	6	Y	Y	-	-	-	-	Y
8A	6X40	+5	2-4-2	Y	8	Y	Y	-	-	10	-	Y





OASIS 2070L TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 6	PHASE 8
Min Green 1 *	10	7	10	7
Extension 1 *	3.0	2.0	3.0	2.0
Max Green 1 *	45	25	45	25
Yellow Clearance	4.3	4.0	3.7	4.6
Red Clearance	1.3	1.7	1.4	1.7
Walk 1 *	7	7	7	7
Don't Walk 1	6	12	7	10
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MIN RECALL	-	MIN RECALL	-
Vehicle Call Memory	YELLOW	-	YELLOW	-
Dual Entry	-	ON	-	ON
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

2 Phase
Fully Actuated
(Isolated)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" c "Standard Specifications for Roads and Struc January 2012, and all applicable sections of the generic Project Special Provisions. The accessed at the following website: http://www.ncdot.org/doh/preconstruct/traffi
2. Do not program signal for late night flashin otherwise directed by the Engineer.
3. Set all detector units to presence mode.
4. Locate new cabinet so as not to obstruct sig vehicles turning right on red.
5. Omit "WALK" and flashing "DON'T WALK" with n
6. Program pedestrian heads to countdown the fl time only.
7. Pavement markings are existing.
8. All signal poles, mast arms and pedestrian designed and manufactured to be similar in a traffic signal equipment currently installed of Main Street and Catawba Avenue in Mount H Carolina, and as specified by the Town of Mo and/or engineer. Signal poles and mast arms and painted black. Pedestrian pedestal poles

LEGEND

PROPOSED		EXI
	Traffic Signal Head	
	Modified Signal Head	
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
DD	Directional Drill	
	Metal Pole with Mastarm	
	Pedestrian Signal Pedestal	

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
FINAL DRAWING Date: 3/19/12
(Zachary M. Little)
Traffic Engineering Branch

Signal Upgrade

Prepared for:
Transportation Mobility and Safety Division
Traffic Engineering Branch
Signal Design Section

NC 273 (Highland Street) at East Catawba Avenue

Division 12 Gaston County Mount Ho

PLAN DATE: March 2012 REVIEWED BY: WJ Hamilton
PREPARED BY: NE Burns REVIEWED BY: 11117 (040)

REVISIONS INIT. DA

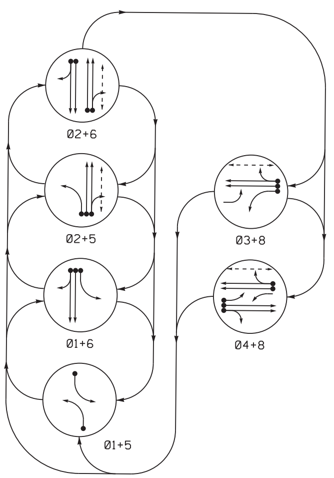
SCALE 0 30 1"=30'

Prepared in the offices of:
RAMEY KEMP & ASSOCIATES, INC.
Transportation Engineers
5808 Faringdon Place, Suite 100
Raleigh, North Carolina 27609
919-872-5115 Tel, 919-878-8419 Fax.
www.rameykemp.com

750 N.Greenfield Pkwy.Garner,NC 27529

PROJECT REFERENCE NO.	SHEET NO.
DIV.	Sig 1.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

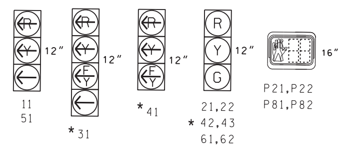
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø3+8	Ø4+8	FLASH
11	←	←	←R	←R	←R	←R	←R
21,22	R	R	G	G	R	R	Y
31	←R	←R	←R	←R	←	←F/Y	←R
41	←R	←R	←R	←R	←F/Y	←F/Y	←R
42,43	R	R	R	R	R	G	R
51	←	←R	←	←R	←R	←R	←R
61,62	R	G	R	G	R	R	Y
81,82	R	R	R	R	G	G	R
P21,P22	DW	DW	W	W	DW	DW	DRK
P81,P82	DW	DW	DW	DW	W	W	DRK

SIGNAL FACE I.D.

All Heads L.E.D.
★ Backplates



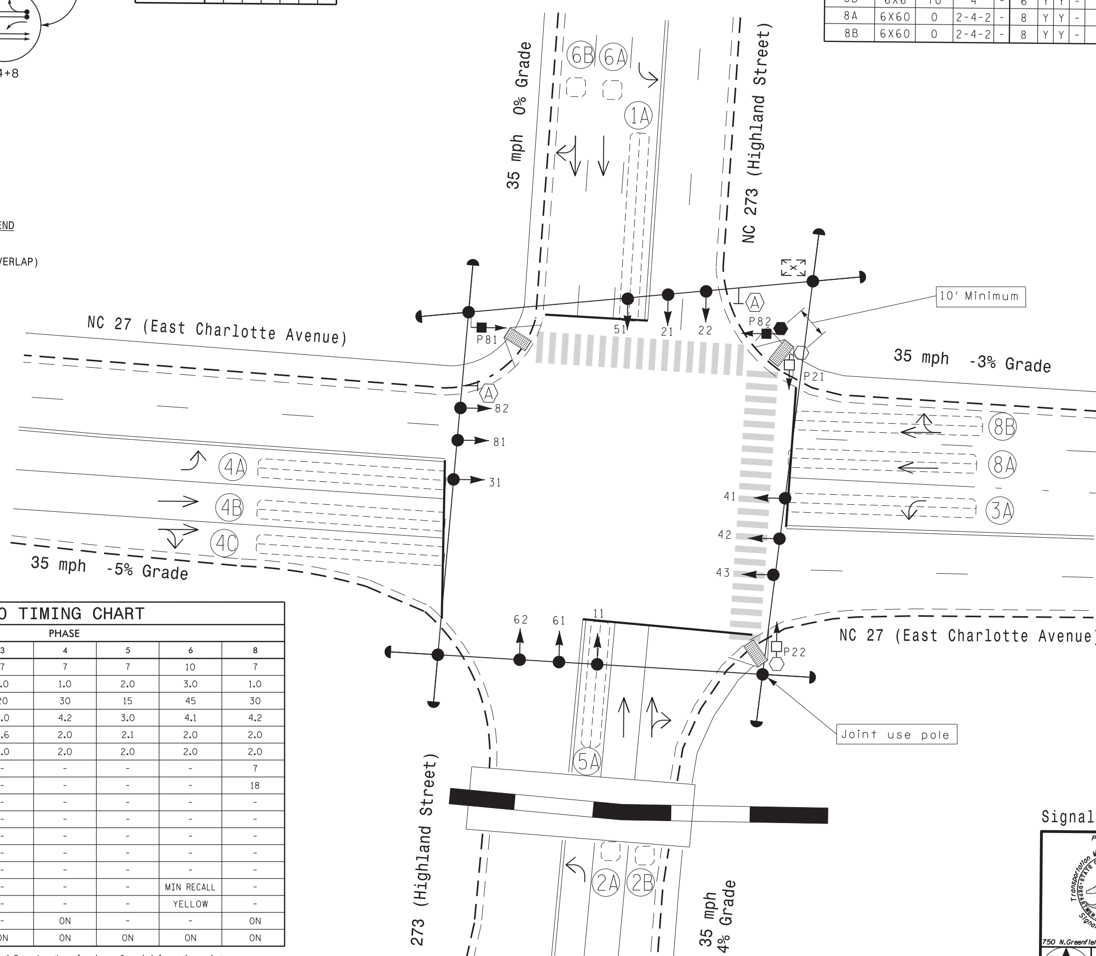
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X60	0	2-4-2	-	1	Y	Y	-	-	3	-	-
2A	6X6	70	4	-	2	Y	Y	-	-	-	-	-
2B	6X6	70	4	-	2	Y	Y	-	-	-	-	-
3A	6X60	0	2-4-2	-	3	Y	Y	-	-	15	-	-
					8	Y	Y	-	-	3	-	-
4A	6X60	0	2-4-2	-	4	Y	Y	-	-	3	-	-
4B	6X60	0	2-4-2	-	4	Y	Y	-	-	-	-	-
4C	6X60	0	2-4-2	-	4	Y	Y	-	-	10	-	-
5A	6X40	0	2-4-2	-	5	Y	Y	-	-	3	-	-
6A	6X6	70	4	-	6	Y	Y	-	-	-	-	-
6B	6X6	70	4	-	6	Y	Y	-	-	-	-	-
8A	6X60	0	2-4-2	-	8	Y	Y	-	-	-	-	-
8B	6X60	0	2-4-2	-	8	Y	Y	-	-	10	-	-

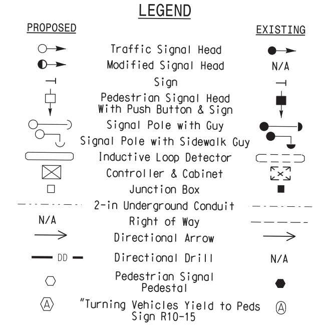
6 Phase
Fully Actuated
Isolated

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. Set all detector units to presence mode.
5. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
6. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
7. Pavement markings are existing.



LEGEND



OASIS 2070 TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	8
Min Green 1 *	7	10	7	7	7	10	7
Extension 1	1.0	3.0	1.0	1.0	2.0	3.0	1.0
Max Green 1 *	20	45	20	30	15	45	30
Yellow Clearance	3.0	4.1	3.0	4.2	3.0	4.1	4.2
Red Clearance	2.8	2.0	2.6	2.0	2.1	2.0	2.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	7	-	-	-	-	7
Don't Walk 1	-	22	-	-	-	-	18
Seconds Per Actuation *	-	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW	-
Dual Entry	-	-	-	ON	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade

Prepared for:
Transportation Mobility and Safety Division
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

NC 273 (Highland Street)
at
NC 27 (East Charlotte Avenue)

Division 12	Gaston County	Mount Holly
PLAN DATE: May 2018	REVIEWED BY:	
PREPARED BY: C. Pierce	RKA PROJ.NO:	

SCALE 0 20
1"=20'

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL 024393
TIMOTHY J. WILLIAMS

T. J. Williams 6/21/2018
SIGNATURE DATE
SIG. INVENTORY NO. 12-0978

Intersection Capacity Analysis

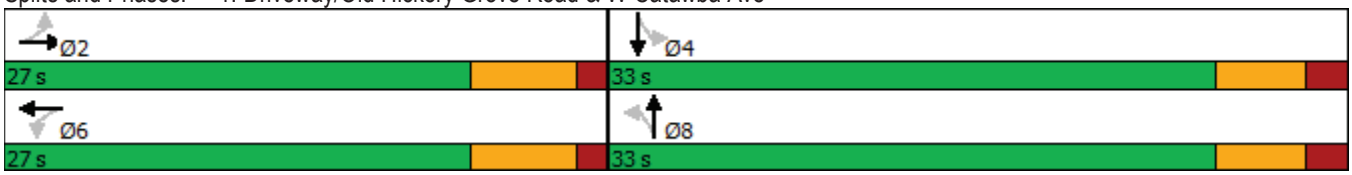
2023 Existing Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	225	4	4	135	97	4	4	4	284	6	39
Future Volume (vph)	18	225	4	4	135	97	4	4	4	284	6	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			-1%			0%			-2%	
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		0.998			0.944			0.955			0.984	
Flt Protected		0.996			0.999			0.984			0.959	
Satd. Flow (prot)	0	1828	0	0	1736	0	0	1750	0	0	1760	0
Flt Permitted		0.962			0.993			0.873			0.747	
Satd. Flow (perm)	0	1766	0	0	1726	0	0	1553	0	0	1371	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			25			35	
Link Distance (ft)		1549			1034			1067			1674	
Travel Time (s)		30.2			20.1			29.1			32.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	4%	2%	2%	5%	2%	2%	2%	2%	3%	2%	2%
Adj. Flow (vph)	20	250	4	4	150	108	4	4	4	316	7	43
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	274	0	0	262	0	0	12	0	0	366	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	18.2	18.2		18.2	18.2		13.0	13.0		13.0	13.0	
Total Split (s)	27.0	27.0		27.0	27.0		33.0	33.0		33.0	33.0	
Total Split (%)	45.0%	45.0%		45.0%	45.0%		55.0%	55.0%		55.0%	55.0%	
Maximum Green (s)	20.8	20.8		20.8	20.8		27.0	27.0		27.0	27.0	
Yellow Time (s)	4.7	4.7		4.7	4.7		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.5	1.5		1.5	1.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.2			-1.2			-1.0			-1.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		1.0	1.0		1.0	1.0	
Recall Mode	Min	Min		Min	Min		None	None		None	None	
Act Effct Green (s)		14.5			14.5			11.0			15.2	
Actuated g/C Ratio		0.36			0.36			0.28			0.38	
v/c Ratio		0.43			0.42			0.03			0.70	
Control Delay		13.9			13.8			10.2			18.4	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		13.9			13.8			10.2			18.4	
LOS		B			B			B			B	
Approach Delay		13.9			13.8			10.2			18.4	
Approach LOS		B			B			B			B	
Queue Length 50th (ft)		41			39			2			60	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)		126			121			8			148	
Internal Link Dist (ft)		1469			954			987			1594	
Turn Bay Length (ft)												
Base Capacity (vph)		1007			984			1126			994	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.27			0.27			0.01			0.37	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 40			
Natural Cycle: 45			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.70			
Intersection Signal Delay: 15.6		Intersection LOS: B	
Intersection Capacity Utilization 55.6%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Driveway/Old Hickory Grove Road & W Catawba Ave



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	482	4	4	239	4	4
Future Volume (vph)	482	4	4	239	4	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.999				0.932	
Flt Protected				0.999	0.976	
Satd. Flow (prot)	1843	0	0	1826	1694	0
Flt Permitted				0.999	0.976	
Satd. Flow (perm)	1843	0	0	1826	1694	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	1034			1509	1194	
Travel Time (s)	20.1			29.4	32.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	2%	2%	4%	2%	2%
Adj. Flow (vph)	536	4	4	266	4	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	540	0	0	270	8	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 35.6%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	482	4	4	239	4	4
Future Vol, veh/h	482	4	4	239	4	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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, %	3	2	2	4	2	2
Mvmt Flow	536	4	4	266	4	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	540	0	812	538
Stage 1	-	-	-	-	538	-
Stage 2	-	-	-	-	274	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1028	-	348	543
Stage 1	-	-	-	-	585	-
Stage 2	-	-	-	-	772	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1028	-	346	543
Mov Cap-2 Maneuver	-	-	-	-	346	-
Stage 1	-	-	-	-	585	-
Stage 2	-	-	-	-	768	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	13.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	423	-	-	1028	-
HCM Lane V/C Ratio	0.021	-	-	0.004	-
HCM Control Delay (s)	13.7	-	-	8.5	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	328	155	14	197	42	5
Future Volume (vph)	328	155	14	197	42	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.957				0.985	
Flt Protected				0.997	0.958	
Satd. Flow (prot)	1777	0	0	1824	1687	0
Flt Permitted				0.997	0.958	
Satd. Flow (perm)	1777	0	0	1824	1687	0
Link Speed (mph)	35			35	35	
Link Distance (ft)	1509			2206	3149	
Travel Time (s)	29.4			43.0	61.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	3%	2%	4%	2%	40%
Adj. Flow (vph)	364	172	16	219	47	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	536	0	0	235	53	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 36.7%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	1.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	328	155	14	197	42	5
Future Vol, veh/h	328	155	14	197	42	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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	3	2	4	2	40
Mvmt Flow	364	172	16	219	47	6

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	536	0	701	450
Stage 1	-	-	-	-	450	-
Stage 2	-	-	-	-	251	-
Critical Hdwy	-	-	4.12	-	6.42	6.6
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.66
Pot Cap-1 Maneuver	-	-	1032	-	405	537
Stage 1	-	-	-	-	642	-
Stage 2	-	-	-	-	791	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1032	-	398	537
Mov Cap-2 Maneuver	-	-	-	-	398	-
Stage 1	-	-	-	-	642	-
Stage 2	-	-	-	-	777	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	15.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	409	-	-	1032	-
HCM Lane V/C Ratio	0.128	-	-	0.015	-
HCM Control Delay (s)	15.1	-	-	8.5	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0	-

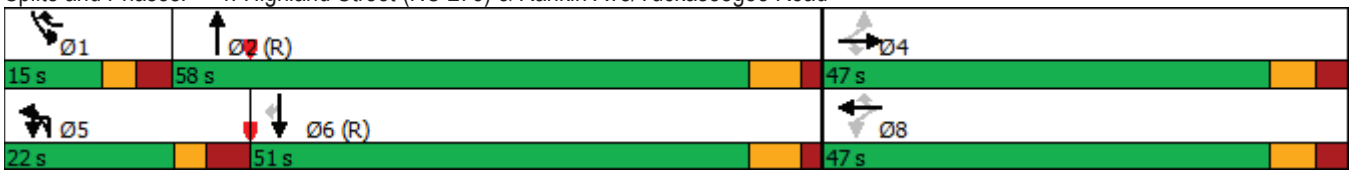
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	62	42	432	18	45	43	19	186	379	16	16	762
Future Volume (vph)	62	42	432	18	45	43	19	186	379	16	16	762
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			-4%				4%			-1%
Storage Length (ft)	150		75	100		150		500		0	0	
Storage Lanes	1		2	1		1		2		0	1	
Taper Length (ft)	125			100				275			100	
Lane Util. Factor	1.00	1.00	0.88	1.00	1.00	1.00	0.95	0.97	0.95	0.95	1.00	0.95
Frt			0.850			0.850			0.994			
Flt Protected	0.950			0.950				0.950			0.950	
Satd. Flow (prot)	1687	1863	2787	1737	1900	1615	0	3335	3264	0	1711	3489
Flt Permitted	0.724			0.726				0.950			0.950	
Satd. Flow (perm)	1286	1863	2787	1327	1900	1615	0	3335	3264	0	1711	3489
Right Turn on Red			Yes			No				No		
Satd. Flow (RTOR)			346									
Link Speed (mph)		35			35				35			35
Link Distance (ft)		250			1386				1719			1141
Travel Time (s)		4.9			27.0				33.5			22.2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	7%	2%	2%	6%	2%	2%	2%	3%	7%	25%	6%	4%
Adj. Flow (vph)	69	47	480	20	50	48	21	207	421	18	18	847
Shared Lane Traffic (%)												
Lane Group Flow (vph)	69	47	480	20	50	48	0	228	439	0	18	847
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	Prot	Prot	NA		Prot	NA
Protected Phases		4			8	1	5	5	2		1	6
Permitted Phases	4		4	8		8						
Detector Phase	4	4	4	8	8	1	5	5	2		1	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0		7.0	12.0
Minimum Split (s)	41.1	41.1	41.1	45.1	45.1	13.3	13.9	13.9	31.6		13.3	40.6
Total Split (s)	47.0	47.0	47.0	47.0	47.0	15.0	22.0	22.0	58.0		15.0	51.0
Total Split (%)	39.2%	39.2%	39.2%	39.2%	39.2%	12.5%	18.3%	18.3%	48.3%		12.5%	42.5%
Maximum Green (s)	39.9	39.9	39.9	39.9	39.9	8.7	15.1	15.1	51.4		8.7	44.4
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1	3.0	3.0	3.0	4.6		3.0	4.6
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.3	3.9	3.9	2.0		3.3	2.0
Lost Time Adjust (s)	-2.1	-2.1	-2.1	-2.1	-2.1	-1.3		-1.9	-1.6		-1.3	-1.6
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0
Lead/Lag						Lead	Lead	Lead	Lag		Lead	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	6.0		2.0	6.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0		2.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0		0.0	15.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.0		0.0	30.0
Recall Mode	None	None	None	None	None	None	None	None	C-Max		None	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0				7.0			7.0
Flash Dont Walk (s)	27.0	27.0	27.0	31.0	31.0				18.0			27.0
Pedestrian Calls (#/hr)	0	0	0	0	0				0			0
Act Effct Green (s)	14.0	14.0	14.0	14.0	14.0	27.5		14.4	85.2		8.5	76.5

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	14
Future Volume (vph)	14
Ideal Flow (vphpl)	1900
Grade (%)	
Storage Length (ft)	0
Storage Lanes	1
Taper Length (ft)	
Lane Util. Factor	1.00
Frt	0.850
Flt Protected	
Satd. Flow (prot)	1517
Flt Permitted	
Satd. Flow (perm)	1517
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	7%
Adj. Flow (vph)	16
Shared Lane Traffic (%)	
Lane Group Flow (vph)	16
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Detector Phase	6
Switch Phase	
Minimum Initial (s)	12.0
Minimum Split (s)	40.6
Total Split (s)	51.0
Total Split (%)	42.5%
Maximum Green (s)	44.4
Yellow Time (s)	4.6
All-Red Time (s)	2.0
Lost Time Adjust (s)	-1.6
Total Lost Time (s)	5.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	6.0
Minimum Gap (s)	3.0
Time Before Reduce (s)	15.0
Time To Reduce (s)	30.0
Recall Mode	C-Max
Walk Time (s)	7.0
Flash Dont Walk (s)	27.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	76.5

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Actuated g/C Ratio	0.12	0.12	0.12	0.12	0.12	0.23		0.12	0.71		0.07	0.64
v/c Ratio	0.46	0.22	0.76	0.13	0.23	0.13		0.57	0.19		0.15	0.38
Control Delay	58.0	48.3	22.3	46.8	48.5	35.7		55.2	7.1		55.3	12.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	58.0	48.3	22.3	46.8	48.5	35.7		55.2	7.1		55.3	12.0
LOS	E	D	C	D	D	D		E	A		E	B
Approach Delay		28.5			43.0				23.5			12.8
Approach LOS		C			D				C			B
Queue Length 50th (ft)	51	34	56	14	36	30		87	56		13	149
Queue Length 95th (ft)	94	67	113	36	70	58		124	97		38	245
Internal Link Dist (ft)		170			1306				1639			1061
Turn Bay Length (ft)	150		75	100		150		500				
Base Capacity (vph)	450	652	1200	464	665	390		479	2316		142	2225
Starvation Cap Reductn	0	0	0	0	0	0		0	0		0	0
Spillback Cap Reductn	0	0	0	0	0	0		0	0		0	0
Storage Cap Reductn	0	0	0	0	0	0		0	0		0	0
Reduced v/c Ratio	0.15	0.07	0.40	0.04	0.08	0.12		0.48	0.19		0.13	0.38

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 21.7		Intersection LOS: C	
Intersection Capacity Utilization 64.5%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 4: Highland Street (NC 273) & Rankin Ave/Tuckaseegee Road



Lane Group	SBR
Actuated g/C Ratio	0.64
v/c Ratio	0.02
Control Delay	10.5
Queue Delay	0.0
Total Delay	10.5
LOS	B
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	4
Queue Length 95th (ft)	16
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	967
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.02

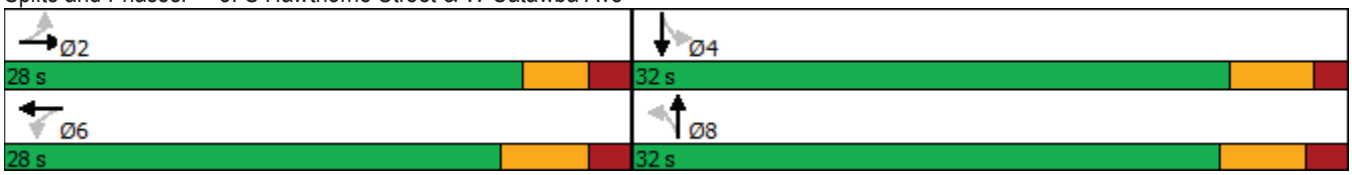
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	138	160	4	21	146	69	4	215	4	29	394	116
Future Volume (vph)	138	160	4	21	146	69	4	215	4	29	394	116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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		0.998			0.960			0.998			0.971	
Flt Protected		0.978			0.996			0.999			0.997	
Satd. Flow (prot)	0	1802	0	0	1739	0	0	1857	0	0	1787	0
Flt Permitted		0.735			0.950			0.991			0.974	
Satd. Flow (perm)	0	1354	0	0	1659	0	0	1842	0	0	1746	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			25			20			20	
Link Distance (ft)		2206			684			1329			1297	
Travel Time (s)		43.0			18.7			45.3			44.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	2%	2%	2%	6%	2%	2%	2%	2%	7%	2%	5%
Adj. Flow (vph)	153	178	4	23	162	77	4	239	4	32	438	129
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	335	0	0	262	0	0	247	0	0	599	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0		10.0	10.0		7.0	7.0	
Minimum Split (s)	16.9	16.9		17.9	17.9		15.8	15.8		12.4	12.4	
Total Split (s)	28.0	28.0		28.0	28.0		32.0	32.0		32.0	32.0	
Total Split (%)	46.7%	46.7%		46.7%	46.7%		53.3%	53.3%		53.3%	53.3%	
Maximum Green (s)	23.1	23.1		22.1	22.1		26.2	26.2		26.6	26.6	
Yellow Time (s)	3.0	3.0		4.0	4.0		3.8	3.8		3.8	3.8	
All-Red Time (s)	1.9	1.9		1.9	1.9		2.0	2.0		1.6	1.6	
Lost Time Adjust (s)		0.1			-0.9			-0.8			-0.4	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Recall Mode	Min	Min		Min	Min		None	None		None	None	
Act Effct Green (s)		19.1			19.1			23.5			23.5	
Actuated g/C Ratio		0.36			0.36			0.44			0.44	
v/c Ratio		0.69			0.44			0.30			0.77	
Control Delay		23.6			16.3			11.2			21.6	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		23.6			16.3			11.2			21.6	
LOS		C			B			B			C	
Approach Delay		23.6			16.3			11.2			21.6	
Approach LOS		C			B			B			C	
Queue Length 50th (ft)		96			67			49			157	
Queue Length 95th (ft)		177			122			96			#333	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		2126			604			1249			1217	
Turn Bay Length (ft)												
Base Capacity (vph)		606			743			968			918	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.55			0.35			0.26			0.65	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 52.9			
Natural Cycle: 45			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 19.3		Intersection LOS: B	
Intersection Capacity Utilization 85.8%		ICU Level of Service E	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 5: S Hawthorne Street & W Catawba Ave

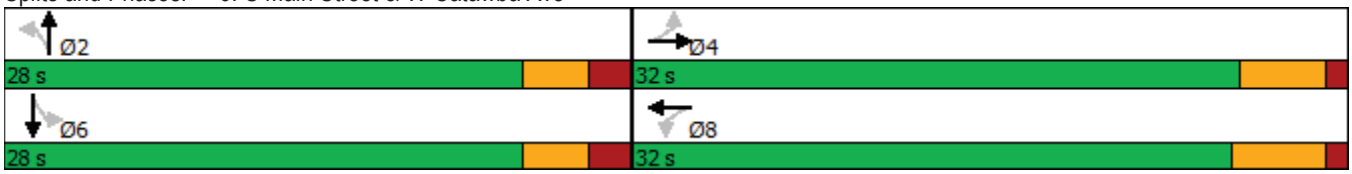


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	146	32	20	93	4	16	96	21	4	131	38
Future Volume (vph)	38	146	32	20	93	4	16	96	21	4	131	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			-5%			0%			0%	
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		0.980			0.996			0.979			0.970	
Flt Protected		0.991			0.992			0.994			0.999	
Satd. Flow (prot)	0	1760	0	0	1778	0	0	1791	0	0	1805	0
Flt Permitted		0.916			0.902			0.949			0.993	
Satd. Flow (perm)	0	1627	0	0	1617	0	0	1710	0	0	1794	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			20			20	
Link Distance (ft)		986			1119			1390			1157	
Travel Time (s)		26.9			30.5			47.4			39.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	6%	3%	15%	7%	2%	2%	2%	10%	2%	2%	2%
Adj. Flow (vph)	42	162	36	22	103	4	18	107	23	4	146	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	240	0	0	129	0	0	148	0	0	192	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	16.9	16.9		17.3	17.3		17.9	17.9		17.9	17.9	
Total Split (s)	32.0	32.0		32.0	32.0		28.0	28.0		28.0	28.0	
Total Split (%)	53.3%	53.3%		53.3%	53.3%		46.7%	46.7%		46.7%	46.7%	
Maximum Green (s)	27.1	27.1		26.7	26.7		23.1	23.1		23.1	23.1	
Yellow Time (s)	3.8	3.8		4.2	4.2		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.1	1.1		1.1	1.1		1.9	1.9		1.9	1.9	
Lost Time Adjust (s)		0.1			-0.3			0.1			0.1	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	5.0	5.0		5.0	5.0		6.0	6.0		6.0	6.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		8.9			8.9			11.6			11.6	
Actuated g/C Ratio		0.29			0.29			0.38			0.38	
v/c Ratio		0.51			0.27			0.23			0.28	
Control Delay		12.4			9.1			8.5			8.8	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		12.4			9.1			8.5			8.8	
LOS		B			A			A			A	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		12.4			9.1			8.5			8.8	
Approach LOS		B			A			A			A	
Queue Length 50th (ft)		27			14			14			18	
Queue Length 95th (ft)		60			34			42			52	
Internal Link Dist (ft)		906			1039			1310			1077	
Turn Bay Length (ft)												
Base Capacity (vph)		1450			1442			1360			1426	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.17			0.09			0.11			0.13	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 30.6			
Natural Cycle: 40			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.51			
Intersection Signal Delay: 10.0		Intersection LOS: B	
Intersection Capacity Utilization 39.0%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 6: S Main Street & W Catawba Ave



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	149	17	8	10	8	4	4	371	13	4	604	100
Future Volume (vph)	149	17	8	10	8	4	4	371	13	4	604	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			-9%			-6%			3%	
Storage Length (ft)	0		0	0		0	50		0	0		0
Storage Lanes	0		0	0		0	1		0	0		1
Taper Length (ft)	25			25			100			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Frt		0.994			0.977			0.995				0.850
Flt Protected		0.959			0.978							
Satd. Flow (prot)	0	1746	0	0	1721	0	0	3450	0	0	1778	1501
Flt Permitted		0.740			0.828			0.950			0.998	
Satd. Flow (perm)	0	1347	0	0	1457	0	0	3278	0	0	1774	1501
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		1119			911			2587			665	
Travel Time (s)		30.5			24.8			50.4			13.0	
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
Heavy Vehicles (%)	4%	2%	25%	20%	2%	2%	50%	7%	2%	50%	5%	6%
Adj. Flow (vph)	166	19	9	11	9	4	4	412	14	4	671	111
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	194	0	0	24	0	0	430	0	0	675	111
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	24.7	24.7		23.3	23.3		18.6	18.6		19.1	19.1	19.1
Total Split (s)	25.0	25.0		25.0	25.0		35.0	35.0		35.0	35.0	35.0
Total Split (%)	41.7%	41.7%		41.7%	41.7%		58.3%	58.3%		58.3%	58.3%	58.3%
Maximum Green (s)	19.3	19.3		18.7	18.7		29.4	29.4		29.9	29.9	29.9
Yellow Time (s)	4.0	4.0		4.6	4.6		4.3	4.3		3.7	3.7	3.7
All-Red Time (s)	1.7	1.7		1.7	1.7		1.3	1.3		1.4	1.4	1.4
Lost Time Adjust (s)		-0.7			-1.3			-0.6			-0.1	-0.1
Total Lost Time (s)		5.0			5.0			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		Min	Min		Min	Min	Min
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	12.0	12.0		10.0	10.0		6.0	6.0		7.0	7.0	7.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)		12.3			12.5			26.2			26.2	26.2
Actuated g/C Ratio		0.28			0.28			0.59			0.59	0.59
v/c Ratio		0.52			0.06			0.22			0.64	0.12
Control Delay		20.2			13.8			7.0			13.3	7.4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay		0.0			0.0			0.0			0.0	0.0
Total Delay		20.2			13.8			7.0			13.3	7.4
LOS		C			B			A			B	A
Approach Delay		20.2			13.8			7.0			12.5	
Approach LOS		C			B			A			B	
Queue Length 50th (ft)		38			4			28			119	13
Queue Length 95th (ft)		105			20			66			#310	42
Internal Link Dist (ft)		1039			831			2507			585	
Turn Bay Length (ft)												
Base Capacity (vph)		648			701			2368			1281	1084
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		0.30			0.03			0.18			0.53	0.10

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 44.1			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.64			
Intersection Signal Delay: 11.9		Intersection LOS: B	
Intersection Capacity Utilization 59.6%		ICU Level of Service B	
Analysis Period (min) 15			

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

Splits and Phases: 7: Highland Street (NC 273) & W Catawba Ave

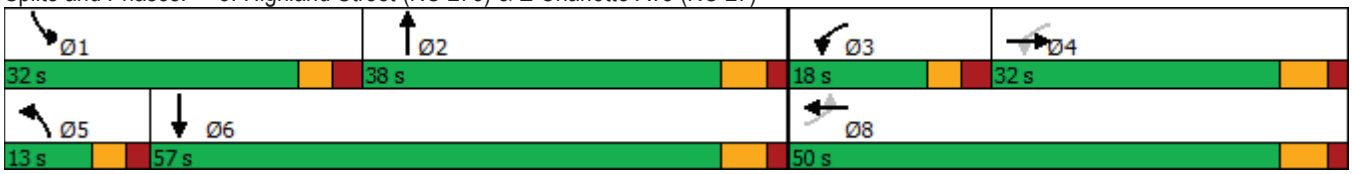
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	633	12	210	207	135	27	215	323	307	466	22
Future Volume (vph)	6	633	12	210	207	135	27	215	323	307	466	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			-3%			-4%			0%	
Storage Length (ft)	175		150	150		0	85		0	375		700
Storage Lanes	1		1	1		0	1		0	1		1
Taper Length (ft)	200			150			30			125		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.997			0.941			0.910			0.993	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1233	3451	0	1745	2984	0	1705	3179	0	1687	3411	0
Flt Permitted	0.484			0.160			0.950			0.950		
Satd. Flow (perm)	628	3451	0	294	2984	0	1705	3179	0	1687	3411	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		478			1420			665			742	
Travel Time (s)		9.3			27.7			13.0			14.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	50%	7%	2%	5%	12%	21%	8%	6%	5%	7%	3%	50%
Adj. Flow (vph)	7	703	13	233	230	150	30	239	359	341	518	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	716	0	233	380	0	30	598	0	341	542	0
Turn Type	D.Pm	NA		D.P+P	NA		Prot	NA		Prot	NA	
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	8			4								
Detector Phase	8	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	10.0		7.0	10.0	
Minimum Split (s)	31.2	13.2		12.6	31.2		12.1	35.1		12.8	16.1	
Total Split (s)	50.0	32.0		18.0	50.0		13.0	38.0		32.0	57.0	
Total Split (%)	41.7%	26.7%		15.0%	41.7%		10.8%	31.7%		26.7%	47.5%	
Maximum Green (s)	43.8	25.8		12.4	43.8		7.9	31.9		26.2	50.9	
Yellow Time (s)	4.2	4.2		3.0	4.2		3.0	4.1		3.0	4.1	
All-Red Time (s)	2.0	2.0		2.6	2.0		2.1	2.0		2.8	2.0	
Lost Time Adjust (s)	-1.2	-1.2		-0.6	-1.2		-0.1	-1.1		-0.8	-1.1	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag		Lag		Lead			Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	1.0		1.0	1.0		2.0	3.0		1.0	3.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)	7.0				7.0			7.0				
Flash Dont Walk (s)	18.0				18.0			22.0				
Pedestrian Calls (#/hr)	0				0			0				
Act Effct Green (s)	43.4	25.6		38.4	43.4		7.4	25.6		24.8	48.4	
Actuated g/C Ratio	0.40	0.23		0.35	0.40		0.07	0.23		0.23	0.44	
v/c Ratio	0.03	0.89		0.85	0.32		0.26	0.98dr		0.89	0.36	
Control Delay	23.5	55.2		54.8	24.7		57.8	48.7		67.7	21.9	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	23.5	55.2		54.8	24.7		57.8	48.7		67.7	21.9	
LOS	C	E		D	C		E	D		E	C	
Approach Delay		54.9			36.1			49.2			39.6	
Approach LOS		D			D			D			D	
Queue Length 50th (ft)	3	264		116	98		21	217		238	143	
Queue Length 95th (ft)	14	#401		#280	151		55	283		#429	191	
Internal Link Dist (ft)		398			1340			585			662	
Turn Bay Length (ft)	175			150			85			375		
Base Capacity (vph)	262	865		279	1246		126	974		422	1655	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.03	0.83		0.84	0.30		0.24	0.61		0.81	0.33	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 109
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 44.8 Intersection LOS: D
Intersection Capacity Utilization 79.5% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 8: Highland Street (NC 273) & E Charlotte Ave (NC 27)

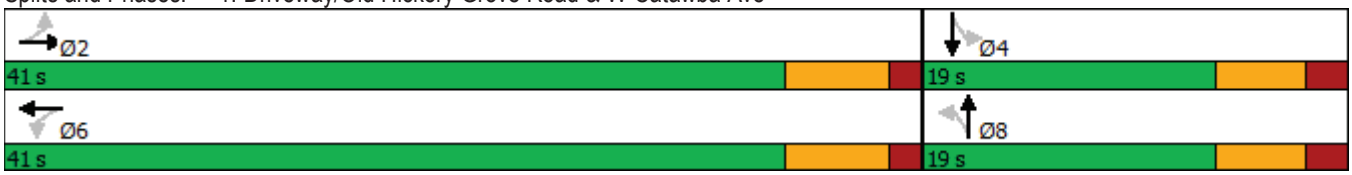


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	216	4	4	295	284	6	4	9	135	4	30
Future Volume (vph)	55	216	4	4	295	284	6	4	9	135	4	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			-1%			0%			-2%	
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		0.998			0.934			0.936			0.976	
Flt Protected		0.990						0.984			0.961	
Satd. Flow (prot)	0	1850	0	0	1749	0	0	1716	0	0	1765	0
Flt Permitted		0.818			0.998			0.881			0.754	
Satd. Flow (perm)	0	1528	0	0	1745	0	0	1536	0	0	1385	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			25			35	
Link Distance (ft)		1549			1034			1067			1674	
Travel Time (s)		30.2			20.1			29.1			32.6	
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)	61	240	4	4	328	316	7	4	10	150	4	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	305	0	0	648	0	0	21	0	0	187	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	18.2	18.2		18.2	18.2		13.0	13.0		13.0	13.0	
Total Split (s)	41.0	41.0		41.0	41.0		19.0	19.0		19.0	19.0	
Total Split (%)	68.3%	68.3%		68.3%	68.3%		31.7%	31.7%		31.7%	31.7%	
Maximum Green (s)	34.8	34.8		34.8	34.8		13.0	13.0		13.0	13.0	
Yellow Time (s)	4.7	4.7		4.7	4.7		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.5	1.5		1.5	1.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.2			-1.2			-1.0			-1.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		1.0	1.0		1.0	1.0	
Recall Mode	Min	Min		Min	Min		None	None		None	None	
Act Effct Green (s)		27.6			27.6			9.3			10.7	
Actuated g/C Ratio		0.63			0.63			0.21			0.24	
v/c Ratio		0.32			0.59			0.06			0.56	
Control Delay		7.0			10.1			18.1			24.0	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		7.0			10.1			18.1			24.0	
LOS		A			B			B			C	
Approach Delay		7.0			10.1			18.1			24.0	
Approach LOS		A			B			B			C	
Queue Length 50th (ft)		37			101			4			38	
Queue Length 95th (ft)		86			220			21			#119	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1469			954			987			1594	
Turn Bay Length (ft)												
Base Capacity (vph)		1276			1457			514			464	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.24			0.44			0.04			0.40	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 44			
Natural Cycle: 55			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.59			
Intersection Signal Delay: 11.7		Intersection LOS: B	
Intersection Capacity Utilization 76.5%		ICU Level of Service D	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 1: Driveway/Old Hickory Grove Road & W Catawba Ave



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	353	4	4	532	4	4
Future Volume (vph)	353	4	4	532	4	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.999				0.932	
Flt Protected					0.976	
Satd. Flow (prot)	1861	0	0	1863	1694	0
Flt Permitted					0.976	
Satd. Flow (perm)	1861	0	0	1863	1694	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	1034			1509	1194	
Travel Time (s)	20.1			29.4	32.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	392	4	4	591	4	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	396	0	0	595	8	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 41.2%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	353	4	4	532	4	4
Future Vol, veh/h	353	4	4	532	4	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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	392	4	4	591	4	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	396	0	993	394
Stage 1	-	-	-	-	394	-
Stage 2	-	-	-	-	599	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1163	-	272	655
Stage 1	-	-	-	-	681	-
Stage 2	-	-	-	-	549	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1163	-	271	655
Mov Cap-2 Maneuver	-	-	-	-	271	-
Stage 1	-	-	-	-	681	-
Stage 2	-	-	-	-	546	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	14.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	383	-	-	1163	-
HCM Lane V/C Ratio	0.023	-	-	0.004	-
HCM Control Delay (s)	14.6	-	-	8.1	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	235	119	15	392	143	8
Future Volume (vph)	235	119	15	392	143	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.955				0.993	
Flt Protected				0.998	0.955	
Satd. Flow (prot)	1779	0	0	1859	1766	0
Flt Permitted				0.998	0.955	
Satd. Flow (perm)	1779	0	0	1859	1766	0
Link Speed (mph)	35			35	35	
Link Distance (ft)	1509			2206	3149	
Travel Time (s)	29.4			43.0	61.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	261	132	17	436	159	9
Shared Lane Traffic (%)						
Lane Group Flow (vph)	393	0	0	453	168	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 47.9%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	235	119	15	392	143	8
Future Vol, veh/h	235	119	15	392	143	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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	261	132	17	436	159	9

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	393	0	797	327
Stage 1	-	-	-	-	327	-
Stage 2	-	-	-	-	470	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1166	-	356	714
Stage 1	-	-	-	-	731	-
Stage 2	-	-	-	-	629	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1166	-	349	714
Mov Cap-2 Maneuver	-	-	-	-	349	-
Stage 1	-	-	-	-	731	-
Stage 2	-	-	-	-	617	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	23.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	359	-	-	1166	-
HCM Lane V/C Ratio	0.467	-	-	0.014	-
HCM Control Delay (s)	23.5	-	-	8.1	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	2.4	-	-	0	-

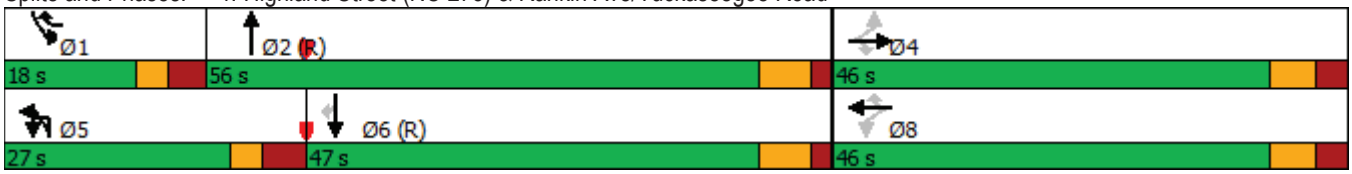
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	51	111	255	41	80	57	28	285	598	60	74	720
Future Volume (vph)	51	111	255	41	80	57	28	285	598	60	74	720
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			-4%				4%			-1%
Storage Length (ft)	150		75	100		150		500		0	0	
Storage Lanes	1		2	1		1		2		0	1	
Taper Length (ft)	125			100				275			100	
Lane Util. Factor	1.00	1.00	0.88	1.00	1.00	1.00	0.95	0.97	0.95	0.95	1.00	0.95
Frt			0.850			0.850			0.986			
Flt Protected	0.950			0.950				0.950			0.950	
Satd. Flow (prot)	1770	1863	2787	1805	1900	1569	0	3364	3417	0	1778	3522
Flt Permitted	0.676			0.550				0.950			0.950	
Satd. Flow (perm)	1259	1863	2787	1045	1900	1569	0	3364	3417	0	1778	3522
Right Turn on Red			Yes			No				No		
Satd. Flow (RTOR)			283									
Link Speed (mph)		35			35				35			35
Link Distance (ft)		250			1386				1719			1141
Travel Time (s)		4.9			27.0				33.5			22.2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	5%	2%	2%	2%	3%	2%	3%
Adj. Flow (vph)	57	123	283	46	89	63	31	317	664	67	82	800
Shared Lane Traffic (%)												
Lane Group Flow (vph)	57	123	283	46	89	63	0	348	731	0	82	800
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	Prot	Prot	NA		Prot	NA
Protected Phases		4			8	1	5	5	2		1	6
Permitted Phases	4		4	8		8						
Detector Phase	4	4	4	8	8	1	5	5	2		1	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0		7.0	12.0
Minimum Split (s)	41.1	41.1	41.1	45.1	45.1	13.3	13.9	13.9	31.6		13.3	40.6
Total Split (s)	46.0	46.0	46.0	46.0	46.0	18.0	27.0	27.0	56.0		18.0	47.0
Total Split (%)	38.3%	38.3%	38.3%	38.3%	38.3%	15.0%	22.5%	22.5%	46.7%		15.0%	39.2%
Maximum Green (s)	38.9	38.9	38.9	38.9	38.9	11.7	20.1	20.1	49.4		11.7	40.4
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1	3.0	3.0	3.0	4.6		3.0	4.6
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.3	3.9	3.9	2.0		3.3	2.0
Lost Time Adjust (s)	-2.1	-2.1	-2.1	-2.1	-2.1	-1.3		-1.9	-1.6		-1.3	-1.6
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0
Lead/Lag						Lead	Lead	Lead	Lag		Lead	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	6.0		2.0	6.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0		2.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0		0.0	15.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.0		0.0	30.0
Recall Mode	None	None	None	None	None	None	None	None	C-Max		None	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0				7.0			7.0
Flash Dont Walk (s)	27.0	27.0	27.0	31.0	31.0				18.0			27.0
Pedestrian Calls (#/hr)	0	0	0	0	0				0			0
Act Effct Green (s)	14.5	14.5	14.5	14.5	14.5	31.0		18.6	79.0		11.5	71.9

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	45
Future Volume (vph)	45
Ideal Flow (vphpl)	1900
Grade (%)	
Storage Length (ft)	0
Storage Lanes	1
Taper Length (ft)	
Lane Util. Factor	1.00
Frt	0.850
Flt Protected	
Satd. Flow (prot)	1591
Flt Permitted	
Satd. Flow (perm)	1591
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	2%
Adj. Flow (vph)	50
Shared Lane Traffic (%)	
Lane Group Flow (vph)	50
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Detector Phase	6
Switch Phase	
Minimum Initial (s)	12.0
Minimum Split (s)	40.6
Total Split (s)	47.0
Total Split (%)	39.2%
Maximum Green (s)	40.4
Yellow Time (s)	4.6
All-Red Time (s)	2.0
Lost Time Adjust (s)	-1.6
Total Lost Time (s)	5.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	6.0
Minimum Gap (s)	3.0
Time Before Reduce (s)	15.0
Time To Reduce (s)	30.0
Recall Mode	C-Max
Walk Time (s)	7.0
Flash Dont Walk (s)	27.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	71.9

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Actuated g/C Ratio	0.12	0.12	0.12	0.12	0.12	0.26		0.16	0.66		0.10	0.60
v/c Ratio	0.38	0.55	0.48	0.37	0.39	0.16		0.67	0.32		0.49	0.38
Control Delay	54.4	58.1	8.1	55.4	52.5	33.0		54.1	10.2		60.5	14.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	54.4	58.1	8.1	55.4	52.5	33.0		54.1	10.2		60.5	14.1
LOS	D	E	A	E	D	C		D	B		E	B
Approach Delay		27.1			47.0				24.3			18.1
Approach LOS		C			D				C			B
Queue Length 50th (ft)	41	91	0	33	65	38		132	117		61	158
Queue Length 95th (ft)	81	148	42	69	112	68		175	190		111	245
Internal Link Dist (ft)		170			1306				1639			1061
Turn Bay Length (ft)	150		75	100		150		500				
Base Capacity (vph)	430	636	1138	357	649	431		622	2250		199	2110
Starvation Cap Reductn	0	0	0	0	0	0		0	0		0	0
Spillback Cap Reductn	0	0	0	0	0	0		0	0		0	0
Storage Cap Reductn	0	0	0	0	0	0		0	0		0	0
Reduced v/c Ratio	0.13	0.19	0.25	0.13	0.14	0.15		0.56	0.32		0.41	0.38

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.67			
Intersection Signal Delay: 24.3		Intersection LOS: C	
Intersection Capacity Utilization 60.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 4: Highland Street (NC 273) & Rankin Ave/Tuckaseegee Road



Lane Group	SBR
Actuated g/C Ratio	0.60
v/c Ratio	0.05
Control Delay	12.3
Queue Delay	0.0
Total Delay	12.3
LOS	B
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	15
Queue Length 95th (ft)	40
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	953
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.05

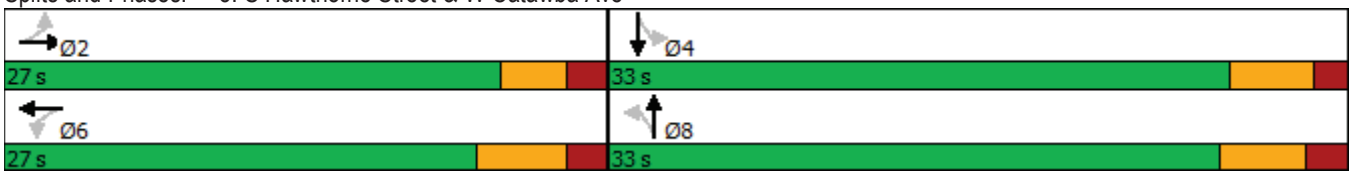
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	132	6	8	263	33	7	261	12	18	286	144
Future Volume (vph)	93	132	6	8	263	33	7	261	12	18	286	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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		0.996			0.985			0.994			0.957	
Flt Protected		0.980			0.999			0.999			0.998	
Satd. Flow (prot)	0	1811	0	0	1810	0	0	1800	0	0	1779	0
Flt Permitted		0.745			0.989			0.985			0.980	
Satd. Flow (perm)	0	1377	0	0	1792	0	0	1775	0	0	1747	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			25			20			20	
Link Distance (ft)		2206			684			1329			1297	
Travel Time (s)		43.0			18.7			45.3			44.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	2%	2%	2%	3%	6%	2%	5%	2%	2%	2%	2%
Adj. Flow (vph)	103	147	7	9	292	37	8	290	13	20	318	160
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	257	0	0	338	0	0	311	0	0	498	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0		10.0	10.0		7.0	7.0	
Minimum Split (s)	16.9	16.9		17.9	17.9		15.8	15.8		12.4	12.4	
Total Split (s)	27.0	27.0		27.0	27.0		33.0	33.0		33.0	33.0	
Total Split (%)	45.0%	45.0%		45.0%	45.0%		55.0%	55.0%		55.0%	55.0%	
Maximum Green (s)	22.1	22.1		21.1	21.1		27.2	27.2		27.6	27.6	
Yellow Time (s)	3.0	3.0		4.0	4.0		3.8	3.8		3.8	3.8	
All-Red Time (s)	1.9	1.9		1.9	1.9		2.0	2.0		1.6	1.6	
Lost Time Adjust (s)		0.1			-0.9			-0.8			-0.4	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Recall Mode	Min	Min		Min	Min		None	None		None	None	
Act Effct Green (s)		17.5			17.5			21.2			21.2	
Actuated g/C Ratio		0.36			0.36			0.43			0.43	
v/c Ratio		0.53			0.53			0.41			0.66	
Control Delay		18.4			17.3			11.7			16.3	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		18.4			17.3			11.7			16.3	
LOS		B			B			B			B	
Approach Delay		18.4			17.3			11.7			16.3	
Approach LOS		B			B			B			B	
Queue Length 50th (ft)		58			76			55			102	
Queue Length 95th (ft)		132			161			120			213	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		2126			604			1249			1217	
Turn Bay Length (ft)												
Base Capacity (vph)		642			836			1055			1038	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.40			0.40			0.29			0.48	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 49.1			
Natural Cycle: 45			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 15.9		Intersection LOS: B	
Intersection Capacity Utilization 74.0%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 5: S Hawthorne Street & W Catawba Ave

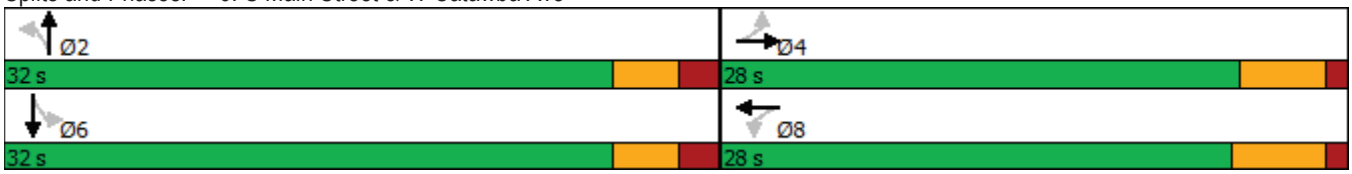


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	99	23	14	216	8	28	188	21	4	152	60
Future Volume (vph)	36	99	23	14	216	8	28	188	21	4	152	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			-5%			0%			0%	
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		0.980			0.995			0.988			0.962	
Flt Protected		0.989			0.997			0.994			0.999	
Satd. Flow (prot)	0	1789	0	0	1849	0	0	1825	0	0	1771	0
Flt Permitted		0.887			0.965			0.942			0.994	
Satd. Flow (perm)	0	1605	0	0	1790	0	0	1729	0	0	1762	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			20			20	
Link Distance (ft)		986			1119			1390			1157	
Travel Time (s)		26.9			30.5			47.4			39.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	3%	4%	7%	4%	13%	2%	2%	5%	25%	3%	2%
Adj. Flow (vph)	40	110	26	16	240	9	31	209	23	4	169	67
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	176	0	0	265	0	0	263	0	0	240	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	16.9	16.9		17.3	17.3		17.9	17.9		17.9	17.9	
Total Split (s)	28.0	28.0		28.0	28.0		32.0	32.0		32.0	32.0	
Total Split (%)	46.7%	46.7%		46.7%	46.7%		53.3%	53.3%		53.3%	53.3%	
Maximum Green (s)	23.1	23.1		22.7	22.7		27.1	27.1		27.1	27.1	
Yellow Time (s)	3.8	3.8		4.2	4.2		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.1	1.1		1.1	1.1		1.9	1.9		1.9	1.9	
Lost Time Adjust (s)		0.1			-0.3			0.1			0.1	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	5.0	5.0		5.0	5.0		6.0	6.0		6.0	6.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		9.3			9.4			14.0			14.0	
Actuated g/C Ratio		0.32			0.33			0.48			0.48	
v/c Ratio		0.34			0.45			0.31			0.28	
Control Delay		10.2			11.3			9.0			8.7	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		10.2			11.3			9.0			8.7	
LOS		B			B			A			A	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		10.2			11.3			9.0			8.7	
Approach LOS		B			B			A			A	
Queue Length 50th (ft)		19			30			27			25	
Queue Length 95th (ft)		55			78			77			70	
Internal Link Dist (ft)		906			1039			1310			1077	
Turn Bay Length (ft)												
Base Capacity (vph)		1286			1434			1566			1596	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.14			0.18			0.17			0.15	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 28.9			
Natural Cycle: 40			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.45			
Intersection Signal Delay: 9.8		Intersection LOS: A	
Intersection Capacity Utilization 55.2%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 6: S Main Street & W Catawba Ave



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	98	13	4	68	89	6	9	599	6	6	665	172
Future Volume (vph)	98	13	4	68	89	6	9	599	6	6	665	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			-9%			-6%			3%	
Storage Length (ft)	0		0	0		0	50		0	0		0
Storage Lanes	0		0	0		0	1		0	0		1
Taper Length (ft)	25			25			100			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Frt		0.996			0.995			0.998				0.850
Flt Protected		0.959			0.980			0.999				
Satd. Flow (prot)	0	1797	0	0	1898	0	0	3600	0	0	1797	1560
Flt Permitted		0.702			0.834			0.944			0.994	
Satd. Flow (perm)	0	1315	0	0	1615	0	0	3402	0	0	1787	1560
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		1119			911			2587			665	
Travel Time (s)		30.5			24.8			50.4			13.0	
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
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	3%	2%	17%	4%	2%
Adj. Flow (vph)	109	14	4	76	99	7	10	666	7	7	739	191
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	127	0	0	182	0	0	683	0	0	746	191
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	24.7	24.7		23.3	23.3		18.6	18.6		19.1	19.1	19.1
Total Split (s)	25.0	25.0		25.0	25.0		35.0	35.0		35.0	35.0	35.0
Total Split (%)	41.7%	41.7%		41.7%	41.7%		58.3%	58.3%		58.3%	58.3%	58.3%
Maximum Green (s)	19.3	19.3		18.7	18.7		29.4	29.4		29.9	29.9	29.9
Yellow Time (s)	4.0	4.0		4.6	4.6		4.3	4.3		3.7	3.7	3.7
All-Red Time (s)	1.7	1.7		1.7	1.7		1.3	1.3		1.4	1.4	1.4
Lost Time Adjust (s)		-0.7			-1.3			-0.6			-0.1	-0.1
Total Lost Time (s)		5.0			5.0			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		Min	Min		Min	Min	Min
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	12.0	12.0		10.0	10.0		6.0	6.0		7.0	7.0	7.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)		11.6			11.7			27.8			27.8	27.8
Actuated g/C Ratio		0.26			0.26			0.62			0.62	0.62
v/c Ratio		0.37			0.43			0.32			0.67	0.20
Control Delay		19.1			19.1			6.7			13.3	6.9

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay		0.0			0.0			0.0			0.0	0.0
Total Delay		19.1			19.1			6.7			13.3	6.9
LOS		B			B			A			B	A
Approach Delay		19.1			19.1			6.7			12.0	
Approach LOS		B			B			A			B	
Queue Length 50th (ft)		28			40			48			138	23
Queue Length 95th (ft)		72			95			95			#381	61
Internal Link Dist (ft)		1039			831			2507			585	
Turn Bay Length (ft)												
Base Capacity (vph)		619			760			2403			1262	1102
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		0.21			0.24			0.28			0.59	0.17

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 44.7
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.67
Intersection Signal Delay: 11.3 Intersection LOS: B
Intersection Capacity Utilization 60.0% ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: Highland Street (NC 273) & W Catawba Ave

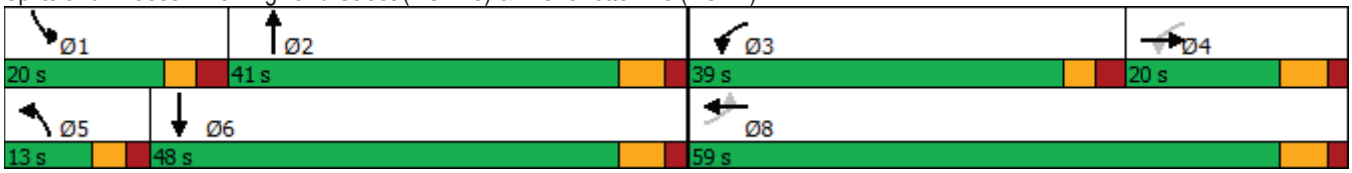
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	291	20	446	555	390	18	398	297	138	386	4
Future Volume (vph)	13	291	20	446	555	390	18	398	297	138	386	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			-3%			-4%			0%	
Storage Length (ft)	175		150	150		0	85		0	375		700
Storage Lanes	1		1	1		0	1		0	1		1
Taper Length (ft)	200			150			30			125		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.990			0.938			0.936			0.999	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1713	3495	0	1779	3281	0	1737	3332	0	1687	3468	0
Flt Permitted	0.146			0.317			0.950			0.950		
Satd. Flow (perm)	263	3495	0	594	3281	0	1737	3332	0	1687	3468	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		478			1420			665			742	
Travel Time (s)		9.3			27.7			13.0			14.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	8%	5%	2%	3%	6%	3%	6%	3%	4%	7%	4%	2%
Adj. Flow (vph)	14	323	22	496	617	433	20	442	330	153	429	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	14	345	0	496	1050	0	20	772	0	153	433	0
Turn Type	D.Pm	NA		D.P+P	NA		Prot	NA		Prot	NA	
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	8			4								
Detector Phase	8	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	10.0		7.0	10.0	
Minimum Split (s)	31.2	13.2		12.6	31.2		12.1	35.1		12.8	16.1	
Total Split (s)	59.0	20.0		39.0	59.0		13.0	41.0		20.0	48.0	
Total Split (%)	49.2%	16.7%		32.5%	49.2%		10.8%	34.2%		16.7%	40.0%	
Maximum Green (s)	52.8	13.8		33.4	52.8		7.9	34.9		14.2	41.9	
Yellow Time (s)	4.2	4.2		3.0	4.2		3.0	4.1		3.0	4.1	
All-Red Time (s)	2.0	2.0		2.6	2.0		2.1	2.0		2.8	2.0	
Lost Time Adjust (s)	-1.2	-1.2		-0.6	-1.2		-0.1	-1.1		-0.8	-1.1	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag		Lag		Lead			Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	1.0		1.0	1.0		2.0	3.0		1.0	3.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)	7.0				7.0			7.0				
Flash Dont Walk (s)	18.0				18.0			22.0				
Pedestrian Calls (#/hr)	0				0			0				
Act Effct Green (s)	47.4	13.8		42.2	47.4		7.5	29.5		12.9	43.1	
Actuated g/C Ratio	0.45	0.13		0.40	0.45		0.07	0.28		0.12	0.41	
v/c Ratio	0.12	0.75		0.89	0.71		0.16	0.83		0.74	0.30	
Control Delay	22.2	57.8		45.4	27.3		55.5	44.9		69.7	23.6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	22.2	57.8		45.4	27.3		55.5	44.9		69.7	23.6	
LOS	C	E		D	C		E	D		E	C	
Approach Delay		56.4			33.1			45.2			35.7	
Approach LOS		E			C			D			D	
Queue Length 50th (ft)	6	130		275	313		14	281		109	102	
Queue Length 95th (ft)	21	#205		#484	419		41	362		#214	172	
Internal Link Dist (ft)		398			1340			585			662	
Turn Bay Length (ft)	175			150			85			375		
Base Capacity (vph)	139	514		651	1740		136	1178		248	1522	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.10	0.67		0.76	0.60		0.15	0.66		0.62	0.28	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 105.2
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 39.0 Intersection LOS: D
Intersection Capacity Utilization 78.5% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 8: Highland Street (NC 273) & E Charlotte Ave (NC 27)



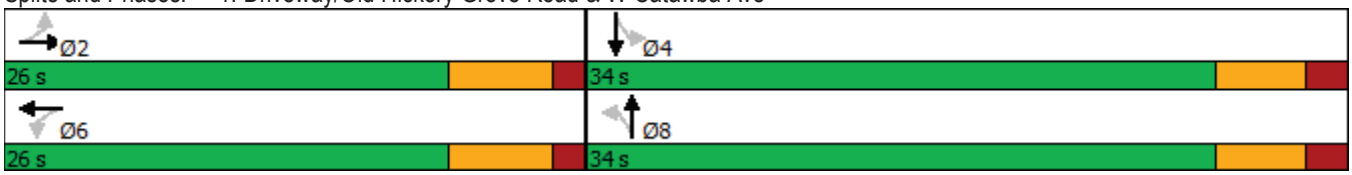
2028 Background Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	248	4	4	149	107	4	4	4	314	7	43
Future Volume (vph)	20	248	4	4	149	107	4	4	4	314	7	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			-1%			0%			-2%	
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		0.998			0.944			0.955			0.984	
Flt Protected		0.996			0.999			0.984			0.959	
Satd. Flow (prot)	0	1828	0	0	1736	0	0	1750	0	0	1760	0
Flt Permitted		0.959			0.994			0.875			0.747	
Satd. Flow (perm)	0	1760	0	0	1727	0	0	1557	0	0	1371	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			25			35	
Link Distance (ft)		1549			1034			1067			1674	
Travel Time (s)		30.2			20.1			29.1			32.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	4%	2%	2%	5%	2%	2%	2%	2%	3%	2%	2%
Adj. Flow (vph)	22	276	4	4	166	119	4	4	4	349	8	48
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	302	0	0	289	0	0	12	0	0	405	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	18.2	18.2		18.2	18.2		13.0	13.0		13.0	13.0	
Total Split (s)	26.0	26.0		26.0	26.0		34.0	34.0		34.0	34.0	
Total Split (%)	43.3%	43.3%		43.3%	43.3%		56.7%	56.7%		56.7%	56.7%	
Maximum Green (s)	19.8	19.8		19.8	19.8		28.0	28.0		28.0	28.0	
Yellow Time (s)	4.7	4.7		4.7	4.7		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.5	1.5		1.5	1.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.2			-1.2			-1.0			-1.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		1.0	1.0		1.0	1.0	
Recall Mode	Min	Min		Min	Min		None	None		None	None	
Act Effct Green (s)		14.9			14.9			11.3			16.8	
Actuated g/C Ratio		0.35			0.35			0.27			0.40	
v/c Ratio		0.48			0.47			0.03			0.74	
Control Delay		15.5			15.4			11.1			19.9	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		15.5			15.4			11.1			19.9	
LOS		B			B			B			B	
Approach Delay		15.5			15.4			11.1			19.9	
Approach LOS		B			B			B			B	
Queue Length 50th (ft)		50			48			2			69	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)		148			142			9			180	
Internal Link Dist (ft)		1469			954			987			1594	
Turn Bay Length (ft)												
Base Capacity (vph)		914			897			1117			984	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.33			0.32			0.01			0.41	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 42.2			
Natural Cycle: 45			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 17.2		Intersection LOS: B	
Intersection Capacity Utilization 60.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Driveway/Old Hickory Grove Road & W Catawba Ave



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	532	4	4	264	4	4
Future Volume (vph)	532	4	4	264	4	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.999				0.932	
Flt Protected				0.999	0.976	
Satd. Flow (prot)	1843	0	0	1826	1694	0
Flt Permitted				0.999	0.976	
Satd. Flow (perm)	1843	0	0	1826	1694	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	1034			1509	1194	
Travel Time (s)	20.1			29.4	32.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	2%	2%	4%	2%	2%
Adj. Flow (vph)	591	4	4	293	4	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	595	0	0	297	8	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 38.2%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	532	4	4	264	4	4
Future Vol, veh/h	532	4	4	264	4	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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, %	3	2	2	4	2	2
Mvmt Flow	591	4	4	293	4	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	595	0	894	593
Stage 1	-	-	-	-	593	-
Stage 2	-	-	-	-	301	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	981	-	312	506
Stage 1	-	-	-	-	552	-
Stage 2	-	-	-	-	751	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	981	-	310	506
Mov Cap-2 Maneuver	-	-	-	-	310	-
Stage 1	-	-	-	-	552	-
Stage 2	-	-	-	-	747	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	14.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	384	-	-	981	-
HCM Lane V/C Ratio	0.023	-	-	0.005	-
HCM Control Delay (s)	14.6	-	-	8.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	362	171	15	218	46	6
Future Volume (vph)	362	171	15	218	46	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.957				0.984	
Flt Protected				0.997	0.958	
Satd. Flow (prot)	1777	0	0	1824	1680	0
Flt Permitted				0.997	0.958	
Satd. Flow (perm)	1777	0	0	1824	1680	0
Link Speed (mph)	35			35	35	
Link Distance (ft)	1509			2206	3149	
Travel Time (s)	29.4			43.0	61.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	3%	2%	4%	2%	40%
Adj. Flow (vph)	402	190	17	242	51	7
Shared Lane Traffic (%)						
Lane Group Flow (vph)	592	0	0	259	58	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 39.5%		ICU Level of Service A	
Analysis Period (min) 15			

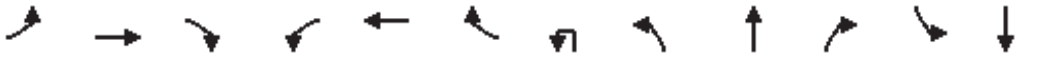
Intersection	
Int Delay, s/veh	1.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	362	171	15	218	46	6
Future Vol, veh/h	362	171	15	218	46	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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	3	2	4	2	40
Mvmt Flow	402	190	17	242	51	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	592	0	773	497
Stage 1	-	-	-	-	497	-
Stage 2	-	-	-	-	276	-
Critical Hdwy	-	-	4.12	-	6.42	6.6
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.66
Pot Cap-1 Maneuver	-	-	984	-	367	504
Stage 1	-	-	-	-	611	-
Stage 2	-	-	-	-	771	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	984	-	360	504
Mov Cap-2 Maneuver	-	-	-	-	360	-
Stage 1	-	-	-	-	611	-
Stage 2	-	-	-	-	756	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	16.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	372	-	-	984	-
HCM Lane V/C Ratio	0.155	-	-	0.017	-
HCM Control Delay (s)	16.4	-	-	8.7	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.5	-	-	0.1	-



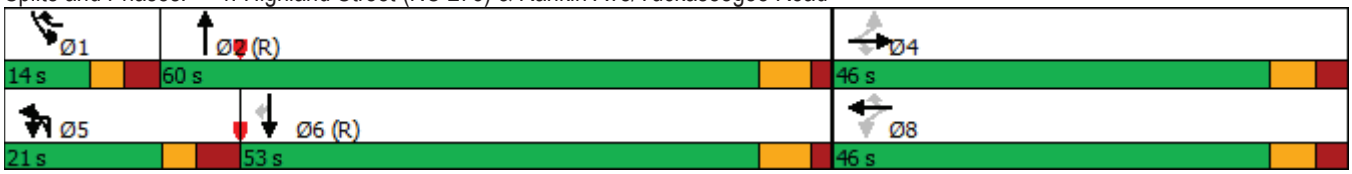
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	68	46	477	20	50	47	21	205	418	18	18	841
Future Volume (vph)	68	46	477	20	50	47	21	205	418	18	18	841
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			-4%				4%			-1%
Storage Length (ft)	150		75	100		150		500		0	0	
Storage Lanes	1		2	1		1		2		0	1	
Taper Length (ft)	125			100				275			100	
Lane Util. Factor	1.00	1.00	0.88	1.00	1.00	1.00	0.95	0.97	0.95	0.95	1.00	0.95
Frt			0.850			0.850			0.994			
Flt Protected	0.950			0.950				0.950			0.950	
Satd. Flow (prot)	1687	1863	2787	1737	1900	1615	0	3335	3264	0	1711	3489
Flt Permitted	0.720			0.724				0.950			0.950	
Satd. Flow (perm)	1279	1863	2787	1324	1900	1615	0	3335	3264	0	1711	3489
Right Turn on Red			Yes			No				No		
Satd. Flow (RTOR)			293									
Link Speed (mph)		35			35				35			35
Link Distance (ft)		250			1386				1719			1141
Travel Time (s)		4.9			27.0				33.5			22.2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	7%	2%	2%	6%	2%	2%	2%	3%	7%	25%	6%	4%
Adj. Flow (vph)	76	51	530	22	56	52	23	228	464	20	20	934
Shared Lane Traffic (%)												
Lane Group Flow (vph)	76	51	530	22	56	52	0	251	484	0	20	934
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	Prot	Prot	NA		Prot	NA
Protected Phases		4			8	1	5	5	2		1	6
Permitted Phases	4		4	8		8						
Detector Phase	4	4	4	8	8	1	5	5	2		1	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0		7.0	12.0
Minimum Split (s)	41.1	41.1	41.1	45.1	45.1	13.3	13.9	13.9	31.6		13.3	40.6
Total Split (s)	46.0	46.0	46.0	46.0	46.0	14.0	21.0	21.0	60.0		14.0	53.0
Total Split (%)	38.3%	38.3%	38.3%	38.3%	38.3%	11.7%	17.5%	17.5%	50.0%		11.7%	44.2%
Maximum Green (s)	38.9	38.9	38.9	38.9	38.9	7.7	14.1	14.1	53.4		7.7	46.4
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1	3.0	3.0	3.0	4.6		3.0	4.6
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.3	3.9	3.9	2.0		3.3	2.0
Lost Time Adjust (s)	-2.1	-2.1	-2.1	-2.1	-2.1	-1.3		-1.9	-1.6		-1.3	-1.6
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0
Lead/Lag						Lead	Lead	Lead	Lag		Lead	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	6.0		2.0	6.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0		2.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0		0.0	15.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.0		0.0	30.0
Recall Mode	None	None	None	None	None	None	None	None	C-Max		None	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0				7.0			7.0
Flash Dont Walk (s)	27.0	27.0	27.0	31.0	31.0				18.0			27.0
Pedestrian Calls (#/hr)	0	0	0	0	0				0			0
Act Effct Green (s)	18.2	18.2	18.2	18.2	18.2	31.7		15.2	81.0		8.5	71.6

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	15
Future Volume (vph)	15
Ideal Flow (vphpl)	1900
Grade (%)	
Storage Length (ft)	0
Storage Lanes	1
Taper Length (ft)	
Lane Util. Factor	1.00
Frt	0.850
Flt Protected	
Satd. Flow (prot)	1517
Flt Permitted	
Satd. Flow (perm)	1517
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	7%
Adj. Flow (vph)	17
Shared Lane Traffic (%)	
Lane Group Flow (vph)	17
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Detector Phase	6
Switch Phase	
Minimum Initial (s)	12.0
Minimum Split (s)	40.6
Total Split (s)	53.0
Total Split (%)	44.2%
Maximum Green (s)	46.4
Yellow Time (s)	4.6
All-Red Time (s)	2.0
Lost Time Adjust (s)	-1.6
Total Lost Time (s)	5.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	6.0
Minimum Gap (s)	3.0
Time Before Reduce (s)	15.0
Time To Reduce (s)	30.0
Recall Mode	C-Max
Walk Time (s)	7.0
Flash Dont Walk (s)	27.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	71.6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Actuated g/C Ratio	0.15	0.15	0.15	0.15	0.15	0.26		0.13	0.68		0.07	0.60
v/c Ratio	0.39	0.18	0.79	0.11	0.19	0.12		0.59	0.22		0.17	0.45
Control Delay	49.9	43.1	29.9	41.8	43.4	31.7		55.1	9.2		55.6	15.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	49.9	43.1	29.9	41.8	43.4	31.7		55.1	9.2		55.6	15.6
LOS	D	D	C	D	D	C		E	A		E	B
Approach Delay		33.3			38.4				24.8			16.4
Approach LOS		C			D				C			B
Queue Length 50th (ft)	54	35	102	15	38	31		95	73		15	196
Queue Length 95th (ft)	95	67	157	37	71	57		135	124		41	317
Internal Link Dist (ft)		170			1306				1639			1061
Turn Bay Length (ft)	150		75	100		150		500				
Base Capacity (vph)	436	636	1145	452	649	434		466	2202		129	2081
Starvation Cap Reductn	0	0	0	0	0	0		0	0		0	0
Spillback Cap Reductn	0	0	0	0	0	0		0	0		0	0
Storage Cap Reductn	0	0	0	0	0	0		0	0		0	0
Reduced v/c Ratio	0.17	0.08	0.46	0.05	0.09	0.12		0.54	0.22		0.16	0.45

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.79			
Intersection Signal Delay: 24.5		Intersection LOS: C	
Intersection Capacity Utilization 68.9%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 4: Highland Street (NC 273) & Rankin Ave/Tuckaseegee Road



Lane Group	SBR
Actuated g/C Ratio	0.60
v/c Ratio	0.02
Control Delay	13.3
Queue Delay	0.0
Total Delay	13.3
LOS	B
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	5
Queue Length 95th (ft)	19
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	904
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.02

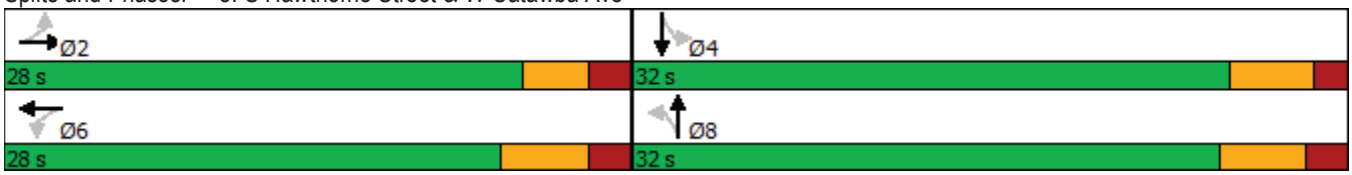
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	152	177	4	23	161	76	4	237	4	32	435	128
Future Volume (vph)	152	177	4	23	161	76	4	237	4	32	435	128
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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		0.999			0.961			0.998			0.971	
Flt Protected		0.978			0.996			0.999			0.997	
Satd. Flow (prot)	0	1804	0	0	1741	0	0	1857	0	0	1787	0
Flt Permitted		0.704			0.945			0.991			0.972	
Satd. Flow (perm)	0	1298	0	0	1652	0	0	1842	0	0	1742	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			25			20			20	
Link Distance (ft)		2206			684			1329			1297	
Travel Time (s)		43.0			18.7			45.3			44.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	2%	2%	2%	6%	2%	2%	2%	2%	7%	2%	5%
Adj. Flow (vph)	169	197	4	26	179	84	4	263	4	36	483	142
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	370	0	0	289	0	0	271	0	0	661	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0		10.0	10.0		7.0	7.0	
Minimum Split (s)	16.9	16.9		17.9	17.9		15.8	15.8		12.4	12.4	
Total Split (s)	28.0	28.0		28.0	28.0		32.0	32.0		32.0	32.0	
Total Split (%)	46.7%	46.7%		46.7%	46.7%		53.3%	53.3%		53.3%	53.3%	
Maximum Green (s)	23.1	23.1		22.1	22.1		26.2	26.2		26.6	26.6	
Yellow Time (s)	3.0	3.0		4.0	4.0		3.8	3.8		3.8	3.8	
All-Red Time (s)	1.9	1.9		1.9	1.9		2.0	2.0		1.6	1.6	
Lost Time Adjust (s)		0.1			-0.9			-0.8			-0.4	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Recall Mode	Min	Min		Min	Min		None	None		None	None	
Act Effct Green (s)		20.3			20.3			25.4			25.4	
Actuated g/C Ratio		0.36			0.36			0.45			0.45	
v/c Ratio		0.78			0.48			0.32			0.84	
Control Delay		30.4			17.2			11.7			26.3	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		30.4			17.2			11.7			26.3	
LOS		C			B			B			C	
Approach Delay		30.4			17.2			11.7			26.3	
Approach LOS		C			B			B			C	
Queue Length 50th (ft)		111			76			60			200	
Queue Length 95th (ft)		#238			135			106			#388	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		2126			604			1249			1217	
Turn Bay Length (ft)												
Base Capacity (vph)		543			692			905			856	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.68			0.42			0.30			0.77	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 55.9			
Natural Cycle: 55			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 23.1		Intersection LOS: C	
Intersection Capacity Utilization 93.9%		ICU Level of Service F	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 5: S Hawthorne Street & W Catawba Ave

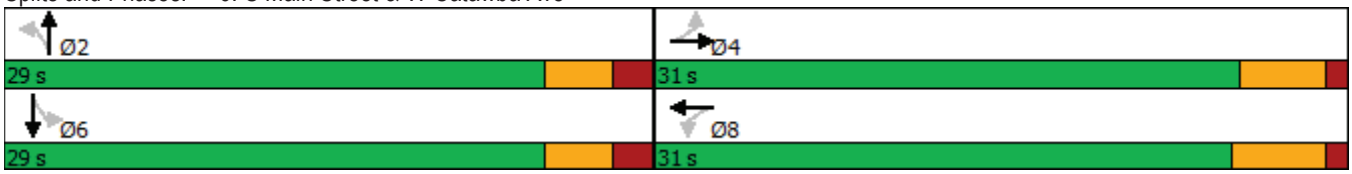


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	161	35	22	103	4	18	106	23	4	145	42
Future Volume (vph)	42	161	35	22	103	4	18	106	23	4	145	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			-5%			0%			0%	
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		0.980			0.996			0.979			0.970	
Flt Protected		0.991			0.992			0.994			0.999	
Satd. Flow (prot)	0	1760	0	0	1778	0	0	1790	0	0	1805	0
Flt Permitted		0.912			0.899			0.944			0.994	
Satd. Flow (perm)	0	1620	0	0	1611	0	0	1700	0	0	1796	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			20			20	
Link Distance (ft)		986			1119			1390			1157	
Travel Time (s)		26.9			30.5			47.4			39.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	6%	3%	15%	7%	2%	2%	2%	10%	2%	2%	2%
Adj. Flow (vph)	47	179	39	24	114	4	20	118	26	4	161	47
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	265	0	0	142	0	0	164	0	0	212	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	16.9	16.9		17.3	17.3		17.9	17.9		17.9	17.9	
Total Split (s)	31.0	31.0		31.0	31.0		29.0	29.0		29.0	29.0	
Total Split (%)	51.7%	51.7%		51.7%	51.7%		48.3%	48.3%		48.3%	48.3%	
Maximum Green (s)	26.1	26.1		25.7	25.7		24.1	24.1		24.1	24.1	
Yellow Time (s)	3.8	3.8		4.2	4.2		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.1	1.1		1.1	1.1		1.9	1.9		1.9	1.9	
Lost Time Adjust (s)		0.1			-0.3			0.1			0.1	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	5.0	5.0		5.0	5.0		6.0	6.0		6.0	6.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		9.3			9.3			10.9			10.9	
Actuated g/C Ratio		0.31			0.31			0.36			0.36	
v/c Ratio		0.53			0.29			0.27			0.33	
Control Delay		12.7			9.2			9.1			9.5	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		12.7			9.2			9.1			9.5	
LOS		B			A			A			A	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		12.7			9.2			9.1			9.5	
Approach LOS		B			A			A			A	
Queue Length 50th (ft)		31			15			16			21	
Queue Length 95th (ft)		71			39			50			62	
Internal Link Dist (ft)		906			1039			1310			1077	
Turn Bay Length (ft)												
Base Capacity (vph)		1398			1390			1354			1431	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.19			0.10			0.12			0.15	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 30.3			
Natural Cycle: 40			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.53			
Intersection Signal Delay: 10.5		Intersection LOS: B	
Intersection Capacity Utilization 42.8%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 6: S Main Street & W Catawba Ave



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	165	19	9	11	9	4	4	410	14	4	667	110
Future Volume (vph)	165	19	9	11	9	4	4	410	14	4	667	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			-9%			-6%			3%	
Storage Length (ft)	0		0	0		0	50		0	0		0
Storage Lanes	0		0	0		0	1		0	0		1
Taper Length (ft)	25			25			100			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Frt		0.994			0.979			0.995				0.850
Flt Protected		0.959			0.977							
Satd. Flow (prot)	0	1746	0	0	1722	0	0	3451	0	0	1778	1501
Flt Permitted		0.739			0.827			0.950			0.998	
Satd. Flow (perm)	0	1345	0	0	1457	0	0	3279	0	0	1775	1501
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		1119			911			2587			665	
Travel Time (s)		30.5			24.8			50.4			13.0	
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
Heavy Vehicles (%)	4%	2%	25%	20%	2%	2%	50%	7%	2%	50%	5%	6%
Adj. Flow (vph)	183	21	10	12	10	4	4	456	16	4	741	122
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	214	0	0	26	0	0	476	0	0	745	122
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	24.7	24.7		23.3	23.3		18.6	18.6		19.1	19.1	19.1
Total Split (s)	25.0	25.0		25.0	25.0		35.0	35.0		35.0	35.0	35.0
Total Split (%)	41.7%	41.7%		41.7%	41.7%		58.3%	58.3%		58.3%	58.3%	58.3%
Maximum Green (s)	19.3	19.3		18.7	18.7		29.4	29.4		29.9	29.9	29.9
Yellow Time (s)	4.0	4.0		4.6	4.6		4.3	4.3		3.7	3.7	3.7
All-Red Time (s)	1.7	1.7		1.7	1.7		1.3	1.3		1.4	1.4	1.4
Lost Time Adjust (s)		-0.7			-1.3			-0.6			-0.1	-0.1
Total Lost Time (s)		5.0			5.0			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		Min	Min		Min	Min	Min
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	12.0	12.0		10.0	10.0		6.0	6.0		7.0	7.0	7.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)		13.4			13.4			26.7			26.7	26.7
Actuated g/C Ratio		0.27			0.27			0.53			0.53	0.53
v/c Ratio		0.60			0.07			0.27			0.79	0.15
Control Delay		23.8			14.4			7.6			19.1	7.7

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay		0.0			0.0			0.0			0.0	0.0
Total Delay		23.8			14.4			7.6			19.1	7.7
LOS		C			B			A			B	A
Approach Delay		23.8			14.4			7.6			17.5	
Approach LOS		C			B			A			B	
Queue Length 50th (ft)		53			6			35			156	16
Queue Length 95th (ft)		116			21			75			#421	47
Internal Link Dist (ft)		1039			831			2507			585	
Turn Bay Length (ft)												
Base Capacity (vph)		546			592			2000			1082	915
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			0.04			0.24			0.69	0.13

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 50.3
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 15.3 Intersection LOS: B
Intersection Capacity Utilization 64.0% ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: Highland Street (NC 273) & W Catawba Ave

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	699	13	232	229	149	30	237	357	339	515	24
Future Volume (vph)	7	699	13	232	229	149	30	237	357	339	515	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			-3%			-4%			0%	
Storage Length (ft)	175		150	150		0	85		0	375		700
Storage Lanes	1		1	1		0	1		0	1		1
Taper Length (ft)	200			150			30			125		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.997			0.941			0.910			0.993	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1233	3451	0	1745	2984	0	1705	3179	0	1687	3410	0
Flt Permitted	0.454			0.950			0.950			0.950		
Satd. Flow (perm)	589	3451	0	1745	2984	0	1705	3179	0	1687	3410	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		478			1420			665			742	
Travel Time (s)		9.3			27.7			13.0			14.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	50%	7%	2%	5%	12%	21%	8%	6%	5%	7%	3%	50%
Adj. Flow (vph)	8	777	14	258	254	166	33	263	397	377	572	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	8	791	0	258	420	0	33	660	0	377	599	0
Turn Type	D.Pm	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	8											
Detector Phase	8	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	10.0		7.0	10.0	
Minimum Split (s)	31.2	13.2		12.6	31.2		12.1	35.1		12.8	16.1	
Total Split (s)	59.0	35.0		24.0	59.0		13.0	37.0		34.0	58.0	
Total Split (%)	45.4%	26.9%		18.5%	45.4%		10.0%	28.5%		26.2%	44.6%	
Maximum Green (s)	52.8	28.8		18.4	52.8		7.9	30.9		28.2	51.9	
Yellow Time (s)	4.2	4.2		3.0	4.2		3.0	4.1		3.0	4.1	
All-Red Time (s)	2.0	2.0		2.6	2.0		2.1	2.0		2.8	2.0	
Lost Time Adjust (s)	-1.2	-1.2		-0.6	-1.2		-0.1	-1.1		-0.8	-1.1	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag		Lag		Lead			Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	1.0		1.0	1.0		2.0	3.0		1.0	3.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)	7.0				7.0			7.0				
Flash Dont Walk (s)	18.0				18.0			22.0				
Pedestrian Calls (#/hr)	0				0			0				
Act Effct Green (s)	54.0	30.0		19.0	54.0		7.5	29.7		29.0	56.3	
Actuated g/C Ratio	0.42	0.23		0.15	0.42		0.06	0.23		0.23	0.44	
v/c Ratio	0.03	0.98		1.00	0.33		0.33	1.09dr		0.98	0.40	
Control Delay	23.3	75.2		109.1	26.1		68.0	63.0		92.1	26.2	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	23.3	75.2		109.1	26.1		68.0	63.0		92.1	26.2	
LOS	C	E		F	C		E	E		F	C	
Approach Delay		74.7			57.7			63.2			51.6	
Approach LOS		E			E			E			D	
Queue Length 50th (ft)	4	352		~224	125		27	280		~321	186	
Queue Length 95th (ft)	15	#491		#402	167		63	#362		#530	241	
Internal Link Dist (ft)		398			1340			585			662	
Turn Bay Length (ft)	175			150			85			375		
Base Capacity (vph)	248	810		259	1261		106	796		383	1501	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.03	0.98		1.00	0.33		0.31	0.83		0.98	0.40	

Intersection Summary

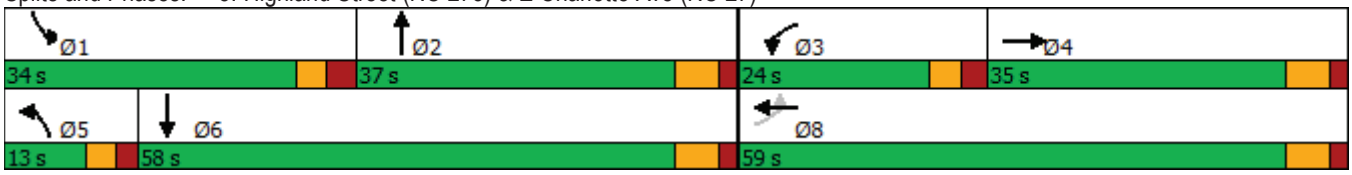
Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 127.8
Natural Cycle: 130
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.00
Intersection Signal Delay: 61.3 Intersection LOS: E
Intersection Capacity Utilization 86.1% ICU Level of Service E
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 8: Highland Street (NC 273) & E Charlotte Ave (NC 27)

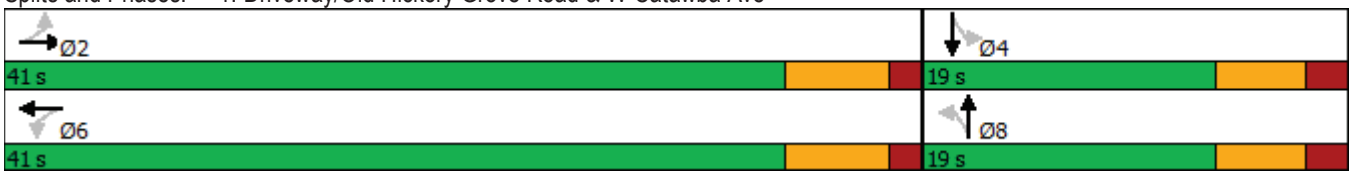


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	61	238	4	4	326	314	7	4	10	149	4	33
Future Volume (vph)	61	238	4	4	326	314	7	4	10	149	4	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			-1%			0%			-2%	
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		0.998			0.934			0.935			0.976	
Flt Protected		0.990						0.983			0.961	
Satd. Flow (prot)	0	1850	0	0	1749	0	0	1712	0	0	1765	0
Flt Permitted		0.794			0.998			0.860			0.753	
Satd. Flow (perm)	0	1483	0	0	1745	0	0	1498	0	0	1383	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			25			35	
Link Distance (ft)		1549			1034			1067			1674	
Travel Time (s)		30.2			20.1			29.1			32.6	
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)	68	264	4	4	362	349	8	4	11	166	4	37
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	336	0	0	715	0	0	23	0	0	207	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	18.2	18.2		18.2	18.2		13.0	13.0		13.0	13.0	
Total Split (s)	41.0	41.0		41.0	41.0		19.0	19.0		19.0	19.0	
Total Split (%)	68.3%	68.3%		68.3%	68.3%		31.7%	31.7%		31.7%	31.7%	
Maximum Green (s)	34.8	34.8		34.8	34.8		13.0	13.0		13.0	13.0	
Yellow Time (s)	4.7	4.7		4.7	4.7		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.5	1.5		1.5	1.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.2			-1.2			-1.0			-1.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		1.0	1.0		1.0	1.0	
Recall Mode	Min	Min		Min	Min		None	None		None	None	
Act Effct Green (s)		28.1			28.1			9.2			11.3	
Actuated g/C Ratio		0.57			0.57			0.19			0.23	
v/c Ratio		0.40			0.73			0.08			0.66	
Control Delay		8.0			13.4			19.7			30.2	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		8.0			13.4			19.7			30.2	
LOS		A			B			B			C	
Approach Delay		8.0			13.4			19.7			30.2	
Approach LOS		A			B			B			C	
Queue Length 50th (ft)		48			134			6			51	
Queue Length 95th (ft)		98			261			22			#148	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1469			954			987			1594	
Turn Bay Length (ft)												
Base Capacity (vph)		1103			1298			433			400	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.30			0.55			0.05			0.52	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 49.7			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.73			
Intersection Signal Delay: 14.8		Intersection LOS: B	
Intersection Capacity Utilization 82.4%		ICU Level of Service E	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 1: Driveway/Old Hickory Grove Road & W Catawba Ave



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	390	4	4	587	4	4
Future Volume (vph)	390	4	4	587	4	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.999				0.932	
Flt Protected					0.976	
Satd. Flow (prot)	1861	0	0	1863	1694	0
Flt Permitted					0.976	
Satd. Flow (perm)	1861	0	0	1863	1694	0
Link Speed (mph)	35			35	25	
Link Distance (ft)	1034			1509	1194	
Travel Time (s)	20.1			29.4	32.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	433	4	4	652	4	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	437	0	0	656	8	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 44.1%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	390	4	4	587	4	4
Future Vol, veh/h	390	4	4	587	4	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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	433	4	4	652	4	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	437	0	1095	435
Stage 1	-	-	-	-	435	-
Stage 2	-	-	-	-	660	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1123	-	236	621
Stage 1	-	-	-	-	653	-
Stage 2	-	-	-	-	514	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1123	-	235	621
Mov Cap-2 Maneuver	-	-	-	-	235	-
Stage 1	-	-	-	-	653	-
Stage 2	-	-	-	-	511	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	15.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	341	-	-	1123	-
HCM Lane V/C Ratio	0.026	-	-	0.004	-
HCM Control Delay (s)	15.8	-	-	8.2	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	259	131	17	433	158	9
Future Volume (vph)	259	131	17	433	158	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.955				0.993	
Flt Protected				0.998	0.955	
Satd. Flow (prot)	1779	0	0	1859	1766	0
Flt Permitted				0.998	0.955	
Satd. Flow (perm)	1779	0	0	1859	1766	0
Link Speed (mph)	35			35	35	
Link Distance (ft)	1509			2206	3149	
Travel Time (s)	29.4			43.0	61.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	288	146	19	481	176	10
Shared Lane Traffic (%)						
Lane Group Flow (vph)	434	0	0	500	186	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 52.5%		ICU Level of Service A	
Analysis Period (min) 15			

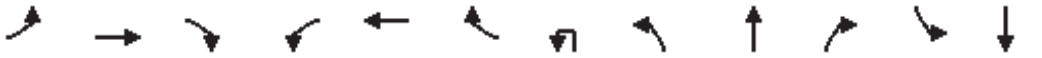
Intersection	
Int Delay, s/veh	5.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	259	131	17	433	158	9
Future Vol, veh/h	259	131	17	433	158	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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	288	146	19	481	176	10

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	434	0	880	361
Stage 1	-	-	-	-	361	-
Stage 2	-	-	-	-	519	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1126	-	318	684
Stage 1	-	-	-	-	705	-
Stage 2	-	-	-	-	597	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1126	-	311	684
Mov Cap-2 Maneuver	-	-	-	-	311	-
Stage 1	-	-	-	-	705	-
Stage 2	-	-	-	-	583	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	30.7
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	320	-	-	1126	-
HCM Lane V/C Ratio	0.58	-	-	0.017	-
HCM Control Delay (s)	30.7	-	-	8.3	0
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	3.4	-	-	0.1	-



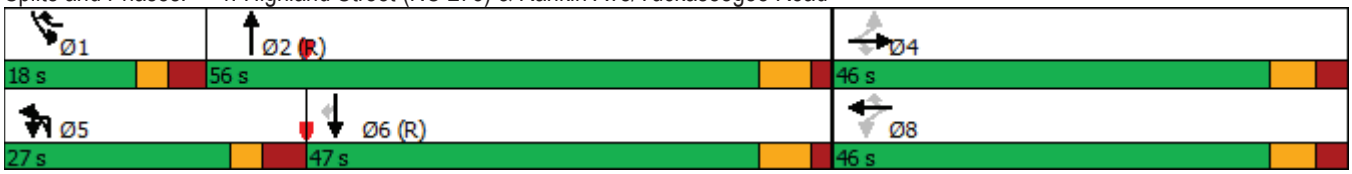
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	56	123	282	45	88	63	31	315	660	66	82	795
Future Volume (vph)	56	123	282	45	88	63	31	315	660	66	82	795
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			-4%				4%			-1%
Storage Length (ft)	150		75	100		150		500		0	0	
Storage Lanes	1		2	1		1		2		0	1	
Taper Length (ft)	125			100				275			100	
Lane Util. Factor	1.00	1.00	0.88	1.00	1.00	1.00	0.95	0.97	0.95	0.95	1.00	0.95
Frt			0.850			0.850			0.986			
Flt Protected	0.950			0.950				0.950			0.950	
Satd. Flow (prot)	1770	1863	2787	1805	1900	1569	0	3364	3417	0	1778	3522
Flt Permitted	0.648			0.512				0.950			0.950	
Satd. Flow (perm)	1207	1863	2787	973	1900	1569	0	3364	3417	0	1778	3522
Right Turn on Red			Yes			No				No		
Satd. Flow (RTOR)			313									
Link Speed (mph)		35			35				35			35
Link Distance (ft)		250			1386				1719			1141
Travel Time (s)		4.9			27.0				33.5			22.2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	5%	2%	2%	2%	3%	2%	3%
Adj. Flow (vph)	62	137	313	50	98	70	34	350	733	73	91	883
Shared Lane Traffic (%)												
Lane Group Flow (vph)	62	137	313	50	98	70	0	384	806	0	91	883
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	Prot	Prot	NA		Prot	NA
Protected Phases		4			8	1	5	5	2		1	6
Permitted Phases	4		4	8		8						
Detector Phase	4	4	4	8	8	1	5	5	2		1	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0		7.0	12.0
Minimum Split (s)	41.1	41.1	41.1	45.1	45.1	13.3	13.9	13.9	31.6		13.3	40.6
Total Split (s)	46.0	46.0	46.0	46.0	46.0	18.0	27.0	27.0	56.0		18.0	47.0
Total Split (%)	38.3%	38.3%	38.3%	38.3%	38.3%	15.0%	22.5%	22.5%	46.7%		15.0%	39.2%
Maximum Green (s)	38.9	38.9	38.9	38.9	38.9	11.7	20.1	20.1	49.4		11.7	40.4
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1	3.0	3.0	3.0	4.6		3.0	4.6
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.3	3.9	3.9	2.0		3.3	2.0
Lost Time Adjust (s)	-2.1	-2.1	-2.1	-2.1	-2.1	-1.3		-1.9	-1.6		-1.3	-1.6
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0
Lead/Lag						Lead	Lead	Lead	Lag		Lead	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	6.0		2.0	6.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0		2.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0		0.0	15.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.0		0.0	30.0
Recall Mode	None	None	None	None	None	None	None	None	C-Max		None	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0				7.0			7.0
Flash Dont Walk (s)	27.0	27.0	27.0	31.0	31.0				18.0			27.0
Pedestrian Calls (#/hr)	0	0	0	0	0				0			0
Act Effct Green (s)	15.4	15.4	15.4	15.4	15.4	32.4		19.8	77.6		12.0	69.7

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	50
Future Volume (vph)	50
Ideal Flow (vphpl)	1900
Grade (%)	
Storage Length (ft)	0
Storage Lanes	1
Taper Length (ft)	
Lane Util. Factor	1.00
Frt	0.850
Flt Protected	
Satd. Flow (prot)	1591
Flt Permitted	
Satd. Flow (perm)	1591
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	2%
Adj. Flow (vph)	56
Shared Lane Traffic (%)	
Lane Group Flow (vph)	56
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Detector Phase	6
Switch Phase	
Minimum Initial (s)	12.0
Minimum Split (s)	40.6
Total Split (s)	47.0
Total Split (%)	39.2%
Maximum Green (s)	40.4
Yellow Time (s)	4.6
All-Red Time (s)	2.0
Lost Time Adjust (s)	-1.6
Total Lost Time (s)	5.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	6.0
Minimum Gap (s)	3.0
Time Before Reduce (s)	15.0
Time To Reduce (s)	30.0
Recall Mode	C-Max
Walk Time (s)	7.0
Flash Dont Walk (s)	27.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	69.7

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13	0.27		0.16	0.65		0.10	0.58
v/c Ratio	0.40	0.57	0.50	0.40	0.40	0.17		0.69	0.36		0.51	0.43
Control Delay	54.5	58.1	7.7	56.3	51.9	32.1		53.7	11.3		60.9	16.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	54.5	58.1	7.7	56.3	51.9	32.1		53.7	11.3		60.9	16.0
LOS	D	E	A	E	D	C		D	B		E	B
Approach Delay		26.8			46.5				25.0			19.8
Approach LOS		C			D				C			B
Queue Length 50th (ft)	45	101	0	36	71	42		145	140		68	191
Queue Length 95th (ft)	86	160	43	75	119	72		190	223		119	291
Internal Link Dist (ft)		170			1306				1639			1061
Turn Bay Length (ft)	150		75	100		150		500				
Base Capacity (vph)	412	636	1158	332	649	446		631	2209		203	2046
Starvation Cap Reductn	0	0	0	0	0	0		0	0		0	0
Spillback Cap Reductn	0	0	0	0	0	0		0	0		0	0
Storage Cap Reductn	0	0	0	0	0	0		0	0		0	0
Reduced v/c Ratio	0.15	0.22	0.27	0.15	0.15	0.16		0.61	0.36		0.45	0.43

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 25.1		Intersection LOS: C	
Intersection Capacity Utilization 64.2%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 4: Highland Street (NC 273) & Rankin Ave/Tuckaseegee Road



Lane Group	SBR
Actuated g/C Ratio	0.58
v/c Ratio	0.06
Control Delay	13.4
Queue Delay	0.0
Total Delay	13.4
LOS	B
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	18
Queue Length 95th (ft)	45
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	924
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.06

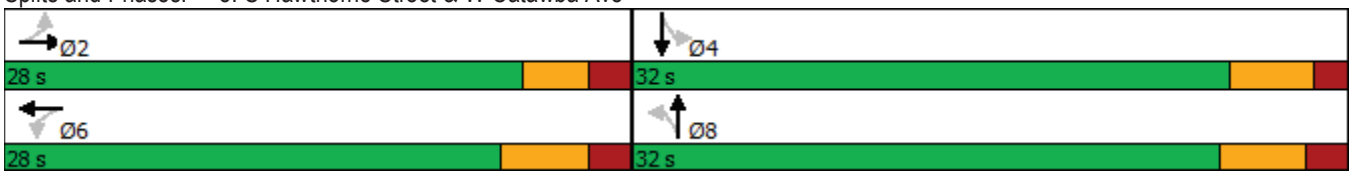
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	146	7	9	290	36	8	288	13	20	316	159
Future Volume (vph)	103	146	7	9	290	36	8	288	13	20	316	159
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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		0.996			0.985			0.994			0.957	
Flt Protected		0.980			0.999			0.999			0.998	
Satd. Flow (prot)	0	1811	0	0	1810	0	0	1800	0	0	1779	0
Flt Permitted		0.704			0.988			0.983			0.979	
Satd. Flow (perm)	0	1301	0	0	1790	0	0	1771	0	0	1745	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			25			20			20	
Link Distance (ft)		2206			684			1329			1297	
Travel Time (s)		43.0			18.7			45.3			44.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	2%	2%	2%	3%	6%	2%	5%	2%	2%	2%	2%
Adj. Flow (vph)	114	162	8	10	322	40	9	320	14	22	351	177
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	284	0	0	372	0	0	343	0	0	550	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0		10.0	10.0		7.0	7.0	
Minimum Split (s)	16.9	16.9		17.9	17.9		15.8	15.8		12.4	12.4	
Total Split (s)	28.0	28.0		28.0	28.0		32.0	32.0		32.0	32.0	
Total Split (%)	46.7%	46.7%		46.7%	46.7%		53.3%	53.3%		53.3%	53.3%	
Maximum Green (s)	23.1	23.1		22.1	22.1		26.2	26.2		26.6	26.6	
Yellow Time (s)	3.0	3.0		4.0	4.0		3.8	3.8		3.8	3.8	
All-Red Time (s)	1.9	1.9		1.9	1.9		2.0	2.0		1.6	1.6	
Lost Time Adjust (s)		0.1			-0.9			-0.8			-0.4	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Recall Mode	Min	Min		Min	Min		None	None		None	None	
Act Effct Green (s)		18.4			18.4			22.0			22.0	
Actuated g/C Ratio		0.36			0.36			0.43			0.43	
v/c Ratio		0.60			0.57			0.45			0.73	
Control Delay		20.5			18.0			12.8			19.1	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		20.5			18.0			12.8			19.1	
LOS		C			B			B			B	
Approach Delay		20.5			18.0			12.8			19.1	
Approach LOS		C			B			B			B	
Queue Length 50th (ft)		72			93			68			127	
Queue Length 95th (ft)		148			174			138			255	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		2126			604			1249			1217	
Turn Bay Length (ft)												
Base Capacity (vph)		610			840			976			961	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.47			0.44			0.35			0.57	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 50.8			
Natural Cycle: 50			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.73			
Intersection Signal Delay: 17.7		Intersection LOS: B	
Intersection Capacity Utilization 80.3%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 5: S Hawthorne Street & W Catawba Ave

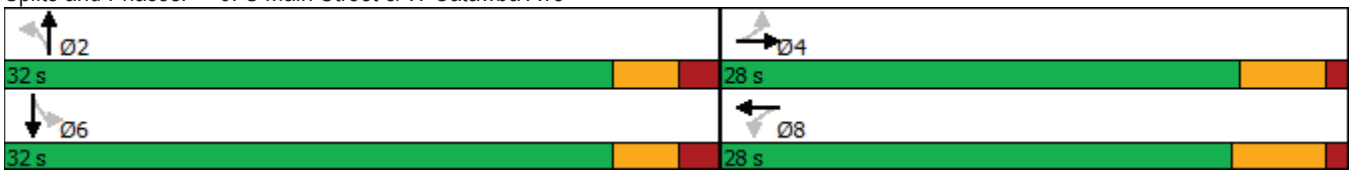


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	109	25	15	238	9	31	208	23	4	168	66
Future Volume (vph)	40	109	25	15	238	9	31	208	23	4	168	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			-5%			0%			0%	
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		0.980			0.995			0.988			0.963	
Flt Protected		0.989			0.997			0.994			0.999	
Satd. Flow (prot)	0	1789	0	0	1849	0	0	1825	0	0	1774	0
Flt Permitted		0.871			0.971			0.933			0.993	
Satd. Flow (perm)	0	1576	0	0	1801	0	0	1713	0	0	1763	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			20			20	
Link Distance (ft)		986			1119			1390			1157	
Travel Time (s)		26.9			30.5			47.4			39.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	3%	4%	7%	4%	13%	2%	2%	5%	25%	3%	2%
Adj. Flow (vph)	44	121	28	17	264	10	34	231	26	4	187	73
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	193	0	0	291	0	0	291	0	0	264	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	16.9	16.9		17.3	17.3		17.9	17.9		17.9	17.9	
Total Split (s)	28.0	28.0		28.0	28.0		32.0	32.0		32.0	32.0	
Total Split (%)	46.7%	46.7%		46.7%	46.7%		53.3%	53.3%		53.3%	53.3%	
Maximum Green (s)	23.1	23.1		22.7	22.7		27.1	27.1		27.1	27.1	
Yellow Time (s)	3.8	3.8		4.2	4.2		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.1	1.1		1.1	1.1		1.9	1.9		1.9	1.9	
Lost Time Adjust (s)		0.1			-0.3			0.1			0.1	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	5.0	5.0		5.0	5.0		6.0	6.0		6.0	6.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		10.0			10.0			11.3			11.3	
Actuated g/C Ratio		0.32			0.32			0.36			0.36	
v/c Ratio		0.39			0.51			0.48			0.42	
Control Delay		11.1			12.5			11.4			10.6	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		11.1			12.5			11.4			10.6	
LOS		B			B			B			B	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		11.1			12.5			11.4			10.6	
Approach LOS		B			B			B			B	
Queue Length 50th (ft)		21			34			33			29	
Queue Length 95th (ft)		65			93			93			83	
Internal Link Dist (ft)		906			1039			1310			1077	
Turn Bay Length (ft)												
Base Capacity (vph)		1176			1344			1500			1544	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.16			0.22			0.19			0.17	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 31.5			
Natural Cycle: 40			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.51			
Intersection Signal Delay: 11.5		Intersection LOS: B	
Intersection Capacity Utilization 61.0%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 6: S Main Street & W Catawba Ave

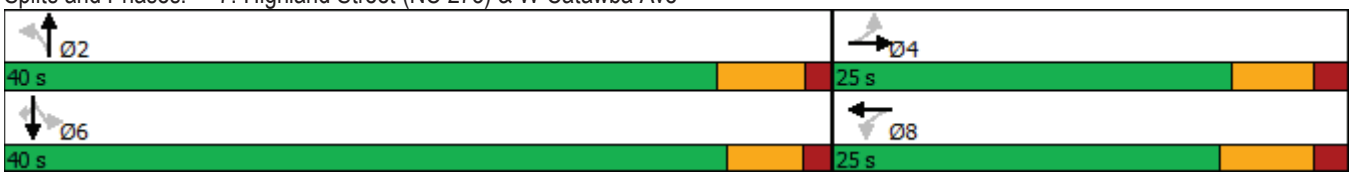


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	108	14	4	75	98	7	10	661	7	7	734	190
Future Volume (vph)	108	14	4	75	98	7	10	661	7	7	734	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			-9%			-6%			3%	
Storage Length (ft)	0		0	0		0	50		0	0		0
Storage Lanes	0		0	0		0	1		0	0		1
Taper Length (ft)	25			25			100			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Frt		0.996			0.995			0.998				0.850
Flt Protected		0.959			0.980			0.999				
Satd. Flow (prot)	0	1797	0	0	1898	0	0	3600	0	0	1797	1560
Flt Permitted		0.655			0.829			0.942			0.993	
Satd. Flow (perm)	0	1227	0	0	1606	0	0	3395	0	0	1785	1560
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		1119			911			2587			665	
Travel Time (s)		30.5			24.8			50.4			13.0	
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
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	3%	2%	17%	4%	2%
Adj. Flow (vph)	120	16	4	83	109	8	11	734	8	8	816	211
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	140	0	0	200	0	0	753	0	0	824	211
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	24.7	24.7		23.3	23.3		18.6	18.6		19.1	19.1	19.1
Total Split (s)	25.0	25.0		25.0	25.0		40.0	40.0		40.0	40.0	40.0
Total Split (%)	38.5%	38.5%		38.5%	38.5%		61.5%	61.5%		61.5%	61.5%	61.5%
Maximum Green (s)	19.3	19.3		18.7	18.7		34.4	34.4		34.9	34.9	34.9
Yellow Time (s)	4.0	4.0		4.6	4.6		4.3	4.3		3.7	3.7	3.7
All-Red Time (s)	1.7	1.7		1.7	1.7		1.3	1.3		1.4	1.4	1.4
Lost Time Adjust (s)		-0.7			-1.3			-0.6			-0.1	-0.1
Total Lost Time (s)		5.0			5.0			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		Min	Min		Min	Min	Min
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	12.0	12.0		10.0	10.0		6.0	6.0		7.0	7.0	7.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)		12.8			12.8			29.6			29.6	29.6
Actuated g/C Ratio		0.24			0.24			0.56			0.56	0.56
v/c Ratio		0.47			0.51			0.39			0.82	0.24
Control Delay		23.7			23.1			7.6			19.2	7.3

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay		0.0			0.0			0.0			0.0	0.0
Total Delay		23.7			23.1			7.6			19.2	7.3
LOS		C			C			A			B	A
Approach Delay		23.7			23.1			7.6			16.8	
Approach LOS		C			C			A			B	
Queue Length 50th (ft)		37			53			59			179	29
Queue Length 95th (ft)		88			116			115			#475	72
Internal Link Dist (ft)		1039			831			2507			585	
Turn Bay Length (ft)												
Base Capacity (vph)		478			626			2317			1218	1064
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		0.29			0.32			0.32			0.68	0.20

Intersection Summary			
Area Type:	Other		
Cycle Length: 65			
Actuated Cycle Length: 52.6			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 14.6		Intersection LOS: B	
Intersection Capacity Utilization 65.6%		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: 7: Highland Street (NC 273) & W Catawba Ave



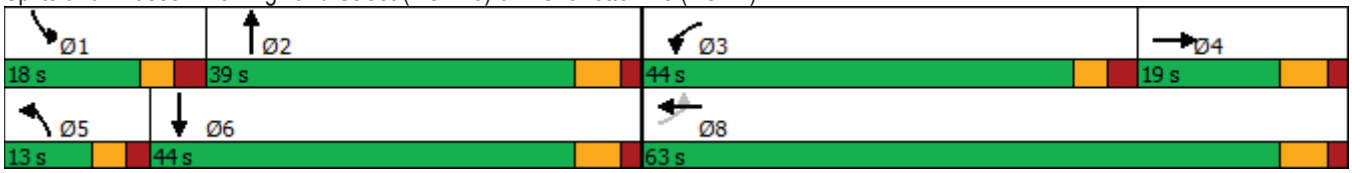
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	321	22	492	613	431	20	439	328	152	426	4
Future Volume (vph)	14	321	22	492	613	431	20	439	328	152	426	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			-3%			-4%			0%	
Storage Length (ft)	175		150	150		0	85		0	375		700
Storage Lanes	1		1	1		0	1		0	1		1
Taper Length (ft)	200			150			30			125		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.991			0.938			0.936			0.999	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1713	3499	0	1779	3281	0	1737	3332	0	1687	3468	0
Flt Permitted	0.127			0.950			0.950			0.950		
Satd. Flow (perm)	229	3499	0	1779	3281	0	1737	3332	0	1687	3468	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		478			1420			665			742	
Travel Time (s)		9.3			27.7			13.0			14.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	8%	5%	2%	3%	6%	3%	6%	3%	4%	7%	4%	2%
Adj. Flow (vph)	16	357	24	547	681	479	22	488	364	169	473	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	381	0	547	1160	0	22	852	0	169	477	0
Turn Type	D.Pm	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	8											
Detector Phase	8	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	10.0		7.0	10.0	
Minimum Split (s)	31.2	13.2		12.6	31.2		12.1	35.1		12.8	16.1	
Total Split (s)	63.0	19.0		44.0	63.0		13.0	39.0		18.0	44.0	
Total Split (%)	52.5%	15.8%		36.7%	52.5%		10.8%	32.5%		15.0%	36.7%	
Maximum Green (s)	56.8	12.8		38.4	56.8		7.9	32.9		12.2	37.9	
Yellow Time (s)	4.2	4.2		3.0	4.2		3.0	4.1		3.0	4.1	
All-Red Time (s)	2.0	2.0		2.6	2.0		2.1	2.0		2.8	2.0	
Lost Time Adjust (s)	-1.2	-1.2		-0.6	-1.2		-0.1	-1.1		-0.8	-1.1	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag		Lag		Lead			Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	1.0		1.0	1.0		2.0	3.0		1.0	3.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)	7.0				7.0			7.0				
Flash Dont Walk (s)	18.0				18.0			22.0				
Pedestrian Calls (#/hr)	0				0			0				
Act Effct Green (s)	56.5	14.0		37.4	56.5		7.3	32.4		12.9	43.1	
Actuated g/C Ratio	0.48	0.12		0.32	0.48		0.06	0.28		0.11	0.37	
v/c Ratio	0.15	0.91		0.96	0.73		0.20	0.92		0.91	0.37	
Control Delay	21.5	77.6		68.9	27.7		58.1	57.3		99.0	29.5	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	21.5	77.6		68.9	27.7		58.1	57.3		99.0	29.5	
LOS	C	E		E	C		E	E		F	C	
Approach Delay		75.4			40.9			57.3			47.7	
Approach LOS		E			D			E			D	
Queue Length 50th (ft)	7	156		412	367		17	334		132	150	
Queue Length 95th (ft)	23	#252		#633	452		44	#451		#267	201	
Internal Link Dist (ft)		398			1340			585			662	
Turn Bay Length (ft)	175			150			85			375		
Base Capacity (vph)	113	420		595	1632		119	972		188	1279	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.14	0.91		0.92	0.71		0.18	0.88		0.90	0.37	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 116.9
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 49.8 Intersection LOS: D
Intersection Capacity Utilization 84.6% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 8: Highland Street (NC 273) & E Charlotte Ave (NC 27)



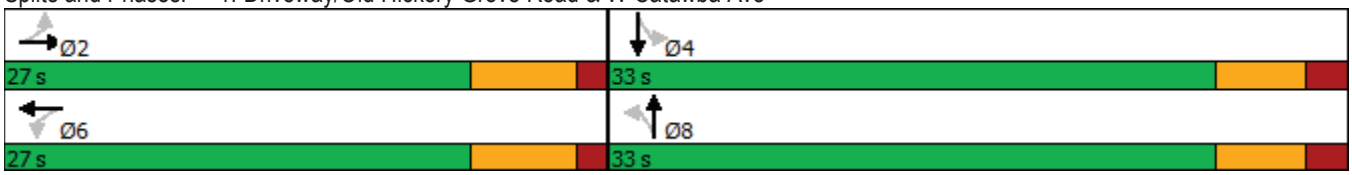
2028 Build-out Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	257	4	4	177	116	4	4	4	317	7	43
Future Volume (vph)	20	257	4	4	177	116	4	4	4	317	7	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			-1%			0%			-2%	
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		0.998			0.947			0.955			0.984	
Flt Protected		0.996			0.999			0.984			0.959	
Satd. Flow (prot)	0	1828	0	0	1741	0	0	1750	0	0	1760	0
Flt Permitted		0.958			0.995			0.876			0.747	
Satd. Flow (perm)	0	1758	0	0	1734	0	0	1558	0	0	1371	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			25			35	
Link Distance (ft)		1549			1034			1067			1674	
Travel Time (s)		30.2			20.1			29.1			32.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	4%	2%	2%	5%	2%	2%	2%	2%	3%	2%	2%
Adj. Flow (vph)	22	286	4	4	197	129	4	4	4	352	8	48
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	312	0	0	330	0	0	12	0	0	408	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	18.2	18.2		18.2	18.2		13.0	13.0		13.0	13.0	
Total Split (s)	27.0	27.0		27.0	27.0		33.0	33.0		33.0	33.0	
Total Split (%)	45.0%	45.0%		45.0%	45.0%		55.0%	55.0%		55.0%	55.0%	
Maximum Green (s)	20.8	20.8		20.8	20.8		27.0	27.0		27.0	27.0	
Yellow Time (s)	4.7	4.7		4.7	4.7		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.5	1.5		1.5	1.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.2			-1.2			-1.0			-1.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		1.0	1.0		1.0	1.0	
Recall Mode	Min	Min		Min	Min		None	None		None	None	
Act Effct Green (s)		15.7			15.7			11.3			17.0	
Actuated g/C Ratio		0.36			0.36			0.26			0.39	
v/c Ratio		0.49			0.52			0.03			0.76	
Control Delay		15.3			16.0			12.2			21.3	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		15.3			16.0			12.2			21.3	
LOS		B			B			B			C	
Approach Delay		15.3			16.0			12.2			21.3	
Approach LOS		B			B			B			C	
Queue Length 50th (ft)		53			57			2			70	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)		148			159			9			192	
Internal Link Dist (ft)		1469			954			987			1594	
Turn Bay Length (ft)												
Base Capacity (vph)		938			925			1058			931	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.33			0.36			0.01			0.44	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 43.2			
Natural Cycle: 45			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 17.8		Intersection LOS: B	
Intersection Capacity Utilization 61.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Driveway/Old Hickory Grove Road & W Catawba Ave



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	535	4	4	273	6	4	0	4	19	0	28
Future Volume (vph)	9	535	4	4	273	6	4	0	4	19	0	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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		0.999			0.997			0.932			0.920	
Flt Protected		0.999			0.999			0.976			0.980	
Satd. Flow (prot)	0	1841	0	0	1821	0	0	1694	0	0	1679	0
Flt Permitted		0.999			0.999			0.976			0.980	
Satd. Flow (perm)	0	1841	0	0	1821	0	0	1694	0	0	1679	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1034			1509			1194			1129	
Travel Time (s)		20.1			29.4			32.6			30.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	3%	2%	2%	4%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	10	594	4	4	303	7	4	0	4	21	0	31
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	608	0	0	314	0	0	8	0	0	52	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 43.5%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	9	535	4	4	273	6	4	0	4	19	0	28
Future Vol, veh/h	9	535	4	4	273	6	4	0	4	19	0	28
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
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	3	2	2	4	2	2	2	2	2	2	2
Mvmt Flow	10	594	4	4	303	7	4	0	4	21	0	31

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	310	0	0	598	0	0	946	934	596	933	933	307
Stage 1	-	-	-	-	-	-	616	616	-	315	315	-
Stage 2	-	-	-	-	-	-	330	318	-	618	618	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
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	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1250	-	-	979	-	-	241	266	504	246	266	733
Stage 1	-	-	-	-	-	-	478	482	-	696	656	-
Stage 2	-	-	-	-	-	-	683	654	-	477	481	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1250	-	-	979	-	-	228	261	504	241	261	733
Mov Cap-2 Maneuver	-	-	-	-	-	-	228	261	-	241	261	-
Stage 1	-	-	-	-	-	-	472	476	-	688	653	-
Stage 2	-	-	-	-	-	-	651	651	-	467	475	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.1	16.8	15.3
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	314	1250	-	-	979	-	-	402
HCM Lane V/C Ratio	0.028	0.008	-	-	0.005	-	-	0.13
HCM Control Delay (s)	16.8	7.9	0	-	8.7	0	-	15.3
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	381	171	15	224	18	46	25	6	55	74	9
Future Volume (vph)	3	381	171	15	224	18	46	25	6	55	74	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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		0.958			0.991			0.989			0.991	
Flt Protected					0.997			0.971			0.980	
Satd. Flow (prot)	0	1779	0	0	1810	0	0	1736	0	0	1809	0
Flt Permitted					0.997			0.971			0.980	
Satd. Flow (perm)	0	1779	0	0	1810	0	0	1736	0	0	1809	0
Link Speed (mph)		35			35			35			25	
Link Distance (ft)		1509			2206			3149			1170	
Travel Time (s)		29.4			43.0			61.3			31.9	
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
Heavy Vehicles (%)	2%	2%	3%	2%	4%	2%	2%	2%	40%	2%	2%	2%
Adj. Flow (vph)	3	423	190	17	249	20	51	28	7	61	82	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	616	0	0	286	0	0	86	0	0	153	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 46.1%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	6.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	3	381	171	15	224	18	46	25	6	55	74	9
Future Vol, veh/h	3	381	171	15	224	18	46	25	6	55	74	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
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	3	2	4	2	2	2	40	2	2	2
Mvmt Flow	3	423	190	17	249	20	51	28	7	61	82	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	269	0	0	613	0	0	863	827	518	835	912	259
Stage 1	-	-	-	-	-	-	524	524	-	293	293	-
Stage 2	-	-	-	-	-	-	339	303	-	542	619	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.6	7.12	6.52	6.22
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	2.218	-	-	2.218	-	-	3.518	4.018	3.66	3.518	4.018	3.318
Pot Cap-1 Maneuver	1295	-	-	966	-	-	275	307	489	287	274	780
Stage 1	-	-	-	-	-	-	537	530	-	715	670	-
Stage 2	-	-	-	-	-	-	676	664	-	525	480	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1295	-	-	966	-	-	203	299	489	258	267	780
Mov Cap-2 Maneuver	-	-	-	-	-	-	203	299	-	258	267	-
Stage 1	-	-	-	-	-	-	535	528	-	712	656	-
Stage 2	-	-	-	-	-	-	571	650	-	489	478	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.5	28.2	33.4
HCM LOS			D	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	239	1295	-	-	966	-	-	275
HCM Lane V/C Ratio	0.358	0.003	-	-	0.017	-	-	0.558
HCM Control Delay (s)	28.2	7.8	0	-	8.8	0	-	33.4
HCM Lane LOS	D	A	A	-	A	A	-	D
HCM 95th %tile Q(veh)	1.5	0	-	-	0.1	-	-	3.1

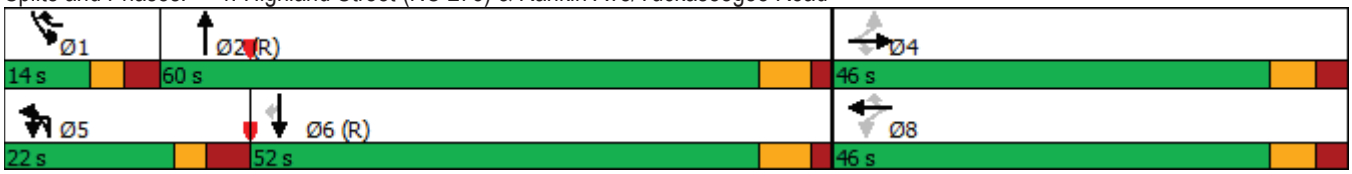
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	68	46	551	20	50	47	21	230	418	18	18	841
Future Volume (vph)	68	46	551	20	50	47	21	230	418	18	18	841
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			-4%				4%			-1%
Storage Length (ft)	150		75	100		150		500		0	0	
Storage Lanes	1		2	1		1		2		0	1	
Taper Length (ft)	125			100				275			100	
Lane Util. Factor	1.00	1.00	0.88	1.00	1.00	1.00	0.95	0.97	0.95	0.95	1.00	0.95
Frt			0.850			0.850			0.994			
Flt Protected	0.950			0.950				0.950			0.950	
Satd. Flow (prot)	1687	1863	2787	1737	1900	1615	0	3334	3264	0	1711	3489
Flt Permitted	0.720			0.724				0.950			0.950	
Satd. Flow (perm)	1279	1863	2787	1324	1900	1615	0	3334	3264	0	1711	3489
Right Turn on Red			Yes			No				No		
Satd. Flow (RTOR)			319									
Link Speed (mph)		35			35				35			35
Link Distance (ft)		250			1386				1719			1141
Travel Time (s)		4.9			27.0				33.5			22.2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	7%	2%	2%	6%	2%	2%	2%	3%	7%	25%	6%	4%
Adj. Flow (vph)	76	51	612	22	56	52	23	256	464	20	20	934
Shared Lane Traffic (%)												
Lane Group Flow (vph)	76	51	612	22	56	52	0	279	484	0	20	934
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	Prot	Prot	NA		Prot	NA
Protected Phases		4			8	1	5	5	2		1	6
Permitted Phases	4		4	8		8						
Detector Phase	4	4	4	8	8	1	5	5	2		1	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0		7.0	12.0
Minimum Split (s)	41.1	41.1	41.1	45.1	45.1	13.3	13.9	13.9	31.6		13.3	40.6
Total Split (s)	46.0	46.0	46.0	46.0	46.0	14.0	22.0	22.0	60.0		14.0	52.0
Total Split (%)	38.3%	38.3%	38.3%	38.3%	38.3%	11.7%	18.3%	18.3%	50.0%		11.7%	43.3%
Maximum Green (s)	38.9	38.9	38.9	38.9	38.9	7.7	15.1	15.1	53.4		7.7	45.4
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1	3.0	3.0	3.0	4.6		3.0	4.6
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.3	3.9	3.9	2.0		3.3	2.0
Lost Time Adjust (s)	-2.1	-2.1	-2.1	-2.1	-2.1	-1.3		-1.9	-1.6		-1.3	-1.6
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0
Lead/Lag						Lead	Lead	Lead	Lag		Lead	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	6.0		2.0	6.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0		2.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0		0.0	15.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.0		0.0	30.0
Recall Mode	None	None	None	None	None	None	None	None	C-Max		None	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0				7.0			7.0
Flash Dont Walk (s)	27.0	27.0	27.0	31.0	31.0				18.0			27.0
Pedestrian Calls (#/hr)	0	0	0	0	0				0			0
Act Effct Green (s)	21.1	21.1	21.1	21.1	21.1	34.6		16.2	78.1		8.5	67.7

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	15
Future Volume (vph)	15
Ideal Flow (vphpl)	1900
Grade (%)	
Storage Length (ft)	0
Storage Lanes	1
Taper Length (ft)	
Lane Util. Factor	1.00
Frt	0.850
Flt Protected	
Satd. Flow (prot)	1517
Flt Permitted	
Satd. Flow (perm)	1517
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	7%
Adj. Flow (vph)	17
Shared Lane Traffic (%)	
Lane Group Flow (vph)	17
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Detector Phase	6
Switch Phase	
Minimum Initial (s)	12.0
Minimum Split (s)	40.6
Total Split (s)	52.0
Total Split (%)	43.3%
Maximum Green (s)	45.4
Yellow Time (s)	4.6
All-Red Time (s)	2.0
Lost Time Adjust (s)	-1.6
Total Lost Time (s)	5.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	6.0
Minimum Gap (s)	3.0
Time Before Reduce (s)	15.0
Time To Reduce (s)	30.0
Recall Mode	C-Max
Walk Time (s)	7.0
Flash Dont Walk (s)	27.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	67.7

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Actuated g/C Ratio	0.18	0.18	0.18	0.18	0.18	0.29		0.14	0.65		0.07	0.56
v/c Ratio	0.34	0.16	0.81	0.09	0.17	0.11		0.62	0.23		0.17	0.47
Control Delay	45.3	40.0	30.9	38.8	40.3	29.3		54.9	10.5		55.6	18.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	45.3	40.0	30.9	38.8	40.3	29.3		54.9	10.5		55.6	18.2
LOS	D	D	C	D	D	C		D	B		E	B
Approach Delay		33.0			35.7				26.7			18.9
Approach LOS		C			D				C			B
Queue Length 50th (ft)	52	34	128	14	37	30		106	79		15	214
Queue Length 95th (ft)	91	64	185	35	69	54		146	134		41	344
Internal Link Dist (ft)		170			1306				1639			1061
Turn Bay Length (ft)	150		75	100		150		500				
Base Capacity (vph)	436	636	1162	452	649	472		495	2123		129	1969
Starvation Cap Reductn	0	0	0	0	0	0		0	0		0	0
Spillback Cap Reductn	0	0	0	0	0	0		0	0		0	0
Storage Cap Reductn	0	0	0	0	0	0		0	0		0	0
Reduced v/c Ratio	0.17	0.08	0.53	0.05	0.09	0.11		0.56	0.23		0.16	0.47

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.81			
Intersection Signal Delay: 26.0		Intersection LOS: C	
Intersection Capacity Utilization 72.2%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 4: Highland Street (NC 273) & Rankin Ave/Tuckaseegee Road



Lane Group	SBR
Actuated g/C Ratio	0.56
v/c Ratio	0.02
Control Delay	15.5
Queue Delay	0.0
Total Delay	15.5
LOS	B
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	6
Queue Length 95th (ft)	21
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	856
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.02

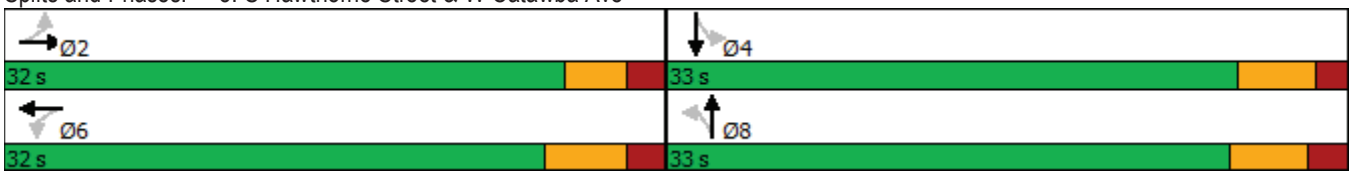
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	180	223	4	23	176	76	4	237	4	32	435	137
Future Volume (vph)	180	223	4	23	176	76	4	237	4	32	435	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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		0.999			0.963			0.998			0.969	
Flt Protected		0.978			0.996			0.999			0.997	
Satd. Flow (prot)	0	1804	0	0	1743	0	0	1857	0	0	1783	0
Flt Permitted		0.697			0.943			0.991			0.972	
Satd. Flow (perm)	0	1286	0	0	1650	0	0	1842	0	0	1738	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			25			20			20	
Link Distance (ft)		2206			684			1329			1297	
Travel Time (s)		43.0			18.7			45.3			44.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	2%	2%	2%	6%	2%	2%	2%	2%	7%	2%	5%
Adj. Flow (vph)	200	248	4	26	196	84	4	263	4	36	483	152
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	452	0	0	306	0	0	271	0	0	671	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0		10.0	10.0		7.0	7.0	
Minimum Split (s)	16.9	16.9		17.9	17.9		15.8	15.8		12.4	12.4	
Total Split (s)	32.0	32.0		32.0	32.0		33.0	33.0		33.0	33.0	
Total Split (%)	49.2%	49.2%		49.2%	49.2%		50.8%	50.8%		50.8%	50.8%	
Maximum Green (s)	27.1	27.1		26.1	26.1		27.2	27.2		27.6	27.6	
Yellow Time (s)	3.0	3.0		4.0	4.0		3.8	3.8		3.8	3.8	
All-Red Time (s)	1.9	1.9		1.9	1.9		2.0	2.0		1.6	1.6	
Lost Time Adjust (s)		0.1			-0.9			-0.8			-0.4	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Recall Mode	Min	Min		Min	Min		None	None		None	None	
Act Effct Green (s)		25.3			25.3			27.0			27.0	
Actuated g/C Ratio		0.41			0.41			0.43			0.43	
v/c Ratio		0.87			0.46			0.34			0.89	
Control Delay		37.1			16.4			13.7			34.4	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		37.1			16.4			13.7			34.4	
LOS		D			B			B			C	
Approach Delay		37.1			16.4			13.7			34.4	
Approach LOS		D			B			B			C	
Queue Length 50th (ft)		155			84			68			236	
Queue Length 95th (ft)		#317			145			119			#436	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		2126			604			1249			1217	
Turn Bay Length (ft)												
Base Capacity (vph)		562			721			835			788	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.80			0.42			0.32			0.85	

Intersection Summary			
Area Type:	Other		
Cycle Length: 65			
Actuated Cycle Length: 62.3			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 28.6		Intersection LOS: C	
Intersection Capacity Utilization 99.3%		ICU Level of Service F	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 5: S Hawthorne Street & W Catawba Ave

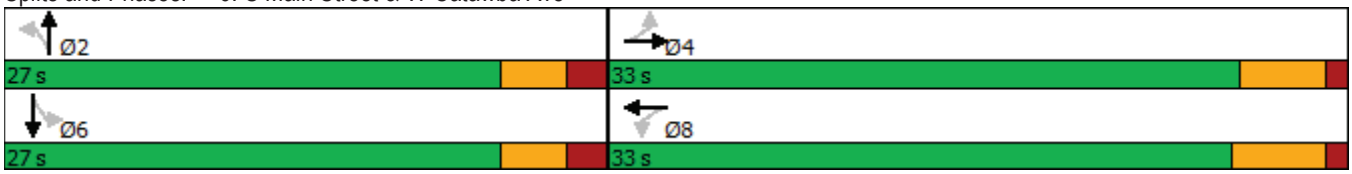


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	207	35	22	118	4	18	106	23	4	145	42
Future Volume (vph)	42	207	35	22	118	4	18	106	23	4	145	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			-5%			0%			0%	
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		0.983			0.997			0.979			0.970	
Flt Protected		0.993			0.993			0.994			0.999	
Satd. Flow (prot)	0	1766	0	0	1784	0	0	1790	0	0	1805	0
Flt Permitted		0.926			0.906			0.942			0.993	
Satd. Flow (perm)	0	1647	0	0	1628	0	0	1697	0	0	1794	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			20			20	
Link Distance (ft)		986			1119			1390			1157	
Travel Time (s)		26.9			30.5			47.4			39.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	6%	3%	15%	7%	2%	2%	2%	10%	2%	2%	2%
Adj. Flow (vph)	47	230	39	24	131	4	20	118	26	4	161	47
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	316	0	0	159	0	0	164	0	0	212	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	16.9	16.9		17.3	17.3		17.9	17.9		17.9	17.9	
Total Split (s)	33.0	33.0		33.0	33.0		27.0	27.0		27.0	27.0	
Total Split (%)	55.0%	55.0%		55.0%	55.0%		45.0%	45.0%		45.0%	45.0%	
Maximum Green (s)	28.1	28.1		27.7	27.7		22.1	22.1		22.1	22.1	
Yellow Time (s)	3.8	3.8		4.2	4.2		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.1	1.1		1.1	1.1		1.9	1.9		1.9	1.9	
Lost Time Adjust (s)		0.1			-0.3			0.1			0.1	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	5.0	5.0		5.0	5.0		6.0	6.0		6.0	6.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		10.3			10.3			10.4			10.4	
Actuated g/C Ratio		0.33			0.33			0.34			0.34	
v/c Ratio		0.58			0.29			0.29			0.35	
Control Delay		13.0			9.0			10.1			10.5	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		13.0			9.0			10.1			10.5	
LOS		B			A			B			B	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		13.0			9.0			10.1			10.5	
Approach LOS		B			A			B			B	
Queue Length 50th (ft)		38			17			17			23	
Queue Length 95th (ft)		88			44			55			68	
Internal Link Dist (ft)		906			1039			1310			1077	
Turn Bay Length (ft)												
Base Capacity (vph)		1509			1491			1229			1299	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.21			0.11			0.13			0.16	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 30.8			
Natural Cycle: 40			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.58			
Intersection Signal Delay: 11.1		Intersection LOS: B	
Intersection Capacity Utilization 45.6%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 6: S Main Street & W Catawba Ave



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	211	19	9	11	9	4	4	410	14	4	667	125
Future Volume (vph)	211	19	9	11	9	4	4	410	14	4	667	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			-9%			-6%			3%	
Storage Length (ft)	0		0	0		0	50		0	0		0
Storage Lanes	0		0	0		0	1		0	0		1
Taper Length (ft)	25			25			100			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Frt		0.995			0.979			0.995				0.850
Flt Protected		0.958			0.977							
Satd. Flow (prot)	0	1748	0	0	1722	0	0	3451	0	0	1778	1501
Flt Permitted		0.732			0.823			0.950			0.998	
Satd. Flow (perm)	0	1336	0	0	1450	0	0	3279	0	0	1775	1501
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		1119			911			2587			665	
Travel Time (s)		30.5			24.8			50.4			13.0	
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
Heavy Vehicles (%)	4%	2%	25%	20%	2%	2%	50%	7%	2%	50%	5%	6%
Adj. Flow (vph)	234	21	10	12	10	4	4	456	16	4	741	139
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	265	0	0	26	0	0	476	0	0	745	139
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	24.7	24.7		23.3	23.3		18.6	18.6		19.1	19.1	19.1
Total Split (s)	25.0	25.0		25.0	25.0		35.0	35.0		35.0	35.0	35.0
Total Split (%)	41.7%	41.7%		41.7%	41.7%		58.3%	58.3%		58.3%	58.3%	58.3%
Maximum Green (s)	19.3	19.3		18.7	18.7		29.4	29.4		29.9	29.9	29.9
Yellow Time (s)	4.0	4.0		4.6	4.6		4.3	4.3		3.7	3.7	3.7
All-Red Time (s)	1.7	1.7		1.7	1.7		1.3	1.3		1.4	1.4	1.4
Lost Time Adjust (s)		-0.7			-1.3			-0.6			-0.1	-0.1
Total Lost Time (s)		5.0			5.0			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		Min	Min		Min	Min	Min
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	12.0	12.0		10.0	10.0		6.0	6.0		7.0	7.0	7.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)		14.8			14.8			25.8			25.8	25.8
Actuated g/C Ratio		0.29			0.29			0.51			0.51	0.51
v/c Ratio		0.68			0.06			0.29			0.83	0.18
Control Delay		26.6			14.2			8.4			22.1	8.5

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay		0.0			0.0			0.0			0.0	0.0
Total Delay		26.6			14.2			8.4			22.1	8.5
LOS		C			B			A			C	A
Approach Delay		26.6			14.2			8.4			19.9	
Approach LOS		C			B			A			B	
Queue Length 50th (ft)		73			6			40			178	21
Queue Length 95th (ft)		147			21			75			#421	53
Internal Link Dist (ft)		1039			831			2507			585	
Turn Bay Length (ft)												
Base Capacity (vph)		541			588			1993			1079	912
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		0.49			0.04			0.24			0.69	0.15

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 50.9			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.83			
Intersection Signal Delay: 17.6		Intersection LOS: B	
Intersection Capacity Utilization 66.5%		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: 7: Highland Street (NC 273) & W Catawba Ave

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	718	13	244	235	149	30	246	394	339	518	24
Future Volume (vph)	7	718	13	244	235	149	30	246	394	339	518	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			-3%			-4%			0%	
Storage Length (ft)	175		150	150		0	85		0	375		700
Storage Lanes	1		1	1		0	1		0	1		1
Taper Length (ft)	200			150			30			125		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.997			0.942			0.908			0.993	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1233	3451	0	1745	2988	0	1705	3173	0	1687	3411	0
Flt Permitted	0.451			0.950			0.950			0.950		
Satd. Flow (perm)	586	3451	0	1745	2988	0	1705	3173	0	1687	3411	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		478			1420			665			742	
Travel Time (s)		9.3			27.7			13.0			14.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	50%	7%	2%	5%	12%	21%	8%	6%	5%	7%	3%	50%
Adj. Flow (vph)	8	798	14	271	261	166	33	273	438	377	576	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	8	812	0	271	427	0	33	711	0	377	603	0
Turn Type	D.Pm	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	8											
Detector Phase	8	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	10.0		7.0	10.0	
Minimum Split (s)	31.2	13.2		12.6	31.2		12.1	35.1		12.8	16.1	
Total Split (s)	61.0	35.0		26.0	61.0		13.0	36.0		33.0	56.0	
Total Split (%)	46.9%	26.9%		20.0%	46.9%		10.0%	27.7%		25.4%	43.1%	
Maximum Green (s)	54.8	28.8		20.4	54.8		7.9	29.9		27.2	49.9	
Yellow Time (s)	4.2	4.2		3.0	4.2		3.0	4.1		3.0	4.1	
All-Red Time (s)	2.0	2.0		2.6	2.0		2.1	2.0		2.8	2.0	
Lost Time Adjust (s)	-1.2	-1.2		-0.6	-1.2		-0.1	-1.1		-0.8	-1.1	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag		Lag		Lead			Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	1.0		1.0	1.0		2.0	3.0		1.0	3.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)	7.0				7.0			7.0				
Flash Dont Walk (s)	18.0				18.0			22.0				
Pedestrian Calls (#/hr)	0				0			0				
Act Effct Green (s)	56.0	30.0		21.0	56.0		7.5	30.5		28.0	55.9	
Actuated g/C Ratio	0.43	0.23		0.16	0.43		0.06	0.24		0.22	0.43	
v/c Ratio	0.03	1.02		0.96	0.33		0.34	1.18dr		1.04	0.41	
Control Delay	22.0	85.1		98.5	25.3		68.4	71.8		105.9	27.4	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	22.0	85.1		98.5	25.3		68.4	71.8		105.9	27.4	
LOS	C	F		F	C		E	E		F	C	
Approach Delay		84.5			53.7			71.7			57.6	
Approach LOS		F			D			E			E	
Queue Length 50th (ft)	4	~381		230	123		27	311		~342	193	
Queue Length 95th (ft)	14	#511		#406	165		63	#432		#542	249	
Internal Link Dist (ft)		398			1340			585			662	
Turn Bay Length (ft)	175			150			85			375		
Base Capacity (vph)	253	799		282	1292		104	759		364	1473	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.03	1.02		0.96	0.33		0.32	0.94		1.04	0.41	

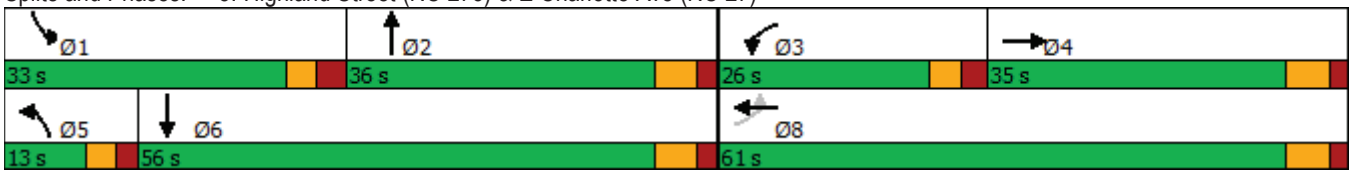
Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 129.5			
Natural Cycle: 130			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.04			
Intersection Signal Delay: 66.8		Intersection LOS: E	
Intersection Capacity Utilization 88.7%		ICU Level of Service E	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 8: Highland Street (NC 273) & E Charlotte Ave (NC 27)

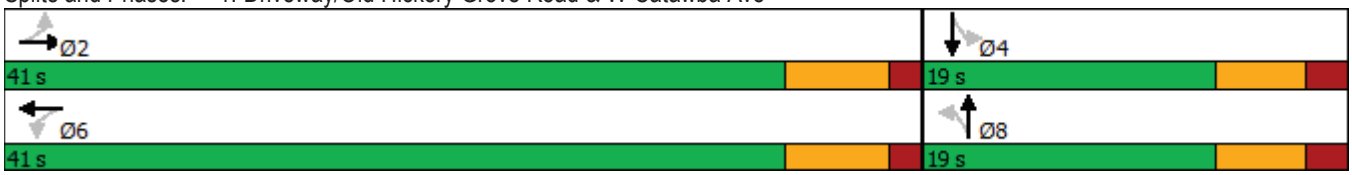


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	61	269	4	4	344	320	7	4	10	159	4	33
Future Volume (vph)	61	269	4	4	344	320	7	4	10	159	4	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-1%			-1%			0%			-2%	
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		0.999			0.935			0.935			0.977	
Flt Protected		0.991						0.983			0.961	
Satd. Flow (prot)	0	1853	0	0	1750	0	0	1712	0	0	1766	0
Flt Permitted		0.804			0.998			0.873			0.750	
Satd. Flow (perm)	0	1504	0	0	1747	0	0	1520	0	0	1379	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			25			35	
Link Distance (ft)		1549			1034			1067			1674	
Travel Time (s)		30.2			20.1			29.1			32.6	
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)	68	299	4	4	382	356	8	4	11	177	4	37
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	371	0	0	742	0	0	23	0	0	218	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	18.2	18.2		18.2	18.2		13.0	13.0		13.0	13.0	
Total Split (s)	41.0	41.0		41.0	41.0		19.0	19.0		19.0	19.0	
Total Split (%)	68.3%	68.3%		68.3%	68.3%		31.7%	31.7%		31.7%	31.7%	
Maximum Green (s)	34.8	34.8		34.8	34.8		13.0	13.0		13.0	13.0	
Yellow Time (s)	4.7	4.7		4.7	4.7		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.5	1.5		1.5	1.5		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.2			-1.2			-1.0			-1.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		1.0	1.0		1.0	1.0	
Recall Mode	Min	Min		Min	Min		None	None		None	None	
Act Effct Green (s)		29.2			29.2			9.2			11.6	
Actuated g/C Ratio		0.57			0.57			0.18			0.23	
v/c Ratio		0.43			0.74			0.08			0.69	
Control Delay		8.3			14.0			20.3			33.1	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		8.3			14.0			20.3			33.1	
LOS		A			B			C			C	
Approach Delay		8.3			14.0			20.3			33.1	
Approach LOS		A			B			C			C	
Queue Length 50th (ft)		58			151			6			56	
Queue Length 95th (ft)		110			280			22			#159	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1469			954			987			1594	
Turn Bay Length (ft)												
Base Capacity (vph)		1086			1262			426			387	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.34			0.59			0.05			0.56	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 51.1			
Natural Cycle: 55			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 15.6		Intersection LOS: B	
Intersection Capacity Utilization 85.9%		ICU Level of Service E	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 1: Driveway/Old Hickory Grove Road & W Catawba Ave



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	400	4	4	593	20	4	0	4	12	0	18
Future Volume (vph)	31	400	4	4	593	20	4	0	4	12	0	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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		0.999			0.996			0.932			0.918	
Flt Protected		0.996						0.976			0.981	
Satd. Flow (prot)	0	1853	0	0	1855	0	0	1694	0	0	1678	0
Flt Permitted		0.996						0.976			0.981	
Satd. Flow (perm)	0	1853	0	0	1855	0	0	1694	0	0	1678	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1034			1509			1194			1129	
Travel Time (s)		20.1			29.4			32.6			30.8	
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)	34	444	4	4	659	22	4	0	4	13	0	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	482	0	0	685	0	0	8	0	0	33	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 53.0%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	31	400	4	4	593	20	4	0	4	12	0	18
Future Vol, veh/h	31	400	4	4	593	20	4	0	4	12	0	18
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
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	34	444	4	4	659	22	4	0	4	13	0	20

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	681	0	0	448	0	0	1202	1203	446	1194	1194	670
Stage 1	-	-	-	-	-	-	514	514	-	678	678	-
Stage 2	-	-	-	-	-	-	688	689	-	516	516	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
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	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	912	-	-	1112	-	-	161	184	612	163	187	457
Stage 1	-	-	-	-	-	-	543	535	-	442	452	-
Stage 2	-	-	-	-	-	-	436	446	-	542	534	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	912	-	-	1112	-	-	147	174	612	155	177	457
Mov Cap-2 Maneuver	-	-	-	-	-	-	147	174	-	155	177	-
Stage 1	-	-	-	-	-	-	516	508	-	420	449	-
Stage 2	-	-	-	-	-	-	414	443	-	511	507	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.6	0.1	20.8	21.1
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	237	912	-	-	1112	-	-	257
HCM Lane V/C Ratio	0.038	0.038	-	-	0.004	-	-	0.13
HCM Control Delay (s)	20.8	9.1	0	-	8.2	0	-	21.1
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-	-	0.4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	271	131	17	453	61	158	82	9	36	48	6
Future Volume (vph)	10	271	131	17	453	61	158	82	9	36	48	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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		0.957			0.984			0.995			0.991	
Flt Protected		0.999			0.998			0.969			0.980	
Satd. Flow (prot)	0	1781	0	0	1829	0	0	1796	0	0	1809	0
Flt Permitted		0.999			0.998			0.969			0.980	
Satd. Flow (perm)	0	1781	0	0	1829	0	0	1796	0	0	1809	0
Link Speed (mph)		35			35			35			25	
Link Distance (ft)		1509			2206			3149			1170	
Travel Time (s)		29.4			43.0			61.3			31.9	
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)	11	301	146	19	503	68	176	91	10	40	53	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	458	0	0	590	0	0	277	0	0	100	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 62.7%		ICU Level of Service B	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	54.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	271	131	17	453	61	158	82	9	36	48	6
Future Vol, veh/h	10	271	131	17	453	61	158	82	9	36	48	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
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	11	301	146	19	503	68	176	91	10	40	53	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	571	0	0	447	0	0	1001	1005	374	1022	1044	537
Stage 1	-	-	-	-	-	-	396	396	-	575	575	-
Stage 2	-	-	-	-	-	-	605	609	-	447	469	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
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	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1002	-	-	1113	-	-	222	241	672	214	229	544
Stage 1	-	-	-	-	-	-	629	604	-	503	503	-
Stage 2	-	-	-	-	-	-	485	485	-	591	561	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1002	-	-	1113	-	-	~ 173	231	672	142	220	544
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 173	231	-	142	220	-
Stage 1	-	-	-	-	-	-	620	595	-	495	490	-
Stage 2	-	-	-	-	-	-	416	473	-	486	553	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.3	264.7	44.8
HCM LOS			F	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	194	1002	-	-	1113	-	-	186
HCM Lane V/C Ratio	1.426	0.011	-	-	0.017	-	-	0.538
HCM Control Delay (s)	264.7	8.6	0	-	8.3	0	-	44.8
HCM Lane LOS	F	A	A	-	A	A	-	E
HCM 95th %tile Q(veh)	16.6	0	-	-	0.1	-	-	2.8

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

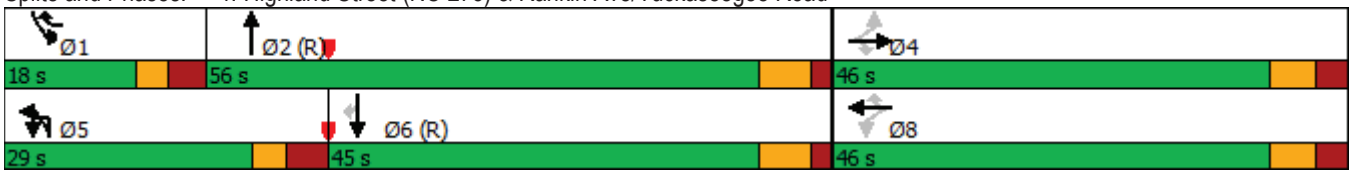
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	56	123	330	45	88	63	31	397	660	66	82	795
Future Volume (vph)	56	123	330	45	88	63	31	397	660	66	82	795
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			-4%				4%			-1%
Storage Length (ft)	150		75	100		150		500		0	0	
Storage Lanes	1		2	1		1		2		0	1	
Taper Length (ft)	125			100				275			100	
Lane Util. Factor	1.00	1.00	0.88	1.00	1.00	1.00	0.95	0.97	0.95	0.95	1.00	0.95
Frt			0.850			0.850			0.986			
Flt Protected	0.950			0.950				0.950			0.950	
Satd. Flow (prot)	1770	1863	2787	1805	1900	1569	0	3364	3417	0	1778	3522
Flt Permitted	0.648			0.512				0.950			0.950	
Satd. Flow (perm)	1207	1863	2787	973	1900	1569	0	3364	3417	0	1778	3522
Right Turn on Red			Yes			No				No		
Satd. Flow (RTOR)			367									
Link Speed (mph)		35			35				35			35
Link Distance (ft)		250			1386				1719			1141
Travel Time (s)		4.9			27.0				33.5			22.2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	5%	2%	2%	2%	3%	2%	3%
Adj. Flow (vph)	62	137	367	50	98	70	34	441	733	73	91	883
Shared Lane Traffic (%)												
Lane Group Flow (vph)	62	137	367	50	98	70	0	475	806	0	91	883
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	Prot	Prot	NA		Prot	NA
Protected Phases		4			8	1	5	5	2		1	6
Permitted Phases	4		4	8		8						
Detector Phase	4	4	4	8	8	1	5	5	2		1	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0		7.0	12.0
Minimum Split (s)	41.1	41.1	41.1	45.1	45.1	13.3	13.9	13.9	31.6		13.3	40.6
Total Split (s)	46.0	46.0	46.0	46.0	46.0	18.0	29.0	29.0	56.0		18.0	45.0
Total Split (%)	38.3%	38.3%	38.3%	38.3%	38.3%	15.0%	24.2%	24.2%	46.7%		15.0%	37.5%
Maximum Green (s)	38.9	38.9	38.9	38.9	38.9	11.7	22.1	22.1	49.4		11.7	38.4
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1	3.0	3.0	3.0	4.6		3.0	4.6
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.3	3.9	3.9	2.0		3.3	2.0
Lost Time Adjust (s)	-2.1	-2.1	-2.1	-2.1	-2.1	-1.3		-1.9	-1.6		-1.3	-1.6
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0
Lead/Lag						Lead	Lead	Lead	Lag		Lead	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	6.0		2.0	6.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0		2.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0		0.0	15.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.0		0.0	30.0
Recall Mode	None	None	None	None	None	None	None	None	C-Max		None	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0				7.0			7.0
Flash Dont Walk (s)	27.0	27.0	27.0	31.0	31.0				18.0			27.0
Pedestrian Calls (#/hr)	0	0	0	0	0				0			0
Act Effct Green (s)	15.4	15.4	15.4	15.4	15.4	32.4		23.0	77.6		12.0	66.6

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	50
Future Volume (vph)	50
Ideal Flow (vphpl)	1900
Grade (%)	
Storage Length (ft)	0
Storage Lanes	1
Taper Length (ft)	
Lane Util. Factor	1.00
Frt	0.850
Flt Protected	
Satd. Flow (prot)	1591
Flt Permitted	
Satd. Flow (perm)	1591
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	2%
Adj. Flow (vph)	56
Shared Lane Traffic (%)	
Lane Group Flow (vph)	56
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Detector Phase	6
Switch Phase	
Minimum Initial (s)	12.0
Minimum Split (s)	40.6
Total Split (s)	45.0
Total Split (%)	37.5%
Maximum Green (s)	38.4
Yellow Time (s)	4.6
All-Red Time (s)	2.0
Lost Time Adjust (s)	-1.6
Total Lost Time (s)	5.0
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	6.0
Minimum Gap (s)	3.0
Time Before Reduce (s)	15.0
Time To Reduce (s)	30.0
Recall Mode	C-Max
Walk Time (s)	7.0
Flash Dont Walk (s)	27.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	66.6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13	0.27		0.19	0.65		0.10	0.56
v/c Ratio	0.40	0.57	0.54	0.40	0.40	0.17		0.74	0.36		0.51	0.45
Control Delay	54.5	58.1	7.6	56.3	51.9	32.1		52.6	11.3		60.9	18.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	54.5	58.1	7.6	56.3	51.9	32.1		52.6	11.3		60.9	18.0
LOS	D	E	A	E	D	C		D	B		E	B
Approach Delay		25.0			46.5				26.6			21.7
Approach LOS		C			D				C			C
Queue Length 50th (ft)	45	101	0	36	71	42		179	140		68	204
Queue Length 95th (ft)	86	160	45	75	119	72		226	223		119	311
Internal Link Dist (ft)		170			1306				1639			1061
Turn Bay Length (ft)	150		75	100		150		500				
Base Capacity (vph)	412	636	1193	332	649	446		702	2209		203	1953
Starvation Cap Reductn	0	0	0	0	0	0		0	0		0	0
Spillback Cap Reductn	0	0	0	0	0	0		0	0		0	0
Storage Cap Reductn	0	0	0	0	0	0		0	0		0	0
Reduced v/c Ratio	0.15	0.22	0.31	0.15	0.15	0.16		0.68	0.36		0.45	0.45

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 111 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 26.1		Intersection LOS: C	
Intersection Capacity Utilization 68.2%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 4: Highland Street (NC 273) & Rankin Ave/Tuckaseegee Road



Lane Group	SBR
Actuated g/C Ratio	0.56
v/c Ratio	0.06
Control Delay	15.1
Queue Delay	0.0
Total Delay	15.1
LOS	B
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	19
Queue Length 95th (ft)	48
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	882
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.06

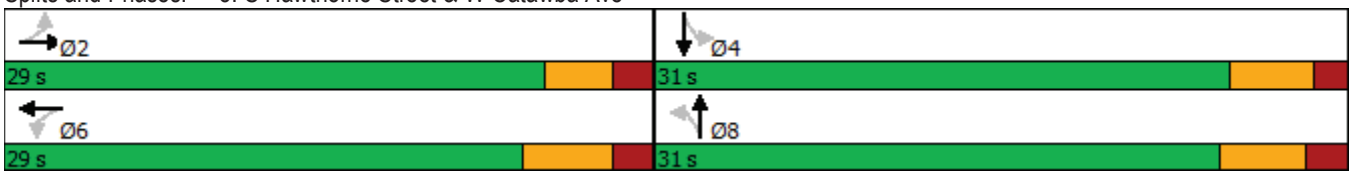
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	121	176	7	9	341	36	8	288	13	20	316	189
Future Volume (vph)	121	176	7	9	341	36	8	288	13	20	316	189
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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		0.997			0.987			0.994			0.951	
Flt Protected		0.981			0.999			0.999			0.998	
Satd. Flow (prot)	0	1815	0	0	1814	0	0	1800	0	0	1768	0
Flt Permitted		0.642			0.989			0.983			0.980	
Satd. Flow (perm)	0	1188	0	0	1796	0	0	1771	0	0	1736	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			25			20			20	
Link Distance (ft)		2206			684			1329			1297	
Travel Time (s)		43.0			18.7			45.3			44.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	2%	2%	2%	3%	6%	2%	5%	2%	2%	2%	2%
Adj. Flow (vph)	134	196	8	10	379	40	9	320	14	22	351	210
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	338	0	0	429	0	0	343	0	0	583	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0	12.0		10.0	10.0		7.0	7.0	
Minimum Split (s)	16.9	16.9		17.9	17.9		15.8	15.8		12.4	12.4	
Total Split (s)	29.0	29.0		29.0	29.0		31.0	31.0		31.0	31.0	
Total Split (%)	48.3%	48.3%		48.3%	48.3%		51.7%	51.7%		51.7%	51.7%	
Maximum Green (s)	24.1	24.1		23.1	23.1		25.2	25.2		25.6	25.6	
Yellow Time (s)	3.0	3.0		4.0	4.0		3.8	3.8		3.8	3.8	
All-Red Time (s)	1.9	1.9		1.9	1.9		2.0	2.0		1.6	1.6	
Lost Time Adjust (s)		0.1			-0.9			-0.8			-0.4	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Recall Mode	Min	Min		Min	Min		None	None		None	None	
Act Effct Green (s)		20.3			20.3			22.9			22.9	
Actuated g/C Ratio		0.38			0.38			0.43			0.43	
v/c Ratio		0.75			0.63			0.45			0.78	
Control Delay		27.9			18.9			13.8			23.4	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		27.9			18.9			13.8			23.4	
LOS		C			B			B			C	
Approach Delay		27.9			18.9			13.8			23.4	
Approach LOS		C			B			B			C	
Queue Length 50th (ft)		98			117			80			166	
Queue Length 95th (ft)		#216			200			143			#332	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		2126			604			1249			1217	
Turn Bay Length (ft)												
Base Capacity (vph)		549			830			887			869	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.62			0.52			0.39			0.67	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 53.5			
Natural Cycle: 55			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 21.2		Intersection LOS: C	
Intersection Capacity Utilization 87.4%		ICU Level of Service E	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 5: S Hawthorne Street & W Catawba Ave

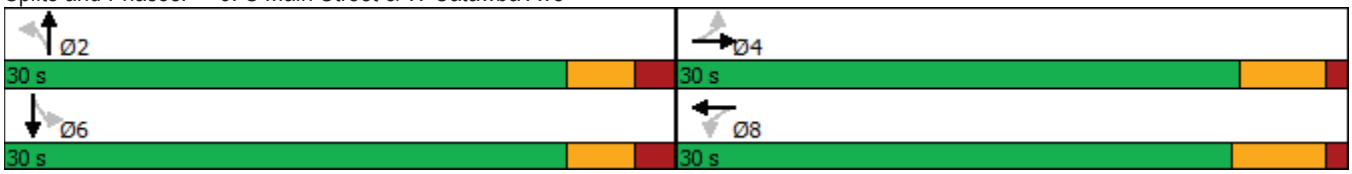


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	139	25	15	289	9	31	208	23	4	168	66
Future Volume (vph)	40	139	25	15	289	9	31	208	23	4	168	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			-5%			0%			0%	
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		0.983			0.996			0.988			0.963	
Flt Protected		0.990			0.998			0.994			0.999	
Satd. Flow (prot)	0	1796	0	0	1854	0	0	1825	0	0	1774	0
Flt Permitted		0.887			0.975			0.934			0.993	
Satd. Flow (perm)	0	1610	0	0	1811	0	0	1714	0	0	1763	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			20			20	
Link Distance (ft)		986			1119			1390			1157	
Travel Time (s)		26.9			30.5			47.4			39.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	3%	4%	7%	4%	13%	2%	2%	5%	25%	3%	2%
Adj. Flow (vph)	44	154	28	17	321	10	34	231	26	4	187	73
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	226	0	0	348	0	0	291	0	0	264	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	16.9	16.9		17.3	17.3		17.9	17.9		17.9	17.9	
Total Split (s)	30.0	30.0		30.0	30.0		30.0	30.0		30.0	30.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		50.0%	50.0%	
Maximum Green (s)	25.1	25.1		24.7	24.7		25.1	25.1		25.1	25.1	
Yellow Time (s)	3.8	3.8		4.2	4.2		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.1	1.1		1.1	1.1		1.9	1.9		1.9	1.9	
Lost Time Adjust (s)		0.1			-0.3			0.1			0.1	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None		None	None		Min	Min		Min	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	5.0	5.0		5.0	5.0		6.0	6.0		6.0	6.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		11.1			11.1			11.5			11.5	
Actuated g/C Ratio		0.34			0.34			0.35			0.35	
v/c Ratio		0.42			0.57			0.49			0.43	
Control Delay		11.2			13.2			12.4			11.5	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		11.2			13.2			12.4			11.5	
LOS		B			B			B			B	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		11.2			13.2			12.4			11.5	
Approach LOS		B			B			B			B	
Queue Length 50th (ft)		25			42			36			32	
Queue Length 95th (ft)		76			115			103			91	
Internal Link Dist (ft)		906			1039			1310			1077	
Turn Bay Length (ft)												
Base Capacity (vph)		1257			1415			1339			1377	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.18			0.25			0.22			0.19	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 32.9			
Natural Cycle: 40			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.57			
Intersection Signal Delay: 12.2		Intersection LOS: B	
Intersection Capacity Utilization 63.7%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 6: S Main Street & W Catawba Ave



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	138	14	4	75	98	7	10	661	7	7	734	241
Future Volume (vph)	138	14	4	75	98	7	10	661	7	7	734	241
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			-9%			-6%			3%	
Storage Length (ft)	0		0	0		0	50		0	0		0
Storage Lanes	0		0	0		0	1		0	0		1
Taper Length (ft)	25			25			100			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Frt		0.997			0.995			0.998				0.850
Flt Protected		0.958			0.980			0.999				
Satd. Flow (prot)	0	1797	0	0	1898	0	0	3600	0	0	1797	1560
Flt Permitted		0.643			0.832			0.943			0.993	
Satd. Flow (perm)	0	1206	0	0	1611	0	0	3398	0	0	1785	1560
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		1119			911			2587			665	
Travel Time (s)		30.5			24.8			50.4			13.0	
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
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	3%	2%	17%	4%	2%
Adj. Flow (vph)	153	16	4	83	109	8	11	734	8	8	816	268
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	173	0	0	200	0	0	753	0	0	824	268
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Detector Phase	4	4		8	8		2	2		6	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	24.7	24.7		23.3	23.3		18.6	18.6		19.1	19.1	19.1
Total Split (s)	25.0	25.0		25.0	25.0		40.0	40.0		40.0	40.0	40.0
Total Split (%)	38.5%	38.5%		38.5%	38.5%		61.5%	61.5%		61.5%	61.5%	61.5%
Maximum Green (s)	19.3	19.3		18.7	18.7		34.4	34.4		34.9	34.9	34.9
Yellow Time (s)	4.0	4.0		4.6	4.6		4.3	4.3		3.7	3.7	3.7
All-Red Time (s)	1.7	1.7		1.7	1.7		1.3	1.3		1.4	1.4	1.4
Lost Time Adjust (s)		-0.7			-1.3			-0.6			-0.1	-0.1
Total Lost Time (s)		5.0			5.0			5.0			5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		Min	Min		Min	Min	Min
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	12.0	12.0		10.0	10.0		6.0	6.0		7.0	7.0	7.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)		13.4			13.6			32.7			32.7	32.7
Actuated g/C Ratio		0.26			0.27			0.64			0.64	0.64
v/c Ratio		0.55			0.47			0.35			0.72	0.27
Control Delay		25.5			21.6			7.3			15.7	7.8

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay		0.0			0.0			0.0			0.0	0.0
Total Delay		25.5			21.6			7.3			15.7	7.8
LOS		C			C			A			B	A
Approach Delay		25.5			21.6			7.3			13.7	
Approach LOS		C			C			A			B	
Queue Length 50th (ft)		48			54			61			186	39
Queue Length 95th (ft)		109			115			121			#490	96
Internal Link Dist (ft)		1039			831			2507			585	
Turn Bay Length (ft)												
Base Capacity (vph)		507			678			2425			1274	1113
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		0.34			0.29			0.31			0.65	0.24

Intersection Summary			
Area Type:	Other		
Cycle Length: 65			
Actuated Cycle Length: 51			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.72			
Intersection Signal Delay: 13.2		Intersection LOS: B	
Intersection Capacity Utilization 67.8%		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: 7: Highland Street (NC 273) & W Catawba Ave

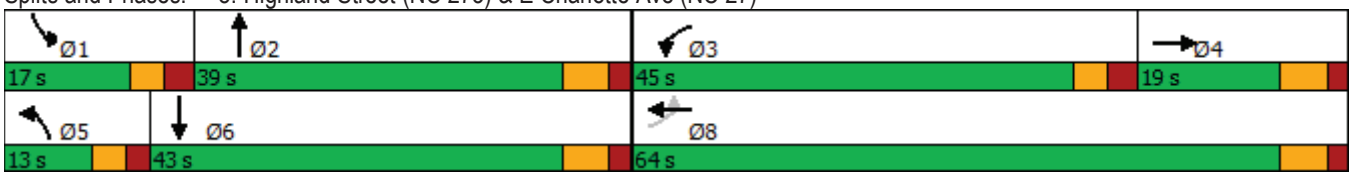
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	333	22	533	633	431	20	445	352	152	436	4
Future Volume (vph)	14	333	22	533	633	431	20	445	352	152	436	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			-3%			-4%			0%	
Storage Length (ft)	175		150	150		0	85		0	375		700
Storage Lanes	1		1	1		0	1		0	1		1
Taper Length (ft)	200			150			30			125		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.991			0.939			0.934			0.999	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1713	3498	0	1779	3284	0	1737	3325	0	1687	3468	0
Flt Permitted	0.126			0.950			0.950			0.950		
Satd. Flow (perm)	227	3498	0	1779	3284	0	1737	3325	0	1687	3468	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		478			1420			665			742	
Travel Time (s)		9.3			27.7			13.0			14.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	8%	5%	2%	3%	6%	3%	6%	3%	4%	7%	4%	2%
Adj. Flow (vph)	16	370	24	592	703	479	22	494	391	169	484	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	394	0	592	1182	0	22	885	0	169	488	0
Turn Type	D.Pm	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	8											
Detector Phase	8	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	10.0		7.0	10.0	
Minimum Split (s)	31.2	13.2		12.6	31.2		12.1	35.1		12.8	16.1	
Total Split (s)	64.0	19.0		45.0	64.0		13.0	39.0		17.0	43.0	
Total Split (%)	53.3%	15.8%		37.5%	53.3%		10.8%	32.5%		14.2%	35.8%	
Maximum Green (s)	57.8	12.8		39.4	57.8		7.9	32.9		11.2	36.9	
Yellow Time (s)	4.2	4.2		3.0	4.2		3.0	4.1		3.0	4.1	
All-Red Time (s)	2.0	2.0		2.6	2.0		2.1	2.0		2.8	2.0	
Lost Time Adjust (s)	-1.2	-1.2		-0.6	-1.2		-0.1	-1.1		-0.8	-1.1	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag		Lag		Lead			Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	1.0		1.0	1.0		2.0	3.0		1.0	3.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)	7.0				7.0			7.0				
Flash Dont Walk (s)	18.0				18.0			22.0				
Pedestrian Calls (#/hr)	0				0			0				
Act Effct Green (s)	59.0	14.0		40.0	59.0		7.3	33.4		12.0	43.0	
Actuated g/C Ratio	0.49	0.12		0.34	0.49		0.06	0.28		0.10	0.36	
v/c Ratio	0.14	0.96		0.99	0.73		0.21	0.95		1.00	0.39	
Control Delay	20.9	88.3		75.4	27.3		58.4	62.6		123.5	30.7	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	20.9	88.3		75.4	27.3		58.4	62.6		123.5	30.7	
LOS	C	F		E	C		E	E		F	C	
Approach Delay		85.7			43.3			62.5			54.6	
Approach LOS		F			D			E			D	
Queue Length 50th (ft)	7	162		456	371		17	352		~133	155	
Queue Length 95th (ft)	23	#264		#699	457		44	#481		#278	208	
Internal Link Dist (ft)		398			1340			585			662	
Turn Bay Length (ft)	175			150			85			375		
Base Capacity (vph)	112	410		596	1623		116	947		169	1248	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.14	0.96		0.99	0.73		0.19	0.93		1.00	0.39	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 119.4
Natural Cycle: 120
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.00
Intersection Signal Delay: 54.6 Intersection LOS: D
Intersection Capacity Utilization 88.1% ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 8: Highland Street (NC 273) & E Charlotte Ave (NC 27)



2028 Build-out Conditions
Improved

Access 2 – Roundabout

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	381	171	15	224	18	46	25	6	55	74	9
Future Volume (vph)	3	381	171	15	224	18	46	25	6	55	74	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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		0.958			0.991			0.989			0.991	
Flt Protected					0.997			0.971			0.980	
Satd. Flow (prot)	0	1779	0	0	1810	0	0	1736	0	0	1809	0
Flt Permitted					0.997			0.971			0.980	
Satd. Flow (perm)	0	1779	0	0	1810	0	0	1736	0	0	1809	0
Link Speed (mph)		35			35			35			25	
Link Distance (ft)		1509			2206			3149			1170	
Travel Time (s)		29.4			43.0			61.3			31.9	
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
Heavy Vehicles (%)	2%	2%	3%	2%	4%	2%	2%	2%	40%	2%	2%	2%
Adj. Flow (vph)	3	423	190	17	249	20	51	28	7	61	82	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	616	0	0	286	0	0	86	0	0	153	0
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary			
Area Type:	Other		
Control Type: Roundabout			
Intersection Capacity Utilization 46.1%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Intersection Delay, s/veh	7.5
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	616	286	86	153
Demand Flow Rate, veh/h	630	296	91	156
Vehicles Circulating, veh/h	163	84	496	328
Vehicles Exiting, veh/h	321	503	297	52
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	9.5	5.0	5.7	5.2
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	630	296	91	156
Cap Entry Lane, veh/h	1169	1267	832	988
Entry HV Adj Factor	0.977	0.966	0.950	0.983
Flow Entry, veh/h	616	286	86	153
Cap Entry, veh/h	1142	1224	790	971
V/C Ratio	0.539	0.234	0.109	0.158
Control Delay, s/veh	9.5	5.0	5.7	5.2
LOS	A	A	A	A
95th %tile Queue, veh	3	1	0	1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	271	131	17	453	61	158	82	9	36	48	6
Future Volume (vph)	10	271	131	17	453	61	158	82	9	36	48	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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		0.957			0.984			0.995			0.991	
Flt Protected		0.999			0.998			0.969			0.980	
Satd. Flow (prot)	0	1781	0	0	1829	0	0	1796	0	0	1809	0
Flt Permitted		0.999			0.998			0.969			0.980	
Satd. Flow (perm)	0	1781	0	0	1829	0	0	1796	0	0	1809	0
Link Speed (mph)		35			35			35			25	
Link Distance (ft)		1509			2206			3149			1170	
Travel Time (s)		29.4			43.0			61.3			31.9	
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)	11	301	146	19	503	68	176	91	10	40	53	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	458	0	0	590	0	0	277	0	0	100	0
Sign Control		Yield			Yield			Yield			Yield	

Intersection Summary			
Area Type:	Other		
Control Type: Roundabout			
Intersection Capacity Utilization 62.7%		ICU Level of Service B	
Analysis Period (min) 15			

Intersection	
Intersection Delay, s/veh	8.7
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	458	590	277	100
Demand Flow Rate, veh/h	467	601	283	102
Vehicles Circulating, veh/h	114	284	359	712
Vehicles Exiting, veh/h	700	358	222	173
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	6.7	11.3	6.9	7.3
Approach LOS	A	B	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	467	601	283	102
Cap Entry Lane, veh/h	1228	1033	957	668
Entry HV Adj Factor	0.981	0.982	0.979	0.980
Flow Entry, veh/h	458	590	277	100
Cap Entry, veh/h	1205	1014	937	654
V/C Ratio	0.380	0.582	0.296	0.153
Control Delay, s/veh	6.7	11.3	6.9	7.3
LOS	A	B	A	A
95th %tile Queue, veh	2	4	1	1

2028 Build-out Conditions
Improved

Access 2 – Two-Way Stop Control

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	271	131	17	453	61	158	82	9	36	48	6
Future Volume (vph)	10	271	131	17	453	61	158	82	9	36	48	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		100	0		100	100		0	100		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.985			0.982	
Flt Protected		0.998			0.998		0.950			0.950		
Satd. Flow (prot)	0	1859	1583	0	1859	1583	1770	1835	0	1770	1829	0
Flt Permitted		0.998			0.998		0.950			0.950		
Satd. Flow (perm)	0	1859	1583	0	1859	1583	1770	1835	0	1770	1829	0
Link Speed (mph)		35			35			35			30	
Link Distance (ft)		1509			2206			3149			1170	
Travel Time (s)		29.4			43.0			61.3			26.6	
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)	11	301	146	19	503	68	176	91	10	40	53	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	312	146	0	522	68	176	101	0	40	60	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 59.7%		ICU Level of Service B	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	15.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	271	131	17	453	61	158	82	9	36	48	6
Future Vol, veh/h	10	271	131	17	453	61	158	82	9	36	48	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	100	-	-	100	100	-	-	100	-	-
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	11	301	146	19	503	68	176	91	10	40	53	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	571	0	0	447	0	0	928	932	301	988	1010	503
Stage 1	-	-	-	-	-	-	323	323	-	541	541	-
Stage 2	-	-	-	-	-	-	605	609	-	447	469	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
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	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1002	-	-	1113	-	-	248	266	739	226	240	569
Stage 1	-	-	-	-	-	-	689	650	-	525	521	-
Stage 2	-	-	-	-	-	-	485	485	-	591	561	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1002	-	-	1113	-	-	195	255	739	156	230	569
Mov Cap-2 Maneuver	-	-	-	-	-	-	195	255	-	156	230	-
Stage 1	-	-	-	-	-	-	679	640	-	517	508	-
Stage 2	-	-	-	-	-	-	418	473	-	493	553	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.3	66.8	28.9
HCM LOS			F	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	195	273	1002	-	-	1113	-	-	156	246
HCM Lane V/C Ratio	0.9	0.37	0.011	-	-	0.017	-	-	0.256	0.244
HCM Control Delay (s)	90.4	25.7	8.6	0	-	8.3	0	-	35.9	24.3
HCM Lane LOS	F	D	A	A	-	A	A	-	E	C
HCM 95th %tile Q(veh)	7	1.6	0	-	-	0.1	-	-	1	0.9

Queuing and Blocking Reports

2028 Background Conditions

Intersection: 1: Driveway/Old Hickory Grove Road & W Catawba Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	158	131	336	204
Average Queue (ft)	41	54	160	90
95th Queue (ft)	105	104	309	150
Link Distance (ft)	1469	970	1037	1590
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: Riddle Street & W Catawba Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	22	35
Average Queue (ft)	1	7
95th Queue (ft)	12	28
Link Distance (ft)	1457	1166
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Rankin Ave & W Catawba Ave

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	8	64	64
Average Queue (ft)	0	9	26
95th Queue (ft)	6	41	56
Link Distance (ft)	1457	2110	3077
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: Highland Street (NC 273) & Rankin Ave/Tuckaseegee Road

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	T	R	R	L	T	R	UL	L	T	TR	L
Maximum Queue (ft)	113	174	145	112	61	103	101	278	153	172	148	51
Average Queue (ft)	54	63	99	82	19	36	29	145	9	72	35	13
95th Queue (ft)	107	148	143	138	51	85	72	243	66	148	106	35
Link Distance (ft)		162				1331				1654	1654	1066
Upstream Blk Time (%)	0	1	0									
Queuing Penalty (veh)	0	2	0									
Storage Bay Dist (ft)	150		75	75	100		150	500	500			
Storage Blk Time (%)	0	5	32	2		2	0					
Queuing Penalty (veh)	0	25	37	2		1	0					

Intersection: 4: Highland Street (NC 273) & Rankin Ave/Tuckaseegee Road

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	306	345	28
Average Queue (ft)	160	174	4
95th Queue (ft)	277	294	19
Link Distance (ft)	1066	1066	1066
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: S Hawthorne Street & W Catawba Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	252	160	161	426
Average Queue (ft)	108	68	75	204
95th Queue (ft)	215	131	135	349
Link Distance (ft)	2110	603	1276	1239
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: S Main Street & W Catawba Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	147	109	104	112
Average Queue (ft)	68	49	46	54
95th Queue (ft)	118	88	89	97
Link Distance (ft)	929	1044	1361	1129
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: Highland Street (NC 273) & W Catawba Ave

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	LT	TR	LT	R
Maximum Queue (ft)	165	56	136	170	351	115
Average Queue (ft)	69	18	44	58	152	31
95th Queue (ft)	121	48	102	126	290	77
Link Distance (ft)	1044	862		2531	587	587
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			50			
Storage Blk Time (%)			4	9		
Queuing Penalty (veh)			10	18		

Intersection: 8: Highland Street (NC 273) & E Charlotte Ave (NC 27)

Movement	EB	EB	EB	B28	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	T	L	T	TR	L	T	TR	L	T
Maximum Queue (ft)	186	490	300	259	293	509	458	114	366	516	471	535
Average Queue (ft)	11	317	250	37	202	222	170	42	164	297	278	191
95th Queue (ft)	72	496	341	178	325	517	427	106	295	489	443	392
Link Distance (ft)		402		1245		1374	1374		587	587		666
Upstream Blk Time (%)		8								2		0
Queuing Penalty (veh)		0								5		0
Storage Bay Dist (ft)	175		150		150			85			375	
Storage Blk Time (%)		41	34		36	3		1	34		6	0
Queuing Penalty (veh)		154	124		42	7		1	10		33	0

Intersection: 8: Highland Street (NC 273) & E Charlotte Ave (NC 27)

Movement	SB	B26
Directions Served	TR	T
Maximum Queue (ft)	364	39
Average Queue (ft)	128	1
95th Queue (ft)	269	29
Link Distance (ft)		1024
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)	700	
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Network Summary

Network wide Queuing Penalty: 471

Intersection: 1: Driveway/Old Hickory Grove Road & W Catawba Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	388	271	526	141
Average Queue (ft)	123	122	317	65
95th Queue (ft)	293	217	608	116
Link Distance (ft)	1469	970	1037	1590
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: Riddle Street & W Catawba Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	33	34
Average Queue (ft)	2	8
95th Queue (ft)	16	29
Link Distance (ft)	1457	1166
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Rankin Ave & W Catawba Ave

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	14	95	155
Average Queue (ft)	1	11	67
95th Queue (ft)	10	55	130
Link Distance (ft)	1457	2110	3077
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: Highland Street (NC 273) & Rankin Ave/Tuckaseegee Road

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	T	R	R	L	T	R	UL	L	T	TR	L
Maximum Queue (ft)	101	175	150	112	103	149	124	399	283	253	242	142
Average Queue (ft)	44	84	84	40	37	63	42	230	44	142	103	63
95th Queue (ft)	92	146	134	99	82	126	97	359	236	231	212	116
Link Distance (ft)		162				1331				1654	1654	1066
Upstream Blk Time (%)		1	0									
Queuing Penalty (veh)		1	0									
Storage Bay Dist (ft)	150		75	75	100		150	500	500			
Storage Blk Time (%)		24	9	1	1	4	0	0				
Queuing Penalty (veh)		81	17	1	1	4	0	1				

Intersection: 4: Highland Street (NC 273) & Rankin Ave/Tuckaseegee Road

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	277	310	76
Average Queue (ft)	185	203	23
95th Queue (ft)	272	295	60
Link Distance (ft)	1066	1066	1066
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: S Hawthorne Street & W Catawba Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	211	196	170	310
Average Queue (ft)	82	94	92	142
95th Queue (ft)	169	169	157	250
Link Distance (ft)	2110	603	1276	1239
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: S Main Street & W Catawba Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	130	160	158	142
Average Queue (ft)	60	79	75	66
95th Queue (ft)	106	132	129	114
Link Distance (ft)	929	1044	1361	1129
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: Highland Street (NC 273) & W Catawba Ave

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	LT	TR	LT	R
Maximum Queue (ft)	132	144	145	176	412	121
Average Queue (ft)	52	73	71	81	167	50
95th Queue (ft)	98	120	131	146	328	103
Link Distance (ft)	1044	862		2531	587	587
Upstream Blk Time (%)					0	
Queuing Penalty (veh)					0	
Storage Bay Dist (ft)			50			
Storage Blk Time (%)			12	12		
Queuing Penalty (veh)			42	42		

Intersection: 8: Highland Street (NC 273) & E Charlotte Ave (NC 27)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	47	232	207	300	1046	996	115	460	475	330	358	252
Average Queue (ft)	11	140	124	277	488	430	35	268	276	160	152	100
95th Queue (ft)	36	204	189	342	954	879	96	407	416	311	269	190
Link Distance (ft)		402			1374	1374		587	587		666	
Upstream Blk Time (%)					0	0			0			
Queuing Penalty (veh)					0	0			0			
Storage Bay Dist (ft)	175		150	150			85			375		700
Storage Blk Time (%)		8	3	47	24		0	52		2		
Queuing Penalty (veh)		15	5	144	119		0	10		7		

Network Summary

Network wide Queuing Penalty: 492

2028 Build-out Conditions

Intersection: 1: Driveway/Old Hickory Grove Road & W Catawba Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	152	170	342	175
Average Queue (ft)	45	67	199	92
95th Queue (ft)	108	128	393	148
Link Distance (ft)	1469	972	1037	1590
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: Riddle Street/Access 1 & W Catawba Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	34	44	34	61
Average Queue (ft)	2	3	6	28
95th Queue (ft)	21	19	25	53
Link Distance (ft)	972	1449	1166	1098
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Rankin Ave/Access 2 & W Catawba Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	50	52	113	139
Average Queue (ft)	4	6	44	52
95th Queue (ft)	26	31	87	97
Link Distance (ft)	1449	2093	3072	1135
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Highland Street (NC 273) & Rankin Ave/Tuckaseegee Road

Movement	EB	EB	EB	EB	B10	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	R	R	T	L	T	R	UL	L	T	TR
Maximum Queue (ft)	145	206	150	112	12	58	122	99	344	112	177	154
Average Queue (ft)	49	73	107	89	1	19	38	37	182	11	77	41
95th Queue (ft)	109	174	151	142	9	49	87	84	295	80	150	116
Link Distance (ft)		162			3072		1331				1654	1654
Upstream Blk Time (%)	0	1	0									
Queuing Penalty (veh)	0	3	0									
Storage Bay Dist (ft)	150		75	75		100		150	500	500		
Storage Blk Time (%)	0	4	36	3			1	0				
Queuing Penalty (veh)	1	21	41	4			0	0				

Intersection: 4: Highland Street (NC 273) & Rankin Ave/Tuckaseegee Road

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (ft)	55	297	342	49
Average Queue (ft)	13	172	186	6
95th Queue (ft)	40	283	309	27
Link Distance (ft)	1066	1066	1066	1066
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: S Hawthorne Street & W Catawba Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	452	190	164	642
Average Queue (ft)	192	87	82	239
95th Queue (ft)	437	163	140	477
Link Distance (ft)	2093	603	1276	1239
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: S Main Street & W Catawba Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	175	119	111	114
Average Queue (ft)	84	52	46	51
95th Queue (ft)	143	99	85	98
Link Distance (ft)	929	1044	1361	1129
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: Highland Street (NC 273) & W Catawba Ave

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	LT	TR	LT	R
Maximum Queue (ft)	317	54	133	438	460	103
Average Queue (ft)	112	14	63	125	169	33
95th Queue (ft)	246	43	139	430	353	80
Link Distance (ft)	1044	862		2531	587	587
Upstream Blk Time (%)					0	
Queuing Penalty (veh)					0	
Storage Bay Dist (ft)			50			
Storage Blk Time (%)			8	20		
Queuing Penalty (veh)			18	41		

Intersection: 8: Highland Street (NC 273) & E Charlotte Ave (NC 27)

Movement	EB	EB	EB	B28	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	T	L	T	TR	L	T	TR	L	T
Maximum Queue (ft)	246	510	300	426	293	479	420	114	506	604	500	755
Average Queue (ft)	17	367	274	63	201	217	161	47	215	409	347	320
95th Queue (ft)	122	540	343	244	326	512	408	110	458	649	560	709
Link Distance (ft)		402		1245		1374	1374		587	587		666
Upstream Blk Time (%)		14							2	11		6
Queuing Penalty (veh)		0							5	35		0
Storage Bay Dist (ft)	175		150		150			85			375	
Storage Blk Time (%)		51	44		35	4		2	33		25	0
Queuing Penalty (veh)		193	164		42	9		3	10		137	1

Intersection: 8: Highland Street (NC 273) & E Charlotte Ave (NC 27)

Movement	SB	B26
Directions Served	TR	T
Maximum Queue (ft)	666	330
Average Queue (ft)	236	49
95th Queue (ft)	597	316
Link Distance (ft)		1024
Upstream Blk Time (%)	1	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)	700	
Storage Blk Time (%)	1	
Queuing Penalty (veh)	3	

Network Summary

Network wide Queuing Penalty: 730

Intersection: 1: Driveway/Old Hickory Grove Road & W Catawba Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	395	280	486	157
Average Queue (ft)	136	129	271	73
95th Queue (ft)	309	224	473	125
Link Distance (ft)	1469	972	1037	1590
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: Riddle Street/Access 1 & W Catawba Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	96	37	35	44
Average Queue (ft)	14	3	9	20
95th Queue (ft)	51	26	32	46
Link Distance (ft)	972	1449	1166	1098
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Rankin Ave/Access 2 & W Catawba Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	65	62	348	96
Average Queue (ft)	6	6	149	41
95th Queue (ft)	36	32	291	77
Link Distance (ft)	1449	2093	3072	1135
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Highland Street (NC 273) & Rankin Ave/Tuckaseegee Road

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	T	R	R	L	T	R	UL	L	T	TR	L
Maximum Queue (ft)	102	168	146	112	113	145	120	515	498	329	233	137
Average Queue (ft)	41	86	90	48	41	64	42	315	107	159	117	62
95th Queue (ft)	89	141	138	102	89	120	93	487	391	302	220	117
Link Distance (ft)		162				1331				1654	1654	1066
Upstream Blk Time (%)		0	0									
Queuing Penalty (veh)		1	0									
Storage Bay Dist (ft)	150		75	75	100		150	500	500			
Storage Blk Time (%)		26	9	0	1	4	0	3	1			
Queuing Penalty (veh)		100	16	1	1	4	0	10	3			

Intersection: 4: Highland Street (NC 273) & Rankin Ave/Tuckaseegee Road

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	299	314	75
Average Queue (ft)	193	207	20
95th Queue (ft)	289	306	53
Link Distance (ft)	1066	1066	1066
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: S Hawthorne Street & W Catawba Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	361	225	218	330
Average Queue (ft)	137	110	109	165
95th Queue (ft)	295	187	191	304
Link Distance (ft)	2093	603	1276	1239
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: S Main Street & W Catawba Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	166	198	183	164
Average Queue (ft)	74	90	76	73
95th Queue (ft)	134	155	143	129
Link Distance (ft)	929	1044	1361	1129
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: Highland Street (NC 273) & W Catawba Ave

Movement	EB	WB	NB	NB	B27	B27	SB	SB
Directions Served	LTR	LTR	LT	TR	T		LT	R
Maximum Queue (ft)	163	139	149	216	10	11	380	202
Average Queue (ft)	67	73	74	87	0	0	153	57
95th Queue (ft)	128	120	140	170	7	8	289	158
Link Distance (ft)	1044	862		2531	1066	1066	587	587
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			50					
Storage Blk Time (%)			11	13				
Queuing Penalty (veh)			38	44				

Intersection: 8: Highland Street (NC 273) & E Charlotte Ave (NC 27)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	68	310	268	300	1024	940	114	484	533	348	270	241
Average Queue (ft)	12	176	158	283	546	482	23	280	310	164	135	99
95th Queue (ft)	44	296	266	340	1067	994	74	435	472	303	224	183
Link Distance (ft)		402			1374	1374		587	587		666	
Upstream Blk Time (%)		0			2	1			0			
Queuing Penalty (veh)		0			0	0			0			
Storage Bay Dist (ft)	175		150	150			85			375		700
Storage Blk Time (%)		22	17	49	26		0	54		1	0	
Queuing Penalty (veh)		46	31	157	137		1	11		3	0	

Network Summary

Network wide Queuing Penalty: 603

2028 Build-out Conditions
Improved

Access 2 – Roundabout

Intersection: 1: Driveway/Old Hickory Grove Road & W Catawba Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	132	165	258	175
Average Queue (ft)	49	73	155	91
95th Queue (ft)	113	135	264	149
Link Distance (ft)	1469	972	1037	1590
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: Riddle Street/Access 1 & W Catawba Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	31	21	35	61
Average Queue (ft)	2	1	5	26
95th Queue (ft)	14	12	25	55
Link Distance (ft)	972	1425	1166	1098
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Rankin Ave/Access 2 & W Catawba Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	109	74	68	59
Average Queue (ft)	39	12	14	17
95th Queue (ft)	95	47	46	48
Link Distance (ft)	1425	2092	3069	1116
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Highland Street (NC 273) & Rankin Ave/Tuckaseegee Road

Movement	EB	EB	EB	EB	B10	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	R	R	T	L	T	R	UL	L	T	TR
Maximum Queue (ft)	147	214	148	112	11	60	94	96	312	170	191	144
Average Queue (ft)	57	85	110	89	0	20	36	28	185	12	82	38
95th Queue (ft)	122	181	152	140	6	51	79	70	284	87	156	109
Link Distance (ft)		162			3069		1331				1654	1654
Upstream Blk Time (%)	0	1	0									
Queuing Penalty (veh)	0	3	0									
Storage Bay Dist (ft)	150		75	75		100		150	500	500		
Storage Blk Time (%)	0	5	36	4			0					
Queuing Penalty (veh)	0	34	41	4			0					

Intersection: 4: Highland Street (NC 273) & Rankin Ave/Tuckaseegee Road

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (ft)	58	326	364	40
Average Queue (ft)	13	186	203	6
95th Queue (ft)	39	296	316	24
Link Distance (ft)	1066	1066	1066	1066
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: S Hawthorne Street & W Catawba Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	388	166	181	750
Average Queue (ft)	165	76	82	306
95th Queue (ft)	321	134	148	645
Link Distance (ft)	2092	603	1276	1239
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: S Main Street & W Catawba Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	176	122	114	106
Average Queue (ft)	83	52	49	57
95th Queue (ft)	143	95	91	96
Link Distance (ft)	929	1044	1361	1129
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: Highland Street (NC 273) & W Catawba Ave

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	LT	TR	LT	R
Maximum Queue (ft)	392	56	149	566	431	164
Average Queue (ft)	151	15	81	202	194	39
95th Queue (ft)	335	44	173	594	399	127
Link Distance (ft)	1044	862		2531	587	587
Upstream Blk Time (%)					0	
Queuing Penalty (veh)					0	
Storage Bay Dist (ft)			50			
Storage Blk Time (%)			13	37		
Queuing Penalty (veh)			28	78		

Intersection: 8: Highland Street (NC 273) & E Charlotte Ave (NC 27)

Movement	EB	EB	EB	B28	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	T	L	T	TR	L	T	TR	L	T
Maximum Queue (ft)	62	490	300	433	300	470	382	114	605	611	472	564
Average Queue (ft)	10	355	269	90	203	185	134	42	331	536	317	262
95th Queue (ft)	43	539	350	405	311	383	296	103	653	701	516	609
Link Distance (ft)		402		1245		1374	1374		587	587		666
Upstream Blk Time (%)		13							6	25		4
Queuing Penalty (veh)		0							19	80		0
Storage Bay Dist (ft)	175		150		150			85			375	
Storage Blk Time (%)		49	43		34	4		1	40		15	0
Queuing Penalty (veh)		188	158		40	10		2	12		84	0

Intersection: 8: Highland Street (NC 273) & E Charlotte Ave (NC 27)

Movement	SB	B26
Directions Served	TR	T
Maximum Queue (ft)	440	236
Average Queue (ft)	210	46
95th Queue (ft)	530	294
Link Distance (ft)		1024
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)	700	
Storage Blk Time (%)	0	
Queuing Penalty (veh)	3	

Network Summary

Network wide Queuing Penalty: 783

Intersection: 1: Driveway/Old Hickory Grove Road & W Catawba Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	550	292	602	144
Average Queue (ft)	182	129	347	72
95th Queue (ft)	462	234	635	124
Link Distance (ft)	1469	972	1037	1590
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: Riddle Street/Access 1 & W Catawba Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	131	20	36	54
Average Queue (ft)	18	1	6	22
95th Queue (ft)	68	15	27	49
Link Distance (ft)	972	1425	1166	1098
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Rankin Ave/Access 2 & W Catawba Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	130	181	118	64
Average Queue (ft)	24	65	50	23
95th Queue (ft)	77	142	102	54
Link Distance (ft)	1425	2092	3069	1116
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Highland Street (NC 273) & Rankin Ave/Tuckaseegee Road

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	T	R	R	L	T	R	UL	L	T	TR	L
Maximum Queue (ft)	93	155	140	112	104	144	96	521	480	400	298	143
Average Queue (ft)	39	83	87	47	42	67	37	320	110	157	122	69
95th Queue (ft)	83	132	130	100	85	127	84	502	416	297	237	125
Link Distance (ft)		162				1331				1654	1654	1066
Upstream Blk Time (%)		0	0									
Queuing Penalty (veh)		0	0									
Storage Bay Dist (ft)	150		75	75	100		150	500	500			
Storage Blk Time (%)		24	10	1	1	5		5	0			
Queuing Penalty (veh)		93	17	1	1	5		16	1			

Intersection: 4: Highland Street (NC 273) & Rankin Ave/Tuckaseegee Road

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	311	331	81
Average Queue (ft)	193	206	23
95th Queue (ft)	288	299	61
Link Distance (ft)	1066	1066	1066
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: S Hawthorne Street & W Catawba Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	461	278	226	375
Average Queue (ft)	148	112	101	179
95th Queue (ft)	345	206	180	321
Link Distance (ft)	2092	603	1276	1239
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: S Main Street & W Catawba Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	156	185	168	144
Average Queue (ft)	66	87	74	68
95th Queue (ft)	123	149	131	116
Link Distance (ft)	929	1044	1361	1129
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: Highland Street (NC 273) & W Catawba Ave

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	LT	TR	LT	R
Maximum Queue (ft)	127	158	147	210	363	180
Average Queue (ft)	59	75	74	86	162	56
95th Queue (ft)	108	130	133	159	303	118
Link Distance (ft)	1044	862		2531	587	587
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			50			
Storage Blk Time (%)			13	12		
Queuing Penalty (veh)			44	41		

Intersection: 8: Highland Street (NC 273) & E Charlotte Ave (NC 27)

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	62	256	229	300	1263	1249	102	459	478	311	270	236
Average Queue (ft)	14	140	124	285	600	531	22	268	294	153	142	110
95th Queue (ft)	47	214	193	335	1222	1144	71	398	437	280	230	206
Link Distance (ft)		402			1374	1374		587	587		666	
Upstream Blk Time (%)					2	1			0			
Queuing Penalty (veh)					0	0			0			
Storage Bay Dist (ft)	175		150	150			85			375		700
Storage Blk Time (%)		9	4	47	25		0	50		0	0	
Queuing Penalty (veh)		18	6	149	136		0	10		0	0	

Network Summary

Network wide Queuing Penalty: 541

SIDRA Reports

2028 Build-out Conditions
Improved

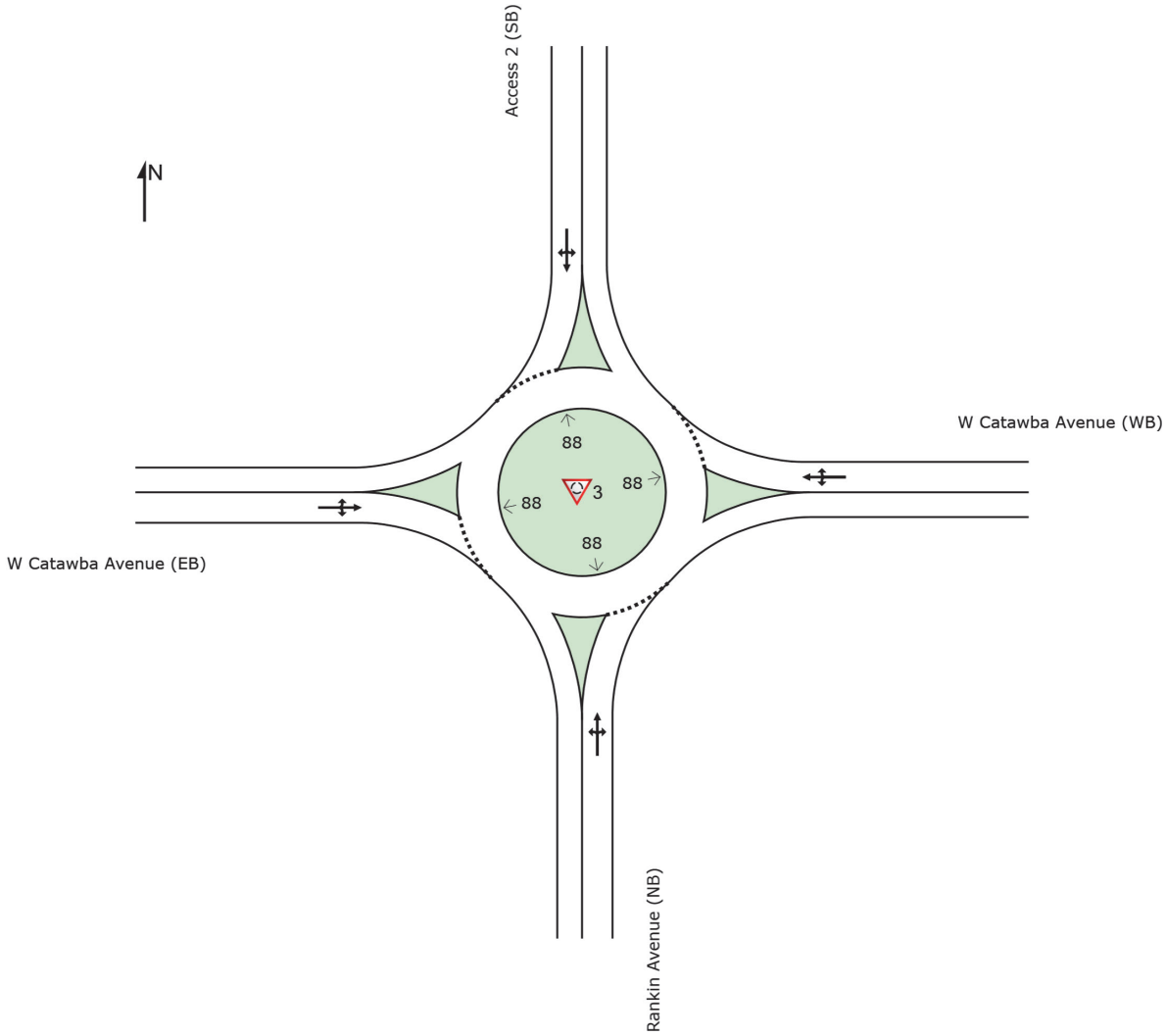
Access 2 – Roundabout

SITE LAYOUT

Site: 3 [#3 2028 BO IMP AM (Site Folder: General)]

Holly Springs TIA update
Site Category: 2028 Build-out IMP
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 3 [#3 2028 BO IMP AM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Holly Springs TIA update
Site Category: 2028 Build-out IMP
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: Rankin Avenue (NB)															
46	L2	All MCs	51	2.0	51	2.0	0.110	5.4	LOS A	0.4	11.1	0.53	0.43	0.53	22.5
25	T1	All MCs	28	2.0	28	2.0	0.110	5.4	LOS A	0.4	11.1	0.53	0.43	0.53	22.7
6	R2	All MCs	7	40.0	7	40.0	0.110	11.6	LOS B	0.4	11.1	0.53	0.43	0.53	22.6
Approach			86	5.0	86	5.0	0.110	5.8	LOS A	0.4	11.1	0.53	0.43	0.53	22.6
East: W Catawba Avenue (WB)															
15	L2	All MCs	17	2.0	17	2.0	0.234	4.8	LOS A	1.2	30.6	0.25	0.10	0.25	23.3
224	T1	All MCs	249	4.0	249	4.0	0.234	4.9	LOS A	1.2	30.6	0.25	0.10	0.25	23.5
18	R2	All MCs	20	2.0	20	2.0	0.234	4.8	LOS A	1.2	30.6	0.25	0.10	0.25	23.4
Approach			286	3.7	286	3.7	0.234	4.9	LOS A	1.2	30.6	0.25	0.10	0.25	23.5
North: Access 2 (SB)															
55	L2	All MCs	61	2.0	61	2.0	0.159	5.2	LOS A	0.7	17.8	0.47	0.32	0.47	22.9
74	T1	All MCs	82	2.0	82	2.0	0.159	5.2	LOS A	0.7	17.8	0.47	0.32	0.47	23.0
9	R2	All MCs	10	2.0	10	2.0	0.159	5.2	LOS A	0.7	17.8	0.47	0.32	0.47	23.0
Approach			153	2.0	153	2.0	0.159	5.2	LOS A	0.7	17.8	0.47	0.32	0.47	23.0
West: W Catawba Avenue (EB)															
3	L2	All MCs	3	2.0	3	2.0	0.541	9.3	LOS A	4.0	101.6	0.53	0.28	0.53	22.3
381	T1	All MCs	423	2.0	423	2.0	0.541	9.3	LOS A	4.0	101.6	0.53	0.28	0.53	22.5
171	R2	All MCs	190	3.0	190	3.0	0.541	9.4	LOS A	4.0	101.6	0.53	0.28	0.53	22.4
Approach			617	2.3	617	2.3	0.541	9.3	LOS A	4.0	101.6	0.53	0.28	0.53	22.5
All Vehicles			1141	2.8	1141	2.8	0.541	7.4	LOS A	4.0	101.6	0.45	0.25	0.45	22.8

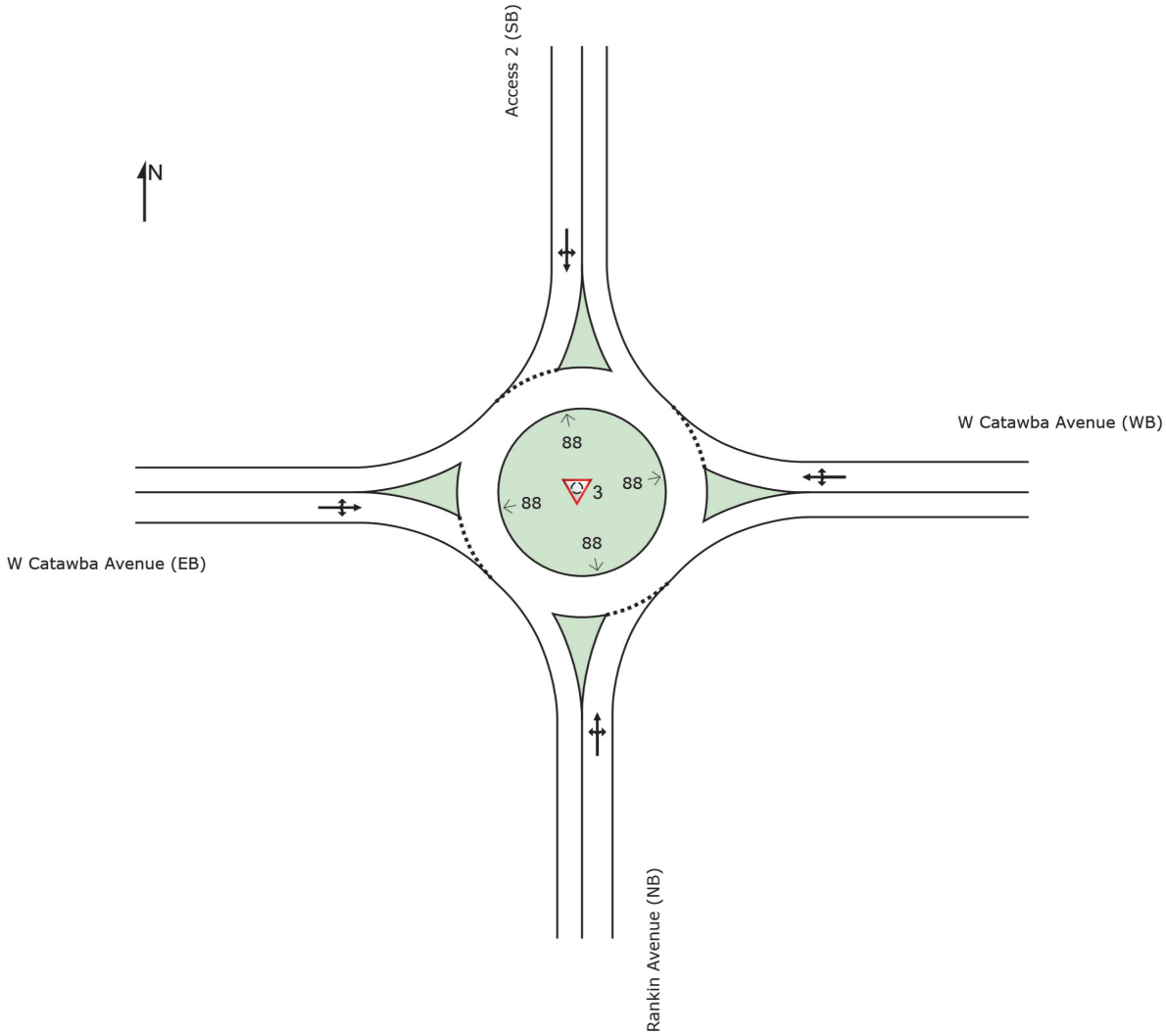
Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

Site: 3 [#3 2028 BO IMP PM (Site Folder: General)]

Holly Springs TIA update
Site Category: 2028 Build-out IMP
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 3 [#3 2028 BO IMP PM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Holly Springs TIA update
Site Category: 2028 Build-out IMP
Roundabout

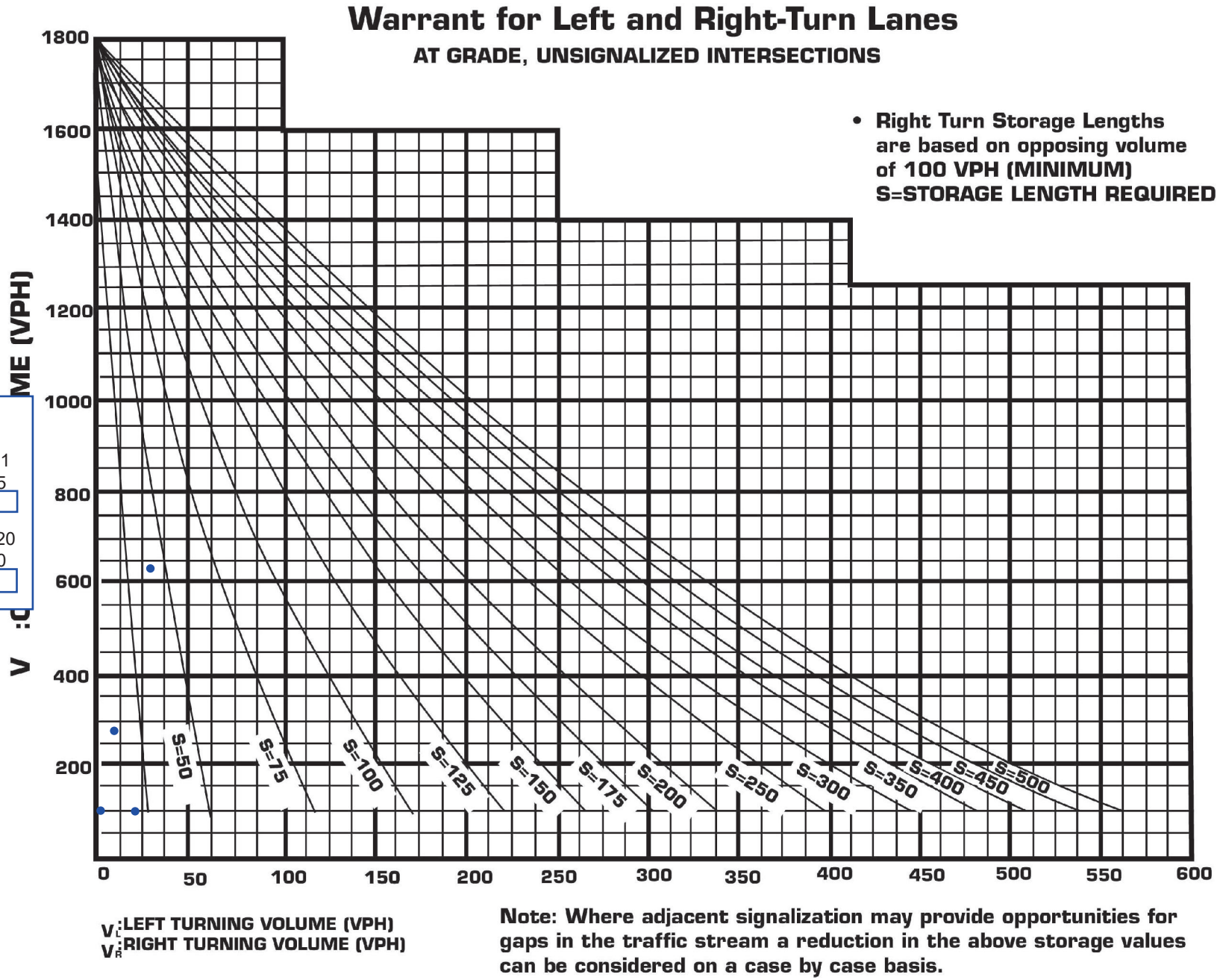
Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: Rankin Avenue (NB)															
158	L2	All MCs	176	2.0	176	2.0	0.297	6.9	LOS A	1.4	36.7	0.54	0.39	0.54	22.3
82	T1	All MCs	91	2.0	91	2.0	0.297	6.9	LOS A	1.4	36.7	0.54	0.39	0.54	22.4
9	R2	All MCs	10	2.0	10	2.0	0.297	6.9	LOS A	1.4	36.7	0.54	0.39	0.54	22.4
Approach			277	2.0	277	2.0	0.297	6.9	LOS A	1.4	36.7	0.54	0.39	0.54	22.3
East: W Catawba Avenue (WB)															
17	L2	All MCs	19	2.0	19	2.0	0.585	11.2	LOS B	5.6	143.1	0.68	0.57	0.87	21.9
453	T1	All MCs	503	2.0	503	2.0	0.585	11.2	LOS B	5.6	143.1	0.68	0.57	0.87	22.1
61	R2	All MCs	68	2.0	68	2.0	0.585	11.2	LOS B	5.6	143.1	0.68	0.57	0.87	22.0
Approach			590	2.0	590	2.0	0.585	11.2	LOS B	5.6	143.1	0.68	0.57	0.87	22.1
North: Access 2 (SB)															
36	L2	All MCs	40	2.0	40	2.0	0.155	7.4	LOS A	0.6	15.4	0.62	0.56	0.62	22.4
48	T1	All MCs	53	2.0	53	2.0	0.155	7.4	LOS A	0.6	15.4	0.62	0.56	0.62	22.6
6	R2	All MCs	7	2.0	7	2.0	0.155	7.4	LOS A	0.6	15.4	0.62	0.56	0.62	22.5
Approach			100	2.0	100	2.0	0.155	7.4	LOS A	0.6	15.4	0.62	0.56	0.62	22.5
West: W Catawba Avenue (EB)															
10	L2	All MCs	11	2.0	11	2.0	0.380	6.6	LOS A	2.3	59.1	0.36	0.17	0.36	22.9
271	T1	All MCs	301	2.0	301	2.0	0.380	6.6	LOS A	2.3	59.1	0.36	0.17	0.36	23.1
131	R2	All MCs	146	2.0	146	2.0	0.380	6.6	LOS A	2.3	59.1	0.36	0.17	0.36	23.0
Approach			458	2.0	458	2.0	0.380	6.6	LOS A	2.3	59.1	0.36	0.17	0.36	23.1
All Vehicles			1424	2.0	1424	2.0	0.585	8.6	LOS A	5.6	143.1	0.55	0.41	0.62	22.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Auxiliary Turn-Lane Warrants

Int. # 2: W Catawba Avenue and Riddle Street/Access #1



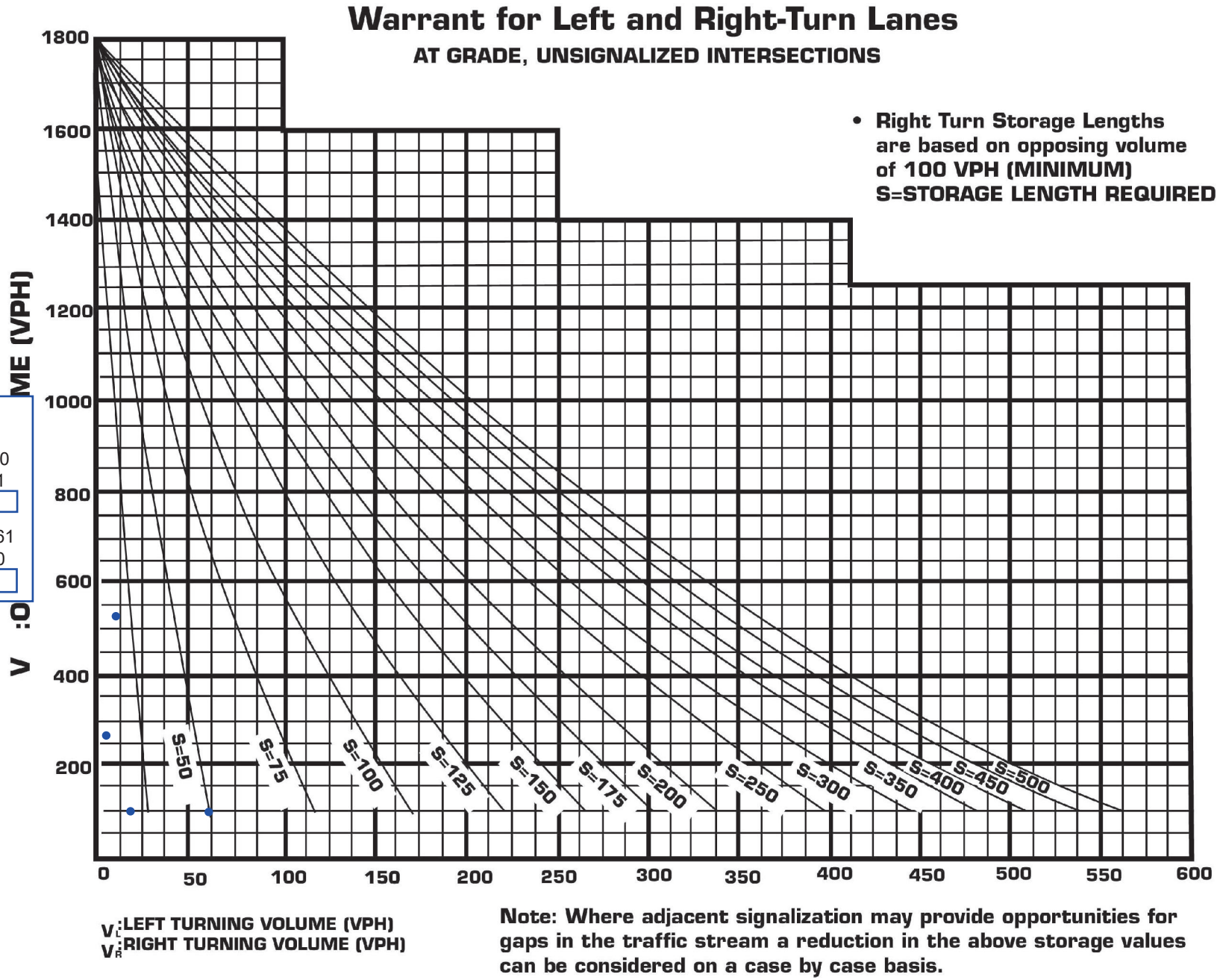
2028 Build

AM	PM
V_{EBL} = 9	V_{EBL} = 31
V_o = 279	V_o = 615
S = 0'	S = 0'
V_{WBR} = 6	V_{WBR} = 20
V_o = 100	V_o = 100
S = 0'	S = 0'

Policy On Street And Driveway Access to North Carolina Highways

July 2003

Int. # 3: W Catawba Avenue and Rankin Avenue/Access #2



2028 Build

AM	PM
V_{EBL} = 3	V_{EBL} = 10
V_o = 257	V_o = 531
S = 0'	S = 0'
V_{WBR} = 18	V_{WBR} = 61
V_o = 100	V_o = 100
S = 0'	S = 0'

Policy On Street And Driveway Access to North Carolina Highways

July 2003