
TRAFFIC IMPACT STUDY

FOR THE

KANNAPOLIS GROCERY STORE DEVELOPMENT

LOCATED
IN
KANNAPOLIS, NORTH CAROLINA

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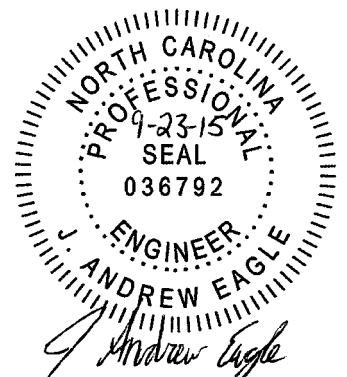


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TRAFFIC IMPACT STUDY

KANNAPOLIS GROCERY STORE DEVELOPMENT

KANNAPOLIS, NORTH CAROLINA

1. EXECUTIVE SUMMARY

This report summarizes the findings of the Traffic Impact Study (TIS) that was performed for the proposed commercial development located along the east side Dale Earnhardt Boulevard at Coldwater Ridge Drive in Kannapolis, North Carolina. The purpose of this study is to determine the potential impact to the surrounding transportation system caused by the traffic generated by the development.

The site is proposed to consist of a 36,200 square foot grocery store. Site access is proposed via one full access driveway across from Coldwater Ridge Drive. The site is expected to be fully built by the year 2017.

The study area for the TIS was determined through coordination with NCDOT and the City of Kannapolis and consists of the following intersections:

1. Dale Earnhardt Boulevard and Coldwater Ridge Drive / Site Drive 1
2. Coldwater Ridge Drive and Roxie Street
3. Concord Lake Road and Roxie Street
4. Dale Earnhardt Boulevard and Concord Lake Road

Based on discussions with NCDOT and the City of Kannapolis, no roadway projects were identified in the study area that would affect traffic operations.

Based on coordination with NCDOT and the City of Concord, no approved offsite developments were included in the traffic analysis.

Several scenarios were analyzed using traffic analysis software. Traffic operations during the AM and PM peak hours were modeled for each scenario. The results of each scenario were compared in order to determine impacts from background traffic growth, and the proposed development.

The following scenarios were modeled:

- 2015 Existing
- 2017 No-Build
- 2017 Build

Based on the analysis results, minor impacts are expected by the proposed development. No queue issues are expected. The following improvements have been recommended to be constructed by the developer:

Dale Earnhardt and Coldwater Ridge Drive / Site Drive 1

- Stripe the eastbound Coldwater Ridge Drive approach to show one left turn lane with 100 feet of storage and one shared through/right turn lane.
- Construct Site Drive 1 with one left turn lane with 100 feet of storage and one shared through/right turn lane.
- Restripe the southbound approach to show one left turn lane with 100 feet of storage.
- Remove pavement markings through intersection.
- Install a traffic signal.

Coldwater Ridge Drive and Roxie Street

- No improvements are recommended.

Concord Lake Road and Roxie Street

- No improvements are recommended.

Dale Earnhardt Boulevard and Concord Lake Road

- No improvements are recommended.

2. INTRODUCTION

2.1. Purpose of Report

This report summarizes the findings of the Traffic Impact Study (TIS) that was performed for the proposed commercial development located along the east side Dale Earnhardt Boulevard at Coldwater Ridge Drive in Kannapolis, North Carolina. The purpose of this study is to determine the potential impact to the surrounding transportation system caused by the traffic generated by the development.

2.2. Study Objectives

The site is proposed to consist of a 36,200 square foot grocery store. Site access is proposed via one full access driveway across from Coldwater Ridge Drive. The site is expected to be fully built by the year 2017.

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

3. AREA CONDITIONS

3.1. Transportation Network Study Area

3.1.1. Area Roadway System

The project study area for this TIS was determined through coordination with the North Carolina Department of Transportation (NCDOT) and the City of Kannapolis. Table 1 summarizes the characteristics of the roadways within the study area. The NCDOT Functional Class map was used to determine the classification of each road. Traffic Volume maps from NCDOT were used to find the average daily traffic (ADT) volumes in vehicles per day (vpd) for the roadways. A field visit was conducted to verify the existing cross-sections and speed limits in mph.

TABLE 1
STUDY AREA ROADS

ROADWAY	CLASSIFICATION	CROSS-SECTION	ADT (vpd)	SPEED LIMIT (mph)
Dale Earnhardt Boulevard	Major Collector	Five-Lane	16,000	45
Coldwater Ridge Drive	Local	Two-Lane	No Data	35
Roxie Street	Local	Two-Lane	12,000	35
Concord Lake Road	Minor Arterial	Two-Lane	11,000	45

3.1.1.1. Existing

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

3.1.1.2. Future

Based on discussions with NCDOT and the City of Kannapolis, no roadway projects were identified in the study area that would affect traffic operations.

3.1.2. Study Area and Existing Traffic Volumes

The study area for the TIS was determined through coordination with NCDOT and the City of Kannapolis and consists of the following intersections:

1. Dale Earnhardt Boulevard and Coldwater Ridge Drive / Site Drive 1
2. Coldwater Ridge Drive and Roxie Street
3. Concord Lake Road and Roxie Street
4. Dale Earnhardt Boulevard and Concord Lake Road

Traffic counts at the study intersections were conducted by RKA during the AM and PM peak periods. A 12-hour count was performed at the intersection of Dale Earnhardt Boulevard and Coldwater Ridge Drive. A copy of the traffic count data can be found in Appendix B of this

report. The peak hour traffic volumes were balanced between intersections where appropriate. Refer to Figure 4 for an illustration of the existing peak hour traffic volumes.

3.2. Study Area – Adjacent Land Use

3.2.1. Existing Land Uses

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

3.2.2. Anticipated or Approved Future Development

Based on coordination with NCDOT and the City of Concord, no approved offsite developments were included in the traffic analysis.

4. PROJECTED TRAFFIC

4.1. Site Traffic

In order to determine the future traffic conditions after the proposed development is completed, an estimate of traffic projected to travel to/from the proposed development is required. The average weekday daily as well as AM and PM peak hour site trips for this study were calculated based on the ITE *Trip Generation Manual*, 9th Edition.

4.1.1. Trip Generation

The site is proposed to consist of a 36,200 square foot grocery store. Table 2 presents a summary of the trip generation calculations for the proposed development.

**TABLE 2
PROPOSED SITE
TRIP GENERATION**

LAND USE	SIZE	DAILY TRIPS (VPD)	PEAK HOUR TRIPS (VPH)			
			AM		PM	
			ENTER	EXIT	ENTER	EXIT
Supermarket (850)	36,200 SF	3,816	76	47	187	180
Pass-By Trips			0	0	66	66
Total New External Trips			76	47	121	114

(1) Based on ITE Trip Generation - 9th Edition

4.1.2. Trip Distribution and Assignment

The trip distribution percentages were developed based on existing traffic patterns, nearby land uses, population centers, and engineering judgment. Figure 5 illustrates the primary trip distribution percentages. It was assumed that pass-by trips would be split such that 40% of pass-by traffic comes from the eastbound direction and 60% comes from the westbound direction relative to the site driveway. Figure 6 illustrates the pass-by trip distribution. These trip distribution percentages were applied to the trip generation data to calculate the primary trip assignments shown in Figure 7 and the pass-by trip assignments shown in Figure 8. Combining the primary trip assignment (Figure 7) with the pass-by trip assignment (Figure 8) results in the total trip assignment for the proposed site as shown in Figure 9.

5. TRAFFIC ANALYSIS

5.1. Traffic Analysis Scenarios

Several scenarios were analyzed using traffic analysis software. Traffic operations during the AM and PM peak hours were modeled for each scenario. The results of each scenario were compared in order to determine impacts from background traffic growth, and the proposed development.

The following scenarios were modeled:

- 2015 Existing
- 2017 No-Build
- 2017 Build

The 2015 Existing scenario included the traffic characteristics that currently exist in the study area. Existing peak hour traffic volumes were used from the intersection counts. No changes to the existing lane configurations were made. Existing signal timing data was obtained from NCDOT and included in the traffic models. The signal cycle lengths and splits were optimized. Right turns on red are currently allowed on all approaches. All models allowed right turns on red. Refer to Appendix C for signal timing data.

The 2017 No-Build scenario was analyzed to determine the expected future traffic operations. Existing peak hour traffic counts were projected to the year 2017 using a growth rate of 2% per year. These projected volumes represent the 2017 No-Build peak hour traffic volumes found in

Figure 10. No changes to the existing lane configurations were made. Existing signal timing data was used. The signal cycle lengths and splits were optimized. Right turns on red were allowed on all approaches.

The 2017 Build scenario was compared to the 2017 No-Build scenario to determine expected impacts caused by the proposed site. This scenario included the same assumptions as the 2017 No-Build scenario. The trips expected to be generated by the proposed site (Figure 9) were added to the 2017 No-Build peak hour volumes (Figure 10). Refer to Figure 11 for the 2017 Build peak hour traffic volumes. Lane configurations at the intersection of Dale Earnhardt Boulevard and Coldwater Ridge Drive were adjusted to include the proposed site driveway. Existing signal timing data was used. The signal cycle lengths and splits were optimized. Right turns on red were allowed on all approaches.

5.2. Traffic Analysis Procedure

All study intersections (both unsignalized and signalized) were analyzed using the methodology outlined in the Highway Capacity Manual (HCM) published by the Transportation Research Board. A computer software package, Synchro and SimTraffic (Version 9), was used to complete the analyses for all of the study area intersections. Synchro was developed by Trafficware Corporation and allows the user to input data into the Synchro software and calculate the output based on methodologies in the HCM. SimTraffic creates a traffic simulation model from the Synchro inputs. SimTraffic was used in this study to determine expected queue lengths.

Analysis results for signalized intersections provide delay, level of service (LOS), and volume to capacity ratios for all movements and approaches. The overall intersection delay, LOS, and maximum v/c ratio is also provided. The capacity analysis for an unsignalized intersection does not provide an overall LOS for the intersection, but rather a LOS for movements and/or approaches that have a conflicting movement. LOS and v/c ratios are the design criteria for this traffic study.

The HCM defines capacity as “the maximum hourly rate at which persons or vehicles can reasonably be expected to traverse a point or uniform section of a lane or roadway during a given

time period under prevailing roadway, traffic, and control conditions”. LOS is a term used to represent different driving conditions, and is defined as a “qualitative measure describing operational conditions within a traffic stream, and their perception by motorists and/or passengers”. LOS varies from Level “A” representing free flow, to Level “F” where greater vehicle delays are evident. The ratio of demand volume to capacity is known as the v/c ratio. This ratio starts at 0.0 (no demand volume). A 1.0 v/c ratio is considered to be at full capacity. Ratios higher than 1.0 are over capacity.

Refer to Table 3 for HCM levels of service and related average control delay per vehicle for both signalized and unsignalized intersections. Control delay as defined by the HCM includes “initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay”. As shown in Table 3, an average control delay of 40 seconds at a signalized intersection results in a LOS D operation.

TABLE 3
HIGHWAY CAPACITY MANUAL - LEVELS OF SERVICE AND DELAY

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

5.3. Mitigation Requirements

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

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

5.4. Capacity and Level of Service at Study Intersections

5.4.1. Dale Earnhardt Boulevard and Coldwater Ridge Drive / Site Drive 1

Dale Earnhardt Boulevard and Coldwater Ridge Drive intersect to form a three-legged unsignalized intersection. The northbound and southbound approaches currently include right turn lanes and cross section includes a two-way left turn lane. The southbound two-way left turn lane is currently striped as a northbound left onto Old Earnhardt Road. The fourth leg is currently stubbed out and not in use. Table 4 summarizes the capacity analysis results. Highlighted values in this table represent impacts by the proposed development. Refer to Appendix D for the Synchro reports. All SimTraffic reports can be found in Appendix H.

Site Drive 1 is proposed to form the fourth leg at this intersection. The southbound approach was modeled with one left turn lane, but it should be noted that this lane would need to be restriped. The Site Drive 1 approach was modeled with one left turn lane and one shared through/right lane. This additional leg and the trips generated by the proposed development are expected to increase delay on the side street approaches. The side street approaches are expected to operate at LOS C during the AM peak hour and LOS F during the PM peak hour of the 2017 Build scenario. SimTraffic indicates the queues on these approaches are expected to be less than approximately 150 feet.

The intersection was also modeled with a traffic signal due to the expected high delays on the side street approaches. A signal warrant analysis was performed based on guidelines in the Manual on Uniform Traffic Control Devices (MUTCD). Analysis was conducted for Warrant 1: Eight-Hour, Warrant 2: Four-Hour, and Warrant 3: Peak Hour. Hourly volumes for the proposed site trips were estimated using the hourly variation in shopping center traffic (land use 820) from the *ITE Trip Generation Manual, 9th Edition*. The 2017 Build volumes are expected to meet all three warrants. The signal warrant analysis can be found at the end of Appendix D. It is recommended the developer install a traffic signal at this intersection.

**TABLE 4
ANALYSIS SUMMARY OF
DALE EARNHARDT BOULEVARD AND
COLDWATER RIDGE DRIVE / SITE DRIVE 1**

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	AM PEAK HOUR		PM PEAK HOUR	
			Approach LOS (Delay)	Overall LOS (Delay)	Approach LOS (Delay)	Overall LOS (Delay)
2015 Existing	EB ² NB ¹ SB	1 LT, 1 RT 1 LT, 2 TH 2 TH, 1 RT	B (12.6) A (8.9) -	N/A ³	C (23.0) A (9.1) -	N/A ³
2017 No-Build	EB ² NB ¹ SB	1 LT, 1 RT 1 LT, 2 TH 2 TH, 1 RT	B (13.1) A (9.0) -	N/A ³	D (25.4) A (9.2) -	N/A ³
2017 Build	EB ² WB ² NB ¹ SB ¹	1 LT, 1 TH-RT 1 LT, 1 TH-RT 1 LT, 2 TH, 1 RT 1 LT, 2 TH, 1 RT	C (20.7) C (18.4) A (9.0) A (8.1)	N/A ³	F (290.3) F (223.8) A (9.1) B (10.4)	N/A ³
2017 Build Improvements	EB WB NB SB	1 LT, 1 TH-RT 1 LT, 1 TH-RT 1 LT, 2 TH, 1 RT 1 LT, 2 TH, 1 RT	B (10.2) B (10.0) A (3.9) A (4.0)	A (4.6)	B (14.7) B (14.9) A (7.2) A (6.8)	A (8.5)

1. Major street left-turn movement for unsignalized intersection.

2. Stop controlled approach for unsignalized intersection.

3. Overall intersection LOS is not provided for unsignalized intersections

5.4.2. Coldwater Ridge Drive and Roxie Street

Coldwater Ridge Drive and Roxie Street intersect to form a three-legged unsignalized intersection. Table 5 summarizes the capacity analysis results. Refer to Appendix E for the Synchro reports. All SimTraffic reports can be found in Appendix H.

Minimal impacts are expected by the proposed development. SimTraffic indicated no queue issues are expected. No improvements are recommended by the developer.

**TABLE 5
ANALYSIS SUMMARY OF
COLDWATER RIDGE DRIVE AND ROXIE STREET**

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	AM PEAK HOUR		PM PEAK HOUR	
			Approach LOS (Delay)	Overall LOS (Delay)	Approach LOS (Delay)	Overall LOS (Delay)
2015 Existing	EB ¹ WB SB ²	1 LT-TH, 1 TH 1 TH-RT 1 LT, 1 RT	A (2.0) - A (9.4)	N/A ³	A (2.0) - B (14.0)	N/A ³
2017 No-Build	EB ¹ WB SB ²	1 LT-TH, 1 TH 1 TH-RT 1 LT, 1 RT	A (2.0) - A (9.4)	N/A ³	A (2.1) - B (14.4)	N/A ³
2017 Build	EB ¹ WB SB ²	1 LT-TH, 1 TH 1 TH-RT 1 LT, 1 RT	A (3.2) - A (9.5)	N/A ³	A (3.4) - C (15.2)	N/A ³

1. Major street left-turn movement for unsignalized intersection.

2. Stop controlled approach for unsignalized intersection.

3. Overall intersection LOS is not provided for unsignalized intersections

5.4.3. Concord Lake Road and Roxie Street

Concord Lake Road and Roxie Street intersect to form a four-legged signalized intersection. Table 6 summarizes the capacity analysis results. Refer to Appendix F for the Synchro reports. All SimTraffic reports can be found in Appendix H.

Minimal impacts are expected by the proposed development. SimTraffic indicated no queue issues are expected. No improvements are recommended by the developer.

**TABLE 6
ANALYSIS SUMMARY OF
CONCORD LAKE ROAD AND ROXIE STREET**

ANALYSIS SCENARIO	A P P R O A C H	LANE CONFIGURATIONS	AM PEAK HOUR		PM PEAK HOUR	
			Approach LOS (Delay)	Overall LOS (Delay)	Approach LOS (Delay)	Overall LOS (Delay)
2015 Existing	EB WB NB SB	1 LT-TH-RT 1 LT-TH, 1 RT 1 LT, 1 TH, 1 RT 1 LT, 1 TH-RT	B (14.1) B (19.8) A (8.4) A (7.6)	A (9.9)	B (13.7) C (28.7) B (19.9) B (16.5)	C (21.2)
2017 No-Build	EB WB NB SB	1 LT-TH-RT 1 LT-TH, 1 RT 1 LT, 1 TH, 1 RT 1 LT, 1 TH-RT	B (14.0) C (20.3) A (8.4) A (7.8)	B (10.1)	B (13.7) C (29.7) C (21.5) B (19.1)	C (22.9)
2017 Build	EB WB NB SB	1 LT-TH-RT 1 LT-TH, 1 RT 1 LT, 1 TH, 1 RT 1 LT, 1 TH-RT	B (14.0) C (21.6) A (8.2) A (8.0)	B (10.5)	B (13.7) C (33.5) C (22.6) C (20.6)	C (25.0)

5.4.4. Dale Earnhardt Boulevard and Concord Lake Road

Dale Earnhardt Boulevard and Concord Lake Road intersect to form a four-legged signalized intersection. Table 7 summarizes the capacity analysis results. Refer to Appendix G for the Synchro reports. All SimTraffic reports can be found in Appendix H.

Minimal impacts are expected by the proposed development. SimTraffic indicated no queue issues are expected. No improvements are recommended by the developer.

**TABLE 7
ANALYSIS SUMMARY OF
DALE EARNHARDT BOULEVARD AND CONCORD LAKE ROAD**

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	AM PEAK HOUR		PM PEAK HOUR	
			Approach LOS (Delay)	Overall LOS (Delay)	Approach LOS (Delay)	Overall LOS (Delay)
2015 Existing	EB WB NB SB	1 LT, 2 TH, 1 RT 1 LT, 2 TH, 1 RT 2 LT, 1 TH-RT 1 LT, 1 TH, 1 RT	A (9.9) B (18.5) C (30.0) B (17.8)	B (16.2)	B (12.4) C (22.4) D (38.7) C (25.8)	C (23.2)
2017 No-Build	EB WB NB SB	1 LT, 2 TH, 1 RT 1 LT, 2 TH, 1 RT 2 LT, 1 TH-RT 1 LT, 1 TH, 1 RT	B (10.0) B (18.9) C (30.5) B (18.0)	B (16.5)	B (12.7) C (22.8) D (40.0) C (26.7)	C (23.8)
2017 Build	EB WB NB SB	1 LT, 2 TH, 1 RT 1 LT, 2 TH, 1 RT 2 LT, 1 TH-RT 1 LT, 1 TH, 1 RT	B (10.2) B (18.7) C (30.9) B (18.3)	B (16.6)	B (13.2) C (23.1) D (40.5) C (26.9)	C (24.1)

6. CONCLUSIONS

This report summarizes the findings of the Traffic Impact Study (TIS) that was performed for the proposed commercial development located along the east side Dale Earnhardt Boulevard at Coldwater Ridge Drive in Kannapolis, North Carolina. The purpose of this study is to determine the potential impact to the surrounding transportation system caused by the traffic generated by the development.

The site is proposed to consist of a 36,200 square foot grocery store. Site access is proposed via one full access driveway across from Coldwater Ridge Drive. The site is expected to be fully built by the year 2017.

6.1. Summary of Recommended Improvements

Based on the analysis results, minor impacts are expected by the proposed development. No queue issues are expected. Refer to Figure 12 for the recommended lane configurations. The following improvements have been recommended to be constructed by the developer:

Dale Earnhardt and Coldwater Ridge Drive / Site Drive 1

- Stripe the eastbound Coldwater Ridge Drive approach to show one left turn lane with 100 feet of storage and one shared through/right turn lane.
- Construct Site Drive 1 with one left turn lane with 100 feet of storage and one shared through/right turn lane.
- Restripe the southbound approach to show one left turn lane with 100 feet of storage.
- Remove pavement markings through intersection.
- Install a traffic signal.

Coldwater Ridge Drive and Roxie Street

- No improvements are recommended.

Concord Lake Road and Roxie Street

- No improvements are recommended.

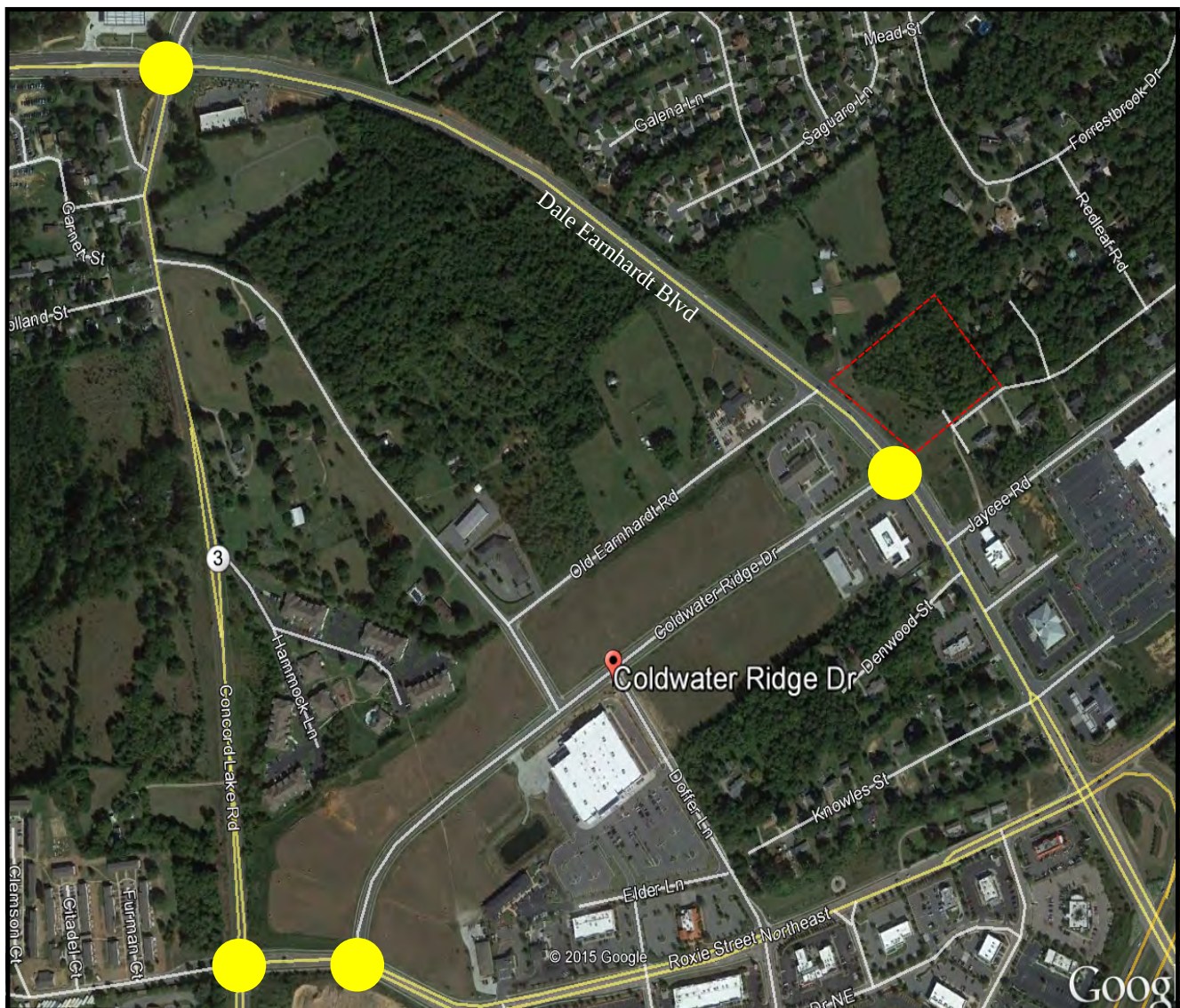
Dale Earnhardt Boulevard and Concord Lake Road

- No improvements are recommended.

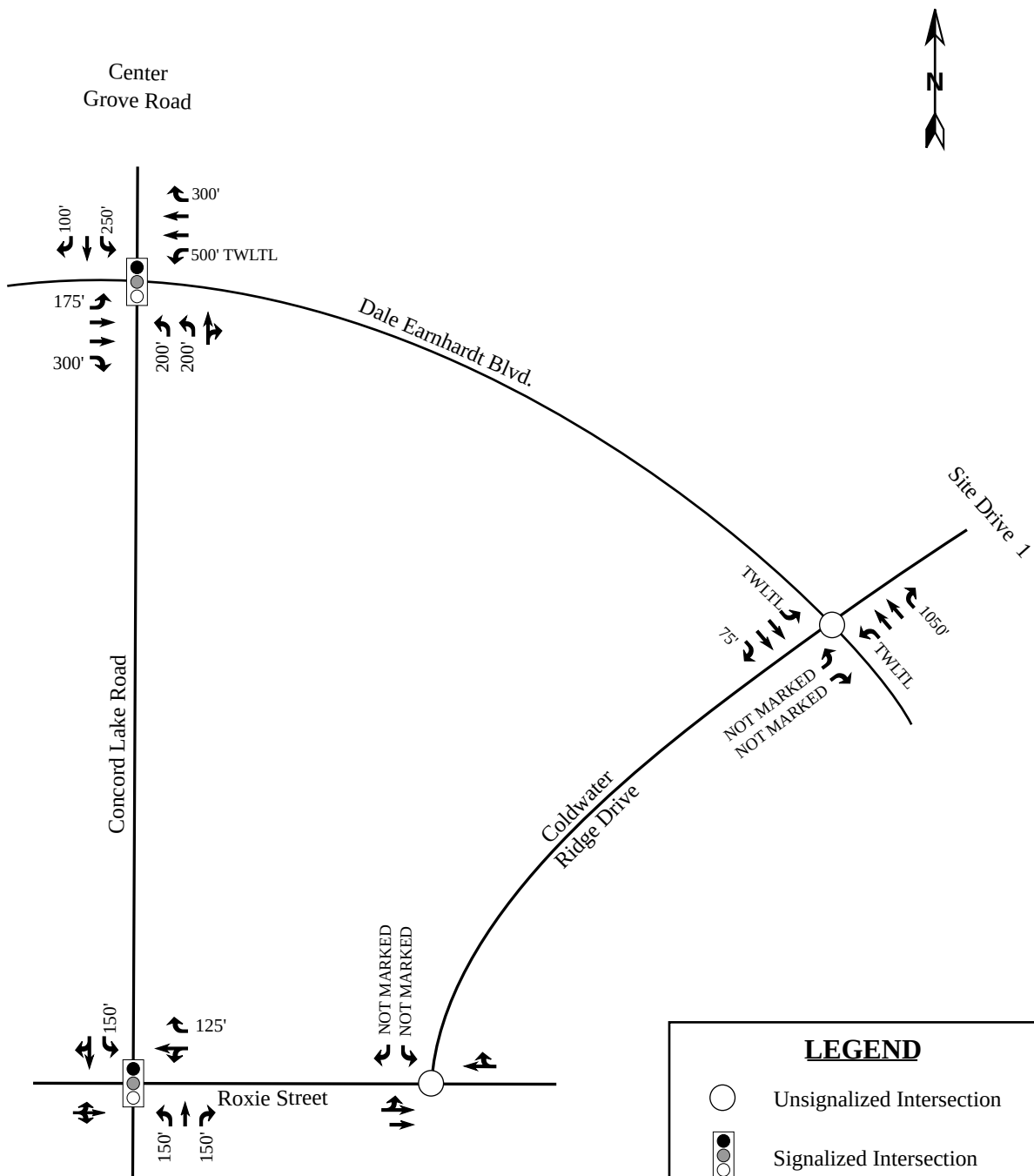
TECHNICAL APPENDIX

APPENDIX A

FIGURES



LEGEND	
	Proposed Site Location
	Study Intersection



LEGEND

○

Unsignalized Intersection

●

Signalized Intersection

➔

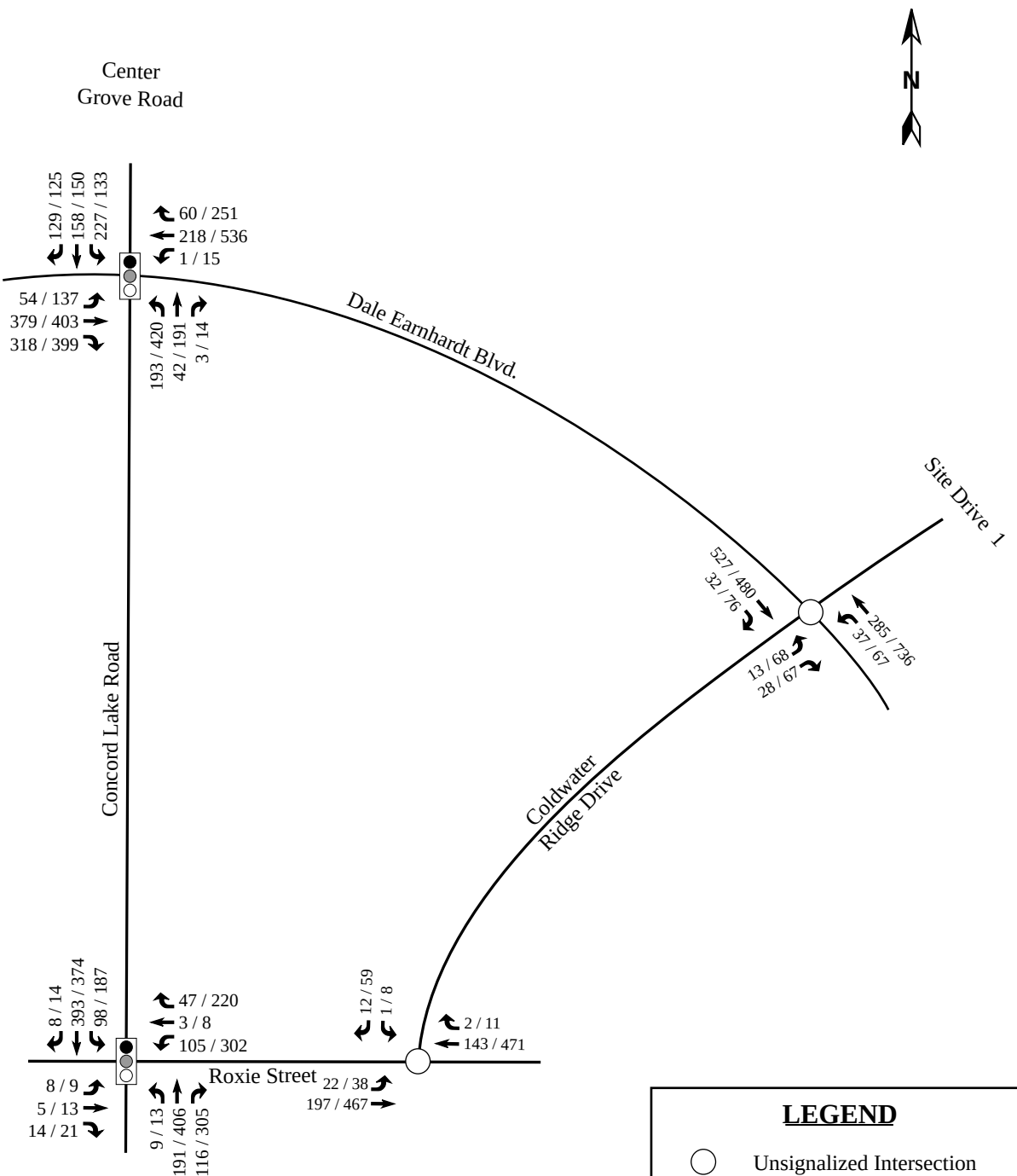
Existing Lane

x'

Storage (In Feet)

TWLTL

Two-Way Left Turn Lane

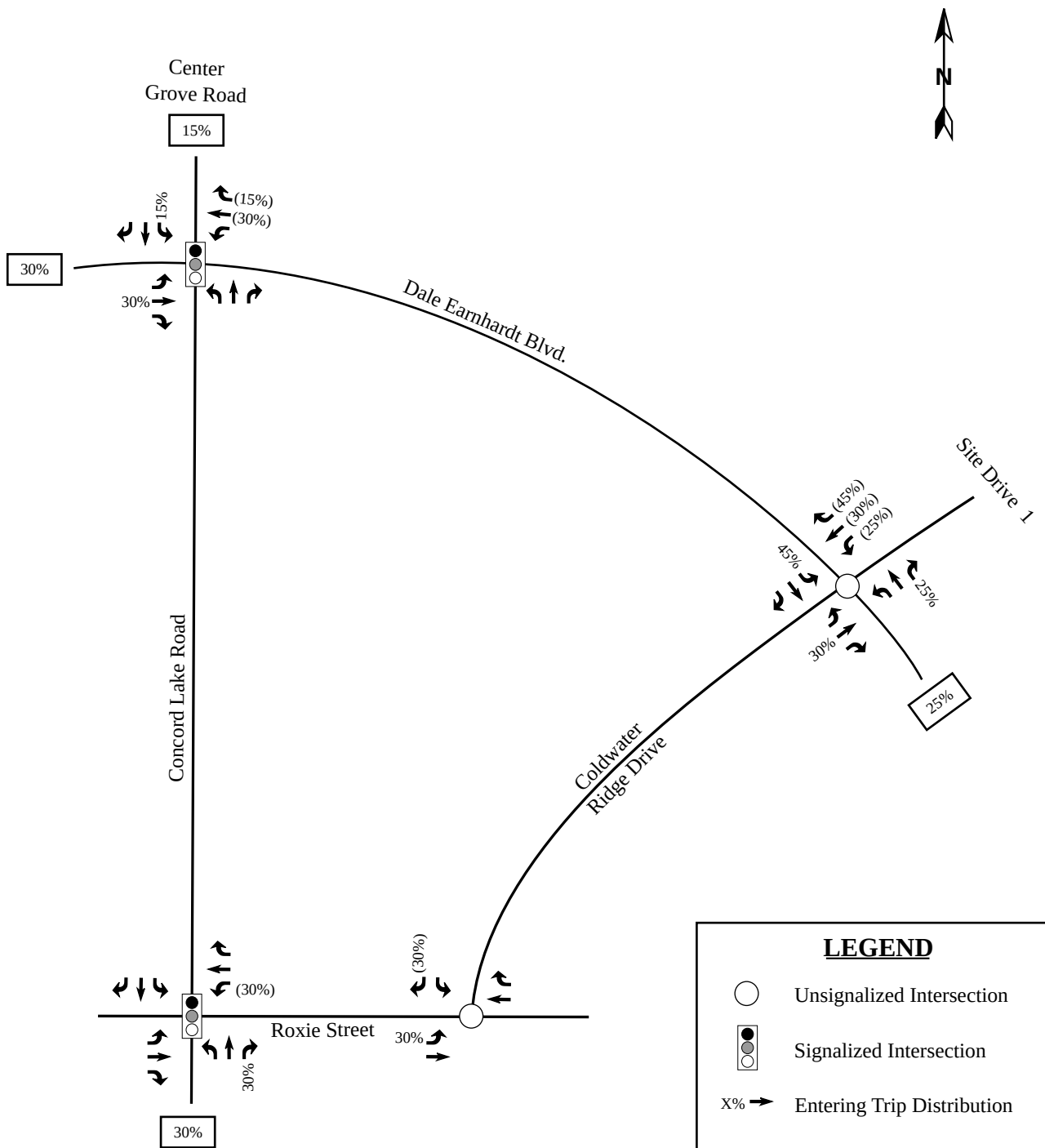


LEGEND

○ Unsignalized Intersection

● Signalized Intersection

X / Y → AM / PM Peak Hour Traffic



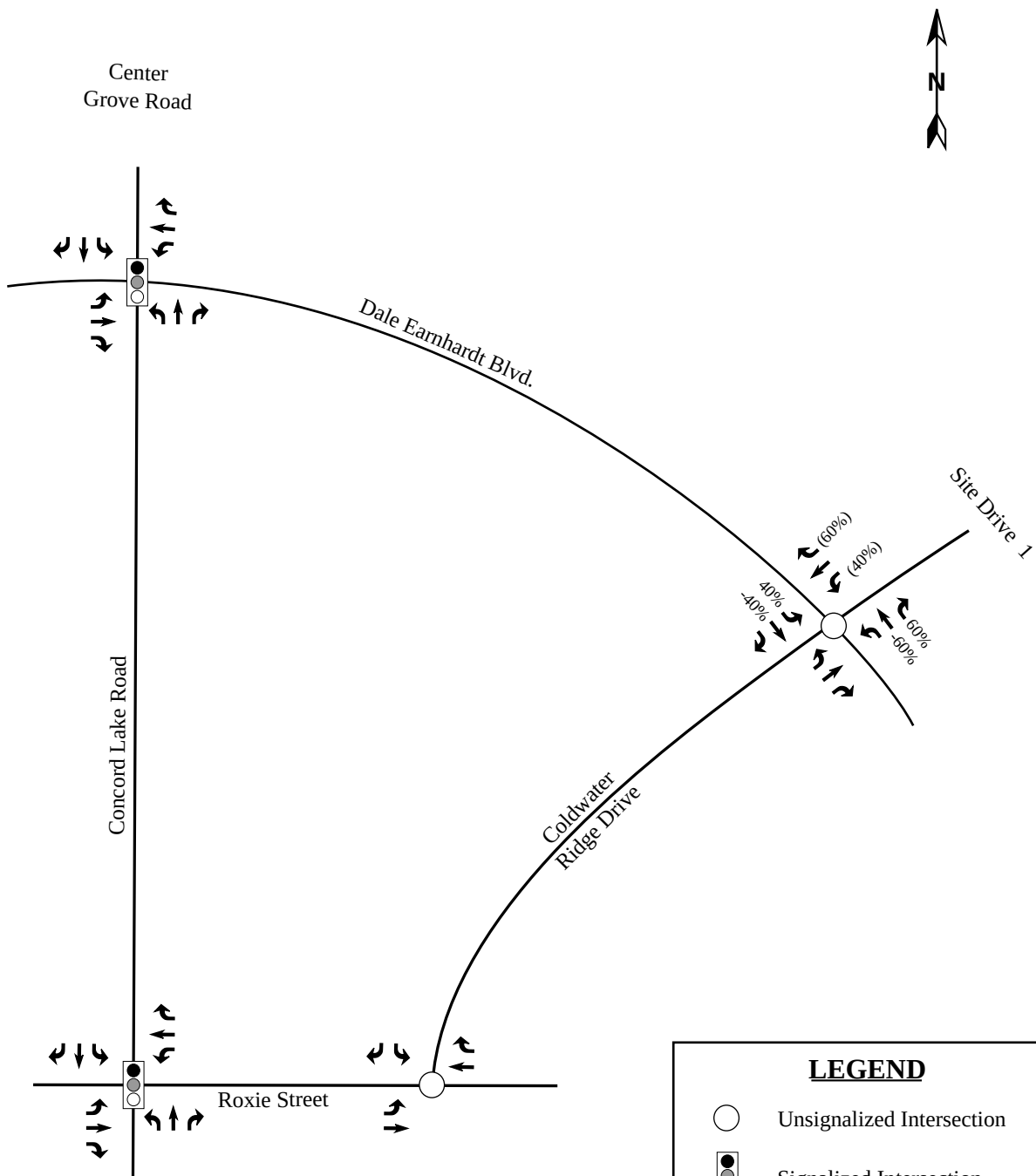
LEGEND

- Unsignalized Intersection
- ◫ Signalized Intersection
- X% → Entering Trip Distribution
- (Y%) → Exiting Trip Distribution
- XX% Regional Trip Distribution

RAMEY KEMP & ASSOCIATES
TRANSPORTATION ENGINEERS

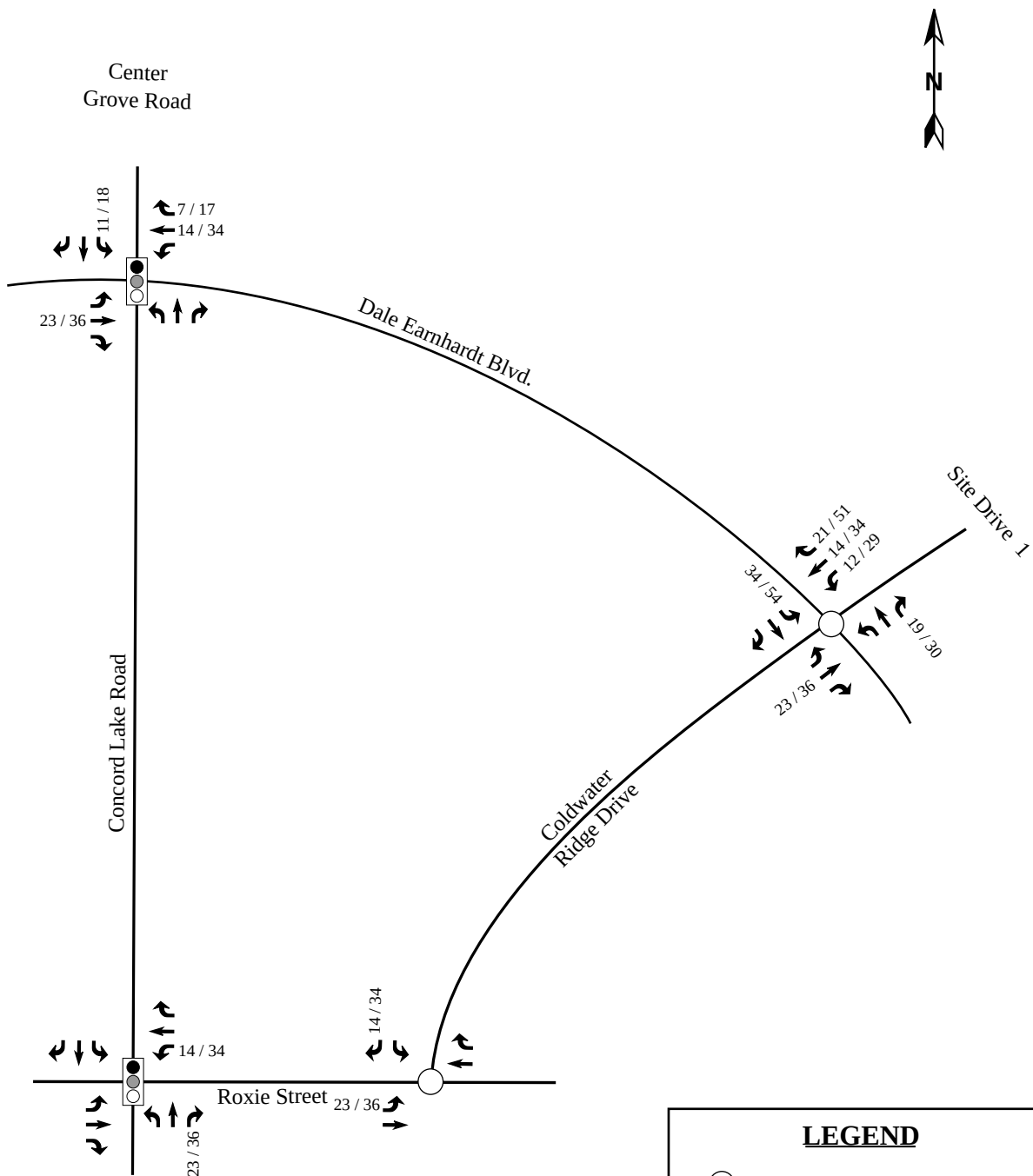
Kannapolis Grocery Store
Kannapolis, NC

Proposed Site Primary Trip Distribution Percentages	
Scale: Not to Scale	Figure 5



LEGEND

- Unsignalized Intersection
- ◫ Signalized Intersection
- X% → Entering Trip Distribution
- (Y%) → Exiting Trip Distribution



LEGEND



Unsignalized Intersection



Signalized Intersection

X / Y → AM / PM Peak Hour Traffic

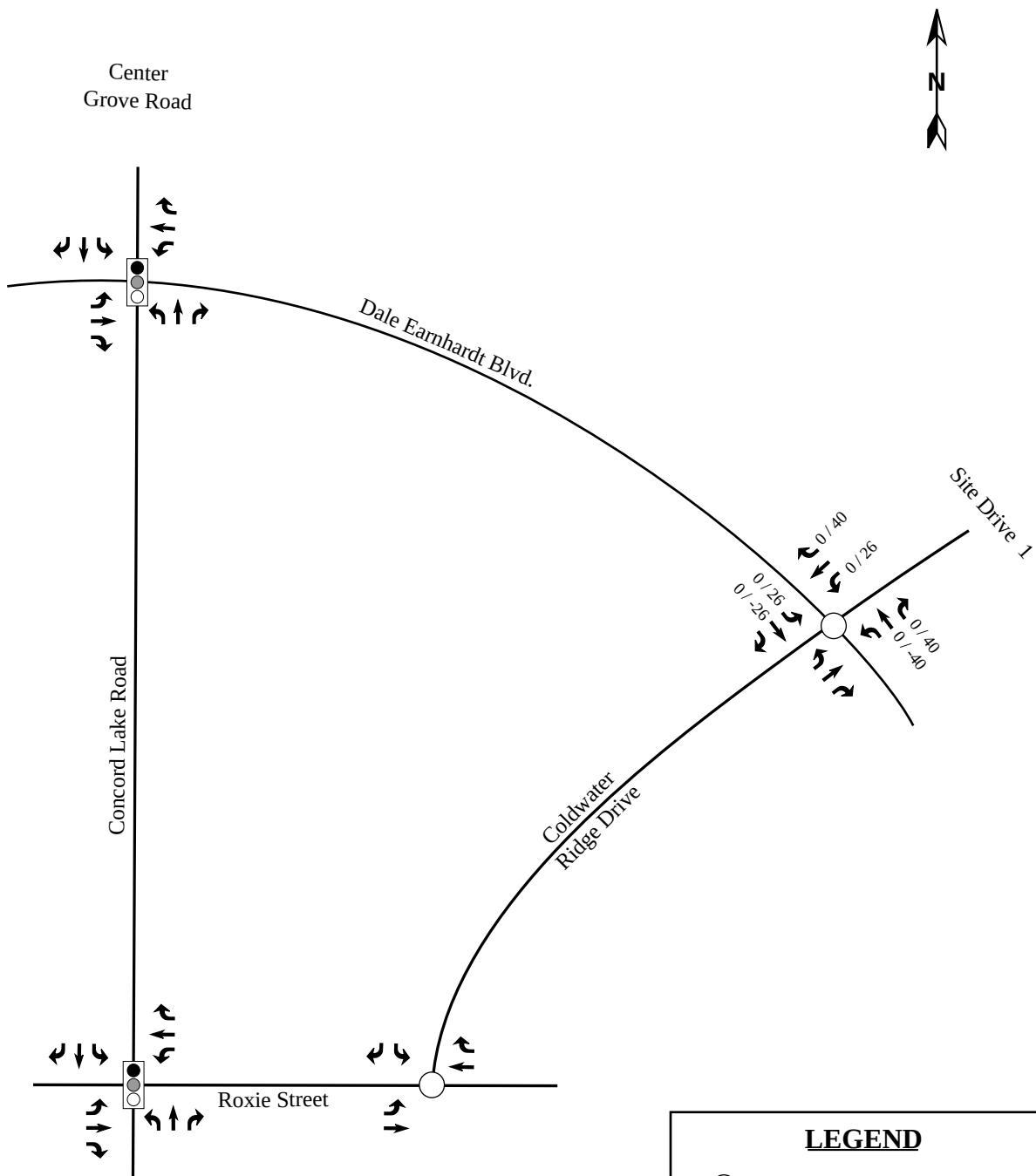


Kannapolis Grocery Store
Kannapolis, NC

Proposed Site
Primary
Trip Assignment

Scale: Not to Scale

Figure 7



LEGEND



Unsignalized Intersection



Signalized Intersection

X / Y → AM / PM Peak Hour Traffic

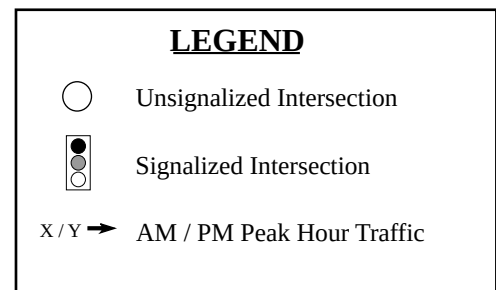


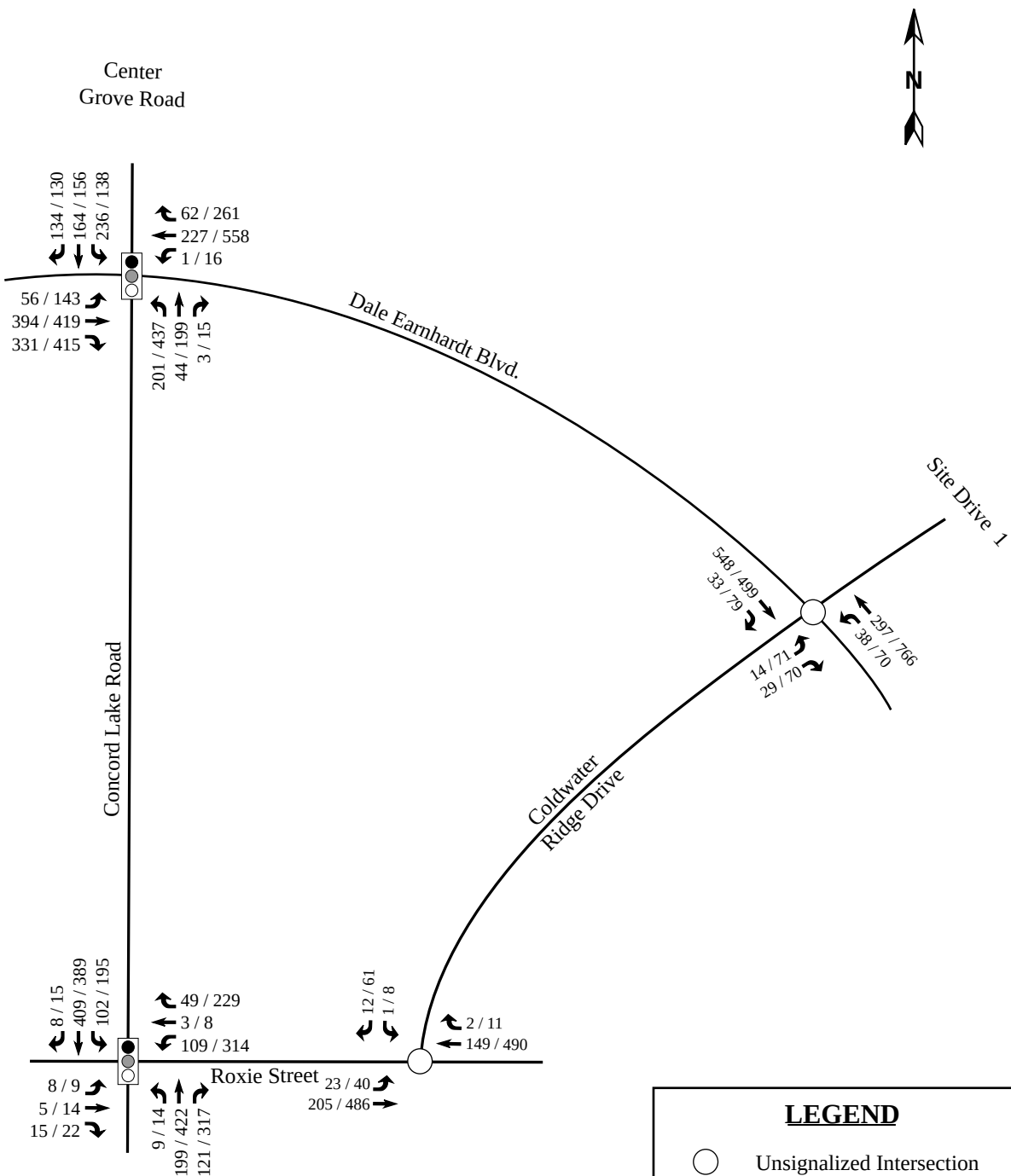
Kannapolis Grocery Store
Kannapolis, NC

Proposed Site
Pass-By
Trip Assignment

Scale: Not to Scale

Figure 8



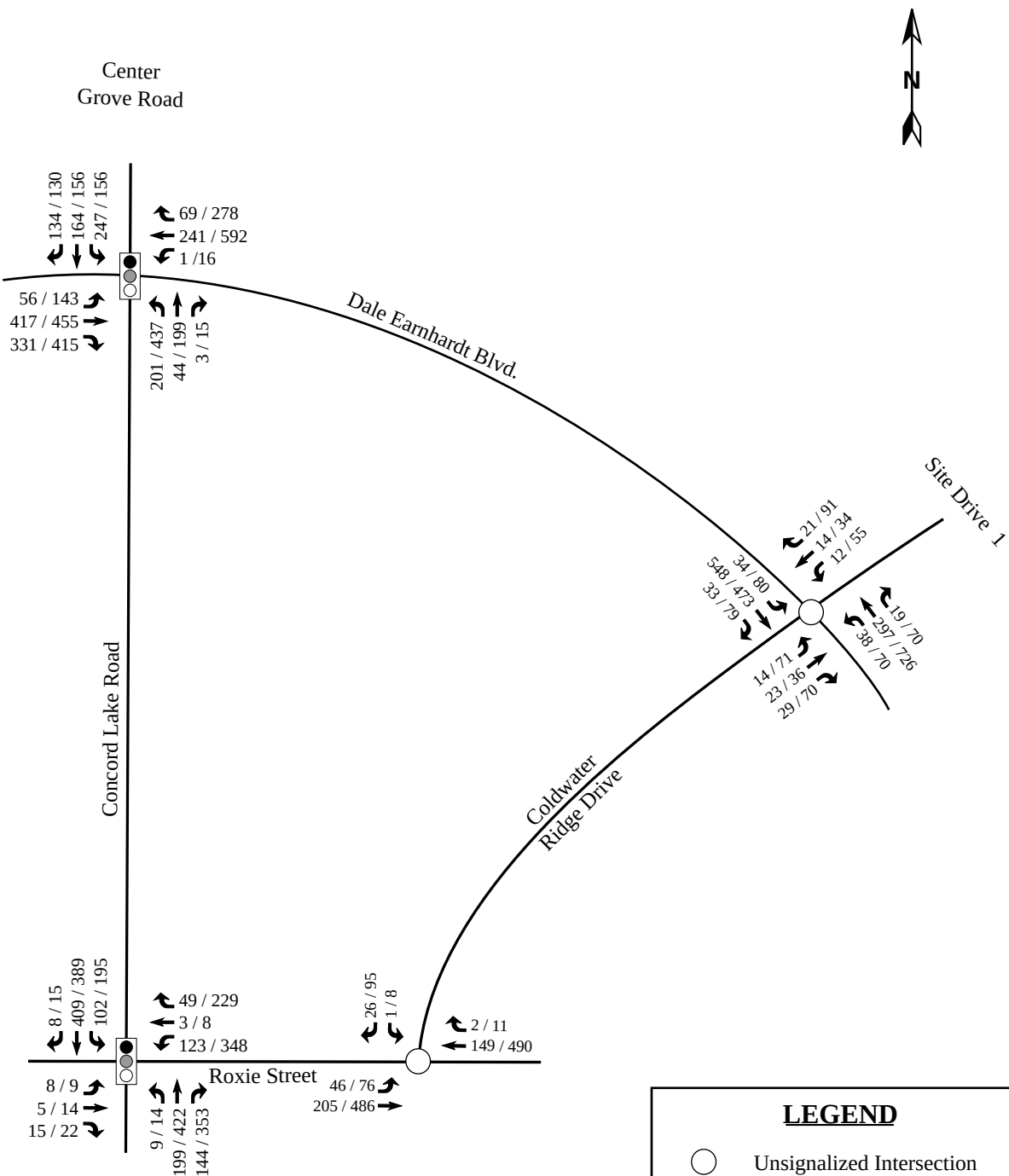


LEGEND

○ Unsignalized Intersection

● Signalized Intersection

X / Y → AM / PM Peak Hour Traffic



LEGEND

- Unsignalized Intersection
- Signalized Intersection
- X / Y → AM / PM Peak Hour Traffic

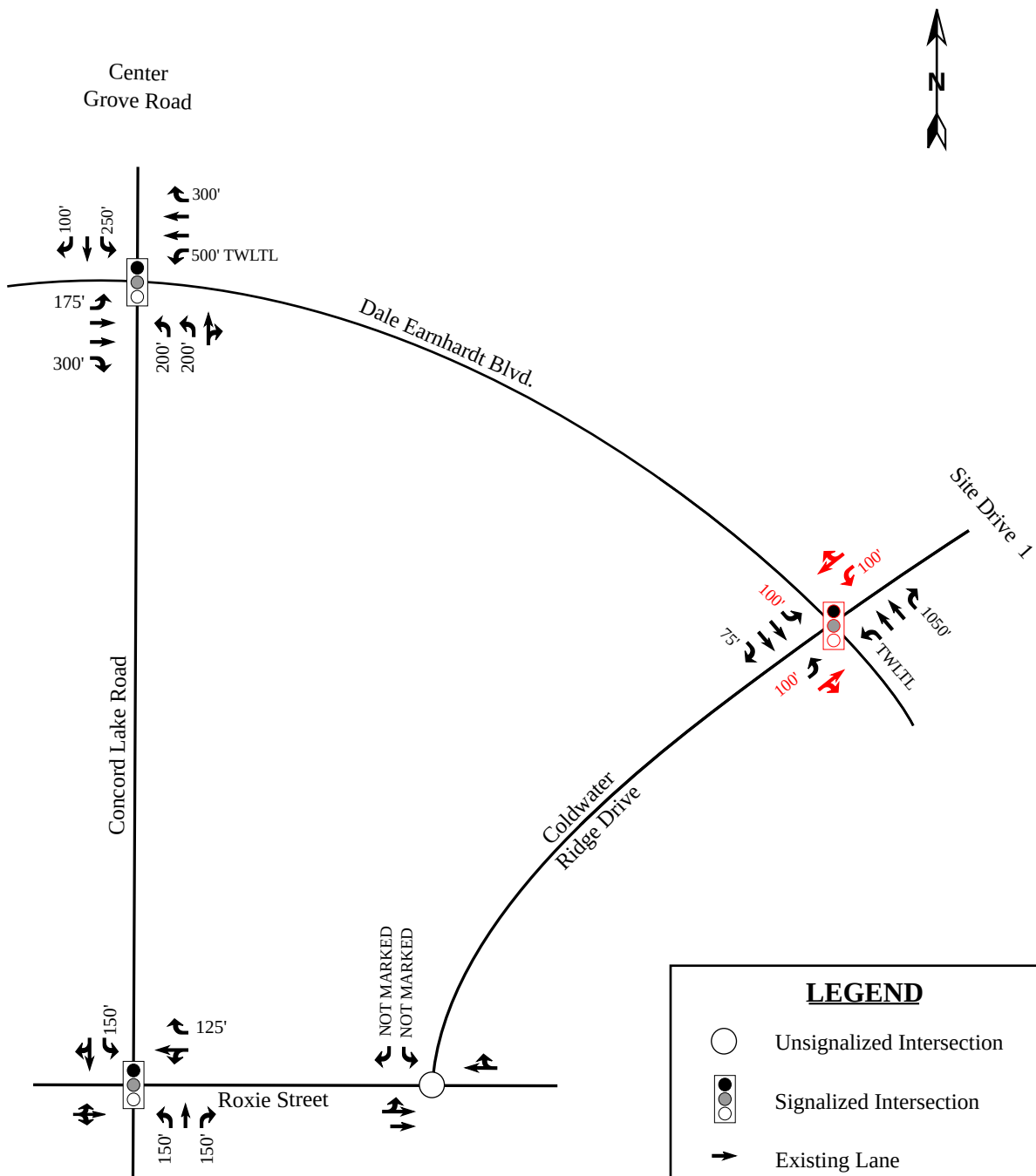


Kannapolis Grocery Store
Kannapolis, NC

2017 Build
Peak Hour Traffic Volumes

Scale: Not to Scale

Figure 11



LEGEND

- Unsignalized Intersection
- Signalized Intersection
- Existing Lane
- Improvement by Developer
- X' Storage (In Feet)
- TWLTL Two-Way Left Turn Lane



Kannapolis Grocery Store
Kannapolis, NC

Recommended
Lane Configurations

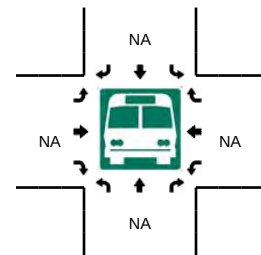
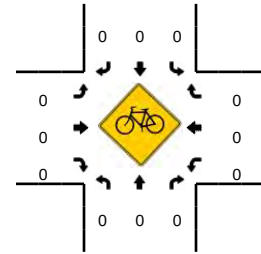
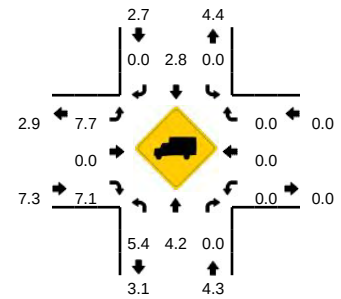
Scale: Not to Scale

Figure 12

APPENDIX B

TRAFFIC COUNT DATA

QC JOB #: 13196505
DATE: Tue, Feb 03 2015

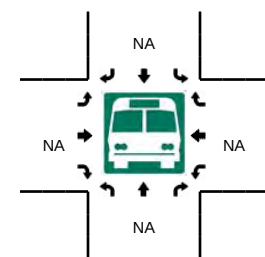
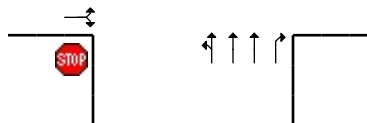
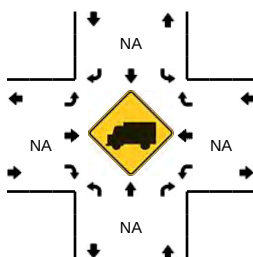
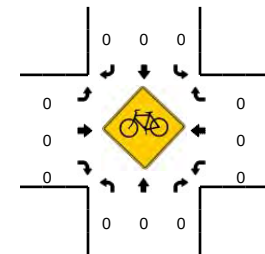
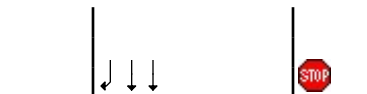
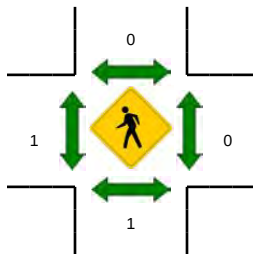
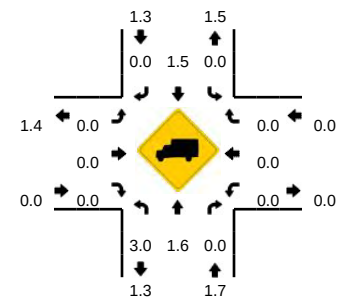
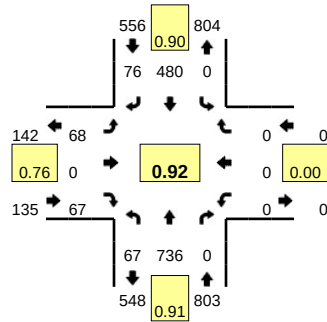


Comments:

LOCATION: Dale Earnhardt Blvd -- Coldwater Ridge Dr
CITY/STATE: Kannapolis, NC

QC JOB #: 13196506
DATE: Tue, Feb 03 2015

Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 5:00 PM -- 5:15 PM



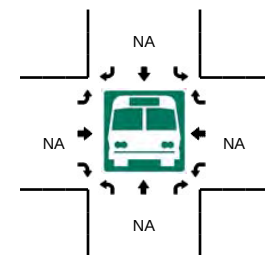
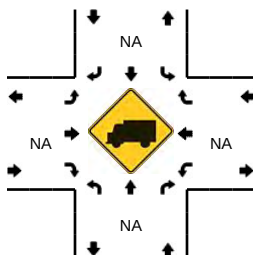
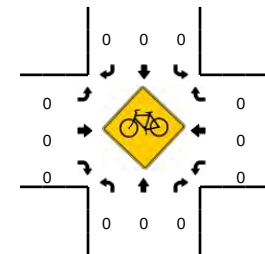
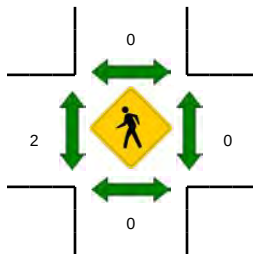
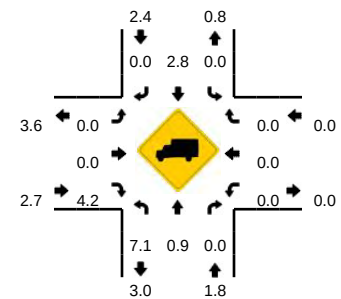
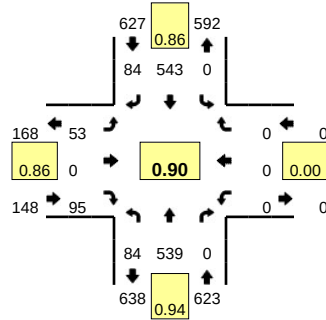
15-Min Count Period Beginning At	Dale Earnhardt Blvd (Northbound)				Dale Earnhardt Blvd (Southbound)				Coldwater Ridge Dr (Eastbound)				Coldwater Ridge Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:30 PM	17	177	0	0	0	106	19	0	20	0	12	0	0	0	0	0	351	
4:45 PM	16	178	0	1	0	138	16	0	6	0	20	0	0	0	0	0	375	
5:00 PM	16	204	0	0	0	118	24	0	21	0	24	0	0	0	0	0	407	
5:15 PM	17	177	0	0	0	118	17	0	21	0	11	0	0	0	0	0	361	1494
5:30 PM	21	173	0	0	0	103	10	0	19	0	14	0	0	0	0	0	340	1483
5:45 PM	9	158	0	0	0	126	7	0	10	0	17	0	0	0	0	0	327	1435
6:00 PM	14	148	0	0	0	107	6	0	13	0	15	0	0	0	0	0	303	1331
6:15 PM	7	143	0	0	0	101	11	0	13	0	8	0	0	0	0	0	283	1253
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	64	816	0	0	0	472	96	0	84	0	96	0	0	0	0	0	1628	
Heavy Trucks	0	16	0	0	0	8	0	0	0	0	0	0	0	0	0	0	24	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Comments:

LOCATION: Dale Earnhardt Blvd -- Coldwater Ridge Dr
CITY/STATE: Kannapolis, NC

QC JOB #: 13588403
DATE: Thu, Sep 10 2015

Peak-Hour: 12:00 PM -- 1:00 PM
Peak 15-Min: 12:30 PM -- 12:45 PM



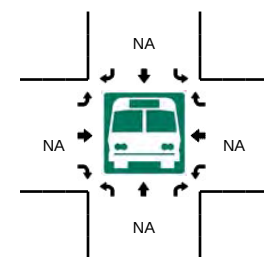
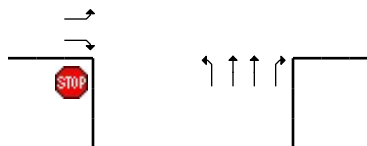
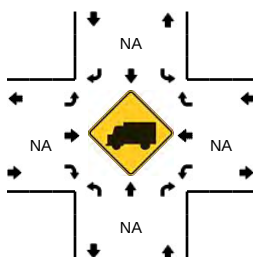
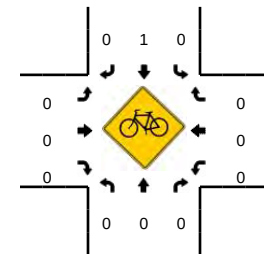
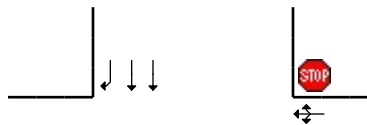
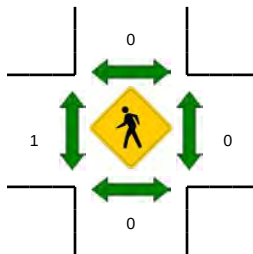
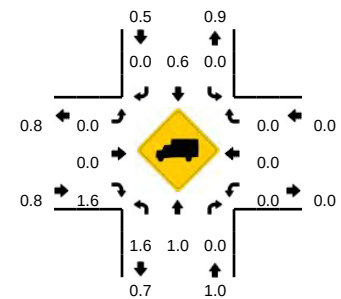
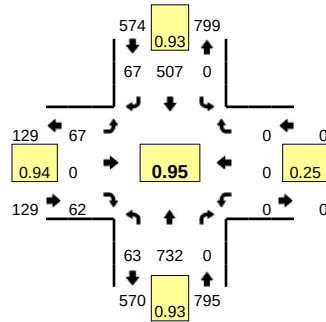
15-Min Count Period Beginning At	Dale Earnhardt Blvd (Northbound)				Dale Earnhardt Blvd (Southbound)				Coldwater Ridge Dr (Eastbound)				Coldwater Ridge Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	1	29	0	0	0	123	3	0	1	0	1	0	0	0	0	0	158	
7:15 AM	4	53	0	1	0	125	5	0	1	0	1	0	0	0	0	0	190	
7:30 AM	2	59	0	0	0	145	6	0	1	0	6	0	0	0	0	0	219	
7:45 AM	6	74	0	0	0	176	5	0	1	0	2	0	0	0	0	0	264	831
8:00 AM	7	72	0	0	0	132	7	0	3	0	4	0	0	0	0	0	225	898
8:15 AM	9	73	0	0	0	132	8	0	3	0	8	0	0	0	0	0	233	941
8:30 AM	7	69	0	0	0	136	21	0	4	0	10	0	0	0	0	0	247	969
8:45 AM	8	73	0	1	0	151	17	0	5	0	13	0	0	0	0	0	268	973
9:00 AM	9	98	0	0	0	106	10	1	5	0	14	0	0	0	0	0	243	991
9:15 AM	8	92	0	0	0	142	9	0	7	0	11	0	0	0	0	0	269	1027
9:30 AM	10	83	0	0	0	134	26	0	5	0	8	0	0	0	0	0	266	1046
9:45 AM	16	85	0	0	0	132	13	0	14	0	13	0	0	0	0	0	273	1051
10:00 AM	11	116	0	0	0	124	9	0	9	0	13	0	0	0	0	0	282	1090
10:15 AM	12	103	0	0	0	117	17	0	7	0	11	0	0	0	0	0	267	1088
10:30 AM	17	126	0	0	0	110	16	0	5	0	17	0	0	0	0	0	291	1113
10:45 AM	15	117	0	0	0	111	18	0	10	0	22	0	0	0	0	0	293	1133
11:00 AM	19	110	0	0	0	121	14	0	7	0	15	0	0	0	0	0	286	1137
11:15 AM	10	132	0	0	0	106	22	0	8	0	17	0	0	0	0	0	295	1165
11:30 AM	12	115	0	0	0	116	17	0	7	0	17	0	0	0	0	0	284	1158
11:45 AM	14	118	0	0	0	124	16	0	11	0	24	0	0	0	0	0	307	1172
12:00 PM	22	132	0	0	0	120	15	0	12	0	16	0	0	0	0	0	317	1203
12:15 PM	15	124	0	0	0	135	26	0	15	0	23	0	0	0	0	0	338	1246
12:30 PM	25	140	0	0	0	156	27	0	13	0	26	0	0	0	0	0	387	1349
12:45 PM	22	143	0	0	0	132	16	0	13	0	30	0	0	0	0	0	356	1398
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	100	560	0	0	0	624	108	0	52	0	104	0	0	0	0	0	1548	
Heavy Trucks	4	4	0	0	0	12	0	0	0	0	8	0	0	0	0	0	28	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Comments:

LOCATION: Dale Earnhardt Blvd -- Coldwater Ridge Dr
CITY/STATE: Kannapolis, NC

QC JOB #: 13588404
DATE: Thu, Sep 10 2015

Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 4:30 PM -- 4:45 PM



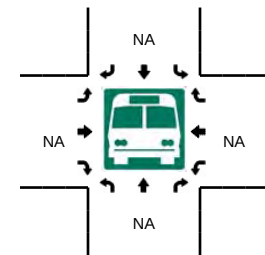
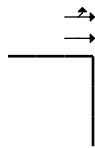
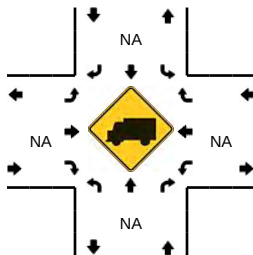
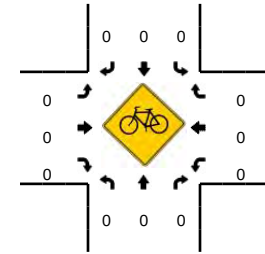
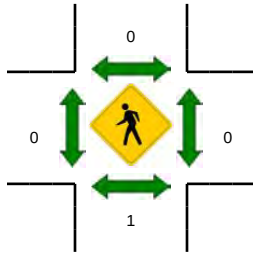
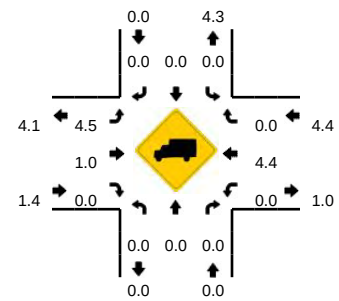
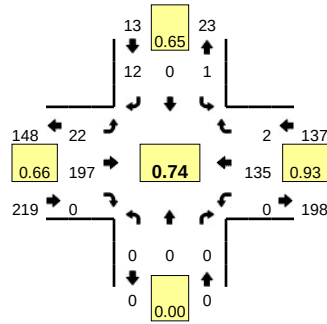
15-Min Count Period Beginning At	Dale Earnhardt Blvd (Northbound)				Dale Earnhardt Blvd (Southbound)				Coldwater Ridge Dr (Eastbound)				Coldwater Ridge Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
1:00 PM	20	124	0	0	0	147	19	0	23	0	24	0	0	0	0	0	357	
1:15 PM	22	152	0	0	0	125	16	0	10	0	21	0	0	0	0	0	346	
1:30 PM	20	130	0	0	0	109	18	0	8	0	22	0	0	0	0	0	307	
1:45 PM	15	131	0	0	0	119	14	0	8	0	23	0	0	0	0	0	310	1320
2:00 PM	25	116	0	0	0	122	15	0	15	0	21	0	0	0	0	0	314	1277
2:15 PM	15	148	0	0	0	128	15	0	16	0	20	0	0	0	0	0	342	1273
2:30 PM	11	144	0	0	0	135	10	0	7	0	22	0	0	0	0	0	329	1295
2:45 PM	16	149	0	0	0	117	12	0	12	0	21	0	0	0	0	0	327	1312
3:00 PM	17	175	0	0	0	101	20	0	14	0	11	0	0	0	0	0	338	1336
3:15 PM	20	160	0	0	0	130	19	0	12	0	15	0	0	0	0	0	356	1350
3:30 PM	14	166	1	0	0	128	14	0	11	0	20	0	0	0	0	0	354	1375
3:45 PM	16	139	0	1	0	93	20	0	10	0	27	0	0	0	1	0	307	1355
4:00 PM	14	165	0	0	0	132	26	0	16	0	20	0	0	0	0	0	373	1390
4:15 PM	17	169	0	0	0	106	18	0	17	0	19	0	0	0	0	0	346	1380
4:30 PM	14	198	0	1	0	131	19	0	19	0	14	0	0	0	0	0	396	1422
4:45 PM	19	171	0	0	0	135	18	0	18	0	20	0	0	0	0	0	381	1496
5:00 PM	14	178	0	0	0	127	19	0	19	0	17	0	0	0	0	0	374	1497
5:15 PM	15	185	0	0	0	114	11	0	11	0	11	0	0	0	0	0	347	1498
5:30 PM	9	179	0	0	0	120	10	0	20	0	18	0	0	0	0	0	356	1458
5:45 PM	10	193	0	0	0	114	10	0	13	0	10	0	0	0	0	0	350	1427
6:00 PM	6	134	0	0	0	94	9	0	5	0	9	0	0	0	0	0	257	1310
6:15 PM	10	128	0	0	0	117	7	0	5	0	2	0	0	0	0	0	269	1232
6:30 PM	6	130	0	0	0	90	4	0	6	0	12	0	0	0	0	0	248	1124
6:45 PM	7	121	0	0	0	112	7	0	11	0	5	0	0	0	0	0	263	1037
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	56	792	0	4	0	524	76	0	76	0	56	0	0	0	0	0	1584	
Heavy Trucks	4	8	0	0	0	8	0	0	0	0	0	0	0	0	0	0	20	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

Comments:

LOCATION: Coldwater Ridge Dr -- Roxie St
CITY/STATE: Kannapolis, NC

QC JOB #: 13196503
DATE: Tue, Feb 03 2015

Peak-Hour: 8:00 AM -- 9:00 AM
Peak 15-Min: 8:45 AM -- 9:00 AM



15-Min Count Period Beginning At	Coldwater Ridge Dr (Northbound)				Coldwater Ridge Dr (Southbound)				Roxie St (Eastbound)				Roxie St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	0	0	0	0	1	35	0	0	0	27	0	0	63	
7:15 AM	0	0	0	0	0	0	3	0	2	28	0	0	0	12	0	0	45	
7:30 AM	0	0	0	0	0	0	2	0	4	28	0	0	0	39	1	0	74	
7:45 AM	0	0	0	0	0	0	1	0	3	40	0	0	0	31	0	0	75	257
8:00 AM	0	0	0	0	0	0	3	0	5	40	0	0	0	26	1	0	75	269
8:15 AM	0	0	0	0	0	0	0	0	6	46	0	0	0	35	1	0	88	312
8:30 AM	0	0	0	0	0	0	5	0	4	35	0	0	0	37	0	0	81	319
8:45 AM	0	0	0	0	1	0	4	0	6	76	0	1	0	37	0	0	125	369

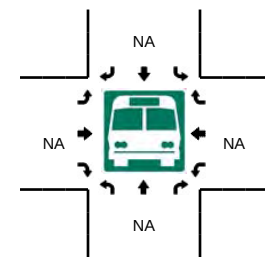
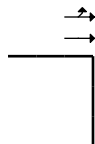
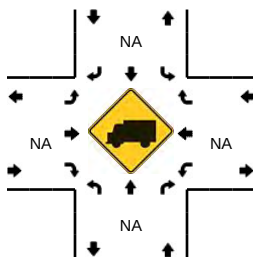
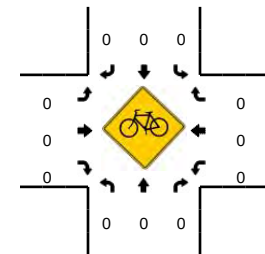
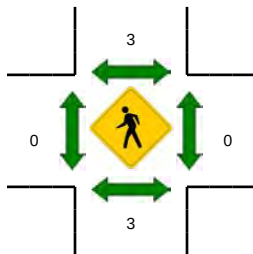
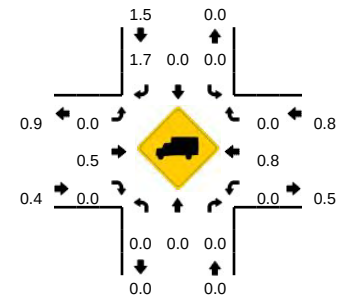
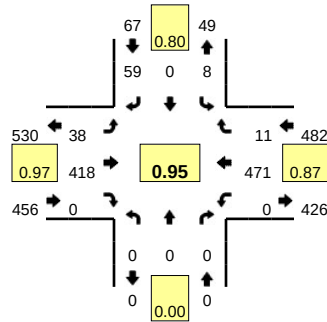
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	4	0	16	0	24	304	0	4	0	148	0	0	500
Heavy Trucks	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	4
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Railroad	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Comments:

LOCATION: Coldwater Ridge Dr -- Roxie St
CITY/STATE: Kannapolis, NC

QC JOB #: 13196504
DATE: Tue, Feb 03 2015

Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 5:00 PM -- 5:15 PM



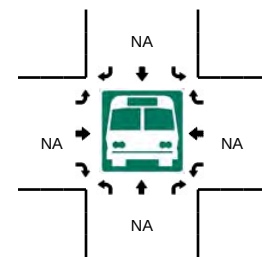
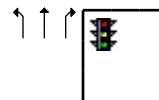
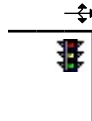
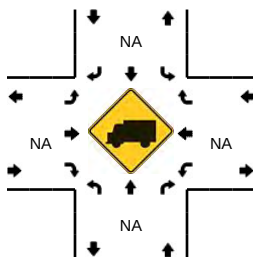
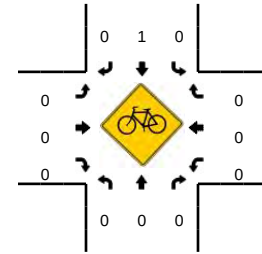
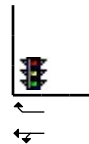
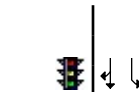
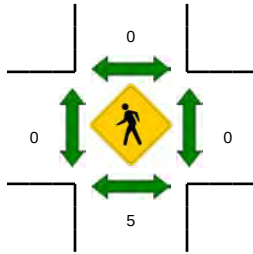
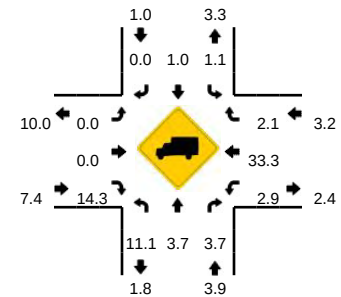
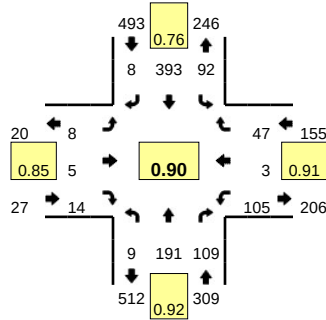
15-Min Count Period Beginning At	Coldwater Ridge Dr (Northbound)				Coldwater Ridge Dr (Southbound)				Roxie St (Eastbound)				Roxie St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:30 PM	0	0	0	0	3	0	18	0	9	104	0	0	0	97	5	0	236	
4:45 PM	0	0	0	0	2	0	11	0	13	105	0	0	0	114	3	0	248	
5:00 PM	0	0	0	0	1	0	16	0	6	102	0	0	0	138	1	0	264	
5:15 PM	0	0	0	0	2	0	14	0	10	107	0	0	0	122	2	0	257	1005
5:30 PM	0	0	0	0	0	0	11	0	5	78	0	0	0	91	1	0	186	955
5:45 PM	0	0	0	0	1	0	7	0	5	116	0	0	0	97	1	0	227	934
6:00 PM	0	0	0	0	1	0	2	0	11	87	0	0	0	108	1	0	210	880
6:15 PM	0	0	0	0	0	0	4	0	3	93	0	0	0	125	0	0	225	848
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	0	0	4	0	64	0	24	408	0	0	0	552	4	0	1056	
Heavy Trucks	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	4	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Comments:

LOCATION: Concord Lake Rd -- Roxie St
CITY/STATE: Kannapolis, NC

QC JOB #: 13588405
DATE: Thu, Sep 10 2015

Peak-Hour: 7:30 AM -- 8:30 AM
Peak 15-Min: 7:45 AM -- 8:00 AM



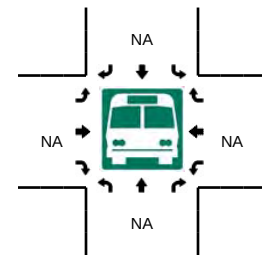
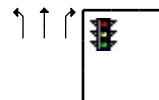
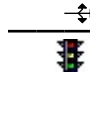
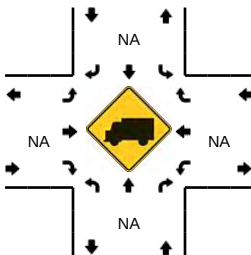
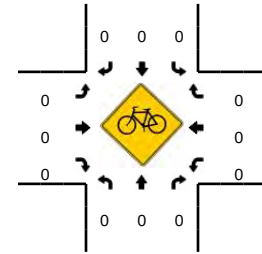
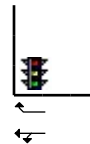
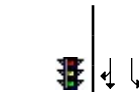
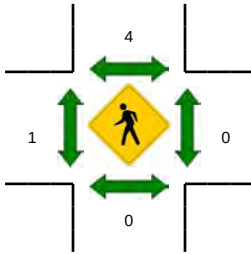
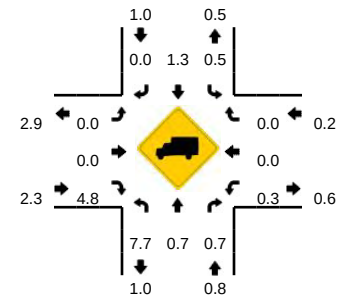
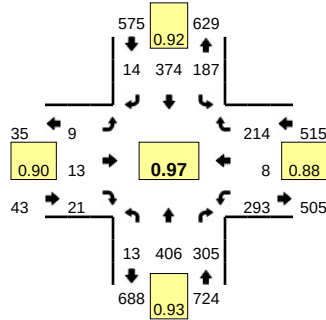
15-Min Count Period Beginning At	Concord Lake Rd (Northbound)				Concord Lake Rd (Southbound)				Roxie St (Eastbound)				Roxie St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	34	21	0	19	73	5	0	3	1	0	0	15	0	7	0	178	
7:15 AM	1	40	23	0	13	72	2	0	3	0	5	0	24	0	12	0	195	
7:30 AM	2	49	23	0	11	104	2	0	4	1	5	0	25	2	9	0	237	
7:45 AM	3	36	25	0	37	125	1	0	1	3	6	0	28	0	7	0	272	882
8:00 AM	1	53	32	0	22	80	2	0	3	0	3	0	29	1	17	0	243	947
8:15 AM	3	53	29	0	22	84	3	0	0	1	0	0	23	0	14	0	232	984
8:30 AM	4	39	31	0	20	69	1	0	2	3	6	0	31	2	12	0	220	967
8:45 AM	5	36	32	0	30	87	0	0	1	1	7	0	37	3	9	0	248	943
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	12	144	100	0	148	500	4	0	4	12	24	0	112	0	28	0	1088	
Heavy Trucks	0	0	4		4	0	0		0	0	0		0	0	0		8	
Pedestrians		8				0				0				0			8	
Bicycles	0	0	0		0	1	0		0	0	0		0	0	0		1	
Railroad																		
Stopped Buses																		

Comments:

LOCATION: Concord Lake Rd -- Roxie St
CITY/STATE: Kannapolis, NC

QC JOB #: 13588406
DATE: Thu, Sep 10 2015

Peak-Hour: 5:00 PM -- 6:00 PM
Peak 15-Min: 5:45 PM -- 6:00 PM



15-Min Count Period Beginning At	Concord Lake Rd (Northbound)				Concord Lake Rd (Southbound)				Roxie St (Eastbound)				Roxie St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	4	77	69	0	37	83	6	0	2	3	4	0	71	1	36	0	393	1649
4:15 PM	9	90	68	0	44	85	2	0	7	4	1	0	71	1	36	0	418	
4:30 PM	2	81	78	0	48	76	1	0	4	2	4	0	58	4	44	0	402	
4:45 PM	1	99	76	0	48	86	4	0	2	2	3	0	73	1	41	0	436	
5:00 PM	5	110	79	0	34	99	5	0	4	1	5	0	65	4	53	0	464	1720
5:15 PM	2	107	74	0	51	99	2	0	2	4	5	0	78	2	37	0	463	1765
5:30 PM	3	90	71	0	46	79	4	0	0	3	7	0	84	1	62	0	450	1813
5:45 PM	3	99	81	0	56	97	3	0	3	5	4	0	66	1	62	0	480	1857

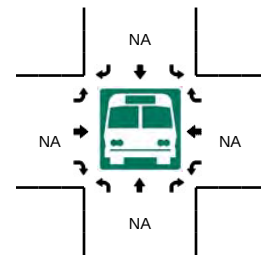
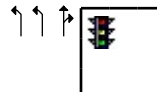
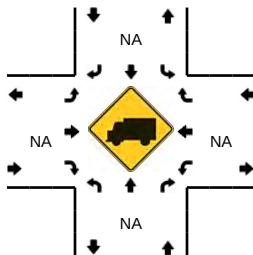
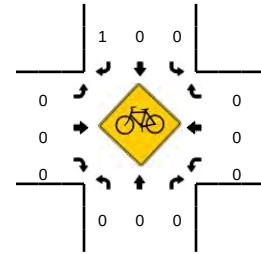
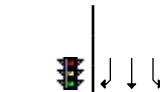
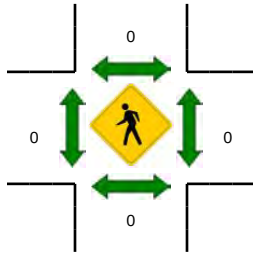
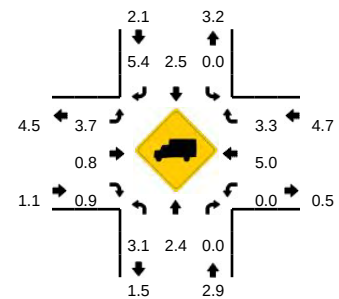
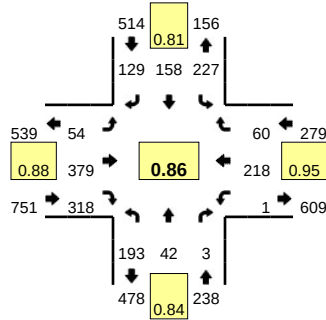
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	12	396	324	0	224	388	12	0	12	20	16	0	264	4	248	0	1920
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Railroad																	
Stopped Buses																	

Comments:

LOCATION: Concord Lake Rd -- Dale Earnhardt
CITY/STATE: Kannapolis, NC

QC JOB #: 13588401
DATE: Thu, Sep 10 2015

Peak-Hour: 7:30 AM -- 8:30 AM
Peak 15-Min: 7:45 AM -- 8:00 AM



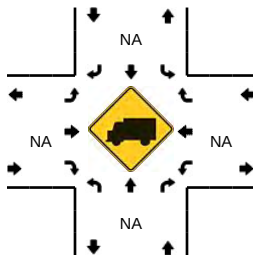
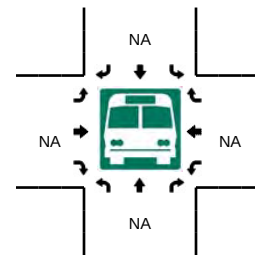
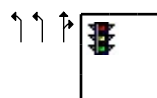
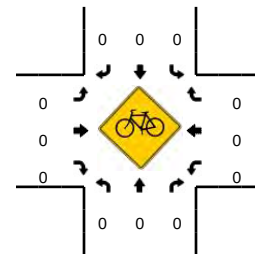
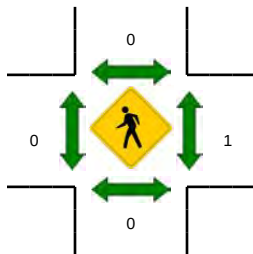
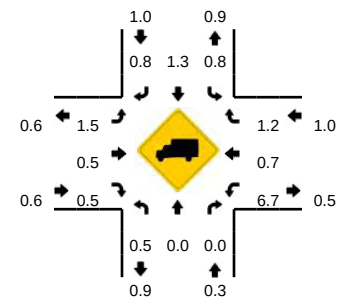
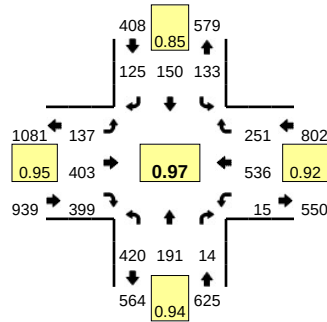
15-Min Count Period Beginning At	Concord Lake Rd (Northbound)				Concord Lake Rd (Southbound)				Dale Earnhardt (Eastbound)				Dale Earnhardt (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	28	9	3	0	69	41	31	0	19	51	48	0	0	26	4	0	329	
7:15 AM	38	14	2	0	56	28	40	0	15	72	54	0	2	36	14	0	371	
7:30 AM	50	13	0	0	66	39	28	0	8	83	72	0	1	49	8	0	417	
7:45 AM	39	6	1	0	67	62	50	0	14	107	99	0	0	60	13	0	518	1635
8:00 AM	57	11	2	1	47	29	33	0	18	90	80	0	0	56	20	0	444	1750
8:15 AM	46	12	0	0	47	28	18	0	14	99	67	0	0	53	19	0	403	1782
8:30 AM	42	15	3	0	41	24	17	0	11	107	66	0	3	49	15	0	393	1758
8:45 AM	36	11	3	0	54	34	15	0	8	108	77	0	0	54	19	0	419	1659
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	156	24	4	0	268	248	200	0	56	428	396	0	0	240	52	0	2072	
Heavy Trucks	4	0	0		0	4	12		0	4	4		0	16	4		48	
Pedestrians		0				0				0				0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Railroad																		
Stopped Buses																		

Comments:

LOCATION: Concord Lake Rd -- Dale Earnhardt Blvd
CITY/STATE: Kannapolis, NC

QC JOB #: 13588402
DATE: Thu, Sep 10 2015

Peak-Hour: 5:00 PM -- 6:00 PM
Peak 15-Min: 5:45 PM -- 6:00 PM



15-Min Count Period Beginning At	Concord Lake Rd (Northbound)				Concord Lake Rd (Southbound)				Dale Earnhardt Blvd (Eastbound)				Dale Earnhardt Blvd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	78	24	6	0	27	24	20	0	25	111	90	0	2	122	50	0	579	
4:15 PM	94	30	4	0	34	30	13	0	30	87	105	0	3	128	47	0	605	
4:30 PM	78	41	2	0	33	25	7	0	30	112	82	0	1	158	60	0	629	
4:45 PM	90	41	3	0	32	35	14	0	27	116	90	0	4	128	53	0	633	2446
5:00 PM	99	49	4	0	39	35	22	0	33	112	101	0	2	149	52	0	697	2564
5:15 PM	124	40	3	0	28	30	28	0	29	103	118	0	4	126	65	0	698	2657
5:30 PM	89	49	3	0	31	41	34	0	43	94	83	0	8	121	67	0	663	2691
5:45 PM	108	53	4	0	35	44	41	0	32	94	97	0	1	140	67	0	716	2774

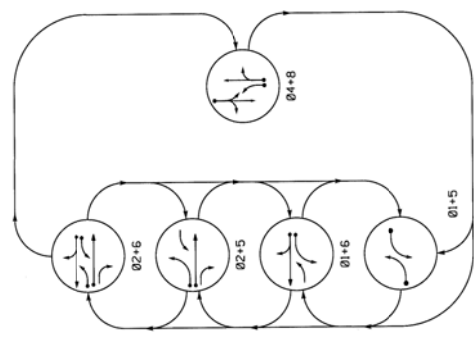
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	432	212	16	0	140	176	164	0	128	376	388	0	4	560	268	0	2864
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	4	0	0	8	0	0	12
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Railroad																	
Stopped Buses																	

Comments:

APPENDIX C

SIGNAL TIMING PLANS

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND
 DETECTED MOVEMENT
 UNDETECTED MOVEMENT (OVERLAP)
 UNDETECTED MOVEMENT
 PEDESTRIAN MOVEMENT

SIGNAL FACE I.D.

All Heads L.E.D.

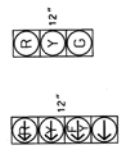


TABLE OF OPERATION

SIGNAL FACE	PHASE
11	0 1 2 3 4 5 6 7 8 9 10 11
21,22	R R G G R Y
41,42	R R G G R Y
51	R R G G R Y
61,62	R R G G R Y
81,82	R R G G R Y

$\overline{Y}$ = Flashing Yellow Arrow

STANDARD SIGNAL FACE CLEARANCES FOR FLASHING LEFT TURN SIGNAL

TO	1	2	3	4
1	1	2	1	2
2	1	2	1	2
3	1	2	1	2
4	1	2	1	2

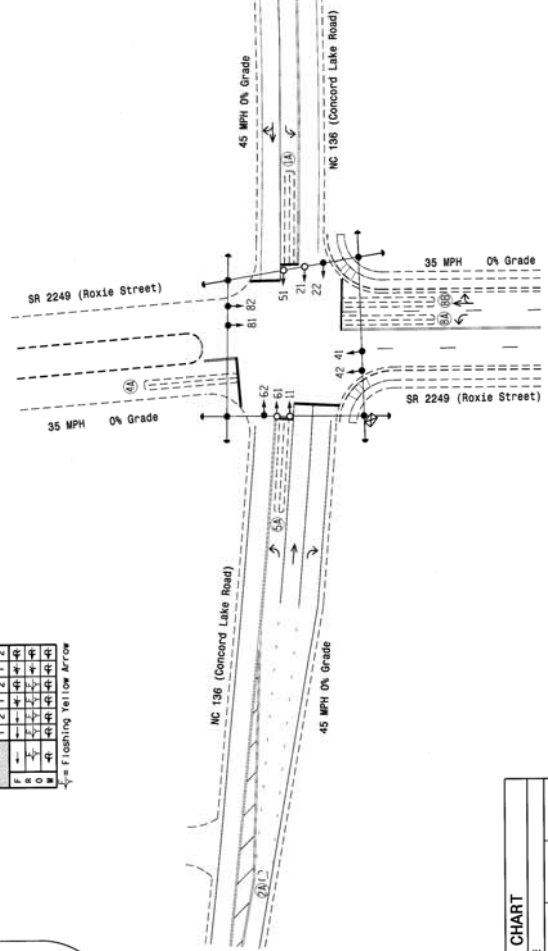
$\overline{Y}$ = Flashing Yellow Arrow

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

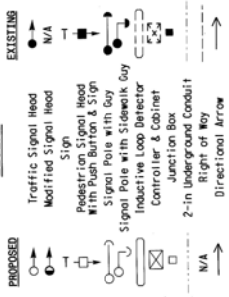
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	INDUCTIVE LOOPS		DETECTOR PROGRAMMING		STITCH TIME	DELAY TIME	SYSTEM
			NEW	EXIST	PHASE	EXTENSION			
1A	6X60	0	EXIST	-	1	Y	-	15	-
2A	6X6	300	EXIST	-	6	Y	Y	-	-
4A	6X60	0	EXIST	-	4	Y	-	5	-
5A	6X60	0	EXIST	-	5	Y	-	15	-
6A	6X6	300	EXIST	-	2	Y	Y	-	-
8A	6X60	0	EXIST	-	8	Y	-	3	-
8B	6X60	0	EXIST	-	8	Y	-	15	-

NOTES

1. Refer to "Roadway Standard Drawings NC001" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
2. Phase 1 and/or phase 5 may be logged.
3. Set all detector units to presence mode.
4. Reposition existing signal heads and detector units in the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. Pavement markings are existing.



LEGEND



OASIS 2070L TIMING CHART

FEATURE	1	2	3	4	5	6	7	8
Min Green 1"	7	12	7	7	12	7	12	7
Extension 1"	1.0	6.0	1.0	1.0	6.0	1.0	6.0	1.0
Max Green 1"	20	100	25	15	100	25	100	25
Yellow Clearance	3.0	4.5	3.0	3.0	4.5	3.0	4.5	3.0
Red Clearance	1.8	1.1	1.8	1.1	1.8	1.1	1.8	1.1
Red Burnt	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1"	-	-	-	-	-	-	-	-
Don't Walk 1"	-	-	-	-	-	-	-	-
Seconds Per Actuation *	2.5	-	-	-	2.5	-	-	-
Max Variable Initial *	34	-	-	-	34	-	-	-
Time Before Reduction *	20	-	-	-	20	-	-	-
Time To Reduce *	35	-	-	-	35	-	-	-
Minimum Gap	-	3.0	-	-	-	3.0	-	-
Recall Recall	-	MIN RECALL	-	-	-	MIN RECALL	-	-
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW	-	-
Dead Entry	-	-	-	ON	ON	-	-	ON
Synchronization Gap	ON	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

Seal of the State of North Carolina

Division 10 Cabarrus County

SR 2249 (Roxie Street)

NC 136 (Concord Lake Road)

Seal of the State of North Carolina

Division 10 Cabarrus County

SR 2249 (Roxie Street)

NC 136 (Concord Lake Road)

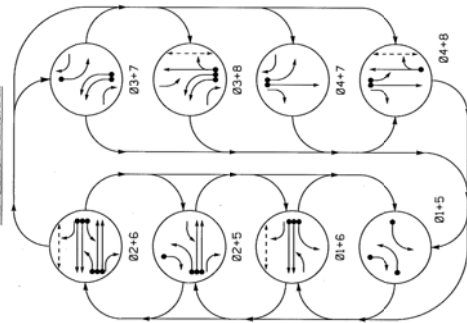
Seal of the State of North Carolina

Division 10 Cabarrus County

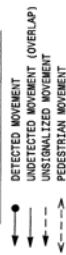
SR 2249 (Roxie Street)

NC 136 (Concord Lake Road)

SIGNAL FACE I. D.

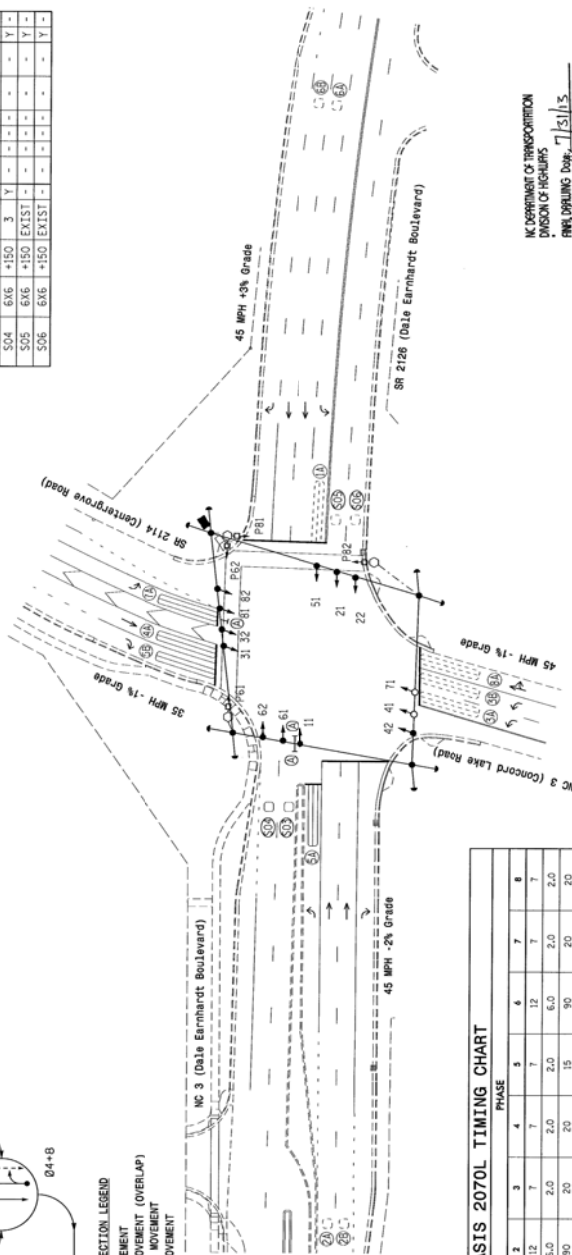
[illegible]

PHASING DIAGRAM DETECTION LEGEND



	OASIS 2070L TIMING CHART								
	PHASE								
FEATURE	1	2	3	4	5	6	7	8	
Mtn Green 1 *	7	12	7	7	7	12	7	7	
Extension 1 *	-	6.0	2.0	2.0	2.0	6.0	2.0	2.0	
Mtn Green 1 *	15	90	20	20	15	90	20	20	
Yellow Clearance	3.0	4.7	3.0	3.0	3.0	4.3	3.0	4.6	
Brd Clearance	5.4	2.0	3.2	2.2	3.7	2.1	2.8	1.9	
Rd Eaves*	-	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Wkld 1 *	-	-	-	-	-	-	-	-	
Don't Walk 1	-	-	-	-	-	22	-	4	
Seconds Per Audition *	-	1.5	-	-	-	1.5	-	22	
Mtn Variables Valid *	-	34	-	-	-	34	-	-	
Time Before Reduction	-	15	-	-	-	15	-	-	
Time To Reduce *	-	3.0	-	-	-	3.0	-	-	
Hdrn Delay	-	-	-	-	-	-	-	-	
Vehic Cell Memory	-	-	-	-	-	-	-	-	
Dual Entry	-	-	-	-	-	MN RECALL YELLOW	-	-	
Subsequent Gas	CN	-	CN	CN	CN	CN	-	CN	

OASIS 2070L TIMING CHART



NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
APPROVAL DATE: 7/31/13
APPROVED BY: (Zachary M. Little)
Traffic Engineering Branch

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS				DETECTOR PROGRAMMING					
4001	4002	4003	EXTENDED FROM TUNING	NEW LOOP	STATUS	EXTENSION	RETRY COUNT	RETRY TIME	RETRY TIME
1A	6x40	0	EXIST	-	1	Y	-	15	-
2A	6x6	300	EXIST	-	2	Y	Y	3	-
2B	6x6	300	EXIST	-	2	Y	Y	-	-
3A	6x40	0	EXIST	-	3	Y	-	3	-
3B	6x40	0	EXIST	-	3	Y	-	-	-
4A	6x40	0	2-4-2	Y	4	Y	-	-	-
5A	6x40	0	2-4-2	Y	5	Y	-	15	-
5B	6x40	0	2-4-2	Y	5	Y	-	15	-
6A	6x6	300	EXIST	-	6	Y	-	-	-
6B	6x6	300	EXIST	-	6	Y	-	-	-
7A	6x40	0	2-4-2	Y	7	Y	-	15	-
8A	6x40	0	EXIST	-	8	Y	-	3	-
9A	6x40	0	EXIST	-	8	Y	-	10	-
502	6x6	150	3	Y	-	-	-	Y	-
504	6x6	150	3	Y	-	-	-	Y	-
505	6x6	150	EXIST	-	-	-	-	Y	-
506	6x6	150	EXIST	-	-	-	-	Y	-

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012, "Standard Specifications for Roads and Structures" dated January 2012, and "Standard Specifications for Bridges and Structures" dated January 2012, and the latest version of the "North Carolina General Statutes" for the most current and complete version of the Special Provisions. The PSP can be accessed at the following websites:
<http://www.ncdot.org/dotn/preconstruct/traffic/tts/>
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. Phase 3 and/or phase 7 may be lagged.
5. Set all detector units to presence mode.
6. Unit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
7. Program pedestrian heads to countdown the flashing "Don't Walk" timing.
8. Pedestrian workings are existing.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
10. Closed loop system data: Controller Asset #1755.

LEGEND



Signal Upgrade

NC 3/SR 2126 (Dale Earnhardt Boulevard) at
NC 3 (Concord Lake Road) /
SR 2114 (Centergrove Road)
Division 10 Cabarrus County Kannapolis

Feemster, P.C.

2157 Raven Drive
Rock Hill, South Carolina 29732
Tel: (803) 372-8032
Fax: (803) 792-0488

[illegible]

APPENDIX D

DALE EARNHARDT BOULEVARD AND COLDWATER RIDGE DRIVE / SITE DRIVE 1

SYNCHRO REPORTS SIGNAL WARRANTS

Kannapolis Grocery Store
1: Dale Earnhardt Boulevard & Coldwater Ridge Drive

2015 Existing
Timing Plan: AM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR			
Lane Configurations									
Traffic Volume (veh/h)	13	28	37	285	527	32			
Future Volume (Veh/h)	13	28	37	285	527	32			
Sign Control	Stop			Free	Free				
Grade	0%			0%	0%				
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90			
Hourly flow rate (vph)	14	31	41	317	586	36			
Pedestrians									
Lane Width (ft)									
Walking Speed (ft/s)									
Percent Blockage									
Right turn flare (veh)									
Median type				None	None				
Median storage (veh)									
Upstream signal (ft)									
pX, platoon unblocked									
vC, conflicting volume	826	293	622						
vC1, stage 1 conf vol									
vC2, stage 2 conf vol									
vCu, unblocked vol	826	293	622						
tC, single (s)	6.8	6.9	4.1						
tC, 2 stage (s)									
tF (s)	3.5	3.3	2.2						
p0 queue free %	95	96	96						
cM capacity (veh/h)	297	703	955						
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3	
Volume Total	14	31	41	158	158	293	293	36	
Volume Left	14	0	41	0	0	0	0	0	
Volume Right	0	31	0	0	0	0	0	36	
cSH	297	703	955	1700	1700	1700	1700	1700	
Volume to Capacity	0.05	0.04	0.04	0.09	0.09	0.17	0.17	0.02	
Queue Length 95th (ft)	4	3	3	0	0	0	0	0	
Control Delay (s)	17.7	10.4	8.9	0.0	0.0	0.0	0.0	0.0	
Lane LOS	C	B	A						
Approach Delay (s)	12.6	1.0				0.0			
Approach LOS	B								
Intersection Summary									
Average Delay			0.9						
Intersection Capacity Utilization			31.2%		ICU Level of Service		A		
Analysis Period (min)			15						

Kannapolis Grocery Store
1: Dale Earnhardt Boulevard & Coldwater Ridge Drive

2017 No-Build
Timing Plan: AM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR			
Lane Configurations									
Traffic Volume (veh/h)	14	29	38	297	548	33			
Future Volume (Veh/h)	14	29	38	297	548	33			
Sign Control	Stop			Free	Free				
Grade	0%			0%	0%				
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90			
Hourly flow rate (vph)	16	32	42	330	609	37			
Pedestrians									
Lane Width (ft)									
Walking Speed (ft/s)									
Percent Blockage									
Right turn flare (veh)									
Median type				None	None				
Median storage (veh)									
Upstream signal (ft)									
pX, platoon unblocked									
vC, conflicting volume	858	304	646						
vC1, stage 1 conf vol									
vC2, stage 2 conf vol									
vCu, unblocked vol	858	304	646						
tC, single (s)	6.8	6.9	4.1						
tC, 2 stage (s)									
tF (s)	3.5	3.3	2.2						
p0 queue free %	94	95	96						
cM capacity (veh/h)	283	691	935						
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3	
Volume Total	16	32	42	165	165	304	304	37	
Volume Left	16	0	42	0	0	0	0	0	
Volume Right	0	32	0	0	0	0	0	37	
cSH	283	691	935	1700	1700	1700	1700	1700	
Volume to Capacity	0.06	0.05	0.04	0.10	0.10	0.18	0.18	0.02	
Queue Length 95th (ft)	4	4	4	0	0	0	0	0	
Control Delay (s)	18.5	10.5	9.0	0.0	0.0	0.0	0.0	0.0	
Lane LOS	C	B	A						
Approach Delay (s)	13.1		1.0	0.0					
Approach LOS	B								
Intersection Summary									
Average Delay			0.9						
Intersection Capacity Utilization			31.8%	ICU Level of Service			A		
Analysis Period (min)			15						

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	23	29	12	14	21	38	297	19	34	548	33
Future Volume (Veh/h)	14	23	29	12	14	21	38	297	19	34	548	33
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	16	26	32	13	16	23	42	330	21	38	609	37
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	965	1120	304	840	1136	165	646			351		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	965	1120	304	840	1136	165	646			351		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	91	86	95	94	91	97	96			97		
cM capacity (veh/h)	179	190	691	208	186	850	935			1204		
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	16	58	13	39	42	165	165	21	38	304	304	37
Volume Left	16	0	13	0	42	0	0	0	38	0	0	0
Volume Right	0	32	0	23	0	0	0	21	0	0	0	37
cSH	179	316	208	344	935	1700	1700	1700	1204	1700	1700	1700
Volume to Capacity	0.09	0.18	0.06	0.11	0.04	0.10	0.10	0.01	0.03	0.18	0.18	0.02
Queue Length 95th (ft)	7	16	5	9	4	0	0	0	2	0	0	0
Control Delay (s)	27.0	18.9	23.4	16.8	9.0	0.0	0.0	0.0	8.1	0.0	0.0	0.0
Lane LOS	D	C	C	C	A				A			
Approach Delay (s)	20.7		18.4		1.0				0.4			
Approach LOS	C		C									
Intersection Summary												
Average Delay			2.6									
Intersection Capacity Utilization			35.9%		ICU Level of Service				A			
Analysis Period (min)			15									

Kannapolis Grocery Store

2017 Build - Improvements

1: Dale Earnhardt Boulevard & Coldwater Ridge Drive/Site Drive 1

Timing Plan: AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	23	29	12	14	21	38	297	19	34	548	33
Future Volume (vph)	14	23	29	12	14	21	38	297	19	34	548	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	500		0	0		0	500		1000	175		75
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.917			0.912				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1708	0	1770	1699	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.833			0.833			0.421			0.553		
Satd. Flow (perm)	1552	1708	0	1552	1699	0	784	3539	1583	1030	3539	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		2829			574			1350			3309	
Travel Time (s)		55.1			11.2			20.5			50.1	
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)	16	26	32	13	16	23	42	330	21	38	609	37
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	58	0	13	39	0	42	330	21	38	609	37
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		12.0	12.0	12.0	12.0	12.0	12.0
Minimum Split (s)	14.0	14.0		14.0	14.0		19.0	19.0	19.0	19.0	19.0	19.0
Total Split (s)	22.0	22.0		22.0	22.0		38.0	38.0	38.0	38.0	38.0	38.0
Total Split (%)	36.7%	36.7%		36.7%	36.7%		63.3%	63.3%	63.3%	63.3%	63.3%	63.3%
Maximum Green (s)	15.0	15.0		15.0	15.0		31.0	31.0	31.0	31.0	31.0	31.0
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0		-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		Min	Min	Min	Min	Min	Min
Act Effect Green (s)	9.5	9.5		9.5	9.5		26.2	26.2	26.2	26.2	26.2	26.2

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.28	0.28		0.28	0.28		0.78	0.78	0.78	0.78	0.78	0.78
v/c Ratio	0.04	0.12		0.03	0.08		0.07	0.12	0.02	0.05	0.22	0.03
Control Delay	9.9	10.3		9.9	10.1		5.1	3.7	4.7	4.8	3.9	4.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.9	10.3		9.9	10.1		5.1	3.7	4.7	4.8	3.9	4.6
LOS	A	B		A	B		A	A	A	A	A	A
Approach Delay		10.2			10.0			3.9			4.0	
Approach LOS		B			B			A			A	
Queue Length 50th (ft)	1	4		1	3		0	0	0	0	0	0
Queue Length 95th (ft)	12	28		10	21		15	34	9	14	63	13
Internal Link Dist (ft)		2749			494			1270			3229	
Turn Bay Length (ft)	500						500		1000	175		75
Base Capacity (vph)	807	888		807	883		742	3350	1498	975	3350	1498
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	0.02	0.07		0.02	0.04		0.06	0.10	0.01	0.04	0.18	0.02

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 33.4

Natural Cycle: 40

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.22

Intersection Signal Delay: 4.6

Intersection LOS: A

Intersection Capacity Utilization 45.1%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 1: Dale Earnhardt Boulevard & Coldwater Ridge Drive/Site Drive 1

			
38 s		22 s	
			
38 s		22 s	

Kannapolis Grocery Store
1: Dale Earnhardt Boulevard & Coldwater Ridge Drive

2015 Existing
Timing Plan: PM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR			
Lane Configurations									
Traffic Volume (veh/h)	68	67	67	736	480	76			
Future Volume (Veh/h)	68	67	67	736	480	76			
Sign Control	Stop			Free	Free				
Grade	0%			0%	0%				
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90			
Hourly flow rate (vph)	76	74	74	818	533	84			
Pedestrians									
Lane Width (ft)									
Walking Speed (ft/s)									
Percent Blockage									
Right turn flare (veh)									
Median type				None	None				
Median storage (veh)									
Upstream signal (ft)									
pX, platoon unblocked									
vC, conflicting volume	1090	266	617						
vC1, stage 1 conf vol									
vC2, stage 2 conf vol									
vCu, unblocked vol	1090	266	617						
tC, single (s)	6.8	6.9	4.1						
tC, 2 stage (s)									
tF (s)	3.5	3.3	2.2						
p0 queue free %	61	90	92						
cM capacity (veh/h)	193	732	959						
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3	
Volume Total	76	74	74	409	409	266	266	84	
Volume Left	76	0	74	0	0	0	0	0	
Volume Right	0	74	0	0	0	0	0	84	
cSH	193	732	959	1700	1700	1700	1700	1700	
Volume to Capacity	0.39	0.10	0.08	0.24	0.24	0.16	0.16	0.05	
Queue Length 95th (ft)	43	8	6	0	0	0	0	0	
Control Delay (s)	35.2	10.5	9.1	0.0	0.0	0.0	0.0	0.0	
Lane LOS	E	B	A						
Approach Delay (s)	23.0		0.8	0.0					
Approach LOS	C								
Intersection Summary									
Average Delay			2.5						
Intersection Capacity Utilization			30.8%	ICU Level of Service			A		
Analysis Period (min)			15						

Kannapolis Grocery Store
1: Dale Earnhardt Boulevard & Coldwater Ridge Drive

2017 No-Build
Timing Plan: PM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR			
Lane Configurations									
Traffic Volume (veh/h)	71	70	70	766	499	79			
Future Volume (Veh/h)	71	70	70	766	499	79			
Sign Control	Stop			Free	Free				
Grade	0%			0%	0%				
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90			
Hourly flow rate (vph)	79	78	78	851	554	88			
Pedestrians									
Lane Width (ft)									
Walking Speed (ft/s)									
Percent Blockage									
Right turn flare (veh)									
Median type				None	None				
Median storage (veh)									
Upstream signal (ft)									
pX, platoon unblocked									
vC, conflicting volume	1136	277	642						
vC1, stage 1 conf vol									
vC2, stage 2 conf vol									
vCu, unblocked vol	1136	277	642						
tC, single (s)	6.8	6.9	4.1						
tC, 2 stage (s)									
tF (s)	3.5	3.3	2.2						
p0 queue free %	56	89	92						
cM capacity (veh/h)	180	720	939						
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3	
Volume Total	79	78	78	426	426	277	277	88	
Volume Left	79	0	78	0	0	0	0	0	
Volume Right	0	78	0	0	0	0	0	88	
cSH	180	720	939	1700	1700	1700	1700	1700	
Volume to Capacity	0.44	0.11	0.08	0.25	0.25	0.16	0.16	0.05	
Queue Length 95th (ft)	51	9	7	0	0	0	0	0	
Control Delay (s)	39.9	10.6	9.2	0.0	0.0	0.0	0.0	0.0	
Lane LOS	E	B	A						
Approach Delay (s)	25.4		0.8	0.0					
Approach LOS	D								
Intersection Summary									
Average Delay			2.7						
Intersection Capacity Utilization			31.8%	ICU Level of Service			A		
Analysis Period (min)			15						

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	71	36	70	55	34	91	70	726	70	80	473	79
Future Volume (Veh/h)	71	36	70	55	34	91	70	726	70	80	473	79
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	79	40	78	61	38	101	78	807	78	89	526	88
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1384	1745	263	1502	1755	404	614			885		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1384	1745	263	1502	1755	404	614			885		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	42	89	0	44	83	92			88		
cM capacity (veh/h)	42	69	735	35	68	597	961			760		
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	79	118	61	139	78	404	404	78	89	263	263	88
Volume Left	79	0	61	0	78	0	0	0	89	0	0	0
Volume Right	0	78	0	101	0	0	0	78	0	0	0	88
cSH	42	173	35	192	961	1700	1700	1700	760	1700	1700	1700
Volume to Capacity	1.90	0.68	1.72	0.73	0.08	0.24	0.24	0.05	0.12	0.15	0.15	0.05
Queue Length 95th (ft)	206	101	166	116	7	0	0	0	10	0	0	0
Control Delay (s)	631.7	61.7	593.2	61.7	9.1	0.0	0.0	0.0	10.4	0.0	0.0	0.0
Lane LOS	F	F	F	F	A				B			
Approach Delay (s)	290.3		223.8		0.7				1.3			
Approach LOS	F		F									
Intersection Summary												
Average Delay			50.2									
Intersection Capacity Utilization			49.2%		ICU Level of Service				A			
Analysis Period (min)			15									

Kannapolis Grocery Store

2017 Build - Improvements

1: Dale Earnhardt Boulevard & Coldwater Ridge Drive/Site Drive 1

Timing Plan: PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	71	36	70	55	34	91	70	726	70	80	473	79
Future Volume (vph)	71	36	70	55	34	91	70	726	70	80	473	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	500		0	0		0	500		1000	175		75
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.901			0.891				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1678	0	1770	1660	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.668			0.681			0.457			0.331		
Satd. Flow (perm)	1244	1678	0	1269	1660	0	851	3539	1583	617	3539	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		2829			574			1350			3309	
Travel Time (s)		55.1			11.2			20.5			50.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	79	40	78	61	38	101	78	807	78	89	526	88
Shared Lane Traffic (%)												
Lane Group Flow (vph)	79	118	0	61	139	0	78	807	78	89	526	88
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		12.0	12.0	12.0	12.0	12.0	12.0
Minimum Split (s)	14.0	14.0		14.0	14.0		19.0	19.0	19.0	19.0	19.0	19.0
Total Split (s)	21.0	21.0		21.0	21.0		39.0	39.0	39.0	39.0	39.0	39.0
Total Split (%)	35.0%	35.0%		35.0%	35.0%		65.0%	65.0%	65.0%	65.0%	65.0%	65.0%
Maximum Green (s)	14.0	14.0		14.0	14.0		32.0	32.0	32.0	32.0	32.0	32.0
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0		-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		Min	Min	Min	Min	Min	Min
Act Effect Green (s)	11.2	11.2		11.2	11.2		24.0	24.0	24.0	24.0	24.0	24.0

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.27	0.27		0.27	0.27		0.59	0.59	0.59	0.59	0.59	0.59
v/c Ratio	0.23	0.26		0.18	0.31		0.16	0.39	0.08	0.25	0.25	0.09
Control Delay	14.9	14.6		14.2	15.1		7.4	7.3	6.4	9.1	6.5	6.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.9	14.6		14.2	15.1		7.4	7.3	6.4	9.1	6.5	6.5
LOS	B	B		B	B		A	A	A	A	A	A
Approach Delay		14.7			14.9			7.2			6.8	
Approach LOS		B			B			A			A	
Queue Length 50th (ft)	13	20		10	23		9	55	8	11	33	10
Queue Length 95th (ft)	46	62		38	71		30	107	27	38	66	30
Internal Link Dist (ft)		2749			494			1270			3229	
Turn Bay Length (ft)	500						500		1000	175		75
Base Capacity (vph)	500	674		510	667		727	3025	1353	527	3025	1353
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	0.16	0.18		0.12	0.21		0.11	0.27	0.06	0.17	0.17	0.07

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 40.9

Natural Cycle: 40

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.39

Intersection Signal Delay: 8.5

Intersection LOS: A

Intersection Capacity Utilization 60.0%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: Dale Earnhardt Boulevard & Coldwater Ridge Drive/Site Drive 1



Signal Warrant - Volume Summary

Table 1: 2015 Existing Traffic Volumes													
	Northbound			Southbound			Eastbound			Westbound			Intersection Volume
	Dale Earnhardt Blvd			Dale Earnhardt Blvd			Coldwater Ridge Dr			Site Drive 1			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
7:00	13	215	0	0	569	19	4	0	10	0	0	0	830
8:00	31	287	0	0	551	53	15	0	35	0	0	0	972
9:00	43	358	0	0	514	58	31	0	46	0	0	0	1,050
10:00	55	462	0	0	462	60	31	0	63	0	0	0	1,133
11:00	55	475	0	0	467	69	33	0	73	0	0	0	1,172
12:00	84	539	0	0	543	84	53	0	95	0	0	0	1,398
13:00	77	537	0	0	500	67	49	0	90	0	0	0	1,320
14:00	67	557	0	0	502	52	50	0	84	0	0	0	1,312
15:00	67	640	1	0	452	73	47	0	73	0	0	1	1,354
16:00	64	703	0	0	504	81	70	0	73	0	0	0	1,495
17:00	48	735	0	0	475	50	63	0	56	0	0	0	1,427
18:00	29	513	0	0	413	27	27	0	28	0	0	0	1,037

Table 2: 2017 No-Build Trips													
	Northbound			Southbound			Eastbound			Westbound			Intersection Volume
	Dale Earnhardt Blvd			Dale Earnhardt Blvd			Coldwater Ridge Dr			Site Drive 1			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
7:00	14	224	0	0	592	20	4	0	10	0	0	0	864
8:00	32	299	0	0	573	55	16	0	36	0	0	0	1,011
9:00	45	372	0	0	535	60	32	0	48	0	0	0	1,092
10:00	57	481	0	0	481	62	32	0	66	0	0	0	1,179
11:00	57	494	0	0	486	72	34	0	76	0	0	0	1,219
12:00	87	561	0	0	565	87	55	0	99	0	0	0	1,454
13:00	80	559	0	0	520	70	51	0	94	0	0	0	1,373
14:00	70	580	0	0	522	54	52	0	87	0	0	0	1,365
15:00	70	666	1	0	470	76	49	0	76	0	0	1	1,409
16:00	67	731	0	0	524	84	73	0	76	0	0	0	1,555
17:00	50	765	0	0	494	52	66	0	58	0	0	0	1,485
18:00	30	534	0	0	430	28	28	0	29	0	0	0	1,079

Table 3: Proposed Site Trips													
	Northbound			Southbound			Eastbound			Westbound			Intersection Volume
	Dale Earnhardt Blvd			Dale Earnhardt Blvd			Coldwater Ridge Dr			Site Drive 1			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
7:00	0	0	10	17	0	0	0	11	0	4	5	8	55
8:00	0	0	15	27	0	0	0	18	0	6	7	10	83
9:00	0	0	26	47	0	0	0	32	0	10	11	17	143
10:00	0	0	34	60	0	0	0	40	0	21	25	37	217
11:00	0	0	40	72	0	0	0	48	0	30	35	53	278
12:00	0	0	45	81	0	0	0	54	0	40	47	71	338
13:00	0	0	39	70	0	0	0	47	0	41	49	74	320
14:00	0	0	37	66	0	0	0	44	0	43	51	77	318
15:00	0	0	37	67	0	0	0	45	0	42	50	76	317
16:00	0	0	38	69	0	0	0	46	0	43	51	77	324
17:00	0	0	40	72	0	0	0	48	0	44	53	79	336
18:00	0	0	38	69	0	0	0	46	0	36	43	64	296

Table 4: 2017 Build Traffic Volumes													
	Northbound			Southbound			Eastbound			Westbound			Intersection Volume
	Dale Earnhardt Blvd			Dale Earnhardt Blvd			Coldwater Ridge Dr			Site Drive 1			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
7:00	14	224	10	17	592	20	4	11	10	4	5	8	919
8:00	32	299	15	27	573	55	16	18	36	6	7	10	1,094
9:00	45	372	26	47	535	60	32	32	48	10	11	17	1,235
10:00	57	481	34	60	481	62	32	40	66	21	25	37	1,396
11:00	57	494	40	72	486	72	34	48	76	30	35	53	1,497
12:00	87	561	45	81	565	87	55	54	99	40	47	71	1,792
13:00	80	559	39	70	520	70	51	47	94	41	49	74	1,693
14:00	70	580	37	66	522	54	52	44	87	43	51	77	1,683
15:00	70	666	38	67	470	76	49	45	76	42	50	77	1,726
16:00	67	731	38	69	524	84	73	46	76	43	51	77	1,879
17:00	50	765	40	72	494	52	66	48	58	44	53	79	1,821
18:00	30	534	38	69	430	28	28	46	29	36	43	64	1,375

Ramey Kemp and Associates

Study Name : Dale Earnhardt Blvd and Coldwater Ridge Dr
Study Date : 09/10/15
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Signal Warrants - Summary

Major Street Approaches

Northbound: Dale Earnhardt Blvd

Number of Lanes: 2
Approach Speed: 45
Total Approach Volume: 7,325

Southbound: Dale Earnhardt Blvd

Number of Lanes: 2
Approach Speed: 45
Total Approach Volume: 7,629

Minor Street Approaches

Eastbound: Coldwater Ridge Dr

Number of Lanes: 2

Total Approach Volume: 1,726

Westbound: Site Drive 1

Number of Lanes: 2

Total Approach Volume: 1,431

Warrant Summary (Rural values apply.)

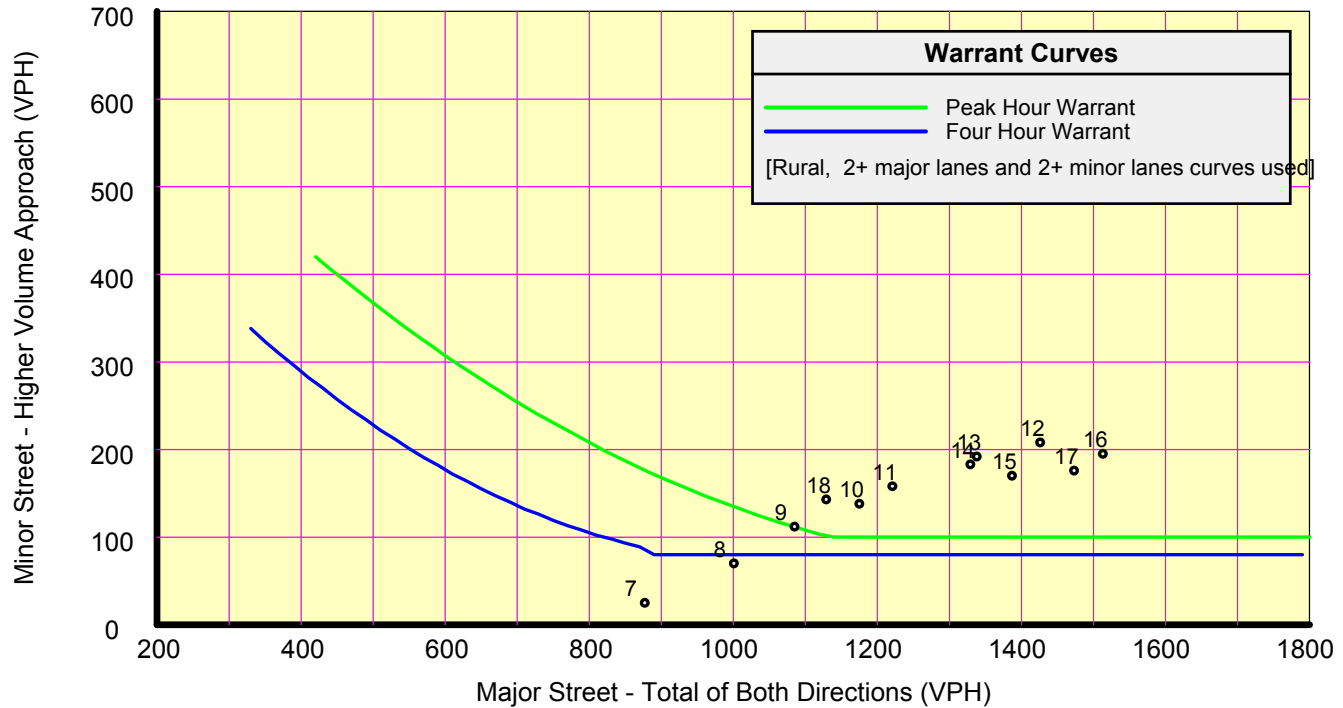
Warrant 1 - Eight Hour Vehicular Volumes	Satisfied
Warrant 1A - Minimum Vehicular Volume Satisfied	
Required volumes reached for 8 hours, 8 are needed	
Warrant 1B - Interruption of Continuous Traffic Satisfied	
Required volumes reached for 11 hours, 8 are needed	
Warrant 1 A&B - Combination of Warrants Satisfied	
Required volumes reached for 10 hours, 8 are needed	
Warrant 2 - Four Hour Volumes	Satisfied
Number of hours (10) volumes exceed minimum >= minimum required (4).	
Warrant 3 - Peak Hour	Satisfied
Warrant 3A - Peak Hour Delay Satisfied	
Number of hours (24) volumes exceed minimum >= required (1). Delay data not evaluated.	
Warrant 3B - Peak Hour Volumes Satisfied	
Volumes exceed minimums for at least one hour.	
Warrant 4 - Pedestrian Volumes	Not Evaluated
Warrant 5 - School Crossing	Not Evaluated
Warrant 6 - Coordinated Signal System	Not Evaluated
Warrant 7 - Crash Experience	Not Evaluated
Warrant 8 - Roadway Network	Not Evaluated

Ramey Kemp and Associates

Study Name : Dale Earnhardt Blvd and Coldwater Ridge Dr

Study Date : 09/10/15

Signal Warrants - Summary Page No. : 2



Analysis of 8-Hour Volume Warrants:

Hour Begin	Major Total	Higher Minor Vol	Dir	War-1A			War-1B			War-1A&B		
				Major Crit	Minor Crit	Meets?	Major Crit	Minor Crit	Meets?	Major Crit	Minor Crit	Meets?
00:00	0	0	EB	420-No	140-No	---	630-No	70-No	---	504-No	112-No	---
01:00	0	0	EB	420-No	140-No	---	630-No	70-No	---	504-No	112-No	---
02:00	0	0	EB	420-No	140-No	---	630-No	70-No	---	504-No	112-No	---
03:00	0	0	EB	420-No	140-No	---	630-No	70-No	---	504-No	112-No	---
04:00	0	0	EB	420-No	140-No	---	630-No	70-No	---	504-No	112-No	---
05:00	0	0	EB	420-No	140-No	---	630-No	70-No	---	504-No	112-No	---
06:00	0	0	EB	420-No	140-No	---	630-No	70-No	---	504-No	112-No	---
07:00	877	25	EB	420-Yes	140-No	Major	630-Yes	70-No	Major	504-Yes	112-No	Major
08:00	1,001	70	EB	420-Yes	140-No	Major	630-Yes	70-Yes	Both	504-Yes	112-No	Major
09:00	1,085	112	EB	420-Yes	140-No	Major	630-Yes	70-Yes	Both	504-Yes	112-Yes	Both
10:00	1,175	138	EB	420-Yes	140-No	Major	630-Yes	70-Yes	Both	504-Yes	112-Yes	Both
11:00	1,221	158	EB	420-Yes	140-Yes	Both	630-Yes	70-Yes	Both	504-Yes	112-Yes	Both
12:00	1,426	208	EB	420-Yes	140-Yes	Both	630-Yes	70-Yes	Both	504-Yes	112-Yes	Both
13:00	1,338	192	EB	420-Yes	140-Yes	Both	630-Yes	70-Yes	Both	504-Yes	112-Yes	Both
14:00	1,329	183	EB	420-Yes	140-Yes	Both	630-Yes	70-Yes	Both	504-Yes	112-Yes	Both
15:00	1,387	170	EB	420-Yes	140-Yes	Both	630-Yes	70-Yes	Both	504-Yes	112-Yes	Both
16:00	1,513	195	EB	420-Yes	140-Yes	Both	630-Yes	70-Yes	Both	504-Yes	112-Yes	Both
17:00	1,473	176	WB	420-Yes	140-Yes	Both	630-Yes	70-Yes	Both	504-Yes	112-Yes	Both
18:00	1,129	143	WB	420-Yes	140-Yes	Both	630-Yes	70-Yes	Both	504-Yes	112-Yes	Both
19:00	0	0	EB	420-No	140-No	---	630-No	70-No	---	504-No	112-No	---
20:00	0	0	EB	420-No	140-No	---	630-No	70-No	---	504-No	112-No	---
21:00	0	0	EB	420-No	140-No	---	630-No	70-No	---	504-No	112-No	---
22:00	0	0	EB	420-No	140-No	---	630-No	70-No	---	504-No	112-No	---
23:00	0	0	EB	420-No	140-No	---	630-No	70-No	---	504-No	112-No	---

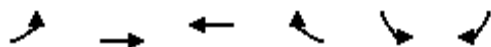
APPENDIX E

**COLDWATER RIDGE DRIVE AND
ROXIE STREET**

SYNCHRO REPORTS

Kannapolis Grocery Store
2: Roxie Street & Coldwater Ridge Drive

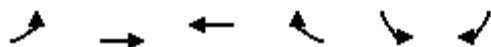
2015 Existing
Timing Plan: AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔↔	↔		↔	↔
Traffic Volume (veh/h)	22	197	143	2	1	12
Future Volume (Veh/h)	22	197	143	2	1	12
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	24	219	159	2	1	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		454				
pX, platoon unblocked						
vC, conflicting volume	161				318	160
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	161				318	160
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				100	98
cM capacity (veh/h)	1416				640	857
Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2	
Volume Total	97	146	161	1	13	
Volume Left	24	0	0	1	0	
Volume Right	0	0	2	0	13	
cSH	1416	1700	1700	640	857	
Volume to Capacity	0.02	0.09	0.09	0.00	0.02	
Queue Length 95th (ft)	1	0	0	0	1	
Control Delay (s)	2.0	0.0	0.0	10.6	9.3	
Lane LOS	A			B	A	
Approach Delay (s)	0.8		0.0	9.4		
Approach LOS				A		
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization			27.1%	ICU Level of Service		A
Analysis Period (min)			15			

Kannapolis Grocery Store
2: Roxie Street & Coldwater Ridge Drive

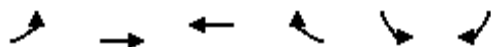
2017 No-Build
Timing Plan: AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔↔	↔		↔	↔
Traffic Volume (veh/h)	23	205	149	2	1	12
Future Volume (Veh/h)	23	205	149	2	1	12
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	26	228	166	2	1	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)		454				
pX, platoon unblocked						
vC, conflicting volume	168				333	167
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	168				333	167
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				100	98
cM capacity (veh/h)	1407				625	848
Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2	
Volume Total	102	152	168	1	13	
Volume Left	26	0	0	1	0	
Volume Right	0	0	2	0	13	
cSH	1407	1700	1700	625	848	
Volume to Capacity	0.02	0.09	0.10	0.00	0.02	
Queue Length 95th (ft)	1	0	0	0	1	
Control Delay (s)	2.0	0.0	0.0	10.8	9.3	
Lane LOS	A			B	A	
Approach Delay (s)	0.8		0.0	9.4		
Approach LOS				A		
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization			27.6%		ICU Level of Service	
Analysis Period (min)			15			
A						

Kannapolis Grocery Store
2: Roxie Street & Coldwater Ridge Drive

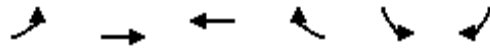
2017 Build
Timing Plan: AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔↔	↔		↔	↔
Traffic Volume (veh/h)	46	205	149	2	1	26
Future Volume (Veh/h)	46	205	149	2	1	26
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	51	228	166	2	1	29
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)		454				
pX, platoon unblocked						
vC, conflicting volume	168				383	167
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	168				383	167
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				100	97
cM capacity (veh/h)	1407				571	848
Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2	
Volume Total	127	152	168	1	29	
Volume Left	51	0	0	1	0	
Volume Right	0	0	2	0	29	
cSH	1407	1700	1700	571	848	
Volume to Capacity	0.04	0.09	0.10	0.00	0.03	
Queue Length 95th (ft)	3	0	0	0	3	
Control Delay (s)	3.2	0.0	0.0	11.3	9.4	
Lane LOS	A			B	A	
Approach Delay (s)	1.5		0.0	9.5		
Approach LOS				A		
Intersection Summary						
Average Delay			1.5			
Intersection Capacity Utilization			28.3%	ICU Level of Service		A
Analysis Period (min)			15			

Kannapolis Grocery Store
2: Roxie Street & Coldwater Ridge Drive

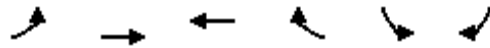
2015 Existing
Timing Plan: PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔↔	↔		↔	↔
Traffic Volume (veh/h)	38	467	471	11	8	59
Future Volume (Veh/h)	38	467	471	11	8	59
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	42	519	523	12	9	66
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)		454				
pX, platoon unblocked						
vC, conflicting volume	535				872	529
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	535				872	529
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				97	87
cM capacity (veh/h)	1029				278	494
Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2	
Volume Total	215	346	535	9	66	
Volume Left	42	0	0	9	0	
Volume Right	0	0	12	0	66	
cSH	1029	1700	1700	278	494	
Volume to Capacity	0.04	0.20	0.31	0.03	0.13	
Queue Length 95th (ft)	3	0	0	3	11	
Control Delay (s)	2.0	0.0	0.0	18.4	13.4	
Lane LOS	A			C	B	
Approach Delay (s)	0.8		0.0	14.0		
Approach LOS				B		
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization			52.0%	ICU Level of Service		A
Analysis Period (min)			15			

Kannapolis Grocery Store
2: Roxie Street & Coldwater Ridge Drive

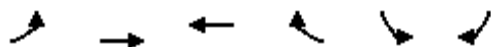
2017 No-Build
Timing Plan: PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	40	486	490	11	8	61
Future Volume (Veh/h)	40	486	490	11	8	61
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	44	540	544	12	9	68
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)		454				
pX, platoon unblocked						
vC, conflicting volume	556				908	550
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	556				908	550
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				97	86
cM capacity (veh/h)	1011				263	479
Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2	
Volume Total	224	360	556	9	68	
Volume Left	44	0	0	9	0	
Volume Right	0	0	12	0	68	
cSH	1011	1700	1700	263	479	
Volume to Capacity	0.04	0.21	0.33	0.03	0.14	
Queue Length 95th (ft)	3	0	0	3	12	
Control Delay (s)	2.1	0.0	0.0	19.2	13.8	
Lane LOS	A			C	B	
Approach Delay (s)	0.8		0.0	14.4		
Approach LOS				B		
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization			54.0%		ICU Level of Service	
					A	
Analysis Period (min)			15			

Kannapolis Grocery Store
2: Roxie Street & Coldwater Ridge Drive

2017 Build
Timing Plan: PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		 				
Traffic Volume (veh/h)	76	486	490	11	8	95
Future Volume (Veh/h)	76	486	490	11	8	95
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	84	540	544	12	9	106
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		454				
pX, platoon unblocked						
vC, conflicting volume	556				988	550
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	556				988	550
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	92				96	78
cM capacity (veh/h)	1011				224	479
Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2	
Volume Total	264	360	556	9	106	
Volume Left	84	0	0	9	0	
Volume Right	0	0	12	0	106	
cSH	1011	1700	1700	224	479	
Volume to Capacity	0.08	0.21	0.33	0.04	0.22	
Queue Length 95th (ft)	7	0	0	3	21	
Control Delay (s)	3.4	0.0	0.0	21.8	14.6	
Lane LOS	A			C	B	
Approach Delay (s)	1.4		0.0	15.2		
Approach LOS				C		
Intersection Summary						
Average Delay			2.0			
Intersection Capacity Utilization			55.4%		ICU Level of Service	
Analysis Period (min)			15			
			B			

APPENDIX F

**CONCORD LAKE ROAD AND
ROXIE STREET**

SYNCHRO REPORTS

Kannapolis Grocery Store
3: Concord Lake Road & Roxie Street

2015 Existing
Timing Plan: AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	5	14	105	3	47	9	191	116	98	393	8
Future Volume (vph)	8	5	14	105	3	47	9	191	116	98	393	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		125	150		150	150		0
Storage Lanes	0		0	0		1	1		1	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.930				0.850			0.850		0.997	
Flt Protected		0.986			0.954		0.950			0.950		
Satd. Flow (prot)	0	1708	0	0	1777	1583	1770	1863	1583	1770	1857	0
Flt Permitted		0.865			0.709		0.505			0.528		
Satd. Flow (perm)	0	1498	0	0	1321	1583	941	1863	1583	984	1857	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16				67			129			1
Link Speed (mph)		15			35			45			45	
Link Distance (ft)		844			454			1854			3180	
Travel Time (s)		38.4			8.8			28.1			48.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	9	6	16	117	3	52	10	212	129	109	437	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	31	0	0	120	52	10	212	129	109	446	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Detector Phase	4	4		8	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	12.0	12.0	7.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0	13.0	12.0	18.0	18.0	12.0	18.0	
Total Split (s)	37.0	37.0		37.0	37.0	37.0	14.0	67.0	67.0	16.0	69.0	
Total Split (%)	30.8%	30.8%		30.8%	30.8%	30.8%	11.7%	55.8%	55.8%	13.3%	57.5%	
Maximum Green (s)	31.4	31.4		31.9	31.9	31.9	9.2	61.4	61.4	11.2	63.4	
Yellow Time (s)	3.8	3.8		3.8	3.8	3.8	3.0	4.5	4.5	3.0	4.5	
All-Red Time (s)	1.8	1.8		1.3	1.3	1.3	1.8	1.1	1.1	1.8	1.1	
Lost Time Adjust (s)		-0.6			-0.1	-1.0	0.2	-0.6	-0.6	0.2	-0.6	
Total Lost Time (s)		5.0			5.0	4.1	5.0	5.0	5.0	5.0	5.0	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	1.0	1.0		1.0	1.0	1.0	1.0	6.0	6.0	1.0	6.0	
Minimum Gap (s)	0.2	0.2		0.2	0.2	0.2	0.2	3.0	3.0	0.2	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	20.0	20.0	0.0	20.0	

Kannapolis Grocery Store
3: Concord Lake Road & Roxie Street

2015 Existing
Timing Plan: AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	35.0	35.0	0.0	35.0	
Recall Mode	None	None		None	None	None	None	Min	Min	None	Min	
Act Effect Green (s)		9.4			9.2	10.2	26.8	23.0	23.0	30.0	30.5	
Actuated g/C Ratio		0.20			0.20	0.22	0.57	0.49	0.49	0.64	0.65	
v/c Ratio		0.10			0.46	0.13	0.02	0.23	0.15	0.15	0.37	
Control Delay		14.1			25.9	5.7	4.4	11.8	3.1	4.9	8.3	
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		14.1			25.9	5.7	4.4	11.8	3.1	4.9	8.3	
LOS		B			C	A	A	B	A	A	A	
Approach Delay		14.1			19.8			8.4			7.6	
Approach LOS		B			B			A			A	
Queue Length 50th (ft)		3			28	0	1	39	0	10	48	
Queue Length 95th (ft)		25			90	19	6	90	25	31	200	
Internal Link Dist (ft)		764			374			1774			3100	
Turn Bay Length (ft)						125	150		150	150		
Base Capacity (vph)		1081			949	1187	738	1830	1557	834	1835	
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			0.13	0.04	0.01	0.12	0.08	0.13	0.24	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 47

Natural Cycle: 50

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.46

Intersection Signal Delay: 9.9

Intersection LOS: A

Intersection Capacity Utilization 52.1%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 3: Concord Lake Road & Roxie Street

 Ø1	 Ø2	 Ø4
16 s	67 s	37 s
 Ø5	 Ø6	 Ø8
14 s	69 s	37 s

Kannapolis Grocery Store
3: Concord Lake Road & Roxie Street

2017 No-Build
Timing Plan: AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	5	15	109	3	49	9	199	121	102	409	8
Future Volume (vph)	8	5	15	109	3	49	9	199	121	102	409	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		125	150		150	150		0
Storage Lanes	0		0	0		1	1		1	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.928				0.850			0.850		0.997	
Flt Protected		0.986			0.953		0.950			0.950		
Satd. Flow (prot)	0	1704	0	0	1775	1583	1770	1863	1583	1770	1857	0
Flt Permitted		0.870			0.708		0.497			0.525		
Satd. Flow (perm)	0	1504	0	0	1319	1583	926	1863	1583	978	1857	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17				67			134			1
Link Speed (mph)		15			35			45			45	
Link Distance (ft)		844			454			1854			3180	
Travel Time (s)		38.4			8.8			28.1			48.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	9	6	17	121	3	54	10	221	134	113	454	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	32	0	0	124	54	10	221	134	113	463	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Detector Phase	4	4		8	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	12.0	12.0	7.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0	13.0	12.0	18.0	18.0	12.0	18.0	
Total Split (s)	36.0	36.0		36.0	36.0	36.0	14.0	68.0	68.0	16.0	70.0	
Total Split (%)	30.0%	30.0%		30.0%	30.0%	30.0%	11.7%	56.7%	56.7%	13.3%	58.3%	
Maximum Green (s)	30.4	30.4		30.9	30.9	30.9	9.2	62.4	62.4	11.2	64.4	
Yellow Time (s)	3.8	3.8		3.8	3.8	3.8	3.0	4.5	4.5	3.0	4.5	
All-Red Time (s)	1.8	1.8		1.3	1.3	1.3	1.8	1.1	1.1	1.8	1.1	
Lost Time Adjust (s)		-0.6			-0.1	-1.0	0.2	-0.6	-0.6	0.2	-0.6	
Total Lost Time (s)		5.0			5.0	4.1	5.0	5.0	5.0	5.0	5.0	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	1.0	1.0		1.0	1.0	1.0	1.0	6.0	6.0	1.0	6.0	
Minimum Gap (s)	0.2	0.2		0.2	0.2	0.2	0.2	3.0	3.0	0.2	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	20.0	20.0	0.0	20.0	

Kannapolis Grocery Store
3: Concord Lake Road & Roxie Street

2017 No-Build
Timing Plan: AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	35.0	35.0	0.0	35.0	
Recall Mode	None	None		None	None	None	None	Min	Min	None	Min	
Act Effect Green (s)		9.6			9.4	10.4	27.3	23.5	23.5	30.5	31.0	
Actuated g/C Ratio		0.20			0.20	0.22	0.57	0.49	0.49	0.64	0.65	
v/c Ratio		0.10			0.48	0.14	0.02	0.24	0.16	0.15	0.38	
Control Delay		14.0			26.5	6.0	4.6	11.9	3.0	5.0	8.5	
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		14.0			26.5	6.0	4.6	11.9	3.0	5.0	8.5	
LOS		B			C	A	A	B	A	A	A	
Approach Delay		14.0			20.3			8.4			7.8	
Approach LOS		B			C			A			A	
Queue Length 50th (ft)		3			30	0	1	42	0	10	52	
Queue Length 95th (ft)		26			95	21	6	94	25	32	211	
Internal Link Dist (ft)		764			374			1774			3100	
Turn Bay Length (ft)						125	150		150	150		
Base Capacity (vph)		1040			907	1140	731	1826	1554	830	1857	
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			0.14	0.05	0.01	0.12	0.09	0.14	0.25	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 47.7

Natural Cycle: 50

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.48

Intersection Signal Delay: 10.1

Intersection LOS: B

Intersection Capacity Utilization 53.2%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 3: Concord Lake Road & Roxie Street

Ø1	Ø2	Ø4
16 s	68 s	36 s
Ø5	Ø6	Ø8
14 s	70 s	36 s

Kannapolis Grocery Store
3: Concord Lake Road & Roxie Street

2017 Build
Timing Plan: AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	5	15	123	3	49	9	199	144	102	409	8
Future Volume (vph)	8	5	15	123	3	49	9	199	144	102	409	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		125	150		150	150		0
Storage Lanes	0		0	0		1	1		1	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.928				0.850			0.850		0.997	
Flt Protected		0.986			0.953		0.950			0.950		
Satd. Flow (prot)	0	1704	0	0	1775	1583	1770	1863	1583	1770	1857	0
Flt Permitted		0.870			0.707		0.497			0.524		
Satd. Flow (perm)	0	1504	0	0	1317	1583	926	1863	1583	976	1857	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17				67			160			1
Link Speed (mph)		15			35			45			45	
Link Distance (ft)		844			454			1854			3180	
Travel Time (s)		38.4			8.8			28.1			48.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	9	6	17	137	3	54	10	221	160	113	454	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	32	0	0	140	54	10	221	160	113	463	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Detector Phase	4	4		8	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	12.0	12.0	7.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0	13.0	12.0	18.0	18.0	12.0	18.0	
Total Split (s)	36.0	36.0		36.0	36.0	36.0	14.0	68.0	68.0	16.0	70.0	
Total Split (%)	30.0%	30.0%		30.0%	30.0%	30.0%	11.7%	56.7%	56.7%	13.3%	58.3%	
Maximum Green (s)	30.4	30.4		30.9	30.9	30.9	9.2	62.4	62.4	11.2	64.4	
Yellow Time (s)	3.8	3.8		3.8	3.8	3.8	3.0	4.5	4.5	3.0	4.5	
All-Red Time (s)	1.8	1.8		1.3	1.3	1.3	1.8	1.1	1.1	1.8	1.1	
Lost Time Adjust (s)		-0.6			-0.1	-1.0	0.2	-0.6	-0.6	0.2	-0.6	
Total Lost Time (s)		5.0			5.0	4.1	5.0	5.0	5.0	5.0	5.0	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	1.0	1.0		1.0	1.0	1.0	1.0	6.0	6.0	1.0	6.0	
Minimum Gap (s)	0.2	0.2		0.2	0.2	0.2	0.2	3.0	3.0	0.2	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	20.0	20.0	0.0	20.0	

Kannapolis Grocery Store
3: Concord Lake Road & Roxie Street

2017 Build
Timing Plan: AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	35.0	35.0	0.0	35.0	
Recall Mode	None	None		None	None	None	None	Min	Min	None	Min	
Act Effect Green (s)		10.2			10.0	11.0	27.5	23.8	23.8	30.7	31.3	
Actuated g/C Ratio		0.21			0.21	0.23	0.57	0.49	0.49	0.64	0.65	
v/c Ratio		0.10			0.51	0.13	0.02	0.24	0.19	0.15	0.38	
Control Delay		14.0			27.6	5.9	4.8	12.2	3.0	5.2	8.7	
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		14.0			27.6	5.9	4.8	12.2	3.0	5.2	8.7	
LOS		B			C	A	A	B	A	A	A	
Approach Delay		14.0			21.6			8.2			8.0	
Approach LOS		B			C			A			A	
Queue Length 50th (ft)		3			34	0	1	42	0	11	54	
Queue Length 95th (ft)		26			107	21	6	99	28	34	219	
Internal Link Dist (ft)		764			374			1774			3100	
Turn Bay Length (ft)						125	150		150	150		
Base Capacity (vph)		1044			910	1136	728	1814	1546	826	1819	
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			0.15	0.05	0.01	0.12	0.10	0.14	0.25	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 48.3

Natural Cycle: 50

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.51

Intersection Signal Delay: 10.5

Intersection LOS: B

Intersection Capacity Utilization 54.0%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 3: Concord Lake Road & Roxie Street

 Ø1	 Ø2	 Ø4
16 s	68 s	36 s
 Ø5	 Ø6	 Ø8
14 s	70 s	36 s

Kannapolis Grocery Store
3: Concord Lake Road & Roxie Street

2015 Existing
Timing Plan: PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	13	21	302	8	220	13	406	305	187	374	14
Future Volume (vph)	9	13	21	302	8	220	13	406	305	187	374	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		125	150		150	150		0
Storage Lanes	0		0	0		1	1		1	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.934				0.850			0.850		0.994	
Flt Protected		0.989			0.954		0.950			0.950		
Satd. Flow (prot)	0	1721	0	0	1777	1583	1770	1863	1583	1770	1852	0
Flt Permitted		0.915			0.697		0.509			0.290		
Satd. Flow (perm)	0	1592	0	0	1298	1583	948	1863	1583	540	1852	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		23				212			253		2	
Link Speed (mph)		15			35			45			45	
Link Distance (ft)		844			454			1854			3180	
Travel Time (s)		38.4			8.8			28.1			48.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	10	14	23	336	9	244	14	451	339	208	416	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	47	0	0	345	244	14	451	339	208	432	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Detector Phase	4	4		8	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	12.0	12.0	7.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0	13.0	12.0	18.0	18.0	12.0	18.0	
Total Split (s)	52.0	52.0		52.0	52.0	52.0	12.0	50.0	50.0	18.0	56.0	
Total Split (%)	43.3%	43.3%		43.3%	43.3%	43.3%	10.0%	41.7%	41.7%	15.0%	46.7%	
Maximum Green (s)	46.4	46.4		46.9	46.9	46.9	7.2	44.4	44.4	13.2	50.4	
Yellow Time (s)	3.8	3.8		3.8	3.8	3.8	3.0	4.5	4.5	3.0	4.5	
All-Red Time (s)	1.8	1.8		1.3	1.3	1.3	1.8	1.1	1.1	1.8	1.1	
Lost Time Adjust (s)		-0.6			-0.1	-1.0	0.2	-0.6	-0.6	0.2	-0.6	
Total Lost Time (s)		5.0			5.0	4.1	5.0	5.0	5.0	5.0	5.0	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	1.0	1.0		1.0	1.0	1.0	1.0	6.0	6.0	1.0	6.0	
Minimum Gap (s)	0.2	0.2		0.2	0.2	0.2	0.2	3.0	3.0	0.2	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	20.0	20.0	0.0	20.0	

Kannapolis Grocery Store
3: Concord Lake Road & Roxie Street

2015 Existing
Timing Plan: PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	35.0	35.0	0.0	35.0	
Recall Mode	None	None		None	None	None	None	Min	Min	None	Min	
Act Effect Green (s)		27.5			27.5	28.5	39.5	32.2	32.2	46.9	45.2	
Actuated g/C Ratio		0.32			0.32	0.33	0.46	0.38	0.38	0.55	0.53	
v/c Ratio		0.09			0.82	0.36	0.03	0.64	0.45	0.48	0.44	
Control Delay		13.7			44.5	6.5	12.3	28.6	8.5	15.5	16.9	
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		13.7			44.5	6.5	12.3	28.6	8.5	15.5	16.9	
LOS		B			D	A	B	C	A	B	B	
Approach Delay		13.7			28.7			19.9			16.5	
Approach LOS		B			C			B			B	
Queue Length 50th (ft)		9			166	11	3	184	28	51	120	
Queue Length 95th (ft)		37			333	68	16	402	121	130	346	
Internal Link Dist (ft)		764			374			1774			3100	
Turn Bay Length (ft)						125	150		150	150		
Base Capacity (vph)		953			769	1040	514	1057	1008	499	1199	
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		0.05			0.45	0.23	0.03	0.43	0.34	0.42	0.36	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 85.2

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 21.2

Intersection LOS: C

Intersection Capacity Utilization 68.0%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 3: Concord Lake Road & Roxie Street

18 s	50 s	52 s
12 s	56 s	52 s

Kannapolis Grocery Store
3: Concord Lake Road & Roxie Street

2017 No-Build
Timing Plan: PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	14	22	314	8	229	14	422	317	195	389	15
Future Volume (vph)	9	14	22	314	8	229	14	422	317	195	389	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		125	150		150	150		0
Storage Lanes	0		0	0		1	1		1	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.935				0.850			0.850		0.994	
Flt Protected		0.990			0.954		0.950			0.950		
Satd. Flow (prot)	0	1724	0	0	1777	1583	1770	1863	1583	1770	1852	0
Flt Permitted		0.919			0.695		0.466			0.267		
Satd. Flow (perm)	0	1601	0	0	1295	1583	868	1863	1583	497	1852	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24				216			246			2
Link Speed (mph)		15			35			45			45	
Link Distance (ft)		844			454			1854			3180	
Travel Time (s)		38.4			8.8			28.1			48.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	10	16	24	349	9	254	16	469	352	217	432	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	50	0	0	358	254	16	469	352	217	449	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Detector Phase	4	4		8	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	12.0	12.0	7.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0	13.0	12.0	18.0	18.0	12.0	18.0	
Total Split (s)	53.0	53.0		53.0	53.0	53.0	12.0	48.0	48.0	19.0	55.0	
Total Split (%)	44.2%	44.2%		44.2%	44.2%	44.2%	10.0%	40.0%	40.0%	15.8%	45.8%	
Maximum Green (s)	47.4	47.4		47.9	47.9	47.9	7.2	42.4	42.4	14.2	49.4	
Yellow Time (s)	3.8	3.8		3.8	3.8	3.8	3.0	4.5	4.5	3.0	4.5	
All-Red Time (s)	1.8	1.8		1.3	1.3	1.3	1.8	1.1	1.1	1.8	1.1	
Lost Time Adjust (s)		-0.6			-0.1	-1.0	0.2	-0.6	-0.6	0.2	-0.6	
Total Lost Time (s)		5.0			5.0	4.1	5.0	5.0	5.0	5.0	5.0	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	1.0	1.0		1.0	1.0	1.0	1.0	6.0	6.0	1.0	6.0	
Minimum Gap (s)	0.2	0.2		0.2	0.2	0.2	0.2	3.0	3.0	0.2	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	20.0	20.0	0.0	20.0	

Kannapolis Grocery Store
3: Concord Lake Road & Roxie Street

2017 No-Build
Timing Plan: PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	35.0	35.0	0.0	35.0	
Recall Mode	None	None		None	None	None	None	Min	Min	None	Min	
Act Effect Green (s)		29.4			29.4	30.3	41.0	33.7	33.7	48.7	45.0	
Actuated g/C Ratio		0.33			0.33	0.34	0.46	0.38	0.38	0.55	0.51	
v/c Ratio		0.09			0.84	0.37	0.03	0.66	0.47	0.53	0.48	
Control Delay		13.7			46.1	6.7	12.9	30.5	9.9	17.1	20.1	
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		13.7			46.1	6.7	12.9	30.5	9.9	17.1	20.1	
LOS		B			D	A	B	C	A	B	C	
Approach Delay		13.7			29.7			21.5			19.1	
Approach LOS		B			C			C			B	
Queue Length 50th (ft)		10			182	14	4	205	37	57	136	
Queue Length 95th (ft)		38			344	72	17	435	142	138	369	
Internal Link Dist (ft)		764			374			1774			3100	
Turn Bay Length (ft)						125	150		150	150		
Base Capacity (vph)		934			747	1019	478	963	937	487	1115	
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		0.05			0.48	0.25	0.03	0.49	0.38	0.45	0.40	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 88.8

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 22.9

Intersection LOS: C

Intersection Capacity Utilization 70.0%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 3: Concord Lake Road & Roxie Street

	Ø1		Ø2		Ø4
19 s		48 s		53 s	
	Ø5		Ø6		Ø8
12 s		55 s		53 s	

Kannapolis Grocery Store

3: Concord Lake Road & Roxie Street

2017 Build
Timing Plan: PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	14	22	348	8	229	14	422	353	195	389	15
Future Volume (vph)	9	14	22	348	8	229	14	422	353	195	389	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		125	150		150	150		0
Storage Lanes	0		0	0		1	1		1	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.935				0.850			0.850		0.994	
Flt Protected		0.990			0.953		0.950			0.950		
Satd. Flow (prot)	0	1724	0	0	1775	1583	1770	1863	1583	1770	1852	0
Flt Permitted		0.916			0.694		0.456			0.256		
Satd. Flow (perm)	0	1595	0	0	1293	1583	849	1863	1583	477	1852	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24				195			274		2	
Link Speed (mph)		15			35			45			45	
Link Distance (ft)		844			454			1854			3180	
Travel Time (s)		38.4			8.8			28.1			48.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	10	16	24	387	9	254	16	469	392	217	432	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	50	0	0	396	254	16	469	392	217	449	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Detector Phase	4	4		8	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	12.0	12.0	7.0	12.0	
Minimum Split (s)	13.0	13.0		13.0	13.0	13.0	12.0	18.0	18.0	12.0	18.0	
Total Split (s)	53.0	53.0		53.0	53.0	53.0	12.0	48.0	48.0	19.0	55.0	
Total Split (%)	44.2%	44.2%		44.2%	44.2%	44.2%	10.0%	40.0%	40.0%	15.8%	45.8%	
Maximum Green (s)	47.4	47.4		47.9	47.9	47.9	7.2	42.4	42.4	14.2	49.4	
Yellow Time (s)	3.8	3.8		3.8	3.8	3.8	3.0	4.5	4.5	3.0	4.5	
All-Red Time (s)	1.8	1.8		1.3	1.3	1.3	1.8	1.1	1.1	1.8	1.1	
Lost Time Adjust (s)		-0.6			-0.1	-1.0	0.2	-0.6	-0.6	0.2	-0.6	
Total Lost Time (s)		5.0			5.0	4.1	5.0	5.0	5.0	5.0	5.0	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	1.0	1.0		1.0	1.0	1.0	1.0	6.0	6.0	1.0	6.0	
Minimum Gap (s)	0.2	0.2		0.2	0.2	0.2	0.2	3.0	3.0	0.2	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	20.0	20.0	0.0	20.0	

Kannapolis Grocery Store
3: Concord Lake Road & Roxie Street

2017 Build
Timing Plan: PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	35.0	35.0	0.0	35.0	
Recall Mode	None	None		None	None	None	None	Min	Min	None	Min	
Act Effect Green (s)		32.9			32.9	33.9	41.9	34.6	34.6	50.1	46.3	
Actuated g/C Ratio		0.35			0.35	0.36	0.45	0.37	0.37	0.54	0.49	
v/c Ratio		0.09			0.87	0.36	0.04	0.68	0.52	0.55	0.49	
Control Delay		13.7			50.0	7.8	13.8	32.9	10.8	18.8	21.5	
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		13.7			50.0	7.8	13.8	32.9	10.8	18.8	21.5	
LOS		B			D	A	B	C	B	B	C	
Approach Delay		13.7			33.5			22.6			20.6	
Approach LOS		B			C			C			C	
Queue Length 50th (ft)		10			215	23	4	229	47	65	155	
Queue Length 95th (ft)		38			#397	85	17	435	158	138	369	
Internal Link Dist (ft)		764			374			1774			3100	
Turn Bay Length (ft)						125	150		150	150		
Base Capacity (vph)		880			704	965	454	909	913	460	1054	
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		0.06			0.56	0.26	0.04	0.52	0.43	0.47	0.43	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 93.6

Natural Cycle: 65

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.87

Intersection Signal Delay: 25.0

Intersection LOS: C

Intersection Capacity Utilization 71.9%

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: 3: Concord Lake Road & Roxie Street



APPENDIX G

DALE EARNHARDT BOULEVARD AND CONCORD LAKE ROAD

SYNCHRO REPORTS

Kannapolis Grocery Store
4: Concord Lake Road & Dale Earnhardt Boulevard

2015 Existing
Timing Plan: AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	379	318	1	218	60	193	42	3	227	158	129
Future Volume (vph)	54	379	318	1	218	60	193	42	3	227	158	129
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175		300	500		300	200		0	250		100
Storage Lanes	1		1	1		1	2		0	1		1
Taper Length (ft)	100			100			250			100		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.991				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	1846	0	1770	1863	1583
Flt Permitted	0.488			0.506			0.950			0.468		
Satd. Flow (perm)	909	3539	1583	943	3539	1583	3433	1846	0	872	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			353			90		3				143
Link Speed (mph)		45			45			45			35	
Link Distance (ft)		2253			3309			3180			3194	
Travel Time (s)		34.1			50.1			48.2			62.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	60	421	353	1	242	67	214	47	3	252	176	143
Shared Lane Traffic (%)												
Lane Group Flow (vph)	60	421	353	1	242	67	214	50	0	252	176	143
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	Prot	NA		pm+pt	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8		7	4	5
Permitted Phases	2		2	6		6				4		4
Detector Phase	5	2	3	1	6	7	3	8		7	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0	7.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	14.0	19.0	14.0	14.0	19.0	13.0	14.0	14.0		13.0	14.0	14.0
Total Split (s)	18.0	40.0	32.0	15.0	37.0	27.0	32.0	38.0		27.0	33.0	18.0
Total Split (%)	15.0%	33.3%	26.7%	12.5%	30.8%	22.5%	26.7%	31.7%		22.5%	27.5%	15.0%
Maximum Green (s)	11.3	33.3	25.8	8.6	30.6	21.2	25.8	31.5		21.2	26.9	11.3
Yellow Time (s)	3.0	4.7	3.0	3.0	4.3	3.0	3.0	4.6		3.0	3.9	3.0
All-Red Time (s)	3.7	2.0	3.2	3.4	2.1	2.8	3.2	1.9		2.8	2.2	3.7
Lost Time Adjust (s)	-1.7	-1.7	-1.2	-1.4	-1.4	-0.8	-1.2	-1.5		-1.8	-1.4	-1.7
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		4.0	4.7	5.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	6.0	2.0	2.0	6.0	2.0	2.0	2.0		2.0	2.0	2.0
Minimum Gap (s)	0.2	3.0	0.2	0.2	3.0	0.2	0.2	0.2		0.2	0.2	0.2
Time Before Reduce (s)	0.0	15.0	0.0	0.0	15.0	0.0	0.0	0.0		0.0	0.0	0.0

Kannapolis Grocery Store
4: Concord Lake Road & Dale Earnhardt Boulevard

2015 Existing
Timing Plan: AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time To Reduce (s)	0.0	30.0	0.0	0.0	30.0	0.0	0.0	0.0		0.0	0.0	0.0
Recall Mode	None	Min	None	None	Min	None	None	None		None	None	None
Act Effect Green (s)	29.8	28.2	43.7	24.7	16.1	40.2	10.4	9.8		28.5	12.6	26.5
Actuated g/C Ratio	0.44	0.41	0.64	0.36	0.24	0.59	0.15	0.14		0.42	0.18	0.39
v/c Ratio	0.12	0.29	0.31	0.00	0.29	0.07	0.41	0.19		0.40	0.51	0.20
Control Delay	12.9	16.1	1.9	13.0	23.2	1.4	30.2	29.1		15.9	31.9	4.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	12.9	16.1	1.9	13.0	23.2	1.4	30.2	29.1		15.9	31.9	4.0
LOS	B	B	A	B	C	A	C	C		B	C	A
Approach Delay	9.9			18.5			30.0			17.8		
Approach LOS	A			B			C			B		
Queue Length 50th (ft)	13	53	0	0	42	0	40	17		63	63	0
Queue Length 95th (ft)	40	137	39	3	84	11	88	56		143	146	35
Internal Link Dist (ft)	2173			3229			3100			3114		
Turn Bay Length (ft)	175		300	500		300	200			250		100
Base Capacity (vph)	569	1850	1446	486	1691	1053	1384	911		684	787	789
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.11	0.23	0.24	0.00	0.14	0.06	0.15	0.05		0.37	0.22	0.18

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 68.3

Natural Cycle: 65

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.51

Intersection Signal Delay: 16.2

Intersection LOS: B

Intersection Capacity Utilization 50.6%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 4: Concord Lake Road & Dale Earnhardt Boulevard

 Ø1	 Ø2	 Ø3	 Ø4
15 s	40 s	32 s	33 s
 Ø5	 Ø6	 Ø7	 Ø8
18 s	37 s	27 s	38 s

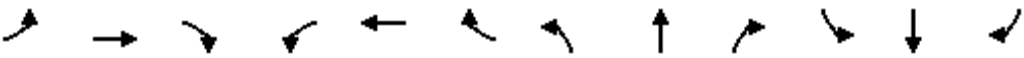
Kannapolis Grocery Store
4: Concord Lake Road & Dale Earnhardt Boulevard

2017 No-Build
Timing Plan: AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	394	331	1	227	62	201	44	3	236	164	134
Future Volume (vph)	56	394	331	1	227	62	201	44	3	236	164	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175		300	500		300	200		0	250		100
Storage Lanes	1		1	1		1	2		0	1		1
Taper Length (ft)	100			100			250			100		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.991				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	1846	0	1770	1863	1583
Flt Permitted	0.485			0.498			0.950			0.469		
Satd. Flow (perm)	903	3539	1583	928	3539	1583	3433	1846	0	874	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			368			90		3				149
Link Speed (mph)		45			45			45			35	
Link Distance (ft)		2253			3309			3180			3194	
Travel Time (s)		34.1			50.1			48.2			62.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	62	438	368	1	252	69	223	49	3	262	182	149
Shared Lane Traffic (%)												
Lane Group Flow (vph)	62	438	368	1	252	69	223	52	0	262	182	149
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	Prot	NA		pm+pt	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8		7	4	5
Permitted Phases	2		2	6		6				4		4
Detector Phase	5	2	3	1	6	7	3	8		7	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0	7.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	14.0	19.0	14.0	14.0	19.0	13.0	14.0	14.0		13.0	14.0	14.0
Total Split (s)	18.0	40.0	32.0	15.0	37.0	28.0	32.0	37.0		28.0	33.0	18.0
Total Split (%)	15.0%	33.3%	26.7%	12.5%	30.8%	23.3%	26.7%	30.8%		23.3%	27.5%	15.0%
Maximum Green (s)	11.3	33.3	25.8	8.6	30.6	22.2	25.8	30.5		22.2	26.9	11.3
Yellow Time (s)	3.0	4.7	3.0	3.0	4.3	3.0	3.0	4.6		3.0	3.9	3.0
All-Red Time (s)	3.7	2.0	3.2	3.4	2.1	2.8	3.2	1.9		2.8	2.2	3.7
Lost Time Adjust (s)	-1.7	-1.7	-1.2	-1.4	-1.4	-0.8	-1.2	-1.5		-1.8	-1.4	-1.7
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		4.0	4.7	5.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	6.0	2.0	2.0	6.0	2.0	2.0	2.0		2.0	2.0	2.0
Minimum Gap (s)	0.2	3.0	0.2	0.2	3.0	0.2	0.2	0.2		0.2	0.2	0.2
Time Before Reduce (s)	0.0	15.0	0.0	0.0	15.0	0.0	0.0	0.0		0.0	0.0	0.0

Kannapolis Grocery Store
4: Concord Lake Road & Dale Earnhardt Boulevard

2017 No-Build
Timing Plan: AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time To Reduce (s)	0.0	30.0	0.0	0.0	30.0	0.0	0.0	0.0		0.0	0.0	0.0
Recall Mode	None	Min	None	None	Min	None	None	None		None	None	None
Act Effect Green (s)	30.1	28.5	44.3	24.9	16.3	41.0	10.6	9.9		29.2	12.9	27.0
Actuated g/C Ratio	0.43	0.41	0.64	0.36	0.24	0.59	0.15	0.14		0.42	0.19	0.39
v/c Ratio	0.12	0.30	0.32	0.00	0.30	0.07	0.42	0.19		0.41	0.52	0.21
Control Delay	13.1	16.4	1.9	13.0	23.6	1.5	30.7	29.7		16.1	32.3	4.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	13.1	16.4	1.9	13.0	23.6	1.5	30.7	29.7		16.1	32.3	4.0
LOS	B	B	A	B	C	A	C	C		B	C	A
Approach Delay	10.0			18.9			30.5			18.0		
Approach LOS	B			B			C			B		
Queue Length 50th (ft)	14	57	0	0	44	0	42	18		67	66	0
Queue Length 95th (ft)	42	145	40	3	88	12	93	58		151	153	36
Internal Link Dist (ft)	2173			3229			3100			3114		
Turn Bay Length (ft)	175		300	500		300	200			250		100
Base Capacity (vph)	565	1830	1441	480	1673	1066	1369	874		697	779	792
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.11	0.24	0.26	0.00	0.15	0.06	0.16	0.06		0.38	0.23	0.19

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 69.2

Natural Cycle: 65

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.52

Intersection Signal Delay: 16.5

Intersection LOS: B

Intersection Capacity Utilization 51.5%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 4: Concord Lake Road & Dale Earnhardt Boulevard

 Ø1	 Ø2	 Ø3	 Ø4
15 s	40 s	32 s	33 s
 Ø5	 Ø6	 Ø7	 Ø8
18 s	37 s	28 s	37 s

Kannapolis Grocery Store
4: Concord Lake Road & Dale Earnhardt Boulevard

2017 Build
Timing Plan: AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	417	331	1	241	69	201	44	3	247	164	134
Future Volume (vph)	56	417	331	1	241	69	201	44	3	247	164	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175		300	500		300	200		0	250		100
Storage Lanes	1		1	1		1	2		0	1		1
Taper Length (ft)	100			100			250			100		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.991				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	1846	0	1770	1863	1583
Flt Permitted	0.478			0.486			0.950			0.460		
Satd. Flow (perm)	890	3539	1583	905	3539	1583	3433	1846	0	857	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			368			90		3				149
Link Speed (mph)		45			45			45			35	
Link Distance (ft)		2253			3309			3180			3194	
Travel Time (s)		34.1			50.1			48.2			62.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	62	463	368	1	268	77	223	49	3	274	182	149
Shared Lane Traffic (%)												
Lane Group Flow (vph)	62	463	368	1	268	77	223	52	0	274	182	149
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	Prot	NA		pm+pt	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8		7	4	5
Permitted Phases	2		2	6		6				4		4
Detector Phase	5	2	3	1	6	7	3	8		7	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0	7.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	14.0	19.0	14.0	14.0	19.0	13.0	14.0	14.0		13.0	14.0	14.0
Total Split (s)	18.0	40.0	32.0	15.0	37.0	28.0	32.0	37.0		28.0	33.0	18.0
Total Split (%)	15.0%	33.3%	26.7%	12.5%	30.8%	23.3%	26.7%	30.8%		23.3%	27.5%	15.0%
Maximum Green (s)	11.3	33.3	25.8	8.6	30.6	22.2	25.8	30.5		22.2	26.9	11.3
Yellow Time (s)	3.0	4.7	3.0	3.0	4.3	3.0	3.0	4.6		3.0	3.9	3.0
All-Red Time (s)	3.7	2.0	3.2	3.4	2.1	2.8	3.2	1.9		2.8	2.2	3.7
Lost Time Adjust (s)	-1.7	-1.7	-1.2	-1.4	-1.4	-0.8	-1.2	-1.5		-1.8	-1.4	-1.7
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		4.0	4.7	5.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	6.0	2.0	2.0	6.0	2.0	2.0	2.0		2.0	2.0	2.0
Minimum Gap (s)	0.2	3.0	0.2	0.2	3.0	0.2	0.2	0.2		0.2	0.2	0.2
Time Before Reduce (s)	0.0	15.0	0.0	0.0	15.0	0.0	0.0	0.0		0.0	0.0	0.0

Kannapolis Grocery Store
4: Concord Lake Road & Dale Earnhardt Boulevard

2017 Build
Timing Plan: AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time To Reduce (s)	0.0	30.0	0.0	0.0	30.0	0.0	0.0	0.0		0.0	0.0	0.0
Recall Mode	None	Min	None	None	Min	None	None	None		None	None	None
Act Effect Green (s)	30.4	28.9	44.6	25.2	16.6	41.7	10.6	9.6		29.4	13.0	27.0
Actuated g/C Ratio	0.44	0.42	0.64	0.36	0.24	0.60	0.15	0.14		0.42	0.19	0.39
v/c Ratio	0.12	0.32	0.32	0.00	0.32	0.08	0.43	0.20		0.43	0.52	0.21
Control Delay	13.1	16.5	1.9	13.0	23.6	1.8	31.0	30.6		16.5	32.6	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	13.1	16.5	1.9	13.0	23.6	1.8	31.0	30.6		16.5	32.6	4.1
LOS	B	B	A	B	C	A	C	C		B	C	A
Approach Delay	10.2				18.7			30.9			18.3	
Approach LOS	B				B			C			B	
Queue Length 50th (ft)	14	61	0	0	47	0	42	18		71	66	0
Queue Length 95th (ft)	42	153	40	3	93	14	93	59		160	154	37
Internal Link Dist (ft)	2173				3229			3100			3114	
Turn Bay Length (ft)	175		300	500		300	200			250		100
Base Capacity (vph)	562	1819	1441	476	1663	1068	1361	869		693	774	789
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.11	0.25	0.26	0.00	0.16	0.07	0.16	0.06		0.40	0.24	0.19

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 69.6

Natural Cycle: 65

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.52

Intersection Signal Delay: 16.6

Intersection LOS: B

Intersection Capacity Utilization 52.7%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 4: Concord Lake Road & Dale Earnhardt Boulevard

 Ø1	 Ø2	 Ø3	 Ø4
15 s	40 s	32 s	33 s
 Ø5	 Ø6	 Ø7	 Ø8
18 s	37 s	28 s	37 s

Kannapolis Grocery Store
4: Concord Lake Road & Dale Earnhardt Boulevard

2015 Existing
Timing Plan: PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	137	403	399	15	536	251	420	191	14	133	150	125
Future Volume (vph)	137	403	399	15	536	251	420	191	14	133	150	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175		300	500		300	200		0	250		100
Storage Lanes	1		1	1		1	2		0	1		1
Taper Length (ft)	100			100			250			100		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.989				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	1842	0	1770	1863	1583
Flt Permitted	0.267			0.493			0.950			0.616		
Satd. Flow (perm)	497	3539	1583	918	3539	1583	3433	1842	0	1147	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			443			279		3				143
Link Speed (mph)		45			45			45			35	
Link Distance (ft)		2253			3309			3180			3194	
Travel Time (s)		34.1			50.1			48.2			62.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	152	448	443	17	596	279	467	212	16	148	167	139
Shared Lane Traffic (%)												
Lane Group Flow (vph)	152	448	443	17	596	279	467	228	0	148	167	139
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	Prot	NA		pm+pt	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8		7	4	5
Permitted Phases	2		2	6		6				4		4
Detector Phase	5	2	3	1	6	7	3	8		7	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0	7.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	14.0	19.0	14.0	14.0	19.0	13.0	14.0	14.0		13.0	14.0	14.0
Total Split (s)	18.0	46.0	33.0	14.0	42.0	17.0	33.0	43.0		17.0	27.0	18.0
Total Split (%)	15.0%	38.3%	27.5%	11.7%	35.0%	14.2%	27.5%	35.8%		14.2%	22.5%	15.0%
Maximum Green (s)	11.3	39.3	26.8	7.6	35.6	11.2	26.8	36.5		11.2	20.9	11.3
Yellow Time (s)	3.0	4.7	3.0	3.0	4.3	3.0	3.0	4.6		3.0	3.9	3.0
All-Red Time (s)	3.7	2.0	3.2	3.4	2.1	2.8	3.2	1.9		2.8	2.2	3.7
Lost Time Adjust (s)	-1.7	-1.7	-1.2	-1.4	-1.4	-0.8	-1.2	-1.5		-1.8	-1.4	-1.7
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		4.0	4.7	5.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	6.0	2.0	2.0	6.0	2.0	2.0	2.0		2.0	2.0	2.0
Minimum Gap (s)	0.2	3.0	0.2	0.2	3.0	0.2	0.2	0.2		0.2	0.2	0.2
Time Before Reduce (s)	0.0	15.0	0.0	0.0	15.0	0.0	0.0	0.0		0.0	0.0	0.0

Kannapolis Grocery Store
4: Concord Lake Road & Dale Earnhardt Boulevard

2015 Existing
Timing Plan: PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time To Reduce (s)	0.0	30.0	0.0	0.0	30.0	0.0	0.0	0.0		0.0	0.0	0.0
Recall Mode	None	Min	None	None	Min	None	None	None		None	None	None
Act Effect Green (s)	43.8	39.4	63.3	35.6	26.9	42.4	18.7	22.4		26.6	14.4	31.2
Actuated g/C Ratio	0.47	0.43	0.69	0.39	0.29	0.46	0.20	0.24		0.29	0.16	0.34
v/c Ratio	0.38	0.30	0.36	0.04	0.58	0.32	0.67	0.51		0.36	0.57	0.22
Control Delay	18.4	21.0	1.8	16.1	31.5	3.3	40.6	34.7		21.4	46.8	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	18.4	21.0	1.8	16.1	31.5	3.3	40.6	34.7		21.4	46.8	5.2
LOS	B	C	A	B	C	A	D	C		C	D	A
Approach Delay	12.4				22.4			38.7			25.8	
Approach LOS	B				C			D			C	
Queue Length 50th (ft)	48	77	0	5	155	0	132	116		54	93	0
Queue Length 95th (ft)	111	179	38	20	258	48	218	206		106	185	41
Internal Link Dist (ft)	2173				3229			3100			3114	
Turn Bay Length (ft)	175		300	500		300	200			250		100
Base Capacity (vph)	421	1661	1351	446	1468	907	1077	786		446	465	654
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.36	0.27	0.33	0.04	0.41	0.31	0.43	0.29		0.33	0.36	0.21

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 92.3

Natural Cycle: 65

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 23.2

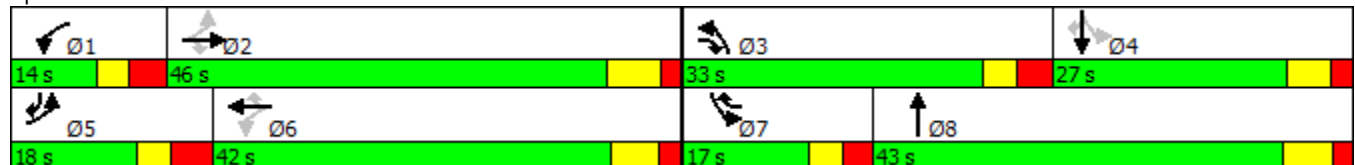
Intersection LOS: C

Intersection Capacity Utilization 58.7%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 4: Concord Lake Road & Dale Earnhardt Boulevard



Kannapolis Grocery Store
4: Concord Lake Road & Dale Earnhardt Boulevard

2017 No-Build
Timing Plan: PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	143	419	415	16	558	261	437	199	15	138	156	130
Future Volume (vph)	143	419	415	16	558	261	437	199	15	138	156	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175		300	500		300	200		0	250		100
Storage Lanes	1		1	1		1	2		0	1		1
Taper Length (ft)	100			100			250			100		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.989				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	1842	0	1770	1863	1583
Flt Permitted	0.256			0.484			0.950			0.611		
Satd. Flow (perm)	477	3539	1583	902	3539	1583	3433	1842	0	1138	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			461			290		3				143
Link Speed (mph)		45			45			45			35	
Link Distance (ft)		2253			3309			3180			3194	
Travel Time (s)		34.1			50.1			48.2			62.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	159	466	461	18	620	290	486	221	17	153	173	144
Shared Lane Traffic (%)												
Lane Group Flow (vph)	159	466	461	18	620	290	486	238	0	153	173	144
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	Prot	NA		pm+pt	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8		7	4	5
Permitted Phases	2		2	6		6				4		4
Detector Phase	5	2	3	1	6	7	3	8		7	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0	7.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	14.0	19.0	14.0	14.0	19.0	13.0	14.0	14.0		13.0	14.0	14.0
Total Split (s)	18.0	46.0	33.0	14.0	42.0	18.0	33.0	42.0		18.0	27.0	18.0
Total Split (%)	15.0%	38.3%	27.5%	11.7%	35.0%	15.0%	27.5%	35.0%		15.0%	22.5%	15.0%
Maximum Green (s)	11.3	39.3	26.8	7.6	35.6	12.2	26.8	35.5		12.2	20.9	11.3
Yellow Time (s)	3.0	4.7	3.0	3.0	4.3	3.0	3.0	4.6		3.0	3.9	3.0
All-Red Time (s)	3.7	2.0	3.2	3.4	2.1	2.8	3.2	1.9		2.8	2.2	3.7
Lost Time Adjust (s)	-1.7	-1.7	-1.2	-1.4	-1.4	-0.8	-1.2	-1.5		-1.8	-1.4	-1.7
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		4.0	4.7	5.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	6.0	2.0	2.0	6.0	2.0	2.0	2.0		2.0	2.0	2.0
Minimum Gap (s)	0.2	3.0	0.2	0.2	3.0	0.2	0.2	0.2		0.2	0.2	0.2
Time Before Reduce (s)	0.0	15.0	0.0	0.0	15.0	0.0	0.0	0.0		0.0	0.0	0.0

Kannapolis Grocery Store
4: Concord Lake Road & Dale Earnhardt Boulevard

2017 No-Build
Timing Plan: PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time To Reduce (s)	0.0	30.0	0.0	0.0	30.0	0.0	0.0	0.0		0.0	0.0	0.0
Recall Mode	None	Min	None	None	Min	None	None	None		None	None	None
Act Effect Green (s)	45.3	40.9	65.5	37.0	28.3	44.2	19.4	23.3		27.4	14.9	31.8
Actuated g/C Ratio	0.48	0.43	0.69	0.39	0.30	0.47	0.20	0.25		0.29	0.16	0.33
v/c Ratio	0.41	0.31	0.37	0.04	0.59	0.33	0.69	0.52		0.38	0.59	0.23
Control Delay	19.1	21.3	1.8	16.4	32.1	3.2	41.9	35.9		21.9	48.3	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	19.1	21.3	1.8	16.4	32.1	3.2	41.9	35.9		21.9	48.3	5.7
LOS	B	C	A	B	C	A	D	D		C	D	A
Approach Delay	12.7			22.8			40.0			26.7		
Approach LOS	B			C			D			C		
Queue Length 50th (ft)	52	83	0	5	166	0	141	125		58	99	0
Queue Length 95th (ft)	117	188	38	21	272	48	231	220		111	195	46
Internal Link Dist (ft)	2173			3229			3100			3114		
Turn Bay Length (ft)	175		300	500		300	200			250		100
Base Capacity (vph)	410	1628	1346	441	1423	928	1044	742		456	451	646
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.39	0.29	0.34	0.04	0.44	0.31	0.47	0.32		0.34	0.38	0.22

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 95

Natural Cycle: 65

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 23.8

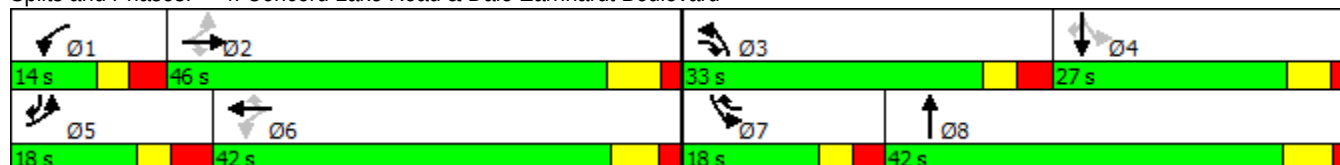
Intersection LOS: C

Intersection Capacity Utilization 60.4%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 4: Concord Lake Road & Dale Earnhardt Boulevard



Kannapolis Grocery Store
4: Concord Lake Road & Dale Earnhardt Boulevard

2017 Build
Timing Plan: PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	143	455	415	16	592	278	437	199	15	156	156	130
Future Volume (vph)	143	455	415	16	592	278	437	199	15	156	156	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175		300	500		300	200		0	250		100
Storage Lanes	1		1	1		1	2		0	1		1
Taper Length (ft)	100			100			250			100		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.989				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	1842	0	1770	1863	1583
Flt Permitted	0.237			0.466			0.950			0.611		
Satd. Flow (perm)	441	3539	1583	868	3539	1583	3433	1842	0	1138	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			461			309		3				143
Link Speed (mph)		45			45			45			35	
Link Distance (ft)		2253			3309			3180			3194	
Travel Time (s)		34.1			50.1			48.2			62.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	159	506	461	18	658	309	486	221	17	173	173	144
Shared Lane Traffic (%)												
Lane Group Flow (vph)	159	506	461	18	658	309	486	238	0	173	173	144
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	Prot	NA		pm+pt	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8		7	4	5
Permitted Phases	2		2	6		6				4		4
Detector Phase	5	2	3	1	6	7	3	8		7	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0	7.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	14.0	19.0	14.0	14.0	19.0	13.0	14.0	14.0		13.0	14.0	14.0
Total Split (s)	18.0	46.0	33.0	14.0	42.0	18.0	33.0	42.0		18.0	27.0	18.0
Total Split (%)	15.0%	38.3%	27.5%	11.7%	35.0%	15.0%	27.5%	35.0%		15.0%	22.5%	15.0%
Maximum Green (s)	11.3	39.3	26.8	7.6	35.6	12.2	26.8	35.5		12.2	20.9	11.3
Yellow Time (s)	3.0	4.7	3.0	3.0	4.3	3.0	3.0	4.6		3.0	3.9	3.0
All-Red Time (s)	3.7	2.0	3.2	3.4	2.1	2.8	3.2	1.9		2.8	2.2	3.7
Lost Time Adjust (s)	-1.7	-1.7	-1.2	-1.4	-1.4	-0.8	-1.2	-1.5		-1.8	-1.4	-1.7
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		4.0	4.7	5.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	6.0	2.0	2.0	6.0	2.0	2.0	2.0		2.0	2.0	2.0
Minimum Gap (s)	0.2	3.0	0.2	0.2	3.0	0.2	0.2	0.2		0.2	0.2	0.2
Time Before Reduce (s)	0.0	15.0	0.0	0.0	15.0	0.0	0.0	0.0		0.0	0.0	0.0

Kannapolis Grocery Store
4: Concord Lake Road & Dale Earnhardt Boulevard

2017 Build
Timing Plan: PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time To Reduce (s)	0.0	30.0	0.0	0.0	30.0	0.0	0.0	0.0		0.0	0.0	0.0
Recall Mode	None	Min	None	None	Min	None	None	None		None	None	None
Act Effect Green (s)	46.0	41.5	66.2	37.7	29.0	45.3	19.5	23.1		27.8	15.0	31.8
Actuated g/C Ratio	0.48	0.43	0.69	0.39	0.30	0.47	0.20	0.24		0.29	0.16	0.33
v/c Ratio	0.42	0.33	0.37	0.04	0.61	0.34	0.69	0.53		0.42	0.59	0.23
Control Delay	19.4	21.6	1.8	16.4	32.6	3.2	42.3	36.7		22.8	48.7	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	19.4	21.6	1.8	16.4	32.6	3.2	42.3	36.7		22.8	48.7	5.7
LOS	B	C	A	B	C	A	D	D		C	D	A
Approach Delay	13.2			23.1			40.5			26.9		
Approach LOS	B			C			D			C		
Queue Length 50th (ft)	52	92	0	5	180	0	144	128		68	100	0
Queue Length 95th (ft)	117	205	38	21	291	49	231	220		125	195	46
Internal Link Dist (ft)	2173			3229			3100			3114		
Turn Bay Length (ft)	175		300	500		300	200			250		100
Base Capacity (vph)	397	1628	1345	434	1408	941	1034	735		453	447	642
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.40	0.31	0.34	0.04	0.47	0.33	0.47	0.32		0.38	0.39	0.22

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 95.8

Natural Cycle: 65

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 24.1

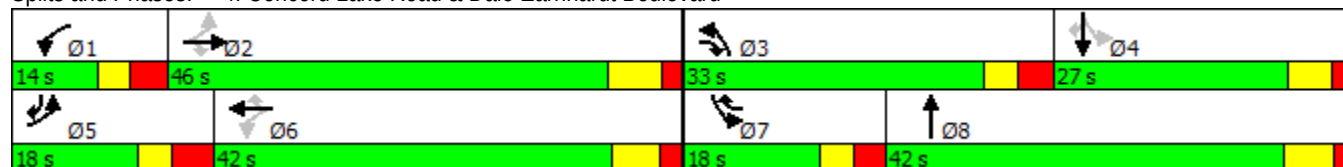
Intersection LOS: C

Intersection Capacity Utilization 61.4%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 4: Concord Lake Road & Dale Earnhardt Boulevard



APPENDIX H

SIMTRAFFIC REPORTS

Intersection: 1: Dale Earnhardt Boulevard & Coldwater Ridge Drive

Movement	EB	EB	NB
Directions Served	L	R	L
Maximum Queue (ft)	35	27	42
Average Queue (ft)	8	8	12
95th Queue (ft)	27	21	36
Link Distance (ft)	2729		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	500		500
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Roxie Street & Coldwater Ridge Drive

Movement	EB	SB	SB
Directions Served	LT	L	R
Maximum Queue (ft)	25	22	34
Average Queue (ft)	3	1	8
95th Queue (ft)	18	9	30
Link Distance (ft)	372		2729
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		500	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Concord Lake Road & Roxie Street

Movement	EB	WB	WB	NB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	TR
Maximum Queue (ft)	50	98	44	28	101	51	67	115
Average Queue (ft)	18	40	16	4	41	21	25	48
95th Queue (ft)	43	77	36	20	82	45	54	97
Link Distance (ft)	795	372			1816			3071
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			125	150		150	150	
Storage Blk Time (%)		0						0
Queuing Penalty (veh)		0						0

Intersection: 4: Concord Lake Road & Dale Earnhardt Boulevard

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	T	T	R	L	L	TR	L	T
Maximum Queue (ft)	59	115	119	128	80	88	46	104	106	61	170	155
Average Queue (ft)	23	61	53	56	35	39	16	41	51	18	76	68
95th Queue (ft)	47	100	96	101	65	74	41	80	90	45	139	130
Link Distance (ft)		2197	2197		3192	3192				3071		3120
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	175			300			300	200	200		250	
Storage Blk Time (%)												4
Queuing Penalty (veh)												15

Intersection: 4: Concord Lake Road & Dale Earnhardt Boulevard

Movement	SB
Directions Served	R
Maximum Queue (ft)	76
Average Queue (ft)	21
95th Queue (ft)	53
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 15

Intersection: 1: Dale Earnhardt Boulevard & Coldwater Ridge Drive/Site Drive 1

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	R	L	R
Maximum Queue (ft)	26	46	27	31	48	4	23	8
Average Queue (ft)	7	14	8	11	14	0	3	0
95th Queue (ft)	24	33	25	25	40	3	13	6
Link Distance (ft)		2729	515	515				
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	500				500	1000	175	75
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 2: Roxie Street & Coldwater Ridge Drive

Movement	EB	SB	SB
Directions Served	LT	L	R
Maximum Queue (ft)	39	11	47
Average Queue (ft)	8	0	17
95th Queue (ft)	31	6	42
Link Distance (ft)	372		2729
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		500	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Concord Lake Road & Roxie Street

Movement	EB	WB	WB	NB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	TR
Maximum Queue (ft)	56	128	50	34	106	61	74	126
Average Queue (ft)	17	52	16	6	41	27	25	53
95th Queue (ft)	46	99	37	25	85	50	55	109
Link Distance (ft)	795	372			1816			3071
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			125	150		150	150	
Storage Blk Time (%)		0						0
Queuing Penalty (veh)		0						0

Intersection: 4: Concord Lake Road & Dale Earnhardt Boulevard

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	L	TR	L
Maximum Queue (ft)	64	121	117	137	5	82	103	54	96	94	72	176
Average Queue (ft)	24	63	53	55	0	37	42	17	41	48	21	80
95th Queue (ft)	54	107	96	107	2	72	86	43	80	81	52	145
Link Distance (ft)		2197	2197			3190	3190					3071
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	175			300	500			300	200	200		250
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 4: Concord Lake Road & Dale Earnhardt Boulevard

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	166	110
Average Queue (ft)	75	24
95th Queue (ft)	136	66
Link Distance (ft)	3120	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		100
Storage Blk Time (%)	5	0
Queuing Penalty (veh)	19	0

Network Summary

Network wide Queuing Penalty: 19

Intersection: 1: Dale Earnhardt Boulevard & Coldwater Ridge Drive/Site Drive 1

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	T	R	L	T	T	R
Maximum Queue (ft)	22	55	31	36	60	74	74	36	34	78	96	56
Average Queue (ft)	7	17	7	11	20	34	19	6	7	28	40	10
95th Queue (ft)	22	43	25	29	49	67	53	25	21	63	81	35
Link Distance (ft)		2729	515	515		1316	1316			3190	3190	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	500				500			1000	175			75
Storage Blk Time (%)											1	0
Queuing Penalty (veh)											0	0

Intersection: 2: Roxie Street & Coldwater Ridge Drive

Movement	EB	SB	SB
Directions Served	LT	L	R
Maximum Queue (ft)	36	11	47
Average Queue (ft)	7	1	16
95th Queue (ft)	28	8	41
Link Distance (ft)	372		2729
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		500	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Concord Lake Road & Roxie Street

Movement	EB	WB	WB	NB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	TR
Maximum Queue (ft)	49	110	56	29	97	64	82	119
Average Queue (ft)	17	49	17	6	43	27	26	44
95th Queue (ft)	45	91	41	24	84	51	57	94
Link Distance (ft)	795	372			1816			3071
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			125	150		150	150	
Storage Blk Time (%)		0						0
Queuing Penalty (veh)		0						0

Intersection: 4: Concord Lake Road & Dale Earnhardt Boulevard

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	L	TR	L
Maximum Queue (ft)	72	116	128	123	2	88	104	51	106	117	96	188
Average Queue (ft)	24	61	52	51	0	38	42	15	42	52	23	88
95th Queue (ft)	54	102	100	94	2	73	86	42	84	93	61	160
Link Distance (ft)		2197	2197			3190	3190				3071	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	175			300	500			300	200	200		250
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 4: Concord Lake Road & Dale Earnhardt Boulevard

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	150	86
Average Queue (ft)	64	22
95th Queue (ft)	118	62
Link Distance (ft)	3120	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		100
Storage Blk Time (%)	2	
Queuing Penalty (veh)	9	

Network Summary

Network wide Queuing Penalty: 9

Intersection: 1: Dale Earnhardt Boulevard & Coldwater Ridge Drive

Movement	EB	EB	NB	SB
Directions Served	L	R	L	R
Maximum Queue (ft)	112	40	61	17
Average Queue (ft)	40	15	20	1
95th Queue (ft)	89	32	48	10
Link Distance (ft)	2729			
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	500		500	75
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: Roxie Street & Coldwater Ridge Drive

Movement	EB	SB	SB
Directions Served	LT	L	R
Maximum Queue (ft)	67	30	61
Average Queue (ft)	13	6	27
95th Queue (ft)	43	25	50
Link Distance (ft)	372		2729
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		500	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Concord Lake Road & Roxie Street

Movement	EB	WB	WB	NB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	TR
Maximum Queue (ft)	73	233	174	35	249	130	152	193
Average Queue (ft)	29	143	57	10	119	47	58	78
95th Queue (ft)	61	218	116	33	202	91	110	151
Link Distance (ft)	795	372			1816			3071
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			125	150		150	150	
Storage Blk Time (%)		14	0		3		0	1
Queuing Penalty (veh)		33	1		10		0	1

Intersection: 4: Concord Lake Road & Dale Earnhardt Boulevard

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	L	TR	L
Maximum Queue (ft)	136	134	144	139	27	216	214	163	202	214	210	135
Average Queue (ft)	60	71	69	64	5	112	122	60	116	120	97	62
95th Queue (ft)	109	119	120	121	16	178	188	114	184	187	178	115
Link Distance (ft)		2197	2197			3192	3192					3071
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	175			300	500			300	200	200		250
Storage Blk Time (%)		0							0	0	0	
Queuing Penalty (veh)		0							0	1	1	

Intersection: 4: Concord Lake Road & Dale Earnhardt Boulevard

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	185	138
Average Queue (ft)	85	34
95th Queue (ft)	159	92
Link Distance (ft)	3120	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		100
Storage Blk Time (%)	9	0
Queuing Penalty (veh)	23	0

Network Summary

Network wide Queuing Penalty: 71

Intersection: 1: Dale Earnhardt Boulevard & Coldwater Ridge Drive/Site Drive 1

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	R	L	T	R
Maximum Queue (ft)	95	94	114	153	56	21	47	3	16
Average Queue (ft)	42	34	33	47	19	1	13	0	1
95th Queue (ft)	84	71	79	116	48	9	36	2	6
Link Distance (ft)		2729	515	515				3190	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	500				500	1000	175		75
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 2: Roxie Street & Coldwater Ridge Drive

Movement	EB	SB	SB
Directions Served	LT	L	R
Maximum Queue (ft)	61	30	78
Average Queue (ft)	24	5	35
95th Queue (ft)	54	24	61
Link Distance (ft)	372		2729
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		500	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Concord Lake Road & Roxie Street

Movement	EB	WB	WB	NB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	TR
Maximum Queue (ft)	67	272	204	79	278	130	180	210
Average Queue (ft)	28	157	66	9	130	55	65	86
95th Queue (ft)	56	245	143	48	231	112	130	174
Link Distance (ft)	795	372			1816			3071
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			125	150		150	150	
Storage Blk Time (%)		17	1		5	0	0	1
Queuing Penalty (veh)		39	2		19	0	2	3

Intersection: 4: Concord Lake Road & Dale Earnhardt Boulevard

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	L	TR	L
Maximum Queue (ft)	136	167	173	161	28	200	221	119	219	213	226	189
Average Queue (ft)	59	84	79	65	5	124	135	54	112	116	98	68
95th Queue (ft)	108	146	138	121	19	190	205	96	185	187	179	130
Link Distance (ft)		2197	2197			3190	3190					3071
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	175			300	500			300	200	200		250
Storage Blk Time (%)	0	0							0	0	1	
Queuing Penalty (veh)	0	0							1	1	2	

Intersection: 4: Concord Lake Road & Dale Earnhardt Boulevard

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	197	172
Average Queue (ft)	85	36
95th Queue (ft)	158	101
Link Distance (ft)	3120	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		100
Storage Blk Time (%)	9	0
Queuing Penalty (veh)	25	0

Network Summary

Network wide Queuing Penalty: 94

Intersection: 1: Dale Earnhardt Boulevard & Coldwater Ridge Drive/Site Drive 1

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	T	R	L	T	T	R
Maximum Queue (ft)	98	101	79	119	73	113	126	70	90	102	117	88
Average Queue (ft)	30	31	24	41	32	63	59	24	27	34	43	23
95th Queue (ft)	68	73	57	89	62	104	104	58	67	77	87	62
Link Distance (ft)		2729	515	515		1316	1316			3190	3190	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	500				500			1000	175			75
Storage Blk Time (%)											1	1
Queuing Penalty (veh)											1	2

Intersection: 2: Roxie Street & Coldwater Ridge Drive

Movement	EB	WB	SB	SB
Directions Served	LT	TR	L	R
Maximum Queue (ft)	75	11	38	70
Average Queue (ft)	24	0	9	34
95th Queue (ft)	57	5	32	57
Link Distance (ft)	372	1625		2729
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		500		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Concord Lake Road & Roxie Street

Movement	EB	WB	WB	NB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	TR
Maximum Queue (ft)	68	304	231	31	236	119	143	163
Average Queue (ft)	27	154	63	10	119	53	56	71
95th Queue (ft)	58	250	147	33	200	92	103	137
Link Distance (ft)	795	372			1816			3071
Upstream Blk Time (%)		0						
Queuing Penalty (veh)		0						
Storage Bay Dist (ft)			125	150		150	150	
Storage Blk Time (%)		15	0		3	0	0	0
Queuing Penalty (veh)		35	1		12	0	1	1

Intersection: 4: Concord Lake Road & Dale Earnhardt Boulevard

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	L	TR	L
Maximum Queue (ft)	157	148	142	170	23	245	219	146	203	194	212	152
Average Queue (ft)	65	77	72	65	4	113	121	62	114	118	95	70
95th Queue (ft)	124	131	126	126	16	189	188	112	177	177	175	128
Link Distance (ft)		2197	2197			3190	3190				3071	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	175			300	500			300	200	200		250
Storage Blk Time (%)	0	0							0	0	0	
Queuing Penalty (veh)	0	0							0	0	2	

Intersection: 4: Concord Lake Road & Dale Earnhardt Boulevard

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	212	160
Average Queue (ft)	84	40
95th Queue (ft)	157	102
Link Distance (ft)	3120	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		100
Storage Blk Time (%)	8	0
Queuing Penalty (veh)	23	1

Network Summary

Network wide Queuing Penalty: 80