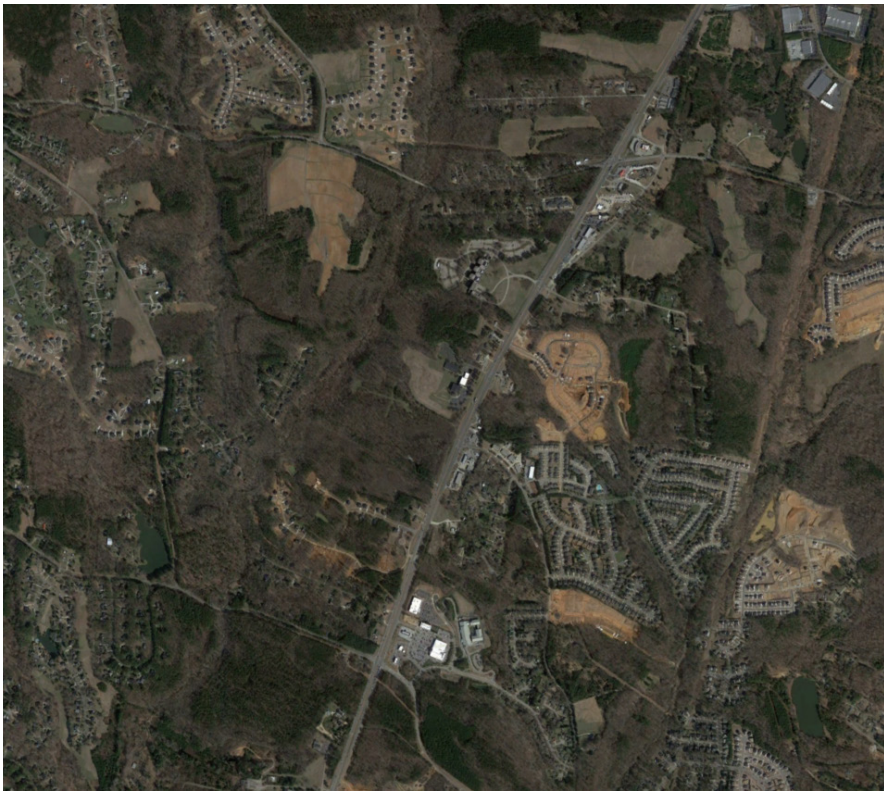
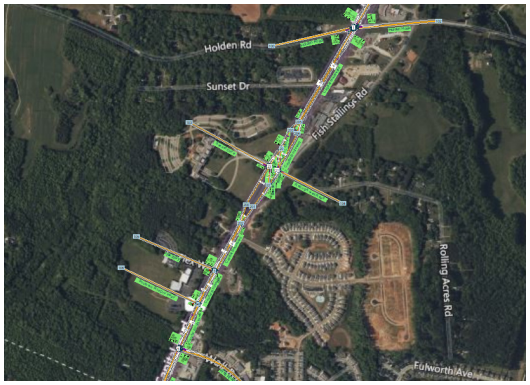
RAMEY KEMP ASSOCIATES

TOGETHER WE ARE LIMITLESS





Capital Lifecare Village

Traffic Impact Analysis

Youngsville, North Carolina

rameykemp.com

TRAFFIC IMPACT ANALYSIS

FOR

CAPITAL LIFECARE VILLAGE

LOCATED

IN

YOUNGSVILLE, NORTH CAROLINA

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5/1/23

APRIL 2023

RKA Project No. 23032

Prepared By: GH

Reviewed By: SB

TRAFFIC IMPACT ANALYSIS
CAPITAL LIFECARE VILLAGE
YOUNGSVILLE, NORTH CAROLINA

EXECUTIVE SUMMARY

1. Development Overview

A Traffic Impact Analysis (TIA) was conducted for the proposed Capital Lifecare Village development in accordance with the North Carolina Department of Transportation (NCDOT) capacity analysis guidelines. The proposed development is to be located at 14101 Capital Boulevard and 51 Flex Way in Youngsville, North Carolina. The proposed development, anticipated to be completed in 2030, is assumed to consist of the following uses:

- 235,370 square feet of office space (91,625 of square feet office currently existing)
- 87 units of assisted living
- 191 units of senior apartments
- 36 four (4) plex units
- 58 multifamily housing (mid-rise)
- 20-unit hospice
- 5,855 square feet of emergency medical services

2. Existing Traffic Conditions

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

- Capital Boulevard & Holden Road (signalized)
- Capital Boulevard and Sunset Drive/Rolling Acres Road (signalized)
- Capital Boulevard and Wall Road (signalized)
- Capital Boulevard and Flex Way (unsignalized)
- Capital Boulevard and Southern Site Driveway (unsignalized)

Existing peak hour traffic volumes were determined based on traffic counts conducted at the study intersections listed below, in February of 2023 during typical weekday AM (7:00 AM – 9:00 AM) and PM (4:00 PM – 6:00 PM) peak periods:

- Capital Boulevard & Holden Road
- Capital Boulevard and Sunset Drive/Rolling Acres Road
- Capital Boulevard and Wall Road
- Capital Boulevard and Flex Way
- Capital Boulevard and Southern Site Driveway

Weekday AM and PM traffic volumes were balanced between study intersections, where appropriate.

3. Site Trip Generation

Average weekday daily, AM peak hour, and PM peak hour trips for the proposed development were estimated using methodology contained within the ITE Trip Generation Manual, 11th Edition. Table E-1 provides a summary of the trip generation potential for the site.

Table E-1: Site Trip Generation

Land Use (ITE Code)	Intensity	Daily Traffic (vpd)	Weekday AM Peak Hour Trips (vph)		Weekday PM Peak Hour Trips (vph)	
			Enter	Exit	Enter	Exit
Single Family Attached Housing (215)	36 DU	224	3	10	11	7
Multifamily Housing (mid-rise) (221)	58 DU	230	3	11	14	9
Senior Apartments (252)	191 DU	577	13	24	27	21
Assisted Living (254)	87 DU	226	10	6	8	13
Nursing Home (620)	20 beds	61	3	1	3	4
Free Standing Emergency Room (650)	5,855 s.f.	146	4	3	4	5
General Office Space (710)	235,370 s.f.	2,444	308	42	57	281
Existing Office Space	*91,625 s.f.*	*-1,075*	*-136*	*-19*	*-26*	*-128*
New Office Space	143,745 s.f.	1,369	172	23	31	153
Total Trips		**2,833**	**208**	**78**	**98**	**212**
*Internal Capture (1% AM & 1% PM) **			*-2*	*0*	*-1*	*0*
Total Primary Trips			**206**	**78**	**97**	**212**

*Utilizing methodology contained in the NCHRP Report 684.

4. Future Traffic Conditions

Through coordination with NCDOT and the County, it was determined that an annual growth rate of 3.0% would be used to generate 2030 projected weekday AM and PM peak hour traffic volumes. The Sorrell Oaks adjacent development was identified to be considered under future conditions.

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

- 2023 Existing Traffic Conditions
- 2030 No-Build Traffic Conditions
- 2030 Build Traffic Conditions
- 2030 Build Traffic Conditions with Improvements

5. Capacity Analysis Summary

The analysis considered weekday AM and PM peak hour traffic for 2023 existing, 2030 no-build, 2030 build, and 2030 build – improved traffic conditions. Refer to Section 7 of the TIA for the capacity analysis summary performed at each study intersection.

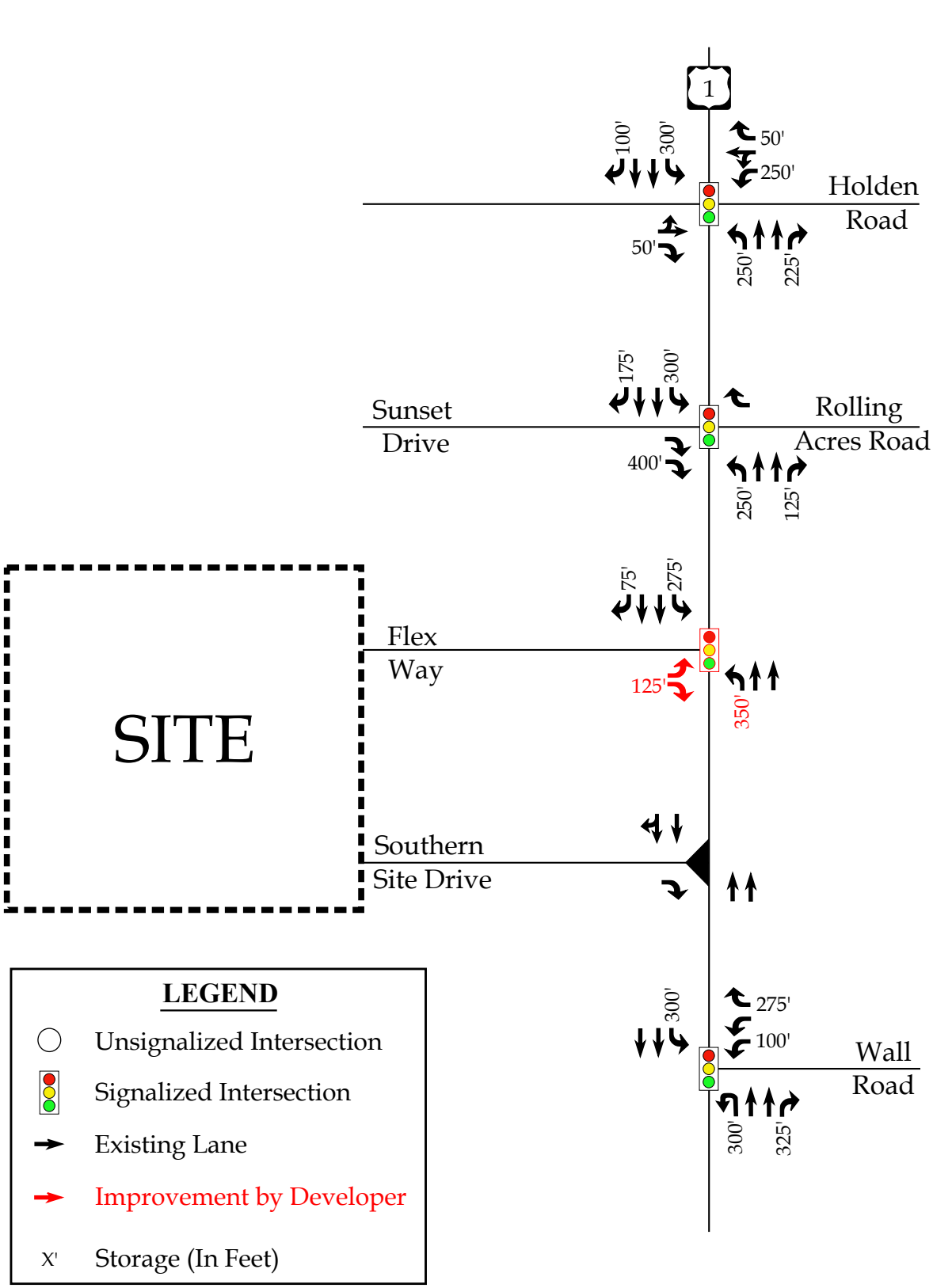
6. Recommendations

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

Recommended Improvements by Developer

Capital Boulevard and Flex Way

- Monitor the intersection for signalization and install a traffic signal once warrants are met.
- Extend the existing northbound Capital Boulevard left turn lane to include 350 feet of storage and appropriate taper length.
- Construct an eastbound Flex Way right turn lane with 125 feet of storage and appropriate taper length.



LEGEND

- Unsignalized Intersection
- Signalized Intersection
- Existing Lane
- Improvement by Developer
- X' Storage (In Feet)

RAMEY KEMP ASSOCIATES

Capital Lifecare Village
Youngsville, NC

Recommended Lane Configurations

Scale: Not to Scale

Figure E-1

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TRAFFIC IMPACT ANALYSIS
CAPITAL LIFECARE VILLAGE
YOUNGSVILLE, NORTH CAROLINA

1. INTRODUCTION

The contents of this report present the findings of the Traffic Impact Analysis (TIA) conducted for the proposed Capital Lifecare Village development to be located at 14101 Capital Boulevard (US 1) and 51 Flex Way in Youngsville, North Carolina. The purpose of this study is to determine the potential impacts to the surrounding transportation system created by traffic generated by the proposed development, as well as recommend improvements to mitigate the impacts.

The proposed development, anticipated to be completed in 2030, is assumed to consist of the following uses:

- 235,370 square feet of office space (91,625 of square feet office currently existing)
- 87 units of assisted living
- 191 units of senior apartments
- 36 four (4) plex units
- 58 multifamily housing (mid-rise)
- 20-unit hospice
- 5,855 square feet of emergency medical services

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

- 2023 Existing Traffic Conditions
- 2030 No-Build Traffic Conditions
- 2030 Build Traffic Conditions
- 2030 Build Traffic Conditions with Improvements

1.1. Site Location and Study Area

The development is proposed to be located at 14101 Capital Boulevard and 51 Flex Way in Youngsville, North Carolina. Refer to Figure 1 for the site location map. The study area for the TIA was determined through coordination with the North Carolina Department of Transportation (NCDOT) and Franklin County (County) and consists of the following existing intersections:

- Capital Boulevard & Holden Road (signalized)
- Capital Boulevard and Sunset Drive/Rolling Acres Road (signalized)
- Capital Boulevard and Wall Road (signalized)
- Capital Boulevard and Flex Way (unsignalized)
- Capital Boulevard and Southern Site Driveway (unsignalized)

Based on coordination with NCDOT and the County, no Memorandum of Understanding (MOU) needed to be submitted for this site. Refer to Appendix A for scoping documentation via email and meeting notes.

1.2. Proposed Land Use and Site Access

The site is expected to be located at 14101 Capital Boulevard and 51 Flex Way. The proposed development, anticipated to be completed in 2030, is assumed to consist of the following uses:

- 235,370 square feet of office space (91,625 of square feet office currently existing)
- 87 units of assisted living
- 191 units of senior apartments
- 36 four (4) plex units
- 58 multifamily housing (mid-rise)
- 20-unit hospice
- 5,855 square feet of emergency medical services

Site access is proposed via existing connections to US 1 at Flex Way and the driveway south of Flex Way (Southern Site Driveway). Refer to Figure 2 for a copy of the preliminary site plan.

1.3. Adjacent Land Uses

The proposed development is located in an area consisting primarily of residential and industrial development. There is a school (Wake Preparatory Academy) located north of the site.

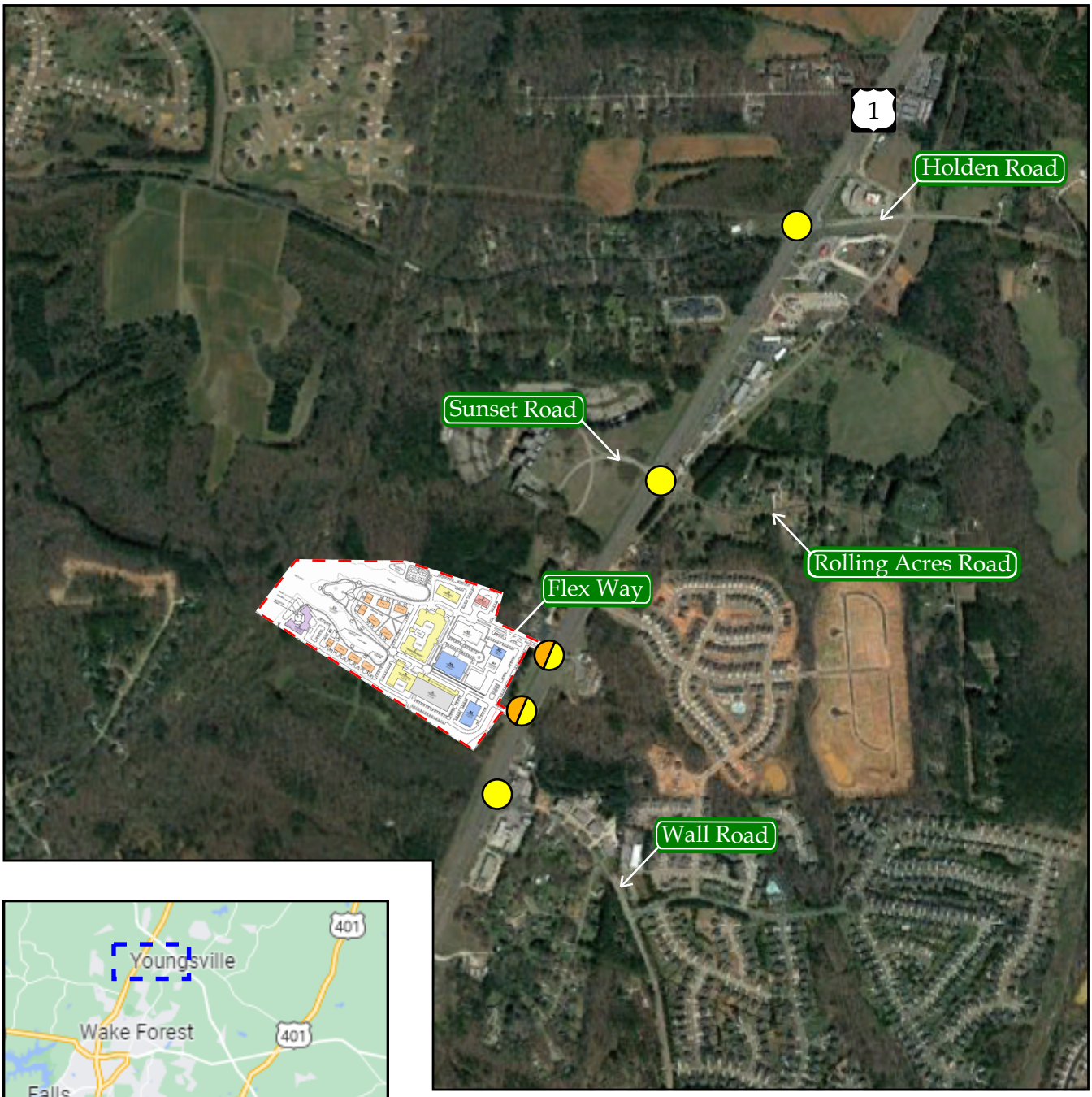
1.4. Existing Roadways

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

Table 1: Existing Roadway Inventory

Road Name	Route Number	Typical Cross Section	Speed Limit	2018 AADT (vpd)
Capital Boulevard	US 1	4-lane divided	55 mph	38,000
Holden Road	SR 1147	2-lane undivided	45 mph	5,300*
Wall Road	SR 1932	2-lane undivided	45 mph	2,630**
Sunset Drive	N/A	2-lane undivided	Not Posted	6,910***
Rolling Acres Road	N/A	2-lane undivided	Not Posted	390**
Flex Way	N/A	2-lane undivided	Not Posted	100**
Southern Site Driveway	N/A	2-lane undivided	Not Posted	170**

*ADT from 2017
**ADT based on the traffic counts from 2023 and assuming the weekday PM peak hour volume is 10% of the average daily traffic.
***ADT based on the traffic counts from 2023 and assuming the weekday AM peak hour volume is 10% of the average daily traffic.



N

LEGEND

- Study Intersection
- Proposed Site Access
- Study Area

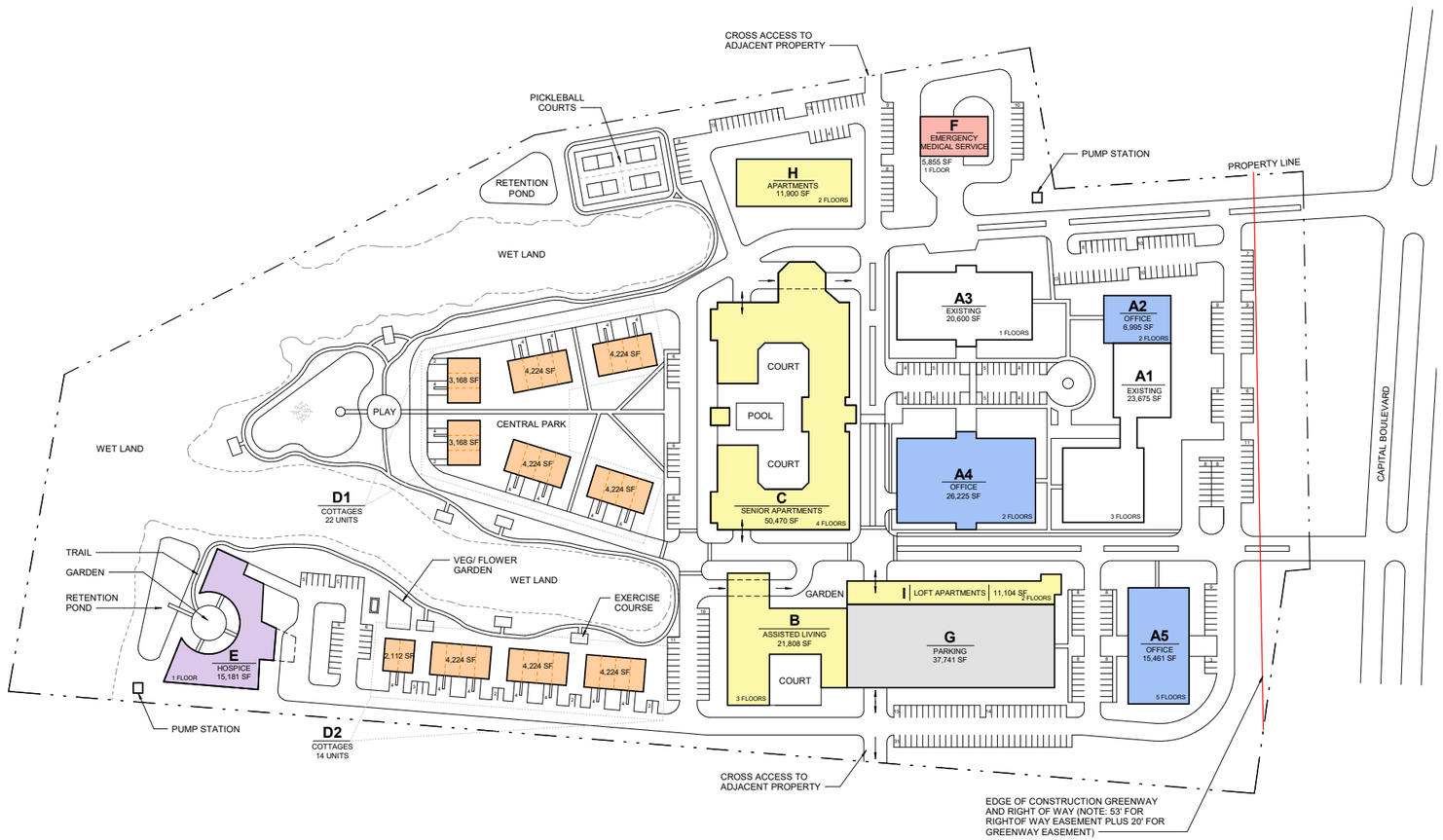
RAMEY KEMP ASSOCIATES

Capital Lifecare Village
Youngsville, NC

Site Location Map

Scale: Not to Scale

Figure 1



SITE & PROJECT DATA

SITE

SITE AREA	35.68 ACRES (APPROX.)
EXISTING ZONING	GB
PROPOSED ZONING	GB CONDITIONAL

PROJECT DATA

USE	AREA / UNITS	PARKING REQ
A1 - OFFICE (EXISTING)	71,025 SF	236
A2 - OFFICE	13,990 SF	46
A3 - OFFICE (EXISTING)	20,600 SF	68
A4 - OFFICE	52,450 SF	174
A5 - OFFICE	77,305 SF	257
TOTAL OFFICE	235,370 SF	781

USE	AREA / UNITS	PARKING REQ
B - ASSISTED LIVING	87 UNITS	41
C - SENIOR APARTMENTS	191 UNITS	308
D1 - (4) PLEX UNITS	22 UNITS	52
D2 - (4) PLEX UNITS	14 UNITS	31
H - APARTMENTS	22 UNITS	55
I - LOFT APARTMENTS	36 UNITS	72
TOTAL LIVING UNITS	372 UNITS	559

USE	AREA / UNITS	PARKING REQ
E - HOSPICE	20 UNITS	10 (EST.)
F - EMERGENCY MEDICAL SERVICES	5,855 SF	6 (EST.)
TOTAL	5,855 SF / 20 UNITS	16

TOTAL PARKING REQUIRED FOR SITE	**1,356 SPACES**

PARKING PROVIDED

C - PODIUM / BELOW	313
PARKING BELOW A4	70
G - PARKING GARAGE (4.5 LEVELS)	570
SURFACE PARKING	461
TOTAL	1,414

SHARED PARKING APPLICATION

OFFICE	
MULTI-FAMILY	
SHARED PARKING FORMULA REQUIRED	
REDUCTION	

NOTE: THIS WOULD REDUCE PARKING DECK FROM (4) FLOOR TO (3) FLOORS

NORTH

SITE PLAN, OPTION 3

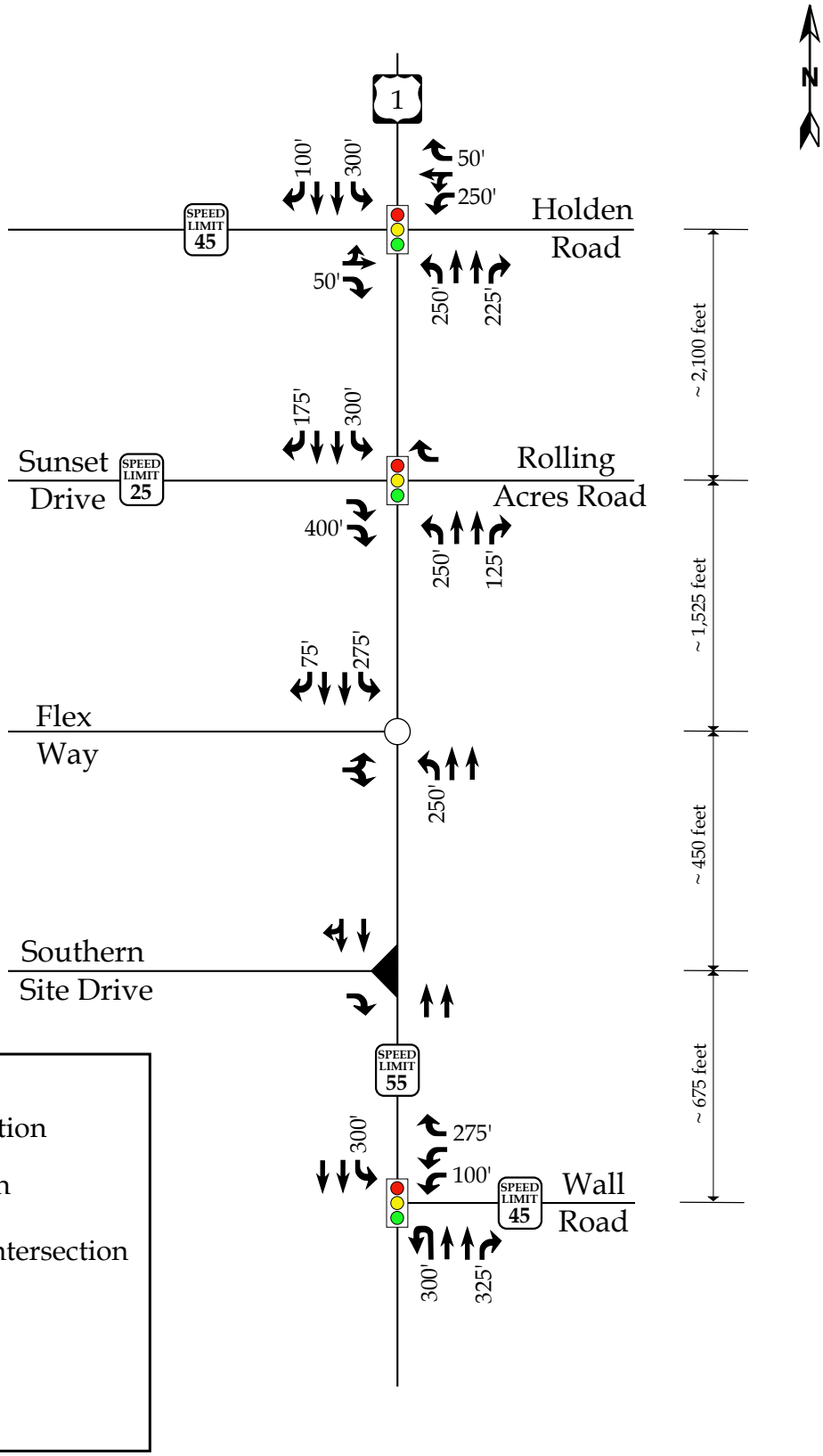
CAPITAL LIFECARE VILLAGE

DECEMBER 14, 2022

0' 80' 160'

SCALE: 1" = 80'

ARCADIS | IBI GROUP
421 Fayetteville Street, Suite 1609
Raleigh, NC, 27601, USA
ibigroup.com



LEGEND

- Unsignalized Intersection
- Signalized Intersection
- Right-In/Right-Out Intersection
- Existing Lane
- X' Storage (In Feet)
- SPEED LIMIT XX Posted Speed Limit

RAMEY KEMP ASSOCIATES

Capital Lifecare Village
Youngsville, NC

2023 Existing
Lane Configurations

Scale: Not to Scale

Figure 3

2. 2023 EXISTING PEAK HOUR CONDITIONS

2.1. 2023 Existing Peak Hour Traffic Volumes

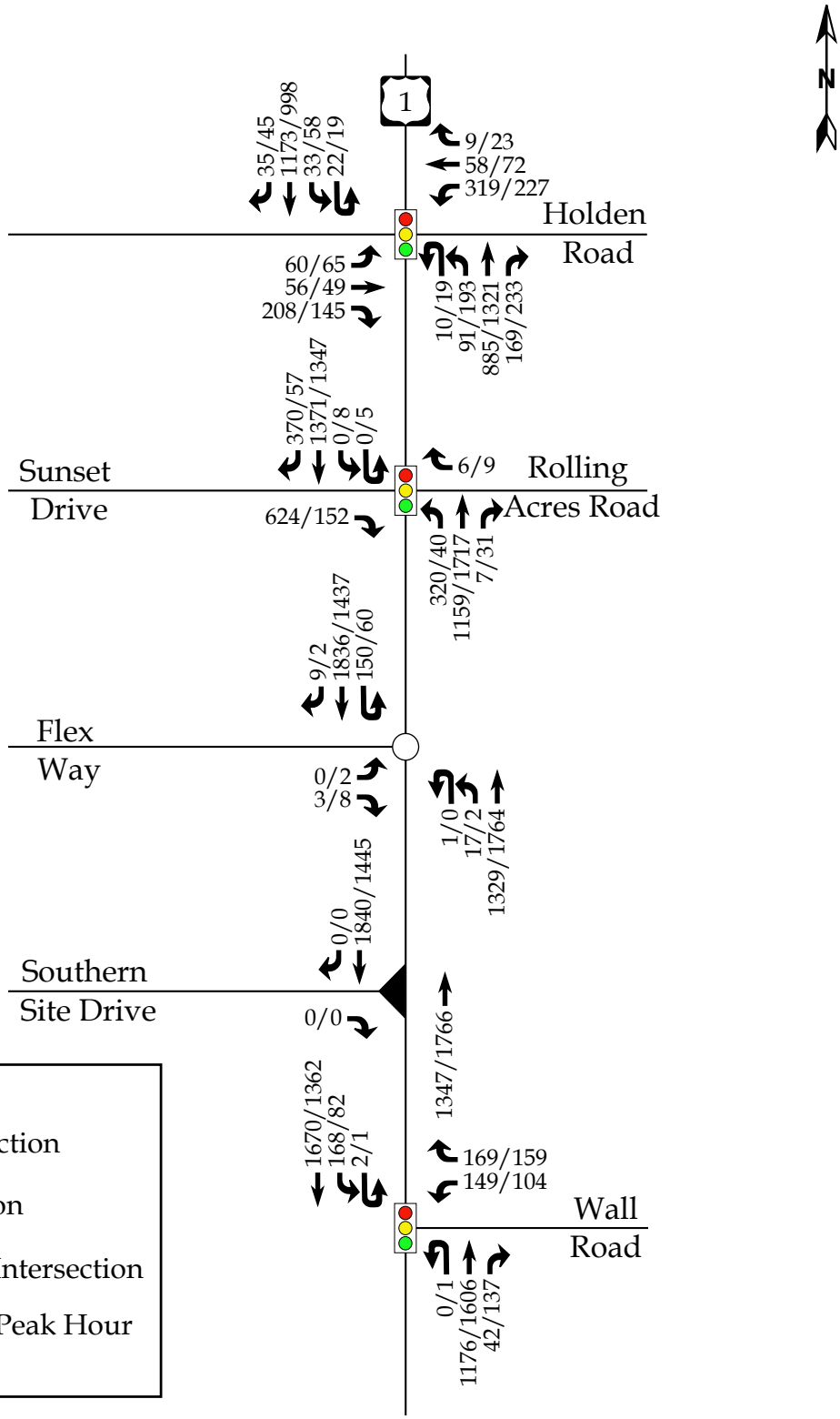
Existing peak hour traffic volumes were determined based on traffic counts conducted at the study intersections listed below, in February of 2023 during typical weekday AM (7:00 AM – 9:00 AM) and PM (4:00 PM – 6:00 PM) peak periods:

- Capital Boulevard & Holden Road
- Capital Boulevard and Sunset Drive/Rolling Acres Road
- Capital Boulevard and Wall Road
- Capital Boulevard and Flex Way
- Capital Boulevard and Southern Site Driveway

Weekday AM and PM traffic volumes were balanced between study intersections, where appropriate. Refer to Figure 4 for 2023 existing weekday AM and PM peak hour traffic volumes. A copy of the count data is located in Appendix B of this report.

2.2. Analysis of 2023 Existing Peak Hour Traffic Conditions

The 2023 existing weekday AM and PM peak hour traffic volumes were analyzed to determine the current levels of service at the study intersections under existing roadway conditions. Signal information was obtained from NCDOT and is included in Appendix C. The results of the analysis are presented in Section 7 of this report.



LEGEND

- Unsignalized Intersection
- Signalized Intersection
- Right-In/Right-Out Intersection
- X / Y → Weekday AM / PM Peak Hour Traffic

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

RAMEY KEMP ASSOCIATES	Capital Lifecare Village Youngsville, NC	2023 Existing Peak Hour Traffic	
		Scale: Not to Scale	Figure 4

3. 2030 NO-BUILD PEAK HOUR CONDITIONS

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

3.1. Ambient Traffic Growth

Through coordination with NCDOT and the County, it was determined that an annual growth rate of 3.0% would be used to generate 2030 projected weekday AM and PM peak hour traffic volumes. Refer to Figure 5 for 2030 projected peak hour traffic.

3.2. Adjacent Development Traffic

Through coordination with NCDOT and the County, the following adjacent development was identified to be included as an approved adjacent development in this study:

- Sorrell Oaks

Table 2, on the following page, provides a summary of the adjacent developments.

Table 2: Adjacent Development Information

Development Name	Location	Build-Out Year	Land Use / Intensity	TIA Performed
Sorrell Oaks	North of Holden Road and west of Sid Mitchell Road	2025	92 dwelling units of single family detached housing	September of 2021 by RKA

It should be noted that the adjacent developments were approved, during scoping, by NCDOT and the County. Adjacent development trips are shown in Figure 6. Adjacent development information can be found in Appendix D.

3.3. Future Roadway Improvements

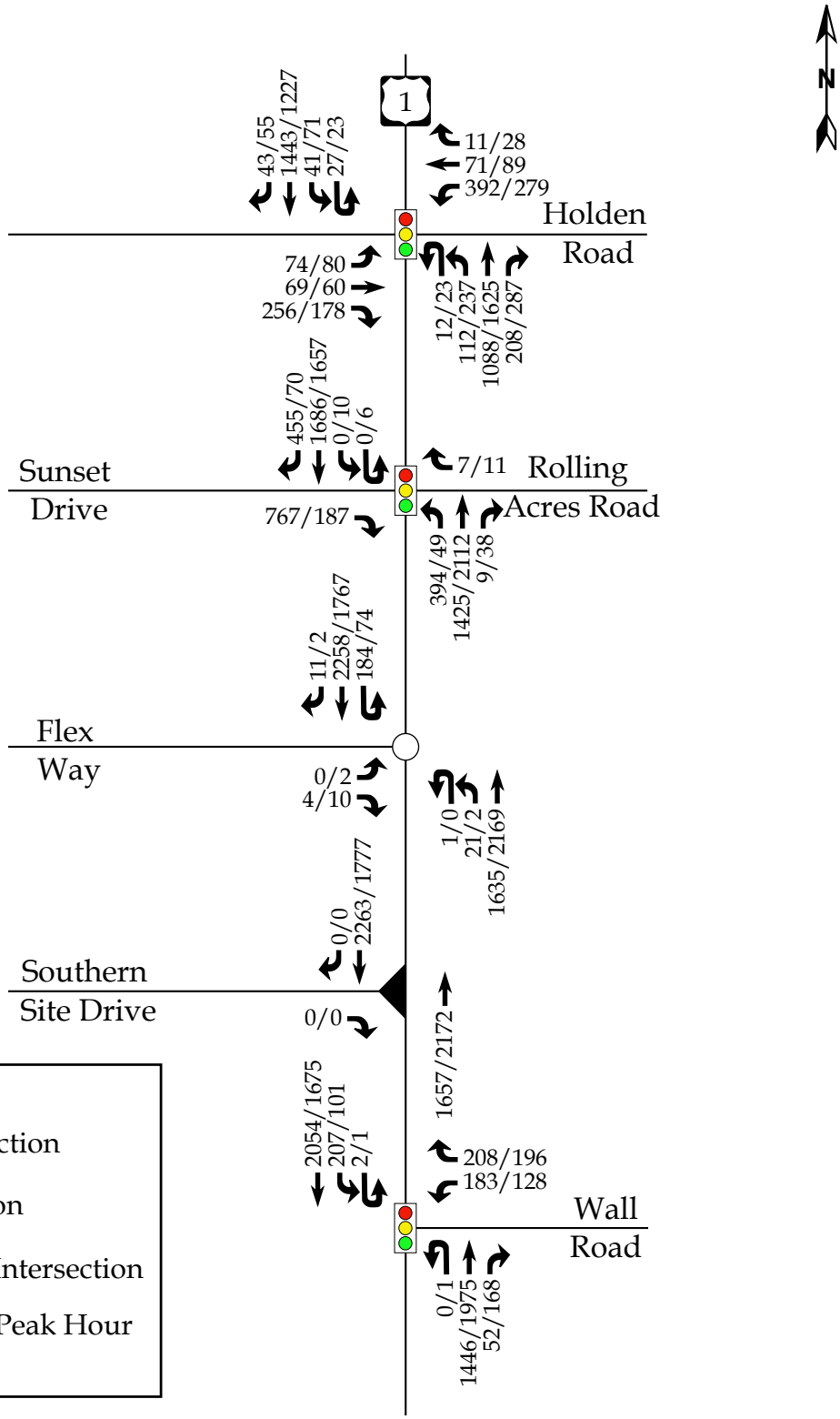
Based on coordination with the NCDOT and the County, it was determined there were no future roadway improvements to consider with this study.

3.4. 2030 No-Build Peak Hour Traffic Volumes

The 2030 no-build traffic volumes were determined by projecting the 2023 existing peak hour traffic to the year 2030 and adding the adjacent development trips. Refer to Figure 7 for an illustration of the 2030 no-build peak hour traffic volumes at the study intersections.

3.5. Analysis of 2030 No-Build Peak Hour Traffic Conditions

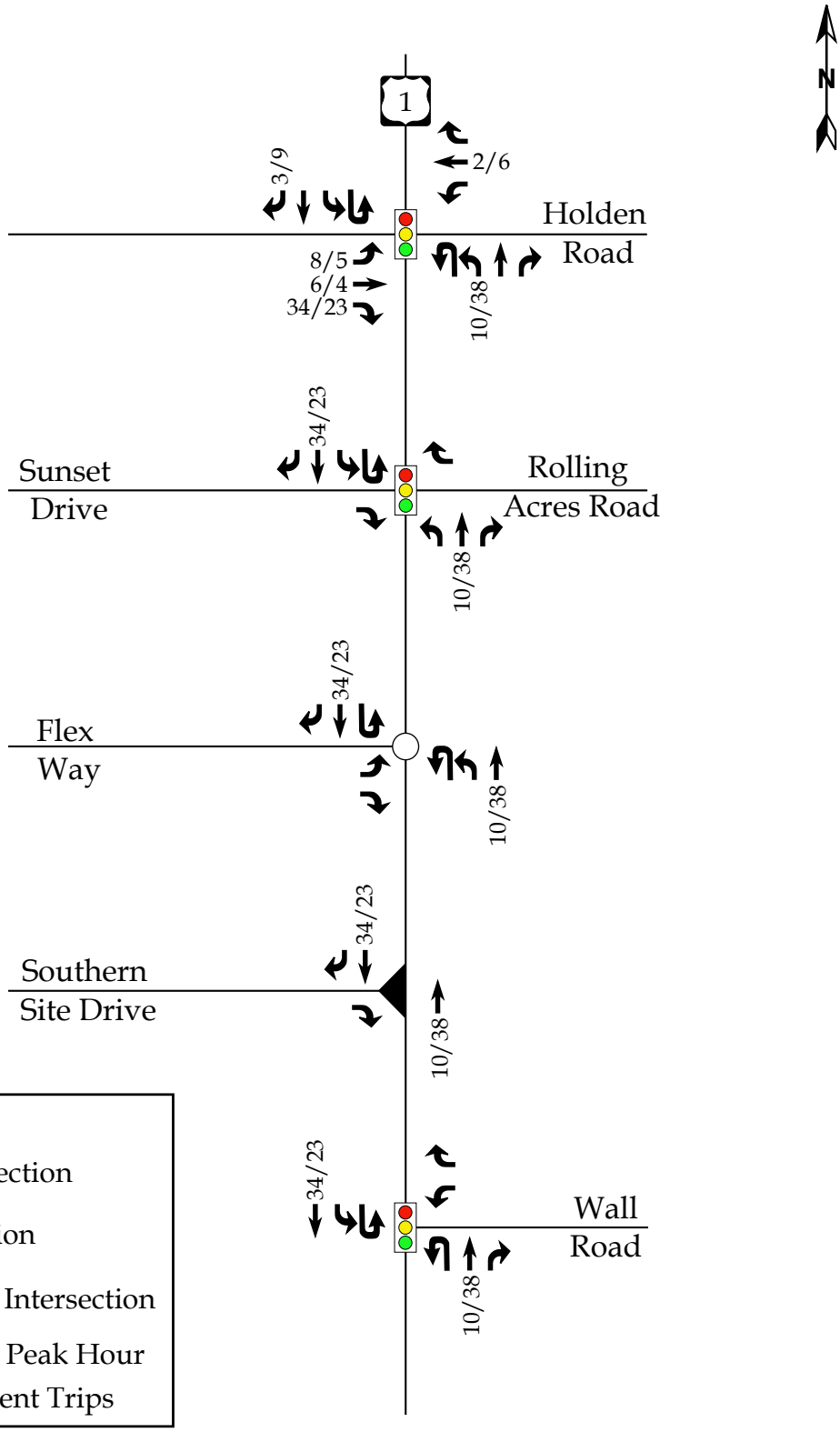
The 2030 no-build AM and PM peak hour traffic volumes at the study intersections were analyzed with existing geometric roadway conditions and traffic control. The analysis results are presented in Section 7 of this report.



LEGEND

- Unsignalized Intersection
- Signalized Intersection
- Right-In/Right-Out Intersection
- X / Y → Weekday AM / PM Peak Hour Traffic

RKA RAMEY KEMP ASSOCIATES	Capital Lifecare Village Youngsville, NC	2030 Projected Peak Hour Traffic
		Scale: Not to Scale — Figure 5



LEGEND

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

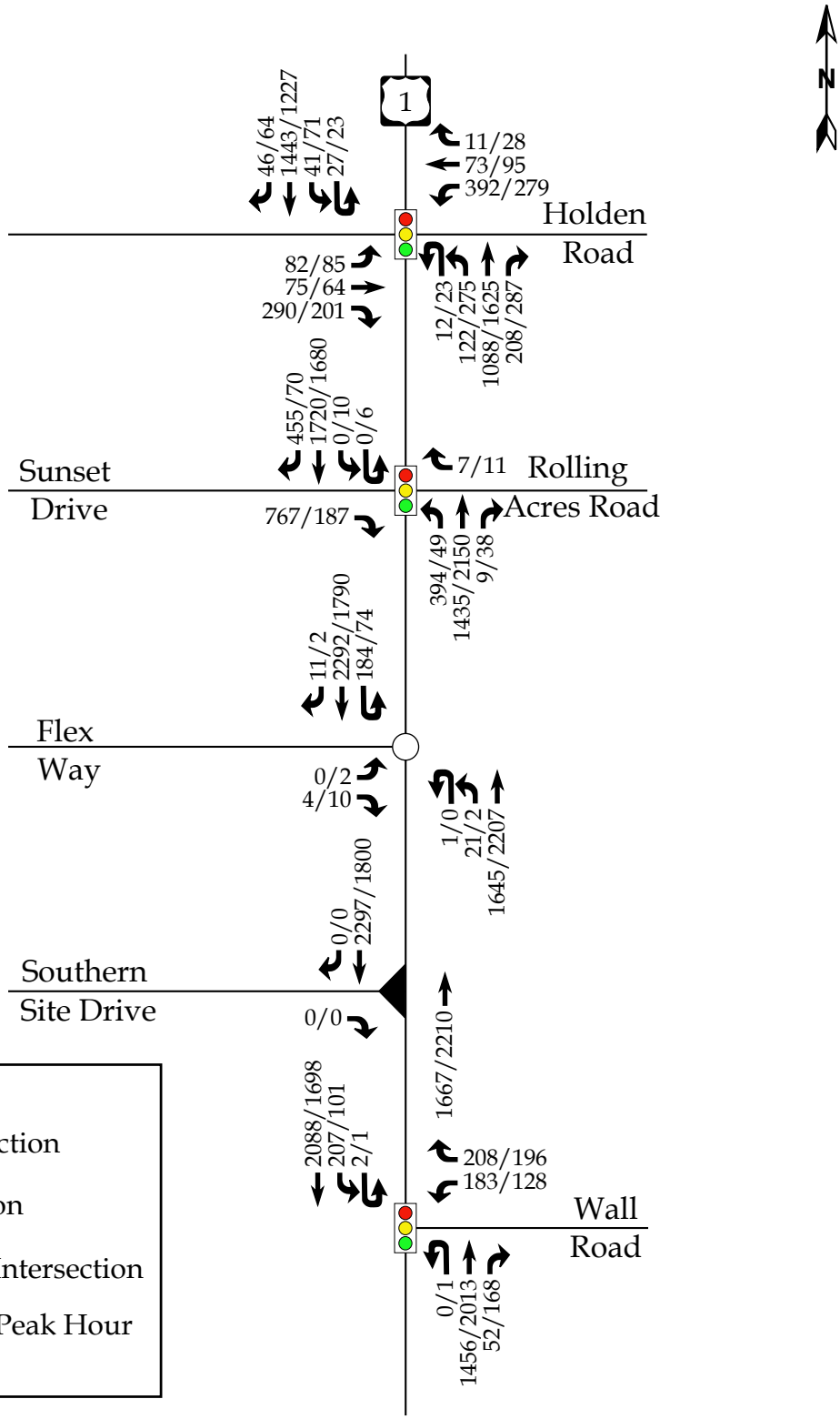
RAMEY KEMP ASSOCIATES

Capital Lifecare Village
Youngsville, NC

Peak Hour Adjacent Development Trips

Scale: Not to Scale

Figure 6



LEGEND

- Unsignalized Intersection
- Signalized Intersection
- Right-In/Right-Out Intersection
- X / Y → Weekday AM / PM Peak Hour Traffic

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

RKA RAMEY KEMP ASSOCIATES	Capital Lifecare Village Youngsville, NC	2030 No-Build Peak Hour Traffic
		Scale: Not to Scale — Figure 7

4. SITE TRIP GENERATION AND DISTRIBUTION

4.1. Trip Generation

Average weekday daily, AM peak hour, and PM peak hour trips for the proposed development were estimated using methodology contained within the ITE *Trip Generation Manual*, 11th Edition. Table 3 provides a summary of the trip generation potential for the site.

Table 3: Trip Generation Summary

Land Use (ITE Code)	Intensity	Daily Traffic (vpd)	Weekday AM Peak Hour Trips (vph)		Weekday PM Peak Hour Trips (vph)	
			Enter	Exit	Enter	Exit
Single Family Attached Housing (215)	36 DU	224	3	10	11	7
Multifamily Housing (mid-rise) (221)	58 DU	230	3	11	14	9
Senior Apartments (252)	191 DU	577	13	24	27	21
Assisted Living (254)	87 DU	226	10	6	8	13
Nursing Home (620)	20 beds	61	3	1	3	4
Free Standing Emergency Room (650)	5,855 s.f.	146	4	3	4	5
General Office Space (710)	235,370 s.f.	2,444	308	42	57	281
Existing Office Space	*91,625 s.f.*	*-1,075*	*-136*	*-19*	*-26*	*-128*
New Office Space	143,745 s.f.	1,369	172	23	31	153
Total Trips		**2,833**	**208**	**78**	**98**	**212**
*Internal Capture (1% AM & 1% PM) **			*-2*	*0*	*-1*	*0*
Total Primary Trips			**206**	**78**	**97**	**212**

*Utilizing methodology contained in the NCHRP Report 684.

It is estimated that the proposed development will generate approximately 2,833 total site trips on the roadway network during a typical 24-hour weekday period. Of the daily traffic volume, it is anticipated that 286 trips (208 entering and 78 exiting) will occur during the

weekday AM peak hour and 310 trips (98 entering and 212 exiting) will occur during the weekday PM peak hour.

Internal capture of trips between the office, residential, and emergency uses was considered in this study. Internal capture is the consideration for trips that will be made within the site between different land uses, so the vehicle technically never leaves the internal site but can still be considered as a trip to that specific land use. Internal capture typically only considers trips between residential, office, and retail/restaurant land uses. Based on NCHRP Report 684 methodology, a weekday AM peak hour internal capture of 1% and a weekday PM peak hour internal capture rate of 1% was applied to the total trips. The internal capture reductions are expected to account for approximately 2 trips (2 entering and 0 exiting) during the weekday AM peak hour and 1 trip (1 entering and 0 exiting) during the weekday PM peak hour.

The total primary site trips are the calculated site trips after the reduction for internal capture. Primary site trips are expected to generate approximately 284 trips (206 entering and 78 exiting) during the weekday AM peak hour and 309 trips (97 entering and 212 exiting) during the weekday PM peak hour.

4.2. Site Trip Distribution and Assignment

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

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

- 70% to/from the south via Capital Boulevard
- 30% to/from the north via Capital Boulevard

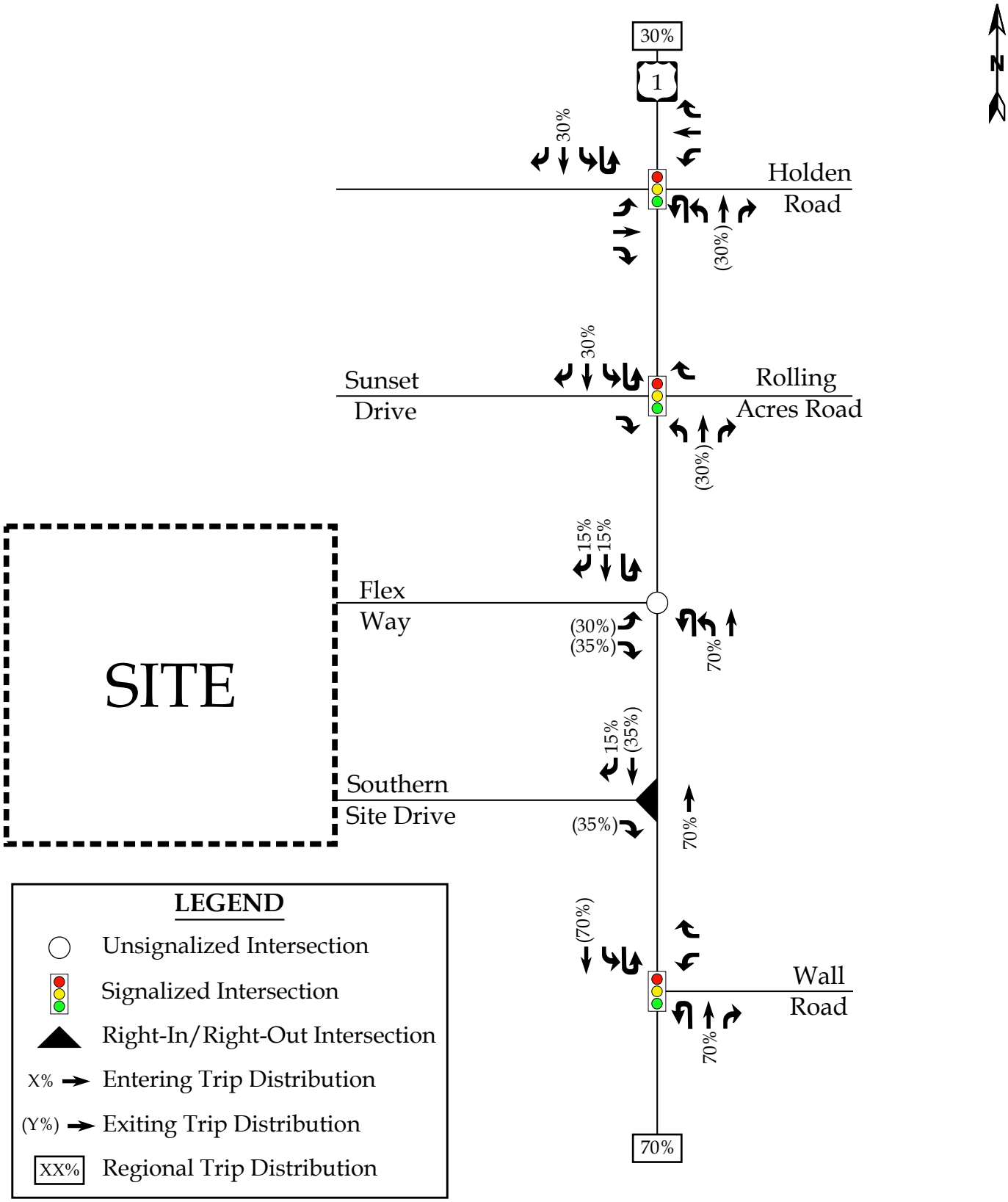
It is estimated that the office site trips will be regionally distributed as follows:

- 65% to/from the south via Capital Boulevard
- 30% to/from the north via Capital Boulevard

- 5% to/from the east via Wall Road

The residential site trip distribution is shown in Figure 8a, and the office site trip distribution is shown in Figure 8b. Refer to Figures 9a-9c for the residential, office, and emergency room/nursing home site trip assignments, respectively.

The total site trips were determined by adding the residential, office, and emergency site trips together. Refer to Figure 10 for the total peak hour site trips at the study intersections.



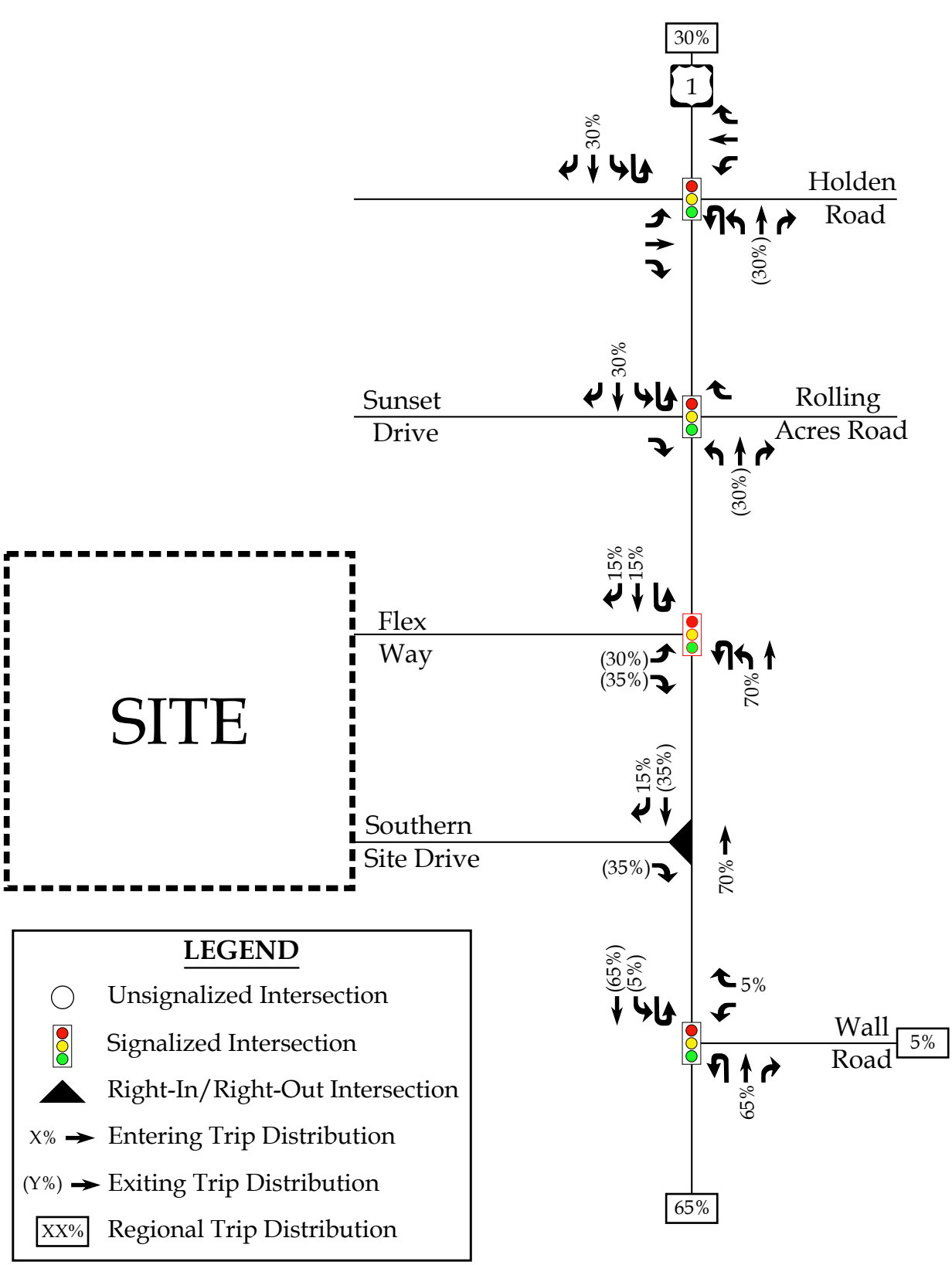
RAMEY KEMP ASSOCIATES

Capital Lifecare Village
Youngsville, NC

Residential Site
Trip Distribution

Scale: Not to Scale

Figure 8a



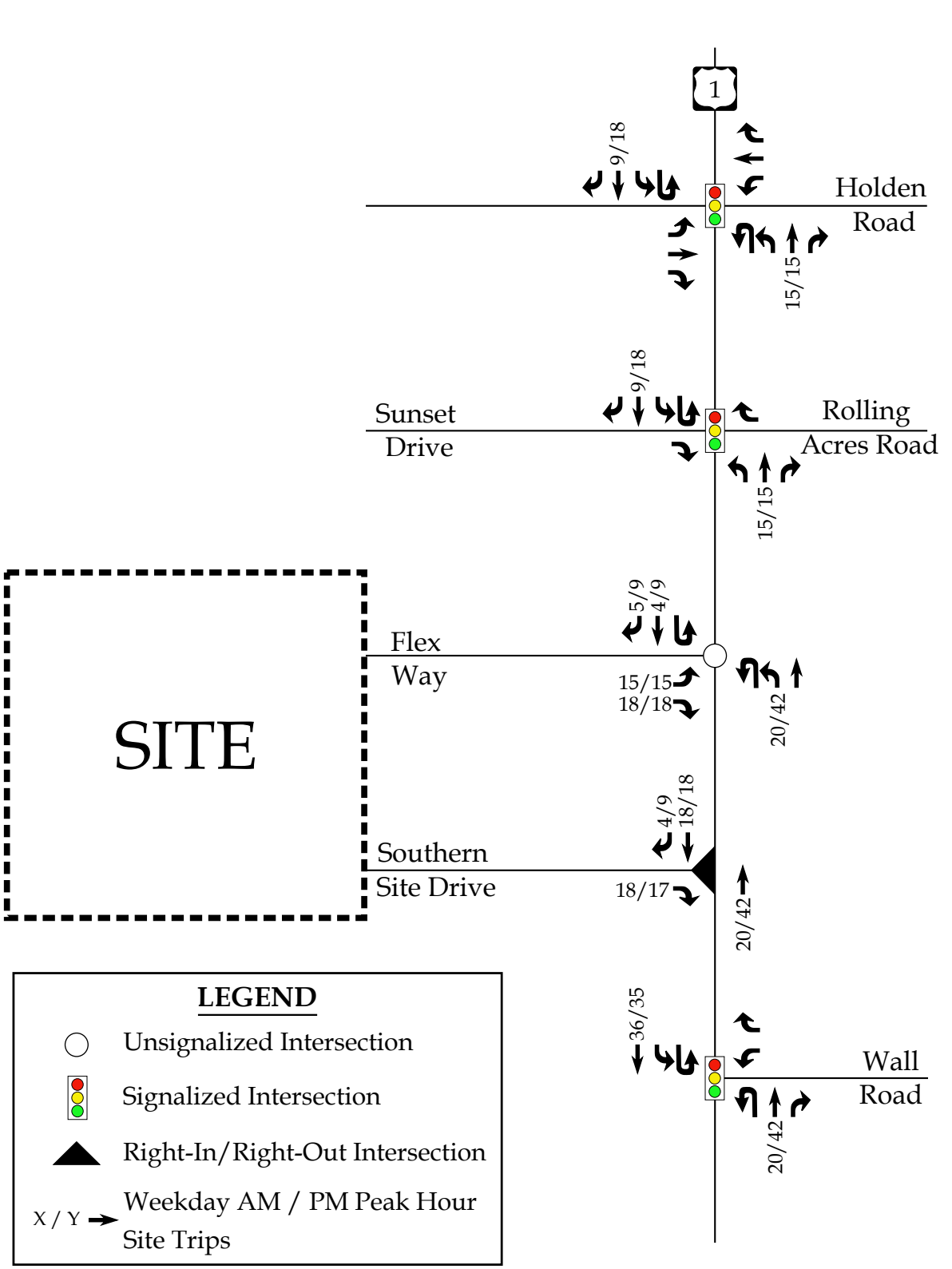
RAMEY KEMP ASSOCIATES

Capital Lifecare Village
Youngsville, NC

Office
Site Trip Distribution

Scale: Not to Scale

Figure 8b



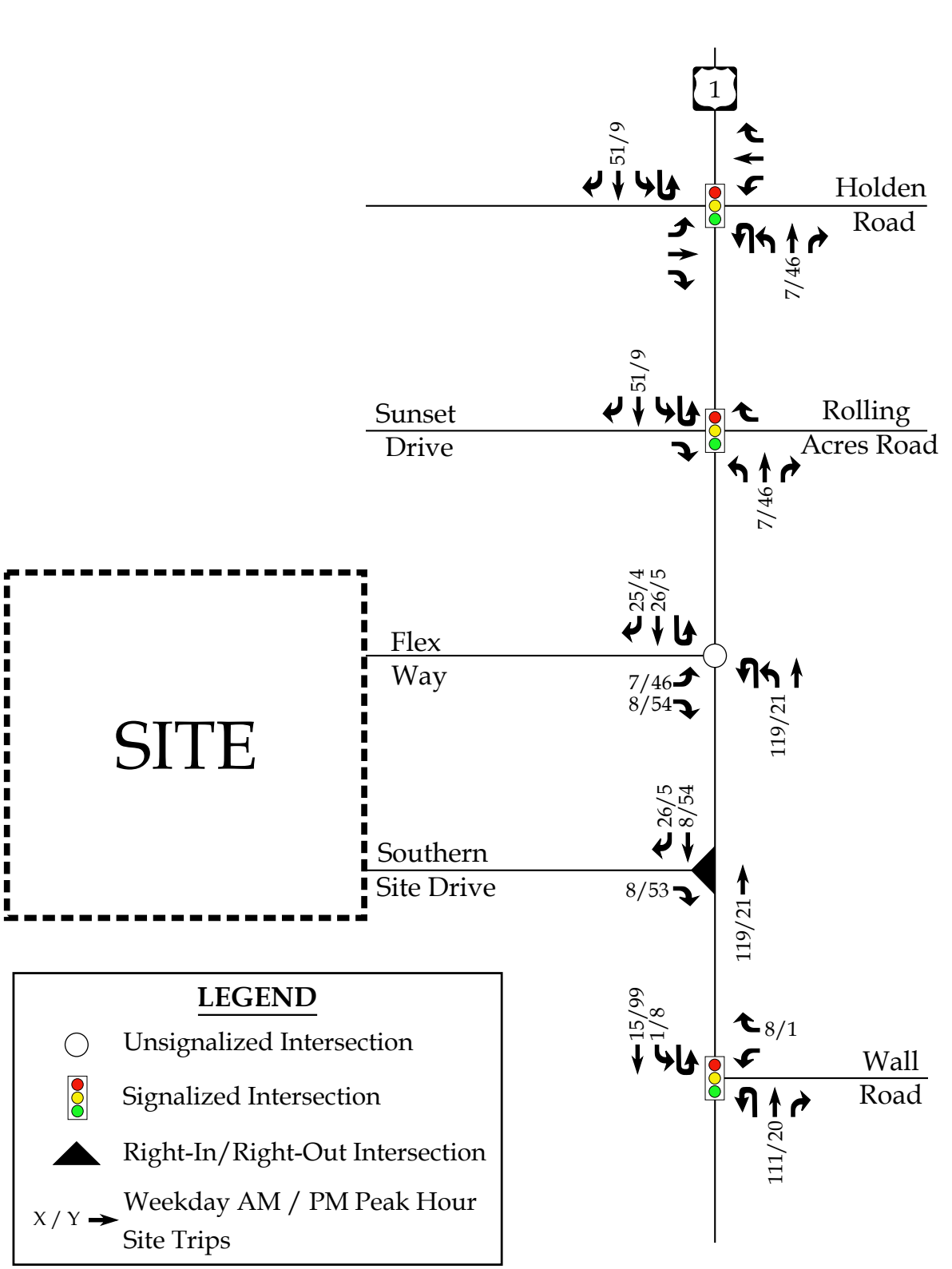
RAMEY KEMP ASSOCIATES

Capital Lifecare Village
Youngsville, NC

Residential
Site Trip Assignment

Scale: Not to Scale

Figure 9a



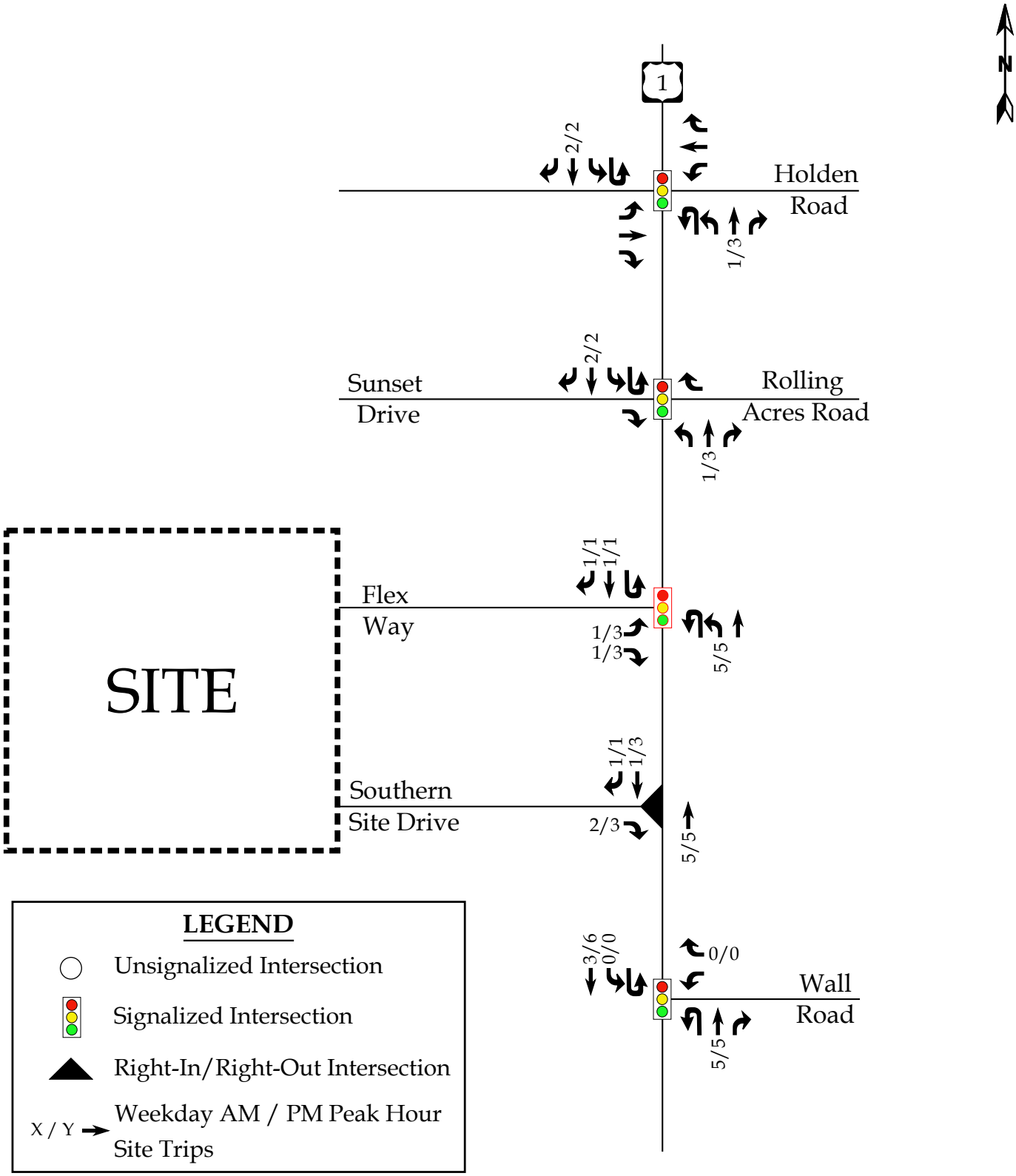
RAMEY KEMP ASSOCIATES

Capital Lifecare Village
Youngsville, NC

Office
Site Trip Assignment

Scale: Not to Scale

Figure 9b



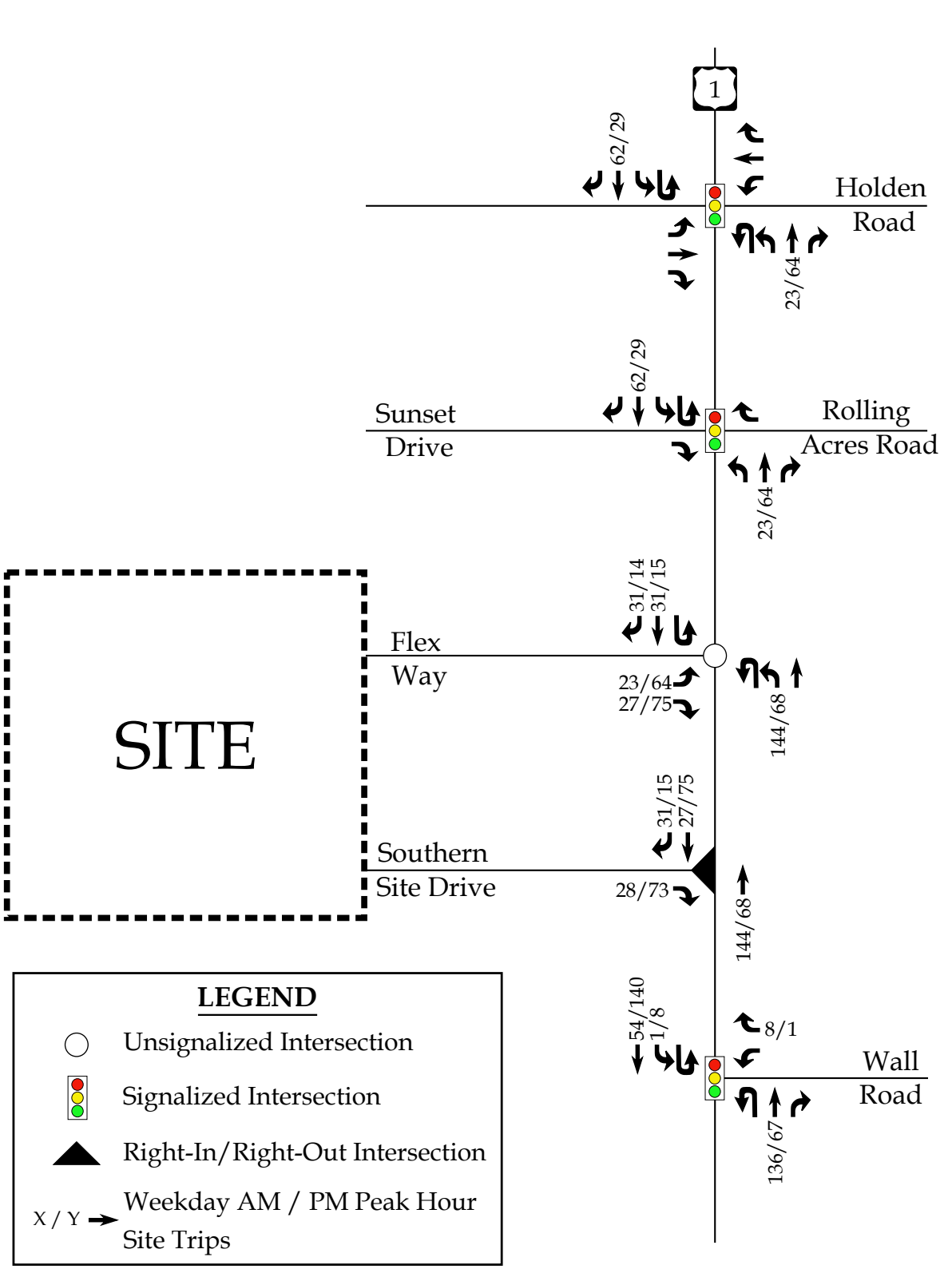
RAMEY KEMP ASSOCIATES

Capital Lifecare Village
Youngsville, NC

Emergency Room/
Nursing Home
Site Trip Assignment

Scale: Not to Scale

Figure 9c



RAMEY KEMP ASSOCIATES

Capital Lifecare Village
Youngsville, NC

Total
Site Trip Assignment

Scale: Not to Scale

Figure 10

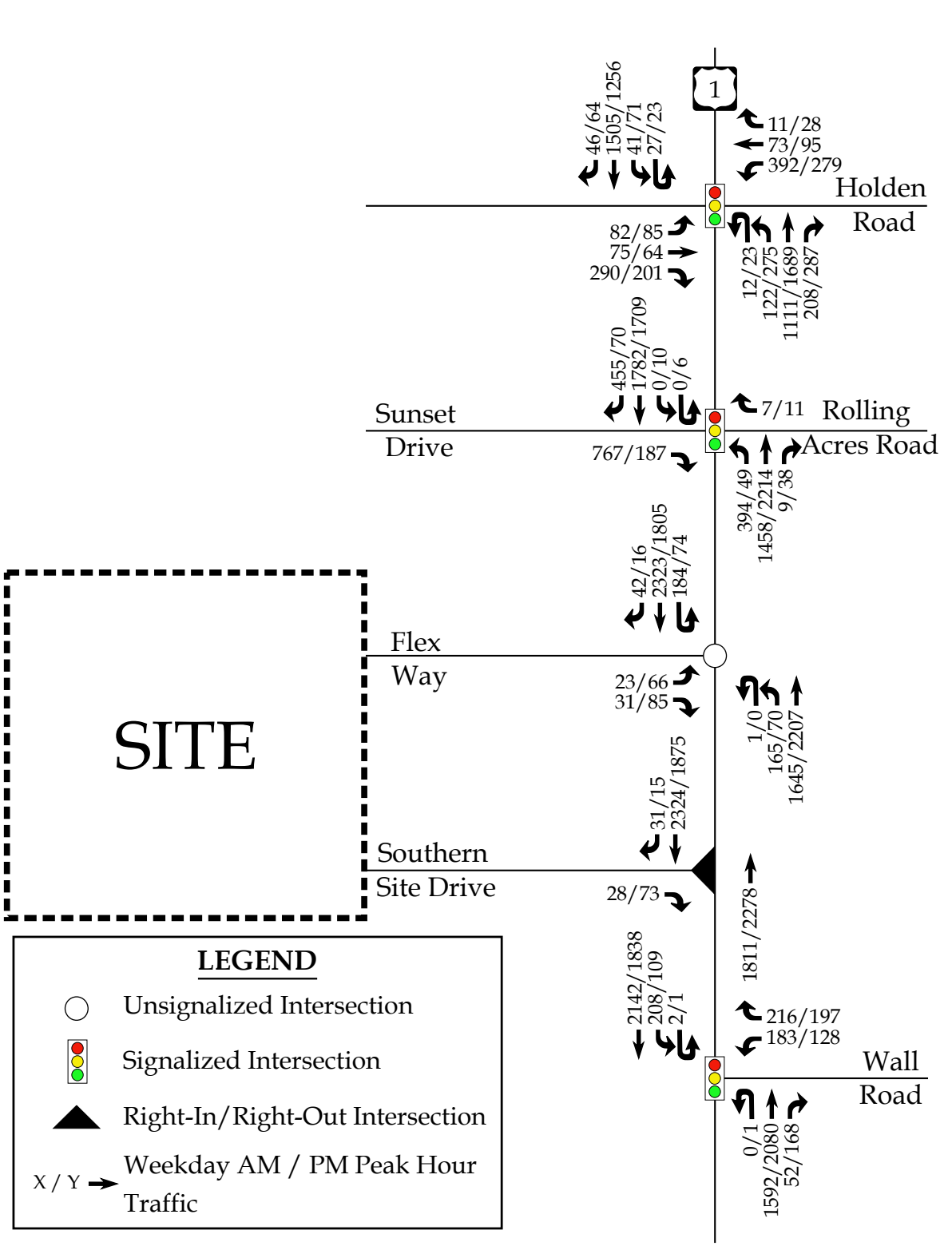
5. 2030 BUILD TRAFFIC CONDITIONS

5.1. 2030 Build Peak Hour Traffic Volumes

To estimate traffic conditions with the site fully built-out, the total site trips were added to the 2030 no-build traffic volumes to determine the 2030 build traffic volumes. Refer to Figure 11 for an illustration of the 2030 build peak hour traffic volumes with the proposed site fully developed.

5.2. Analysis of 2030 Build Peak Hour Traffic Conditions

Study intersections were analyzed with the 2030 build traffic volumes using the same methodology previously discussed for existing and no-build traffic conditions. Intersections were analyzed with improvements necessary to accommodate future traffic volumes. The results of the capacity analysis for each intersection are presented in Section 7 of this report.



LEGEND

- Unsignalized Intersection
- Signalized Intersection
- Right-In/Right-Out Intersection
- X / Y → Weekday AM / PM Peak Hour Traffic

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

RKA RAMEY KEMP ASSOCIATES	Capital Lifecare Village Youngsville, NC	2030 Build Peak Hour Traffic
		Scale: Not to Scale — Figure 11

6. TRAFFIC ANALYSIS PROCEDURE

Study intersections were analyzed using the methodology outlined in the *Highway Capacity Manual* (HCM), 6th Edition published by the Transportation Research Board. Capacity and level of service are the design criteria for this traffic study. A computer software package, Synchro (Version 11.1), was used to complete the analyses for the study area intersections. Please note that the unsignalized capacity analysis does not provide an overall level of service for an intersection; only delay for an approach with a conflicting movement.

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

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

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

6.1. Adjustments to Analysis Guidelines

Capacity analysis at all study intersections was completed according to the NCDOT Congestion Management Guidelines.

7. CAPACITY ANALYSIS

7.1. Capital Boulevard and Holden Road

The existing signalized intersection of Capital Boulevard and Holden Road was analyzed under existing and all future traffic conditions with lane configurations and traffic control shown in Table 5. Refer to Table 5 for a summary of the analysis results. Refer to Appendix E for the Synchro capacity analysis reports and Appendix J for the SimTraffic queuing reports.

Table 5: Analysis Summary of Capital Boulevard and Holden Road

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
2023 Existing	EB	1 LT-TH, 1 RT	E	D (47)	E	D (39)
	WB	1 LT, 1 LT-TH, 1 RT	E		E	
	NB	1 LT, 2 TH, 1 RT	C		D	
	SB	1 LT, 2 TH, 1 RT	E		C	
2030 No-Build	EB	1 LT-TH, 1 RT	F	F (86)	E	F (97)
	WB	1 LT, 1 LT-TH, 1 RT	E		E	
	NB	1 LT, 2 TH, 1 RT	D		F	
	SB	1 LT, 2 TH, 1 RT	F		D	
2030 Build	EB	1 LT-TH, 1 RT	F	F (95)	E	F (106)
	WB	1 LT, 1 LT-TH, 1 RT	E		E	
	NB	1 LT, 2 TH, 1 RT	D		F	
	SB	1 LT, 2 TH, 1 RT	F		D	
2030 Build with Signal Timing Modifications	EB	1 LT-TH, 1 RT	F	E (65)	F	E (56)
	WB	1 LT, 1 LT-TH, 1 RT	F		F	
	NB	1 LT, 2 TH, 1 RT	C		D	
	SB	1 LT, 2 TH, 1 RT	E		D	

Capacity analysis of 2023 existing traffic conditions indicates that the signal currently operates at an overall LOS D during the weekday AM and PM peak hours. Under all 2030 future traffic conditions overall levels of service are expected to operate at LOS F during the weekday AM and PM peak hours. All approach levels of service are expected to operate poorly (LOS E or LOS F) during the peak hours except for the northbound approach during the weekday AM peak hour (LOS D) and the southbound approach during the PM peak hour (LOS D). Maximum queue lengths are expected to be similar when comparing 2030 no-build traffic conditions to 2030 build traffic conditions.

Due to the poor level of service, signal timing modifications were considered. Under 2030 build – improved traffic conditions, signal timing modifications were analyzed to allow for more green time on the northbound and southbound approaches to account for the heavy through movement volumes. All signalized intersections along Capital Boulevard were modeled as a coordinated system. The intersection is expected to operate at LOS E during the weekday AM and PM peak hours under 2030 build – improved traffic conditions. With the signal timing modifications, overall delays are expected to improve by 30.0 seconds during the weekday AM peak hour and improve by 50.0 seconds during the weekday PM peak hour. Although analysis with signal timing modifications were shown, signal timing modifications are periodically done by NCDOT and not the responsibility of the developer.

Geometric improvements were considered at this intersection along Capital Boulevard, however, there are no geometric improvements that would provide realistic operational benefit to increase capacity at this intersection other than widening Capital Boulevard to provide additional through lanes. Widening Capital Boulevard to provide additional through lanes is not a reasonable improvement for a private development of this size to mitigate the proportional impacts the proposed site traffic is expected to have at this intersection. It should be noted that the proposed development is expected to account for approximately 2.1% of the overall traffic at this intersection during both the weekday AM and PM peak hours under 2030 build traffic conditions. No improvements are recommended by the developer.

7.2. Capital Boulevard and Sunset Drive / Rolling Acres Road

The existing left-over intersection of Capital Boulevard and Sunset Drive / Rolling Acres Road was analyzed under existing and all future traffic conditions with the lane configurations and traffic control shown in Table 6. Refer to Table 6 for a summary of the analysis results. Refer to Appendix F for the Synchro capacity analysis reports and Appendix J for the SimTraffic queuing reports.

Table 6: Analysis Summary of Capital Boulevard and Sunset Drive / Rolling Acres Road

ANALYSIS SCENARIO	NODE	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
				Approach	Overall (seconds)	Approach	Overall (seconds)
2023 Existing	21	WB NB SB*	1 RT 2 TH, 1 RT 1 LT	D A E	A (1)	E A E	A (3)
	23	EB NB** SB	2 RT 2 TH, 1 RT 1 LT	F E A	D (49)	E D A	A (10)
2030 No-Build	21	WB NB SB*	1 RT 2 TH, 1 RT 1 LT	E A E	A (2)	E A E	A (4)
	23	EB NB** SB	2 RT 2 TH, 1 RT 1 LT	F F A	F (80)	E D A	B (11)
2030 Build	21	WB NB SB*	1 RT 2 TH, 1 RT 1 LT	E A E	A (2)	E A E	A (5)
	23	EB NB** SB	2 RT 2 TH, 1 RT 1 LT	F F A	E (79)	E D A	B (11)
2030 Build with Signal Timing Modifications	21	WB NB SB*	1 RT 2 TH, 1 RT 1 LT	E A D	A (1)	E A E	A (2)
	23	EB NB** SB	2 RT 2 TH, 1 RT 1 LT	E C A	C (24)	E D A	A (7)

Capital Boulevard and Rolling Acres Road intersection is highlighted in yellow.
Capital Boulevard and Sunset Drive intersection is highlighted in blue.
*Due to the super-street configuration, the southbound U-Turn movement was modeled as an eastbound left turn movement.
**Due to the super-street configuration, the northbound U-Turn movement was modeled as a westbound left turn movement.

Capacity analysis indicates that the intersection of Capital Boulevard and Rolling Acres Road (node 21 in Table 6) is expected to operate at an overall LOS A during the weekday AM and PM peak hours under existing and all future traffic conditions. The westbound and southbound approaches are expected to operate similarly when comparing 2030 no-build and 2030 build traffic conditions and operate at LOS E during the weekday AM and PM peak hours. The northbound approach is expected to operate at LOS A during the weekday AM and PM peak hours under existing and all future traffic conditions. No queuing issues are expected. No improvements are recommended by the developer at the signalized left-over intersection of Capital Boulevard and Rolling Acres Road.

Capacity analysis indicates that the intersection of Capital Boulevard and Sunset Drive (node 23 in Table 6) is expected to operate poorly (LOS E and LOS F) during the weekday AM peak hour under 2030 no-build and 2030 build traffic conditions. During the weekday PM peak hour, the intersection is expected to operate at an overall LOS B under 2030 no-build and 2030 build traffic conditions. Several approaches are expected to operate poorly (LOS E and LOS F) during the weekday AM and PM peak hours under 2030 no-build and 2030 build traffic conditions. The eastbound approach is expected to queue back more than 1,180 feet during the weekday AM and PM peak hours. It should be noted that Sunset Drive serves as the only entrance/exit to the Wake Preparatory Academy. This is likely the cause of the poor operations and long queues during the peak hours.

Due to the poor levels of service and queuing issues on the eastbound approach, signal timing modifications were considered at the signalized left-over intersection of Capital Boulevard and Sunset Drive. Under 2030 build – improved traffic conditions, signal timing modifications were analyzed to allow for more green time on the eastbound approach to account for the heavy through movement volumes. All signalized intersections along Capital Boulevard were modeled as a coordinated system. The intersection is expected to operate at LOS C during the weekday AM peak hour and operate at LOS A during the PM peak hour under 2030 build – improved traffic conditions. With the signal timing modifications, overall delays are expected to improve by approximately 55.0 seconds during the weekday AM peak hour and improve by approximately 4.0 seconds during the weekday PM peak hour. Maximum queues are

expected to decrease by approximately 700 feet during the weekday AM peak hour and by approximately 1,010 feet during the weekday PM peak hour. Although analysis with signal timing modifications were shown, signal timing modifications are periodically done by NCDOT and not the responsibility of the developer.

It should also be noted that based on coordination with NCDOT, a TIA is underway analyzing the intersection of Capital Boulevard and Sunset Drive (Wake Prep Driveway), and that any improvements associated with the intersection will be the responsibility of NCDOT. No improvements at the signalized left-over intersection of Capital Boulevard and Sunset Drive are recommended by the developer.

7.3. Capital Boulevard and Flex Way

The existing unsignalized intersection of Capital Boulevard and Flex Way was analyzed under existing and all future traffic conditions with the lane configurations and traffic control shown in Table 7. Refer to Table 7 for a summary of the analysis results. Refer to Appendix G for the Synchro capacity analysis reports and Appendix J for the SimTraffic queuing reports.

Table 7: Analysis Summary of Capital Boulevard and Flex Way

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
2023 Existing	EB NB SB	1 LT-RT 1 LT, 2 TH 1 UT, 2 TH, 1 RT	C[2] D[1] F[1]	N/A	F[2] B[1] F[1]	N/A
2030 No-Build	EB NB SB	1 LT-RT 1 LT, 2 TH 1 UT, 2 TH, 1 RT	D[2] F[1] F[1]	N/A	C[2] C[1] F[1]	N/A
2030 Build	EB NB SB	1 LT-RT 1 LT, 2 TH 1 UT, 2 TH, 1 RT	E[2] F[1] F[1]	N/A	E[2] C[1] F[1]	N/A
2030 Build Improved **(Signalized)**	EB NB SB	1 LT, **1 RT** 1 LT, 2 TH 1 UT, 2 TH, 1 RT	D B C	C (25)	E A A	B (10)

Bold indicates improvement and/or lane reconfiguration to be done by the developer.
1. Level of service for major-street left-turn / U-turn movement.
2. Level of service for minor-street approach.

Capacity analysis indicates that the southbound left turn movement is expected to operate at LOS F during the weekday AM and PM peak hour under 2023 existing and all future 2030 traffic conditions. The northbound left turn movement is expected to operate at LOS F during the weekday AM peak hour and operate at LOS C during the weekday PM peak hour under 2030 no-build and build traffic conditions. The minor street approach is expected to be impacted and degrade from LOS D to LOS E during the weekday AM peak hour and degrade from LOS C to LOS E during the weekday PM peak hour when comparing 2030 no-build and build traffic conditions. Maximum queues on the eastbound approach are expected to

increase by approximately 1000 feet during the weekday AM peak hour and by approximately 912 feet during the weekday PM peak hour. Mitigation was considered at this intersection to alleviate poor operations due to the poor levels of service and long queues.

Under 2030 build – improved traffic conditions, this intersection was modeled as a signalized intersection with two minor street approach egress lanes (1 left turn lane and 1 right turn lane). Capacity analysis indicates that signalizing this intersection will improve overall and approach levels of service. Overall levels of service are expected to operate at LOS C or better during the weekday AM and PM peak hours under 2030 build – improved (signalized) traffic conditions. Additionally, approach levels of service are expected to operate at LOS D or better during the weekday AM and PM peak hours under 2030 build – improved (signalized) traffic conditions except for the eastbound approach which operates at LOS E during the weekday PM peak hour. It should be noted that the eastbound approach delay is only 0.5 seconds over the LOS D threshold (55.0 seconds) for a signalized intersection. Maximum queues are not expected to exceed 85 feet on the eastbound approach during the weekday AM peak hour, and 175 feet on the eastbound approach during the weekday PM peak hour. The following improvements are recommended by the developer:

- Monitor the intersection for signalization and install a traffic signal once warrants are met.
- Extend the existing northbound Capital Boulevard left turn lane to include 350 feet of storage and appropriate taper length.
- Construct an eastbound Flex Way right turn lane with 125 feet of storage and appropriate taper length.

7.4. Capital Boulevard and Southern Site Driveway

The existing right-in/right-out intersection of Capital Boulevard and Southern Site Driveway was analyzed under existing and all future traffic conditions with the lane configurations and traffic control shown in Table 8. Refer to Table 8 for a summary of the analysis results. Refer to Appendix H for the Synchro capacity analysis reports and turn lane warrants. Refer to Appendix J for the SimTraffic queuing reports.

Table 8: Analysis Summary of Capital Boulevard and Southern Site Driveway

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
2023 Existing	EB NB SB	1 RT 2 TH 1 TH, 1 TH-RT	C[2] -- --	N/A	C[2] -- --	N/A
2030 No-Build	EB NB SB	1 RT 2 TH 1 TH, 1 TH-RT	D[2] -- --	N/A	C[2] -- --	N/A
2030 Build	EB NB SB	1 RT 2 TH 1 TH, 1 TH-RT	E[2] -- --	N/A	D[2] -- --	N/A

2. Level of service for minor-street approach.

Capacity analysis indicates that the eastbound minor street approach is expected to operate at LOS D or better during the weekday AM and PM peak hours under existing and all future traffic conditions except during the weekday AM peak hour under 2030 build traffic conditions where the approach operates at LOS E. It should be noted that the minor street approach delay is only 0.2 seconds over the LOS D threshold (35.0 seconds) for an unsignalized intersection. Maximum queues are not expected to exceed 100 feet on the eastbound approach during the weekday AM and PM peak hours.

No turn lane is warranted based on a review of the turn lane warrants contained within NCDOT's *"Policy on Street and Driveway Access to North Carolina Highways"*. No improvements are recommended by the developer.

7.5. Capital Boulevard and Wall Road

The existing signalized intersection of Capital Boulevard and Wall Road was analyzed under existing and all future traffic conditions with the lane configurations and traffic control shown in Table 9. Refer to Table 9 for a summary of the analysis results. Refer to Appendix I for the Synchro capacity analysis reports and Appendix J for the SimTraffic queuing reports.

Table 9: Analysis Summary of Capital Boulevard and Wall Road

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
2023 Existing	WB NB SB	2 LT, 1 RT 1 UT, 2 TH, 1 RT 1 LT, 2 TH	E B A	B (13)	E A A	B (12)
2030 No-Build	WB NB SB	2 LT, 1 RT 1 UT, 2 TH, 1 RT 1 LT, 2 TH	E B B	B (18)	E B A	B (17)
2030 Build	WB NB SB	2 LT, 1 RT 1 UT, 2 TH, 1 RT 1 LT, 2 TH	E B B	B (20)	E B A	B (18)
2030 Build with Signal Timing Modifications	WB NB SB	2 LT, 1 RT 1 UT, 2 TH, 1 RT 1 LT, 2 TH	E B A	B (15)	E C A	B (16)

Capacity analysis indicates that the intersection is expected to operate at an overall LOS B during the weekday AM and PM peak hours under existing and all future traffic conditions. The mainline (Capital Boulevard) approaches are expected to operate at LOS B or better during the weekday AM and PM peak hours under existing and all future traffic conditions. The westbound approach is expected to operate at LOS E during the weekday AM and PM peak hours under existing and all future traffic conditions. Queueing issues were identified on multiple approaches.

Due to the queuing issues, signal timing modifications were considered. Under 2030 build – improved traffic conditions, signal timing modifications were analyzed to allow for more

green time on the northbound and southbound approaches to account for the heavy through movement volumes. All signalized intersections along Capital Boulevard were modeled as a coordinated system. With the signal timing modifications, similar maximum queues are expected during the weekday AM peak hour when comparing 2030 no-build traffic conditions to 2030 build – improved traffic conditions. Maximum queues are expected to decrease on all approaches during the weekday PM peak hour when comparing 2030 no-build traffic conditions to 2030 build – improved traffic conditions. Although analysis with signal timing modifications were shown, signal timing modifications are periodically done by NCDOT and not the responsibility of the developer.

8. CONCLUSIONS

This Traffic Impact Analysis was conducted to determine the potential traffic impacts of the proposed mixed-use development, at 14101 Capital Boulevard (US 1) and 51 Flex Way in Youngsville, North Carolina. The proposed development is expected to be a mixed-use development and be built out in 2030. Site access is proposed via existing connections to US 1 at Flex Way and the driveway south of Flex Way (Southern Site Driveway).

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

- 2023 Existing Traffic Conditions
- 2030 No-Build Traffic Conditions
- 2030 Build Traffic Conditions
- 2030 Build Traffic Conditions with Improvements

Trip Generation

It is estimated that the proposed development will generate approximately 2,833 total site trips on the roadway network during a typical 24-hour weekday period. Of the daily traffic volume, it is anticipated that 286 trips (208 entering and 78 exiting) will occur during the weekday AM peak hour and 310 trips (98 entering and 212 exiting) will occur during the weekday PM peak hour.

Internal capture of trips between the office, residential, and emergency uses was considered in this study. Internal capture is the consideration for trips that will be made within the site between different land uses, so the vehicle technically never leaves the internal site but can still be considered as a trip to that specific land use. Internal capture typically only considers trips between residential, office, and retail/restaurant land uses. Based on NCHRP Report 684 methodology, a weekday AM peak hour internal capture of 1% and a weekday PM peak hour internal capture rate of 1% was applied to the total trips. The internal capture reductions are expected to account for approximately 2 trips (2 entering and 0 exiting) during the weekday AM peak hour and 1 trip (1 entering and 0 exiting) during the weekday PM peak hour.

The total primary site trips are the calculated site trips after the reduction for internal capture. Primary site trips are expected to generate approximately 284 trips (206 entering and 78 exiting) during the weekday AM peak hour and 309 trips (97 entering and 212 exiting) during the weekday PM peak hour.

Adjustments to Analysis Guidelines

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

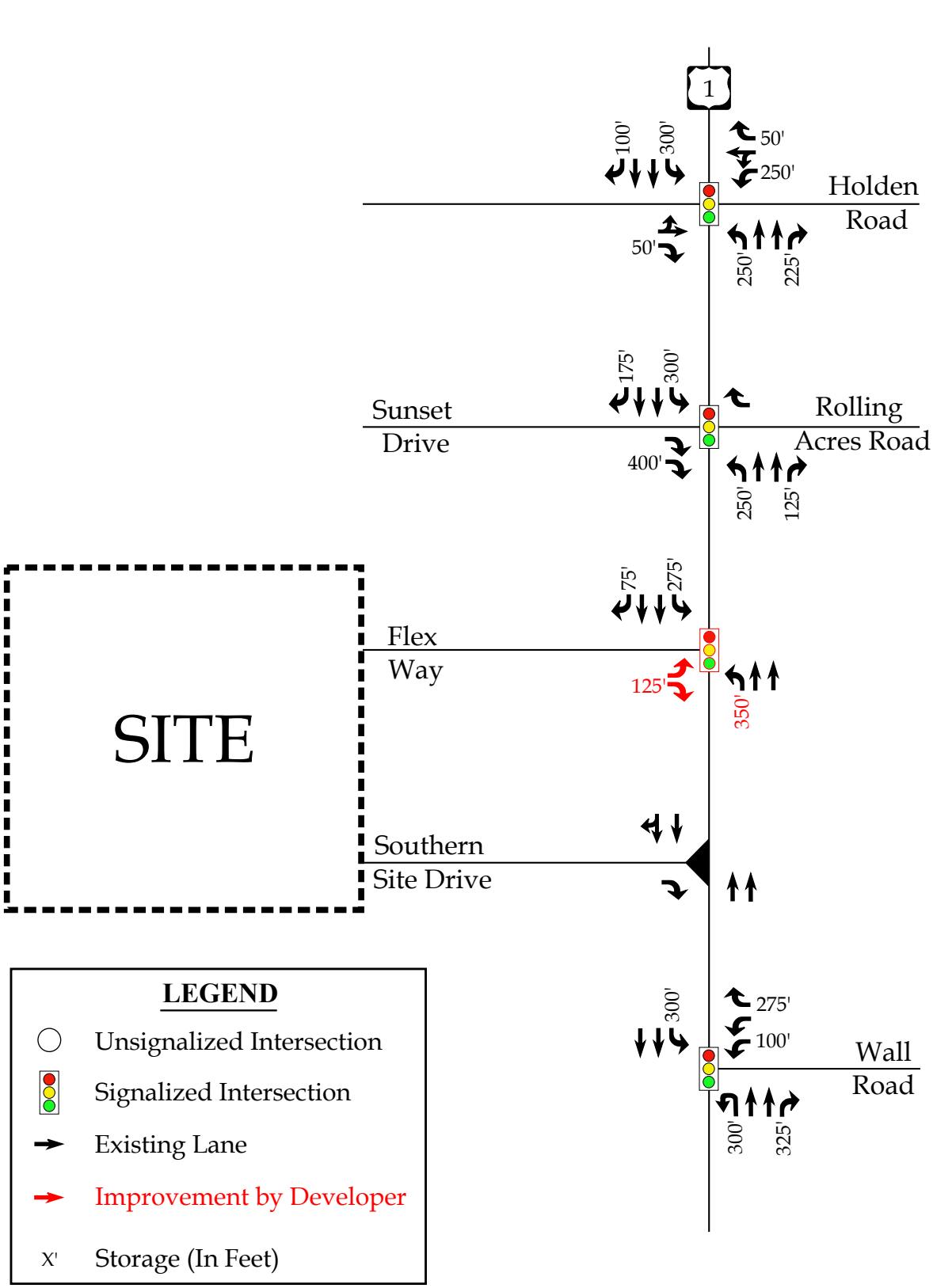
9. RECOMMENDATIONS

Based on the findings of this study, specific geometric improvements have been identified and are recommended to accommodate future traffic conditions. See a more detailed description of the recommended improvements below. Refer to Figure 12 for an illustration of the recommended lane configuration for the proposed development.

Recommended Improvements by Developer

Capital Boulevard and Flex Way

- Monitor the intersection for signalization and install a traffic signal once warrants are met.
- Extend the existing northbound Capital Boulevard left turn lane to include 350 feet of storage and appropriate taper length.
- Construct an eastbound Flex Way right turn lane with 125 feet of storage and appropriate taper length.



LEGEND

- Unsignalized Intersection
- Signalized Intersection
- Existing Lane
- Improvement by Developer
- X' Storage (In Feet)

RAMEY KEMP ASSOCIATES

Capital Lifecare Village
Youngsville, NC

Recommended Lane Configurations

Scale: Not to Scale

Figure 12

TECHNICAL APPENDIX

APPENDIX A

SCOPING DOCUMENTATION

Garrett Honeycutt

From: Sean Brennan
Sent: Friday, February 3, 2023 10:37 AM
To: Jason Rogers; Scott Hammerbacher; Wheeler, Millard S
Cc: Joshua Reinke; Danielle Troutman; Will Forrestal
Subject: 14101 Capital Blvd and 51 Flex Way

Scott W/Scott H/Jason,

I wanted to reach out about scoping a TIA for a proposed development located at 14101 Capital Blvd and 51 Flex Way in Franklin County. Can you provide some dates and times that work for a Teams meeting?

<u>TIA Scope</u>

- Development Density (Net new trips for the site is 2,714 daily trips)
    - 235,370 SF of Office (*91,625 SF of Office is existing*)
        - 2,444 Daily Trips (*Existing 1,075 Daily Trips*) net new Daily Trips is 1,396
        - AM 308 entering, 42 exiting (*Existing AM 137 entering, 18 exiting*)
        - PM 57 entering, 281 exiting (*Existing PM 26 entering, 128 exiting*)
    - 87 Units of Assisted Living
        - 226 Daily Trips
        - AM 9 entering, 7 exiting
        - PM 8 entering, 13 exiting
    - 191 Units of Senior Apartments
        - 577 Daily Trips
        - AM 13 entering, 24 exiting
        - PM 27 entering, 21 exiting
    - 36 (4)Plex Units
        - 224 Daily Trips
        - AM 3 entering, 10 exiting
        - PM 10 entering, 8 exiting
    - 58 Multifamily Housing (Mid-Rise)
        - 230 Daily Trips
        - AM 3 entering, 11 exiting
        - PM 14 entering, 9 exiting
    - 20 Unit Hospice
        - 61 Daily Trips
        - AM 3 entering, 1 exiting
        - PM 3 entering, 4 exiting
    - 5,855 SF of Emergency Medical Services
        - AM 4 entering, 4 exiting
        - PM 4 entering, 4 exiting
- Build Year: Future Buildout Year and phasing plan to be determined
- Proposed Study Intersections:
    - Capital Boulevard and Holden Road
    - Capital Boulevard and Sunset Drive
    - Capital Boulevard and Wall Road
    - Capital Boulevard and Flex Way
    - Capital Boulevard and Southern Site Access
- Analysis Scenarios: (additional scenarios to come after phasing plan is determined)

    - 2023 Existing
    - Future buildout year No-Build
    - Future buildout year Build
    - Future buildout year Build, with Improvements (if necessary)
- Proposed Regional Distribution:
    - 70% to/from the south via Capital Boulevard
    - 30% to/from the north via Capital Boulevard
- Adjacent Developments:
    - Please Advise
- Growth Rate:
    - 2% growth rate to build year

Regards,

Sean Brennan, PE
Traffic Engineering Project Manager
D 919 987 1300 Ext: 1020 | C 919 414 2250
RAMEY KEMP ASSOCIATES
TOGETHER WE ARE LIMITLESS

14101 Capital Boulevard and 51 Flex Way

6,000 students for Wake Prep - Need TIA information and improvements
TIA at Franklin/Wake County Line - get from NCDOT
No MOU needed
3% growth rate

Garrett Honeycutt

From: Danielle Troutman
Sent: Thursday, April 13, 2023 3:16 PM
To: Garrett Honeycutt
Subject: FW: Traffic Counts along Capital Blvd

Danielle Troutman, EI
Traffic Engineering Associate
D 919 987 1296 | T 919 872 5115
RAMEY KEMP ASSOCIATES
TOGETHER WE ARE LIMITLESS

From: Sean Brennan <sbrennan@rameykemp.com>
Sent: Monday, March 6, 2023 1:31 PM
To: Will Forrestal <wforrestal@mc1.biz>
Cc: Danielle Troutman <dtroutman@rameykemp.com>
Subject: RE: Traffic Counts along Capital Blvd

Will,

We have the count information back and today we went out in the field to collect the signal timings from the signal cabinets. Now that we have collected all of our data, we can enter the information into our traffic software and start developing the report.

Also, I heard back from NCDOT that the updated Wake Prep Academy study that they thought was finished, hasn't been completed yet. We can still move forward with our study by making note that the Department is completing a TIA studying the Wake Prep Driveway and Capital Blvd intersection and that any improvements to solve existing traffic issues at this intersection will be the responsibility of the Department.

Regards,

Sean Brennan, PE
Traffic Engineering Project Manager
D 919 987 1300 Ext: 1020 | C 919 414 2250
RAMEY KEMP ASSOCIATES
TOGETHER WE ARE LIMITLESS

From: Will Forrestal <wforrestal@mc1.biz>
Sent: Monday, March 6, 2023 12:05 PM

To: Sean Brennan <sbrennan@rameykemp.com>
Cc: Danielle Troutman <dtroutman@rameykemp.com>
Subject: RE: Traffic Counts along Capital Blvd

Sean-
Any information you can share regarding Traffic Counts, next steps? Further feedback from DOT and/or FCO?

Will Forrestal
Project Manager
Macallan Construction
Cell (919) 454-2684

From: Will Forrestal
Sent: Friday, February 17, 2023 8:41 AM
To: Sean Brennan <sbrennan@rameykemp.com>
Cc: Danielle Troutman <dtroutman@rameykemp.com>
Subject: RE: Traffic Counts along Capital Blvd

Thank you for the clarification.

Will Forrestal
Project Manager
Macallan Construction
Cell (919) 454-2684

From: Sean Brennan <sbrennan@rameykemp.com>
Sent: Friday, February 17, 2023 7:56 AM
To: Will Forrestal <wforrestal@mc1.biz>
Cc: Danielle Troutman <dtroutman@rameykemp.com>
Subject: RE: Traffic Counts along Capital Blvd

Will,

Sorry for the inconvenience, but the counts are now scheduled to be taken Wednesday (2/22), because Monday is President's Day and that may skew the counts on Tuesday. Once again, I apologize for the inconvenience.

Regards,

Sean Brennan, PE
Traffic Engineering Project Manager
D 919 987 1300 Ext: 1020 | C 919 414 2250
RAMEY KEMP ASSOCIATES
TOGETHER WE ARE LIMITLESS

From: Will Forrestal <wforrestal@mc1.biz>
Sent: Wednesday, February 15, 2023 11:29 AM
To: Sean Brennan <sbrennan@rameykemp.com>
Cc: Danielle Troutman <dtroutman@rameykemp.com>
Subject: RE: Traffic Counts along Capital Blvd

Done.

Thanks for confirming.

Will Forrestal
Project Manager
Macallan Construction
Cell (919) 454-2684

From: Sean Brennan <sbrennan@rameykemp.com>
Sent: Wednesday, February 15, 2023 8:33 AM
To: Will Forrestal <wforrestal@mc1.biz>
Cc: Danielle Troutman <dtroutman@rameykemp.com>
Subject: Traffic Counts along Capital Blvd

Will,

The Traffic Counts are scheduled for next Tuesday (2/21). I wanted to let you know so you could notify the existing business.

Regards,

—

Sean Brennan, PE
Traffic Engineering Project Manager
D 919 987 1300 Ext: 1020 | C 919 414 2250
RAMEY KEMP ASSOCIATES
TOGETHER WE ARE LIMITLESS

APPENDIX B

TRAFFIC COUNT DATA

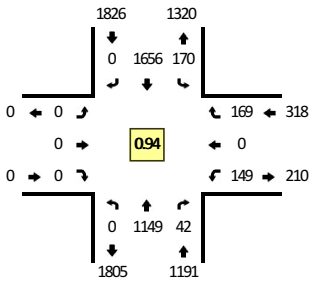
Type of peak hour being reported: Intersection Peak

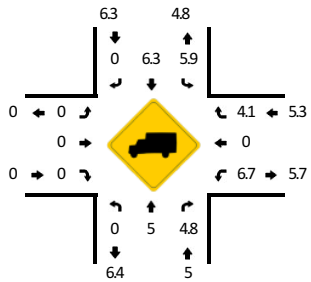
Method for determining peak hour: Total Entering Volume

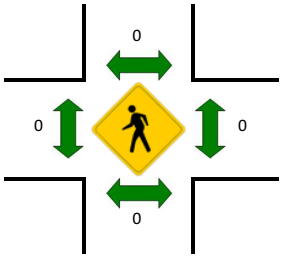
LOCATION: Capital Blvd -- Wall Rd
CITY/STATE: Wake Forest, NC

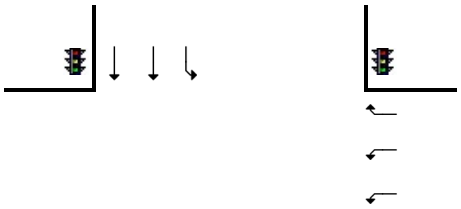
QC JOB #: 16095801
DATE: Wed, Feb 22 2023

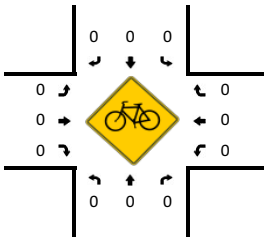
Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:00 AM -- 7:15 AM

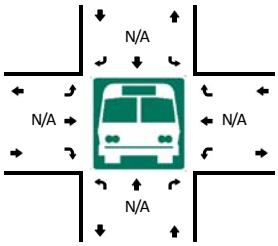


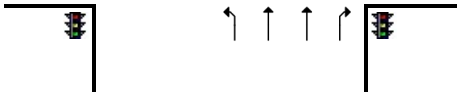


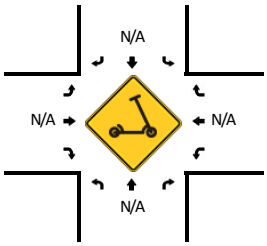












15-Min Count Period Beginning At	Capital Blvd (Northbound)				Capital Blvd (Southbound)				Wall Rd (Eastbound)				Wall Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	269	10	0	45	465	0	1	0	0	0	0	54	0	44	0	888	
7:15 AM	0	265	8	0	55	376	0	0	0	0	0	0	33	0	28	0	765	
7:30 AM	0	301	11	0	30	378	0	0	0	0	0	0	36	0	48	0	804	
7:45 AM	0	314	13	0	38	437	0	1	0	0	0	0	26	0	49	0	878	3335
8:00 AM	0	254	12	0	54	450	0	0	0	0	0	0	41	0	28	0	839	3286
8:15 AM	0	247	12	0	17	352	0	0	0	0	0	0	44	0	18	0	690	3211
8:30 AM	0	247	13	2	14	360	0	0	0	0	0	0	22	0	16	0	674	3081
8:45 AM	0	227	18	0	23	304	0	0	0	0	0	0	32	0	15	0	619	2822

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	1076	40	0	180	1860	0	4	0	0	0	0	216	0	176	0	3552
Heavy Trucks	0	64	4		4	80	0		0	0	0		8	0	8		168
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 2/27/2023 6:58 PM

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

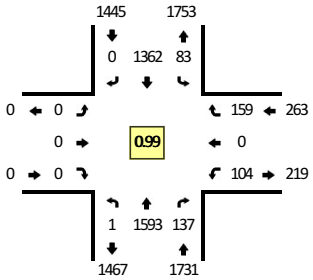
Type of peak hour being reported: Intersection Peak

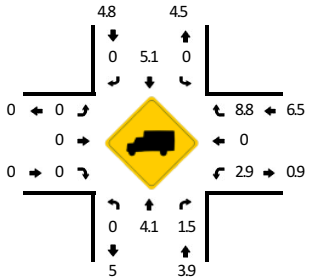
Method for determining peak hour: Total Entering Volume

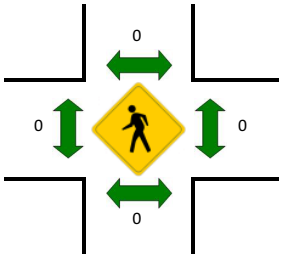
LOCATION: Capital Blvd -- Wall Rd
CITY/STATE: Wake Forest, NC

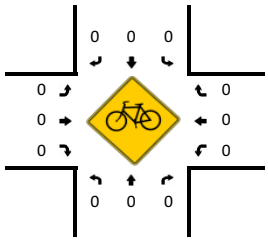
QC JOB #: 16095802
DATE: Wed, Feb 22 2023

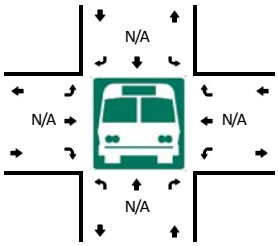
Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 5:00 PM -- 5:15 PM

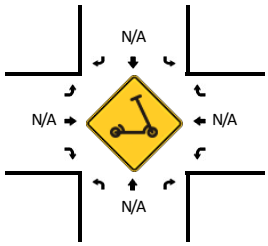












15-Min Count Period Beginning At	Capital Blvd (Northbound)				Capital Blvd (Southbound)				Wall Rd (Eastbound)				Wall Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	377	20	0	13	309	0	0	0	0	0	0	24	0	28	0	771	
4:15 PM	0	350	27	1	23	339	0	0	0	0	0	0	31	0	50	0	821	
4:30 PM	0	397	29	0	22	347	0	1	0	0	0	0	29	0	32	0	857	
4:45 PM	0	401	34	0	19	342	0	0	0	0	0	0	22	0	36	0	854	3303
5:00 PM	0	400	35	1	20	336	0	0	0	0	0	0	29	0	51	0	872	3404
5:15 PM	0	395	39	0	21	337	0	0	0	0	0	0	24	0	40	0	856	3439
5:30 PM	0	416	31	0	20	328	0	1	0	0	0	0	26	0	35	0	857	3439
5:45 PM	0	427	37	0	18	299	0	0	0	0	0	0	27	0	31	0	839	3424

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	1600	140	4	80	1344	0	0	0	0	0	0	116	0	204	0	3488
Heavy Trucks	0	56	0		0	72	0		0	0	0		4	0	4		136
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 2/27/2023 6:58 PM

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

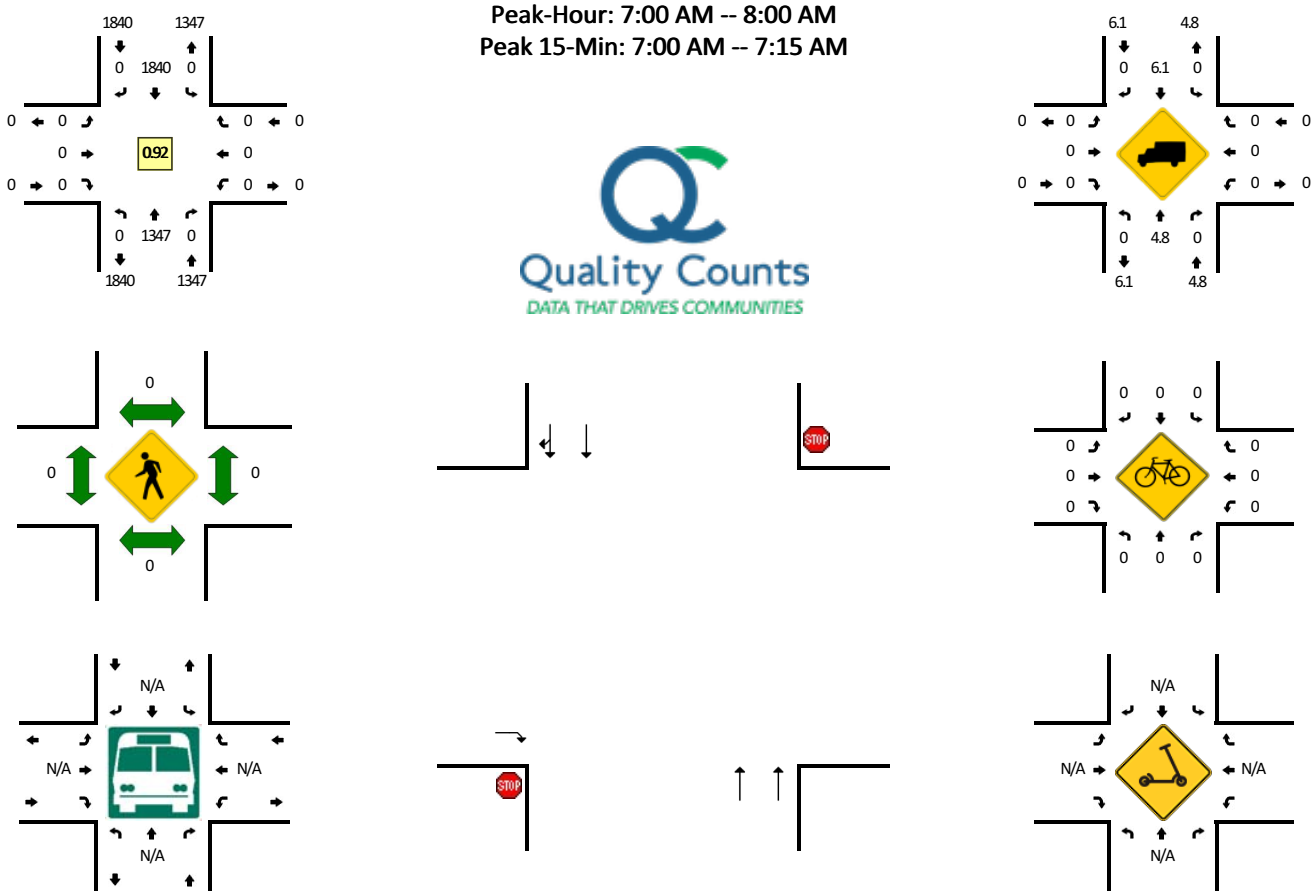
Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: Capital Blvd -- Xerium Technologies Dwy
CITY/STATE: Youngsville, NC

QC JOB #: 16095803
DATE: Wed, Feb 22 2023

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



15-Min Count Period Beginning At	Capital Blvd (Northbound)				Capital Blvd (Southbound)				Xerium Technologies Dwy (Eastbound)				Xerium Technologies Dwy (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	337	0	0	0	530	0	0	0	0	0	0	0	0	0	0	867	
7:15 AM	0	296	0	0	0	424	0	0	0	0	0	0	0	0	0	0	720	
7:30 AM	0	359	0	0	0	414	0	0	0	0	0	0	0	0	0	0	773	
7:45 AM	0	355	0	0	0	472	0	0	0	0	0	0	0	0	0	0	827	3187
8:00 AM	0	291	0	0	0	510	0	0	0	0	0	0	0	0	0	0	801	3121
8:15 AM	0	267	0	0	0	374	0	0	0	0	1	0	0	0	0	0	642	3043
8:30 AM	0	257	0	0	0	374	0	0	0	0	0	0	0	0	0	0	631	2901
8:45 AM	0	242	0	0	0	322	0	0	0	0	0	0	0	0	0	0	564	2638

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	1348	0	0	0	2120	0	0	0	0	0	0	0	0	0	0	3468
Heavy Trucks	0	72	0		0	88	0		0	0	0		0	0	0		160
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 2/27/2023 6:58 PM

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

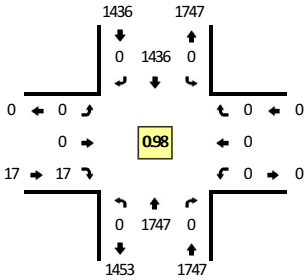
Type of peak hour being reported: Intersection Peak

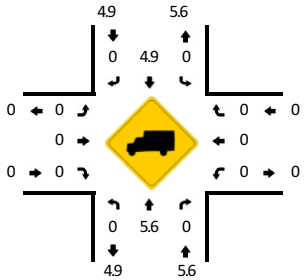
Method for determining peak hour: Total Entering Volume

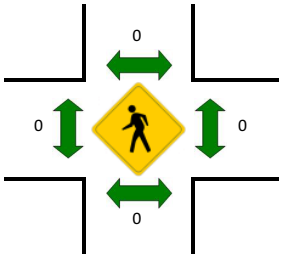
LOCATION: Capital Blvd -- Xerium Technologies Dwy
CITY/STATE: Youngsville, NC

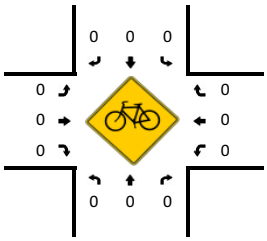
QC JOB #: 16095804
DATE: Wed, Feb 22 2023

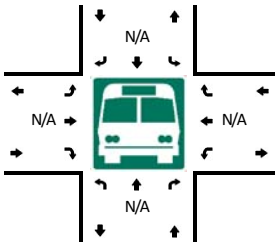
Peak-Hour: 4:15 PM -- 5:15 PM
Peak 15-Min: 4:30 PM -- 4:45 PM

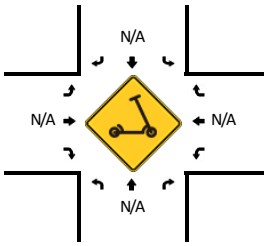












15-Min Count Period Beginning At	Capital Blvd (Northbound)				Capital Blvd (Southbound)				Xerium Technologies Dwy (Eastbound)				Xerium Technologies Dwy (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	403	0	0	0	305	0	0	0	0	4	0	0	0	0	0	712	
4:15 PM	0	439	0	0	0	355	0	0	0	0	9	0	0	0	0	0	803	
4:30 PM	0	435	0	0	0	371	0	0	0	0	7	0	0	0	0	0	813	
4:45 PM	0	432	0	0	0	357	0	0	0	0	1	0	0	0	0	0	790	3118
5:00 PM	0	441	0	0	0	353	0	0	0	0	0	0	0	0	0	0	794	3200
5:15 PM	0	431	0	0	0	363	0	0	0	0	0	0	0	0	0	0	794	3191
5:30 PM	0	464	0	0	0	349	0	0	0	0	1	0	0	0	0	0	814	3192
5:45 PM	0	461	0	0	0	324	0	0	0	0	0	0	0	0	0	0	785	3187

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	1740	0	0	0	1484	0	0	0	0	28	0	0	0	0	0	3252
Heavy Trucks	0	108	0		0	80	0		0	0	0		0	0	0		188
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 2/27/2023 6:58 PM

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

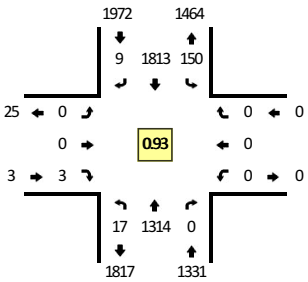
Type of peak hour being reported: Intersection Peak

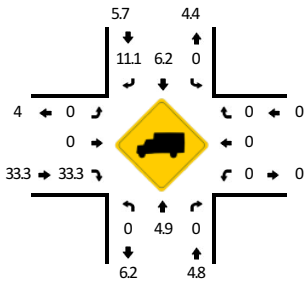
Method for determining peak hour: Total Entering Volume

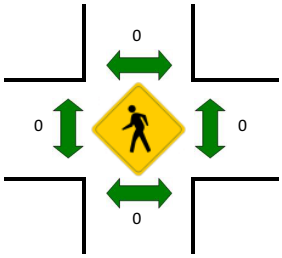
LOCATION: Capital Blvd -- Flex Way
CITY/STATE: Wake Forest, NC

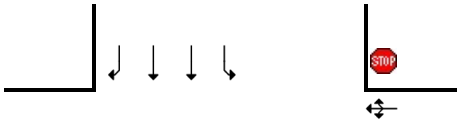
QC JOB #: 16095805
DATE: Wed, Feb 22 2023

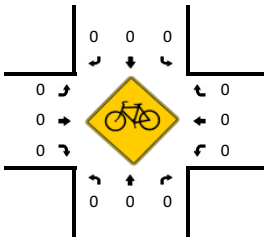
Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:00 AM -- 7:15 AM

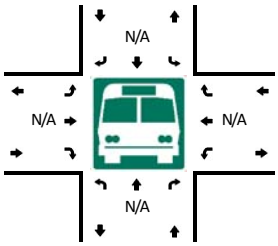


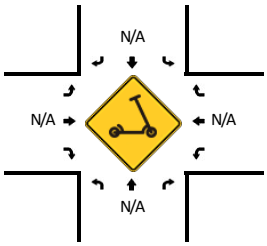












15-Min Count Period Beginning At	Capital Blvd (Northbound)				Capital Blvd (Southbound)				Flex Way (Eastbound)				Flex Way (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	1	334	0	0	0	518	2	37	0	0	0	0	0	0	0	0	892	
7:15 AM	4	289	0	0	0	420	1	45	0	0	2	0	0	0	0	0	761	
7:30 AM	6	345	0	0	0	405	2	30	0	0	1	0	0	0	0	0	789	
7:45 AM	5	346	0	1	0	470	4	38	0	0	0	0	0	0	0	0	864	3306
8:00 AM	7	278	1	0	0	507	4	58	1	0	0	0	0	0	0	0	856	3270
8:15 AM	4	269	0	0	0	380	0	8	0	0	0	0	0	0	0	0	661	3170
8:30 AM	1	255	0	1	0	368	0	6	0	0	0	0	0	0	0	0	631	3012
8:45 AM	2	245	0	0	0	325	0	5	0	0	1	0	0	0	0	0	578	2726

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	4	1336	0	0	0	2072	8	148	0	0	0	0	0	0	0	0	3568
Heavy Trucks	0	72	0		0	88	4		0	0	0		0	0	0		164
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 2/27/2023 6:58 PM

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

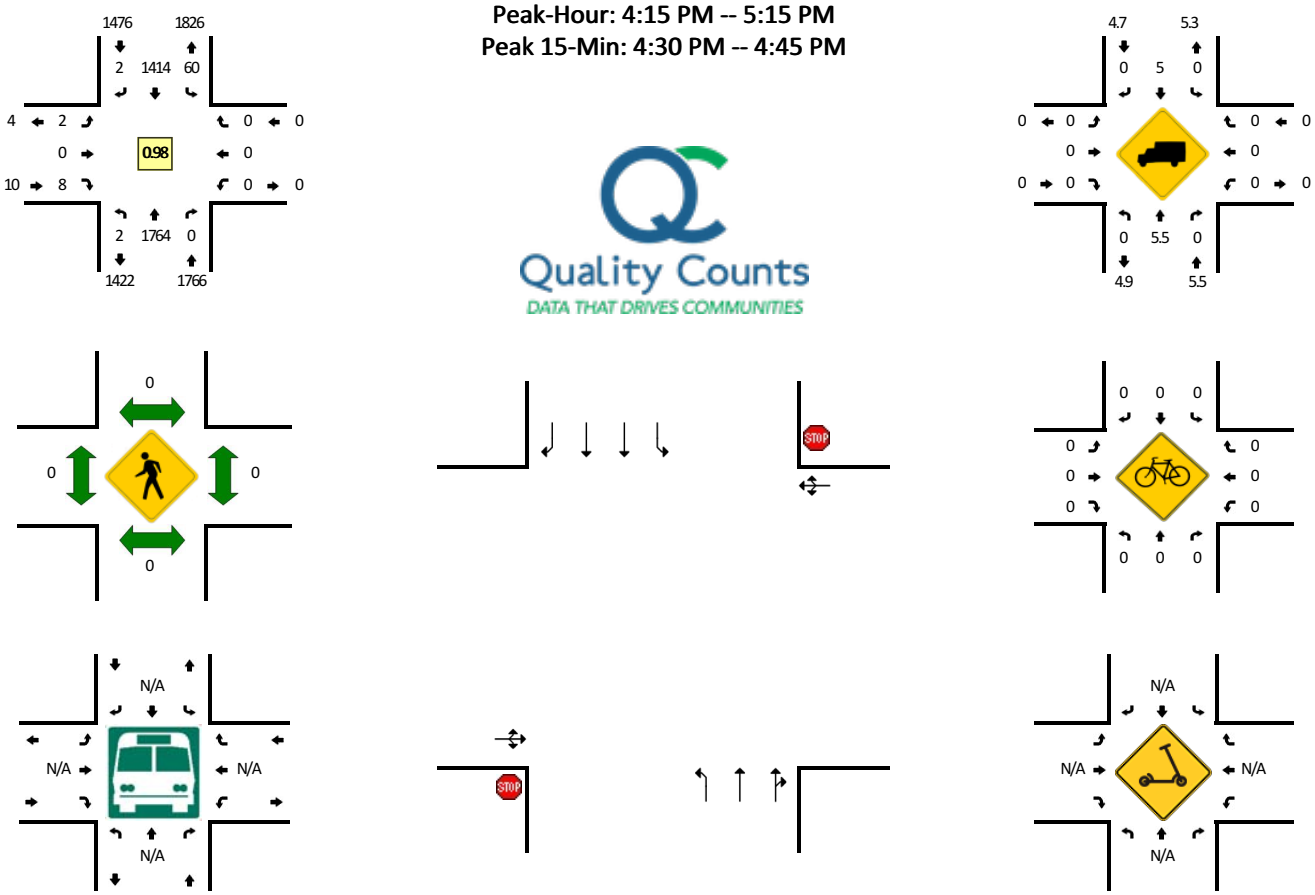
Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: Capital Blvd -- Flex Way
CITY/STATE: Wake Forest, NC

QC JOB #: 16095806
DATE: Wed, Feb 22 2023

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



15-Min Count Period Beginning At	Capital Blvd (Northbound)				Capital Blvd (Southbound)				Flex Way (Eastbound)				Flex Way (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	403	0	1	0	311	0	14	0	0	0	0	0	0	0	0	729	
4:15 PM	1	442	0	0	0	345	1	15	1	0	6	0	0	0	0	0	811	
4:30 PM	1	440	0	0	0	366	1	22	1	0	1	0	0	0	0	0	832	
4:45 PM	0	432	0	0	0	350	0	11	0	0	0	0	0	0	0	0	793	3165
5:00 PM	0	450	0	0	0	353	0	12	0	0	1	0	0	0	0	0	816	3252
5:15 PM	1	434	0	0	0	358	0	9	0	0	0	0	0	0	0	0	802	3243
5:30 PM	0	452	0	1	0	352	1	16	0	0	0	0	0	0	1	0	823	3234
5:45 PM	0	469	0	0	0	318	0	11	0	0	0	0	1	0	1	0	800	3241

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	4	1760	0	0	0	1464	4	88	4	0	4	0	0	0	0	0	3328
Heavy Trucks	0	108	0		0	76	0		0	0	0		0	0	0		184
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 2/27/2023 6:58 PM

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

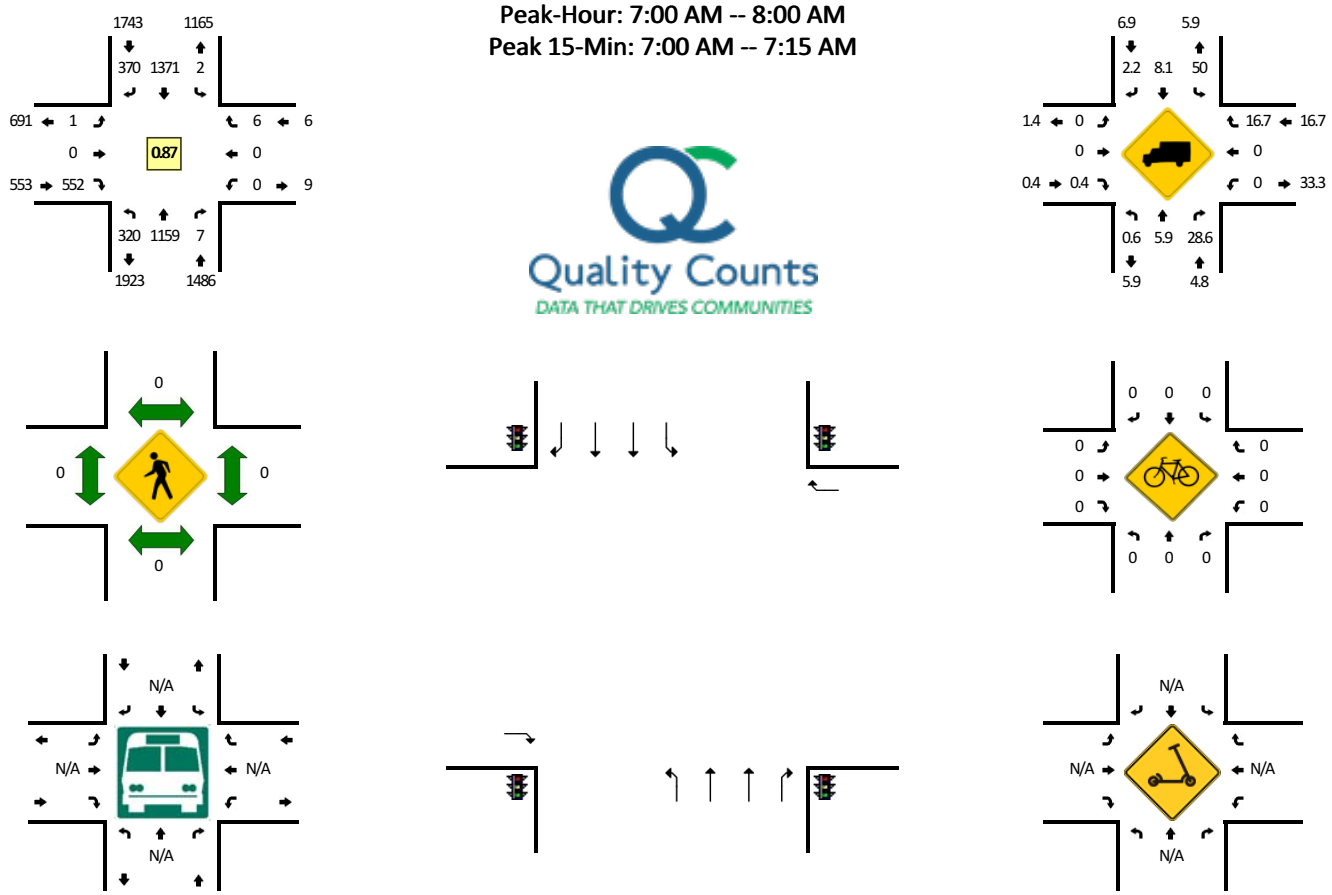
Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: Capital Blvd -- Sunset Dr
CITY/STATE: Youngsville, NC

QC JOB #: 16095807
DATE: Wed, Feb 22 2023

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



15-Min Count Period Beginning At	Capital Blvd (Northbound)				Capital Blvd (Southbound)				Sunset Dr (Eastbound)				Sunset Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	117	272	3	0	1	353	161	0	0	0	176	0	0	0	1	0	1084	
7:15 AM	43	289	1	0	0	323	39	0	0	0	131	0	0	0	2	0	828	
7:30 AM	64	306	3	0	1	326	63	0	0	0	111	0	0	0	0	0	874	
7:45 AM	96	292	0	0	0	369	107	0	0	0	134	1	0	0	3	0	1002	3788
8:00 AM	37	291	9	0	1	394	66	0	0	0	161	0	0	0	5	0	964	3668
8:15 AM	7	252	1	3	2	357	12	1	0	0	20	0	0	0	2	0	657	3497
8:30 AM	5	248	2	1	2	377	6	0	0	0	11	1	0	0	2	0	655	3278
8:45 AM	4	237	6	2	1	311	3	0	0	0	5	0	0	0	1	0	570	2846

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	468	1088	12	0	4	1412	644	0	0	0	704	0	0	0	4	0	4336
Heavy Trucks	0	72	4		4	84	12		0	0	8		0	0	0		184
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 2/27/2023 6:58 PM

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

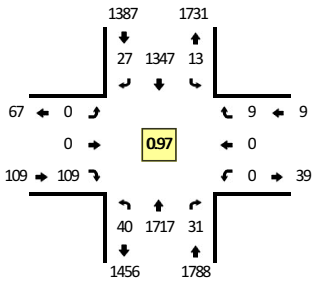
Type of peak hour being reported: Intersection Peak

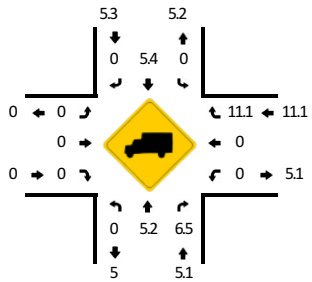
Method for determining peak hour: Total Entering Volume

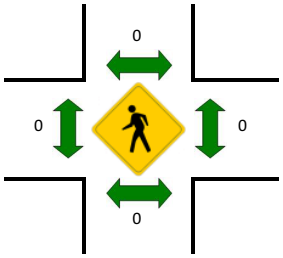
LOCATION: Capital Blvd -- Sunset Dr
CITY/STATE: Youngsville, NC

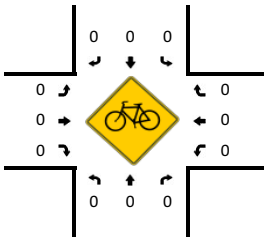
QC JOB #: 16095808
DATE: Wed, Feb 22 2023

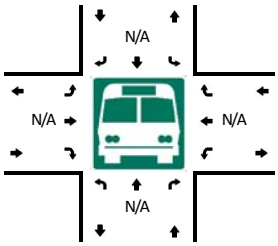
Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 4:30 PM -- 4:45 PM

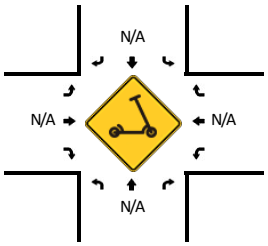












15-Min Count Period Beginning At	Capital Blvd (Northbound)				Capital Blvd (Southbound)				Sunset Dr (Eastbound)				Sunset Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	15	399	6	0	1	282	12	3	0	0	45	0	0	0	1	0	764	
4:15 PM	16	416	6	0	1	305	9	0	0	0	37	0	0	0	4	0	794	
4:30 PM	10	440	10	0	0	341	6	1	0	0	41	0	0	0	3	0	852	
4:45 PM	7	413	9	0	2	329	3	2	0	0	19	0	0	0	1	0	785	3195
5:00 PM	11	440	5	0	4	353	8	1	0	0	25	0	0	0	2	0	849	3280
5:15 PM	12	424	7	0	2	324	10	1	0	0	24	0	0	0	3	0	807	3293
5:30 PM	12	438	4	0	4	335	7	2	0	0	29	0	0	0	3	0	834	3275
5:45 PM	15	435	6	0	1	312	8	0	0	0	21	0	0	0	0	0	798	3288

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	40	1760	40	0	0	1364	24	4	0	0	164	0	0	0	12	0	3408
Heavy Trucks	0	108	4		0	80	0		0	0	0		0	0	0		192
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 2/27/2023 6:58 PM

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

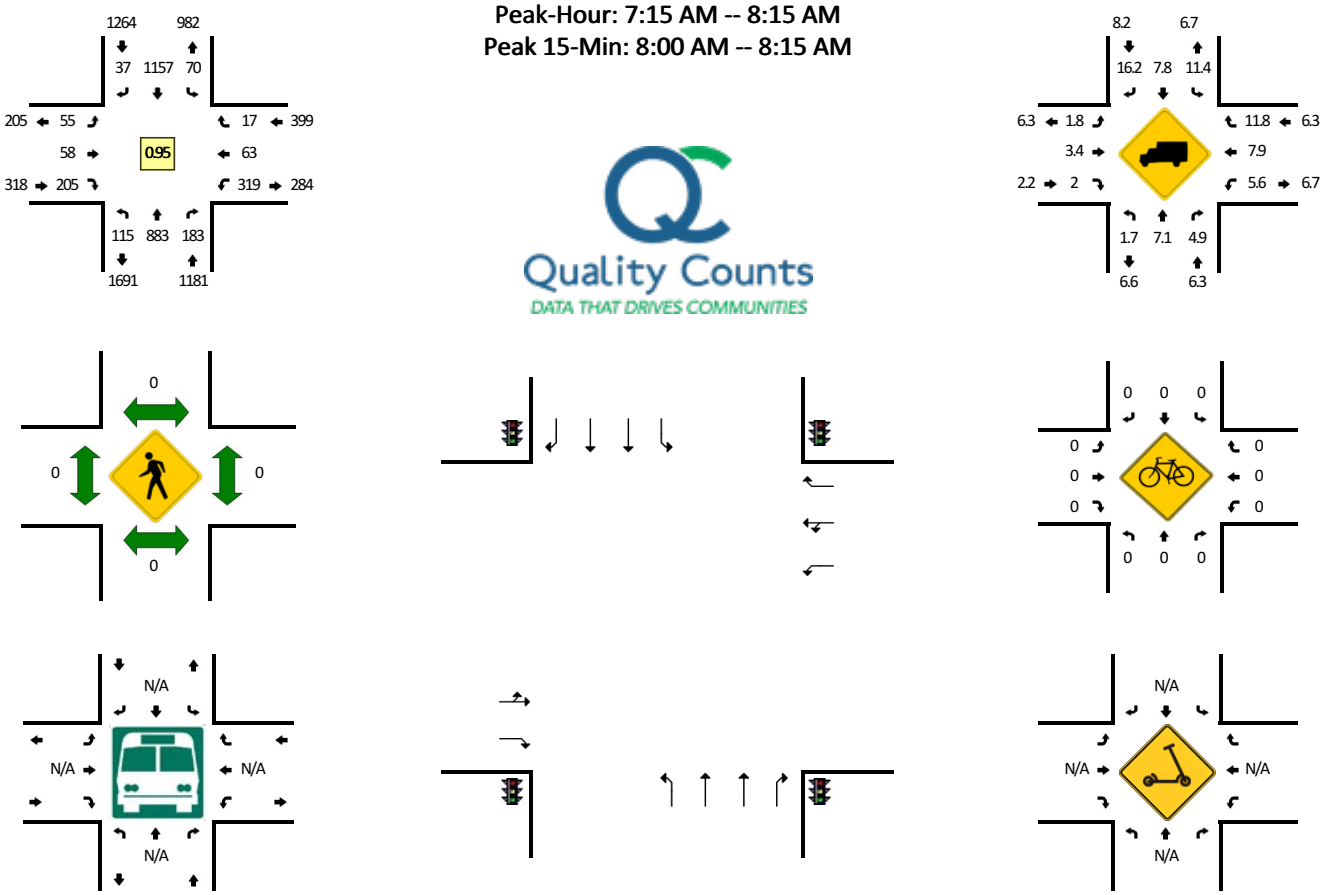
Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: Capital Blvd -- Holden Rd
CITY/STATE: Youngsville, NC

QC JOB #: 16095809
DATE: Wed, Feb 22 2023

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



15-Min Count Period Beginning At	Capital Blvd (Northbound)				Capital Blvd (Southbound)				Holden Rd (Eastbound)				Holden Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	23	207	34	7	5	310	8	3	8	16	62	0	102	11	1	0	797	
7:15 AM	29	222	62	0	6	277	8	6	12	18	36	0	52	12	1	0	741	
7:30 AM	20	237	38	1	13	295	8	9	17	10	47	0	67	16	3	0	781	
7:45 AM	19	216	35	2	9	291	11	4	23	12	63	0	98	19	4	0	806	3125
8:00 AM	37	208	48	7	15	294	10	8	3	18	59	0	102	16	9	0	834	3162
8:15 AM	13	205	25	3	8	276	17	5	11	11	24	0	72	13	7	0	690	3111
8:30 AM	20	208	34	3	7	278	11	6	3	11	45	0	59	12	3	0	700	3030
8:45 AM	18	174	36	3	14	223	7	2	7	10	45	0	50	12	6	0	607	2831

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	148	832	192	28	60	1176	40	32	12	72	236	0	408	64	36	0	3336
Heavy Trucks	0	80	8		12	80	0		0	0	0		20	4	0		204
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 2/27/2023 6:58 PM

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

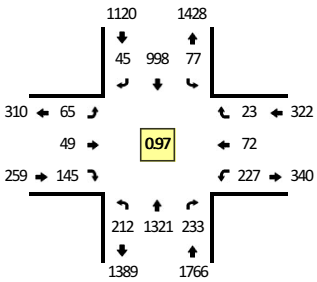
Type of peak hour being reported: Intersection Peak

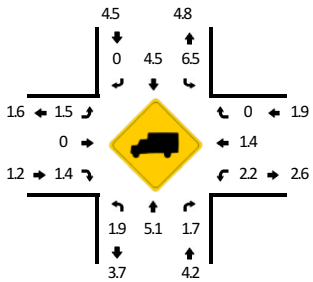
Method for determining peak hour: Total Entering Volume

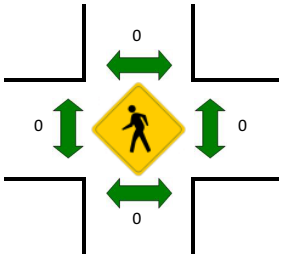
LOCATION: Capital Blvd -- Holden Rd
CITY/STATE: Youngsville, NC

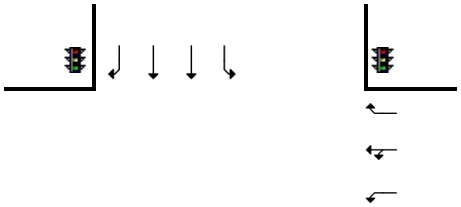
QC JOB #: 16095810
DATE: Wed, Feb 22 2023

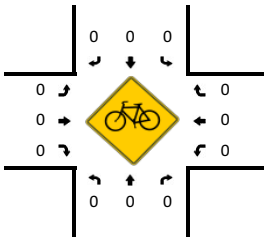
Peak-Hour: 4:45 PM -- 5:45 PM
Peak 15-Min: 5:30 PM -- 5:45 PM

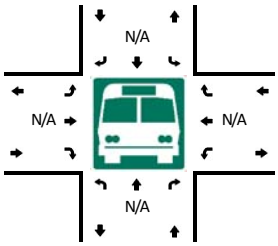


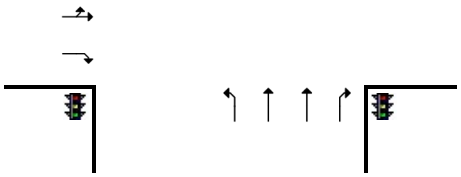


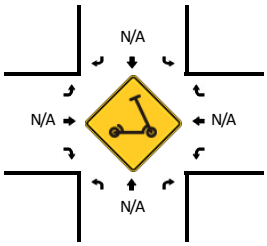












15-Min Count Period Beginning At	Capital Blvd (Northbound)				Capital Blvd (Southbound)				Holden Rd (Eastbound)				Holden Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	44	312	61	3	11	231	8	3	10	18	31	0	37	20	4	0	793	
4:15 PM	38	299	66	6	12	214	13	6	17	10	37	0	63	20	8	0	809	
4:30 PM	47	324	60	5	9	274	17	5	17	11	35	0	47	15	5	0	871	
4:45 PM	36	341	41	3	13	264	11	7	24	12	20	0	49	17	7	0	845	3318
5:00 PM	47	335	53	3	16	271	11	4	14	7	26	0	56	15	6	0	864	3389
5:15 PM	55	317	68	6	16	229	11	6	15	14	46	0	62	19	5	0	869	3449
5:30 PM	55	328	71	7	13	234	12	2	12	16	53	0	60	21	5	0	889	3467
5:45 PM	42	315	63	6	15	240	11	4	18	16	34	0	42	14	9	0	829	3451

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	220	1312	284	28	52	936	48	8	48	64	212	0	240	84	20	0	3556
Heavy Trucks	8	36	8		8	20	0		0	0	8		8	4	0		100
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 2/27/2023 6:58 PM

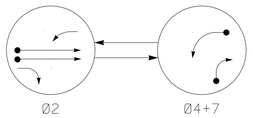
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

APPENDIX C

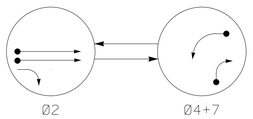
SIGNAL INFORMATION

PROJECT REFERENCE NO.	SHEET NO.
36249.4492	Sig.1.0

DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

DEFAULT PHASING TABLE OF OPERATION

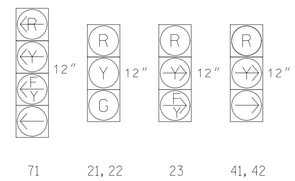
SIGNAL FACE	PHASE Ø2	PHASE Ø4+7	FLASH
21, 22	G	R	Y
23	F Y	R	Y
41, 42	R	→	R
71	F Y	←	Y

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2	PHASE Ø4+7	FLASH
21, 22	G	R	Y
23	F Y	R	Y
41,42	R	→	R
71	R	←	Y

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

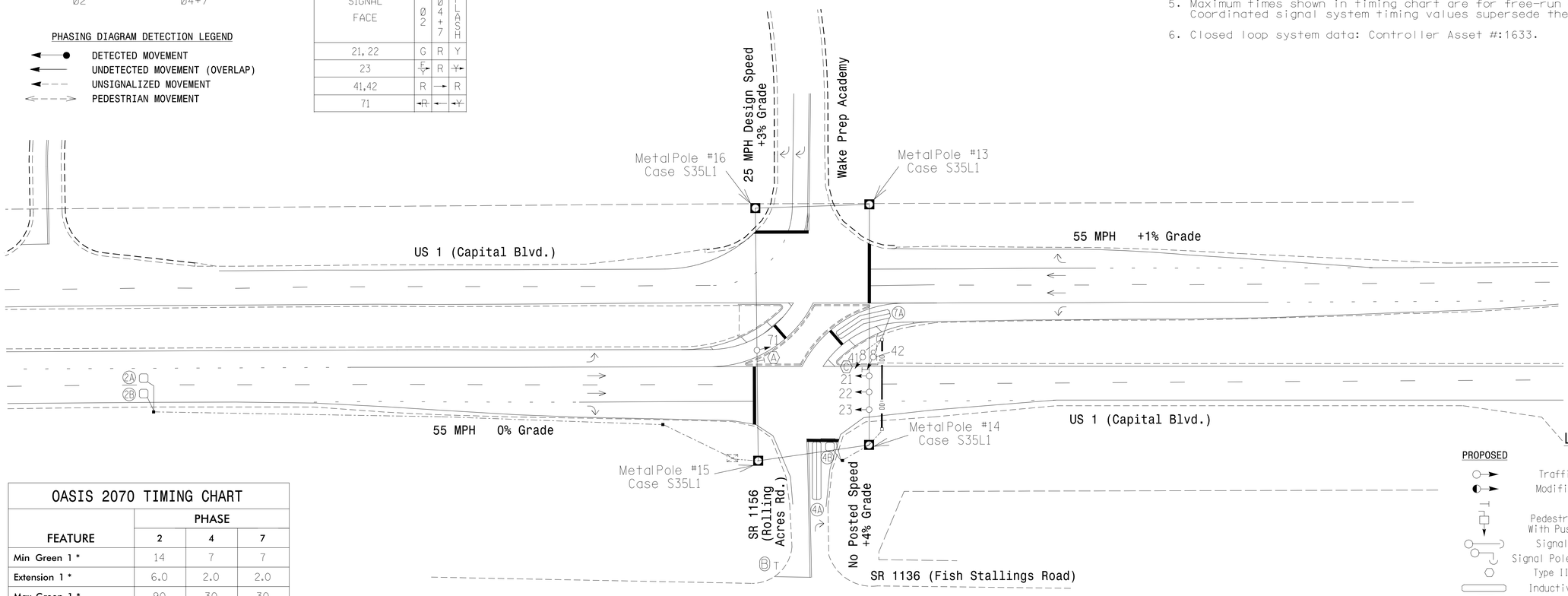
INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X6	420	5	Y	2	Y	Y	-	-	-	-	Y
2B	6X6	420	5	Y	2	Y	Y	-	-	-	-	Y
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	15	-	Y
4B	6X6	0	3	Y	4	Y	Y	-	-	15	-	Y
7A	6X40	0	2-4-2	Y	7	Y	Y	-	-	15*	-	Y

* Disable delay during alternate phasing.

2 Phase
Fully Actuated
US 1 (Capital Blvd.) Closed Loop System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018 and all applicable sections of the latest version of the generic Project Special Provisions. The PSP can be accessed at the following website: http://connect.ncdot.gov/resources/safety/Pages/ITS-Design-Resources.aspx
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Set all detector units to presence mode.
4. The Division Traffic Engineer will determine the hours of use for each phasing plan.
5. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
6. Closed loop system data: Controller Asset #:1633.

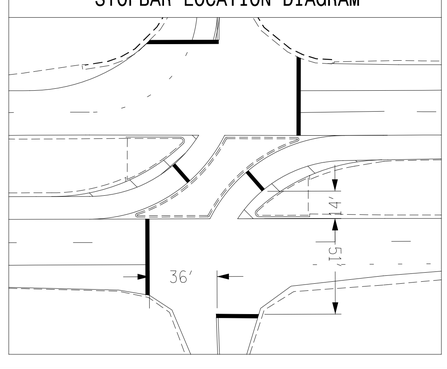


OASIS 2070 TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 7
Min Green 1 *	14	7	7
Extension 1 *	6.0	2.0	2.0
Max Green 1 *	90	30	30
Yellow Clearance	5.2	3.0	3.0
Red Clearance	1.0	2.3	2.3
Walk 1 *	-	-	-
Don't Walk 1	-	-	-
Seconds Per Actuation *	1.5	-	-
Max Variable Initial *	46	-	-
Time Before Reduction *	15	-	-
Time To Reduce *	50	-	-
Minimum Gap	3.4	-	-
Recall Mode	MIN RECALL	-	-
Vehicle Call Memory	YELLOW	-	-
Dual Entry	-	ON	ON
Simultaneous Gap	ON	ON	ON

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

STOPBAR LOCATION DIAGRAM



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Type III Signal Pedestal	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
DD	Directional Drill	N/A
N/A	Right of Way	
	Directional Arrow	
	Metal Strain Pole	
A	"U-TURN YIELD TO RIGHT TURN" Sign (R10-16)	A
B	"STOP" Sign (R1-1)	B
C	No Left Turn Sign (R3-2)	C

NC Dept of Transportation
Division of Highways

Final Drawing Date: 09/01/2022

DocuSigned by:
ITS & Signals Unit

Signal Upgrade

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
919.829.0328

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

US 1 NB (Capital Boulevard)
at
SR 1156 (Rolling Acres Road)

Division 5 Franklin County Youngsville

PLAN DATE: September 2022 REVIEWED BY: L. Dorn
PREPARED BY: M.L. Stygles REVIEWED BY: J. Ma

SCALE 0 50 1"=50'

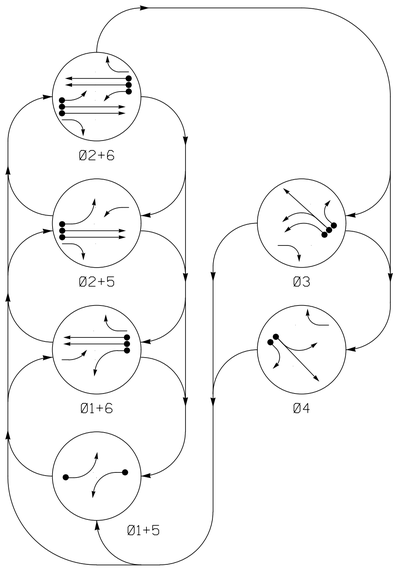
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 046057 ENGINEER MATTHEW L. STYGLES
DocuSigned by:
394B9A1E4A8F4AC...
SIGNATURE 9/1/2022 DATE
SIG. INVENTORY NO. 05-1633

9/1/2022
05163L_202208_p.dgn
mstygles

PROJECT REFERENCE NO.	SHEET NO.
U-6023	Sig 18.0

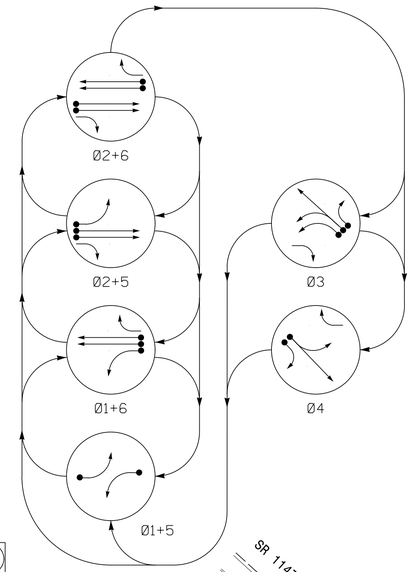
DEFAULT PHASING DIAGRAM



DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø3	Ø4	FLASH
11	↚	↚	F̸Y	F̸Y	R̸	R̸	Y̸
21	R	R	G	G	R	R	Y
22	R	R	G	G	R̸	R	Y
31	R	R	R	R	G	R	R
32	R	R	R	R	G	R	R
41	R	R	R	R	G	R	R
42	R	R	R	R	G	G	R
51	↚	F̸Y	↚	F̸Y	R̸	R̸	Y̸
61	R	G	R	G	R	R	Y
62	R	G	R	G	R	R̸	Y

ALTERNATE PHASING DIAGRAM



ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø3	Ø4	FLASH
11	↚	↚	R̸	R̸	R̸	R̸	Y̸
21	R	R	G	G	R	R	Y
22	R	R	G	G	R̸	R	Y
31	R	R	R	R	G	R	R
32	R	R	R	R	G	R	R
41	R	R	R	R	G	R	R
42	R	R	R	R	R	G	R
51	↚	R̸	↚	R̸	R̸	R̸	Y̸
61	R	G	R	G	R	R	Y
62	R	G	R	G	R	R̸	Y

DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X60	0	2-4-2	-	1	Yes	-	15*	-	N	-	X
					6#	Yes	-	3	-	G	-	X
2A/S3	6X6	420	EXIST	-	2	Yes	-	-	X	N	X	X
2A/S4	6X6	420	EXIST	-	2	Yes	-	-	X	N	X	X
3A	6X40	0	2-4-2	-	3	Yes	-	3	-	N	-	X
3B	6X40	0	2-4-2	-	3	Yes	-	3	-	N	-	X
3C	6X15	+5	EXIST	-	3	Yes	-	15	-	N	-	X
4A	6X40	0	2-4-2	-	4	Yes	-	-	-	N	-	X
4B	6X25	+5	2-4-2	-	4	Yes	-	15	-	N	-	X
5A	6X60	0	2-4-2	-	5	Yes	-	15*	-	N	-	X
					2#	Yes	-	3	-	G	-	X
6A	6X6	420	EXIST	-	6	Yes	-	-	X	N	-	X
6B	6X6	420	EXIST	-	6	Yes	-	-	X	N	-	X
S1	6X6	+300	EXIST	-	SYS	No	-	-	-	N	X	X
S2	6X6	+300	EXIST	-	SYS	No	-	-	-	N	X	X

* Disable Delay during Alternate Phasing operation.
\# Disable Phase call for loop during Alternate Phasing operation.

6 PHASE FULLY ACTUATED (WAKE FOREST SIGNAL SYSTEM)

NOTES

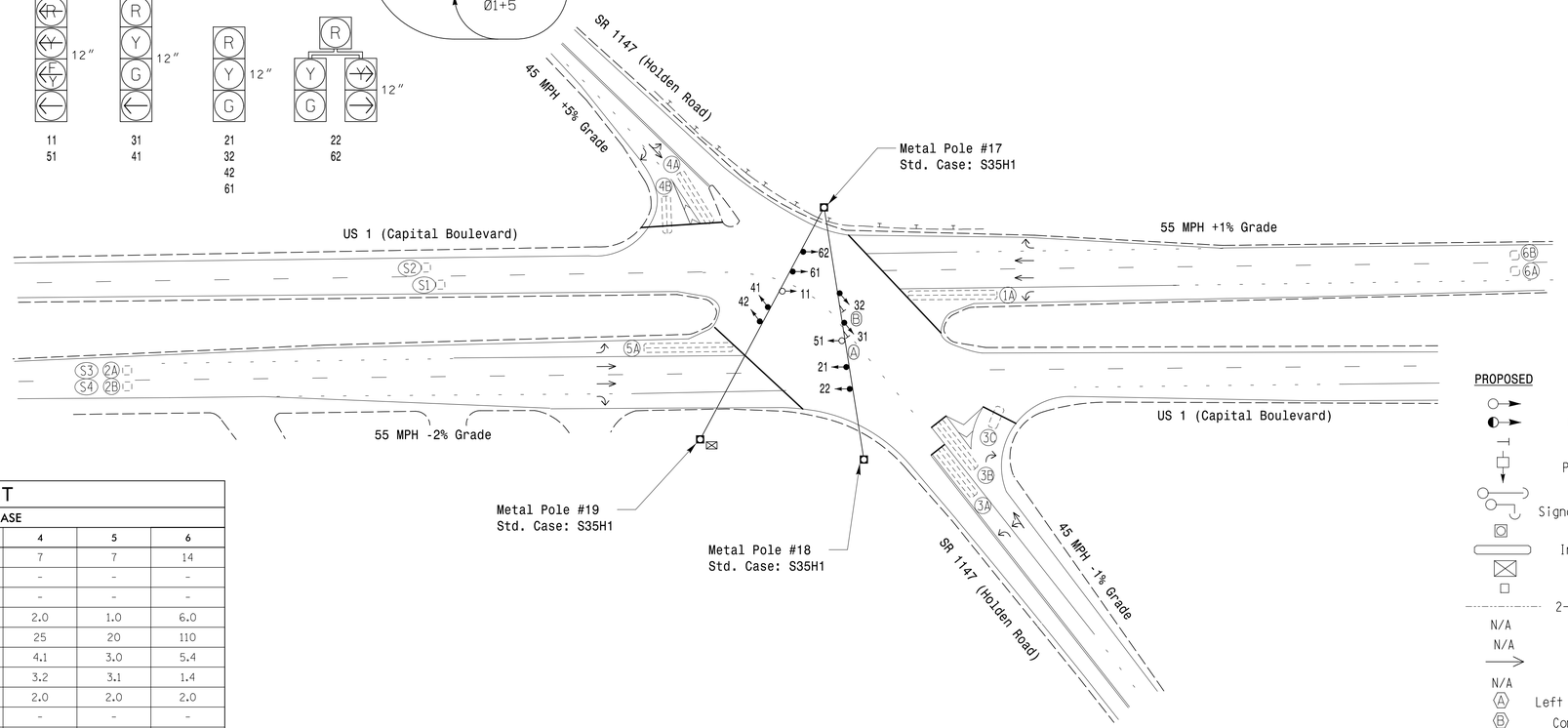
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. The order of phase 3 and phase 4 may be reversed.
5. Renumber existing signal heads 22, 23, 62, and 63 as 21, 22, 62, and 63, respectively.
6. Set all detector units to presence mode.
7. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
8. Pavement markings are existing.
9. The Division (Town) Traffic Engineer will determine the hours of use for each phasing plan.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
11. Loop data based on previous plan and/or field observations.
12. Install new cabinet on the existing cabinet foundation.

SIGNAL FACE I.D.

All Heads L.E.D.

PHASING DIAGRAM DETECTION LEGEND

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



TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6
Min Green *	7	14	7	7	7	14
Walk *	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-
Veh. Extension *	1.0	6.0	2.0	2.0	1.0	6.0
Max 1 *	20	110	35	25	20	110
Yellow	3.0	5.4	4.6	4.1	3.0	5.4
Red Clear	2.8	1.4	3.0	3.2	3.1	1.4
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0
Actuations B4 Add *	-	-	-	-	-	-
Seconds /Actuation *	-	1.5	-	-	-	1.5
Max Initial *	-	46	-	-	-	46
Time Before Reduction *	-	15	-	-	-	15
Time To Reduce *	-	30	-	-	-	30
Minimum Gap	-	3.4	-	-	-	3.4
Locking Detector	-	X	-	-	-	X
Recall Position	-	VEH RECALL	-	-	-	VEH RECALL
Dual Entry	-	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X	X

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

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Metal Strain Pole	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
N/A	Guardrail	
	Directional Arrow	
N/A	Curb Ramp	
A	Left Arrow "ONLY" Sign (R3-5L)	A
B	Combined Through and Left Arrow Sign (R3-6L)	B

Signal Upgrade

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED IN THE OFFICE OF:
Kimley»Horn
NC License #F-0102
421 Fayetteville Street, Suite 600
Raleigh, NC 27601
(919) 677-2000

Prepared For: Transportation Mobility and Safety Division, Signal Design Section, Department of Transportation, State of North Carolina
750 N.Greenfield Pkwy,Garner,NC 27529

SCALE 0 50 1"=50'

US 1 (Capital Boulevard) at SR 1147 (Holden Road)

Division 5 Franklin County Youngsville

PLAN DATE: February 2022 REVIEWED BY: CF Davis
PREPARED BY: MC Burke REVIEWED BY: SL Phillips

REVISIONS	INIT.	DATE

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 032607 ENGINEER STACIE L. PHILLIPS

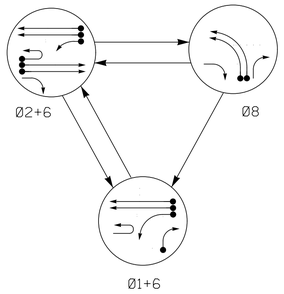
DocuSigned by: 7/11/2022
SIGNATURE DATE

SIG. INVENTORY NO. 05-1703

PROJECT REFERENCE NO.	SHEET NO.
U-6023	Sig 47.0

3 PHASE FULLY ACTUATED (WAKE FOREST SIGNAL SYSTEM)

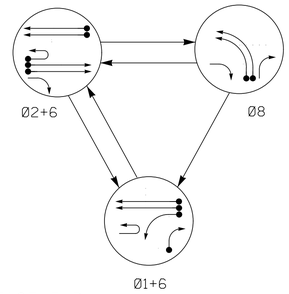
DEFAULT PHASING DIAGRAM



DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+6	Ø2+6	Ø8	FLASH
11	←	F Y	R	Y
21	F Y	F Y	R	Y
22	R	G	R	Y
23	R	G	R →	Y
61,62	G	G	R	Y
81,82	R	R	←	R
83	F Y →	R	F Y →	R

ALTERNATE PHASING DIAGRAM



ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+6	Ø2+6	Ø8	FLASH
11	←	R	R	Y
21	F Y	F Y	R	Y
22	R	G	R	Y
23	R	G	R →	Y
61,62	G	G	R	Y
81,82	R	R	←	R
83	F Y →	R	F Y →	R

DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	-	1	Yes	-	15*	-	N	-	X
					6#	Yes	-	3	-	G	-	X
1B	6X40	0	2-4-2	-	1	Yes	-	15	-	N	-	X
2A/S1	6X6	420	EXIST	-	2	Yes	-	-	X	N	X	X
2B/S2	6X6	420	EXIST	-	2	Yes	-	-	X	N	X	X
2C	6X40	0	2-4-2	-	2	Yes	-	3	-	G	-	X
6A/S3	6X6	420	EXIST	-	6	Yes	-	-	X	N	X	X
6B/S4	6X6	420	EXIST	-	6	Yes	-	-	X	N	X	X
8A	6X40	0	2-4-2	-	8	Yes	-	3	-	N	-	X
8B	6X40	0	2-4-2	-	8	Yes	-	-	-	N	-	X

* Disable Delay during Alternate Phasing operation.
\# Disable Phase call for loop during Alternate Phasing operation.

NOTES

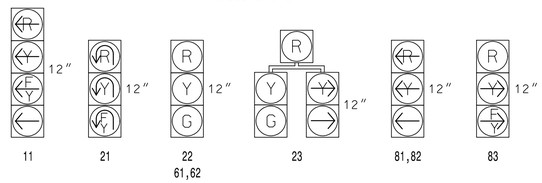
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 may be lagged.
4. Set all detector units to presence mode.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. Remove existing "Right Turn on Red Must Yield to U-Turn" (R10-30) sign and Left Arrow "ONLY" (R3-5L) sign.
7. Pavement markings are existing.
8. The Division (Town) Traffic Engineer will determine the hours of use for each phasing plan.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
10. Existing loop 8C has been relabeled to 1B.
11. Install new cabinet on the existing cabinet foundation.
12. Modify signal head 21 as shown.

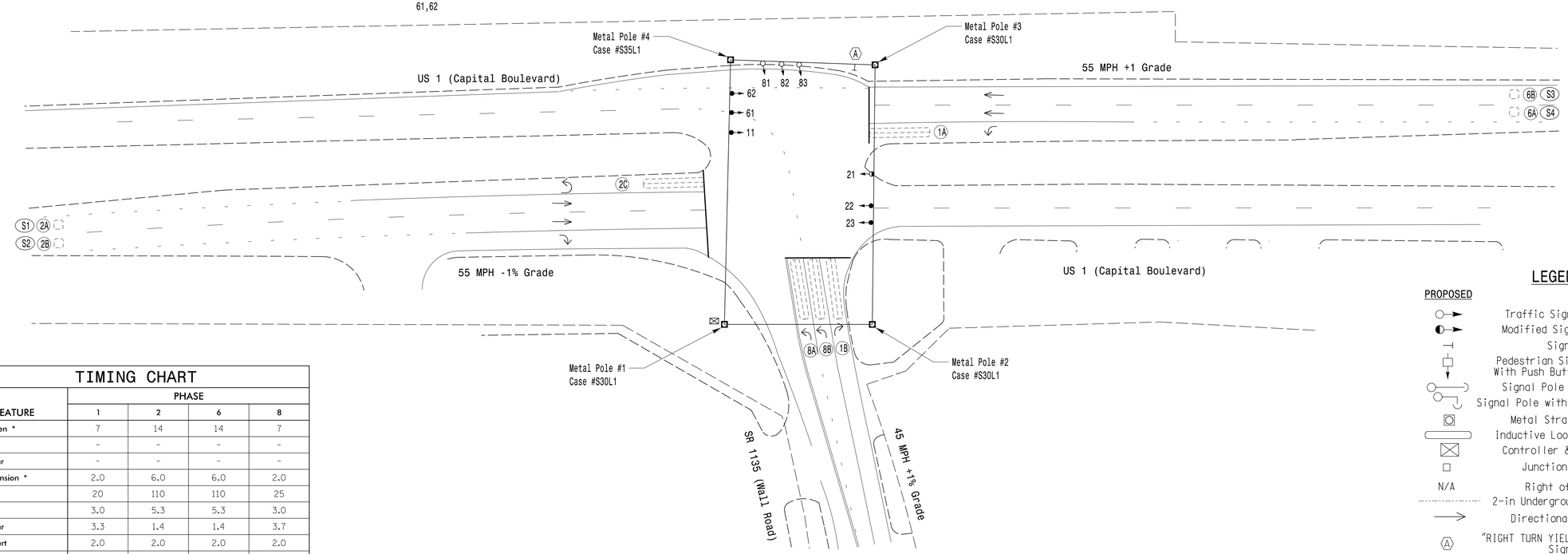
PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.

All Heads L.E.D.





LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Metal Strain Pole	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
N/A	Right of Way	
	2-in Underground Conduit	
	Directional Arrow	
	"RIGHT TURN YIELD TO U-TURN" Sign	

TIMING CHART

FEATURE	PHASE 1	2	6	8
Min Green *	7	14	14	7
Walk *	-	-	-	-
Ped Clear	-	-	-	-
Veh. Extension *	2.0	6.0	6.0	2.0
Max 1 *	20	110	110	25
Yellow	3.0	5.3	5.3	3.0
Red Clear	3.3	1.4	1.4	3.7
Red Revert	2.0	2.0	2.0	2.0
Actuations B4 Add *	-	-	-	-
Seconds /Actuation *	-	1.5	1.5	-
Max Initial *	-	46	46	-
Time Before Reduction *	-	15	15	-
Time To Reduce *	-	30	30	-
Minimum Gap	-	3.4	3.4	-
Locking Detector	-	X	X	-
Recall Position	-	VEH RECALL	VEH RECALL	-
Dual Entry	-	-	-	-
Simultaneous Gap	X	X	X	X

* 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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED IN THE OFFICE OF:
Kimley»Horn
NC License #F-0102
421 Fayetteville Street, Suite 600
Raleigh, NC 27601
(919) 677-2000

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

SCALE 1"=40' (0 – 40)

US 1 (Capital Boulevard) at SR 1135 (Wall Road)

Division 5 Franklin County Wake Forest

PLAN DATE: February 2022 REVIEWED BY: CF Davis
PREPARED BY: MC Burke REVIEWED BY: SL Phillips

REVISIONS	INIT.	DATE

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 032607 ENGINEER SYLACIE L. PHILLIPS

DocuSigned by: 7/11/2022
DESIGN ENGINEER SIGNATURE DATE

SIG. INVENTORY NO. 05-2408

RKA Signal Timing Data Collection

Intersection: US 1 @ Wall (05-2408)

Timing Plans

Event #	Run Time		Plan #	Offset #
Event 1	1/1-12/31 0630-0915	M-F	1	1
Event 2	0915-1130	M-F	6	1
Event 3	1130-1500	M-F	2	1
Event 4	1500-1845	M-F	3	1
Event 5	1845-2100	M-F	6	1
Event 10	0730-1100	Sat	4	1
Event 11	1100-1830	Sat	5	1
Event 12	1830-2000	Sat	4	1
Event 15	0800-1100	Sun	4	1
Event 16	1100-1800	Sun	5	1
17	Splits 1800-2000	Sun	4	1

2011 plan

Phase #	Cycle Length	Offset	Phase Sequence	Timing splits - Phase #								
				1	2	3	4	5	6	7	8	9
Plan 1	150	142		20	105				125		25	
Plan 2	140	126		20	95				115		25	
Plan 3	150	113		15	110				125		25	
Plan 4	110	36		20	65				85		25	
Plan 5	180	82		20	130				150		30	
Plan 6	120	117		20	75				95		25	
Plan 7												
Plan 8												
Plan 9												
Plan 10												

11/22 - 28 Thur FREE

RKA Signal Timing Data Collection

Intersection: US 1 @ Holden Road (05-1703).

Timing Plans

Event #	Run Time	Plan #	Offset #
Event 1			
Event 2	6:30-9:00 1/1 - 12/31 M-F	1	1
Event 3	15:00 - 18:45 1/1 - 12/31 M-F	2	1
Event 4	9:00-15:00 1/1-12/31 M-F	3	1
Event 5	9:00 - 19:00 1/1-12/31 S	3	1
Event 6			
Event 7			
Event 8			
Event 9			
Event 10			

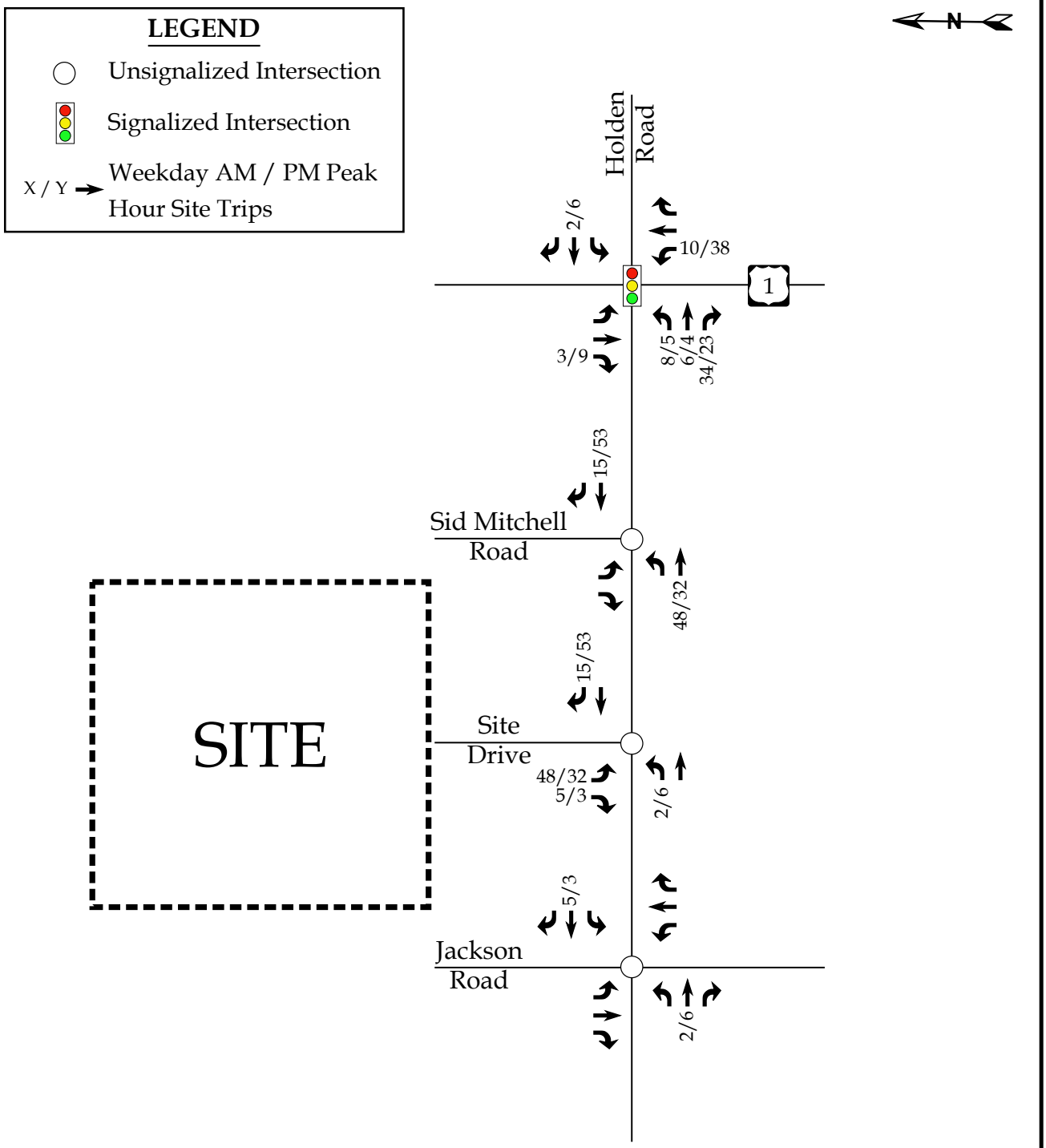
Plan 2007

Splits

Phase #	Cycle Length	Offset	Phase Sequence	Timing splits - Phase #								
				1	2	3	4	5	6	7	8	9
Plan 1	120	1		15	50	35	20	15	50			
Plan 2	120	89		15	55	30	20	15	55			
Plan 3	100	92		15	45	25	15	15	45			
Plan 4												
Plan 5												
Plan 6												
Plan 7												
Plan 8												
Plan 9												
Plan 10												

APPENDIX D

ADJACENT DEVELOPMENT INFORMATION



Moving forward. RKA RAMEY KEMP ASSOCIATES	Sorrell Oaks Franklin County, NC	Site Trip Assignment Scale: Not to Scale | Figure 9

APPENDIX E

CAPACITY ANALYSIS CALCULATIONS

CAPITAL BOULEVARD

&

HOLDEN ROAD

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	60	56	208	319	58	9	10	91	885	169	22	33
Future Volume (vph)	60	56	208	319	58	9	10	91	885	169	22	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		5%			-1%				-2%			
Storage Length (ft)	0		50	250		50		250		225		300
Storage Lanes	0		1	1		1		1		1		1
Taper Length (ft)	100			100				100				100
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Frt			0.850			0.850				0.850		
Flt Protected		0.975		0.950	0.966			0.950				0.950
Satd. Flow (prot)	0	1771	1544	1690	1718	1591	0	1787	3575	1599	0	1761
Flt Permitted		0.975		0.950	0.966			0.093				0.133
Satd. Flow (perm)	0	1771	1544	1690	1718	1591	0	175	3575	1599	0	247
Right Turn on Red			No			No				No		
Satd. Flow (RTOR)												
Link Speed (mph)		45			45				55			
Link Distance (ft)		1089			1109				1415			
Travel Time (s)		16.5			16.8				17.5			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	67	62	231	354	64	10	11	101	983	188	24	37
Shared Lane Traffic (%)				41%								
Lane Group Flow (vph)	0	129	231	209	209	10	0	112	983	188	0	61
Turn Type	Split	NA	Perm	Split	NA	Perm	D.P+P	D.P+P	NA	pm+ov	D.P+P	D.P+P
Protected Phases	4	4		3	3		5	5	2	3	1	1
Permitted Phases			4			3	6	6		2	2	2
Detector Phase	4	4	4	3	3	3	5	5	2	3	1	1
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	14.0	7.0	7.0	7.0
Minimum Split (s)	14.3	14.3	14.3	14.6	14.6	14.6	13.1	13.1	20.8	14.6	12.8	12.8
Total Split (s)	20.0	20.0	20.0	35.0	35.0	35.0	15.0	15.0	50.0	35.0	15.0	15.0
Total Split (%)	16.7%	16.7%	16.7%	29.2%	29.2%	29.2%	12.5%	12.5%	41.7%	29.2%	12.5%	12.5%
Maximum Green (s)	12.7	12.7	12.7	27.4	27.4	27.4	8.9	8.9	43.2	27.4	9.2	9.2
Yellow Time (s)	4.1	4.1	4.1	4.6	4.6	4.6	3.0	3.0	5.4	4.6	3.0	3.0
All-Red Time (s)	3.2	3.2	3.2	3.0	3.0	3.0	3.1	3.1	1.4	3.0	2.8	2.8
Lost Time Adjust (s)		-2.3	-2.3	-2.6	-2.6	-2.6		-1.1	-1.8	-2.6		-0.8
Total Lost Time (s)		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0		5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	1.0	6.0	2.0	1.0	1.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	1.0	3.4	2.0	1.0	1.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	None	None	None	C-Max	None	None	None
Act Effct Green (s)		24.4	24.4	21.8	21.8	21.8		53.8	47.6	70.4		54.8
Actuated g/C Ratio		0.20	0.20	0.18	0.18	0.18		0.45	0.40	0.59		0.46
v/c Ratio		0.36	0.74	0.68	0.67	0.03		0.57	0.69	0.20		0.27
Control Delay		46.8	61.4	56.8	55.9	37.3		47.4	33.8	7.0		27.1
Queue Delay		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0

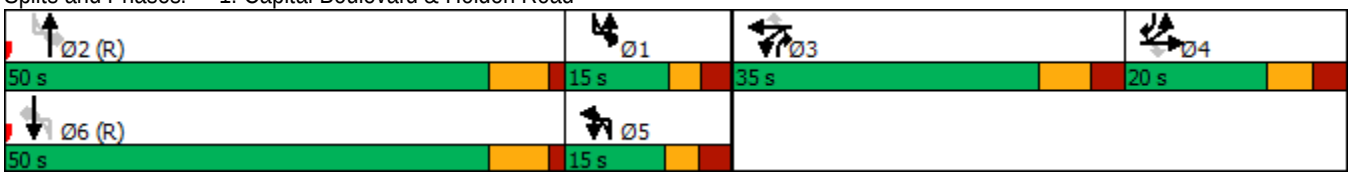
Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1173	35
Future Volume (vph)	1173	35
Ideal Flow (vphpl)	1900	1900
Grade (%)	1%	
Storage Length (ft)		100
Storage Lanes		1
Taper Length (ft)		
Lane Util. Factor	0.95	1.00
Frt		0.850
Flt Protected		
Satd. Flow (prot)	3522	1575
Flt Permitted		
Satd. Flow (perm)	3522	1575
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	55	
Link Distance (ft)	1323	
Travel Time (s)	16.4	
Peak Hour Factor	0.90	0.90
Adj. Flow (vph)	1303	39
Shared Lane Traffic (%)		
Lane Group Flow (vph)	1303	39
Turn Type	NA	pm+ov
Protected Phases	6	4
Permitted Phases		6
Detector Phase	6	4
Switch Phase		
Minimum Initial (s)	14.0	7.0
Minimum Split (s)	20.8	14.3
Total Split (s)	50.0	20.0
Total Split (%)	41.7%	16.7%
Maximum Green (s)	43.2	12.7
Yellow Time (s)	5.4	4.1
All-Red Time (s)	1.4	3.2
Lost Time Adjust (s)	-1.8	-2.3
Total Lost Time (s)	5.0	5.0
Lead/Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes
Vehicle Extension (s)	6.0	2.0
Minimum Gap (s)	3.4	2.0
Time Before Reduce (s)	15.0	0.0
Time To Reduce (s)	30.0	0.0
Recall Mode	C-Max	None
Act Effct Green (s)	45.0	74.4
Actuated g/C Ratio	0.38	0.62
v/c Ratio	0.99	0.04
Control Delay	59.4	10.8
Queue Delay	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Total Delay		46.8	61.4	56.8	55.9	37.3		47.4	33.8	7.0		27.1
LOS		D	E	E	E	D		D	C	A		C
Approach Delay		56.2			55.9				31.1			
Approach LOS		E			E				C			
Queue Length 50th (ft)		86	168	161	160	7		47	344	43		25
Queue Length 95th (ft)		160	#366	231	230	21		89	422	34		48
Internal Link Dist (ft)		1009			1029				1335			
Turn Bay Length (ft)			50	250		50		250		225		300
Base Capacity (vph)		360	314	422	429	397		214	1418	1047		241
Starvation Cap Reductn		0	0	0	0	0		0	0	0		0
Spillback Cap Reductn		0	0	0	0	0		0	0	0		0
Storage Cap Reductn		0	0	0	0	0		0	0	0		0
Reduced v/c Ratio		0.36	0.74	0.50	0.49	0.03		0.52	0.69	0.18		0.25

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 1 (1%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 47.1 Intersection LOS: D
Intersection Capacity Utilization 78.2% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Capital Boulevard & Holden Road



Lane Group	SBT	SBR
Total Delay	59.4	10.8
LOS	E	B
Approach Delay	56.6	
Approach LOS	E	
Queue Length 50th (ft)	521	11
Queue Length 95th (ft)	#682	30
Internal Link Dist (ft)	1243	
Turn Bay Length (ft)		100
Base Capacity (vph)	1320	976
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.99	0.04

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	65	49	145	227	72	23	19	193	1321	233	19	58
Future Volume (vph)	65	49	145	227	72	23	19	193	1321	233	19	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		5%			-1%				-2%			
Storage Length (ft)	0		50	250		50		250		225		300
Storage Lanes	0		1	1		1		1		1		1
Taper Length (ft)	100			100				100				100
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Frt			0.850			0.850				0.850		
Flt Protected		0.972		0.950	0.974			0.950				0.950
Satd. Flow (prot)	0	1765	1544	1690	1732	1591	0	1787	3575	1599	0	1761
Flt Permitted		0.972		0.950	0.974			0.123				0.073
Satd. Flow (perm)	0	1765	1544	1690	1732	1591	0	231	3575	1599	0	135
Right Turn on Red			No			No				No		
Satd. Flow (RTOR)												
Link Speed (mph)		45			45				55			
Link Distance (ft)		1089			1109				1415			
Travel Time (s)		16.5			16.8				17.5			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	72	54	161	252	80	26	21	214	1468	259	21	64
Shared Lane Traffic (%)				35%								
Lane Group Flow (vph)	0	126	161	164	168	26	0	235	1468	259	0	85
Turn Type	Split	NA	Perm	Split	NA	Perm	D.P+P	D.P+P	NA	pm+ov	D.P+P	D.P+P
Protected Phases	4	4		3	3		5	5	2	3	1	1
Permitted Phases			4			3	6	6		2	2	2
Detector Phase	4	4	4	3	3	3	5	5	2	3	1	1
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	14.0	7.0	7.0	7.0
Minimum Split (s)	14.3	14.3	14.3	14.6	14.6	14.6	13.1	13.1	20.8	14.6	12.8	12.8
Total Split (s)	20.0	20.0	20.0	30.0	30.0	30.0	15.0	15.0	55.0	30.0	15.0	15.0
Total Split (%)	16.7%	16.7%	16.7%	25.0%	25.0%	25.0%	12.5%	12.5%	45.8%	25.0%	12.5%	12.5%
Maximum Green (s)	12.7	12.7	12.7	22.4	22.4	22.4	8.9	8.9	48.2	22.4	9.2	9.2
Yellow Time (s)	4.1	4.1	4.1	4.6	4.6	4.6	3.0	3.0	5.4	4.6	3.0	3.0
All-Red Time (s)	3.2	3.2	3.2	3.0	3.0	3.0	3.1	3.1	1.4	3.0	2.8	2.8
Lost Time Adjust (s)		-2.3	-2.3	-2.6	-2.6	-2.6		-1.1	-1.8	-2.6		-0.8
Total Lost Time (s)		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0		5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	1.0	6.0	2.0	1.0	1.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	1.0	3.4	2.0	1.0	1.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	None	None	None	C-Max	None	None	None
Act Effct Green (s)		17.3	17.3	18.6	18.6	18.6		64.2	57.2	76.7		65.2
Actuated g/C Ratio		0.14	0.14	0.16	0.16	0.16		0.54	0.48	0.64		0.54
v/c Ratio		0.50	0.73	0.63	0.63	0.11		0.93	0.86	0.25		0.42
Control Delay		54.7	68.4	57.6	57.4	42.1		75.1	38.3	7.1		39.0
Queue Delay		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0

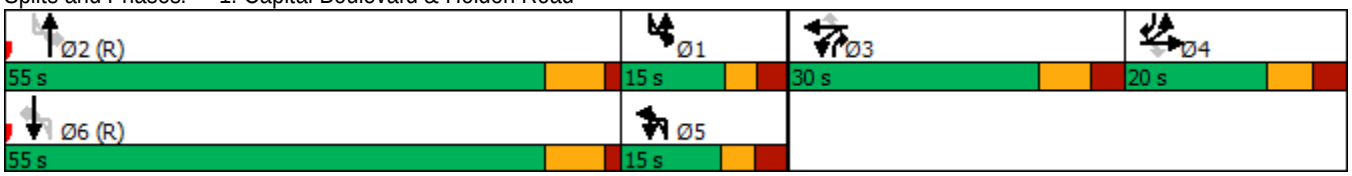
Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	998	45
Future Volume (vph)	998	45
Ideal Flow (vphpl)	1900	1900
Grade (%)	1%	
Storage Length (ft)		100
Storage Lanes		1
Taper Length (ft)		
Lane Util. Factor	0.95	1.00
Frt		0.850
Flt Protected		
Satd. Flow (prot)	3522	1575
Flt Permitted		
Satd. Flow (perm)	3522	1575
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	55	
Link Distance (ft)	1323	
Travel Time (s)	16.4	
Peak Hour Factor	0.90	0.90
Adj. Flow (vph)	1109	50
Shared Lane Traffic (%)		
Lane Group Flow (vph)	1109	50
Turn Type	NA	pm+ov
Protected Phases	6	4
Permitted Phases		6
Detector Phase	6	4
Switch Phase		
Minimum Initial (s)	14.0	7.0
Minimum Split (s)	20.8	14.3
Total Split (s)	55.0	20.0
Total Split (%)	45.8%	16.7%
Maximum Green (s)	48.2	12.7
Yellow Time (s)	5.4	4.1
All-Red Time (s)	1.4	3.2
Lost Time Adjust (s)	-1.8	-2.3
Total Lost Time (s)	5.0	5.0
Lead/Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes
Vehicle Extension (s)	6.0	2.0
Minimum Gap (s)	3.4	2.0
Time Before Reduce (s)	15.0	0.0
Time To Reduce (s)	30.0	0.0
Recall Mode	C-Max	None
Act Effct Green (s)	54.2	76.4
Actuated g/C Ratio	0.45	0.64
v/c Ratio	0.70	0.05
Control Delay	30.2	9.6
Queue Delay	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Total Delay		54.7	68.4	57.6	57.4	42.1		75.1	38.3	7.1		39.0
LOS		D	E	E	E	D		E	D	A		D
Approach Delay		62.4			56.3				38.6			
Approach LOS		E			E				D			
Queue Length 50th (ft)		88	117	126	129	18		103	574	55		30
Queue Length 95th (ft)		158	#242	192	196	42		#260	#741	79		68
Internal Link Dist (ft)		1009			1029				1335			
Turn Bay Length (ft)			50	250		50		250		225		300
Base Capacity (vph)		257	225	352	360	331		253	1702	1108		208
Starvation Cap Reductn		0	0	0	0	0		0	0	0		0
Spillback Cap Reductn		0	0	0	0	0		0	0	0		0
Storage Cap Reductn		0	0	0	0	0		0	0	0		0
Reduced v/c Ratio		0.49	0.72	0.47	0.47	0.08		0.93	0.86	0.23		0.41

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 89 (74%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 39.2 Intersection LOS: D
Intersection Capacity Utilization 73.2% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Capital Boulevard & Holden Road



Lane Group	SBT	SBR
Total Delay	30.2	9.6
LOS	C	A
Approach Delay	30.0	
Approach LOS	C	
Queue Length 50th (ft)	374	14
Queue Length 95th (ft)	463	34
Internal Link Dist (ft)	1243	
Turn Bay Length (ft)		100
Base Capacity (vph)	1589	992
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.70	0.05

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	82	75	290	392	73	11	12	122	1088	208	27	41
Future Volume (vph)	82	75	290	392	73	11	12	122	1088	208	27	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		5%			-1%				-2%			
Storage Length (ft)	0		50	250		50		250		225		300
Storage Lanes	0		1	1		1		1		1		1
Taper Length (ft)	100			100				100				100
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Frt			0.850			0.850				0.850		
Flt Protected		0.975		0.950	0.967			0.950				0.950
Satd. Flow (prot)	0	1771	1544	1690	1720	1591	0	1787	3575	1599	0	1761
Flt Permitted		0.975		0.950	0.967			0.093				0.088
Satd. Flow (perm)	0	1771	1544	1690	1720	1591	0	175	3575	1599	0	163
Right Turn on Red			No			No				No		
Satd. Flow (RTOR)												
Link Speed (mph)		45			45				55			
Link Distance (ft)		1089			1109				1415			
Travel Time (s)		16.5			16.8				17.5			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	91	83	322	436	81	12	13	136	1209	231	30	46
Shared Lane Traffic (%)				41%								
Lane Group Flow (vph)	0	174	322	257	260	12	0	149	1209	231	0	76
Turn Type	Split	NA	Perm	Split	NA	Perm	D.P+P	D.P+P	NA	pm+ov	D.P+P	D.P+P
Protected Phases	4	4		3	3		5	5	2	3	1	1
Permitted Phases			4			3	6	6		2	2	2
Detector Phase	4	4	4	3	3	3	5	5	2	3	1	1
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	14.0	7.0	7.0	7.0
Minimum Split (s)	14.3	14.3	14.3	14.6	14.6	14.6	13.1	13.1	20.8	14.6	12.8	12.8
Total Split (s)	20.0	20.0	20.0	35.0	35.0	35.0	15.0	15.0	50.0	35.0	15.0	15.0
Total Split (%)	16.7%	16.7%	16.7%	29.2%	29.2%	29.2%	12.5%	12.5%	41.7%	29.2%	12.5%	12.5%
Maximum Green (s)	12.7	12.7	12.7	27.4	27.4	27.4	8.9	8.9	43.2	27.4	9.2	9.2
Yellow Time (s)	4.1	4.1	4.1	4.6	4.6	4.6	3.0	3.0	5.4	4.6	3.0	3.0
All-Red Time (s)	3.2	3.2	3.2	3.0	3.0	3.0	3.1	3.1	1.4	3.0	2.8	2.8
Lost Time Adjust (s)		-2.3	-2.3	-2.6	-2.6	-2.6		-1.1	-1.8	-2.6		-0.8
Total Lost Time (s)		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0		5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	1.0	6.0	2.0	1.0	1.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	1.0	3.4	2.0	1.0	1.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	None	None	None	C-Max	None	None	None
Act Effct Green (s)		21.2	21.2	24.6	24.6	24.6		54.3	47.6	73.2		55.3
Actuated g/C Ratio		0.18	0.18	0.20	0.20	0.20		0.45	0.40	0.61		0.46
v/c Ratio		0.56	1.18	0.74	0.74	0.04		0.73	0.85	0.24		0.39
Control Delay		54.8	157.8	57.8	57.2	35.7		59.0	40.0	6.4		38.3
Queue Delay		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0

Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1443	46
Future Volume (vph)	1443	46
Ideal Flow (vphpl)	1900	1900
Grade (%)	1%	
Storage Length (ft)		100
Storage Lanes		1
Taper Length (ft)		
Lane Util. Factor	0.95	1.00
Frt		0.850
Flt Protected		
Satd. Flow (prot)	3522	1575
Flt Permitted		
Satd. Flow (perm)	3522	1575
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	55	
Link Distance (ft)	1323	
Travel Time (s)	16.4	
Peak Hour Factor	0.90	0.90
Adj. Flow (vph)	1603	51
Shared Lane Traffic (%)		
Lane Group Flow (vph)	1603	51
Turn Type	NA	pm+ov
Protected Phases	6	4
Permitted Phases		6
Detector Phase	6	4
Switch Phase		
Minimum Initial (s)	14.0	7.0
Minimum Split (s)	20.8	14.3
Total Split (s)	50.0	20.0
Total Split (%)	41.7%	16.7%
Maximum Green (s)	43.2	12.7
Yellow Time (s)	5.4	4.1
All-Red Time (s)	1.4	3.2
Lost Time Adjust (s)	-1.8	-2.3
Total Lost Time (s)	5.0	5.0
Lead/Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes
Vehicle Extension (s)	6.0	2.0
Minimum Gap (s)	3.4	2.0
Time Before Reduce (s)	15.0	0.0
Time To Reduce (s)	30.0	0.0
Recall Mode	C-Max	None
Act Effct Green (s)	45.0	71.2
Actuated g/C Ratio	0.38	0.59
v/c Ratio	1.21	0.05
Control Delay	137.8	12.2
Queue Delay	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Total Delay		54.8	157.8	57.8	57.2	35.7		59.0	40.0	6.4		38.3
LOS		D	F	E	E	D		E	D	A		D
Approach Delay		121.7			57.0				36.9			
Approach LOS		F			E				D			
Queue Length 50th (ft)		126	~314	196	198	7		61	459	46		30
Queue Length 95th (ft)		#247	#547	282	284	23		#148	#593	41		57
Internal Link Dist (ft)		1009			1029				1335			
Turn Bay Length (ft)			50	250		50		250		225		300
Base Capacity (vph)		312	272	422	430	397		214	1418	1047		208
Starvation Cap Reductn		0	0	0	0	0		0	0	0		0
Spillback Cap Reductn		0	0	0	0	0		0	0	0		0
Storage Cap Reductn		0	0	0	0	0		0	0	0		0
Reduced v/c Ratio		0.56	1.18	0.61	0.60	0.03		0.70	0.85	0.22		0.37

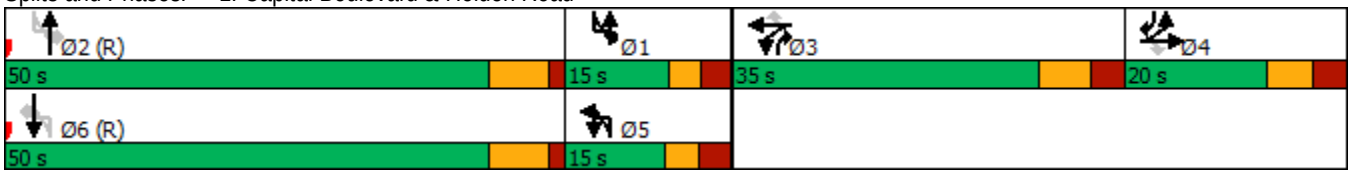
Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 1 (1%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.21
Intersection Signal Delay: 86.0 Intersection LOS: F
Intersection Capacity Utilization 94.7% ICU Level of Service F
Analysis Period (min) 15

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

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

Splits and Phases: 1: Capital Boulevard & Holden Road



Lane Group	SBT	SBR
Total Delay	137.8	12.2
LOS	F	B
Approach Delay	129.7	
Approach LOS	F	
Queue Length 50th (ft)	~799	16
Queue Length 95th (ft)	#939	38
Internal Link Dist (ft)	1243	
Turn Bay Length (ft)		100
Base Capacity (vph)	1320	934
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	1.21	0.05

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	85	64	201	279	95	28	23	275	1625	287	23	71
Future Volume (vph)	85	64	201	279	95	28	23	275	1625	287	23	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		5%			-1%				-2%			
Storage Length (ft)	0		50	250		50		250		225		300
Storage Lanes	0		1	1		1		1		1		1
Taper Length (ft)	100			100				100				100
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Frt			0.850			0.850				0.850		
Flt Protected		0.972		0.950	0.976			0.950				0.950
Satd. Flow (prot)	0	1765	1544	1690	1736	1591	0	1787	3575	1599	0	1761
Flt Permitted		0.972		0.950	0.976			0.081				0.082
Satd. Flow (perm)	0	1765	1544	1690	1736	1591	0	152	3575	1599	0	152
Right Turn on Red			No			No				No		
Satd. Flow (RTOR)												
Link Speed (mph)		45			45				55			
Link Distance (ft)		1089			1109				1415			
Travel Time (s)		16.5			16.8				17.5			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	94	71	223	310	106	31	26	306	1806	319	26	79
Shared Lane Traffic (%)				34%								
Lane Group Flow (vph)	0	165	223	205	211	31	0	332	1806	319	0	105
Turn Type	Split	NA	Perm	Split	NA	Perm	D.P+P	D.P+P	NA	pm+ov	D.P+P	D.P+P
Protected Phases	4	4		3	3		5	5	2	3	1	1
Permitted Phases			4			3	6	6		2	2	2
Detector Phase	4	4	4	3	3	3	5	5	2	3	1	1
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	14.0	7.0	7.0	7.0
Minimum Split (s)	14.3	14.3	14.3	14.6	14.6	14.6	13.1	13.1	20.8	14.6	12.8	12.8
Total Split (s)	20.0	20.0	20.0	30.0	30.0	30.0	15.0	15.0	55.0	30.0	15.0	15.0
Total Split (%)	16.7%	16.7%	16.7%	25.0%	25.0%	25.0%	12.5%	12.5%	45.8%	25.0%	12.5%	12.5%
Maximum Green (s)	12.7	12.7	12.7	22.4	22.4	22.4	8.9	8.9	48.2	22.4	9.2	9.2
Yellow Time (s)	4.1	4.1	4.1	4.6	4.6	4.6	3.0	3.0	5.4	4.6	3.0	3.0
All-Red Time (s)	3.2	3.2	3.2	3.0	3.0	3.0	3.1	3.1	1.4	3.0	2.8	2.8
Lost Time Adjust (s)		-2.3	-2.3	-2.6	-2.6	-2.6		-1.1	-1.8	-2.6		-0.8
Total Lost Time (s)		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0		5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	1.0	6.0	2.0	1.0	1.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	1.0	3.4	2.0	1.0	1.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	None	None	None	C-Max	None	None	None
Act Effct Green (s)		19.2	19.2	20.8	20.8	20.8		60.0	50.0	70.8		60.0
Actuated g/C Ratio		0.16	0.16	0.17	0.17	0.17		0.50	0.42	0.59		0.50
v/c Ratio		0.59	0.90	0.70	0.70	0.11		1.57	1.21	0.34		0.50
Control Delay		57.4	87.6	59.4	59.2	40.9		302.9	135.1	7.8		43.1
Queue Delay		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0

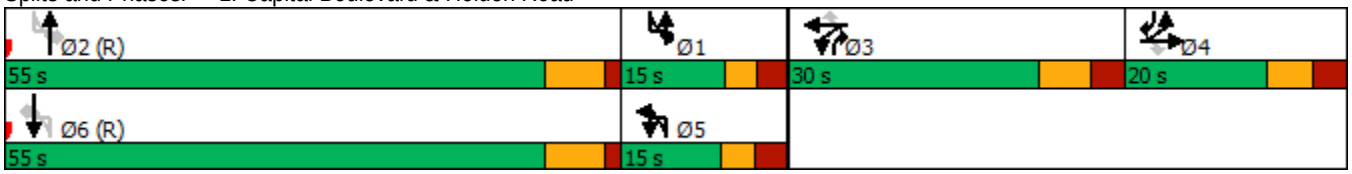
Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1227	64
Future Volume (vph)	1227	64
Ideal Flow (vphpl)	1900	1900
Grade (%)	1%	
Storage Length (ft)		100
Storage Lanes		1
Taper Length (ft)		
Lane Util. Factor	0.95	1.00
Frt		0.850
Flt Protected		
Satd. Flow (prot)	3522	1575
Flt Permitted		
Satd. Flow (perm)	3522	1575
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	55	
Link Distance (ft)	1323	
Travel Time (s)	16.4	
Peak Hour Factor	0.90	0.90
Adj. Flow (vph)	1363	71
Shared Lane Traffic (%)		
Lane Group Flow (vph)	1363	71
Turn Type	NA	pm+ov
Protected Phases	6	4
Permitted Phases		6
Detector Phase	6	4
Switch Phase		
Minimum Initial (s)	14.0	7.0
Minimum Split (s)	20.8	14.3
Total Split (s)	55.0	20.0
Total Split (%)	45.8%	16.7%
Maximum Green (s)	48.2	12.7
Yellow Time (s)	5.4	4.1
All-Red Time (s)	1.4	3.2
Lost Time Adjust (s)	-1.8	-2.3
Total Lost Time (s)	5.0	5.0
Lead/Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes
Vehicle Extension (s)	6.0	2.0
Minimum Gap (s)	3.4	2.0
Time Before Reduce (s)	15.0	0.0
Time To Reduce (s)	30.0	0.0
Recall Mode	C-Max	None
Act Effct Green (s)	50.0	74.2
Actuated g/C Ratio	0.42	0.62
v/c Ratio	0.93	0.07
Control Delay	45.5	10.4
Queue Delay	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Total Delay		57.4	87.6	59.4	59.2	40.9		302.9	135.1	7.8		43.1
LOS		E	F	E	E	D		F	F	A		D
Approach Delay		74.7			58.0				141.3			
Approach LOS		E			E				F			
Queue Length 50th (ft)		121	173	157	162	20		~315	~905	64		38
Queue Length 95th (ft)		#230	#363	237	243	47		#513	#1037	83		83
Internal Link Dist (ft)		1009			1029				1335			
Turn Bay Length (ft)			50	250		50		250		225		300
Base Capacity (vph)		282	247	352	361	331		212	1489	999		210
Starvation Cap Reductn		0	0	0	0	0		0	0	0		0
Spillback Cap Reductn		0	0	0	0	0		0	0	0		0
Storage Cap Reductn		0	0	0	0	0		0	0	0		0
Reduced v/c Ratio		0.59	0.90	0.58	0.58	0.09		1.57	1.21	0.32		0.50

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 89 (74%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.57
Intersection Signal Delay: 97.1 Intersection LOS: F
Intersection Capacity Utilization 89.8% ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Capital Boulevard & Holden Road



Lane Group	SBT	SBR
Total Delay	45.5	10.4
LOS	D	B
Approach Delay	43.7	
Approach LOS	D	
Queue Length 50th (ft)	520	21
Queue Length 95th (ft)	#672	44
Internal Link Dist (ft)	1243	
Turn Bay Length (ft)		100
Base Capacity (vph)	1467	973
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.93	0.07

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	82	75	290	392	73	11	12	122	1111	208	27	41
Future Volume (vph)	82	75	290	392	73	11	12	122	1111	208	27	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		5%			-1%				-2%			
Storage Length (ft)	0		50	250		50		250		225		300
Storage Lanes	0		1	1		1		1		1		1
Taper Length (ft)	100			100				100				100
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Frt			0.850			0.850				0.850		
Flt Protected		0.975		0.950	0.967			0.950				0.950
Satd. Flow (prot)	0	1771	1544	1690	1720	1591	0	1787	3575	1599	0	1761
Flt Permitted		0.975		0.950	0.967			0.093				0.088
Satd. Flow (perm)	0	1771	1544	1690	1720	1591	0	175	3575	1599	0	163
Right Turn on Red			No			No				No		
Satd. Flow (RTOR)												
Link Speed (mph)		45			45				55			
Link Distance (ft)		1089			1109				1415			
Travel Time (s)		16.5			16.8				17.5			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	91	83	322	436	81	12	13	136	1234	231	30	46
Shared Lane Traffic (%)				41%								
Lane Group Flow (vph)	0	174	322	257	260	12	0	149	1234	231	0	76
Turn Type	Split	NA	Perm	Split	NA	Perm	D.P+P	D.P+P	NA	pm+ov	D.P+P	D.P+P
Protected Phases	4	4		3	3		5	5	2	3	1	1
Permitted Phases			4			3	6	6		2	2	2
Detector Phase	4	4	4	3	3	3	5	5	2	3	1	1
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	14.0	7.0	7.0	7.0
Minimum Split (s)	14.3	14.3	14.3	14.6	14.6	14.6	13.1	13.1	20.8	14.6	12.8	12.8
Total Split (s)	20.0	20.0	20.0	35.0	35.0	35.0	15.0	15.0	50.0	35.0	15.0	15.0
Total Split (%)	16.7%	16.7%	16.7%	29.2%	29.2%	29.2%	12.5%	12.5%	41.7%	29.2%	12.5%	12.5%
Maximum Green (s)	12.7	12.7	12.7	27.4	27.4	27.4	8.9	8.9	43.2	27.4	9.2	9.2
Yellow Time (s)	4.1	4.1	4.1	4.6	4.6	4.6	3.0	3.0	5.4	4.6	3.0	3.0
All-Red Time (s)	3.2	3.2	3.2	3.0	3.0	3.0	3.1	3.1	1.4	3.0	2.8	2.8
Lost Time Adjust (s)		-2.3	-2.3	-2.6	-2.6	-2.6		-1.1	-1.8	-2.6		-0.8
Total Lost Time (s)		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0		5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	1.0	6.0	2.0	1.0	1.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	1.0	3.4	2.0	1.0	1.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	None	None	None	C-Max	None	None	None
Act Effct Green (s)		21.2	21.2	24.6	24.6	24.6		54.3	47.6	73.2		55.3
Actuated g/C Ratio		0.18	0.18	0.20	0.20	0.20		0.45	0.40	0.61		0.46
v/c Ratio		0.56	1.18	0.74	0.74	0.04		0.73	0.87	0.24		0.39
Control Delay		54.8	157.8	57.8	57.2	35.7		58.9	41.1	6.4		38.3
Queue Delay		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0

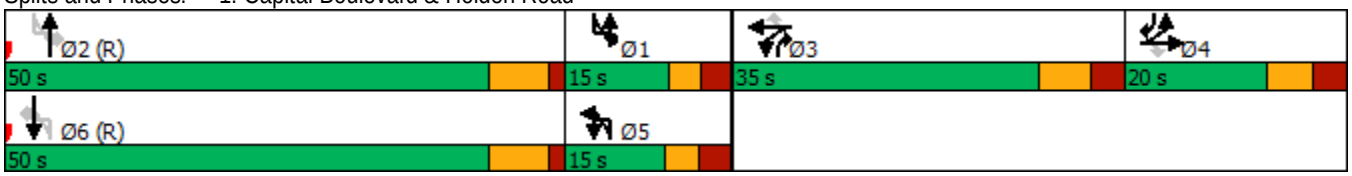
Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1505	46
Future Volume (vph)	1505	46
Ideal Flow (vphpl)	1900	1900
Grade (%)	1%	
Storage Length (ft)		100
Storage Lanes		1
Taper Length (ft)		
Lane Util. Factor	0.95	1.00
Frt		0.850
Flt Protected		
Satd. Flow (prot)	3522	1575
Flt Permitted		
Satd. Flow (perm)	3522	1575
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	55	
Link Distance (ft)	1323	
Travel Time (s)	16.4	
Peak Hour Factor	0.90	0.90
Adj. Flow (vph)	1672	51
Shared Lane Traffic (%)		
Lane Group Flow (vph)	1672	51
Turn Type	NA	pm+ov
Protected Phases	6	4
Permitted Phases		6
Detector Phase	6	4
Switch Phase		
Minimum Initial (s)	14.0	7.0
Minimum Split (s)	20.8	14.3
Total Split (s)	50.0	20.0
Total Split (%)	41.7%	16.7%
Maximum Green (s)	43.2	12.7
Yellow Time (s)	5.4	4.1
All-Red Time (s)	1.4	3.2
Lost Time Adjust (s)	-1.8	-2.3
Total Lost Time (s)	5.0	5.0
Lead/Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes
Vehicle Extension (s)	6.0	2.0
Minimum Gap (s)	3.4	2.0
Time Before Reduce (s)	15.0	0.0
Time To Reduce (s)	30.0	0.0
Recall Mode	C-Max	None
Act Effct Green (s)	45.0	71.2
Actuated g/C Ratio	0.38	0.59
v/c Ratio	1.27	0.05
Control Delay	159.5	12.2
Queue Delay	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Total Delay		54.8	157.8	57.8	57.2	35.7		58.9	41.1	6.4		38.3
LOS		D	F	E	E	D		E	D	A		D
Approach Delay		121.7			57.0				37.8			
Approach LOS		F			E				D			
Queue Length 50th (ft)		126	~314	196	198	7		62	474	46		30
Queue Length 95th (ft)		#247	#547	282	284	23		#149	#615	41		57
Internal Link Dist (ft)		1009			1029				1335			
Turn Bay Length (ft)			50	250		50		250		225		300
Base Capacity (vph)		312	272	422	430	397		214	1418	1047		208
Starvation Cap Reductn		0	0	0	0	0		0	0	0		0
Spillback Cap Reductn		0	0	0	0	0		0	0	0		0
Storage Cap Reductn		0	0	0	0	0		0	0	0		0
Reduced v/c Ratio		0.56	1.18	0.61	0.60	0.03		0.70	0.87	0.22		0.37

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 1 (1%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.27
Intersection Signal Delay: 95.0 Intersection LOS: F
Intersection Capacity Utilization 96.4% ICU Level of Service F
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Capital Boulevard & Holden Road



Lane Group	SBT	SBR
Total Delay	159.5	12.2
LOS	F	B
Approach Delay	150.2	
Approach LOS	F	
Queue Length 50th (ft)	~858	16
Queue Length 95th (ft)	#997	38
Internal Link Dist (ft)	1243	
Turn Bay Length (ft)		100
Base Capacity (vph)	1320	934
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	1.27	0.05

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	85	64	201	279	95	28	23	275	1689	287	23	71
Future Volume (vph)	85	64	201	279	95	28	23	275	1689	287	23	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		5%			-1%				-2%			
Storage Length (ft)	0		50	250		50		250		225		300
Storage Lanes	0		1	1		1		1		1		1
Taper Length (ft)	100			100				100				100
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Frt			0.850			0.850				0.850		
Flt Protected		0.972		0.950	0.976			0.950				0.950
Satd. Flow (prot)	0	1765	1544	1690	1736	1591	0	1787	3575	1599	0	1761
Flt Permitted		0.972		0.950	0.976			0.081				0.082
Satd. Flow (perm)	0	1765	1544	1690	1736	1591	0	152	3575	1599	0	152
Right Turn on Red			No			No				No		
Satd. Flow (RTOR)												
Link Speed (mph)		45			45				55			
Link Distance (ft)		1089			1109				1415			
Travel Time (s)		16.5			16.8				17.5			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	94	71	223	310	106	31	26	306	1877	319	26	79
Shared Lane Traffic (%)				34%								
Lane Group Flow (vph)	0	165	223	205	211	31	0	332	1877	319	0	105
Turn Type	Split	NA	Perm	Split	NA	Perm	D.P+P	D.P+P	NA	pm+ov	D.P+P	D.P+P
Protected Phases	4	4		3	3		5	5	2	3	1	1
Permitted Phases			4			3	6	6		2	2	2
Detector Phase	4	4	4	3	3	3	5	5	2	3	1	1
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	14.0	7.0	7.0	7.0
Minimum Split (s)	14.3	14.3	14.3	14.6	14.6	14.6	13.1	13.1	20.8	14.6	12.8	12.8
Total Split (s)	20.0	20.0	20.0	30.0	30.0	30.0	15.0	15.0	55.0	30.0	15.0	15.0
Total Split (%)	16.7%	16.7%	16.7%	25.0%	25.0%	25.0%	12.5%	12.5%	45.8%	25.0%	12.5%	12.5%
Maximum Green (s)	12.7	12.7	12.7	22.4	22.4	22.4	8.9	8.9	48.2	22.4	9.2	9.2
Yellow Time (s)	4.1	4.1	4.1	4.6	4.6	4.6	3.0	3.0	5.4	4.6	3.0	3.0
All-Red Time (s)	3.2	3.2	3.2	3.0	3.0	3.0	3.1	3.1	1.4	3.0	2.8	2.8
Lost Time Adjust (s)		-2.3	-2.3	-2.6	-2.6	-2.6		-1.1	-1.8	-2.6		-0.8
Total Lost Time (s)		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0		5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	1.0	6.0	2.0	1.0	1.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	1.0	3.4	2.0	1.0	1.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	None	None	None	C-Max	None	None	None
Act Effct Green (s)		19.2	19.2	20.8	20.8	20.8		60.0	50.0	70.8		60.0
Actuated g/C Ratio		0.16	0.16	0.17	0.17	0.17		0.50	0.42	0.59		0.50
v/c Ratio		0.59	0.90	0.70	0.70	0.11		1.57	1.26	0.34		0.50
Control Delay		57.4	87.6	59.4	59.2	40.9		302.5	155.0	7.8		43.1
Queue Delay		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0

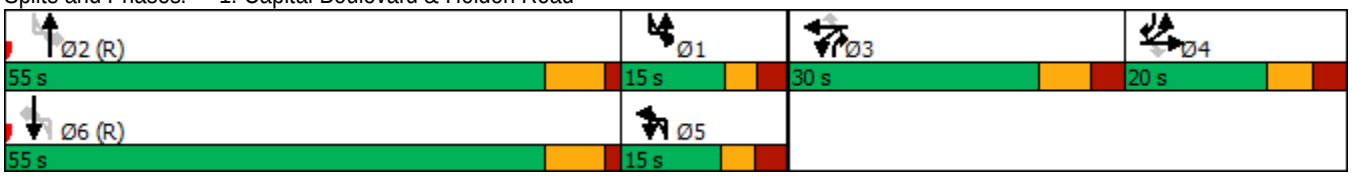
Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1256	64
Future Volume (vph)	1256	64
Ideal Flow (vphpl)	1900	1900
Grade (%)	1%	
Storage Length (ft)		100
Storage Lanes		1
Taper Length (ft)		
Lane Util. Factor	0.95	1.00
Frt		0.850
Flt Protected		
Satd. Flow (prot)	3522	1575
Flt Permitted		
Satd. Flow (perm)	3522	1575
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	55	
Link Distance (ft)	1323	
Travel Time (s)	16.4	
Peak Hour Factor	0.90	0.90
Adj. Flow (vph)	1396	71
Shared Lane Traffic (%)		
Lane Group Flow (vph)	1396	71
Turn Type	NA	pm+ov
Protected Phases	6	4
Permitted Phases		6
Detector Phase	6	4
Switch Phase		
Minimum Initial (s)	14.0	7.0
Minimum Split (s)	20.8	14.3
Total Split (s)	55.0	20.0
Total Split (%)	45.8%	16.7%
Maximum Green (s)	48.2	12.7
Yellow Time (s)	5.4	4.1
All-Red Time (s)	1.4	3.2
Lost Time Adjust (s)	-1.8	-2.3
Total Lost Time (s)	5.0	5.0
Lead/Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes
Vehicle Extension (s)	6.0	2.0
Minimum Gap (s)	3.4	2.0
Time Before Reduce (s)	15.0	0.0
Time To Reduce (s)	30.0	0.0
Recall Mode	C-Max	None
Act Effct Green (s)	50.0	74.2
Actuated g/C Ratio	0.42	0.62
v/c Ratio	0.95	0.07
Control Delay	48.7	10.4
Queue Delay	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Total Delay		57.4	87.6	59.4	59.2	40.9		302.5	155.0	7.8		43.1
LOS		E	F	E	E	D		F	F	A		D
Approach Delay		74.7			58.0				155.8			
Approach LOS		E			E				F			
Queue Length 50th (ft)		121	173	157	162	20		~315	~965	64		38
Queue Length 95th (ft)		#230	#363	237	243	47		#514	#1099	91		83
Internal Link Dist (ft)		1009			1029				1335			
Turn Bay Length (ft)			50	250		50		250		225		300
Base Capacity (vph)		282	247	352	361	331		212	1489	999		210
Starvation Cap Reductn		0	0	0	0	0		0	0	0		0
Spillback Cap Reductn		0	0	0	0	0		0	0	0		0
Storage Cap Reductn		0	0	0	0	0		0	0	0		0
Reduced v/c Ratio		0.59	0.90	0.58	0.58	0.09		1.57	1.26	0.32		0.50

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 89 (74%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
Natural Cycle: 140
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.57
Intersection Signal Delay: 105.8 Intersection LOS: F
Intersection Capacity Utilization 90.6% ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Capital Boulevard & Holden Road



Lane Group	SBT	SBR
Total Delay	48.7	10.4
LOS	D	B
Approach Delay	46.6	
Approach LOS	D	
Queue Length 50th (ft)	541	21
Queue Length 95th (ft)	#701	44
Internal Link Dist (ft)	1243	
Turn Bay Length (ft)		100
Base Capacity (vph)	1467	973
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.95	0.07

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	82	75	290	392	73	11	12	122	1111	208	27	41
Future Volume (vph)	82	75	290	392	73	11	12	122	1111	208	27	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		5%			-1%				-2%			
Storage Length (ft)	0		50	250		50		250		225		300
Storage Lanes	0		1	1		1		1		1		1
Taper Length (ft)	100			100				100				100
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Frt			0.850			0.850				0.850		
Flt Protected		0.975		0.950	0.967			0.950				0.950
Satd. Flow (prot)	0	1771	1544	1690	1720	1591	0	1787	3575	1599	0	1761
Flt Permitted		0.975		0.950	0.967			0.072				0.091
Satd. Flow (perm)	0	1771	1544	1690	1720	1591	0	135	3575	1599	0	169
Right Turn on Red			No			No				No		
Satd. Flow (RTOR)												
Link Speed (mph)		45			45				55			
Link Distance (ft)		1089			1109				1415			
Travel Time (s)		16.5			16.8				17.5			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	91	83	322	436	81	12	13	136	1234	231	30	46
Shared Lane Traffic (%)				41%								
Lane Group Flow (vph)	0	174	322	257	260	12	0	149	1234	231	0	76
Turn Type	Split	NA	Perm	Split	NA	Perm	D.P+P	D.P+P	NA	pm+ov	D.P+P	D.P+P
Protected Phases	4	4		3	3		5	5	2	3	1	1
Permitted Phases			4			3	6	6		2	2	2
Detector Phase	4	4	4	3	3	3	5	5	2	3	1	1
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	14.0	7.0	7.0	7.0
Minimum Split (s)	14.3	14.3	14.3	14.6	14.6	14.6	13.1	13.1	20.8	14.6	12.8	12.8
Total Split (s)	30.4	30.4	30.4	24.0	24.0	24.0	13.1	13.1	62.8	24.0	12.8	12.8
Total Split (%)	23.4%	23.4%	23.4%	18.5%	18.5%	18.5%	10.1%	10.1%	48.3%	18.5%	9.8%	9.8%
Maximum Green (s)	23.1	23.1	23.1	16.4	16.4	16.4	7.0	7.0	56.0	16.4	7.0	7.0
Yellow Time (s)	4.1	4.1	4.1	4.6	4.6	4.6	3.0	3.0	5.4	4.6	3.0	3.0
All-Red Time (s)	3.2	3.2	3.2	3.0	3.0	3.0	3.1	3.1	1.4	3.0	2.8	2.8
Lost Time Adjust (s)		-2.3	-2.3	-2.6	-2.6	-2.6		-1.1	-1.8	-2.6		-0.8
Total Lost Time (s)		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0		5.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lag	Lag	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	1.0	6.0	2.0	1.0	1.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	1.0	3.4	2.0	1.0	1.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	None	None	None	C-Max	None	None	None
Act Effct Green (s)		25.4	25.4	19.0	19.0	19.0		65.6	60.4	84.4		66.6
Actuated g/C Ratio		0.20	0.20	0.15	0.15	0.15		0.50	0.46	0.65		0.51
v/c Ratio		0.50	1.07	1.04	1.04	0.05		0.87	0.74	0.22		0.42
Control Delay		52.5	120.9	121.6	120.0	48.5		80.9	21.9	3.7		37.7
Queue Delay		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0

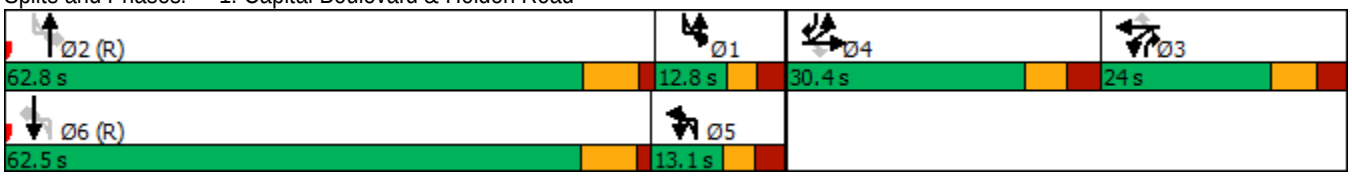
Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1505	46
Future Volume (vph)	1505	46
Ideal Flow (vphpl)	1900	1900
Grade (%)	1%	
Storage Length (ft)		100
Storage Lanes		1
Taper Length (ft)		
Lane Util. Factor	0.95	1.00
Frt		0.850
Flt Protected		
Satd. Flow (prot)	3522	1575
Flt Permitted		
Satd. Flow (perm)	3522	1575
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	55	
Link Distance (ft)	1323	
Travel Time (s)	16.4	
Peak Hour Factor	0.90	0.90
Adj. Flow (vph)	1672	51
Shared Lane Traffic (%)		
Lane Group Flow (vph)	1672	51
Turn Type	NA	pm+ov
Protected Phases	6	4
Permitted Phases		6
Detector Phase	6	4
Switch Phase		
Minimum Initial (s)	14.0	7.0
Minimum Split (s)	20.8	14.3
Total Split (s)	62.5	30.4
Total Split (%)	48.1%	23.4%
Maximum Green (s)	55.7	23.1
Yellow Time (s)	5.4	4.1
All-Red Time (s)	1.4	3.2
Lost Time Adjust (s)	-1.8	-2.3
Total Lost Time (s)	5.0	5.0
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Vehicle Extension (s)	6.0	2.0
Minimum Gap (s)	3.4	2.0
Time Before Reduce (s)	15.0	0.0
Time To Reduce (s)	30.0	0.0
Recall Mode	C-Max	None
Act Effct Green (s)	57.5	82.9
Actuated g/C Ratio	0.44	0.64
v/c Ratio	1.07	0.05
Control Delay	80.8	4.8
Queue Delay	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Total Delay		52.5	120.9	121.6	120.0	48.5		80.9	21.9	3.7		37.7
LOS		D	F	F	F	D		F	C	A		D
Approach Delay		96.9			119.1				24.7			
Approach LOS		F			F				C			
Queue Length 50th (ft)		132	~300	~246	~247	9		80	495	28		29
Queue Length 95th (ft)		208	#487	#428	#431	28		#205	466	18		55
Internal Link Dist (ft)		1009			1029				1335			
Turn Bay Length (ft)			50	250		50		250		225		300
Base Capacity (vph)		346	301	247	251	232		171	1659	1037		181
Starvation Cap Reductn		0	0	0	0	0		0	0	0		0
Spillback Cap Reductn		0	0	0	0	0		0	0	0		0
Storage Cap Reductn		0	0	0	0	0		0	0	0		0
Reduced v/c Ratio		0.50	1.07	1.04	1.04	0.05		0.87	0.74	0.22		0.42

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 123 (95%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.07
Intersection Signal Delay: 65.1 Intersection LOS: E
Intersection Capacity Utilization 96.4% ICU Level of Service F
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Capital Boulevard & Holden Road



Lane Group	SBT	SBR
Total Delay	80.8	4.8
LOS	F	A
Approach Delay	76.8	
Approach LOS	E	
Queue Length 50th (ft)	~823	8
Queue Length 95th (ft)	#962	18
Internal Link Dist (ft)	1243	
Turn Bay Length (ft)		100
Base Capacity (vph)	1557	1004
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	1.07	0.05

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	85	64	201	279	95	28	23	275	1689	287	23	71
Future Volume (vph)	85	64	201	279	95	28	23	275	1689	287	23	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		5%			-1%				-2%			
Storage Length (ft)	0		50	250		50		250		225		300
Storage Lanes	0		1	1		1		1		1		1
Taper Length (ft)	100			100				100				100
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Frt			0.850			0.850				0.850		
Flt Protected		0.972		0.950	0.976			0.950				0.950
Satd. Flow (prot)	0	1765	1544	1690	1736	1591	0	1787	3575	1599	0	1761
Flt Permitted		0.972		0.950	0.976			0.079				0.067
Satd. Flow (perm)	0	1765	1544	1690	1736	1591	0	149	3575	1599	0	124
Right Turn on Red			No			No				No		
Satd. Flow (RTOR)												
Link Speed (mph)		45			45				55			
Link Distance (ft)		1089			1109				1415			
Travel Time (s)		16.5			16.8				17.5			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	94	71	223	310	106	31	26	306	1877	319	26	79
Shared Lane Traffic (%)				34%								
Lane Group Flow (vph)	0	165	223	205	211	31	0	332	1877	319	0	105
Turn Type	Split	NA	Perm	Split	NA	Perm	D.P+P	D.P+P	NA	pm+ov	D.P+P	D.P+P
Protected Phases	4	4		3	3		5	5	2	3	1	1
Permitted Phases			4			3	6	6		2	2	2
Detector Phase	4	4	4	3	3	3	5	5	2	3	1	1
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	14.0	7.0	7.0	7.0
Minimum Split (s)	14.3	14.3	14.3	14.6	14.6	14.6	13.1	13.1	20.8	14.6	12.8	12.8
Total Split (s)	22.0	22.0	22.0	19.1	19.1	19.1	22.8	22.8	66.1	19.1	12.8	12.8
Total Split (%)	18.3%	18.3%	18.3%	15.9%	15.9%	15.9%	19.0%	19.0%	55.1%	15.9%	10.7%	10.7%
Maximum Green (s)	14.7	14.7	14.7	11.5	11.5	11.5	16.7	16.7	59.3	11.5	7.0	7.0
Yellow Time (s)	4.1	4.1	4.1	4.6	4.6	4.6	3.0	3.0	5.4	4.6	3.0	3.0
All-Red Time (s)	3.2	3.2	3.2	3.0	3.0	3.0	3.1	3.1	1.4	3.0	2.8	2.8
Lost Time Adjust (s)		-2.3	-2.3	-2.6	-2.6	-2.6		-1.1	-1.8	-2.6		-0.8
Total Lost Time (s)		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0		5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	1.0	6.0	2.0	1.0	1.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	1.0	3.4	2.0	1.0	1.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	None	None	None	C-Max	None	None	None
Act Effct Green (s)		17.0	17.0	14.1	14.1	14.1		68.9	61.1	75.2		68.9
Actuated g/C Ratio		0.14	0.14	0.12	0.12	0.12		0.57	0.51	0.63		0.57
v/c Ratio		0.66	1.02	1.04	1.04	0.17		1.01	1.03	0.32		0.59
Control Delay		62.4	118.0	125.2	125.4	50.2		80.1	47.0	5.0		47.7
Queue Delay		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0

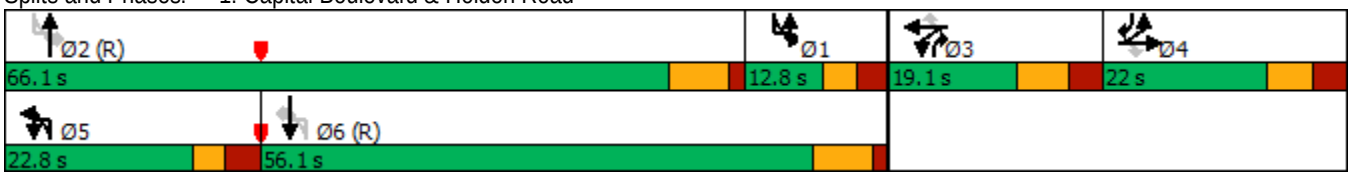
Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1256	64
Future Volume (vph)	1256	64
Ideal Flow (vphpl)	1900	1900
Grade (%)	1%	
Storage Length (ft)		100
Storage Lanes		1
Taper Length (ft)		
Lane Util. Factor	0.95	1.00
Frt		0.850
Flt Protected		
Satd. Flow (prot)	3522	1575
Flt Permitted		
Satd. Flow (perm)	3522	1575
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	55	
Link Distance (ft)	1323	
Travel Time (s)	16.4	
Peak Hour Factor	0.90	0.90
Adj. Flow (vph)	1396	71
Shared Lane Traffic (%)		
Lane Group Flow (vph)	1396	71
Turn Type	NA	pm+ov
Protected Phases	6	4
Permitted Phases		6
Detector Phase	6	4
Switch Phase		
Minimum Initial (s)	14.0	7.0
Minimum Split (s)	20.8	14.3
Total Split (s)	56.1	22.0
Total Split (%)	46.8%	18.3%
Maximum Green (s)	49.3	14.7
Yellow Time (s)	5.4	4.1
All-Red Time (s)	1.4	3.2
Lost Time Adjust (s)	-1.8	-2.3
Total Lost Time (s)	5.0	5.0
Lead/Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes
Vehicle Extension (s)	6.0	2.0
Minimum Gap (s)	3.4	2.0
Time Before Reduce (s)	15.0	0.0
Time To Reduce (s)	30.0	0.0
Recall Mode	C-Max	None
Act Effct Green (s)	51.1	68.1
Actuated g/C Ratio	0.43	0.57
v/c Ratio	0.93	0.08
Control Delay	45.0	6.2
Queue Delay	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Total Delay		62.4	118.0	125.2	125.4	50.2		80.1	47.0	5.0		47.7
LOS		E	F	F	F	D		F	D	A		D
Approach Delay		94.3			120.1				46.1			
Approach LOS		F			F				D			
Queue Length 50th (ft)		123	~183	~178	~185	22		~204	~824	66		31
Queue Length 95th (ft)		#202	#343	#342	#349	53		#402	#954	94		87
Internal Link Dist (ft)		1009			1029				1335			
Turn Bay Length (ft)			50	250		50		250		225		300
Base Capacity (vph)		250	218	198	203	186		328	1820	1002		177
Starvation Cap Reductn		0	0	0	0	0		0	0	0		0
Spillback Cap Reductn		0	0	0	0	0		0	0	0		0
Storage Cap Reductn		0	0	0	0	0		0	0	0		0
Reduced v/c Ratio		0.66	1.02	1.04	1.04	0.17		1.01	1.03	0.32		0.59

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 94 (78%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
Natural Cycle: 140
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.04
Intersection Signal Delay: 55.7 Intersection LOS: E
Intersection Capacity Utilization 90.6% ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Capital Boulevard & Holden Road



Lane Group	SBT	SBR
Total Delay	45.0	6.2
LOS	D	A
Approach Delay	43.4	
Approach LOS	D	
Queue Length 50th (ft)	532	11
Queue Length 95th (ft)	#687	22
Internal Link Dist (ft)	1243	
Turn Bay Length (ft)		100
Base Capacity (vph)	1499	893
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.93	0.08

Intersection Summary

APPENDIX F

CAPACITY ANALYSIS CALCULATIONS

CAPITAL BOULEVARD

&

SUNSET DRIVE / ROLLING ACRES ROAD

21: Capital Boulevard & Rolling Acres Road Leftover/Rolling Acres Road

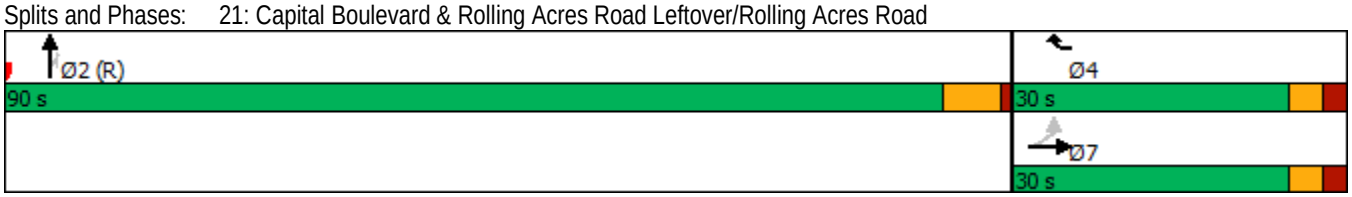
Timing Plan: AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	4	0	0	0	6	0	1159	7	0	0	0
Future Volume (vph)	0	4	0	0	0	6	0	1159	7	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			4%			0%			0%	
Storage Length (ft)	0		0	0		0	0		125	0		0
Storage Lanes	0		0	0		1	0		1	0		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	0.95	1.00	1.00	1.00	1.00
Frt						0.865			0.850			
Flt Protected												
Satd. Flow (prot)	0	1863	0	0	0	1579	0	3539	1583	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	1863	0	0	0	1579	0	3539	1583	0	0	0
Right Turn on Red	No		No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			25			55			55	
Link Distance (ft)		280			957			225			542	
Travel Time (s)		4.2			26.1			2.8			6.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	4	0	0	0	7	0	1288	8	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	4	0	0	0	7	0	1288	8	0	0	0
Turn Type		NA				Prot		NA	Perm			
Protected Phases		7				4		2				
Permitted Phases	7								2			
Detector Phase	7	7				4		2	2			
Switch Phase												
Minimum Initial (s)	7.0	7.0				7.0		14.0	14.0			
Minimum Split (s)	12.3	12.3				12.3		20.2	20.2			
Total Split (s)	30.0	30.0				30.0		90.0	90.0			
Total Split (%)	25.0%	25.0%				25.0%		75.0%	75.0%			
Maximum Green (s)	24.7	24.7				24.7		83.8	83.8			
Yellow Time (s)	3.0	3.0				3.0		5.2	5.2			
All-Red Time (s)	2.3	2.3				2.3		1.0	1.0			
Lost Time Adjust (s)		-0.3				-0.3		-1.2	-1.2			
Total Lost Time (s)		5.0				5.0		5.0	5.0			
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0				2.0		6.0	6.0			
Minimum Gap (s)	2.0	2.0				2.0		3.4	3.4			
Time Before Reduce (s)	0.0	0.0				0.0		15.0	15.0			
Time To Reduce (s)	0.0	0.0				0.0		50.0	50.0			
Recall Mode	None	None				None		C-Max	C-Max			
Act Effct Green (s)		7.3				7.3		116.5	116.5			
Actuated g/C Ratio		0.06				0.06		0.97	0.97			
v/c Ratio		0.04				0.07		0.37	0.01			
Control Delay		55.2				55.0		0.9	0.7			
Queue Delay		0.0				0.0		0.0	0.0			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		55.2				55.0		0.9	0.7			
LOS		E				D		A	A			
Approach Delay		55.3			55.0			0.9				
Approach LOS		E			D			A				
Queue Length 50th (ft)		3				5		0	0			
Queue Length 95th (ft)		m6				21		m104	m2			
Internal Link Dist (ft)		200			877			145			462	
Turn Bay Length (ft)									125			
Base Capacity (vph)		388				328		3437	1537			
Starvation Cap Reductn		0				0		0	0			
Spillback Cap Reductn		0				0		0	0			
Storage Cap Reductn		0				0		0	0			
Reduced v/c Ratio		0.01				0.02		0.37	0.01			

Intersection Summary	
Area Type: Other	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.37	
Intersection Signal Delay: 1.3	Intersection LOS: A
Intersection Capacity Utilization 51.5%	ICU Level of Service A
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 21: Capital Boulevard & Rolling Acres Road Leftover/Rolling Acres Road



21: Capital Boulevard & Rolling Acres Road Leftover/Rolling Acres Road

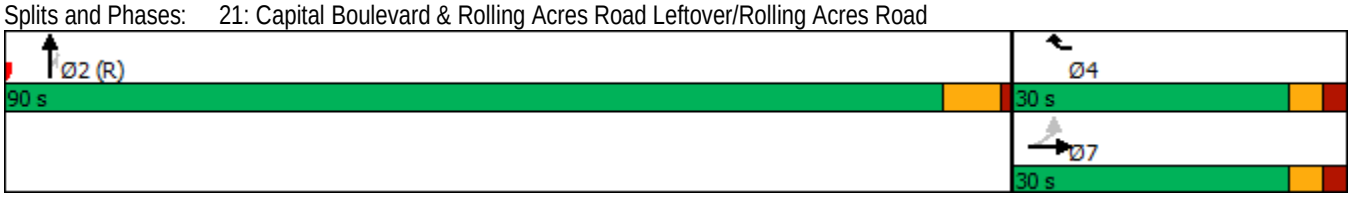
Timing Plan: PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	8	0	0	0	9	0	1717	31	0	0	0
Future Volume (vph)	5	8	0	0	0	9	0	1717	31	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			4%			0%			0%	
Storage Length (ft)	0		0	0		0	0		125	0		0
Storage Lanes	0		0	0		1	0		1	0		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	0.95	1.00	1.00	1.00	1.00
Frt						0.865			0.850			
Flt Protected		0.980										
Satd. Flow (prot)	0	1825	0	0	0	1579	0	3539	1583	0	0	0
Flt Permitted		0.980										
Satd. Flow (perm)	0	1825	0	0	0	1579	0	3539	1583	0	0	0
Right Turn on Red	No		No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			25			55			55	
Link Distance (ft)		280			957			225			542	
Travel Time (s)		4.2			26.1			2.8			6.7	
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)	6	9	0	0	0	10	0	1908	34	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	15	0	0	0	10	0	1908	34	0	0	0
Turn Type	Perm	NA				Prot		NA	Perm			
Protected Phases		7				4		2				
Permitted Phases	7								2			
Detector Phase	7	7				4		2	2			
Switch Phase												
Minimum Initial (s)	7.0	7.0				7.0		14.0	14.0			
Minimum Split (s)	12.3	12.3				12.3		20.2	20.2			
Total Split (s)	30.0	30.0				30.0		90.0	90.0			
Total Split (%)	25.0%	25.0%				25.0%		75.0%	75.0%			
Maximum Green (s)	24.7	24.7				24.7		83.8	83.8			
Yellow Time (s)	3.0	3.0				3.0		5.2	5.2			
All-Red Time (s)	2.3	2.3				2.3		1.0	1.0			
Lost Time Adjust (s)		-0.3				-0.3		-1.2	-1.2			
Total Lost Time (s)		5.0				5.0		5.0	5.0			
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0				2.0		6.0	6.0			
Minimum Gap (s)	2.0	2.0				2.0		3.4	3.4			
Time Before Reduce (s)	0.0	0.0				0.0		15.0	15.0			
Time To Reduce (s)	0.0	0.0				0.0		50.0	50.0			
Recall Mode	None	None				None		C-Max	C-Max			
Act Effct Green (s)		7.3				7.3		113.0	113.0			
Actuated g/C Ratio		0.06				0.06		0.94	0.94			
v/c Ratio		0.13				0.10		0.57	0.02			
Control Delay		66.8				55.8		2.1	1.0			
Queue Delay		0.0				0.0		0.0	0.0			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		66.8				55.8		2.1	1.0			
LOS		E				E		A	A			
Approach Delay		66.8			55.8			2.1				
Approach LOS		E			E			A				
Queue Length 50th (ft)		11				8		0	0			
Queue Length 95th (ft)		m20				26		202	m6			
Internal Link Dist (ft)		200			877			145			462	
Turn Bay Length (ft)									125			
Base Capacity (vph)		380				328		3333	1491			
Starvation Cap Reductn		0				0		0	0			
Spillback Cap Reductn		0				0		0	0			
Storage Cap Reductn		0				0		0	0			
Reduced v/c Ratio		0.04				0.03		0.57	0.02			

Intersection Summary	
Area Type: Other	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.57	
Intersection Signal Delay: 2.8	Intersection LOS: A
Intersection Capacity Utilization 71.6%	ICU Level of Service C
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 21: Capital Boulevard & Rolling Acres Road Leftover/Rolling Acres Road



21: Capital Boulevard & Rolling Acres Road Leftover/Rolling Acres Road

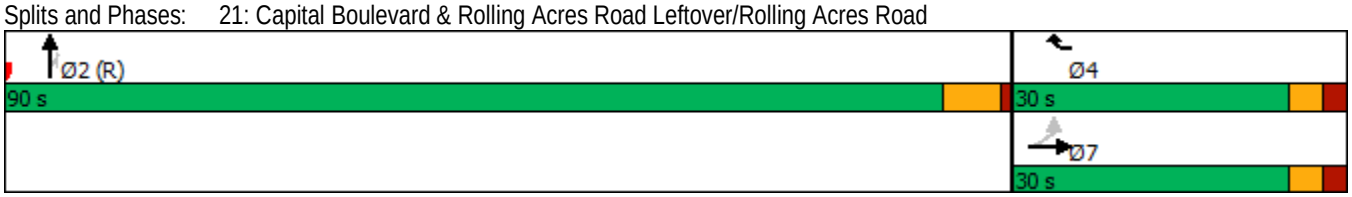
Timing Plan: AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	4	0	0	0	7	0	1435	9	0	0	0
Future Volume (vph)	0	4	0	0	0	7	0	1435	9	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			4%			0%			0%	
Storage Length (ft)	0		0	0		0	0		125	0		0
Storage Lanes	0		0	0		1	0		1	0		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	0.95	1.00	1.00	1.00	1.00
Frt						0.865			0.850			
Flt Protected												
Satd. Flow (prot)	0	1863	0	0	0	1579	0	3539	1583	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	1863	0	0	0	1579	0	3539	1583	0	0	0
Right Turn on Red	No		No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			25			55			55	
Link Distance (ft)		280			957			225			542	
Travel Time (s)		4.2			26.1			2.8			6.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	4	0	0	0	8	0	1594	10	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	4	0	0	0	8	0	1594	10	0	0	0
Turn Type		NA				Prot		NA	Perm			
Protected Phases		7				4		2				
Permitted Phases	7								2			
Detector Phase	7	7				4		2	2			
Switch Phase												
Minimum Initial (s)	7.0	7.0				7.0		14.0	14.0			
Minimum Split (s)	12.3	12.3				12.3		20.2	20.2			
Total Split (s)	30.0	30.0				30.0		90.0	90.0			
Total Split (%)	25.0%	25.0%				25.0%		75.0%	75.0%			
Maximum Green (s)	24.7	24.7				24.7		83.8	83.8			
Yellow Time (s)	3.0	3.0				3.0		5.2	5.2			
All-Red Time (s)	2.3	2.3				2.3		1.0	1.0			
Lost Time Adjust (s)		-0.3				-0.3		-1.2	-1.2			
Total Lost Time (s)		5.0				5.0		5.0	5.0			
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0				2.0		6.0	6.0			
Minimum Gap (s)	2.0	2.0				2.0		3.4	3.4			
Time Before Reduce (s)	0.0	0.0				0.0		15.0	15.0			
Time To Reduce (s)	0.0	0.0				0.0		50.0	50.0			
Recall Mode	None	None				None		C-Max	C-Max			
Act Effct Green (s)		7.3				7.3		116.5	116.5			
Actuated g/C Ratio		0.06				0.06		0.97	0.97			
v/c Ratio		0.04				0.08		0.46	0.01			
Control Delay		57.2				55.3		1.1	0.7			
Queue Delay		0.0				0.0		0.0	0.0			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		57.2				55.3		1.1	0.7			
LOS		E				E		A	A			
Approach Delay		57.3			55.3			1.1				
Approach LOS		E			E			A				
Queue Length 50th (ft)		3				6		0	0			
Queue Length 95th (ft)		m2				23		m144	m3			
Internal Link Dist (ft)		200			877			145			462	
Turn Bay Length (ft)									125			
Base Capacity (vph)		388				328		3437	1537			
Starvation Cap Reductn		0				0		0	0			
Spillback Cap Reductn		0				0		0	0			
Storage Cap Reductn		0				0		0	0			
Reduced v/c Ratio		0.01				0.02		0.46	0.01			

Intersection Summary	
Area Type: Other	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.46	
Intersection Signal Delay: 1.5	Intersection LOS: A
Intersection Capacity Utilization 63.5%	ICU Level of Service B
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 21: Capital Boulevard & Rolling Acres Road Leftover/Rolling Acres Road



21: Capital Boulevard & Rolling Acres Road Leftover/Rolling Acres Road

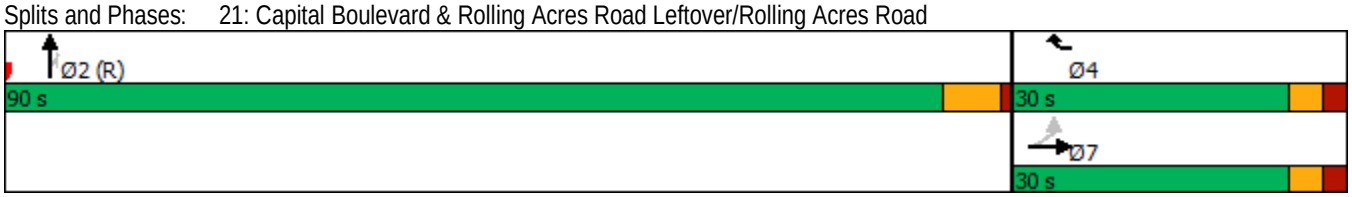
Timing Plan: PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	10	0	0	0	11	0	2150	38	0	0	0
Future Volume (vph)	6	10	0	0	0	11	0	2150	38	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			4%			0%			0%	
Storage Length (ft)	0		0	0		0	0		125	0		0
Storage Lanes	0		0	0		1	0		1	0		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	0.95	1.00	1.00	1.00	1.00
Frt						0.865			0.850			
Flt Protected		0.981										
Satd. Flow (prot)	0	1827	0	0	0	1579	0	3539	1583	0	0	0
Flt Permitted		0.981										
Satd. Flow (perm)	0	1827	0	0	0	1579	0	3539	1583	0	0	0
Right Turn on Red	No		No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			25			55			55	
Link Distance (ft)		280			957			225			542	
Travel Time (s)		4.2			26.1			2.8			6.7	
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)	7	11	0	0	0	12	0	2389	42	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	18	0	0	0	12	0	2389	42	0	0	0
Turn Type	Perm	NA				Prot		NA	Perm			
Protected Phases		7				4		2				
Permitted Phases	7								2			
Detector Phase	7	7				4		2	2			
Switch Phase												
Minimum Initial (s)	7.0	7.0				7.0		14.0	14.0			
Minimum Split (s)	12.3	12.3				12.3		20.2	20.2			
Total Split (s)	30.0	30.0				30.0		90.0	90.0			
Total Split (%)	25.0%	25.0%				25.0%		75.0%	75.0%			
Maximum Green (s)	24.7	24.7				24.7		83.8	83.8			
Yellow Time (s)	3.0	3.0				3.0		5.2	5.2			
All-Red Time (s)	2.3	2.3				2.3		1.0	1.0			
Lost Time Adjust (s)		-0.3				-0.3		-1.2	-1.2			
Total Lost Time (s)		5.0				5.0		5.0	5.0			
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0				2.0		6.0	6.0			
Minimum Gap (s)	2.0	2.0				2.0		3.4	3.4			
Time Before Reduce (s)	0.0	0.0				0.0		15.0	15.0			
Time To Reduce (s)	0.0	0.0				0.0		50.0	50.0			
Recall Mode	None	None				None		C-Max	C-Max			
Act Effct Green (s)		7.4				7.4		113.0	113.0			
Actuated g/C Ratio		0.06				0.06		0.94	0.94			
v/c Ratio		0.16				0.12		0.72	0.03			
Control Delay		65.6				56.1		3.5	1.0			
Queue Delay		0.0				0.0		0.0	0.0			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		65.6				56.1		3.5	1.0			
LOS		E				E		A	A			
Approach Delay		65.6			56.1			3.5				
Approach LOS		E			E			A				
Queue Length 50th (ft)		14				9		0	0			
Queue Length 95th (ft)		m16				30		390	m8			
Internal Link Dist (ft)		200			877			145			462	
Turn Bay Length (ft)									125			
Base Capacity (vph)		380				328		3331	1490			
Starvation Cap Reductn		0				0		0	0			
Spillback Cap Reductn		0				0		0	0			
Storage Cap Reductn		0				0		0	0			
Reduced v/c Ratio		0.05				0.04		0.72	0.03			

Intersection Summary	
Area Type: Other	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 4.2	Intersection LOS: A
Intersection Capacity Utilization 83.6%	ICU Level of Service E
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 21: Capital Boulevard & Rolling Acres Road Leftover/Rolling Acres Road

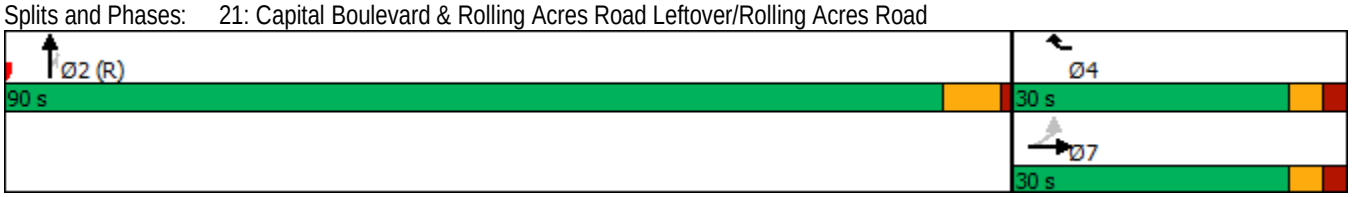


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	4	0	0	0	7	0	1458	9	0	0	0
Future Volume (vph)	0	4	0	0	0	7	0	1458	9	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			4%			0%			0%	
Storage Length (ft)	0		0	0		0	0		125	0		0
Storage Lanes	0		0	0		1	0		1	0		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	0.95	1.00	1.00	1.00	1.00
Frt						0.865			0.850			
Flt Protected												
Satd. Flow (prot)	0	1863	0	0	0	1579	0	3539	1583	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	1863	0	0	0	1579	0	3539	1583	0	0	0
Right Turn on Red	No		No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			25			55			55	
Link Distance (ft)		280			957			225			542	
Travel Time (s)		4.2			26.1			2.8			6.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	4	0	0	0	8	0	1620	10	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	4	0	0	0	8	0	1620	10	0	0	0
Turn Type		NA				Prot		NA	Perm			
Protected Phases		7				4		2				
Permitted Phases	7								2			
Detector Phase	7	7				4		2	2			
Switch Phase												
Minimum Initial (s)	7.0	7.0				7.0		14.0	14.0			
Minimum Split (s)	12.3	12.3				12.3		20.2	20.2			
Total Split (s)	30.0	30.0				30.0		90.0	90.0			
Total Split (%)	25.0%	25.0%				25.0%		75.0%	75.0%			
Maximum Green (s)	24.7	24.7				24.7		83.8	83.8			
Yellow Time (s)	3.0	3.0				3.0		5.2	5.2			
All-Red Time (s)	2.3	2.3				2.3		1.0	1.0			
Lost Time Adjust (s)		-0.3				-0.3		-1.2	-1.2			
Total Lost Time (s)		5.0				5.0		5.0	5.0			
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0				2.0		6.0	6.0			
Minimum Gap (s)	2.0	2.0				2.0		3.4	3.4			
Time Before Reduce (s)	0.0	0.0				0.0		15.0	15.0			
Time To Reduce (s)	0.0	0.0				0.0		50.0	50.0			
Recall Mode	None	None				None		C-Max	C-Max			
Act Effct Green (s)		7.3				7.3		116.5	116.5			
Actuated g/C Ratio		0.06				0.06		0.97	0.97			
v/c Ratio		0.04				0.08		0.47	0.01			
Control Delay		57.0				55.3		1.1	0.7			
Queue Delay		0.0				0.0		0.0	0.0			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		57.0				55.3		1.1	0.7			
LOS		E				E		A	A			
Approach Delay		57.0			55.3			1.1				
Approach LOS		E			E			A				
Queue Length 50th (ft)		3				6		0	0			
Queue Length 95th (ft)		m2				23		m147	m3			
Internal Link Dist (ft)		200			877			145			462	
Turn Bay Length (ft)									125			
Base Capacity (vph)		388				328		3437	1537			
Starvation Cap Reductn		0				0		0	0			
Spillback Cap Reductn		0				0		0	0			
Storage Cap Reductn		0				0		0	0			
Reduced v/c Ratio		0.01				0.02		0.47	0.01			

Intersection Summary	
Area Type: Other	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.47	
Intersection Signal Delay: 1.5	Intersection LOS: A
Intersection Capacity Utilization 65.2%	ICU Level of Service C
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 21: Capital Boulevard & Rolling Acres Road Leftover/Rolling Acres Road

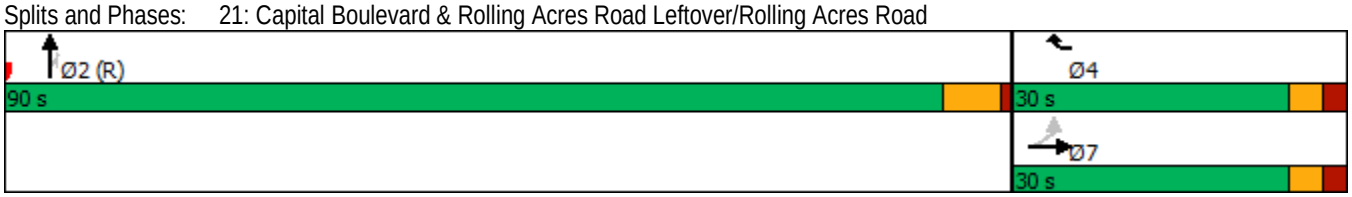


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	10	0	0	0	11	0	2214	38	0	0	0
Future Volume (vph)	6	10	0	0	0	11	0	2214	38	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			4%			0%			0%	
Storage Length (ft)	0		0	0		0	0		125	0		0
Storage Lanes	0		0	0		1	0		1	0		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	0.95	1.00	1.00	1.00	1.00
Frt						0.865			0.850			
Flt Protected		0.981										
Satd. Flow (prot)	0	1827	0	0	0	1579	0	3539	1583	0	0	0
Flt Permitted		0.981										
Satd. Flow (perm)	0	1827	0	0	0	1579	0	3539	1583	0	0	0
Right Turn on Red	No		No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			25			55			55	
Link Distance (ft)		280			957			225			542	
Travel Time (s)		4.2			26.1			2.8			6.7	
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)	7	11	0	0	0	12	0	2460	42	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	18	0	0	0	12	0	2460	42	0	0	0
Turn Type	Perm	NA				Prot		NA	Perm			
Protected Phases		7				4		2				
Permitted Phases	7								2			
Detector Phase	7	7				4		2	2			
Switch Phase												
Minimum Initial (s)	7.0	7.0				7.0		14.0	14.0			
Minimum Split (s)	12.3	12.3				12.3		20.2	20.2			
Total Split (s)	30.0	30.0				30.0		90.0	90.0			
Total Split (%)	25.0%	25.0%				25.0%		75.0%	75.0%			
Maximum Green (s)	24.7	24.7				24.7		83.8	83.8			
Yellow Time (s)	3.0	3.0				3.0		5.2	5.2			
All-Red Time (s)	2.3	2.3				2.3		1.0	1.0			
Lost Time Adjust (s)		-0.3				-0.3		-1.2	-1.2			
Total Lost Time (s)		5.0				5.0		5.0	5.0			
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0				2.0		6.0	6.0			
Minimum Gap (s)	2.0	2.0				2.0		3.4	3.4			
Time Before Reduce (s)	0.0	0.0				0.0		15.0	15.0			
Time To Reduce (s)	0.0	0.0				0.0		50.0	50.0			
Recall Mode	None	None				None		C-Max	C-Max			
Act Effct Green (s)		7.4				7.4		113.0	113.0			
Actuated g/C Ratio		0.06				0.06		0.94	0.94			
v/c Ratio		0.16				0.12		0.74	0.03			
Control Delay		66.2				56.1		3.9	1.0			
Queue Delay		0.0				0.0		0.0	0.0			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		66.2				56.1		3.9	1.0			
LOS		E				E		A	A			
Approach Delay		66.3			56.1			3.8				
Approach LOS		E			E			A				
Queue Length 50th (ft)		14				9		0	0			
Queue Length 95th (ft)		m16				30		429	m8			
Internal Link Dist (ft)		200			877			145			462	
Turn Bay Length (ft)									125			
Base Capacity (vph)		380				328		3331	1490			
Starvation Cap Reductn		0				0		0	0			
Spillback Cap Reductn		0				0		0	0			
Storage Cap Reductn		0				0		0	0			
Reduced v/c Ratio		0.05				0.04		0.74	0.03			

Intersection Summary	
Area Type: Other	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 4.5	Intersection LOS: A
Intersection Capacity Utilization 85.4%	ICU Level of Service E
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 21: Capital Boulevard & Rolling Acres Road Leftover/Rolling Acres Road



21: Capital Boulevard & Rolling Acres Road Leftover/Rolling Acres Road

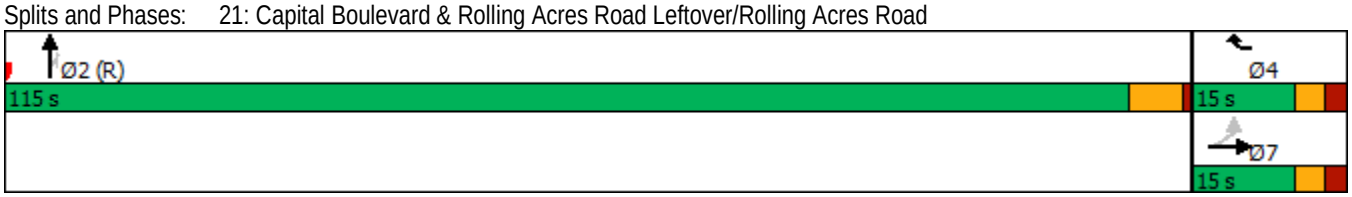
Timing Plan: AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	4	0	0	0	7	0	1458	9	0	0	0
Future Volume (vph)	0	4	0	0	0	7	0	1458	9	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			4%			0%			0%	
Storage Length (ft)	0		0	0		0	0		125	0		0
Storage Lanes	0		0	0		1	0		1	0		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	0.95	1.00	1.00	1.00	1.00
Frt						0.865			0.850			
Flt Protected												
Satd. Flow (prot)	0	1863	0	0	0	1579	0	3539	1583	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	1863	0	0	0	1579	0	3539	1583	0	0	0
Right Turn on Red	No		No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			25			55			55	
Link Distance (ft)		280			957			225			542	
Travel Time (s)		4.2			26.1			2.8			6.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	4	0	0	0	8	0	1620	10	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	4	0	0	0	8	0	1620	10	0	0	0
Turn Type		NA				Prot		NA	Perm			
Protected Phases		7				4		2				
Permitted Phases	7								2			
Detector Phase	7	7				4		2	2			
Switch Phase												
Minimum Initial (s)	7.0	7.0				7.0		14.0	14.0			
Minimum Split (s)	12.3	12.3				12.3		20.2	20.2			
Total Split (s)	15.0	15.0				15.0		115.0	115.0			
Total Split (%)	11.5%	11.5%				11.5%		88.5%	88.5%			
Maximum Green (s)	9.7	9.7				9.7		108.8	108.8			
Yellow Time (s)	3.0	3.0				3.0		5.2	5.2			
All-Red Time (s)	2.3	2.3				2.3		1.0	1.0			
Lost Time Adjust (s)		-0.3				-0.3		-1.2	-1.2			
Total Lost Time (s)		5.0				5.0		5.0	5.0			
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0				2.0		6.0	6.0			
Minimum Gap (s)	2.0	2.0				2.0		3.4	3.4			
Time Before Reduce (s)	0.0	0.0				0.0		15.0	15.0			
Time To Reduce (s)	0.0	0.0				0.0		50.0	50.0			
Recall Mode	None	None				None		C-Max	C-Max			
Act Effct Green (s)		7.3				7.3		126.5	126.5			
Actuated g/C Ratio		0.06				0.06		0.97	0.97			
v/c Ratio		0.04				0.09		0.47	0.01			
Control Delay		50.0				60.7		0.5	0.3			
Queue Delay		0.0				0.0		0.0	0.0			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		50.0				60.7		0.5	0.3			
LOS		D				E		A	A			
Approach Delay		50.0			60.7			0.5				
Approach LOS		D			E			A				
Queue Length 50th (ft)		3				7		0	0			
Queue Length 95th (ft)		m2				24		60	m1			
Internal Link Dist (ft)		200			877			145			462	
Turn Bay Length (ft)									125			
Base Capacity (vph)		143				121		3445	1541			
Starvation Cap Reductn		0				0		0	0			
Spillback Cap Reductn		0				0		0	0			
Storage Cap Reductn		0				0		0	0			
Reduced v/c Ratio		0.03				0.07		0.47	0.01			

Intersection Summary	
Area Type:	Other
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 73 (56%), Referenced to phase 2:NBT, Start of Green	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.47	
Intersection Signal Delay: 0.9	Intersection LOS: A
Intersection Capacity Utilization 65.2%	ICU Level of Service C
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 21: Capital Boulevard & Rolling Acres Road Leftover/Rolling Acres Road



21: Capital Boulevard & Rolling Acres Road Leftover/Rolling Acres Road

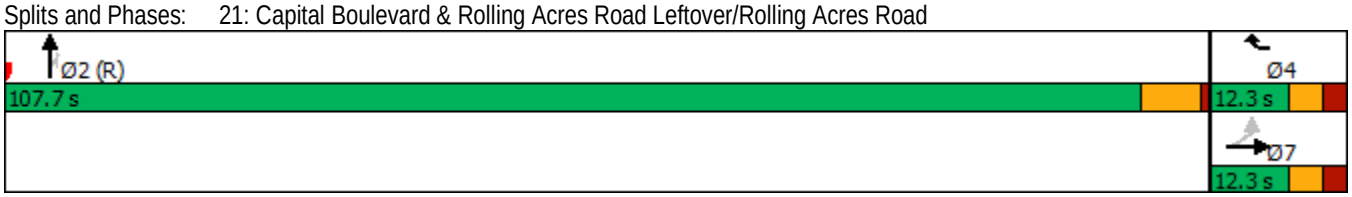
Timing Plan: PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	10	0	0	0	11	0	2214	38	0	0	0
Future Volume (vph)	6	10	0	0	0	11	0	2214	38	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			4%			0%			0%	
Storage Length (ft)	0		0	0		0	0		125	0		0
Storage Lanes	0		0	0		1	0		1	0		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	0.95	1.00	1.00	1.00	1.00
Frt						0.865			0.850			
Flt Protected		0.981										
Satd. Flow (prot)	0	1827	0	0	0	1579	0	3539	1583	0	0	0
Flt Permitted		0.981										
Satd. Flow (perm)	0	1827	0	0	0	1579	0	3539	1583	0	0	0
Right Turn on Red	No		No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			25			55			55	
Link Distance (ft)		280			957			225			542	
Travel Time (s)		4.2			26.1			2.8			6.7	
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)	7	11	0	0	0	12	0	2460	42	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	18	0	0	0	12	0	2460	42	0	0	0
Turn Type	Perm	NA				Prot		NA	Perm			
Protected Phases		7				4		2				
Permitted Phases	7								2			
Detector Phase	7	7				4		2	2			
Switch Phase												
Minimum Initial (s)	7.0	7.0				7.0		14.0	14.0			
Minimum Split (s)	12.3	12.3				12.3		20.2	20.2			
Total Split (s)	12.3	12.3				12.3		107.7	107.7			
Total Split (%)	10.3%	10.3%				10.3%		89.8%	89.8%			
Maximum Green (s)	7.0	7.0				7.0		101.5	101.5			
Yellow Time (s)	3.0	3.0				3.0		5.2	5.2			
All-Red Time (s)	2.3	2.3				2.3		1.0	1.0			
Lost Time Adjust (s)		-0.3				-0.3		-1.2	-1.2			
Total Lost Time (s)		5.0				5.0		5.0	5.0			
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0				2.0		6.0	6.0			
Minimum Gap (s)	2.0	2.0				2.0		3.4	3.4			
Time Before Reduce (s)	0.0	0.0				0.0		15.0	15.0			
Time To Reduce (s)	0.0	0.0				0.0		50.0	50.0			
Recall Mode	None	None				None		C-Max	C-Max			
Act Effct Green (s)		7.3				7.3		113.1	113.1			
Actuated g/C Ratio		0.06				0.06		0.94	0.94			
v/c Ratio		0.16				0.12		0.74	0.03			
Control Delay		72.8				56.5		1.2	0.3			
Queue Delay		0.0				0.0		0.0	0.0			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		72.8				56.5		1.2	0.3			
LOS		E				E		A	A			
Approach Delay		72.8			56.5			1.2				
Approach LOS		E			E			A				
Queue Length 50th (ft)		13				9		0	0			
Queue Length 95th (ft)		m15				30		36	m1			
Internal Link Dist (ft)		200			877			145			462	
Turn Bay Length (ft)									125			
Base Capacity (vph)		111				96		3335	1491			
Starvation Cap Reductn		0				0		0	0			
Spillback Cap Reductn		0				0		0	0			
Storage Cap Reductn		0				0		0	0			
Reduced v/c Ratio		0.16				0.13		0.74	0.03			

Intersection Summary	
Area Type: Other	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 13 (11%), Referenced to phase 2:NBT, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 2.0	Intersection LOS: A
Intersection Capacity Utilization 85.4%	ICU Level of Service E
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 21: Capital Boulevard & Rolling Acres Road Leftover/Rolling Acres Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	624	0	320	0	0	0	0	0	1371	370
Future Volume (vph)	0	0	624	0	320	0	0	0	0	0	1371	370
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			0%			0%			1%	
Storage Length (ft)	0		400	0		0	0		0	0		175
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Frt			0.850									0.850
Flt Protected												
Satd. Flow (prot)	0	0	2745	0	1863	0	0	0	0	0	3522	1575
Flt Permitted												
Satd. Flow (perm)	0	0	2745	0	1863	0	0	0	0	0	3522	1575
Right Turn on Red			No	No		No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			45			55			55	
Link Distance (ft)		1183			237			577			277	
Travel Time (s)		32.3			3.6			7.2			3.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	693	0	356	0	0	0	0	0	1523	411
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	693	0	356	0	0	0	0	0	1523	411
Turn Type			Prot		NA						NA	Perm
Protected Phases			8		3						6	
Permitted Phases				3								6
Detector Phase			8	3	3						6	6
Switch Phase												
Minimum Initial (s)			7.0	7.0	7.0						14.0	14.0
Minimum Split (s)			14.0	14.0	14.0						21.0	21.0
Total Split (s)			30.0	30.0	30.0						90.0	90.0
Total Split (%)			25.0%	25.0%	25.0%						75.0%	75.0%
Maximum Green (s)			23.0	23.0	23.0						83.0	83.0
Yellow Time (s)			5.0	5.0	5.0						5.0	5.0
All-Red Time (s)			2.0	2.0	2.0						2.0	2.0
Lost Time Adjust (s)			-2.0		-2.0						-2.0	-2.0
Total Lost Time (s)			5.0		5.0						5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)			2.0	2.0	2.0						6.0	6.0
Minimum Gap (s)			2.0	2.0	2.0						3.4	3.4
Time Before Reduce (s)			0.0	0.0	0.0						15.0	15.0
Time To Reduce (s)			0.0	0.0	0.0						50.0	50.0
Recall Mode			None	None	None						C-Max	C-Max
Act Effct Green (s)			25.0		25.0						85.0	85.0
Actuated g/C Ratio			0.21		0.21						0.71	0.71
v/c Ratio			1.21		0.92						0.61	0.37
Control Delay			152.5		75.8						6.3	5.4
Queue Delay			0.0		0.0						0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay			152.5		75.8						6.3	5.4
LOS			F		E						A	A
Approach Delay		152.5			75.8						6.1	
Approach LOS		F			E						A	
Queue Length 50th (ft)			~372		273						175	74
Queue Length 95th (ft)			#504		m#444						m133	m72
Internal Link Dist (ft)		1103			157			497			197	
Turn Bay Length (ft)			400									175
Base Capacity (vph)			571		388						2494	1115
Starvation Cap Reductn			0		0						0	0
Spillback Cap Reductn			0		0						0	0
Storage Cap Reductn			0		0						0	0
Reduced v/c Ratio			1.21		0.92						0.61	0.37

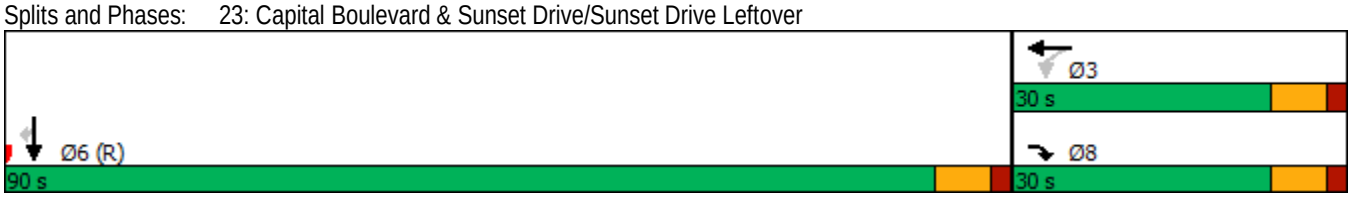
Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 6:SBT, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.21	
Intersection Signal Delay: 48.5	Intersection LOS: D
Intersection Capacity Utilization 97.6%	ICU Level of Service F
Analysis Period (min) 15	

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

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

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 23: Capital Boulevard & Sunset Drive/Sunset Drive Leftover

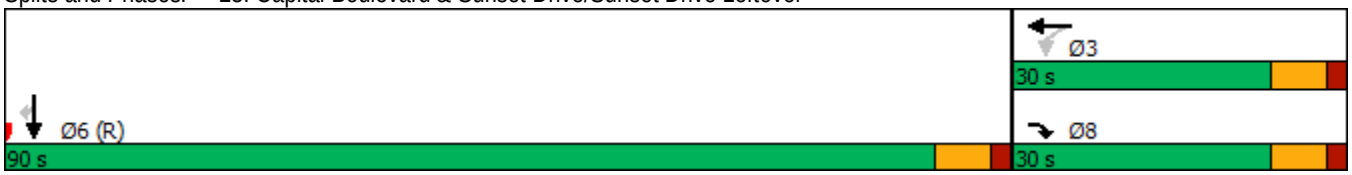


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	152	0	40	0	0	0	0	0	1347	57
Future Volume (vph)	0	0	152	0	40	0	0	0	0	0	1347	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			0%			0%			1%	
Storage Length (ft)	0		400	0		0	0		0	0		175
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Frt			0.850									0.850
Flt Protected												
Satd. Flow (prot)	0	0	2745	0	1863	0	0	0	0	0	3522	1575
Flt Permitted												
Satd. Flow (perm)	0	0	2745	0	1863	0	0	0	0	0	3522	1575
Right Turn on Red			No	No		No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			45			55			55	
Link Distance (ft)		1183			237			577			277	
Travel Time (s)		32.3			3.6			7.2			3.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	169	0	44	0	0	0	0	0	1497	63
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	169	0	44	0	0	0	0	0	1497	63
Turn Type			Prot		NA						NA	Perm
Protected Phases			8		3						6	
Permitted Phases				3								6
Detector Phase			8	3	3						6	6
Switch Phase												
Minimum Initial (s)			7.0	7.0	7.0						14.0	14.0
Minimum Split (s)			14.0	14.0	14.0						21.0	21.0
Total Split (s)			30.0	30.0	30.0						90.0	90.0
Total Split (%)			25.0%	25.0%	25.0%						75.0%	75.0%
Maximum Green (s)			23.0	23.0	23.0						83.0	83.0
Yellow Time (s)			5.0	5.0	5.0						5.0	5.0
All-Red Time (s)			2.0	2.0	2.0						2.0	2.0
Lost Time Adjust (s)			-2.0		-2.0						-2.0	-2.0
Total Lost Time (s)			5.0		5.0						5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)			2.0	2.0	2.0						6.0	6.0
Minimum Gap (s)			2.0	2.0	2.0						3.4	3.4
Time Before Reduce (s)			0.0	0.0	0.0						15.0	15.0
Time To Reduce (s)			0.0	0.0	0.0						50.0	50.0
Recall Mode			None	None	None						C-Max	C-Max
Act Effct Green (s)			13.8		13.8						96.2	96.2
Actuated g/C Ratio			0.12		0.12						0.80	0.80
v/c Ratio			0.54		0.21						0.53	0.05
Control Delay			56.0		49.7						3.5	1.5
Queue Delay			0.0		0.0						0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay			56.0		49.7						3.5	1.5
LOS			E		D						A	A
Approach Delay		56.0			49.7						3.5	
Approach LOS		E			D						A	
Queue Length 50th (ft)			71		32						68	5
Queue Length 95th (ft)			107		m65						m83	m8
Internal Link Dist (ft)		1103			157			497			197	
Turn Bay Length (ft)			400									175
Base Capacity (vph)			571		388						2824	1262
Starvation Cap Reductn			0		0						0	0
Spillback Cap Reductn			0		0						0	0
Storage Cap Reductn			0		0						0	0
Reduced v/c Ratio			0.30		0.11						0.53	0.05

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 6:SBT, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.54	
Intersection Signal Delay: 9.6	Intersection LOS: A
Intersection Capacity Utilization 51.7%	ICU Level of Service A
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 23: Capital Boulevard & Sunset Drive/Sunset Drive Leftover



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	767	0	394	0	0	0	0	0	1720	455
Future Volume (vph)	0	0	767	0	394	0	0	0	0	0	1720	455
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			0%			0%			1%	
Storage Length (ft)	0		400	0		0	0		0	0		175
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Frt			0.850									0.850
Flt Protected												
Satd. Flow (prot)	0	0	2745	0	1863	0	0	0	0	0	3522	1575
Flt Permitted												
Satd. Flow (perm)	0	0	2745	0	1863	0	0	0	0	0	3522	1575
Right Turn on Red			No	No		No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			45			55			55	
Link Distance (ft)		1183			237			577			277	
Travel Time (s)		32.3			3.6			7.2			3.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	852	0	438	0	0	0	0	0	1911	506
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	852	0	438	0	0	0	0	0	1911	506
Turn Type			Prot		NA						NA	Perm
Protected Phases			8		3						6	
Permitted Phases				3								6
Detector Phase			8	3	3						6	6
Switch Phase												
Minimum Initial (s)			7.0	7.0	7.0						14.0	14.0
Minimum Split (s)			14.0	14.0	14.0						21.0	21.0
Total Split (s)			30.0	30.0	30.0						90.0	90.0
Total Split (%)			25.0%	25.0%	25.0%						75.0%	75.0%
Maximum Green (s)			23.0	23.0	23.0						83.0	83.0
Yellow Time (s)			5.0	5.0	5.0						5.0	5.0
All-Red Time (s)			2.0	2.0	2.0						2.0	2.0
Lost Time Adjust (s)			-2.0		-2.0						-2.0	-2.0
Total Lost Time (s)			5.0		5.0						5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)			2.0	2.0	2.0						6.0	6.0
Minimum Gap (s)			2.0	2.0	2.0						3.4	3.4
Time Before Reduce (s)			0.0	0.0	0.0						15.0	15.0
Time To Reduce (s)			0.0	0.0	0.0						50.0	50.0
Recall Mode			None	None	None						C-Max	C-Max
Act Effct Green (s)			25.0		25.0						85.0	85.0
Actuated g/C Ratio			0.21		0.21						0.71	0.71
v/c Ratio			1.49		1.13						0.77	0.45
Control Delay			265.2		128.8						6.4	4.5
Queue Delay			0.0		0.0						0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay			265.2		128.8						6.4	4.5
LOS			F		F						A	A
Approach Delay		265.2			128.8						6.0	
Approach LOS		F			F						A	
Queue Length 50th (ft)			~518		~395						200	79
Queue Length 95th (ft)			#657		m#587						m138	m72
Internal Link Dist (ft)		1103			157			497			197	
Turn Bay Length (ft)			400									175
Base Capacity (vph)			571		388						2494	1115
Starvation Cap Reductn			0		0						0	0
Spillback Cap Reductn			0		0						0	0
Storage Cap Reductn			0		0						0	0
Reduced v/c Ratio			1.49		1.13						0.77	0.45

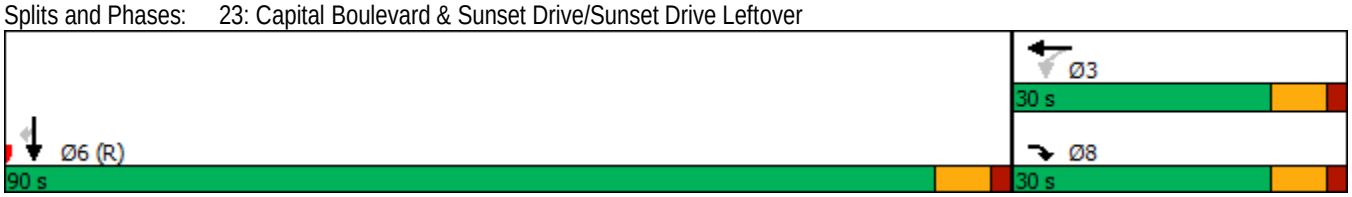
Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 6:SBT, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.49	
Intersection Signal Delay: 80.1	Intersection LOS: F
Intersection Capacity Utilization 120.0%	ICU Level of Service H
Analysis Period (min) 15	

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

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

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 23: Capital Boulevard & Sunset Drive/Sunset Drive Leftover

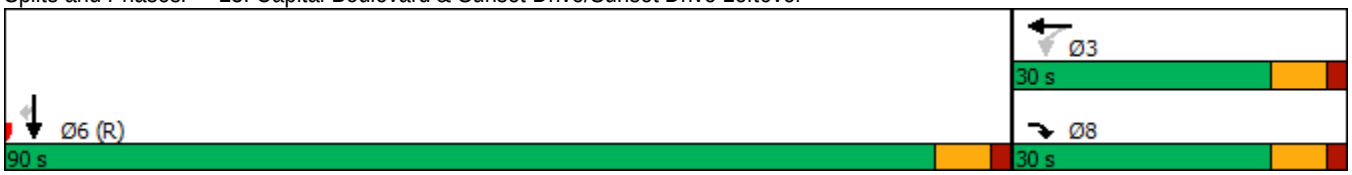


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	187	0	49	0	0	0	0	0	1680	70
Future Volume (vph)	0	0	187	0	49	0	0	0	0	0	1680	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			0%			0%			1%	
Storage Length (ft)	0		400	0		0	0		0	0		175
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Frt			0.850									0.850
Flt Protected												
Satd. Flow (prot)	0	0	2745	0	1863	0	0	0	0	0	3522	1575
Flt Permitted												
Satd. Flow (perm)	0	0	2745	0	1863	0	0	0	0	0	3522	1575
Right Turn on Red			No	No		No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			45			55			55	
Link Distance (ft)		1183			237			577			277	
Travel Time (s)		32.3			3.6			7.2			3.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	208	0	54	0	0	0	0	0	1867	78
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	208	0	54	0	0	0	0	0	1867	78
Turn Type			Prot		NA						NA	Perm
Protected Phases			8		3						6	
Permitted Phases				3								6
Detector Phase			8	3	3						6	6
Switch Phase												
Minimum Initial (s)			7.0	7.0	7.0						14.0	14.0
Minimum Split (s)			14.0	14.0	14.0						21.0	21.0
Total Split (s)			30.0	30.0	30.0						90.0	90.0
Total Split (%)			25.0%	25.0%	25.0%						75.0%	75.0%
Maximum Green (s)			23.0	23.0	23.0						83.0	83.0
Yellow Time (s)			5.0	5.0	5.0						5.0	5.0
All-Red Time (s)			2.0	2.0	2.0						2.0	2.0
Lost Time Adjust (s)			-2.0		-2.0						-2.0	-2.0
Total Lost Time (s)			5.0		5.0						5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)			2.0	2.0	2.0						6.0	6.0
Minimum Gap (s)			2.0	2.0	2.0						3.4	3.4
Time Before Reduce (s)			0.0	0.0	0.0						15.0	15.0
Time To Reduce (s)			0.0	0.0	0.0						50.0	50.0
Recall Mode			None	None	None						C-Max	C-Max
Act Effct Green (s)			15.5		15.5						94.5	94.5
Actuated g/C Ratio			0.13		0.13						0.79	0.79
v/c Ratio			0.59		0.23						0.67	0.06
Control Delay			55.8		47.9						5.5	1.7
Queue Delay			0.0		0.0						0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay			55.8		47.9						5.5	1.7
LOS			E		D						A	A
Approach Delay		55.8			47.9						5.3	
Approach LOS		E			D						A	
Queue Length 50th (ft)			87		38						98	6
Queue Length 95th (ft)			127		m74						m738	m10
Internal Link Dist (ft)		1103			157			497			197	
Turn Bay Length (ft)			400									175
Base Capacity (vph)			571		388						2774	1240
Starvation Cap Reductn			0		0						0	0
Spillback Cap Reductn			0		0						0	0
Storage Cap Reductn			0		0						0	0
Reduced v/c Ratio			0.36		0.14						0.67	0.06

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 6:SBT, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 11.1	Intersection LOS: B
Intersection Capacity Utilization 63.8%	ICU Level of Service B
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 23: Capital Boulevard & Sunset Drive/Sunset Drive Leftover



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	767	0	394	0	0	0	0	0	1782	455
Future Volume (vph)	0	0	767	0	394	0	0	0	0	0	1782	455
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			0%			0%			1%	
Storage Length (ft)	0		400	0		0	0		0	0		175
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Frt			0.850									0.850
Flt Protected												
Satd. Flow (prot)	0	0	2745	0	1863	0	0	0	0	0	3522	1575
Flt Permitted												
Satd. Flow (perm)	0	0	2745	0	1863	0	0	0	0	0	3522	1575
Right Turn on Red			No	No		No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			45			55			55	
Link Distance (ft)		1183			237			577			277	
Travel Time (s)		32.3			3.6			7.2			3.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	852	0	438	0	0	0	0	0	1980	506
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	852	0	438	0	0	0	0	0	1980	506
Turn Type			Prot		NA						NA	Perm
Protected Phases			8		3						6	
Permitted Phases				3								6
Detector Phase			8	3	3						6	6
Switch Phase												
Minimum Initial (s)			7.0	7.0	7.0						14.0	14.0
Minimum Split (s)			14.0	14.0	14.0						21.0	21.0
Total Split (s)			30.0	30.0	30.0						90.0	90.0
Total Split (%)			25.0%	25.0%	25.0%						75.0%	75.0%
Maximum Green (s)			23.0	23.0	23.0						83.0	83.0
Yellow Time (s)			5.0	5.0	5.0						5.0	5.0
All-Red Time (s)			2.0	2.0	2.0						2.0	2.0
Lost Time Adjust (s)			-2.0		-2.0						-2.0	-2.0
Total Lost Time (s)			5.0		5.0						5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)			2.0	2.0	2.0						6.0	6.0
Minimum Gap (s)			2.0	2.0	2.0						3.4	3.4
Time Before Reduce (s)			0.0	0.0	0.0						15.0	15.0
Time To Reduce (s)			0.0	0.0	0.0						50.0	50.0
Recall Mode			None	None	None						C-Max	C-Max
Act Effct Green (s)			25.0		25.0						85.0	85.0
Actuated g/C Ratio			0.21		0.21						0.71	0.71
v/c Ratio			1.49		1.13						0.79	0.45
Control Delay			265.2		128.7						6.7	4.4
Queue Delay			0.0		0.0						0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay			265.2		128.7						6.7	4.4
LOS			F		F						A	A
Approach Delay		265.2			128.7						6.2	
Approach LOS		F			F						A	
Queue Length 50th (ft)			~518		~396						203	77
Queue Length 95th (ft)			#657		m#586						m136	m68
Internal Link Dist (ft)		1103			157			497			197	
Turn Bay Length (ft)			400									175
Base Capacity (vph)			571		388						2494	1115
Starvation Cap Reductn			0		0						0	0
Spillback Cap Reductn			0		0						0	0
Storage Cap Reductn			0		0						0	0
Reduced v/c Ratio			1.49		1.13						0.79	0.45

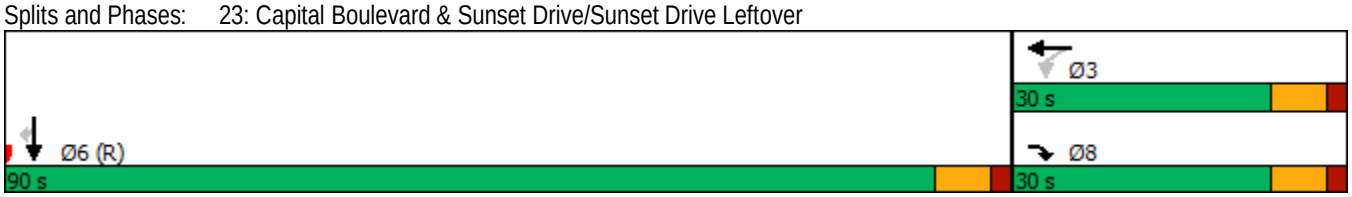
Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 6:SBT, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.49	
Intersection Signal Delay: 78.9	Intersection LOS: E
Intersection Capacity Utilization 122.3%	ICU Level of Service H
Analysis Period (min) 15	

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

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

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 23: Capital Boulevard & Sunset Drive/Sunset Drive Leftover

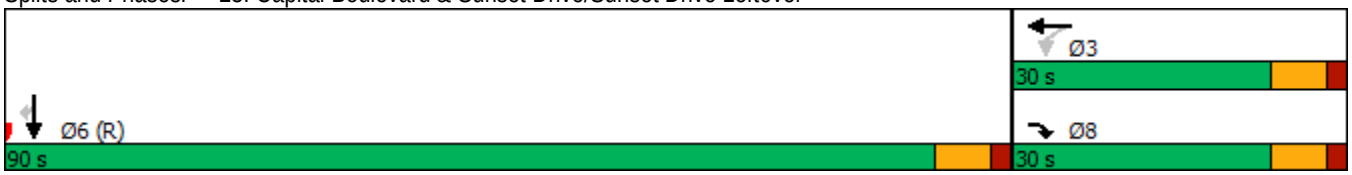


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	187	0	49	0	0	0	0	0	1709	70
Future Volume (vph)	0	0	187	0	49	0	0	0	0	0	1709	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			0%			0%			1%	
Storage Length (ft)	0		400	0		0	0		0	0		175
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Frt			0.850									0.850
Flt Protected												
Satd. Flow (prot)	0	0	2745	0	1863	0	0	0	0	0	3522	1575
Flt Permitted												
Satd. Flow (perm)	0	0	2745	0	1863	0	0	0	0	0	3522	1575
Right Turn on Red			No	No		No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			45			55			55	
Link Distance (ft)		1183			237			577			277	
Travel Time (s)		32.3			3.6			7.2			3.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	208	0	54	0	0	0	0	0	1899	78
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	208	0	54	0	0	0	0	0	1899	78
Turn Type			Prot		NA						NA	Perm
Protected Phases			8		3						6	
Permitted Phases				3								6
Detector Phase			8	3	3						6	6
Switch Phase												
Minimum Initial (s)			7.0	7.0	7.0						14.0	14.0
Minimum Split (s)			14.0	14.0	14.0						21.0	21.0
Total Split (s)			30.0	30.0	30.0						90.0	90.0
Total Split (%)			25.0%	25.0%	25.0%						75.0%	75.0%
Maximum Green (s)			23.0	23.0	23.0						83.0	83.0
Yellow Time (s)			5.0	5.0	5.0						5.0	5.0
All-Red Time (s)			2.0	2.0	2.0						2.0	2.0
Lost Time Adjust (s)			-2.0		-2.0						-2.0	-2.0
Total Lost Time (s)			5.0		5.0						5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)			2.0	2.0	2.0						6.0	6.0
Minimum Gap (s)			2.0	2.0	2.0						3.4	3.4
Time Before Reduce (s)			0.0	0.0	0.0						15.0	15.0
Time To Reduce (s)			0.0	0.0	0.0						50.0	50.0
Recall Mode			None	None	None						C-Max	C-Max
Act Effct Green (s)			15.5		15.5						94.5	94.5
Actuated g/C Ratio			0.13		0.13						0.79	0.79
v/c Ratio			0.59		0.23						0.68	0.06
Control Delay			55.8		47.9						5.6	1.6
Queue Delay			0.0		0.0						0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay			55.8		47.9						5.6	1.6
LOS			E		D						A	A
Approach Delay		55.8			47.9						5.5	
Approach LOS		E			D						A	
Queue Length 50th (ft)			87		38						98	6
Queue Length 95th (ft)			127		m74						m740	m10
Internal Link Dist (ft)		1103			157			497			197	
Turn Bay Length (ft)			400									175
Base Capacity (vph)			571		388						2774	1240
Starvation Cap Reductn			0		0						0	0
Spillback Cap Reductn			0		0						0	0
Storage Cap Reductn			0		0						0	0
Reduced v/c Ratio			0.36		0.14						0.68	0.06

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 6:SBT, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 11.2	Intersection LOS: B
Intersection Capacity Utilization 65.6%	ICU Level of Service C
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 23: Capital Boulevard & Sunset Drive/Sunset Drive Leftover



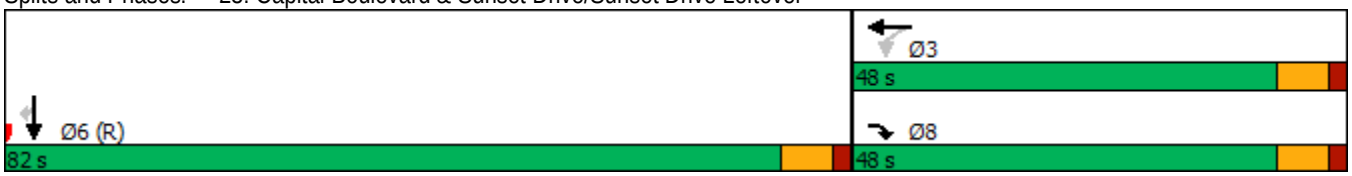
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	767	0	394	0	0	0	0	0	1782	455
Future Volume (vph)	0	0	767	0	394	0	0	0	0	0	1782	455
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			0%			0%			1%	
Storage Length (ft)	0		400	0		0	0		0	0		175
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Frt			0.850									0.850
Flt Protected												
Satd. Flow (prot)	0	0	2745	0	1863	0	0	0	0	0	3522	1575
Flt Permitted												
Satd. Flow (perm)	0	0	2745	0	1863	0	0	0	0	0	3522	1575
Right Turn on Red			No	No		No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			45			55			55	
Link Distance (ft)		1183			237			577			277	
Travel Time (s)		32.3			3.6			7.2			3.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	852	0	438	0	0	0	0	0	1980	506
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	852	0	438	0	0	0	0	0	1980	506
Turn Type			Prot		NA						NA	Perm
Protected Phases			8		3						6	
Permitted Phases				3								6
Detector Phase			8	3	3						6	6
Switch Phase												
Minimum Initial (s)			7.0	7.0	7.0						14.0	14.0
Minimum Split (s)			14.0	14.0	14.0						21.0	21.0
Total Split (s)			48.0	48.0	48.0						82.0	82.0
Total Split (%)			36.9%	36.9%	36.9%						63.1%	63.1%
Maximum Green (s)			41.0	41.0	41.0						75.0	75.0
Yellow Time (s)			5.0	5.0	5.0						5.0	5.0
All-Red Time (s)			2.0	2.0	2.0						2.0	2.0
Lost Time Adjust (s)			-2.0		-2.0						-2.0	-2.0
Total Lost Time (s)			5.0		5.0						5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)			2.0	2.0	2.0						6.0	6.0
Minimum Gap (s)			2.0	2.0	2.0						3.4	3.4
Time Before Reduce (s)			0.0	0.0	0.0						15.0	15.0
Time To Reduce (s)			0.0	0.0	0.0						50.0	50.0
Recall Mode			None	None	None						C-Max	C-Max
Act Effct Green (s)			42.4		42.4						77.6	77.6
Actuated g/C Ratio			0.33		0.33						0.60	0.60
v/c Ratio			0.95		0.72						0.94	0.54
Control Delay			63.5		34.8						9.5	4.9
Queue Delay			0.0		0.0						0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay			63.5		34.8						9.5	4.9
LOS			E		C						A	A
Approach Delay		63.5			34.8						8.5	
Approach LOS		E			C						A	
Queue Length 50th (ft)			394		239						298	97
Queue Length 95th (ft)			#538		400						m281	m89
Internal Link Dist (ft)		1103			157			497			197	
Turn Bay Length (ft)			400									175
Base Capacity (vph)			907		616						2102	939
Starvation Cap Reductn			0		0						0	0
Spillback Cap Reductn			0		0						0	0
Storage Cap Reductn			0		0						0	0
Reduced v/c Ratio			0.94		0.71						0.94	0.54

Intersection Summary	
Area Type:	Other
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 6:SBT, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 24.0	Intersection LOS: C
Intersection Capacity Utilization 122.3%	ICU Level of Service H
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 23: Capital Boulevard & Sunset Drive/Sunset Drive Leftover

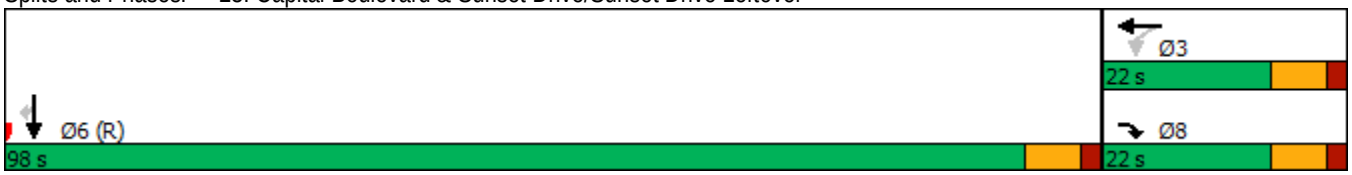


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	187	0	49	0	0	0	0	0	1709	70
Future Volume (vph)	0	0	187	0	49	0	0	0	0	0	1709	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			0%			0%			1%	
Storage Length (ft)	0		400	0		0	0		0	0		175
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Frt			0.850									0.850
Flt Protected												
Satd. Flow (prot)	0	0	2745	0	1863	0	0	0	0	0	3522	1575
Flt Permitted												
Satd. Flow (perm)	0	0	2745	0	1863	0	0	0	0	0	3522	1575
Right Turn on Red			No	No		No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			45			55			55	
Link Distance (ft)		1183			237			577			277	
Travel Time (s)		32.3			3.6			7.2			3.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	208	0	54	0	0	0	0	0	1899	78
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	208	0	54	0	0	0	0	0	1899	78
Turn Type			Prot		NA						NA	Perm
Protected Phases			8		3						6	
Permitted Phases				3								6
Detector Phase			8	3	3						6	6
Switch Phase												
Minimum Initial (s)			7.0	7.0	7.0						14.0	14.0
Minimum Split (s)			14.0	14.0	14.0						21.0	21.0
Total Split (s)			22.0	22.0	22.0						98.0	98.0
Total Split (%)			18.3%	18.3%	18.3%						81.7%	81.7%
Maximum Green (s)			15.0	15.0	15.0						91.0	91.0
Yellow Time (s)			5.0	5.0	5.0						5.0	5.0
All-Red Time (s)			2.0	2.0	2.0						2.0	2.0
Lost Time Adjust (s)			-2.0		-2.0						-2.0	-2.0
Total Lost Time (s)			5.0		5.0						5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)			2.0	2.0	2.0						6.0	6.0
Minimum Gap (s)			2.0	2.0	2.0						3.4	3.4
Time Before Reduce (s)			0.0	0.0	0.0						15.0	15.0
Time To Reduce (s)			0.0	0.0	0.0						50.0	50.0
Recall Mode			None	None	None						C-Max	C-Max
Act Effct Green (s)			14.8		14.8						95.2	95.2
Actuated g/C Ratio			0.12		0.12						0.79	0.79
v/c Ratio			0.62		0.23						0.68	0.06
Control Delay			57.7		39.3						1.1	0.2
Queue Delay			0.0		0.0						0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay			57.7		39.3						1.1	0.2
LOS			E		D						A	A
Approach Delay		57.7			39.3						1.0	
Approach LOS		E			D						A	
Queue Length 50th (ft)			87		39						10	1
Queue Length 95th (ft)			130		m44						m12	m1
Internal Link Dist (ft)		1103			157			497			197	
Turn Bay Length (ft)			400									175
Base Capacity (vph)			388		263						2793	1249
Starvation Cap Reductn			0		0						0	0
Spillback Cap Reductn			0		0						0	0
Storage Cap Reductn			0		0						0	0
Reduced v/c Ratio			0.54		0.21						0.68	0.06

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 6:SBT, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 7.2	Intersection LOS: A
Intersection Capacity Utilization 65.6%	ICU Level of Service C
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 23: Capital Boulevard & Sunset Drive/Sunset Drive Leftover



APPENDIX G

CAPACITY ANALYSIS CALCULATIONS

CAPITAL BOULEVARD

&

FLEX WAY

Intersection	
Int Delay, s/veh	6.2

Movement	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR
Lane Configurations								
Traffic Vol, veh/h	4	4	4	17	1329	150	1836	9
Future Vol, veh/h	4	4	4	17	1329	150	1836	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	None	-	-	None	-	-	None
Storage Length	0	-	-	250	-	275	-	75
Veh in Median Storage, #	0	-	-	-	0	-	0	-
Grade, %	0	-	-	-	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2
Mvmt Flow	4	4	4	19	1477	167	2040	10

Major/Minor	Minor2		Major1			Major2		
Conflicting Flow All	3159	1020	2040	2050	0	1477	-	0
Stage 1	2374	-	-	-	-	-	-	-
Stage 2	785	-	-	-	-	-	-	-
Critical Hdwy	6.84	6.94	6.44	4.14	-	6.44	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.52	2.22	-	2.52	-	-
Pot Cap-1 Maneuver	8	234	70	270	-	~ 163	-	-
Stage 1	56	-	-	-	-	-	-	-
Stage 2	410	-	-	-	-	-	-	-
Platoon blocked, %					-		-	-
Mov Cap-1 Maneuver	0	234	174	174	-	~ 163	-	-
Mov Cap-2 Maneuver	0	-	-	-	-	-	-	-
Stage 1	49	-	-	-	-	-	-	-
Stage 2	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	21	0.4	10
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBU	SBT	SBR
Capacity (veh/h)	174	-	234	~ 163	-	-
HCM Lane V/C Ratio	0.134	-	0.038	1.022	-	-
HCM Control Delay (s)	28.9	-	21	133.1	-	-
HCM Lane LOS	D	-	C	F	-	-
HCM 95th %tile Q(veh)	0.5	-	0.1	8.1	-	-

Notes

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

Intersection	
Int Delay, s/veh	6.6

Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Vol, veh/h	4	8	4	1764	60	1437	4
Future Vol, veh/h	4	8	4	1764	60	1437	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	-	None
Storage Length	0	-	250	-	275	-	75
Veh in Median Storage, #	0	-	-	0	-	0	-
Grade, %	0	-	-	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	4	9	4	1960	67	1597	4

Major/Minor	Minor2		Major1		Major2		
Conflicting Flow All	2719	799	1601	0	1960	-	0
Stage 1	1731	-	-	-	-	-	-
Stage 2	988	-	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	6.44	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	2.52	-	-
Pot Cap-1 Maneuver	17	328	405	-	79	-	-
Stage 1	128	-	-	-	-	-	-
Stage 2	321	-	-	-	-	-	-
Platoon blocked, %				-		-	-
Mov Cap-1 Maneuver	~ 3	328	405	-	79	-	-
Mov Cap-2 Maneuver	~ 3	-	-	-	-	-	-
Stage 1	127	-	-	-	-	-	-
Stage 2	49	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 1041	0	6.1
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBU	SBT	SBR
Capacity (veh/h)	405	-	9	79	-	-
HCM Lane V/C Ratio	0.011	-	1.481	0.844	-	-
HCM Control Delay (s)	14	-	$ 1041	151.6	-	-
HCM Lane LOS	B	-	F	F	-	-
HCM 95th %tile Q(veh)	0	-	2.5	4.3	-	-

Notes

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

Intersection	
Int Delay, s/veh	27.5

Movement	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR
Lane Configurations								
Traffic Vol, veh/h	4	4	4	21	1645	184	2292	11
Future Vol, veh/h	4	4	4	21	1645	184	2292	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	None	-	-	None	-	-	None
Storage Length	0	-	-	250	-	275	-	75
Veh in Median Storage, #	0	-	-	-	0	-	0	-
Grade, %	0	-	-	-	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2
Mvmt Flow	4	4	4	23	1828	204	2547	12

Major/Minor	Minor2		Major1			Major2		
Conflicting Flow All	3923	1274	2547	2559	0	1828	-	0
Stage 1	2955	-	-	-	-	-	-	-
Stage 2	968	-	-	-	-	-	-	-
Critical Hdwy	6.84	6.94	6.44	4.14	-	6.44	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.52	2.22	-	2.52	-	-
Pot Cap-1 Maneuver	~ 2	158	32	170	-	~ 96	-	-
Stage 1	26	-	-	-	-	-	-	-
Stage 2	329	-	-	-	-	-	-	-
Platoon blocked, %					-		-	-
Mov Cap-1 Maneuver	0	158	99	99	-	~ 96	-	-
Mov Cap-2 Maneuver	0	-	-	-	-	-	-	-
Stage 1	19	-	-	-	-	-	-	-
Stage 2	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	29.1	0.8	45.4
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBU	SBT	SBR
Capacity (veh/h)	99	-	158	~ 96	-	-
HCM Lane V/C Ratio	0.281	-	0.056	2.13	-	-
HCM Control Delay (s)	55	-	29.1	$ 613.7	-	-
HCM Lane LOS	F	-	D	F	-	-
HCM 95th %tile Q(veh)	1	-	0.2	17.9	-	-

Notes

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

Intersection	
Int Delay, s/veh	14.4

Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Vol, veh/h	4	10	4	2207	74	1790	4
Future Vol, veh/h	4	10	4	2207	74	1790	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	-	None
Storage Length	0	-	250	-	275	-	75
Veh in Median Storage, #	0	-	-	0	-	0	-
Grade, %	0	-	-	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	4	11	4	2452	82	1989	4

Major/Minor	Minor2		Major1		Major2		
Conflicting Flow All	3387	995	1993	0	2452	-	0
Stage 1	2153	-	-	-	-	-	-
Stage 2	1234	-	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	6.44	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	2.52	-	-
Pot Cap-1 Maneuver	6	243	285	-	~ 37	-	-
Stage 1	75	-	-	-	-	-	-
Stage 2	238	-	-	-	-	-	-
Platoon blocked, %				-		-	-
Mov Cap-1 Maneuver	0	243	285	-	~ 37	-	-
Mov Cap-2 Maneuver	0	-	-	-	-	-	-
Stage 1	74	-	-	-	-	-	-
Stage 2	0	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	20.8	0	31.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBU	SBT	SBR
Capacity (veh/h)	285	-	243	~ 37	-	-
HCM Lane V/C Ratio	0.016	-	0.064	2.222	-	-
HCM Control Delay (s)	17.8	-	20.8	$ 793.1	-	-
HCM Lane LOS	C	-	C	F	-	-
HCM 95th %tile Q(veh)	0	-	0.2	9.1	-	-

Notes

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

Intersection	
Int Delay, s/veh	35.5

Movement	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR
Lane Configurations								
Traffic Vol, veh/h	23	31	4	165	1645	184	2323	42
Future Vol, veh/h	23	31	4	165	1645	184	2323	42
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	None	-	-	None	-	-	None
Storage Length	0	-	-	250	-	275	-	75
Veh in Median Storage, #	0	-	-	-	0	-	0	-
Grade, %	0	-	-	-	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2
Mvmt Flow	26	34	4	183	1828	204	2581	47

Major/Minor	Minor2		Major1			Major2		
Conflicting Flow All	4277	1291	2581	2628	0	1828	-	0
Stage 1	2989	-	-	-	-	-	-	-
Stage 2	1288	-	-	-	-	-	-	-
Critical Hdwy	6.84	6.94	6.44	4.14	-	6.44	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.52	2.22	-	2.52	-	-
Pot Cap-1 Maneuver	~ 1	154	31	~ 160	-	~ 96	-	-
Stage 1	~ 25	-	-	-	-	-	-	-
Stage 2	223	-	-	-	-	-	-	-
Platoon blocked, %					-		-	-
Mov Cap-1 Maneuver	0	154	142	~ 142	-	~ 96	-	-
Mov Cap-2 Maneuver	0	-	-	-	-	-	-	-
Stage 1	0	-	-	-	-	-	-	-
Stage 2	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	42.6	22.9	44.3
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBU	SBT	SBR
Capacity (veh/h)	~ 142	-	154	~ 96	-	-
HCM Lane V/C Ratio	1.322	-	0.39	2.13	-	-
HCM Control Delay (s)	246.1	-	42.6	$ 613.7	-	-
HCM Lane LOS	F	-	E	F	-	-
HCM 95th %tile Q(veh)	11.7	-	1.7	17.9	-	-

Notes

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

Intersection	
Int Delay, s/veh	15.7

Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Vol, veh/h	66	85	70	2207	74	1805	16
Future Vol, veh/h	66	85	70	2207	74	1805	16
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	-	None
Storage Length	0	-	250	-	275	-	75
Veh in Median Storage, #	0	-	-	0	-	0	-
Grade, %	0	-	-	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	73	94	78	2452	82	2006	18

Major/Minor	Minor2		Major1		Major2		
Conflicting Flow All	3552	1003	2024	0	2452	-	0
Stage 1	2170	-	-	-	-	-	-
Stage 2	1382	-	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	6.44	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	2.52	-	-
Pot Cap-1 Maneuver	~ 4	240	277	-	~ 37	-	-
Stage 1	~ 73	-	-	-	-	-	-
Stage 2	198	-	-	-	-	-	-
Platoon blocked, %				-		-	-
Mov Cap-1 Maneuver	0	240	277	-	~ 37	-	-
Mov Cap-2 Maneuver	0	-	-	-	-	-	-
Stage 1	~ 52	-	-	-	-	-	-
Stage 2	0	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	48.7	0.7	31
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBU	SBT	SBR
Capacity (veh/h)	277	-	240	~ 37	-	-
HCM Lane V/C Ratio	0.281	-	0.699	2.222	-	-
HCM Control Delay (s)	23	-	48.7	$ 793.1	-	-
HCM Lane LOS	C	-	E	F	-	-
HCM 95th %tile Q(veh)	1.1	-	4.6	9.1	-	-

Notes

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

Lane Group	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	23	31	4	165	1645	184	2323	42
Future Volume (vph)	23	31	4	165	1645	184	2323	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	125		350		275		125
Storage Lanes	1	1		1		1		1
Taper Length (ft)	100			100		100		
Lane Util. Factor	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Frt		0.850						0.850
Flt Protected	0.950			0.950		0.950		
Satd. Flow (prot)	1770	1583	0	1770	3539	1770	3539	1583
Flt Permitted	0.950			0.950		0.950		
Satd. Flow (perm)	1770	1583	0	1770	3539	1770	3539	1583
Right Turn on Red		No						No
Satd. Flow (RTOR)								
Link Speed (mph)	25				55		55	
Link Distance (ft)	1112				480		702	
Travel Time (s)	30.3				6.0		8.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	26	34	4	183	1828	204	2581	47
Shared Lane Traffic (%)								
Lane Group Flow (vph)	26	34	0	187	1828	204	2581	47
Turn Type	Prot	pm+ov	Prot	Prot	NA	Prot	NA	pm+ov
Protected Phases	4	5!	5!	5	2	1	6	4
Permitted Phases		4						6
Detector Phase	4	5	5	5	2	1	6	4
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	14.0	7.0	14.0	7.0
Minimum Split (s)	14.0	14.0	14.0	14.0	21.0	14.0	21.0	14.0
Total Split (s)	14.0	19.0	19.0	19.0	87.0	29.0	97.0	14.0
Total Split (%)	10.8%	14.6%	14.6%	14.6%	66.9%	22.3%	74.6%	10.8%
Maximum Green (s)	7.0	12.0	12.0	12.0	80.0	22.0	90.0	7.0
Yellow Time (s)	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
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0
Lead/Lag		Lag	Lag	Lag	Lag	Lead	Lead	
Lead-Lag Optimize?		Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	C-Max	None	C-Max	None
Act Effct Green (s)	9.0	25.2		14.0	87.9	20.9	94.8	106.0
Actuated g/C Ratio	0.07	0.19		0.11	0.68	0.16	0.73	0.82
v/c Ratio	0.21	0.11		0.98	0.76	0.72	1.00	0.04
Control Delay	61.7	42.1		98.9	8.1	58.0	28.7	2.2
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	61.7	42.1		98.9	8.1	58.0	28.7	2.2
LOS	E	D		F	A	E	C	A
Approach Delay	50.6				16.5		30.3	
Approach LOS	D				B		C	

Lane Group	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR
Queue Length 50th (ft)	21	23		161	168	157	~1226	6
Queue Length 95th (ft)	52	53		m#276	182	m166	#1358	m6
Internal Link Dist (ft)	1032				400		622	
Turn Bay Length (ft)		125		350		275		125
Base Capacity (vph)	122	306		190	2392	326	2580	1290
Starvation Cap Reductn	0	0		0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0
Reduced v/c Ratio	0.21	0.11		0.98	0.76	0.63	1.00	0.04

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 57 (44%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 140
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.00
Intersection Signal Delay: 24.9 Intersection LOS: C
Intersection Capacity Utilization 91.9% ICU Level of Service F
Analysis Period (min) 15

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

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

m Volume for 95th percentile queue is metered by upstream signal.

! Phase conflict between lane groups.

Splits and Phases: 3: Capital Boulevard & Flex Way

Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	66	85	70	2207	74	1805	16
Future Volume (vph)	66	85	70	2207	74	1805	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	125	350		275		125
Storage Lanes	1	1	1		1		1
Taper Length (ft)	100		100		100		
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.95	1.00
Frt		0.850					0.850
Flt Protected	0.950		0.950		0.950		
Satd. Flow (prot)	1770	1583	1770	3539	1770	3539	1583
Flt Permitted	0.950		0.950		0.950		
Satd. Flow (perm)	1770	1583	1770	3539	1770	3539	1583
Right Turn on Red		No					No
Satd. Flow (RTOR)							
Link Speed (mph)	25			55		55	
Link Distance (ft)	1112			480		702	
Travel Time (s)	30.3			6.0		8.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	73	94	78	2452	82	2006	18
Shared Lane Traffic (%)							
Lane Group Flow (vph)	73	94	78	2452	82	2006	18
Turn Type	Prot	pm+ov	Prot	NA	Prot	NA	pm+ov
Protected Phases	4	5	5	2	1	6	4
Permitted Phases		4					6
Detector Phase	4	5	5	2	1	6	4
Switch Phase							
Minimum Initial (s)	7.0	7.0	7.0	14.0	7.0	14.0	7.0
Minimum Split (s)	14.0	14.0	14.0	21.0	14.0	21.0	14.0
Total Split (s)	14.0	16.0	16.0	92.0	14.0	90.0	14.0
Total Split (%)	11.7%	13.3%	13.3%	76.7%	11.7%	75.0%	11.7%
Maximum Green (s)	7.0	9.0	9.0	85.0	7.0	83.0	7.0
Yellow Time (s)	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
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag		Lag	Lag	Lead	Lag	Lead	
Lead-Lag Optimize?		Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	C-Max	None	C-Max	None
Act Effct Green (s)	9.0	21.9	10.7	93.6	9.0	88.1	99.3
Actuated g/C Ratio	0.08	0.18	0.09	0.78	0.08	0.73	0.83
v/c Ratio	0.55	0.33	0.50	0.89	0.62	0.77	0.01
Control Delay	69.9	44.4	51.1	8.0	68.0	5.3	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.9	44.4	51.1	8.0	68.0	5.3	0.9
LOS	E	D	D	A	E	A	A
Approach Delay	55.5			9.3		7.7	
Approach LOS	E			A		A	

Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Queue Length 50th (ft)	56	62	61	178	64	181	1
Queue Length 95th (ft)	#109	112	m67	#492	m99	195	m1
Internal Link Dist (ft)	1032			400		622	
Turn Bay Length (ft)		125	350		275		125
Base Capacity (vph)	132	292	162	2760	132	2598	1309
Starvation Cap Reductn	0	0	0	3	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.32	0.48	0.89	0.62	0.77	0.01

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 4 (3%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 10.2 Intersection LOS: B
Intersection Capacity Utilization 75.7% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Capital Boulevard & Flex Way

APPENDIX H

CAPACITY ANALYSIS CALCULATIONS
AND TURN LANE WARRANTS
CAPITAL BOULEVARD
&
SOUTHERN SITE DRIVEAY

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	4	0	1347	1840	4
Future Vol, veh/h	0	4	0	1347	1840	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	4	0	1497	2044	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	1024	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	233	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	233	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	20.8	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	233	-	-
HCM Lane V/C Ratio	-	0.019	-	-
HCM Control Delay (s)	-	20.8	-	-
HCM Lane LOS	-	C	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	4	0	1766	1445	4
Future Vol, veh/h	0	4	0	1766	1445	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	4	0	1962	1606	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	805	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	325	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	325	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.2	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	325	-	-
HCM Lane V/C Ratio	-	0.014	-	-
HCM Control Delay (s)	-	16.2	-	-
HCM Lane LOS	-	C	-	-
HCM 95th %tile Q(veh)	-	0	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	4	0	1667	2297	4
Future Vol, veh/h	0	4	0	1667	2297	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	4	0	1852	2552	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	1278	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	157	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	157	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	28.6	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	157	-	-
HCM Lane V/C Ratio	-	0.028	-	-
HCM Control Delay (s)	-	28.6	-	-
HCM Lane LOS	-	D	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	4	0	2210	1800	4
Future Vol, veh/h	0	4	0	2210	1800	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	4	0	2456	2000	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	1002	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	241	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	241	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	20.2	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	241	-	-
HCM Lane V/C Ratio	-	0.018	-	-
HCM Control Delay (s)	-	20.2	-	-
HCM Lane LOS	-	C	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	28	0	1811	2324	31
Future Vol, veh/h	0	28	0	1811	2324	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	31	0	2012	2582	34

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	1308	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	150	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	150	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	35.2	0	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	150	-	-
HCM Lane V/C Ratio	-	0.207	-	-
HCM Control Delay (s)	-	35.2	-	-
HCM Lane LOS	-	E	-	-
HCM 95th %tile Q(veh)	-	0.7	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	73	0	2278	1875	15
Future Vol, veh/h	0	73	0	2278	1875	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	81	0	2531	2083	17

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	1050	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	224	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	224	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

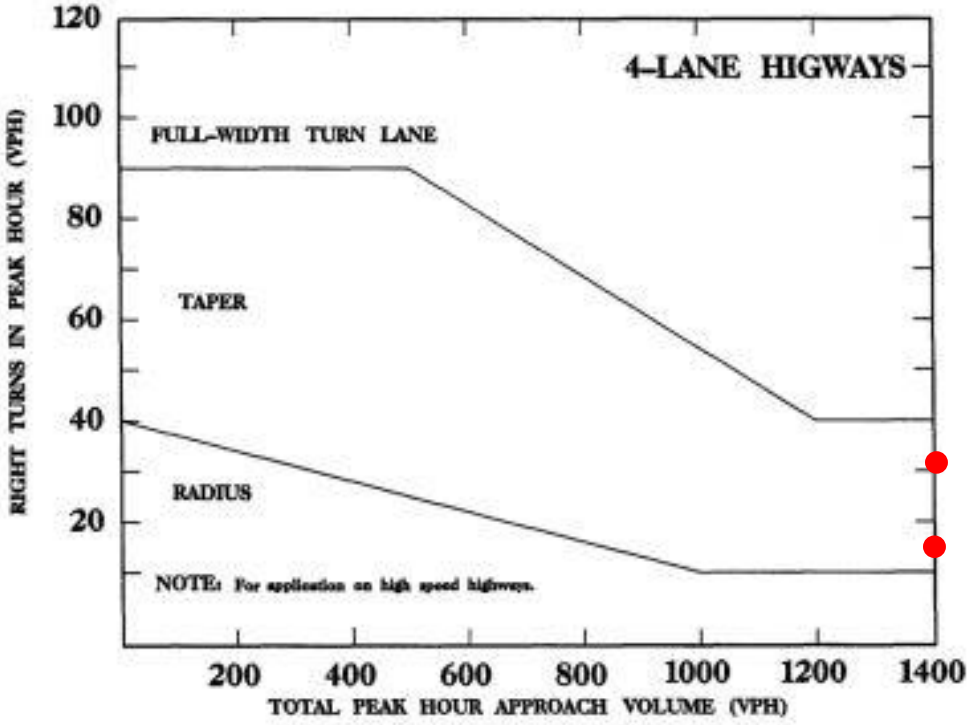
Approach	EB	NB	SB
HCM Control Delay, s	29.9	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	224	-	-
HCM Lane V/C Ratio	-	0.362	-	-
HCM Control Delay (s)	-	29.9	-	-
HCM Lane LOS	-	D	-	-
HCM 95th %tile Q(veh)	-	1.6	-	-

Capital Boulevard and Southern Site Driveway

2030 Build				
Peak Hour	**Approach**	**Right Turn Volume**	**Approach Volume**	**Warranted?**
AM	Southbound	31	2355	No
PM	Southbound	15	1890	No

RIGHT TURN LANE WARRANTS



APPENDIX I

CAPACITY ANALYSIS CALCULATIONS

CAPITAL BOULEVARD

&

WALL ROAD

Lane Group	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	149	169	4	1176	42	4	168	1670
Future Volume (vph)	149	169	4	1176	42	4	168	1670
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)	1%			-1%				1%
Storage Length (ft)	100	275	300		325		300	
Storage Lanes	1	1	1		1		1	
Taper Length (ft)	100		100				100	
Lane Util. Factor	0.97	1.00	1.00	0.95	1.00	0.95	1.00	0.95
Frt		0.850			0.850			
Flt Protected	0.950		0.950				0.950	
Satd. Flow (prot)	3416	1575	1778	3557	1591	0	1761	3522
Flt Permitted	0.950		0.099				0.167	
Satd. Flow (perm)	3416	1575	185	3557	1591	0	310	3522
Right Turn on Red		No			No			
Satd. Flow (RTOR)								
Link Speed (mph)	45			55				55
Link Distance (ft)	1434			1181				632
Travel Time (s)	21.7			14.6				7.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	166	188	4	1307	47	4	187	1856
Shared Lane Traffic (%)								
Lane Group Flow (vph)	166	188	4	1307	47	0	191	1856
Turn Type	Prot	pm+ov	D.Pm	NA	pm+ov	D.P+P	D.P+P	NA
Protected Phases	8	1!		2	8	1!	1	6
Permitted Phases		8	6		2	2	2	
Detector Phase	8	1	6	2	8	1	1	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	14.0	14.0	7.0	7.0	7.0	14.0
Minimum Split (s)	13.7	13.3	20.7	20.7	13.7	13.3	13.3	20.7
Total Split (s)	25.0	20.0	125.0	105.0	25.0	20.0	20.0	125.0
Total Split (%)	16.7%	13.3%	83.3%	70.0%	16.7%	13.3%	13.3%	83.3%
Maximum Green (s)	18.3	13.7	118.3	98.3	18.3	13.7	13.7	118.3
Yellow Time (s)	3.0	3.0	5.3	5.3	3.0	3.0	3.0	5.3
All-Red Time (s)	3.7	3.3	1.4	1.4	3.7	3.3	3.3	1.4
Lost Time Adjust (s)	-1.7	-1.3	-1.7	-1.7	-1.7		-1.3	-1.7
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0
Lead/Lag		Lag		Lead		Lag	Lag	
Lead-Lag Optimize?		Yes		Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	6.0	6.0	2.0	2.0	2.0	6.0
Minimum Gap (s)	2.0	2.0	3.4	3.4	2.0	2.0	2.0	3.4
Time Before Reduce (s)	0.0	0.0	15.0	15.0	0.0	0.0	0.0	15.0
Time To Reduce (s)	0.0	0.0	30.0	30.0	0.0	0.0	0.0	30.0
Recall Mode	None	None	C-Max	C-Max	None	None	None	C-Max
Act Effct Green (s)	13.4	33.4	126.6	106.6	125.0		121.6	126.6
Actuated g/C Ratio	0.09	0.22	0.84	0.71	0.83		0.81	0.84
v/c Ratio	0.55	0.54	0.03	0.52	0.04		0.48	0.62
Control Delay	71.9	57.4	2.8	11.0	2.2		12.9	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0

Lane Group	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Total Delay	71.9	57.4	2.8	11.0	2.2		12.9	5.2
LOS	E	E	A	B	A		B	A
Approach Delay	64.2			10.7				5.9
Approach LOS	E			B				A
Queue Length 50th (ft)	81	164	1	283	6		26	250
Queue Length 95th (ft)	119	240	3	361	13		47	346
Internal Link Dist (ft)	1354			1101				552
Turn Bay Length (ft)	100	275	300		325		300	
Base Capacity (vph)	455	350	156	2528	1321		396	2973
Starvation Cap Reductn	0	0	0	0	0		0	0
Spillback Cap Reductn	0	0	0	0	0		0	0
Storage Cap Reductn	0	0	0	0	0		0	0
Reduced v/c Ratio	0.36	0.54	0.03	0.52	0.04		0.48	0.62

Intersection Summary	
Area Type: Other	
Cycle Length: 150	
Actuated Cycle Length: 150	
Offset: 142 (95%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.62	
Intersection Signal Delay: 13.1	Intersection LOS: B
Intersection Capacity Utilization 76.2%	ICU Level of Service D
Analysis Period (min) 15	
! Phase conflict between lane groups.	

Splits and Phases: 5: Capital Boulevard & Wall Road

Lane Group	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	104	159	4	1606	137	4	82	1362
Future Volume (vph)	104	159	4	1606	137	4	82	1362
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)	1%			-1%				1%
Storage Length (ft)	100	275	300		325		300	
Storage Lanes	1	1	1		1		1	
Taper Length (ft)	100		100				100	
Lane Util. Factor	0.97	1.00	1.00	0.95	1.00	0.95	1.00	0.95
Frt		0.850			0.850			
Flt Protected	0.950		0.950				0.950	
Satd. Flow (prot)	3416	1575	1778	3557	1591	0	1761	3522
Flt Permitted	0.950		0.155				0.090	
Satd. Flow (perm)	3416	1575	290	3557	1591	0	167	3522
Right Turn on Red		No			No			
Satd. Flow (RTOR)								
Link Speed (mph)	45			55				55
Link Distance (ft)	1434			1181				632
Travel Time (s)	21.7			14.6				7.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	116	177	4	1784	152	4	91	1513
Shared Lane Traffic (%)								
Lane Group Flow (vph)	116	177	4	1784	152	0	95	1513
Turn Type	Prot	pm+ov	D.Pm	NA	pm+ov	D.P+P	D.P+P	NA
Protected Phases	8	1!		2	8	1!	1	6
Permitted Phases		8	6		2	2	2	
Detector Phase	8	1	6	2	8	1	1	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	14.0	14.0	7.0	7.0	7.0	14.0
Minimum Split (s)	13.7	13.3	20.7	20.7	13.7	13.3	13.3	20.7
Total Split (s)	25.0	15.0	125.0	110.0	25.0	15.0	15.0	125.0
Total Split (%)	16.7%	10.0%	83.3%	73.3%	16.7%	10.0%	10.0%	83.3%
Maximum Green (s)	18.3	8.7	118.3	103.3	18.3	8.7	8.7	118.3
Yellow Time (s)	3.0	3.0	5.3	5.3	3.0	3.0	3.0	5.3
All-Red Time (s)	3.7	3.3	1.4	1.4	3.7	3.3	3.3	1.4
Lost Time Adjust (s)	-1.7	-1.3	-1.7	-1.7	-1.7		-1.3	-1.7
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0
Lead/Lag		Lag		Lead		Lag	Lag	
Lead-Lag Optimize?		Yes		Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	6.0	6.0	2.0	2.0	2.0	6.0
Minimum Gap (s)	2.0	2.0	3.4	3.4	2.0	2.0	2.0	3.4
Time Before Reduce (s)	0.0	0.0	15.0	15.0	0.0	0.0	0.0	15.0
Time To Reduce (s)	0.0	0.0	30.0	30.0	0.0	0.0	0.0	30.0
Recall Mode	None	None	C-Max	C-Max	None	None	None	C-Max
Act Effct Green (s)	11.3	26.3	128.7	113.7	130.0		123.7	128.7
Actuated g/C Ratio	0.08	0.18	0.86	0.76	0.87		0.82	0.86
v/c Ratio	0.45	0.64	0.02	0.66	0.11		0.39	0.50
Control Delay	71.7	68.7	2.0	10.5	1.7		13.1	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0

Lane Group	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Total Delay	71.7	68.7	2.0	10.5	1.7		13.1	3.4
LOS	E	E	A	B	A		B	A
Approach Delay	69.9			9.8				4.0
Approach LOS	E			A				A
Queue Length 50th (ft)	57	163	0	395	16		11	147
Queue Length 95th (ft)	89	244	2	500	26		22	203
Internal Link Dist (ft)	1354			1101				552
Turn Bay Length (ft)	100	275	300		325		300	
Base Capacity (vph)	455	275	248	2696	1378		243	3022
Starvation Cap Reductn	0	0	0	0	0		0	0
Spillback Cap Reductn	0	0	0	0	0		0	0
Storage Cap Reductn	0	0	0	0	0		0	0
Reduced v/c Ratio	0.25	0.64	0.02	0.66	0.11		0.39	0.50

Intersection Summary	
Area Type: Other	
Cycle Length: 150	
Actuated Cycle Length: 150	
Offset: 113 (75%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 11.9	Intersection LOS: B
Intersection Capacity Utilization 72.6%	ICU Level of Service C
Analysis Period (min) 15	
! Phase conflict between lane groups.	

Splits and Phases: 5: Capital Boulevard & Wall Road

Lane Group	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	183	208	4	1456	52	4	207	2088
Future Volume (vph)	183	208	4	1456	52	4	207	2088
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)	1%			-1%				1%
Storage Length (ft)	100	275	300		325		300	
Storage Lanes	1	1	1		1		1	
Taper Length (ft)	100		100				100	
Lane Util. Factor	0.97	1.00	1.00	0.95	1.00	0.95	1.00	0.95
Frt		0.850			0.850			
Flt Protected	0.950		0.950				0.950	
Satd. Flow (prot)	3416	1575	1778	3557	1591	0	1761	3522
Flt Permitted	0.950		0.046				0.102	
Satd. Flow (perm)	3416	1575	86	3557	1591	0	189	3522
Right Turn on Red		No			No			
Satd. Flow (RTOR)								
Link Speed (mph)	45			55				55
Link Distance (ft)	1434			1181				632
Travel Time (s)	21.7			14.6				7.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	203	231	4	1618	58	4	230	2320
Shared Lane Traffic (%)								
Lane Group Flow (vph)	203	231	4	1618	58	0	234	2320
Turn Type	Prot	pm+ov	D.Pm	NA	pm+ov	D.P+P	D.P+P	NA
Protected Phases	8	1!		2	8	1!	1	6
Permitted Phases		8	6		2	2	2	
Detector Phase	8	1	6	2	8	1	1	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	14.0	14.0	7.0	7.0	7.0	14.0
Minimum Split (s)	13.7	13.3	20.7	20.7	13.7	13.3	13.3	20.7
Total Split (s)	25.0	20.0	125.0	105.0	25.0	20.0	20.0	125.0
Total Split (%)	16.7%	13.3%	83.3%	70.0%	16.7%	13.3%	13.3%	83.3%
Maximum Green (s)	18.3	13.7	118.3	98.3	18.3	13.7	13.7	118.3
Yellow Time (s)	3.0	3.0	5.3	5.3	3.0	3.0	3.0	5.3
All-Red Time (s)	3.7	3.3	1.4	1.4	3.7	3.3	3.3	1.4
Lost Time Adjust (s)	-1.7	-1.3	-1.7	-1.7	-1.7		-1.3	-1.7
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0
Lead/Lag		Lag		Lead		Lag	Lag	
Lead-Lag Optimize?		Yes		Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	6.0	6.0	2.0	2.0	2.0	6.0
Minimum Gap (s)	2.0	2.0	3.4	3.4	2.0	2.0	2.0	3.4
Time Before Reduce (s)	0.0	0.0	15.0	15.0	0.0	0.0	0.0	15.0
Time To Reduce (s)	0.0	0.0	30.0	30.0	0.0	0.0	0.0	30.0
Recall Mode	None	None	C-Max	C-Max	None	None	None	C-Max
Act Effct Green (s)	15.0	35.0	125.0	105.0	125.0		120.0	125.0
Actuated g/C Ratio	0.10	0.23	0.83	0.70	0.83		0.80	0.83
v/c Ratio	0.60	0.63	0.06	0.65	0.04		0.76	0.79
Control Delay	71.7	59.7	4.5	14.2	2.2		46.6	9.1
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0

Lane Group	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Total Delay	71.7	59.7	4.5	14.2	2.2		46.6	9.1
LOS	E	E	A	B	A		D	A
Approach Delay	65.3			13.8				12.5
Approach LOS	E			B				B
Queue Length 50th (ft)	99	205	1	423	8		83	472
Queue Length 95th (ft)	139	291	4	538	15		#211	660
Internal Link Dist (ft)	1354			1101				552
Turn Bay Length (ft)	100	275	300		325		300	
Base Capacity (vph)	455	367	71	2490	1314		308	2935
Starvation Cap Reductn	0	0	0	0	0		0	0
Spillback Cap Reductn	0	0	0	0	0		0	0
Storage Cap Reductn	0	0	0	0	0		0	0
Reduced v/c Ratio	0.45	0.63	0.06	0.65	0.04		0.76	0.79

Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 150
Offset: 142 (95%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 17.9 Intersection LOS: B
Intersection Capacity Utilization 87.7% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
! Phase conflict between lane groups.

Splits and Phases: 5: Capital Boulevard & Wall Road

Lane Group	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	128	196	4	2013	168	4	101	1698
Future Volume (vph)	128	196	4	2013	168	4	101	1698
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)	1%			-1%				1%
Storage Length (ft)	100	275	300		325		300	
Storage Lanes	1	1	1		1		1	
Taper Length (ft)	100		100				100	
Lane Util. Factor	0.97	1.00	1.00	0.95	1.00	0.95	1.00	0.95
Frt		0.850			0.850			
Flt Protected	0.950		0.950				0.950	
Satd. Flow (prot)	3416	1575	1778	3557	1591	0	1761	3522
Flt Permitted	0.950		0.096				0.036	
Satd. Flow (perm)	3416	1575	180	3557	1591	0	67	3522
Right Turn on Red		No			No			
Satd. Flow (RTOR)								
Link Speed (mph)	45			55				55
Link Distance (ft)	1434			1181				632
Travel Time (s)	21.7			14.6				7.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	142	218	4	2237	187	4	112	1887
Shared Lane Traffic (%)								
Lane Group Flow (vph)	142	218	4	2237	187	0	116	1887
Turn Type	Prot	pm+ov	D.Pm	NA	pm+ov	D.P+P	D.P+P	NA
Protected Phases	8	1!		2	8	1!	1	6
Permitted Phases		8	6		2	2	2	
Detector Phase	8	1	6	2	8	1	1	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	14.0	14.0	7.0	7.0	7.0	14.0
Minimum Split (s)	13.7	13.3	20.7	20.7	13.7	13.3	13.3	20.7
Total Split (s)	25.0	15.0	125.0	110.0	25.0	15.0	15.0	125.0
Total Split (%)	16.7%	10.0%	83.3%	73.3%	16.7%	10.0%	10.0%	83.3%
Maximum Green (s)	18.3	8.7	118.3	103.3	18.3	8.7	8.7	118.3
Yellow Time (s)	3.0	3.0	5.3	5.3	3.0	3.0	3.0	5.3
All-Red Time (s)	3.7	3.3	1.4	1.4	3.7	3.3	3.3	1.4
Lost Time Adjust (s)	-1.7	-1.3	-1.7	-1.7	-1.7		-1.3	-1.7
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0
Lead/Lag		Lag		Lead		Lag	Lag	
Lead-Lag Optimize?		Yes		Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	6.0	6.0	2.0	2.0	2.0	6.0
Minimum Gap (s)	2.0	2.0	3.4	3.4	2.0	2.0	2.0	3.4
Time Before Reduce (s)	0.0	0.0	15.0	15.0	0.0	0.0	0.0	15.0
Time To Reduce (s)	0.0	0.0	30.0	30.0	0.0	0.0	0.0	30.0
Recall Mode	None	None	C-Max	C-Max	None	None	None	C-Max
Act Effct Green (s)	12.3	27.3	127.7	112.7	130.0		122.7	127.7
Actuated g/C Ratio	0.08	0.18	0.85	0.75	0.87		0.82	0.85
v/c Ratio	0.51	0.76	0.03	0.84	0.14		0.69	0.63
Control Delay	71.9	75.6	2.5	16.8	1.7		62.0	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0

Lane Group	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Total Delay	71.9	75.6	2.5	16.8	1.7		62.0	4.9
LOS	E	E	A	B	A		E	A
Approach Delay	74.1			15.6				8.2
Approach LOS	E			B				A
Queue Length 50th (ft)	69	205	0	690	21		59	242
Queue Length 95th (ft)	105	296	3	884	31		#152	337
Internal Link Dist (ft)	1354			1101				552
Turn Bay Length (ft)	100	275	300		325		300	
Base Capacity (vph)	455	287	153	2671	1377		167	2997
Starvation Cap Reductn	0	0	0	0	0		0	0
Spillback Cap Reductn	0	0	0	0	0		0	0
Storage Cap Reductn	0	0	0	0	0		0	0
Reduced v/c Ratio	0.31	0.76	0.03	0.84	0.14		0.69	0.63

Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 150
Offset: 113 (75%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 16.9 Intersection LOS: B
Intersection Capacity Utilization 86.1% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
! Phase conflict between lane groups.

Splits and Phases: 5: Capital Boulevard & Wall Road

Lane Group	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	183	216	4	1592	52	4	208	2142
Future Volume (vph)	183	216	4	1592	52	4	208	2142
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)	1%			-1%				1%
Storage Length (ft)	100	275	300		325		300	
Storage Lanes	1	1	1		1		1	
Taper Length (ft)	100		100				100	
Lane Util. Factor	0.97	1.00	1.00	0.95	1.00	0.95	1.00	0.95
Frt		0.850			0.850			
Flt Protected	0.950		0.950				0.950	
Satd. Flow (prot)	3416	1575	1778	3557	1591	0	1761	3522
Flt Permitted	0.950		0.041				0.077	
Satd. Flow (perm)	3416	1575	77	3557	1591	0	143	3522
Right Turn on Red		No			No			
Satd. Flow (RTOR)								
Link Speed (mph)	45			55				55
Link Distance (ft)	1434			1181				632
Travel Time (s)	21.7			14.6				7.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	203	240	4	1769	58	4	231	2380
Shared Lane Traffic (%)								
Lane Group Flow (vph)	203	240	4	1769	58	0	235	2380
Turn Type	Prot	pm+ov	D.Pm	NA	pm+ov	D.P+P	D.P+P	NA
Protected Phases	8	1!		2	8	1!	1	6
Permitted Phases		8	6		2	2	2	
Detector Phase	8	1	6	2	8	1	1	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	14.0	14.0	7.0	7.0	7.0	14.0
Minimum Split (s)	13.7	13.3	20.7	20.7	13.7	13.3	13.3	20.7
Total Split (s)	25.0	20.0	125.0	105.0	25.0	20.0	20.0	125.0
Total Split (%)	16.7%	13.3%	83.3%	70.0%	16.7%	13.3%	13.3%	83.3%
Maximum Green (s)	18.3	13.7	118.3	98.3	18.3	13.7	13.7	118.3
Yellow Time (s)	3.0	3.0	5.3	5.3	3.0	3.0	3.0	5.3
All-Red Time (s)	3.7	3.3	1.4	1.4	3.7	3.3	3.3	1.4
Lost Time Adjust (s)	-1.7	-1.3	-1.7	-1.7	-1.7		-1.3	-1.7
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0
Lead/Lag		Lag		Lead		Lag	Lag	
Lead-Lag Optimize?		Yes		Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	6.0	6.0	2.0	2.0	2.0	6.0
Minimum Gap (s)	2.0	2.0	3.4	3.4	2.0	2.0	2.0	3.4
Time Before Reduce (s)	0.0	0.0	15.0	15.0	0.0	0.0	0.0	15.0
Time To Reduce (s)	0.0	0.0	30.0	30.0	0.0	0.0	0.0	30.0
Recall Mode	None	None	C-Max	C-Max	None	None	None	C-Max
Act Effct Green (s)	15.0	35.0	125.0	105.0	125.0		120.0	125.0
Actuated g/C Ratio	0.10	0.23	0.83	0.70	0.83		0.80	0.83
v/c Ratio	0.60	0.65	0.06	0.71	0.04		0.85	0.81
Control Delay	71.7	60.9	5.0	15.8	2.2		65.7	9.8
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0

Lane Group	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Total Delay	71.7	60.9	5.0	15.8	2.2		65.7	9.8
LOS	E	E	A	B	A		E	A
Approach Delay	65.8			15.4				14.8
Approach LOS	E			B				B
Queue Length 50th (ft)	99	214	1	502	8		123	511
Queue Length 95th (ft)	139	304	4	636	15		#280	715
Internal Link Dist (ft)	1354			1101				552
Turn Bay Length (ft)	100	275	300		325		300	
Base Capacity (vph)	455	367	64	2490	1314		276	2935
Starvation Cap Reductn	0	0	0	0	0		0	0
Spillback Cap Reductn	0	0	0	0	0		0	0
Storage Cap Reductn	0	0	0	0	0		0	0
Reduced v/c Ratio	0.45	0.65	0.06	0.71	0.04		0.85	0.81

Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 150
Offset: 142 (95%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 19.6 Intersection LOS: B
Intersection Capacity Utilization 89.2% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
! Phase conflict between lane groups.

Splits and Phases: 5: Capital Boulevard & Wall Road

Lane Group	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	128	197	4	2080	168	4	109	1838
Future Volume (vph)	128	197	4	2080	168	4	109	1838
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)	1%			-1%				1%
Storage Length (ft)	100	275	300		325		300	
Storage Lanes	1	1	1		1		1	
Taper Length (ft)	100		100				100	
Lane Util. Factor	0.97	1.00	1.00	0.95	1.00	0.95	1.00	0.95
Frt		0.850			0.850			
Flt Protected	0.950		0.950				0.950	
Satd. Flow (prot)	3416	1575	1778	3557	1591	0	1761	3522
Flt Permitted	0.950		0.078				0.036	
Satd. Flow (perm)	3416	1575	146	3557	1591	0	67	3522
Right Turn on Red		No			No			
Satd. Flow (RTOR)								
Link Speed (mph)	45			55				55
Link Distance (ft)	1434			1181				632
Travel Time (s)	21.7			14.6				7.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	142	219	4	2311	187	4	121	2042
Shared Lane Traffic (%)								
Lane Group Flow (vph)	142	219	4	2311	187	0	125	2042
Turn Type	Prot	pm+ov	D.Pm	NA	pm+ov	D.P+P	D.P+P	NA
Protected Phases	8	1!		2	8	1!	1	6
Permitted Phases		8	6		2	2	2	
Detector Phase	8	1	6	2	8	1	1	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	14.0	14.0	7.0	7.0	7.0	14.0
Minimum Split (s)	13.7	13.3	20.7	20.7	13.7	13.3	13.3	20.7
Total Split (s)	25.0	15.0	125.0	110.0	25.0	15.0	15.0	125.0
Total Split (%)	16.7%	10.0%	83.3%	73.3%	16.7%	10.0%	10.0%	83.3%
Maximum Green (s)	18.3	8.7	118.3	103.3	18.3	8.7	8.7	118.3
Yellow Time (s)	3.0	3.0	5.3	5.3	3.0	3.0	3.0	5.3
All-Red Time (s)	3.7	3.3	1.4	1.4	3.7	3.3	3.3	1.4
Lost Time Adjust (s)	-1.7	-1.3	-1.7	-1.7	-1.7		-1.3	-1.7
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0
Lead/Lag		Lag		Lead		Lag	Lag	
Lead-Lag Optimize?		Yes		Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	6.0	6.0	2.0	2.0	2.0	6.0
Minimum Gap (s)	2.0	2.0	3.4	3.4	2.0	2.0	2.0	3.4
Time Before Reduce (s)	0.0	0.0	15.0	15.0	0.0	0.0	0.0	15.0
Time To Reduce (s)	0.0	0.0	30.0	30.0	0.0	0.0	0.0	30.0
Recall Mode	None	None	C-Max	C-Max	None	None	None	C-Max
Act Effct Green (s)	12.3	27.3	127.7	112.7	130.0		122.7	127.7
Actuated g/C Ratio	0.08	0.18	0.85	0.75	0.87		0.82	0.85
v/c Ratio	0.51	0.76	0.03	0.87	0.14		0.75	0.68
Control Delay	71.9	75.9	2.8	18.4	1.7		68.2	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0

Lane Group	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Total Delay	71.9	75.9	2.8	18.4	1.7		68.2	5.6
LOS	E	E	A	B	A		E	A
Approach Delay	74.3			17.1				9.2
Approach LOS	E			B				A
Queue Length 50th (ft)	69	206	0	755	21		69	290
Queue Length 95th (ft)	105	297	3	968	31		#175	403
Internal Link Dist (ft)	1354			1101				552
Turn Bay Length (ft)	100	275	300		325		300	
Base Capacity (vph)	455	287	124	2671	1377		167	2997
Starvation Cap Reductn	0	0	0	0	0		0	0
Spillback Cap Reductn	0	0	0	0	0		0	0
Storage Cap Reductn	0	0	0	0	0		0	0
Reduced v/c Ratio	0.31	0.76	0.03	0.87	0.14		0.75	0.68

Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 150
Offset: 113 (75%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 17.8 Intersection LOS: B
Intersection Capacity Utilization 88.5% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
! Phase conflict between lane groups.

Splits and Phases: 5: Capital Boulevard & Wall Road

Lane Group	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	183	216	4	1592	52	4	208	2142
Future Volume (vph)	183	216	4	1592	52	4	208	2142
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)	1%			-1%				1%
Storage Length (ft)	100	275	300		325		300	
Storage Lanes	1	1	1		1		1	
Taper Length (ft)	100		100				100	
Lane Util. Factor	0.97	1.00	1.00	0.95	1.00	0.95	1.00	0.95
Frt		0.850			0.850			
Flt Protected	0.950		0.950				0.950	
Satd. Flow (prot)	3416	1575	1778	3557	1591	0	1761	3522
Flt Permitted	0.950		0.041				0.067	
Satd. Flow (perm)	3416	1575	77	3557	1591	0	124	3522
Right Turn on Red		No			No			
Satd. Flow (RTOR)								
Link Speed (mph)	45			55				55
Link Distance (ft)	1434			1181				632
Travel Time (s)	21.7			14.6				7.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	203	240	4	1769	58	4	231	2380
Shared Lane Traffic (%)								
Lane Group Flow (vph)	203	240	4	1769	58	0	235	2380
Turn Type	Prot	pm+ov	D.Pm	NA	pm+ov	D.P+P	D.P+P	NA
Protected Phases	8	1!		2	8	1!	1	6
Permitted Phases		8	6		2	2	2	
Detector Phase	8	1	6	2	8	1	1	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	14.0	14.0	7.0	7.0	7.0	14.0
Minimum Split (s)	13.7	13.3	20.7	20.7	13.7	13.3	13.3	20.7
Total Split (s)	17.0	27.0	113.0	86.0	17.0	27.0	27.0	113.0
Total Split (%)	13.1%	20.8%	86.9%	66.2%	13.1%	20.8%	20.8%	86.9%
Maximum Green (s)	10.3	20.7	106.3	79.3	10.3	20.7	20.7	106.3
Yellow Time (s)	3.0	3.0	5.3	5.3	3.0	3.0	3.0	5.3
All-Red Time (s)	3.7	3.3	1.4	1.4	3.7	3.3	3.3	1.4
Lost Time Adjust (s)	-1.7	-1.3	-1.7	-1.7	-1.7		-1.3	-1.7
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0
Lead/Lag		Lead		Lag		Lead	Lead	
Lead-Lag Optimize?		Yes		Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	6.0	6.0	2.0	2.0	2.0	6.0
Minimum Gap (s)	2.0	2.0	3.4	3.4	2.0	2.0	2.0	3.4
Time Before Reduce (s)	0.0	0.0	15.0	15.0	0.0	0.0	0.0	15.0
Time To Reduce (s)	0.0	0.0	30.0	30.0	0.0	0.0	0.0	30.0
Recall Mode	None	None	C-Max	C-Max	None	None	None	C-Max
Act Effct Green (s)	11.6	34.2	108.4	85.8	102.5		103.4	108.4
Actuated g/C Ratio	0.09	0.26	0.83	0.66	0.79		0.80	0.83
v/c Ratio	0.66	0.58	0.06	0.75	0.05		0.74	0.81
Control Delay	68.4	47.0	4.2	18.4	3.7		48.3	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.2

Lane Group	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Total Delay	68.4	47.0	4.2	18.4	3.7		48.3	2.1
LOS	E	D	A	B	A		D	A
Approach Delay	56.8			17.9				6.2
Approach LOS	E			B				A
Queue Length 50th (ft)	86	174	0	506	9		128	15
Queue Length 95th (ft)	128	253	3	655	22		m126	m15
Internal Link Dist (ft)	1354			1101				552
Turn Bay Length (ft)	100	275	300		325		300	
Base Capacity (vph)	315	468	63	2348	1258		378	2935
Starvation Cap Reductn	0	0	0	0	0		0	111
Spillback Cap Reductn	0	0	0	0	0		0	0
Storage Cap Reductn	0	0	0	0	0		0	0
Reduced v/c Ratio	0.64	0.51	0.06	0.75	0.05		0.62	0.84

Intersection Summary	
Area Type:	Other
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 55 (42%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 15.2	Intersection LOS: B
Intersection Capacity Utilization 89.2%	ICU Level of Service E
Analysis Period (min) 15	

m Volume for 95th percentile queue is metered by upstream signal.

! Phase conflict between lane groups.

Splits and Phases: 5: Capital Boulevard & Wall Road

Lane Group	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	128	197	4	2080	168	4	109	1838
Future Volume (vph)	128	197	4	2080	168	4	109	1838
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)	1%			-1%				1%
Storage Length (ft)	100	275	300		325		300	
Storage Lanes	1	1	1		1		1	
Taper Length (ft)	100		100				100	
Lane Util. Factor	0.97	1.00	1.00	0.95	1.00	0.95	1.00	0.95
Frt		0.850			0.850			
Flt Protected	0.950		0.950				0.950	
Satd. Flow (prot)	3416	1575	1778	3557	1591	0	1761	3522
Flt Permitted	0.950		0.077				0.047	
Satd. Flow (perm)	3416	1575	144	3557	1591	0	87	3522
Right Turn on Red		No			No			
Satd. Flow (RTOR)								
Link Speed (mph)	45			55				55
Link Distance (ft)	1434			1181				632
Travel Time (s)	21.7			14.6				7.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	142	219	4	2311	187	4	121	2042
Shared Lane Traffic (%)								
Lane Group Flow (vph)	142	219	4	2311	187	0	125	2042
Turn Type	Prot	pm+ov	D.Pm	NA	pm+ov	D.P+P	D.P+P	NA
Protected Phases	8	1!		2	8	1!	1	6
Permitted Phases		8	6		2	2	2	
Detector Phase	8	1	6	2	8	1	1	6
Switch Phase								
Minimum Initial (s)	7.0	7.0	14.0	14.0	7.0	7.0	7.0	14.0
Minimum Split (s)	13.7	13.3	20.7	20.7	13.7	13.3	13.3	20.7
Total Split (s)	13.8	15.6	106.2	90.6	13.8	15.6	15.6	106.2
Total Split (%)	11.5%	13.0%	88.5%	75.5%	11.5%	13.0%	13.0%	88.5%
Maximum Green (s)	7.1	9.3	99.5	83.9	7.1	9.3	9.3	99.5
Yellow Time (s)	3.0	3.0	5.3	5.3	3.0	3.0	3.0	5.3
All-Red Time (s)	3.7	3.3	1.4	1.4	3.7	3.3	3.3	1.4
Lost Time Adjust (s)	-1.7	-1.3	-1.7	-1.7	-1.7		-1.3	-1.7
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0
Lead/Lag		Lag		Lead		Lag	Lag	
Lead-Lag Optimize?		Yes		Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	6.0	6.0	2.0	2.0	2.0	6.0
Minimum Gap (s)	2.0	2.0	3.4	3.4	2.0	2.0	2.0	3.4
Time Before Reduce (s)	0.0	0.0	15.0	15.0	0.0	0.0	0.0	15.0
Time To Reduce (s)	0.0	0.0	30.0	30.0	0.0	0.0	0.0	30.0
Recall Mode	None	None	C-Max	C-Max	None	None	None	C-Max
Act Effct Green (s)	8.8	24.4	101.2	85.6	99.4		96.2	101.2
Actuated g/C Ratio	0.07	0.20	0.84	0.71	0.83		0.80	0.84
v/c Ratio	0.57	0.68	0.03	0.91	0.14		0.58	0.69
Control Delay	63.3	56.4	2.2	21.0	2.3		28.7	1.5
Queue Delay	0.0	0.0	0.0	1.0	0.0		0.0	0.0

Lane Group	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Total Delay	63.3	56.4	2.2	22.0	2.3		28.7	1.5
LOS	E	E	A	C	A		C	A
Approach Delay	59.1			20.5				3.1
Approach LOS	E			C				A
Queue Length 50th (ft)	55	158	0	686	22		44	38
Queue Length 95th (ft)	90	247	2	841	34		m75	42
Internal Link Dist (ft)	1354			1101				552
Turn Bay Length (ft)	100	275	300		325		300	
Base Capacity (vph)	250	320	121	2538	1304		217	2971
Starvation Cap Reductn	0	0	0	0	0		0	0
Spillback Cap Reductn	0	0	0	77	0		0	0
Storage Cap Reductn	0	0	0	0	0		0	0
Reduced v/c Ratio	0.57	0.68	0.03	0.94	0.14		0.58	0.69

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 2 (2%), Referenced to phase 2:NBSB and 6:NBSB, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 15.8 Intersection LOS: B
Intersection Capacity Utilization 88.5% ICU Level of Service E
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.
! Phase conflict between lane groups.

Splits and Phases: 5: Capital Boulevard & Wall Road

APPENDIX J

SIMTRAFFIC QUEUEING REPORTS

Intersection: 1: Capital Boulevard & Holden Road

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	LT	R	UL	T	T	R	UL	T	T
Maximum Queue (ft)	251	150	242	283	150	141	236	250	49	143	429	426
Average Queue (ft)	105	79	123	192	15	52	105	116	7	26	238	220
95th Queue (ft)	194	160	217	261	89	117	208	215	31	91	375	371
Link Distance (ft)	1014			1043			1311	1311			1262	1262
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)		50	250		50	250			225	300		
Storage Blk Time (%)	47	5	0	64			0	1			4	26
Queuing Penalty (veh)	99	5	0	108			0	1			2	9

Intersection: 1: Capital Boulevard & Holden Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	163
Average Queue (ft)	18
95th Queue (ft)	107
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: Capital Boulevard & Flex Way

Movement	EB	NB	SB
Directions Served	LR	UL	U
Maximum Queue (ft)	50	52	134
Average Queue (ft)	11	15	58
95th Queue (ft)	37	41	112
Link Distance (ft)	1054		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		250	275
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: Capital Boulevard & Southern Site Driveway

Movement	EB
Directions Served	R
Maximum Queue (ft)	35
Average Queue (ft)	5
95th Queue (ft)	25
Link Distance (ft)	1060
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Capital Boulevard & Wall Road

Movement	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	U	T	T	R	UL	T	T
Maximum Queue (ft)	165	213	254	37	301	276	29	176	181	160
Average Queue (ft)	54	103	129	5	162	118	5	89	73	66
95th Queue (ft)	136	175	221	23	262	225	21	157	161	141
Link Distance (ft)		1378			1145	1145			560	560
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		275	300			325	300		
Storage Blk Time (%)	2	14	0		0	0				
Queuing Penalty (veh)	5	33	0		0	0				

Intersection: 20: Capital Boulevard & Rolling Acres Road Leftover

Movement	SB
Directions Served	T
Maximum Queue (ft)	7
Average Queue (ft)	0
95th Queue (ft)	5
Link Distance (ft)	220
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 21: Capital Boulevard & Rolling Acres Road Leftover/Rolling Acres Road

Movement	EB	WB	NB	NB	NB
Directions Served	LT	R	T	T	R
Maximum Queue (ft)	34	36	66	87	12
Average Queue (ft)	5	7	9	14	0
95th Queue (ft)	21	25	42	58	6
Link Distance (ft)	222	904	168	168	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					125
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 22: Capital Boulevard & Sunset Drive Leftover

Movement	NB	NB	NB	B201	B201
Directions Served	L	T	T	T	T
Maximum Queue (ft)	113	287	200	27	20
Average Queue (ft)	51	68	26	2	1
95th Queue (ft)	133	247	147	22	15
Link Distance (ft)		300	300	224	224
Upstream Blk Time (%)		1	0		
Queuing Penalty (veh)		10	1		
Storage Bay Dist (ft)	13				
Storage Blk Time (%)	6				
Queuing Penalty (veh)	38				

Intersection: 23: Capital Boulevard & Sunset Drive/Sunset Drive Leftover

Movement	EB	EB	WB	SB	SB	SB
Directions Served	R	R	LT	T	T	R
Maximum Queue (ft)	684	485	220	162	239	188
Average Queue (ft)	408	350	181	93	101	54
95th Queue (ft)	658	522	237	152	180	135
Link Distance (ft)	1131		144	203	203	
Upstream Blk Time (%)			41		0	0
Queuing Penalty (veh)			132		3	0
Storage Bay Dist (ft)		400				175
Storage Blk Time (%)	20	11			1	0
Queuing Penalty (veh)	64	33			2	1

Intersection: 202: Capital Boulevard

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 205: Capital Boulevard

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 547

Intersection: 1: Capital Boulevard & Holden Road

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	LT	R	UL	T	T	R	UL	T	T
Maximum Queue (ft)	209	150	209	251	150	349	494	528	325	162	327	293
Average Queue (ft)	103	52	88	147	26	196	273	268	79	47	202	165
95th Queue (ft)	174	132	188	222	117	368	459	458	290	112	298	267
Link Distance (ft)	1014			1043			1311	1311			1262	1262
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)		50	250		50	250			225	300		
Storage Blk Time (%)	47	1		65	0	13	8	13			1	15
Queuing Penalty (veh)	69	2		88	0	84	18	29			1	7

Intersection: 1: Capital Boulevard & Holden Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	199
Average Queue (ft)	15
95th Queue (ft)	92
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: Capital Boulevard & Flex Way

Movement	EB	NB	SB
Directions Served	LR	L	U
Maximum Queue (ft)	54	26	80
Average Queue (ft)	12	3	37
95th Queue (ft)	37	15	72
Link Distance (ft)	1054		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		250	275
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 4: Capital Boulevard & Southern Site Driveway

Movement	EB
Directions Served	R
Maximum Queue (ft)	31
Average Queue (ft)	2
95th Queue (ft)	15
Link Distance (ft)	1060
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Capital Boulevard & Wall Road

Movement	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	U	T	T	R	UL	T	T
Maximum Queue (ft)	113	143	223	28	282	263	85	126	147	156
Average Queue (ft)	22	70	122	4	161	130	19	58	51	48
95th Queue (ft)	67	126	200	18	267	244	57	109	129	118
Link Distance (ft)		1378			1145	1145			560	560
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		275	300			325	300		
Storage Blk Time (%)	0	5			0					
Queuing Penalty (veh)	0	10			0					

Intersection: 20: Capital Boulevard & Rolling Acres Road Leftover

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 21: Capital Boulevard & Rolling Acres Road Leftover/Rolling Acres Road

Movement	EB	WB	NB	NB	NB
Directions Served	LT	R	T	T	R
Maximum Queue (ft)	51	32	99	116	34
Average Queue (ft)	14	7	24	27	2
95th Queue (ft)	38	24	80	89	16
Link Distance (ft)	222	904	168	168	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					125
Storage Blk Time (%)				0	
Queuing Penalty (veh)				0	

Intersection: 22: Capital Boulevard & Sunset Drive Leftover

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 23: Capital Boulevard & Sunset Drive/Sunset Drive Leftover

Movement	EB	EB	WB	SB	SB	SB
Directions Served	R	R	LT	T	T	R
Maximum Queue (ft)	162	141	68	109	121	63
Average Queue (ft)	93	45	20	27	42	6
95th Queue (ft)	143	112	53	75	93	28
Link Distance (ft)	1131		144	203	203	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		400				175
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 202: Capital Boulevard

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 205: Capital Boulevard

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 307

Intersection: 1: Capital Boulevard & Holden Road

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	LT	R	UL	T	T	R	UL	T	T
Maximum Queue (ft)	754	150	272	302	150	202	336	352	213	400	1195	1189
Average Queue (ft)	388	145	159	210	21	66	171	176	14	176	820	808
95th Queue (ft)	788	173	241	281	105	143	295	293	93	482	1336	1327
Link Distance (ft)	1014			1043			1311	1311			1262	1262
Upstream Blk Time (%)	0										10	10
Queuing Penalty (veh)	0										0	0
Storage Bay Dist (ft)		50	250		50	250			225	300		
Storage Blk Time (%)	58	27	0	67		0	2	3			53	55
Queuing Penalty (veh)	167	42	0	138		0	2	7			36	25

Intersection: 1: Capital Boulevard & Holden Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	200
Average Queue (ft)	46
95th Queue (ft)	177
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: Capital Boulevard & Flex Way

Movement	EB	NB	NB	NB	SB	SB	SB
Directions Served	LR	UL	T	T	U	T	T
Maximum Queue (ft)	62	72	77	88	332	410	276
Average Queue (ft)	19	23	3	4	143	74	52
95th Queue (ft)	60	62	35	41	313	384	347
Link Distance (ft)	1054		428	428		643	643
Upstream Blk Time (%)						1	1
Queuing Penalty (veh)						16	9
Storage Bay Dist (ft)		250			275		
Storage Blk Time (%)					11	0	
Queuing Penalty (veh)					130	0	

Intersection: 4: Capital Boulevard & Southern Site Driveway

Movement	EB
Directions Served	R
Maximum Queue (ft)	32
Average Queue (ft)	5
95th Queue (ft)	23
Link Distance (ft)	1060
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Capital Boulevard & Wall Road

Movement	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	U	T	T	R	UL	T	T
Maximum Queue (ft)	176	242	278	28	323	292	45	280	239	220
Average Queue (ft)	69	116	158	3	202	156	7	141	101	94
95th Queue (ft)	151	189	245	17	305	273	28	235	204	184
Link Distance (ft)		1378			1145	1145			560	560
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		275	300			325	300		
Storage Blk Time (%)	3	20	0		1	0		0	0	
Queuing Penalty (veh)	8	59	1		0	0		2	0	

Intersection: 20: Capital Boulevard & Rolling Acres Road Leftover

Movement	SB	SB
Directions Served	T	T
Maximum Queue (ft)	11	41
Average Queue (ft)	0	2
95th Queue (ft)	8	18
Link Distance (ft)	220	220
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 21: Capital Boulevard & Rolling Acres Road Leftover/Rolling Acres Road

Movement	EB	WB	NB	NB	NB
Directions Served	LT	R	T	T	R
Maximum Queue (ft)	19	28	71	92	6
Average Queue (ft)	4	5	7	13	0
95th Queue (ft)	18	19	39	57	4
Link Distance (ft)	222	904	168	168	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					125
Storage Blk Time (%)				0	
Queuing Penalty (veh)				0	

Intersection: 22: Capital Boulevard & Sunset Drive Leftover

Movement	NB	NB	NB	B201	B201
Directions Served	L	T	T	T	T
Maximum Queue (ft)	113	407	362	299	273
Average Queue (ft)	101	288	107	159	70
95th Queue (ft)	150	521	341	364	242
Link Distance (ft)		300	300	224	224
Upstream Blk Time (%)		51	2	32	2
Queuing Penalty (veh)		465	22	290	22
Storage Bay Dist (ft)	13				
Storage Blk Time (%)	13				
Queuing Penalty (veh)	95				

Intersection: 23: Capital Boulevard & Sunset Drive/Sunset Drive Leftover

Movement	EB	EB	WB	SB	SB	SB
Directions Served	R	R	LT	T	T	R
Maximum Queue (ft)	1181	500	234	256	276	203
Average Queue (ft)	1112	497	204	166	179	128
95th Queue (ft)	1343	529	225	241	258	226
Link Distance (ft)	1131		144	203	203	
Upstream Blk Time (%)	72		74	2	2	0
Queuing Penalty (veh)	0		291	22	24	0
Storage Bay Dist (ft)		400				175
Storage Blk Time (%)	83	82			5	1
Queuing Penalty (veh)	316	314			22	6

Intersection: 202: Capital Boulevard

Movement	NB	NB	SB	SB	B200	B200
Directions Served	R	R	T	T	T	T
Maximum Queue (ft)	614	606	101	88	96	93
Average Queue (ft)	176	159	12	10	4	4
95th Queue (ft)	538	512	91	83	71	67
Link Distance (ft)	643	643	206	206	504	504
Upstream Blk Time (%)	1	0	1	0		
Queuing Penalty (veh)	6	2	13	6		
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 205: Capital Boulevard

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 2561

Intersection: 1: Capital Boulevard & Holden Road

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	LT	R	UL	T	T	R	UL	T	T
Maximum Queue (ft)	597	150	302	555	150	350	1337	1364	325	293	823	810
Average Queue (ft)	203	111	141	217	24	348	1262	1255	145	69	347	322
95th Queue (ft)	441	185	256	459	111	359	1554	1632	394	198	694	679
Link Distance (ft)	1014			1043			1311	1311			1262	1262
Upstream Blk Time (%)	0			1			19	16			3	3
Queuing Penalty (veh)	0			0			205	169			0	0
Storage Bay Dist (ft)		50	250		50	250			225	300		
Storage Blk Time (%)	59	5	1	69	0	94	16	27		0	15	37
Queuing Penalty (veh)	119	7	3	116	0	761	48	78		0	14	24

Intersection: 1: Capital Boulevard & Holden Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	200
Average Queue (ft)	45
95th Queue (ft)	175
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: Capital Boulevard & Flex Way

Movement	EB	NB	NB	NB	SB	SB	SB
Directions Served	LR	L	T	T	U	T	T
Maximum Queue (ft)	157	157	473	462	374	607	611
Average Queue (ft)	74	7	230	228	182	180	80
95th Queue (ft)	189	74	585	580	413	618	423
Link Distance (ft)	1054		428	428		643	643
Upstream Blk Time (%)			5	6		15	2
Queuing Penalty (veh)			56	63		142	15
Storage Bay Dist (ft)		250			275		
Storage Blk Time (%)			40		35	0	
Queuing Penalty (veh)			2		310	0	

Intersection: 4: Capital Boulevard & Southern Site Driveway

Movement	EB	NB	NB
Directions Served	R	T	T
Maximum Queue (ft)	31	586	585
Average Queue (ft)	4	250	255
95th Queue (ft)	20	689	700
Link Distance (ft)	1060	560	560
Upstream Blk Time (%)		1	2
Queuing Penalty (veh)		10	17
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: Capital Boulevard & Wall Road

Movement	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	U	T	T	R	UL	T	T
Maximum Queue (ft)	131	473	345	102	1179	1193	425	183	180	170
Average Queue (ft)	36	195	224	8	534	518	142	78	62	56
95th Queue (ft)	95	499	380	85	1227	1235	449	164	154	138
Link Distance (ft)		1378			1145	1145			560	560
Upstream Blk Time (%)					17	18				
Queuing Penalty (veh)					0	0				
Storage Bay Dist (ft)	100		275	300			325	300		
Storage Blk Time (%)	0	7	16		27	26				
Queuing Penalty (veh)	1	18	20		1	43				

Intersection: 20: Capital Boulevard & Rolling Acres Road Leftover

Movement	SB	SB	B203	B203
Directions Served	T	T	T	T
Maximum Queue (ft)	177	180	96	94
Average Queue (ft)	34	34	16	15
95th Queue (ft)	187	185	91	87
Link Distance (ft)	220	220	102	102
Upstream Blk Time (%)	10	10	9	9
Queuing Penalty (veh)	86	87	78	79
Storage Bay Dist (ft)				
Storage Blk Time (%)	9			
Queuing Penalty (veh)	2			

Intersection: 21: Capital Boulevard & Rolling Acres Road Leftover/Rolling Acres Road

Movement	EB	WB	NB	NB	NB
Directions Served	LT	R	T	T	R
Maximum Queue (ft)	56	44	271	274	168
Average Queue (ft)	15	9	188	192	61
95th Queue (ft)	45	30	338	341	193
Link Distance (ft)	222	904	168	168	
Upstream Blk Time (%)			56	59	1
Queuing Penalty (veh)			618	647	0
Storage Bay Dist (ft)					125
Storage Blk Time (%)				60	0
Queuing Penalty (veh)				23	0

Intersection: 22: Capital Boulevard & Sunset Drive Leftover

Movement	NB	NB	NB	B201	B201
Directions Served	L	T	T	T	T
Maximum Queue (ft)	113	405	410	287	291
Average Queue (ft)	43	268	271	160	160
95th Queue (ft)	133	547	552	349	347
Link Distance (ft)		300	300	224	224
Upstream Blk Time (%)		55	60	9	11
Queuing Penalty (veh)		613	667	103	127
Storage Bay Dist (ft)	13				
Storage Blk Time (%)		27			
Queuing Penalty (veh)		13			

Intersection: 23: Capital Boulevard & Sunset Drive/Sunset Drive Leftover

Movement	EB	EB	WB	SB	SB	SB
Directions Served	R	R	LT	T	T	R
Maximum Queue (ft)	305	278	82	209	218	98
Average Queue (ft)	123	79	26	70	82	8
95th Queue (ft)	260	218	63	208	212	48
Link Distance (ft)	1131		144	203	203	
Upstream Blk Time (%)				11	11	0
Queuing Penalty (veh)				98	100	0
Storage Bay Dist (ft)		400				175
Storage Blk Time (%)	2	2			12	
Queuing Penalty (veh)	2	1			8	

Intersection: 202: Capital Boulevard

Movement	NB	NB	SB	SB	B200	B200
Directions Served	R	R	T	T	T	T
Maximum Queue (ft)	686	680	171	177	317	315
Average Queue (ft)	387	390	47	48	73	73
95th Queue (ft)	894	898	215	218	364	363
Link Distance (ft)	643	643	206	206	504	504
Upstream Blk Time (%)	4	6	15	14	10	10
Queuing Penalty (veh)	47	68	140	129	95	97
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 205: Capital Boulevard

Movement	NB	NB	B204	B204	SB	SB
Directions Served	T	T	T	T	R	R
Maximum Queue (ft)	211	217	526	532	740	747
Average Queue (ft)	154	156	388	392	110	112
95th Queue (ft)	261	266	714	715	685	695
Link Distance (ft)	102	102	485	485	1311	1311
Upstream Blk Time (%)	68	63	8	9	6	6
Queuing Penalty (veh)	739	680	82	102	50	52
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Network Summary

Network wide Queuing Penalty: 7876

Intersection: 1: Capital Boulevard & Holden Road

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	LT	R	UL	T	T	R	UL	T	T
Maximum Queue (ft)	638	150	306	362	150	260	322	332	210	400	1264	1246
Average Queue (ft)	323	140	165	222	22	78	169	175	18	181	994	987
95th Queue (ft)	673	180	259	305	110	179	300	299	115	488	1590	1593
Link Distance (ft)	1014			1043			1311	1311			1262	1262
Upstream Blk Time (%)											32	39
Queuing Penalty (veh)											0	0
Storage Bay Dist (ft)		50	250		50	250			225	300		
Storage Blk Time (%)	56	22	0	67		0	2	5			55	56
Queuing Penalty (veh)	161	34	0	138		0	3	10			37	26

Intersection: 1: Capital Boulevard & Holden Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	200
Average Queue (ft)	50
95th Queue (ft)	187
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: Capital Boulevard & Flex Way

Movement	EB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LR	UL	T	T	U	T	T	R
Maximum Queue (ft)	1062	350	456	444	332	386	217	37
Average Queue (ft)	662	288	306	79	130	39	15	3
95th Queue (ft)	1229	438	618	339	276	241	166	20
Link Distance (ft)	1054		428	428		643	643	
Upstream Blk Time (%)	23		35	0		0	0	
Queuing Penalty (veh)	0		317	4		1	2	
Storage Bay Dist (ft)		250			275			75
Storage Blk Time (%)		67	2		6	0		
Queuing Penalty (veh)		549	3		69	0		

Intersection: 4: Capital Boulevard & Southern Site Driveway

Movement	EB	NB	NB
Directions Served	R	T	T
Maximum Queue (ft)	80	587	605
Average Queue (ft)	27	275	254
95th Queue (ft)	65	706	695
Link Distance (ft)	1060	560	560
Upstream Blk Time (%)		15	9
Queuing Penalty (veh)		136	80
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: Capital Boulevard & Wall Road

Movement	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	U	T	T	R	UL	T	T
Maximum Queue (ft)	168	720	357	106	1072	1065	424	376	369	331
Average Queue (ft)	65	275	226	7	502	453	65	194	120	105
95th Queue (ft)	146	827	375	62	1129	1103	306	339	282	243
Link Distance (ft)		1378			1145	1145			560	560
Upstream Blk Time (%)		4			14	11				
Queuing Penalty (veh)		0			0	0				
Storage Bay Dist (ft)	100		275	300			325	300		
Storage Blk Time (%)	3	19	18		30	22		6	1	
Queuing Penalty (veh)	10	59	33		1	11		60	1	

Intersection: 20: Capital Boulevard & Rolling Acres Road Leftover

Movement	SB	SB
Directions Served	T	T
Maximum Queue (ft)	43	69
Average Queue (ft)	2	3
95th Queue (ft)	16	26
Link Distance (ft)	220	220
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 21: Capital Boulevard & Rolling Acres Road Leftover/Rolling Acres Road

Movement	EB	WB	NB	NB	NB
Directions Served	LT	R	T	T	R
Maximum Queue (ft)	38	32	67	95	6
Average Queue (ft)	4	7	9	16	0
95th Queue (ft)	21	23	41	65	6
Link Distance (ft)	222	904	168	168	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					125
Storage Blk Time (%)				0	
Queuing Penalty (veh)				0	

Intersection: 22: Capital Boulevard & Sunset Drive Leftover

Movement	NB	NB	NB	B201	B201
Directions Served	L	T	T	T	T
Maximum Queue (ft)	113	399	339	278	233
Average Queue (ft)	95	266	132	101	61
95th Queue (ft)	155	511	371	287	219
Link Distance (ft)		300	300	224	224
Upstream Blk Time (%)		36	2	14	2
Queuing Penalty (veh)		334	14	126	16
Storage Bay Dist (ft)	13				
Storage Blk Time (%)	13				
Queuing Penalty (veh)	95				

Intersection: 23: Capital Boulevard & Sunset Drive/Sunset Drive Leftover

Movement	EB	EB	WB	SB	SB	SB
Directions Served	R	R	LT	T	T	R
Maximum Queue (ft)	1181	500	223	277	278	203
Average Queue (ft)	1108	499	199	164	179	128
95th Queue (ft)	1320	505	231	245	263	227
Link Distance (ft)	1131		144	203	203	
Upstream Blk Time (%)	71		70	2	2	1
Queuing Penalty (veh)	0		277	24	27	0
Storage Bay Dist (ft)		400				175
Storage Blk Time (%)	84	83			5	1
Queuing Penalty (veh)	323	320			22	7

Intersection: 202: Capital Boulevard

Movement	NB	NB	SB	SB	B200	B200
Directions Served	R	R	T	T	T	T
Maximum Queue (ft)	345	336	56	56	4	12
Average Queue (ft)	75	66	3	3	0	0
95th Queue (ft)	344	333	50	46	3	8
Link Distance (ft)	643	643	206	206	504	504
Upstream Blk Time (%)	1	0	0	0		
Queuing Penalty (veh)	5	4	2	2		
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 205: Capital Boulevard

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 3343

Intersection: 1: Capital Boulevard & Holden Road

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	LT	R	UL	T	T	R	UL	T	T
Maximum Queue (ft)	471	150	290	373	150	350	1354	1363	325	399	764	722
Average Queue (ft)	170	102	138	189	38	345	1246	1218	158	84	343	311
95th Queue (ft)	340	185	249	292	142	387	1574	1665	410	251	645	608
Link Distance (ft)	1014			1043			1311	1311			1262	1262
Upstream Blk Time (%)							17	15			1	1
Queuing Penalty (veh)							185	172			0	0
Storage Bay Dist (ft)		50	250		50	250			225	300		
Storage Blk Time (%)	61	7	1	71	0	91	18	28		0	14	36
Queuing Penalty (veh)	123	10	2	118	1	771	53	81		0	13	23

Intersection: 1: Capital Boulevard & Holden Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	200
Average Queue (ft)	53
95th Queue (ft)	189
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 3: Capital Boulevard & Flex Way

Movement	EB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LR	L	T	T	U	T	T	R
Maximum Queue (ft)	1069	350	473	471	374	663	698	13
Average Queue (ft)	977	146	220	219	200	210	115	0
95th Queue (ft)	1261	392	575	574	425	677	518	5
Link Distance (ft)	1054		428	428		643	643	
Upstream Blk Time (%)	75		6	6		19	5	
Queuing Penalty (veh)	0		65	68		183	43	
Storage Bay Dist (ft)		250			275			75
Storage Blk Time (%)			39		38	0		
Queuing Penalty (veh)			27		342	0		

Intersection: 4: Capital Boulevard & Southern Site Driveway

Movement	EB	NB	NB
Directions Served	R	T	T
Maximum Queue (ft)	98	580	579
Average Queue (ft)	46	238	236
95th Queue (ft)	81	680	676
Link Distance (ft)	1060	560	560
Upstream Blk Time (%)		2	2
Queuing Penalty (veh)		19	19
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: Capital Boulevard & Wall Road

Movement	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	U	T	T	R	UL	T	T
Maximum Queue (ft)	137	524	368	34	1187	1193	425	242	205	197
Average Queue (ft)	35	167	214	4	562	537	151	99	74	64
95th Queue (ft)	96	421	359	20	1253	1256	467	224	173	152
Link Distance (ft)		1378			1145	1145			560	560
Upstream Blk Time (%)					18	18				
Queuing Penalty (veh)					0	0				
Storage Bay Dist (ft)	100		275	300			325	300		
Storage Blk Time (%)	1	9	11		27	25		0		
Queuing Penalty (veh)	2	23	14		1	42		0		

Intersection: 20: Capital Boulevard & Rolling Acres Road Leftover

Movement	SB	SB	SB	B203	B203
Directions Served	L	T	T	T	T
Maximum Queue (ft)	48	184	187	100	94
Average Queue (ft)	2	32	32	14	13
95th Queue (ft)	30	180	182	84	83
Link Distance (ft)		220	220	102	102
Upstream Blk Time (%)		9	9	7	7
Queuing Penalty (veh)		81	82	61	59
Storage Bay Dist (ft)	20				
Storage Blk Time (%)		8			
Queuing Penalty (veh)		1			

Intersection: 21: Capital Boulevard & Rolling Acres Road Leftover/Rolling Acres Road

Movement	EB	WB	NB	NB	NB
Directions Served	LT	R	T	T	R
Maximum Queue (ft)	56	41	267	272	168
Average Queue (ft)	16	11	186	190	70
95th Queue (ft)	45	34	334	335	205
Link Distance (ft)	222	904	168	168	
Upstream Blk Time (%)			55	57	1
Queuing Penalty (veh)			616	639	0
Storage Bay Dist (ft)					125
Storage Blk Time (%)				58	0
Queuing Penalty (veh)				22	0

Intersection: 22: Capital Boulevard & Sunset Drive Leftover

Movement	NB	NB	NB	B201	B201
Directions Served	L	T	T	T	T
Maximum Queue (ft)	112	419	408	293	289
Average Queue (ft)	40	257	256	150	155
95th Queue (ft)	128	549	544	340	345
Link Distance (ft)		300	300	224	224
Upstream Blk Time (%)		53	57	10	12
Queuing Penalty (veh)		615	660	114	137
Storage Bay Dist (ft)	13				
Storage Blk Time (%)		27			
Queuing Penalty (veh)		13			

Intersection: 23: Capital Boulevard & Sunset Drive/Sunset Drive Leftover

Movement	EB	EB	WB	SB	SB	SB
Directions Served	R	R	LT	T	T	R
Maximum Queue (ft)	213	189	69	218	218	138
Average Queue (ft)	103	59	21	71	79	10
95th Queue (ft)	174	145	53	203	206	71
Link Distance (ft)	1131		144	203	203	
Upstream Blk Time (%)				10	10	0
Queuing Penalty (veh)				87	88	0
Storage Bay Dist (ft)		400				175
Storage Blk Time (%)					10	
Queuing Penalty (veh)					7	

Intersection: 202: Capital Boulevard

Movement	NB	NB	SB	SB	B200	B200
Directions Served	R	R	T	T	T	T
Maximum Queue (ft)	682	684	264	270	402	422
Average Queue (ft)	376	377	58	51	76	76
95th Queue (ft)	892	894	239	220	367	370
Link Distance (ft)	643	643	206	206	504	504
Upstream Blk Time (%)	6	6	17	9	7	7
Queuing Penalty (veh)	71	72	162	90	67	67
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 205: Capital Boulevard

Movement	NB	NB	B204	B204	SB	SB
Directions Served	T	T	T	T	R	R
Maximum Queue (ft)	220	215	520	536	586	592
Average Queue (ft)	146	142	370	376	94	95
95th Queue (ft)	269	272	714	722	633	642
Link Distance (ft)	102	102	485	485	1311	1311
Upstream Blk Time (%)	65	62	9	11	3	4
Queuing Penalty (veh)	724	696	97	118	26	38
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Network Summary

Network wide Queuing Penalty: 7911

Intersection: 1: Capital Boulevard & Holden Road

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	LT	R	UL	T	T	R	UL	T	T
Maximum Queue (ft)	676	150	336	396	150	302	318	276	96	400	974	958
Average Queue (ft)	364	143	192	248	23	153	121	117	11	134	623	612
95th Queue (ft)	651	184	299	352	110	292	256	220	50	408	948	922
Link Distance (ft)	1014			1043			1311	1311			1262	1262
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)		50	250		50	250			225	300		
Storage Blk Time (%)	58	20	1	76		5	0	1			45	51
Queuing Penalty (veh)	168	31	3	157		29	1	2			30	24

Intersection: 1: Capital Boulevard & Holden Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	200
Average Queue (ft)	51
95th Queue (ft)	193
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: Capital Boulevard & Flex Way

Movement	EB	EB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	R	UL	T	T	U	T	T	R
Maximum Queue (ft)	84	63	384	455	437	312	459	469	190
Average Queue (ft)	25	21	303	312	239	160	262	283	23
95th Queue (ft)	62	53	471	539	451	267	412	427	115
Link Distance (ft)	1055			416	416		643	643	
Upstream Blk Time (%)			7	16	1				
Queuing Penalty (veh)			0	147	9				
Storage Bay Dist (ft)		125	350			275			125
Storage Blk Time (%)	0		30	6		1	6	19	
Queuing Penalty (veh)	0		247	11		8	10	8	

Intersection: 4: Capital Boulevard & Southern Site Driveway

Movement	EB	NB	NB	SB	SB
Directions Served	R	T	T	T	TR
Maximum Queue (ft)	87	398	385	70	83
Average Queue (ft)	30	148	125	4	4
95th Queue (ft)	70	502	472	60	70
Link Distance (ft)	1060	560	560	416	416
Upstream Blk Time (%)		4	2		0
Queuing Penalty (veh)		34	23		0
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 5: Capital Boulevard & Wall Road

Movement	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	U	T	T	R	UL	T	T
Maximum Queue (ft)	176	247	308	98	625	597	195	320	303	276
Average Queue (ft)	83	130	147	6	338	295	21	168	109	104
95th Queue (ft)	166	214	257	61	777	753	134	280	244	232
Link Distance (ft)		1378			1145	1145			560	560
Upstream Blk Time (%)					6	4			0	0
Queuing Penalty (veh)					0	0			2	2
Storage Bay Dist (ft)	100		275	300			325	300		
Storage Blk Time (%)	7	29	1		10	7		2	0	
Queuing Penalty (veh)	23	89	2		0	4		23	0	

Intersection: 20: Capital Boulevard & Rolling Acres Road Leftover

Movement	SB	SB	B203	B203
Directions Served	T	T	T	T
Maximum Queue (ft)	269	283	60	105
Average Queue (ft)	105	127	10	13
95th Queue (ft)	267	299	67	78
Link Distance (ft)	220	220	102	102
Upstream Blk Time (%)	4	6	1	2
Queuing Penalty (veh)	44	64	16	20
Storage Bay Dist (ft)				
Storage Blk Time (%)	13			
Queuing Penalty (veh)	1			

Intersection: 21: Capital Boulevard & Rolling Acres Road Leftover/Rolling Acres Road

Movement	EB	WB	NB	NB
Directions Served	LT	R	T	T
Maximum Queue (ft)	39	36	43	61
Average Queue (ft)	4	7	5	8
95th Queue (ft)	22	26	25	38
Link Distance (ft)	222	904	168	168
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 22: Capital Boulevard & Sunset Drive Leftover

Movement	NB	NB
Directions Served	L	T
Maximum Queue (ft)	112	187
Average Queue (ft)	19	8
95th Queue (ft)	71	70
Link Distance (ft)		300
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	13	
Storage Blk Time (%)	1	
Queuing Penalty (veh)	10	

Intersection: 23: Capital Boulevard & Sunset Drive/Sunset Drive Leftover

Movement	EB	EB	WB	SB	SB	SB
Directions Served	R	R	LT	T	T	R
Maximum Queue (ft)	478	463	204	289	299	203
Average Queue (ft)	297	267	150	264	268	183
95th Queue (ft)	424	393	245	316	313	254
Link Distance (ft)	1131		144	203	203	
Upstream Blk Time (%)			20	26	25	2
Queuing Penalty (veh)			80	286	277	0
Storage Bay Dist (ft)		400				175
Storage Blk Time (%)	2	0			29	4
Queuing Penalty (veh)	7	1			130	40

Intersection: 202: Capital Boulevard

Movement	SB
Directions Served	T
Maximum Queue (ft)	8
Average Queue (ft)	0
95th Queue (ft)	6
Link Distance (ft)	206
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 205: Capital Boulevard

Movement	SB	SB
Directions Served	R	R
Maximum Queue (ft)	63	59
Average Queue (ft)	6	8
95th Queue (ft)	66	75
Link Distance (ft)	1311	1311
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 2061

Intersection: 1: Capital Boulevard & Holden Road

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	LT	R	UL	T	T	R	UL	T	T
Maximum Queue (ft)	334	150	350	1070	150	350	560	560	325	304	489	468
Average Queue (ft)	143	86	328	826	66	192	269	278	89	70	300	272
95th Queue (ft)	289	178	415	1335	188	325	435	445	303	189	439	422
Link Distance (ft)	1014			1043			1311	1311			1262	1262
Upstream Blk Time (%)				46								
Queuing Penalty (veh)				0								
Storage Bay Dist (ft)		50	250		50	250			225	300		
Storage Blk Time (%)	56	4	63	92	0	5	9	14	0		10	33
Queuing Penalty (veh)	112	6	164	154	0	42	26	41	0		9	21

Intersection: 1: Capital Boulevard & Holden Road

Movement	SB
Directions Served	R
Maximum Queue (ft)	200
Average Queue (ft)	45
95th Queue (ft)	180
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: Capital Boulevard & Flex Way

Movement	EB	EB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	R	L	T	T	U	T	T	R
Maximum Queue (ft)	173	170	117	357	347	147	227	215	28
Average Queue (ft)	69	65	58	182	189	62	112	111	2
95th Queue (ft)	139	128	101	326	332	130	180	183	14
Link Distance (ft)	1055			416	416		643	643	
Upstream Blk Time (%)				0	0				
Queuing Penalty (veh)				1	1				
Storage Bay Dist (ft)		125	350			275			125
Storage Blk Time (%)	3	2		0			0	6	
Queuing Penalty (veh)	2	1		0			0	1	

Intersection: 4: Capital Boulevard & Southern Site Driveway

Movement	EB	NB	NB
Directions Served	R	T	T
Maximum Queue (ft)	100	11	113
Average Queue (ft)	47	0	7
95th Queue (ft)	85	8	103
Link Distance (ft)	1060	560	560
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: Capital Boulevard & Wall Road

Movement	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	U	T	T	R	UL	T	T
Maximum Queue (ft)	129	310	291	33	468	473	282	175	126	77
Average Queue (ft)	31	102	154	4	263	233	35	93	33	28
95th Queue (ft)	90	235	260	21	408	389	134	167	87	65
Link Distance (ft)		1378			1145	1145			560	560
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	100		275	300			325	300		
Storage Blk Time (%)	0	7	3		4	2				
Queuing Penalty (veh)	1	19	3		0	3				

Intersection: 20: Capital Boulevard & Rolling Acres Road Leftover

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 21: Capital Boulevard & Rolling Acres Road Leftover/Rolling Acres Road

Movement	EB	WB	NB	NB	NB
Directions Served	LT	R	T	T	R
Maximum Queue (ft)	56	36	135	134	30
Average Queue (ft)	20	7	29	35	2
95th Queue (ft)	48	25	89	107	12
Link Distance (ft)	222	904	168	168	
Upstream Blk Time (%)			0		
Queuing Penalty (veh)			0		
Storage Bay Dist (ft)					125
Storage Blk Time (%)				0	
Queuing Penalty (veh)				0	

Intersection: 22: Capital Boulevard & Sunset Drive Leftover

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 23: Capital Boulevard & Sunset Drive/Sunset Drive Leftover

Movement	EB	EB	WB	SB	SB	SB
Directions Served	R	R	LT	T	T	R
Maximum Queue (ft)	171	149	86	68	81	22
Average Queue (ft)	100	59	25	16	27	2
95th Queue (ft)	158	131	63	50	63	12
Link Distance (ft)	1131		144	203	203	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		400				175
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 202: Capital Boulevard

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 205: Capital Boulevard

Movement	NB
Directions Served	T
Maximum Queue (ft)	4
Average Queue (ft)	0
95th Queue (ft)	3
Link Distance (ft)	102
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 608