RAMEY KEMP ASSOCIATES
TOGETHER WE ARE LIMITLESS

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

November 23, 2022

Andrew Spiliotis
Town of Knightdale
950 Steeple Square Court
Knightdale, NC 7545
andrew.spiliotis@knightdalenc.gov

Subject: **Traffic Assessment Letter**
Hinton Oaks Industrial – Knightdale, North Carolina

Dear Mr. Spiliotis:

This letter provides a summary of a Traffic Assessment prepared for the Hinton Oaks Industrial development located north of US 64 Business (Knightdale Boulevard), along Hinton Oaks Boulevard in Knightdale, North Carolina. Refer to the attachments for the site location map. The purpose of the study is to determine how traffic generated by the proposed development is expected to impact the surrounding roadways and intersections.

The proposed development is expected to consist of 344,000 s.f. of industrial. The proposed development is anticipated to be completed by 2028. Access to the site is proposed via connection to the existing Hinton Oaks Boulevard.

Based on coordination with the Town and NCDOT, no future roadway improvement projects were identified in the study area.

Refer to the attachments for a copy of the preliminary site plan.

Study Area

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

- US 64 Business (Knightdale Boulevard) and Hinton Oaks Boulevard
- I-540 Northbound Ramps and US 64 Business (Knightdale Boulevard)
- I-540 Southbound Ramps and US 64 Business (Knightdale Boulevard)

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 the existing lane configuration figure. Refer to the attachments for a site location map and the existing lane configuration figure. Table 1 provides a summary of this information as well.

Table 1: Existing Roadway Inventory

Road Name	Route Number	Typical Cross Section	Speed Limit	ADT (vpd)
Knightdale Boulevard	US 64 Business	6-lane divided	45 mph	34,000[1]
I-540		6-lane divided	70 mph	51,000[1]
Hinton Oaks Boulevard	N/A	2-lane undivided	25 mph	7,300[2]

1. ADT from 2020.
2. ADT based on the traffic counts from 2022 and assuming the weekday PM peak hour volume is 10% of the average daily traffic.

Analysis Scenarios

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

- 2022 Existing Traffic Conditions
- 2028 + 1 No-Build Traffic Conditions
- 2028 + 1 Build Traffic Conditions
- 2028 + 10 Build Traffic Conditions

2022 Existing Traffic Volumes

Existing traffic volumes were based off previous peak hour traffic counts that were performed in January 2020 at the intersections listed below on a typical weekday during AM (7:00 – 9:00 AM) and PM (4:00 – 6:00 PM) peak periods, while schools were in session:

- US 64 Business (Knightdale Boulevard) and Hinton Oaks Boulevard
- I-540 Northbound Ramps and US 64 Business
- I-540 Southbound Ramps and US 64 Business

Volumes were balanced between study intersections where appropriate. Existing traffic volumes were determined by projecting 2020 traffic volumes to 2022 using a 3% annual growth rate. It should be noted that volumes were taken prior to the traffic pattern changes associated with the COVID-19 pandemic.

2029 No-Build Traffic Volumes

Based on coordination with Town and NCDOT, it was determined that an annual growth rate of 3% would be used to generate 2029 projected weekday AM and PM peak hour traffic volumes. Site trips from the adjacent developments listed below were also included in the study.

- Legacy Oaks
- Hinton Oaks Industrial

The 2029 no-build traffic volumes were determined by projecting the 2022 existing peak hour traffic to the year 2029 and adding the adjacent development trips. Refer to the attachments for an illustration of the 2029 no-build peak hour traffic volumes. It should be noted that the Merritt Midway Business Park, submitted in May 2020, is expected to extend the eastbound left turn lanes at the intersection of US 64 Business and Hinton Oaks Boulevard to include a total of 400 feet of storage.

Trip Generation

Average weekday AM and PM peak hour trips for the existing Hinton Oaks Industrial facility were estimated using traffic counts conducted by Ramey Kemp & Associates, Inc. (RKA), along Hinton Oaks Boulevard in July of 2022 during weekday AM (7:00 AM – 9:00 AM) and PM (4:00 PM – 6:00 PM) peak periods. It should be noted that these times are expected to capture the shift changes of the facility. Refer to the attachments for the count data at the existing site drives. Table 1 provides the current number of trips generated from the existing facility based on the 2022 traffic count data. The table also shows trip generation rates calculated for the expansion of the facility using the trip generation data gathered from the existing facility.

Table 1: Trip Generation for Existing Hinton Oaks Industrial Facility

Land Use	Intensity	AM Peak Hour Trips (vph)		PM Peak Hour Trips (vph)	
		Enter	Exit	Enter	Exit
Existing Hinton Oaks Industrial Facility	502.5 KSF	140	67	36	135

Calculated Trip Generation Rates (based on 2022 traffic count data)			
AM Peak Hour Rate		**PM Peak Hour Rate**	
0.41 trips/KSF		0.34 trips/KSF	
Enter: 68%	Exit: 32%	Enter: 21%	Exit: 79%

Land Use	Intensity	AM Peak Hour Trips (vph)		PM Peak Hour Trips (vph)	
		Enter	Exit	Enter	Exit
Proposed Expansion	344 KSF	96	45	25	92

As shown in Table 1, July 2022 traffic count data estimates that the existing facility is currently generating 207 trips (140 entering and 67 exiting) during the weekday AM peak hour and 171 trips (36 entering and 135 exiting) during the weekday PM peak hour. It should be noted that the development was built-out to approximately 502,500 s.f. present during the shift that count data was collected.

Trip generation data for the existing facility was utilized to calculate a rate (trips per ksf) for the weekday AM and PM peak hours. Illustrated in Table 1, the weekday AM peak hour is expected to generate 0.41 trips per ksf for the expanded Hinton Oaks Industrial facility, with 68% of vehicles entering and 32% of vehicles exiting. The weekday PM peak hour is estimated to generate 0.34 trips per ksf for the expanded facility, with 21% of vehicles entering and 79% of vehicles exiting. Based on the information above, the proposed expansion is expected to generate 141 trips (96 entering and 45 exiting) during the weekday AM peak hour and 117 trips (25 entering and 92 exiting) during the weekday PM peak hour.

Trip Distribution and Assignment

The primary site trips are distributed based on the locations of existing traffic patterns, population centers adjacent to the study area, and engineering judgment. A summary of the overall distributions is below:

- 35% to/from the north via I-540
- 40% to/from the south via I-540
- 15% to/from the west via US 64 Business
- 10% to/from the east via US 64 Business

It should be noted that the regional distributions were approved by NCDOT and the Town during the scoping process. Refer to the attachments for email coordination and approval, as well as illustrations of the site trip distribution and site trip assignment, respectively.

2029 / 2038 Build Traffic

To estimate traffic conditions with the site fully built-out, the total site trips were added to the 2029 no-build traffic volumes to determine the 2029 build traffic volumes. The 2038 build traffic volumes were developed using the same methodology as the 2029 build traffic volumes; however, background volumes were grown to the year 2038 rather than 2029.

Capacity Analysis

Study intersections were analyzed using the methodology outlined in the Highway Capacity Manual (HCM), 6th Edition published by the Transportation Research Board. Capacity and level of service are the design criteria for this traffic study. A computer software packages, Synchro and SIDRA, were 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 3, on the following page, for HCM levels of service and related average control delay per vehicle for both signalized and unsignalized intersections. Control delay as defined by the HCM includes "initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay". An average control delay of 50 seconds at a signalized intersection results in LOS "D" operation at the intersection.

Table 3: Highway Capacity Manual – Levels-of-Service and Delay

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

The study intersections were analyzed under 2022 existing, 2029 no-build, 2029 build, and 2038 build traffic conditions with lane configurations and traffic control shown in Tables 4-6. Refer to Tables 4-6 for a summary of the analysis results. The Synchro capacity analysis reports are attached to this report.

Table 4: Analysis Summary of I-540 Southbound Ramps [NB–SB] and US 64 Business (Knightdale Boulevard) [EB-WB]

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
2022 Existing Conditions	EB WB SB	3 TH, 1 RT 1 LT, 2 TH 1 LT, 1 TH, 1 TH-RT	A A A	A (5)	A A A	A (7)
2029 No-Build Conditions	EB WB SB	3 TH, 1 RT 1 LT, 2 TH 1 LT, 1 TH, 1 TH-RT	A A A	A (9)	B B A	B (14)
2029 Build Conditions	EB WB SB	3 TH, 1 RT 1 LT, 2 TH 1 LT, 1 TH, 1 TH-RT	A B A	A (9)	B B A	B (15)
2038 Build Conditions	EB WB SB	3 TH, 1 RT 1 LT, 2 TH 1 LT, 1 TH, 1 TH-RT	B B A	B (11)	C B A	B (17)

Capacity analysis of 2022 existing, 2029 no-build, 2029 build, and 2038 traffic conditions indicates that the intersection currently operates at an overall LOS B or better during the weekday AM and PM peak hour. All approaches are expected to operate at LOS B or better. No significant increase in queue or delay is expected.

Table 5: I-540 Northbound Ramps [NB–SB] and US 64 Business (Knightdale Boulevard) [EB-WB]

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
2022 Existing Conditions	EB WB NB	2 LT, 3 TH 3 TH, 1 RT 1 LT-TH, 2 RT	C B E	B (20)	C A F	C (27)
2029 No-Build Conditions	EB WB NB	2 LT, 3 TH 3 TH, 1 RT 1 LT-TH, 2 RT	C C E	C (28)	D B F	D (54)
2029 Build Conditions	EB WB NB	2 LT, 3 TH 3 TH, 1 RT 1 LT-TH, 2 RT	C C E	C (30)	D B F	D (54)
2038 Build Conditions	EB WB NB	2 LT, 3 TH 3 TH, 1 RT 1 LT-TH, 2 RT	D D E	D (42)	E B F	F (83)

Capacity analysis of 2022 existing, 2029 no-build, and 2029 build traffic conditions indicates that the intersection currently operates at an overall LOS D or better during the weekday AM and PM peak hour. Under all future conditions, the northbound approach is expected to operate at LOS F during the PM peak hour and is expected to operate at LOS E during the AM peak hour. The overall intersection is expected to operate at LOS F during the 2038 build PM peak hour.

Significant queues were observed along the northbound approach under all future conditions. In order to reduce queues, converting the northbound left-through lane to a shared left-through-right was considered. With this improvement, queues still developed along the northbound approach. It should be noted that the queues were observed under existing and no-build conditions. The proposed site is anticipated to produce less than 150 peak hour trips and under 2029 build conditions, site traffic accounted for only 2% of the anticipated volume. Due to the existing issues as well as the site being responsible for a minor portion of the anticipated volume, no improvements by the development are recommended.

Table 6: Hinton Oaks Boulevard [NB–SB] and US 64 Business (Knightdale Boulevard) [EB-WB]

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
2022 Existing Conditions	EB	2 LT, 3 TH, 1 RT	B	C (22)	C	C (26)
	WB	1 LT, 3 TH, 1 RT	B		C	
	NB	2 LT, 1 TH, 1 RT	E		E	
	SB	2 LT, 1 TH-RT, 1 RT	D		E	
2029 No-Build Conditions	EB	2 LT, 3 TH, 1 RT	C	D (39)	F	E (66)
	WB	1 LT, 3 TH, 1 RT	D		C	
	NB	2 LT, 1 TH, 1 RT	F		E	
	SB	2 LT, 1 TH-RT, 1 RT	D		E	
2029 Build Conditions	EB	2 LT, 3 TH, 1 RT	D	D (45)	F	E (70)
	WB	1 LT, 3 TH, 1 RT	D		C	
	NB	2 LT, 1 TH, 1 RT	F		E	
	SB	2 LT, 1 TH-RT, 1 RT	D		F	
2029 Build Conditions – Field Conditions	EB	2 LT, 3 TH, 1 RT	D	D (42)	D	D (43)
	WB	1 LT, 3 TH, 1 RT	D		C	
	NB	2 LT, 1 TH, 1 RT	F		D	
	SB	2 LT, 1 TH-RT, 1 RT	C		D	
2038 Build Conditions	EB	2 LT, 3 TH, 1 RT	D	E (60)	F	F (97)
	WB	1 LT, 3 TH, 1 RT	E		D	
	NB	2 LT, 1 TH, 1 RT	F		E	
	SB	2 LT, 1 TH-RT, 1 RT	D		F	
2038 Build Conditions – Field Conditions	EB	2 LT, 3 TH, 1 RT	D	E (57)	F	E (69)
	WB	1 LT, 3 TH, 1 RT	E		D	
	NB	2 LT, 1 TH, 1 RT	F		D	
	SB	2 LT, 1 TH-RT, 1 RT	C		D	

Capacity analysis of 2022 existing, 2029 no-build, and 2029 build traffic conditions indicates that the intersection currently operates at an overall LOS E or better during the weekday AM and PM peak hour. Under all future conditions, the northbound approach is expected to operate at LOS F during the PM peak hour and is expected to operate at LOS E during the AM peak hour.

Significant queues are expected along the eastbound and northbound approaches under 2029 no-build and 2029 build conditions. These queues are existing issues and are not due to the development traffic. Significant delays are expected under 2038 build during both peak hours. Additionally, the study intersection is completely built out with multiple turn lanes on all approaches; therefore, no geometric improvements could be constructed here. Further mitigation would require corridor level improvements. The intersection was also analyzed with right-turn on reds allowed in order to better replicate field conditions. With right-turns on red allowed, delays were expected to significantly improve. While delays do improve under 2038 build conditions, LOS E is still expected during the PM peak hour. It should be noted that the site trips only account for approximately 2% of the total traffic at the intersection. No improvements by the developer are recommended.

Recommendations

Based on the findings of this study, while existing issues are present, the proposed site is not expected to cause significant impacts. Due to the minimal impacts, no improvements by the development are recommended.

Findings and Summary

Based on the findings of this study, no specific geometric improvements have been identified.

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

Sincerely,

Caroline Cheeves, P.E.
Traffic Engineering Project Manager
Infrastructure Consulting Services, Inc.
dba
RAMEY KEMP ASSOCIATES

NC Corporate License # F-1489

Attachments: Scoping Documentation
Traffic Counts
Figures
Capacity Analysis Reports

TECHNICAL APPENDIX

APPENDIX A

SCOPING DOCUMENTATION

RAMEY KEMP ASSOCIATES
Moving forward.

T 919 872 5115

5808 Faringdon Place
Raleigh, NC 27609

October 11, 2022

Andrew Spiliotis
Town of Knightdale
950 Steeple Square Court
Knightdale, NC 7545
andrew.spiliotis@knightdalenc.gov

Reference: Hinton Oaks
Knightdale, North Carolina

Subject: Memorandum of Understanding for Traffic Assessment Letter

Dear Mr. Spiliotis:

The following is a Memorandum of Understanding (MOU) outlining the proposed scope of work and assumptions related to the Traffic Assessment Letter for the proposed Hinton Oaks Industrial Park development to be located north of US 64 Business (Knightdale Boulevard), along Hinton Oaks Boulevard in Knightdale, North Carolina. The proposed development is expected to consist of 344,000 s.f. of industrial and be built out by 2028. Access to the site is proposed via connection to the existing Hinton Oaks Boulevard. A preliminary site plan is included in the attachments. This MOU is compiled with information regarding the scope of the Hinton Oaks development Traffic Assessment Letter, per the scoping meeting with the Town of Knightdale (Town) and the North Carolina Department of Transportation (NCDOT) on 8/24/2022.

Study Area

Based on coordination with the Town and NCDOT, the study area is proposed to consist of the following intersections:

- US 64 Business (Knightdale Boulevard) and Hinton Oaks Boulevard
- I-540 Northbound Ramps and US 64 Business
- I-540 Southbound Ramps and US 64 Business

Analysis Scenarios

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

- 2022 Existing Traffic Conditions
- 2028 + 1 No-Build Traffic Conditions
- 2028 + 1 Build Traffic Conditions
- 2028 + 10 Build Traffic Conditions

Existing Traffic Volumes

Existing traffic volumes will be based off of previous peak hour traffic counts that were performed in January 2020 at all study intersections on a typical weekday during AM (7:00 – 9:00 AM) and PM (4:00 – 6:00 PM) peak periods, while schools were in session. Volumes will be balanced between study intersections where appropriate. Existing traffic volumes will be determined by projecting 2020 traffic volumes to 2022 using a 3% annual growth rate. It should be noted that volumes were taken prior to the pandemic.

No-Build Traffic Volumes

Based on coordination with the Town and NCDOT, no-build traffic volumes will be determined by projecting 2022 existing traffic volumes to the build-out year using a 3% annual growth rate.

Through coordination with the Town and NCDOT, the following adjacent developments will be included in the traffic assessment letter:

- Legacy Oaks
- Hinton Oaks Industrial

All other future developments will be accounted for with the proposed 3% annual growth rate. The provided TIAs for the adjacent developments listed above and associated trips and improvements will be incorporated into the traffic assessment letter.

Future Roadway Improvements

Based on coordination with the Town and NCDOT, no future roadway improvement projects were identified in the study area.

Trip Generation

Average weekday AM and PM peak hour trips for the existing Hinton Oaks Industrial facility were estimated using traffic counts conducted by Ramey Kemp & Associates, Inc. (RKA), along Hinton Oaks Boulevard in July of 2022 during weekday AM (7:00 AM – 9:00 AM) and PM (4:00 PM – 6:00 PM) peak periods. It should be noted that these times are expected to capture the shift changes of the facility. Refer to the attachments for the count data at the existing site drives. Table 1 provides the current number of trips generated from the existing facility based on the 2022 traffic count data. The table also shows trip generation rates calculated for the expansion of the facility using the trip generation data gathered from the existing facility.

Table 1: Trip Generation for Existing Hinton Oaks Industrial Facility

Land Use	Intensity	AM Peak Hour Trips (vph)		PM Peak Hour Trips (vph)	
		Enter	Exit	Enter	Exit
Existing Hinton Oaks Industrial Facility	502.5 KSF	140	67	36	135

Calculated Trip Generation Rates (based on 2022 traffic count data)			
AM Peak Hour Rate		**PM Peak Hour Rate**	
0.41 trips/employee		0.34 trips/employee	
Enter: 68%	Exit: 32%	Enter: 21%	Exit: 79%

Land Use	Intensity	AM Peak Hour Trips (vph)		PM Peak Hour Trips (vph)	
		Enter	Exit	Enter	Exit
Proposed Expansion	344 KSF	96	45	25	92

As shown in Table 1, July 2022 traffic count data estimates that the existing facility is currently generating 207 trips (140 entering and 67 exiting) during the weekday AM peak hour and 171 trips (36 entering and 135 exiting) during the weekday PM peak hour. It should be noted that the development was built-out to approximately 502,500 s.f. present during the shift that count data was collected.

Trip generation data for the existing facility was utilized to calculate a rate (trips per employee) for the weekday AM and PM peak hours. Illustrated in Table 1, the weekday AM peak hour is expected to generate 0.41 trips per employee for the expanded Hinton Oaks Industrial facility, with 68% of vehicles entering and 32% of vehicles exiting. The weekday PM peak hour is estimated to generate 0.34 trips per employee for the expanded facility, with 21% of vehicles entering and 79% of vehicles exiting. Based on the information above, the proposed expansion is expected to generate 141 trips (96 entering and 45 exiting) during the weekday AM peak hour and 117 trips (25 entering and 92 exiting) during the weekday PM peak hour.

Trip Distribution and Assignment

The primary site trips are distributed based on the locations of existing traffic patterns, population centers adjacent to the study area, and engineering judgment. A summary of the overall site trip distributions is below:

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

- 35% to/from the north via I-540
- 40% to/from the south via I-540
- 15% to/from the west via US 64 Business
- 10% to/from the east via US 64 Business

Report

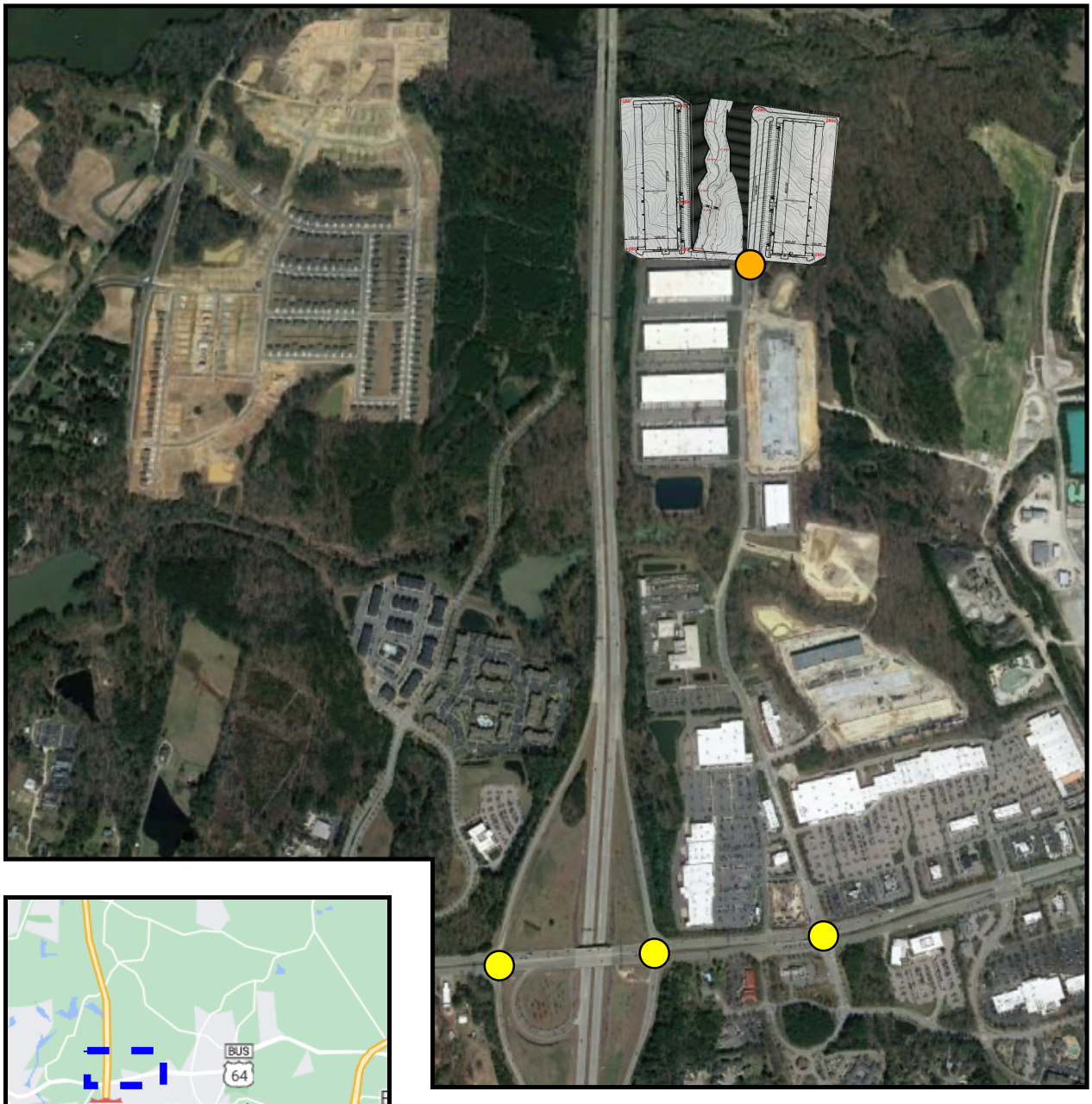
The traffic assessment letter will be prepared based on the Town and NCDOT requirements. If you find this memorandum of understanding acceptable, please let me know so that we may include it in the traffic assessment letter. If you have any questions or concerns, please do not hesitate to contact me.

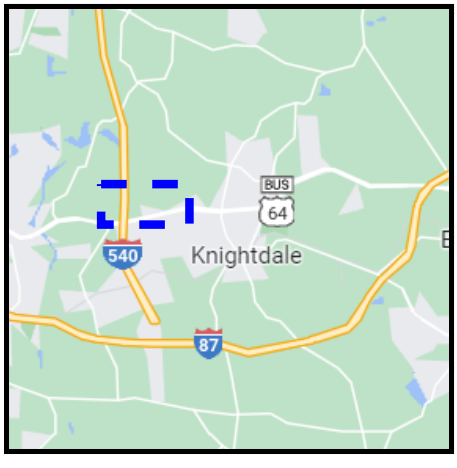
Sincerely,
Ramey Kemp & Associates, Inc.

Caroline Cheeves

Caroline Cheeves, PE
Traffic Engineering Project Manager

Attachments: Site Location Map
Preliminary Site Plan
Existing Peak Hour Traffic Volumes Figure
Proposed Site Trip Distribution Figures





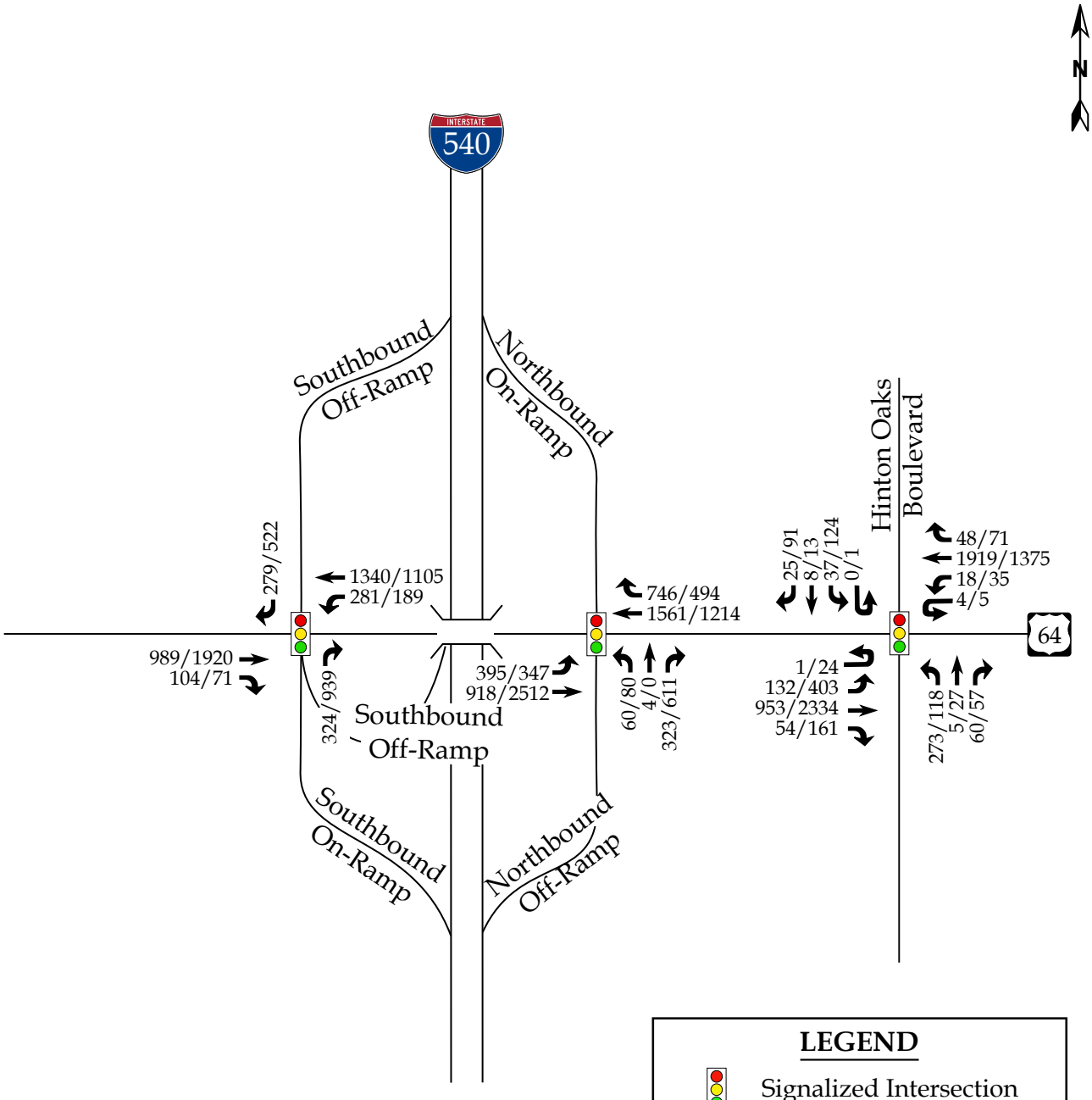
N

LEGEND

- Study Intersection
- Proposed Site Access
- Study Area

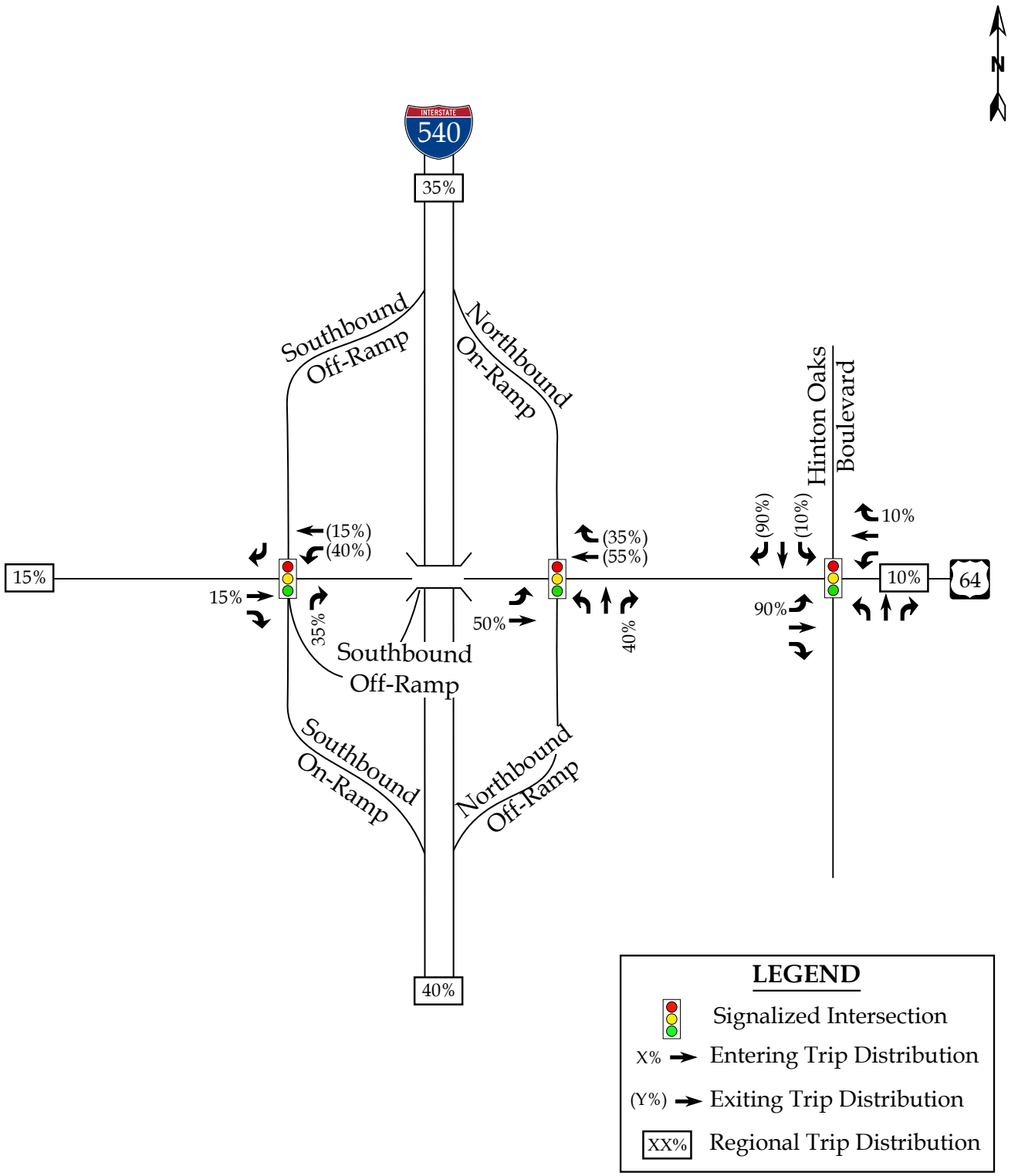
RKA RAMEY KEMP ASSOCIATES	Hinton Oaks Knightdale, NC	Site Location Map Scale: Not to Scale


PROPOSED SCM
PROPOSED SCM
35' WALL
+280
280+
30' WALL
20' WALL
+280
280+
10' WALL
25' WALL
13' WALL
PROPOSED BUILDING
180,000 SF
900.00'
25' WALL
280+
10' WALL
5' WALL
130.00'
200.00'
10' WALL
+280
280+
20' WALL
HINTON OAKS BOULEVARD
820.00'
PROPOSED BUILDING
184,000 SF
10' WALL
+280
280+
200.00'
130.00'
280+
+282.0
INTERSTATE 40



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	Hinton Oaks Knightdale, NC	2022 Existing Peak Hour Traffic
		Scale: Not to Scale | Figure 4



RKA RAMEY KEMP ASSOCIATES	Hinton Oaks Knightdale, NC	Site Trip Distribution Scale: Not to Scale | Figure 8

APPENDIX B

TRAFFIC COUNTS

Project ID: 20-09026-001
Location: I-540 & Northern Wake Expy SB Ramps & US 64 & Knightdale Blvd **Day: Thursday**
City: Knightdale **Date: 01/30/2020**

Groups Printed - Cars, PU, Vans - Heavy Trucks

	I-540 & Northern Wake Expy SB Ramps Northbound						I-540 & Northern Wake Expy SB Ramps Southbound						US 64 & Knightdale Blvd Eastbound						US 64 & Knightdale Blvd Westbound						
Start Time	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Int. Total
7:00 AM	0	0	0	0	0	0	0	0	62	0	0	62	0	257	19	0	0	276	55	308	0	0	0	363	701
7:15 AM	0	0	0	0	0	0	0	0	48	0	0	48	0	217	29	0	0	246	64	321	0	0	0	385	679
7:30 AM	0	0	0	0	0	0	0	0	62	0	0	62	0	237	30	0	0	267	73	349	0	0	0	422	751
7:45 AM	0	0	0	0	0	0	0	0	91	0	0	91	0	221	20	0	0	241	73	285	0	1	0	359	691
Total	0	0	0	0	0	0	0	0	263	0	0	263	0	932	98	0	0	1030	265	1263	0	1	0	1529	2822
8:00 AM	0	0	0	0	0	0	0	0	73	0	0	73	0	222	26	0	0	248	56	278	0	1	0	335	656
8:15 AM	0	0	0	0	0	0	0	0	102	0	0	102	0	203	17	0	0	220	58	261	0	3	0	322	644
8:30 AM	0	0	0	0	0	0	0	0	62	0	0	62	0	213	26	0	0	239	47	220	0	2	0	269	570
8:45 AM	0	0	0	0	0	0	0	0	57	0	0	57	0	205	14	0	0	219	49	205	0	1	0	255	531
Total	0	0	0	0	0	0	0	0	294	0	0	294	0	843	83	0	0	926	210	964	0	7	0	1181	2401
BREAK																									
4:00 PM	0	0	0	0	0	0	0	0	102	0	1	102	0	334	33	0	0	367	54	210	0	1	0	265	734
4:15 PM	0	0	0	0	0	0	0	0	116	0	0	116	0	377	21	0	0	398	67	206	0	1	0	274	788
4:30 PM	0	0	0	0	0	0	0	0	106	0	0	106	0	399	22	0	0	421	67	242	0	1	0	310	837
4:45 PM	0	0	0	0	0	0	0	0	103	0	0	103	0	426	21	0	0	447	41	228	0	0	0	269	819
Total	0	0	0	0	0	0	0	0	427	0	1	427	0	1536	97	0	0	1633	229	886	0	3	0	1118	3178
5:00 PM	0	0	0	0	0	0	0	0	117	0	0	117	0	478	18	0	0	496	44	256	0	1	0	301	914
5:15 PM	0	0	0	0	0	0	0	0	135	0	0	135	0	450	12	0	0	462	51	240	0	1	0	292	889
5:30 PM	0	0	0	0	0	0	0	0	126	0	0	126	0	457	18	0	0	475	41	271	0	0	0	312	913
5:45 PM	0	0	0	0	0	0	0	0	114	0	0	114	0	425	19	0	0	444	42	266	0	0	0	308	866
Total	0	0	0	0	0	0	0	0	492	0	0	492	0	1810	67	0	0	1877	178	1033	0	2	0	1213	3582
Grand Total	0	0	0	0	0	0	0	0	1476	0	1	1476	0	5121	345	0	0	5466	882	4146	0	13	0	5041	11983
Apprch %	0.0	0.0	0.0	0.0	0.0		0.0	0.0	100.0	0.0	0.1		0.0	93.7	6.3	0.0	0.0		17.5	82.2	0.0	0.3	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.3	0.0	0.0	12.3	0.0	42.7	2.9	0.0	0.0	45.6	7.4	34.6	0.0	0.1	0.0	42.1	
Cars, PU, Vans	0	0	0	0		0	0	0	1423	0		1423	0	4981	336	0		5317	848	4034	0	13		4895	11635
% Cars, PU, Vans	0.0	0.0	0.0	0.0		0.0	0.0	0.0	96.4	0.0		96.4	0.0	97.3	97.4	0.0		97.3	96.1	97.3	0.0	100.0		97.1	97.1
Heavy Trucks	0	0	0	0		0	0	0	53	0		53	0	140	9	0		149	34	112	0	0		146	348
%Heavy Trucks	0.0	0.0	0.0	0.0		0.0	0.0	0.0	3.6	0.0		3.6	0.0	2.7	2.6	0.0		2.7	3.9	2.7	0.0	0.0		2.9	2.9

Project ID: 20-09026-001
Location: I-540 & Northern Wake Expy SB Ramps & US 64 & **Day: Thursday**
City: Knightdale **Date: 01/30/2020**

PEAK HOURS

AM

	540 & Northern Wake Expy SB Ramp Northbound					540 & Northern Wake Expy SB Ramp Southbound					US 64 & Knightdale Blvd Eastbound					US 64 & Knightdale Blvd Westbound					
Start Time	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Int. Total
Peak Hour Analysis from 07:00 AM to 09:00 AM																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
7:00 AM	0	0	0	0	0	0	0	62	0	62	0	257	19	0	276	55	308	0	0	363	701
7:15 AM	0	0	0	0	0	0	0	48	0	48	0	217	29	0	246	64	321	0	0	385	679
7:30 AM	0	0	0	0	0	0	0	62	0	62	0	237	30	0	267	73	349	0	0	422	751
7:45 AM	0	0	0	0	0	0	0	91	0	91	0	221	20	0	241	73	285	0	1	359	691
Total Volume	0	0	0	0	0	0	0	263	0	263	0	932	98	0	1030	265	1263	0	1	1529	2822
% App. Total	0.0	0.0	0.0	0.0	0	0.0	0.0	100.0	0.0	100	0.0	90.5	9.5	0.0	100	17.3	82.6	0.0	0.1	100	
PHF									0.723						0.933					0.906	0.939
Cars, PU, Vans	0	0	0	0	0	0	0	255	0	255	0	902	95	0	997	250	1222	0	1	1473	2725
% Cars, PU, Vans	0.0	0.0	0.0	0.0	0.0	0.0	0.0	97.0	0.0	97.0	0.0	96.8	96.9	0.0	96.8	94.3	96.8	0.0	100.0	96.3	96.6
Heavy Trucks	0	0	0	0	0	0	0	8	0	8	0	30	3	0	33	15	41	0	0	56	97
%Heavy Trucks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	3.0	0.0	3.2	3.1	0.0	3.2	5.7	3.2	0.0	0.0	3.7	3.4

PM

	540 & Northern Wake Expy SB Ramp Northbound					540 & Northern Wake Expy SB Ramp Southbound					US 64 & Knightdale Blvd Eastbound					US 64 & Knightdale Blvd Westbound					
Start Time	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Int. Total
Peak Hour Analysis from 04:00 PM to 06:00 PM																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
5:00 PM	0	0	0	0	0	0	0	117	0	117	0	478	18	0	496	44	256	0	1	301	914
5:15 PM	0	0	0	0	0	0	0	135	0	135	0	450	12	0	462	51	240	0	1	292	889
5:30 PM	0	0	0	0	0	0	0	126	0	126	0	457	18	0	475	41	271	0	0	312	913
5:45 PM	0	0	0	0	0	0	0	114	0	114	0	425	19	0	444	42	266	0	0	308	866
Total Volume	0	0	0	0	0	0	0	492	0	492	0	1810	67	0	1877	178	1033	0	2	1213	3582
% App. Total	0.0	0.0	0.0	0.0	0	0.0	0.0	100.0	0.0	100	0.0	96.4	3.6	0.0	100	14.7	85.2	0.0	0.2	100	
PHF									0.911						0.946					0.972	0.980
Cars, PU, Vans	0	0	0	0	0	0	0	476	0	476	0	1781	67	0	1848	177	1022	0	2	1201	3525
% Cars, PU, Vans	0.0	0.0	0.0	0.0	0.0	0.0	0.0	96.7	0.0	96.7	0.0	98.4	100.0	0.0	98.5	99.4	98.9	0.0	100.0	99.0	98.4
Heavy Trucks	0	0	0	0	0	0	0	16	0	16	0	29	0	0	29	1	11	0	0	12	57
%Heavy Trucks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.3	0.0	3.3	0.0	1.6	0.0	0.0	1.5	0.6	1.1	0.0	0.0	1.0	1.6

Project ID: 20-09026-002
Location: I-540 & Northern Wake Expy NB Ramps & US 64 & Knightdale Blvd **Day: Thursday**
City: Knightdale **Date: 01/30/2020**

Groups Printed - Cars, PU, Vans - Heavy Trucks

	I-540 & Northern Wake Expy NB Ramps Northbound						I-540 & Northern Wake Expy NB Ramps Southbound						US 64 & Knightdale Blvd Eastbound						US 64 & Knightdale Blvd Westbound						
Start Time	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Int. Total
7:00 AM	13	0	54	0	0	67	0	0	0	0	0	0	80	189	0	0	0	269	0	350	174	0	0	524	860
7:15 AM	9	0	60	0	0	69	0	0	0	0	0	0	99	203	0	1	0	303	0	362	183	0	0	545	917
7:30 AM	20	2	97	0	0	119	0	0	0	0	0	0	104	216	0	0	0	320	0	412	179	0	0	591	1030
7:45 AM	15	2	93	0	0	110	0	0	0	0	0	0	89	257	0	0	0	346	0	336	167	0	0	503	959
Total	57	4	304	0	0	365	0	0	0	0	0	0	372	865	0	1	0	1238	0	1460	703	0	0	2163	3766
8:00 AM	17	0	72	0	0	89	0	0	0	0	0	0	67	226	0	1	0	294	0	339	138	0	0	477	860
8:15 AM	12	0	98	0	0	110	0	0	0	0	0	0	90	210	0	1	0	301	0	298	119	0	0	417	828
8:30 AM	14	0	78	0	0	92	0	0	0	0	0	0	68	228	0	0	0	296	0	268	141	0	0	409	797
8:45 AM	17	0	79	0	0	96	0	0	0	0	0	0	83	208	0	0	0	291	0	221	122	0	0	343	730
Total	60	0	327	0	0	387	0	0	0	0	0	0	308	872	0	2	0	1182	0	1126	520	0	0	1646	3215
BREAK																									
4:00 PM	12	0	133	0	0	145	0	0	0	0	1	0	51	441	0	2	0	494	0	256	116	0	0	372	1011
4:15 PM	18	1	151	0	0	170	0	0	0	0	0	0	73	479	0	1	0	553	0	250	109	0	0	359	1082
4:30 PM	25	1	137	0	0	163	0	0	0	0	0	0	82	488	0	0	0	570	0	273	107	0	0	380	1113
4:45 PM	13	0	135	0	0	148	0	0	0	0	0	0	77	534	0	1	0	612	0	269	114	0	0	383	1143
Total	68	2	556	0	0	626	0	0	0	0	1	0	283	1942	0	4	0	2229	0	1048	446	0	0	1494	4349
5:00 PM	18	0	156	0	0	174	0	0	0	0	0	0	103	572	0	0	0	675	0	265	112	0	0	377	1226
5:15 PM	11	0	137	0	0	148	0	0	0	0	0	0	87	612	0	0	0	699	0	306	138	0	0	444	1291
5:30 PM	30	0	143	0	0	173	0	0	0	0	0	0	66	621	0	0	0	687	0	273	117	0	0	390	1250
5:45 PM	16	0	140	0	0	156	0	0	0	0	0	0	71	563	0	0	0	634	0	300	99	0	0	399	1189
Total	75	0	576	0	0	651	0	0	0	0	0	0	327	2368	0	0	0	2695	0	1144	466	0	0	1610	4956
Grand Total	260	6	1763	0	0	2029	0	0	0	0	1	0	1290	6047	0	7	0	7344	0	4778	2135	0	0	6913	16286
Apprch %	12.8	0.3	86.9	0.0	0.0		0.0	0.0	0.0	0.0	0.0		17.6	82.3	0.0	0.1	0.0		0.0	69.1	30.9	0.0	0.0		
Total %	1.6	0.0	10.8	0.0	0.0	12.5	0.0	0.0	0.0	0.0	0.0	0.0	7.9	37.1	0.0	0.0	0.0	45.1	0.0	29.3	13.1	0.0	0.0	42.4	
Cars, PU, Vans	254	5	1710	0		1969	0	0	0	0		0	1254	5855	0	6		7115	0	4639	2045	0		6684	15768
% Cars, PU, Vans	97.7	83.3	97.0	0.0		97.0	0.0	0.0	0.0	0.0		0.0	97.2	96.8	0.0	85.7		96.9	0.0	97.1	95.8	0.0		96.7	96.8
Heavy Trucks	6	1	53	0		60	0	0	0	0		0	36	192	0	1		229	0	139	90	0		229	518
%Heavy Trucks	2.3	16.7	3.0	0.0		3.0	0.0	0.0	0.0	0.0		0.0	2.8	3.2	0.0	14.3		3.1	0.0	2.9	4.2	0.0		3.3	3.2

Project ID: 20-09026-002
Location: I-540 & Northern Wake Expy NB Ramps & US 64 & **Day: Thursday**
City: Knightdale **Date: 01/30/2020**

PEAK HOURS

AM

	540 & Northern Wake Expy NB Ramps Northbound					540 & Northern Wake Expy NB Ramp Southbound					US 64 & Knightdale Blvd Eastbound					US 64 & Knightdale Blvd Westbound					
Start Time	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Int. Total
Peak Hour Analysis from 07:00 AM to 09:00 AM																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
7:00 AM	13	0	54	0	67	0	0	0	0	0	80	189	0	0	269	0	350	174	0	524	860
7:15 AM	9	0	60	0	69	0	0	0	0	0	99	203	0	1	303	0	362	183	0	545	917
7:30 AM	20	2	97	0	119	0	0	0	0	0	104	216	0	0	320	0	412	179	0	591	1030
7:45 AM	15	2	93	0	110	0	0	0	0	0	89	257	0	0	346	0	336	167	0	503	959
Total Volume	57	4	304	0	365	0	0	0	0	0	372	865	0	1	1238	0	1460	703	0	2163	3766
% App. Total	15.6	1.1	83.3	0.0	100	0.0	0.0	0.0	0.0	0	30.0	69.9	0.0	0.1	100	0.0	67.5	32.5	0.0	100	
PHF					0.767										0.895					0.915	0.914
Cars, PU, Vans	56	3	285	0	344	0	0	0	0	0	360	830	0	1	1191	0	1405	671	0	2076	3611
% Cars, PU, Vans	98.2	75.0	93.8	0.0	94.2	0.0	0.0	0.0	0.0	0.0	96.8	96.0	0.0	100.0	96.2	0.0	96.2	95.4	0.0	96.0	95.9
Heavy Trucks	1	1	19	0	21	0	0	0	0	0	12	35	0	0	47	0	55	32	0	87	155
%Heavy Trucks	1.8	25.0	6.3	0.0	5.8	0.0	0.0	0.0	0.0	0.0	3.2	4.0	0.0	0.0	3.8	0.0	3.8	4.6	0.0	4.0	4.1

PM

	540 & Northern Wake Expy NB Ramps Northbound					540 & Northern Wake Expy NB Ramp Southbound					US 64 & Knightdale Blvd Eastbound					US 64 & Knightdale Blvd Westbound					
Start Time	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Int. Total
Peak Hour Analysis from 04:00 PM to 06:00 PM																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
5:00 PM	18	0	156	0	174	0	0	0	0	0	103	572	0	0	675	0	265	112	0	377	1226
5:15 PM	11	0	137	0	148	0	0	0	0	0	87	612	0	0	699	0	306	138	0	444	1291
5:30 PM	30	0	143	0	173	0	0	0	0	0	66	621	0	0	687	0	273	117	0	390	1250
5:45 PM	16	0	140	0	156	0	0	0	0	0	71	563	0	0	634	0	300	99	0	399	1189
Total Volume	75	0	576	0	651	0	0	0	0	0	327	2368	0	0	2695	0	1144	466	0	1610	4956
% App. Total	11.5	0.0	88.5	0.0	100	0.0	0.0	0.0	0.0	0	12.1	87.9	0.0	0.0	100	0.0	71.1	28.9	0.0	100	
PHF					0.935										0.964					0.907	0.960
Cars, PU, Vans	73	0	573	0	646	0	0	0	0	0	324	2323	0	0	2647	0	1134	456	0	1590	4883
% Cars, PU, Vans	97.3	0.0	99.5	0.0	99.2	0.0	0.0	0.0	0.0	0.0	99.1	98.1	0.0	0.0	98.2	0.0	99.1	97.9	0.0	98.8	98.5
Heavy Trucks	2	0	3	0	5	0	0	0	0	0	3	45	0	0	48	0	10	10	0	20	73
%Heavy Trucks	2.7	0.0	0.5	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.9	1.9	0.0	0.0	1.8	0.0	0.9	2.1	0.0	1.2	1.5

Project ID: 20-09026-003
Location: Hinton Oaks Blvd & US 64/Knightdale Blvd
City: Knightdale

Day: Thursday
Date: 01/30/2020

Groups Printed - Cars, PU, Vans - Heavy Trucks

	Hinton Oaks Blvd Northbound						Hinton Oaks Blvd Southbound						US 64/Knightdale Blvd Eastbound						US 64/Knightdale Blvd Westbound						
Start Time	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Int. Total
7:00 AM	69	0	27	0	0	96	6	0	2	0	0	8	29	199	10	1	0	239	3	440	10	1	0	454	797
7:15 AM	70	0	10	0	0	80	5	2	6	0	0	13	26	197	10	0	0	233	2	458	9	1	0	470	796
7:30 AM	62	3	14	0	0	79	10	3	6	0	0	19	31	242	12	0	0	285	9	489	7	0	0	505	888
7:45 AM	56	2	6	0	1	64	14	3	10	0	0	27	38	260	19	0	0	317	3	422	19	2	0	446	854
Total	257	5	57	0	1	319	35	8	24	0	0	67	124	898	51	1	0	1074	17	1809	45	4	0	1875	3335
8:00 AM	50	3	12	0	0	65	14	1	14	0	0	29	38	233	12	0	0	283	1	385	12	0	0	398	775
8:15 AM	44	3	13	0	0	60	9	1	12	0	0	22	47	224	7	0	0	278	4	353	19	2	0	378	738
8:30 AM	29	1	11	0	0	41	10	2	12	0	0	24	33	230	12	0	0	275	5	330	11	0	0	346	686
8:45 AM	31	5	10	0	0	46	11	0	17	0	0	28	54	210	11	0	0	275	8	297	11	0	0	316	665
Total	154	12	46	0	0	212	44	4	55	0	0	103	172	897	42	0	0	1111	18	1365	53	2	0	1438	2864
BREAK																									
4:00 PM	34	3	14	0	0	51	38	6	32	0	1	76	73	423	33	11	0	540	6	253	17	2	0	278	945
4:15 PM	27	5	9	0	0	41	20	6	26	0	0	52	70	477	24	3	0	574	5	305	16	3	0	329	996
4:30 PM	21	6	11	0	0	38	42	3	34	0	0	79	76	496	31	4	0	607	6	308	13	1	0	328	1052
4:45 PM	37	3	12	0	0	52	32	7	30	0	0	69	76	499	26	4	0	605	7	283	7	2	0	299	1025
Total	119	17	46	0	0	182	132	22	122	0	1	276	295	1895	114	22	0	2326	24	1149	53	8	0	1234	4018
5:00 PM	31	6	14	0	0	51	28	2	25	0	0	55	90	562	43	5	0	700	12	306	19	2	0	339	1145
5:15 PM	30	5	19	0	0	54	32	4	23	0	0	59	98	548	31	5	0	682	9	325	13	2	0	349	1144
5:30 PM	24	9	11	0	0	44	28	2	14	1	0	45	98	579	43	5	0	725	4	360	16	1	0	381	1195
5:45 PM	26	5	10	0	0	41	29	4	24	0	0	57	94	511	35	8	0	648	8	305	19	0	0	332	1078
Total	111	25	54	0	0	190	117	12	86	1	0	216	380	2200	152	23	0	2755	33	1296	67	5	0	1401	4562
Grand Total	641	59	203	0	1	903	328	46	287	1	1	662	971	5890	359	46	0	7266	92	5619	218	19	0	5948	14779
Apprch %	71.0	6.5	22.5	0.0	0.1		49.5	6.9	43.4	0.2	0.2		13.4	81.1	4.9	0.6	0.0		1.5	94.5	3.7	0.3	0.0		
Total %	4.3	0.4	1.4	0.0	0.0	6.1	2.2	0.3	1.9	0.0	0.0	4.5	6.6	39.9	2.4	0.3	0.0	49.2	0.6	38.0	1.5	0.1	0.0	40.2	
Cars, PU, Vans	639	59	203	0		901	321	46	271	1		639	946	5676	358	46		7026	90	5410	210	19		5729	14295
% Cars, PU, Vans	99.7	100.0	100.0	0.0		99.8	97.9	100.0	94.4	100.0		96.5	97.4	96.4	99.7	100.0		96.7	97.8	96.3	96.3	100.0		96.3	96.7
Heavy Trucks	2	0	0	0		2	7	0	16	0		23	25	214	1	0		240	2	209	8	0		219	484
%Heavy Trucks	0.3	0.0	0.0	0.0		0.2	2.1	0.0	5.6	0.0		3.5	2.6	3.6	0.3	0.0		3.3	2.2	3.7	3.7	0.0		3.7	3.3

Project ID: 20-09026-003
Location: Hinton Oaks Blvd & US 64/Knightdale Blvd
City: Knightdale

PEAK HOURS

Day: Thursday
Date: 01/30/2020

AM

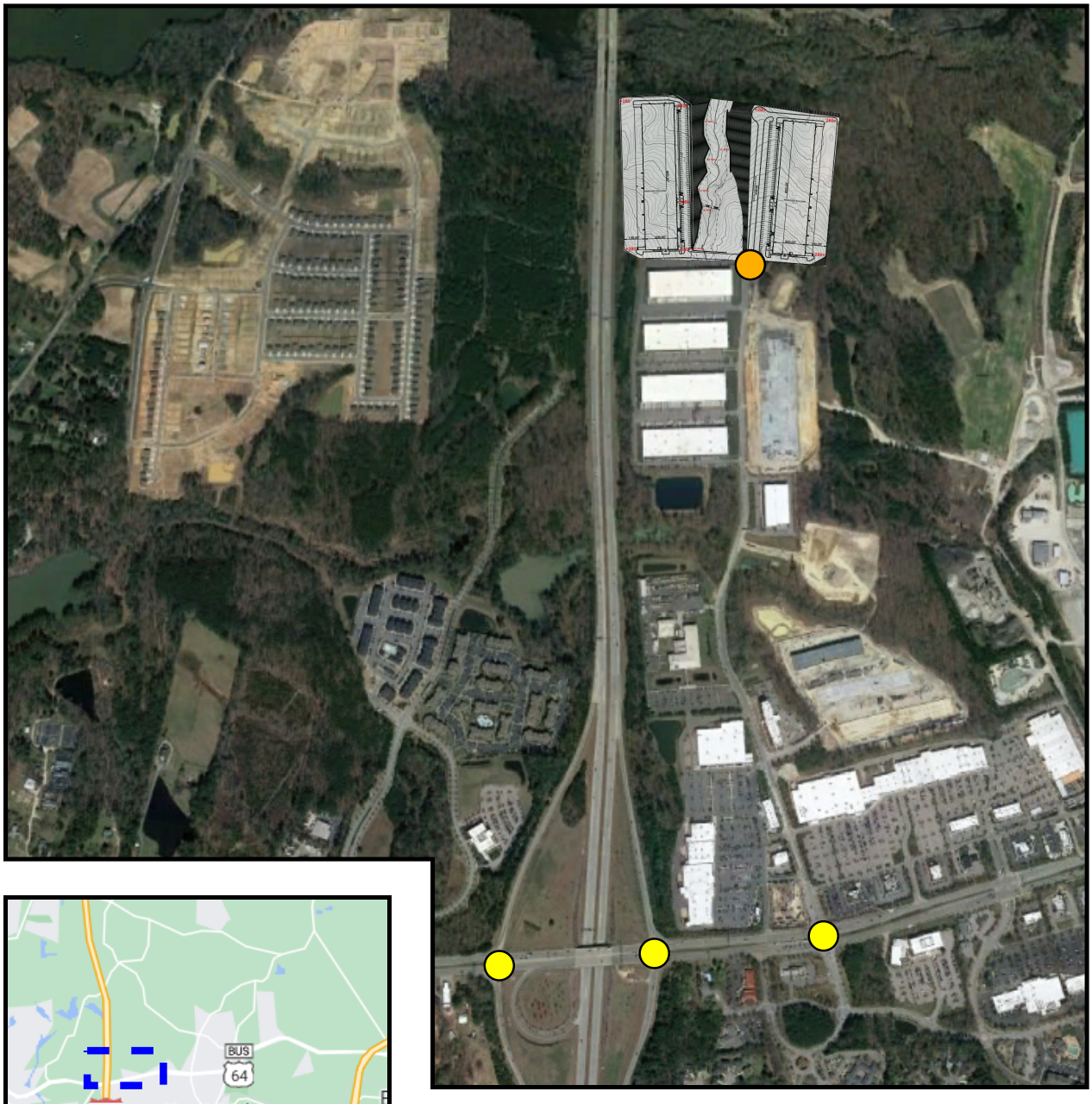
	Hinton Oaks Blvd Northbound					Hinton Oaks Blvd Southbound					US 64/Knightdale Blvd Eastbound					US 64/Knightdale Blvd Westbound					
Start Time	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Int. Total
Peak Hour Analysis from 07:00 AM to 09:00 AM																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
7:00 AM	69	0	27	0	96	6	0	2	0	8	29	199	10	1	239	3	440	10	1	454	797
7:15 AM	70	0	10	0	80	5	2	6	0	13	26	197	10	0	233	2	458	9	1	470	796
7:30 AM	62	3	14	0	79	10	3	6	0	19	31	242	12	0	285	9	489	7	0	505	888
7:45 AM	56	2	6	0	64	14	3	10	0	27	38	260	19	0	317	3	422	19	2	446	854
Total Volume	257	5	57	0	319	35	8	24	0	67	124	898	51	1	1074	17	1809	45	4	1875	3335
% App. Total	80.6	1.6	17.9	0.0	100	52.2	11.9	35.8	0.0	100	11.5	83.6	4.7	0.1	100	0.9	96.5	2.4	0.2	100	
PHF					0.831					0.620					0.847					0.928	0.939
Cars, PU, Vans	256	5	57	0	318	33	8	20	0	61	120	846	51	1	1018	15	1731	44	4	1794	3191
% Cars, PU, Vans	99.6	100.0	100.0	0.0	99.7	94.3	100.0	83.3	0.0	91.0	96.8	94.2	100.0	100.0	94.8	88.2	95.7	97.8	100.0	95.7	95.7
Heavy Trucks	1	0	0	0	1	2	0	4	0	6	4	52	0	0	56	2	78	1	0	81	144
%Heavy Trucks	0.4	0.0	0.0	0.0	0.3	5.7	0.0	16.7	0.0	9.0	3.2	5.8	0.0	0.0	5.2	11.8	4.3	2.2	0.0	4.3	4.3

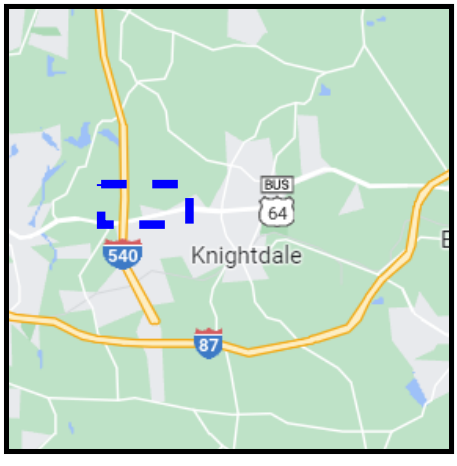
PM

	Hinton Oaks Blvd Northbound					Hinton Oaks Blvd Southbound					US 64/Knightdale Blvd Eastbound					US 64/Knightdale Blvd Westbound					
Start Time	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Int. Total
Peak Hour Analysis from 04:00 PM to 06:00 PM																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
5:00 PM	31	6	14	0	51	28	2	25	0	55	90	562	43	5	700	12	306	19	2	339	1145
5:15 PM	30	5	19	0	54	32	4	23	0	59	98	548	31	5	682	9	325	13	2	349	1144
5:30 PM	24	9	11	0	44	28	2	14	1	45	98	579	43	5	725	4	360	16	1	381	1195
5:45 PM	26	5	10	0	41	29	4	24	0	57	94	511	35	8	648	8	305	19	0	332	1078
Total Volume	111	25	54	0	190	117	12	86	1	216	380	2200	152	23	2755	33	1296	67	5	1401	4562
% App. Total	58.4	13.2	28.4	0.0	100	54.2	5.6	39.8	0.5	100	13.8	79.9	5.5	0.8	100	2.4	92.5	4.8	0.4	100	
PHF					0.880					0.915					0.950					0.919	0.954
Cars, PU, Vans	110	25	54	0	189	117	12	82	1	212	372	2162	151	23	2708	33	1278	66	5	1382	4491
% Cars, PU, Vans	99.1	100.0	100.0	0.0	99.5	100.0	100.0	95.3	100.0	98.1	97.9	98.3	99.3	100.0	98.3	100.0	98.6	98.5	100.0	98.6	98.4
Heavy Trucks	1	0	0	0	1	0	0	4	0	4	8	38	1	0	47	0	18	1	0	19	71
%Heavy Trucks	0.9	0.0	0.0	0.0	0.5	0.0	0.0	4.7	0.0	1.9	2.1	1.7	0.7	0.0	1.7	0.0	1.4	1.5	0.0	1.4	1.6

APPENDIX C

FIGURES



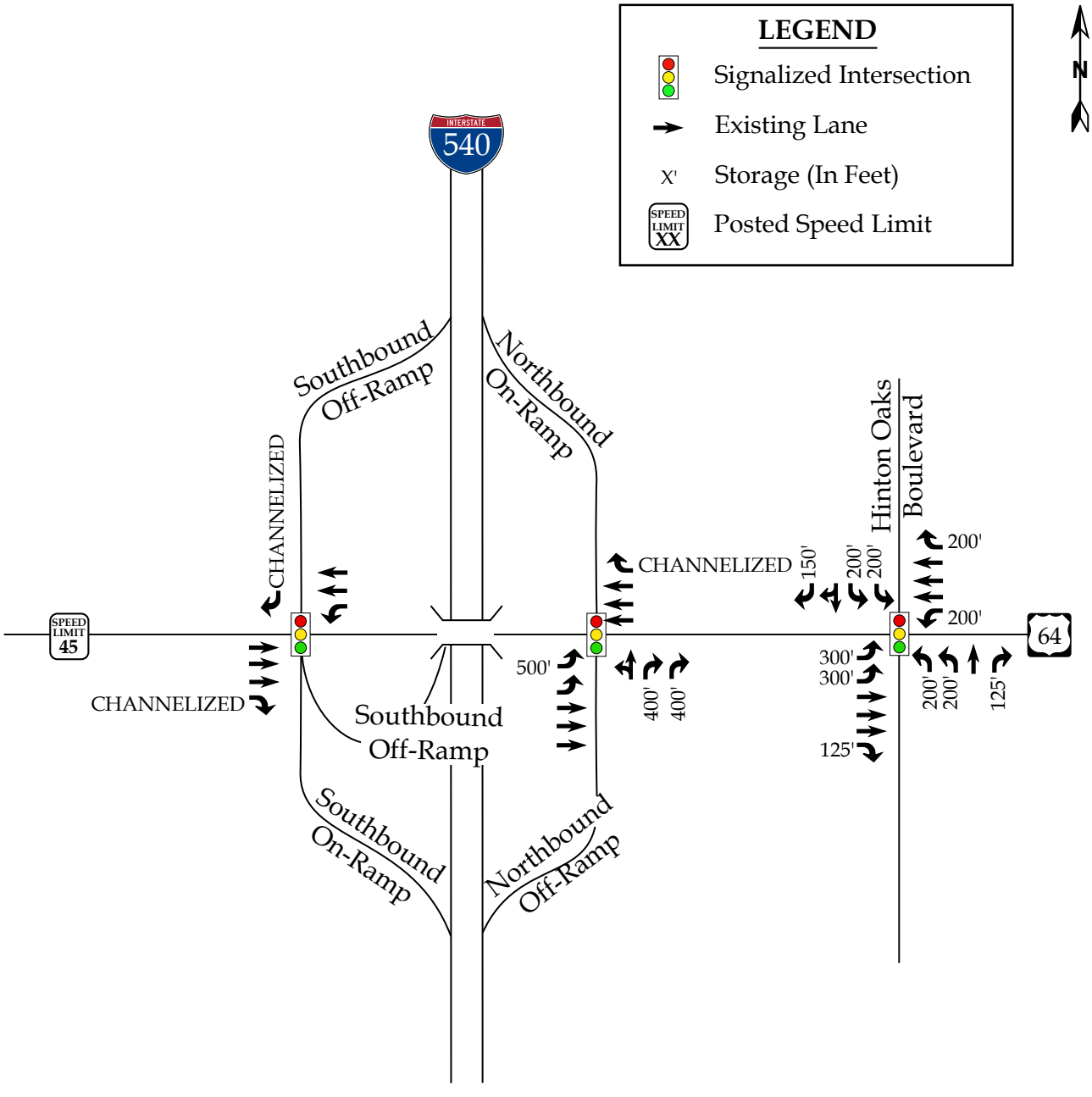


N

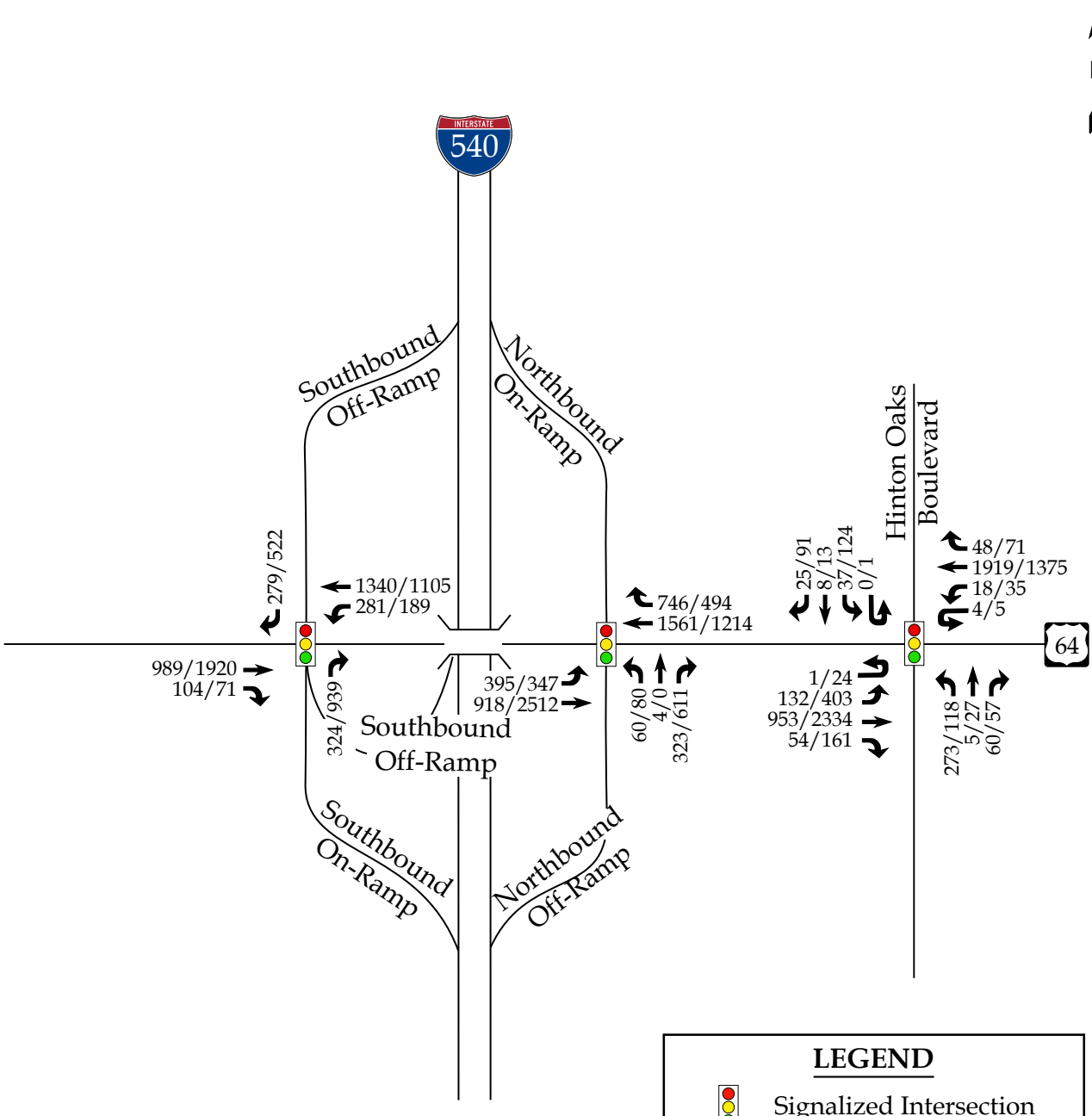
LEGEND

- Study Intersection
- Proposed Site Access
- Study Area

RAMEY KEMP ASSOCIATES	Hinton Oaks Knightdale, NC	Site Location Map	
		Scale: Not to Scale	Figure 1

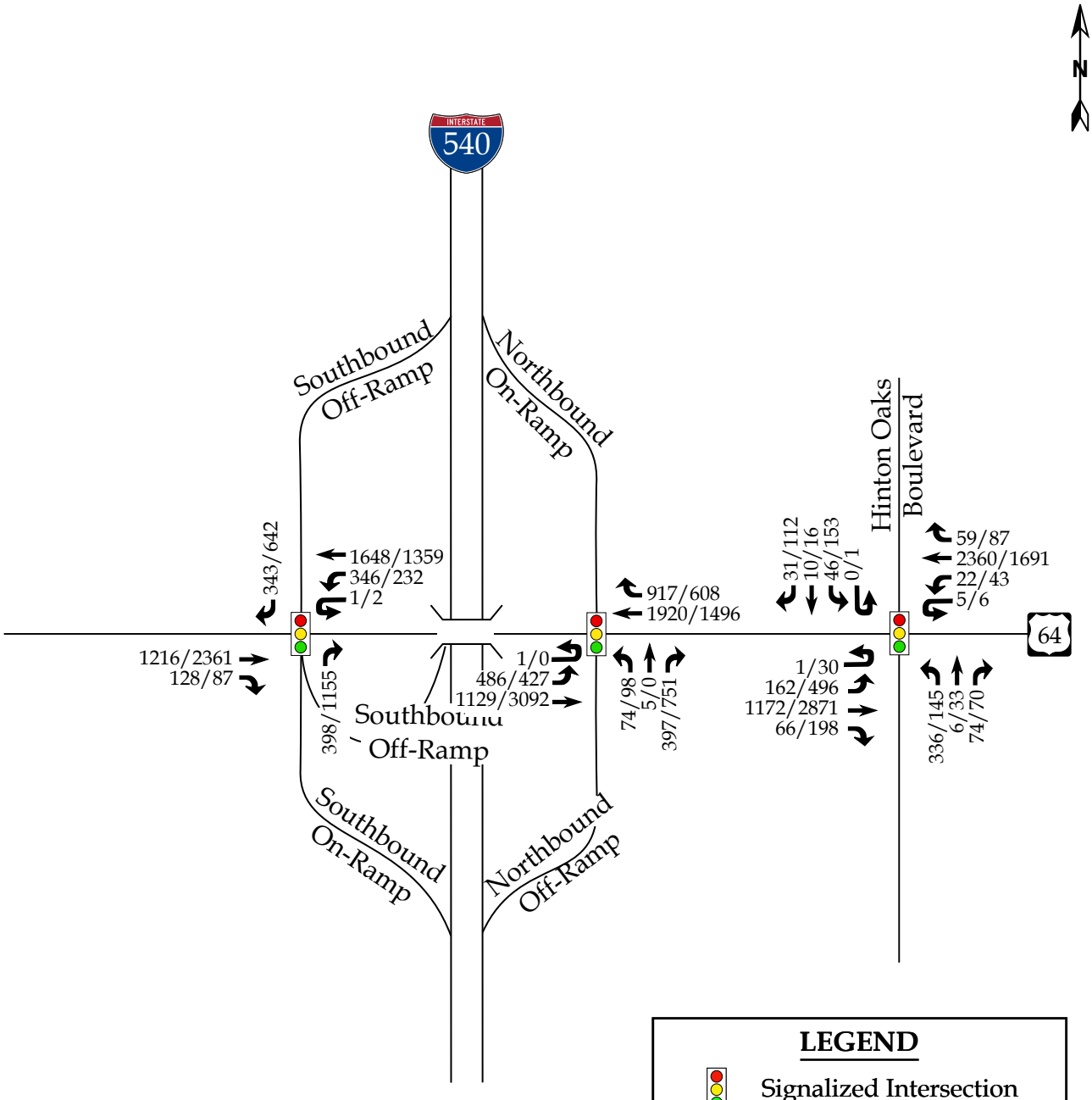


RKA RAMEY KEMP ASSOCIATES	Hinton Oaks Knightdale, NC	2022 Existing Lane Configurations
		Scale: Not to Scale | Figure 3



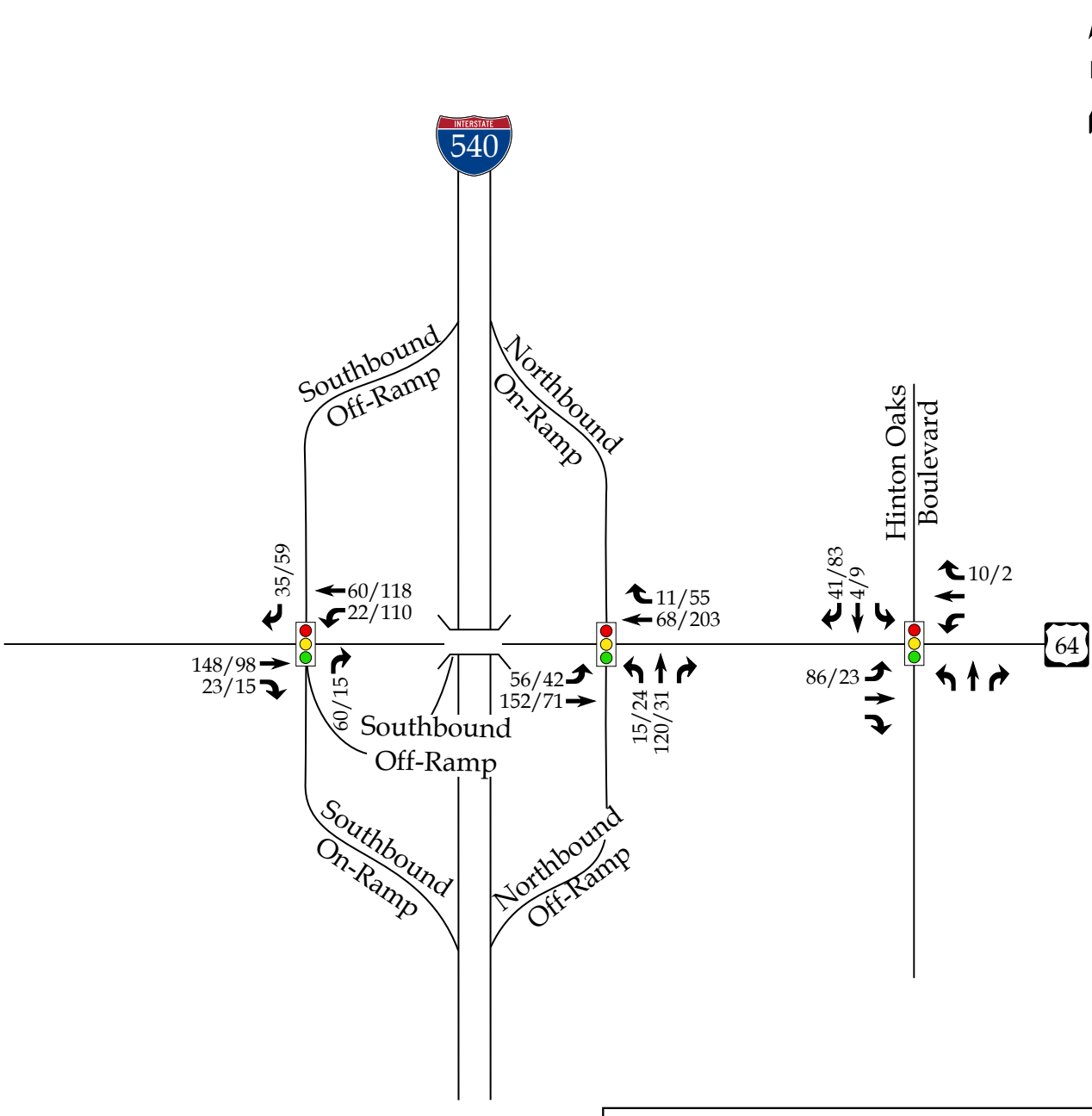
Note: Based on NCDOT Congestion Management guidelines, a volume of 4 vehicles per hour (vph) was analyzed for any movement with less than 4 vph.

RKA RAMEY KEMP ASSOCIATES	Hinton Oaks Knightdale, NC	2022 Existing Peak Hour Traffic
		Scale: Not to Scale | Figure 4



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	Hinton Oaks Knightdale, NC	2029 Projected Peak Hour Traffic Scale: Not to Scale | Figure 5



LEGEND

Signalized Intersection

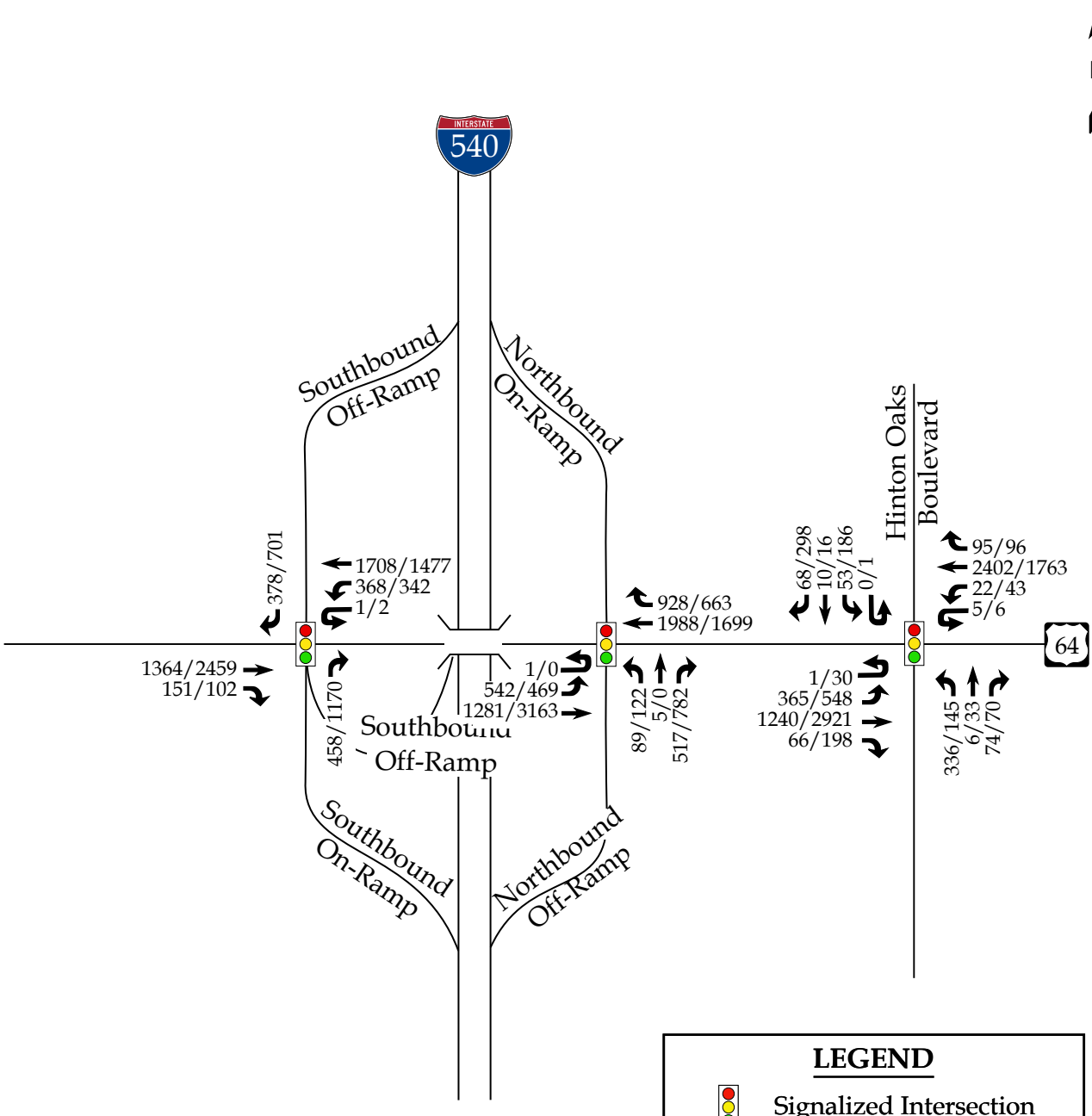
X / Y → Weekday AM / PM Peak Hour Adjacent Development Trips

RAMEY KEMP ASSOCIATES

Hinton Oaks
Knightdale, NC

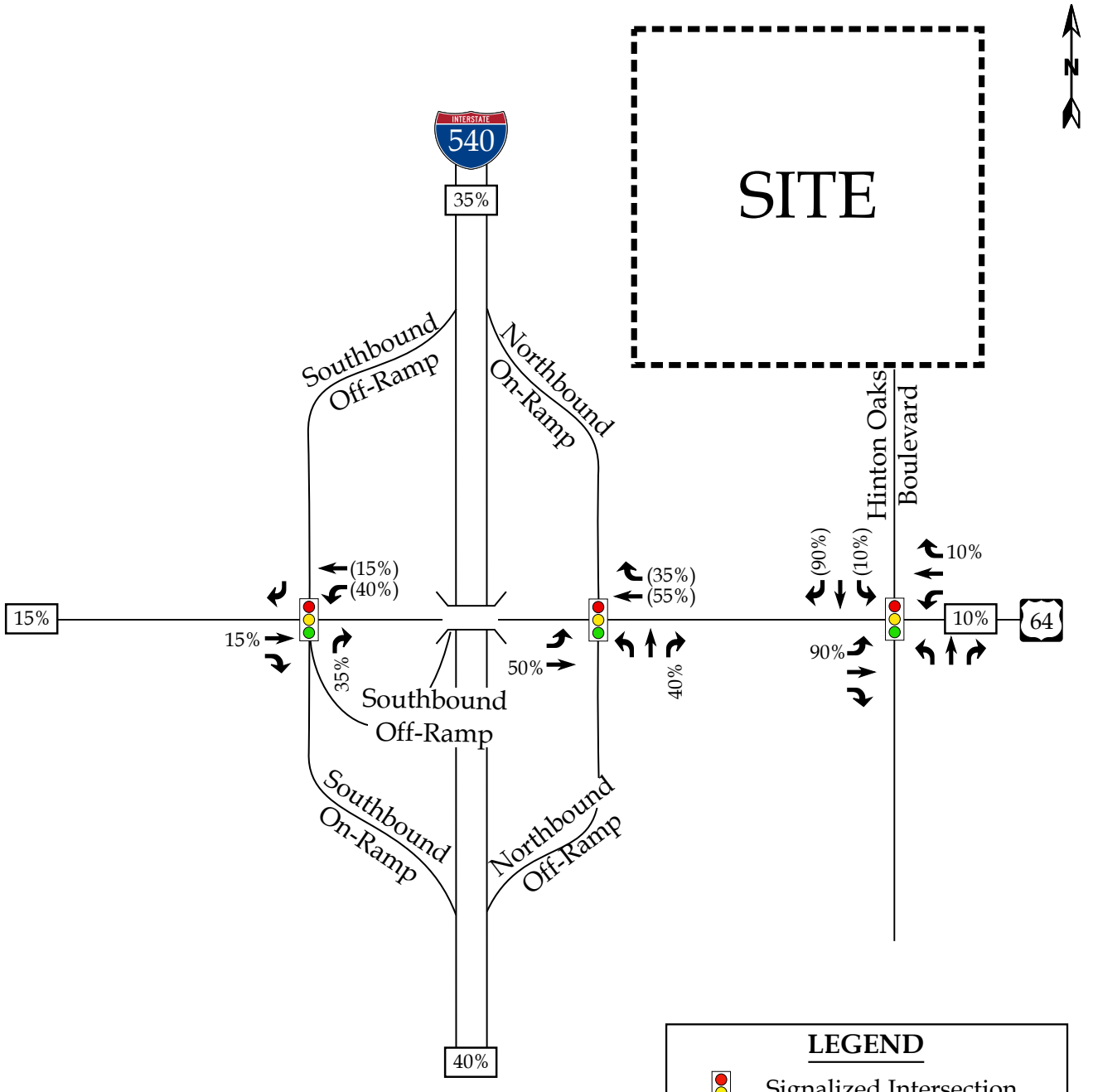
Peak Hour Adjacent Development Trips

Scale: Not to Scale | Figure 6

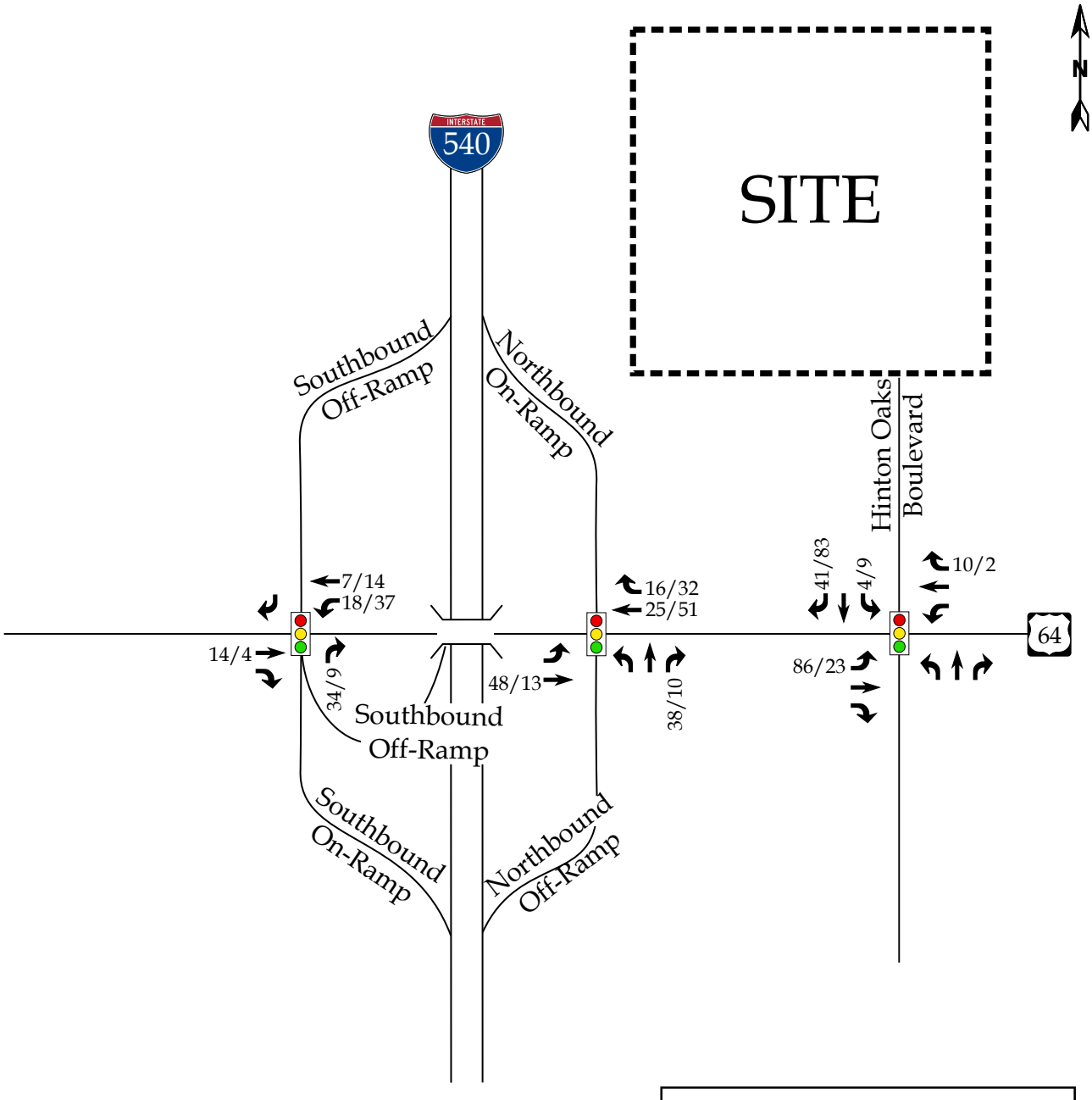


Note: Based on NCDOT Congestion Management guidelines, a volume of 4 vehicles per hour (vph) was analyzed for any movement with less than 4 vph.

RKA RAMEY KEMP ASSOCIATES	Hinton Oaks Knightdale, NC	2029 No-Build Peak Hour Traffic Scale: Not to Scale | Figure 7



RKA RAMEY KEMP ASSOCIATES	Hinton Oaks Knightdale, NC	Site Trip Distribution Scale: Not to Scale | Figure 8

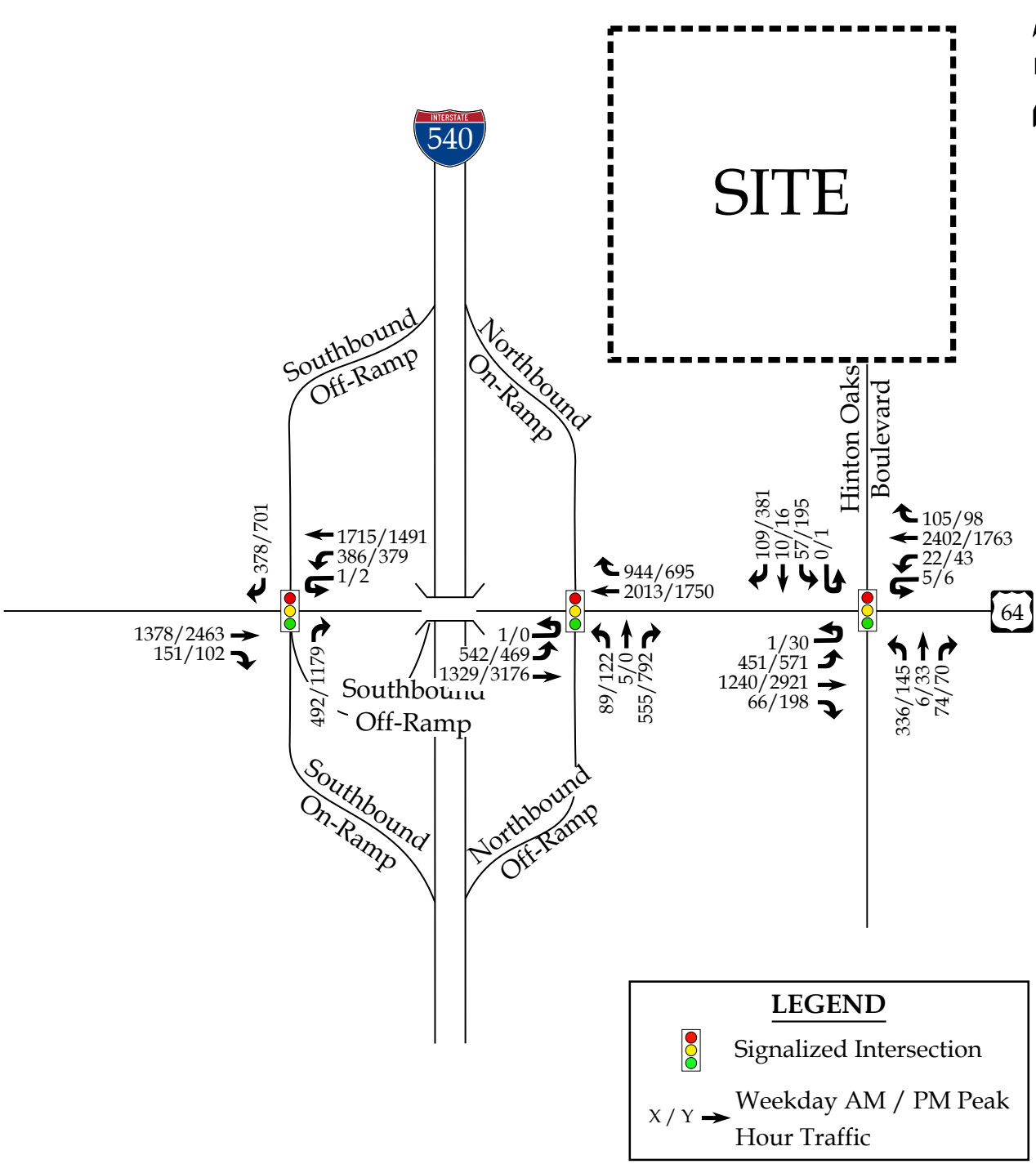


LEGEND

Signalized Intersection

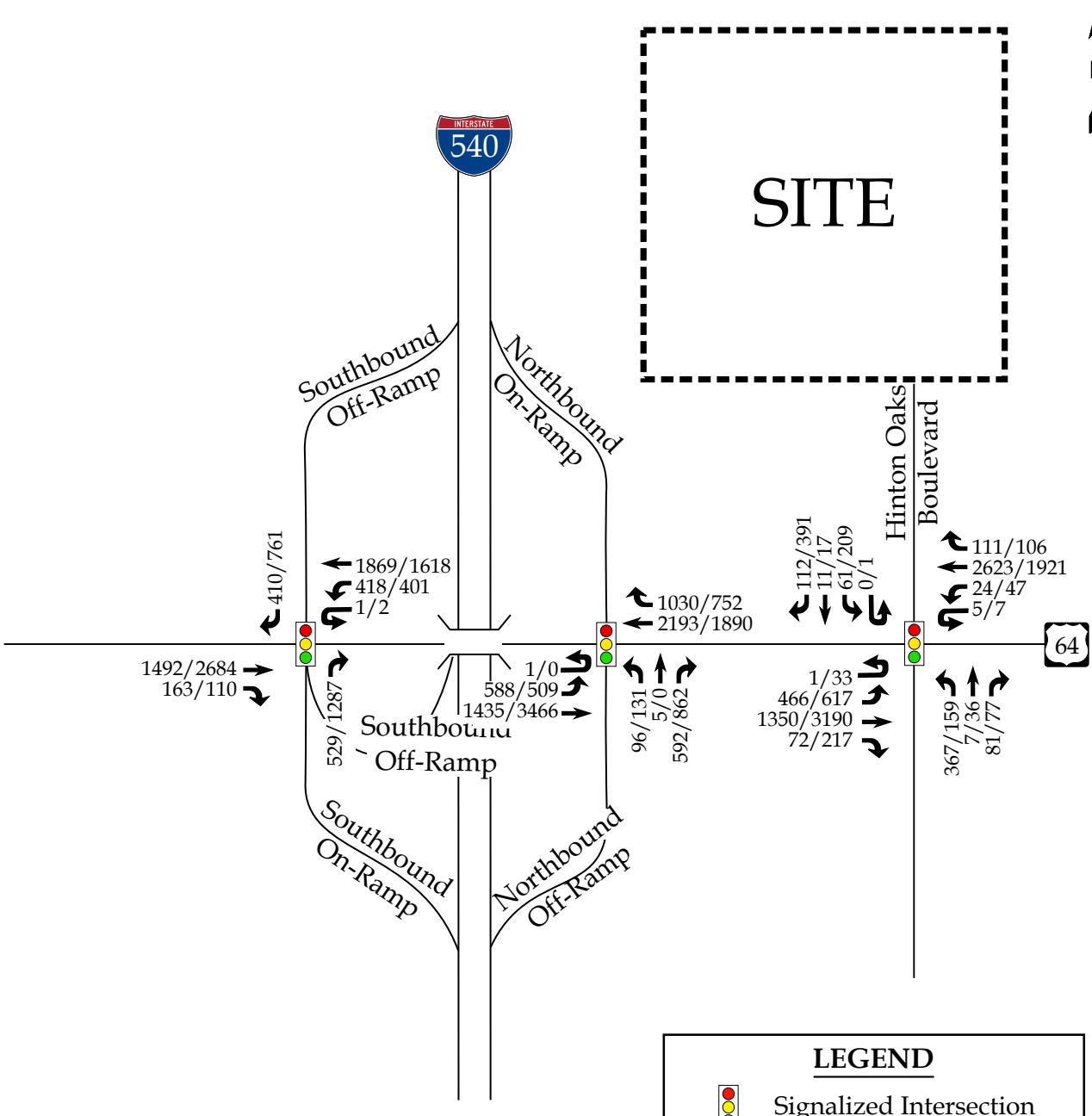
X / Y → Weekday AM / PM Peak Hour Site Trips

RKA RAMEY KEMP ASSOCIATES	Hinton Oaks Knightdale, NC	Site Trip Assignment
		Scale: Not to Scale | Figure 9



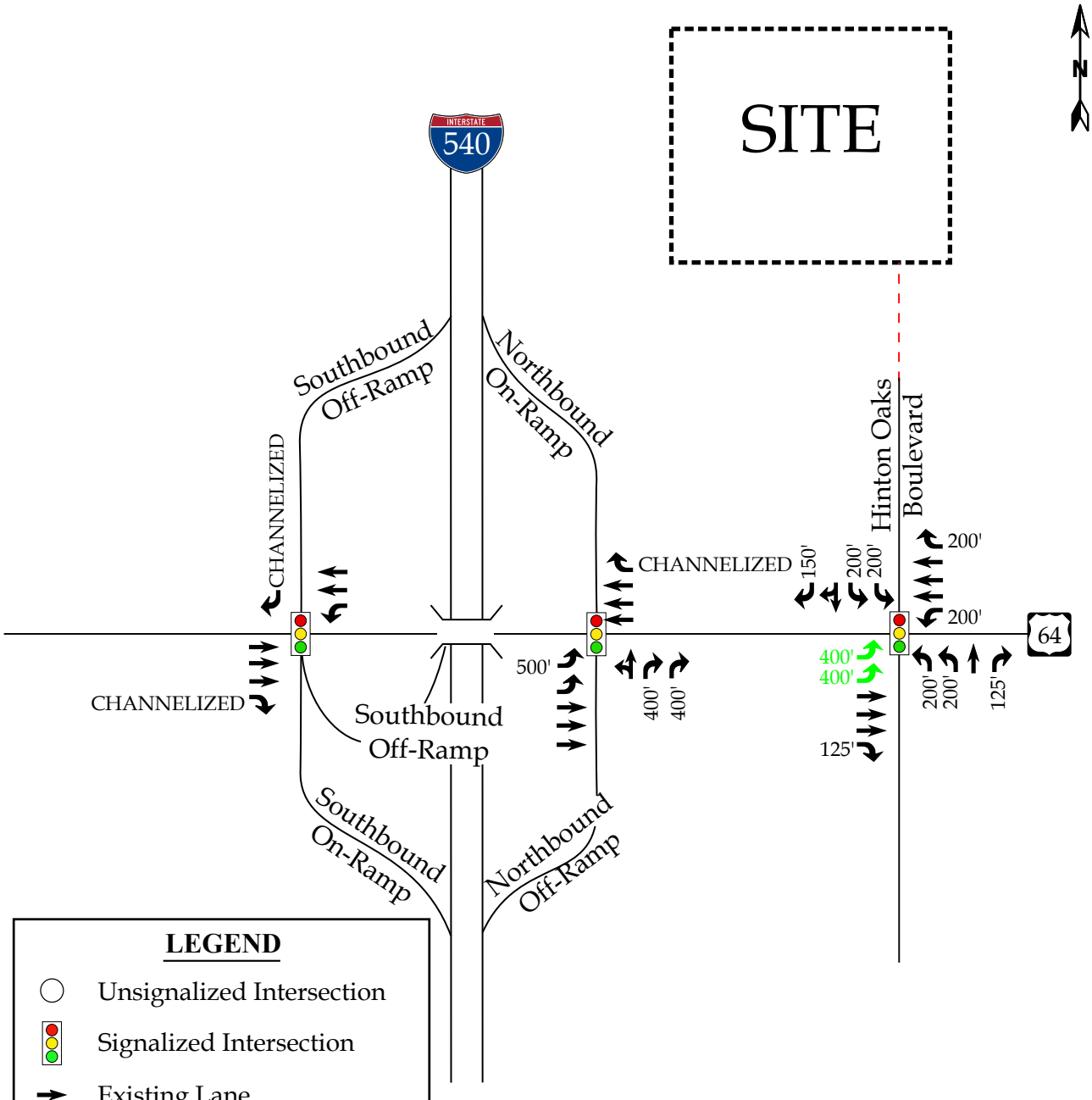
Note: Based on NCDOT Congestion Management guidelines, a volume of 4 vehicles per hour (vph) was analyzed for any movement with less than 4 vph.

RKA RAMEY KEMP ASSOCIATES	Hinton Oaks Knightdale, NC	2029 Build Peak Hour Traffic Scale: Not to Scale | Figure 10



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	Hinton Oaks Knightdale, NC	2038 Build Peak Hour Traffic Scale: Not to Scale | Figure 11



LEGEND

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

RKA RAMEY KEMP ASSOCIATES	Hinton Oaks Knightdale, NC	Recommended Lane Configurations Scale: Not to Scale | Figure 12

APPENDIX D

CAPACITY ANALYSIS CALCULATIONS

I-540 SOUTHBOUND RAMPS

&

US 64 BUSINESS

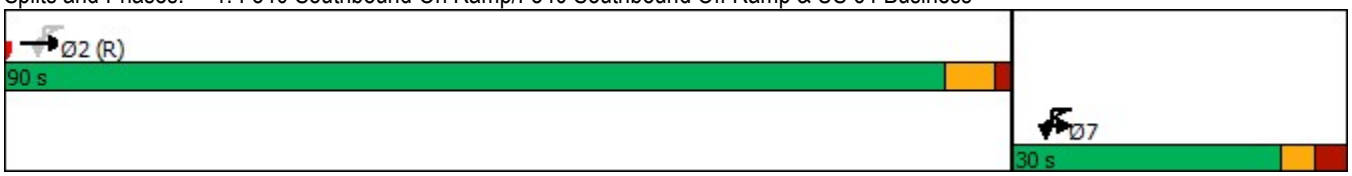
Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	0	989	104	1	281	1340	0	0	0	0	0	0
Future Volume (vph)	0	989	104	1	281	1340	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850									
Flt Protected					0.950							
Satd. Flow (prot)	0	5085	1583	0	1770	3539	0	0	0	0	0	0
Flt Permitted					0.234							
Satd. Flow (perm)	0	5085	1583	0	436	3539	0	0	0	0	0	0
Right Turn on Red			No				No			No		
Satd. Flow (RTOR)												
Link Speed (mph)		45				45			35			35
Link Distance (ft)		1813				339			1226			1278
Travel Time (s)		27.5				5.1			23.9			24.9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1099	116	1	312	1489	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1099	116	0	313	1489	0	0	0	0	0	0
Turn Type		NA	Free	D.P+P	D.P+P	NA						
Protected Phases		2		7	7	Free!						
Permitted Phases			Free	2	2							
Detector Phase		2		7	7							
Switch Phase												
Minimum Initial (s)		12.0		7.0	7.0							
Minimum Split (s)		18.0		13.1	13.1							
Total Split (s)		90.0		30.0	30.0							
Total Split (%)		75.0%		25.0%	25.0%							
Maximum Green (s)		84.0		23.9	23.9							
Yellow Time (s)		4.4		3.0	3.0							
All-Red Time (s)		1.6		3.1	3.1							
Lost Time Adjust (s)		-1.0			-1.1							
Total Lost Time (s)		5.0			5.0							
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		6.0		2.0	2.0							
Minimum Gap (s)		3.2		2.0	2.0							
Time Before Reduce (s)		20.0		0.0	0.0							
Time To Reduce (s)		45.0		0.0	0.0							
Recall Mode		C-Min		None	None							
Act Effct Green (s)		86.3	120.0		110.0	120.0						
Actuated g/C Ratio		0.72	1.00		0.92	1.00						
v/c Ratio		0.30	0.07		0.47	0.42						
Control Delay		6.8	0.1		14.6	2.2						
Queue Delay		0.0	0.0		0.0	0.0						
Total Delay		6.8	0.1		14.6	2.2						
LOS		A	A		B	A						
Approach Delay		6.1				4.3						0.3
Approach LOS		A				A						A

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	279
Future Volume (vph)	279
Ideal Flow (vphpl)	1900
Lane Util. Factor	1.00
Frt	0.865
Flt Protected	
Satd. Flow (prot)	1611
Flt Permitted	
Satd. Flow (perm)	1611
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Adj. Flow (vph)	310
Shared Lane Traffic (%)	
Lane Group Flow (vph)	310
Turn Type	custom
Protected Phases	Free!
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Minimum Gap (s)	
Time Before Reduce (s)	
Time To Reduce (s)	
Recall Mode	
Act Effct Green (s)	120.0
Actuated g/C Ratio	1.00
v/c Ratio	0.19
Control Delay	0.3
Queue Delay	0.0
Total Delay	0.3
LOS	A
Approach Delay	
Approach LOS	

Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Queue Length 50th (ft)		100	0		100	74						
Queue Length 95th (ft)		149	0		210	46						
Internal Link Dist (ft)		1733				259			1146			1198
Turn Bay Length (ft)												
Base Capacity (vph)		3727	1583		703	3539						
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		0.29	0.07		0.45	0.42						

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 41 (34%), Referenced to phase 2:EBWB and 6:, Start of Green			
Natural Cycle: 40			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.47			
Intersection Signal Delay: 4.6		Intersection LOS: A	
Intersection Capacity Utilization 45.9%		ICU Level of Service A	
Analysis Period (min) 15			
! Phase conflict between lane groups.			

Splits and Phases: 1: I-540 Southbound On Ramp/I-540 Southbound Off Ramp & US 64 Business



Lane Group	SBR
Queue Length 50th (ft)	0
Queue Length 95th (ft)	0
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	1611
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.19

Intersection Summary

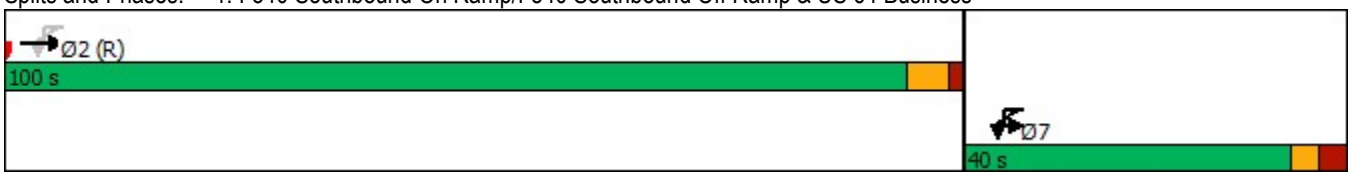
Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	0	1920	71	2	189	1105	0	0	0	0	0	0
Future Volume (vph)	0	1920	71	2	189	1105	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850									
Flt Protected					0.950							
Satd. Flow (prot)	0	5085	1583	0	1770	3539	0	0	0	0	0	0
Flt Permitted					0.069							
Satd. Flow (perm)	0	5085	1583	0	129	3539	0	0	0	0	0	0
Right Turn on Red			No				No			No		
Satd. Flow (RTOR)												
Link Speed (mph)		45				45			35			35
Link Distance (ft)		1813				339			1226			1278
Travel Time (s)		27.5				5.1			23.9			24.9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	2133	79	2	210	1228	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2133	79	0	212	1228	0	0	0	0	0	0
Turn Type		NA	Free	D.P+P	D.P+P	NA						
Protected Phases		2		7	7	Free!						
Permitted Phases			Free	2	2							
Detector Phase		2		7	7							
Switch Phase												
Minimum Initial (s)		12.0		7.0	7.0							
Minimum Split (s)		18.0		13.1	13.1							
Total Split (s)		100.0		40.0	40.0							
Total Split (%)		71.4%		28.6%	28.6%							
Maximum Green (s)		94.0		33.9	33.9							
Yellow Time (s)		4.4		3.0	3.0							
All-Red Time (s)		1.6		3.1	3.1							
Lost Time Adjust (s)		-1.0			-1.1							
Total Lost Time (s)		5.0			5.0							
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		6.0		2.0	2.0							
Minimum Gap (s)		3.2		2.0	2.0							
Time Before Reduce (s)		20.0		0.0	0.0							
Time To Reduce (s)		45.0		0.0	0.0							
Recall Mode		C-Min		None	None							
Act Effct Green (s)		110.9	140.0		130.0	140.0						
Actuated g/C Ratio		0.79	1.00		0.93	1.00						
v/c Ratio		0.53	0.05		0.62	0.35						
Control Delay		6.3	0.1		56.8	1.4						
Queue Delay		0.0	0.0		0.0	0.0						
Total Delay		6.3	0.1		56.8	1.4						
LOS		A	A		E	A						
Approach Delay		6.0				9.6						0.6
Approach LOS		A				A						A

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	522
Future Volume (vph)	522
Ideal Flow (vphpl)	1900
Lane Util. Factor	1.00
Frt	0.865
Flt Protected	
Satd. Flow (prot)	1611
Flt Permitted	
Satd. Flow (perm)	1611
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Adj. Flow (vph)	580
Shared Lane Traffic (%)	
Lane Group Flow (vph)	580
Turn Type	custom
Protected Phases	Free!
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Minimum Gap (s)	
Time Before Reduce (s)	
Time To Reduce (s)	
Recall Mode	
Act Effct Green (s)	140.0
Actuated g/C Ratio	1.00
v/c Ratio	0.36
Control Delay	0.6
Queue Delay	0.0
Total Delay	0.6
LOS	A
Approach Delay	
Approach LOS	

Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Queue Length 50th (ft)		212	0		127	28						
Queue Length 95th (ft)		323	0		221	15						
Internal Link Dist (ft)		1733				259			1146			1198
Turn Bay Length (ft)												
Base Capacity (vph)		4028	1583		534	3539						
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		0.53	0.05		0.40	0.35						

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 94 (67%), Referenced to phase 2:EBWB and 6:, Start of Green			
Natural Cycle: 40			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.62			
Intersection Signal Delay: 6.5		Intersection LOS: A	
Intersection Capacity Utilization 101.9%		ICU Level of Service G	
Analysis Period (min) 15			
! Phase conflict between lane groups.			

Splits and Phases: 1: I-540 Southbound On Ramp/I-540 Southbound Off Ramp & US 64 Business



Lane Group	SBR
Queue Length 50th (ft)	0
Queue Length 95th (ft)	0
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	1611
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.36

Intersection Summary

Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	0	1364	151	1	368	1708	0	0	0	0	0	0
Future Volume (vph)	0	1364	151	1	368	1708	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850									
Flt Protected					0.950							
Satd. Flow (prot)	0	5085	1583	0	1770	3539	0	0	0	0	0	0
Flt Permitted					0.136							
Satd. Flow (perm)	0	5085	1583	0	253	3539	0	0	0	0	0	0
Right Turn on Red			No				No			No		
Satd. Flow (RTOR)												
Link Speed (mph)		45				45			35			35
Link Distance (ft)		1813				339			1226			1278
Travel Time (s)		27.5				5.1			23.9			24.9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1516	168	1	409	1898	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1516	168	0	410	1898	0	0	0	0	0	0
Turn Type		NA	Free	D.P+P	D.P+P	NA						
Protected Phases		2		7	7	Free!						
Permitted Phases			Free	2	2							
Detector Phase		2		7	7							
Switch Phase												
Minimum Initial (s)		12.0		7.0	7.0							
Minimum Split (s)		18.0		13.1	13.1							
Total Split (s)		90.0		30.0	30.0							
Total Split (%)		75.0%		25.0%	25.0%							
Maximum Green (s)		84.0		23.9	23.9							
Yellow Time (s)		4.4		3.0	3.0							
All-Red Time (s)		1.6		3.1	3.1							
Lost Time Adjust (s)		-1.0			-1.1							
Total Lost Time (s)		5.0			5.0							
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		6.0		2.0	2.0							
Minimum Gap (s)		3.2		2.0	2.0							
Time Before Reduce (s)		20.0		0.0	0.0							
Time To Reduce (s)		45.0		0.0	0.0							
Recall Mode		C-Min		None	None							
Act Effct Green (s)		81.5	120.0		110.0	120.0						
Actuated g/C Ratio		0.68	1.00		0.92	1.00						
v/c Ratio		0.44	0.11		0.69	0.54						
Control Delay		9.8	0.1		31.9	5.0						
Queue Delay		0.0	0.0		0.0	0.0						
Total Delay		9.8	0.1		31.9	5.0						
LOS		A	A		C	A						
Approach Delay		8.9				9.7						0.4
Approach LOS		A				A						A

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	378
Future Volume (vph)	378
Ideal Flow (vphpl)	1900
Lane Util. Factor	1.00
Frt	0.865
Flt Protected	
Satd. Flow (prot)	1611
Flt Permitted	
Satd. Flow (perm)	1611
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Adj. Flow (vph)	420
Shared Lane Traffic (%)	
Lane Group Flow (vph)	420
Turn Type	custom
Protected Phases	Free!
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Minimum Gap (s)	
Time Before Reduce (s)	
Time To Reduce (s)	
Recall Mode	
Act Effct Green (s)	120.0
Actuated g/C Ratio	1.00
v/c Ratio	0.26
Control Delay	0.4
Queue Delay	0.0
Total Delay	0.4
LOS	A
Approach Delay	
Approach LOS	

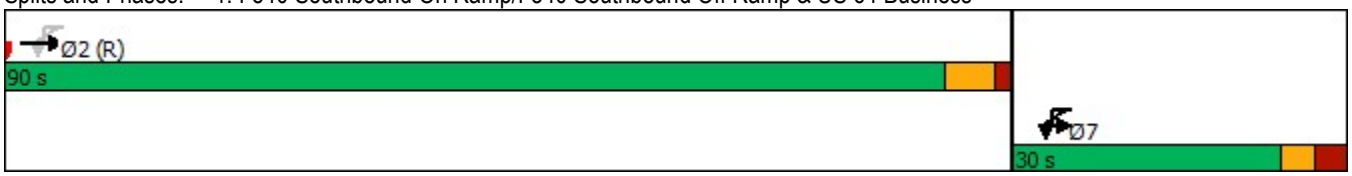
Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Queue Length 50th (ft)		177	0		245	206						
Queue Length 95th (ft)		255	0		m265	m131						
Internal Link Dist (ft)		1733				259			1146			1198
Turn Bay Length (ft)												
Base Capacity (vph)		3633	1583		603	3539						
Starvation Cap Reductn		0	0		0	0						
Spillback Cap Reductn		0	0		0	0						
Storage Cap Reductn		0	0		0	0						
Reduced v/c Ratio		0.42	0.11		0.68	0.54						

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 41 (34%), Referenced to phase 2:EBWB and 6:, Start of Green			
Natural Cycle: 40			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 8.5		Intersection LOS: A	
Intersection Capacity Utilization 61.4%		ICU Level of Service B	
Analysis Period (min) 15			

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

! Phase conflict between lane groups.

Splits and Phases: 1: I-540 Southbound On Ramp/I-540 Southbound Off Ramp & US 64 Business



Lane Group	SBR
Queue Length 50th (ft)	0
Queue Length 95th (ft)	0
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	1611
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.26

Intersection Summary

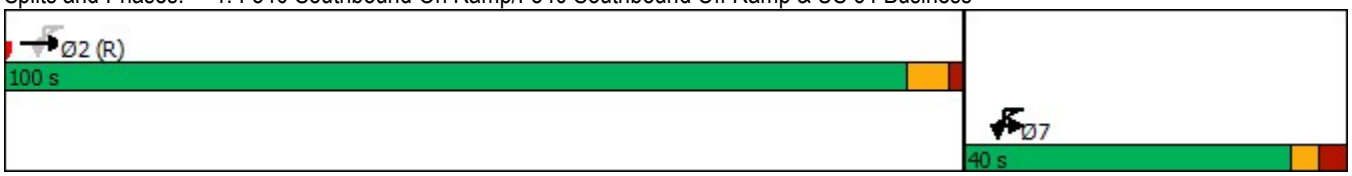
Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	0	2459	102	2	342	1477	0	0	0	0	0	0
Future Volume (vph)	0	2459	102	2	342	1477	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850									
Flt Protected					0.950							
Satd. Flow (prot)	0	5085	1583	0	1770	3539	0	0	0	0	0	0
Flt Permitted					0.041							
Satd. Flow (perm)	0	5085	1583	0	76	3539	0	0	0	0	0	0
Right Turn on Red			No				No			No		
Satd. Flow (RTOR)												
Link Speed (mph)		45				45			35			35
Link Distance (ft)		1813				339			1226			1278
Travel Time (s)		27.5				5.1			23.9			24.9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	2732	113	2	380	1641	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2732	113	0	382	1641	0	0	0	0	0	0
Turn Type		NA	Free	D.P+P	D.P+P	NA						
Protected Phases		2		7	7	Free!						
Permitted Phases			Free	2	2							
Detector Phase		2		7	7							
Switch Phase												
Minimum Initial (s)		12.0		7.0	7.0							
Minimum Split (s)		18.0		13.1	13.1							
Total Split (s)		100.0		40.0	40.0							
Total Split (%)		71.4%		28.6%	28.6%							
Maximum Green (s)		94.0		33.9	33.9							
Yellow Time (s)		4.4		3.0	3.0							
All-Red Time (s)		1.6		3.1	3.1							
Lost Time Adjust (s)		-1.0			-1.1							
Total Lost Time (s)		5.0			5.0							
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		6.0		2.0	2.0							
Minimum Gap (s)		3.2		2.0	2.0							
Time Before Reduce (s)		20.0		0.0	0.0							
Time To Reduce (s)		45.0		0.0	0.0							
Recall Mode		C-Min		None	None							
Act Effct Green (s)		98.6	140.0		130.0	140.0						
Actuated g/C Ratio		0.70	1.00		0.93	1.00						
v/c Ratio		0.76	0.07		0.85	0.46						
Control Delay		15.7	0.1		73.6	2.5						
Queue Delay		0.0	0.0		0.0	0.0						
Total Delay		15.7	0.1		73.6	2.5						
LOS		B	A		E	A						
Approach Delay		15.1				16.0						1.0
Approach LOS		B				B						A

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	701
Future Volume (vph)	701
Ideal Flow (vphpl)	1900
Lane Util. Factor	1.00
Frt	0.865
Flt Protected	
Satd. Flow (prot)	1611
Flt Permitted	
Satd. Flow (perm)	1611
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Adj. Flow (vph)	779
Shared Lane Traffic (%)	
Lane Group Flow (vph)	779
Turn Type	custom
Protected Phases	Free!
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Minimum Gap (s)	
Time Before Reduce (s)	
Time To Reduce (s)	
Recall Mode	
Act Effct Green (s)	140.0
Actuated g/C Ratio	1.00
v/c Ratio	0.48
Control Delay	1.0
Queue Delay	0.0
Total Delay	1.0
LOS	A
Approach Delay	
Approach LOS	

Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Queue Length 50th (ft)		552	0		334	61						
Queue Length 95th (ft)		645	0		253	46						
Internal Link Dist (ft)		1733				259			1146			1198
Turn Bay Length (ft)												
Base Capacity (vph)		3586	1583		497	3539						
Starvation Cap Reductn		0	0		0	0						
Spillback Cap Reductn		48	0		0	0						
Storage Cap Reductn		0	0		0	0						
Reduced v/c Ratio		0.77	0.07		0.77	0.46						

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 94 (67%), Referenced to phase 2:EBWB and 6:, Start of Green			
Natural Cycle: 45			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.85			
Intersection Signal Delay: 13.5		Intersection LOS: B	
Intersection Capacity Utilization 126.7%		ICU Level of Service H	
Analysis Period (min) 15			
! Phase conflict between lane groups.			

Splits and Phases: 1: I-540 Southbound On Ramp/I-540 Southbound Off Ramp & US 64 Business



Lane Group	SBR
Queue Length 50th (ft)	0
Queue Length 95th (ft)	0
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	1611
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.48

Intersection Summary

Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	0	1378	151	1	386	1715	0	0	0	0	0	0
Future Volume (vph)	0	1378	151	1	386	1715	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850									
Flt Protected					0.950							
Satd. Flow (prot)	0	5085	1583	0	1770	3539	0	0	0	0	0	0
Flt Permitted					0.131							
Satd. Flow (perm)	0	5085	1583	0	244	3539	0	0	0	0	0	0
Right Turn on Red			No				No			No		
Satd. Flow (RTOR)												
Link Speed (mph)		45				45			35			35
Link Distance (ft)		1813				339			1226			1278
Travel Time (s)		27.5				5.1			23.9			24.9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1531	168	1	429	1906	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1531	168	0	430	1906	0	0	0	0	0	0
Turn Type		NA	Free	D.P+P	D.P+P	NA						
Protected Phases		2		7	7	Free!						
Permitted Phases			Free	2	2							
Detector Phase		2		7	7							
Switch Phase												
Minimum Initial (s)		12.0		7.0	7.0							
Minimum Split (s)		18.0		13.1	13.1							
Total Split (s)		90.0		30.0	30.0							
Total Split (%)		75.0%		25.0%	25.0%							
Maximum Green (s)		84.0		23.9	23.9							
Yellow Time (s)		4.4		3.0	3.0							
All-Red Time (s)		1.6		3.1	3.1							
Lost Time Adjust (s)		-1.0			-1.1							
Total Lost Time (s)		5.0			5.0							
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		6.0		2.0	2.0							
Minimum Gap (s)		3.2		2.0	2.0							
Time Before Reduce (s)		20.0		0.0	0.0							
Time To Reduce (s)		45.0		0.0	0.0							
Recall Mode		C-Min		None	None							
Act Effct Green (s)		80.0	120.0		110.0	120.0						
Actuated g/C Ratio		0.67	1.00		0.92	1.00						
v/c Ratio		0.45	0.11		0.71	0.54						
Control Delay		10.6	0.1		33.5	5.0						
Queue Delay		0.0	0.0		0.0	0.0						
Total Delay		10.6	0.1		33.5	5.0						
LOS		B	A		C	A						
Approach Delay		9.6				10.3						0.4
Approach LOS		A				B						A

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	378
Future Volume (vph)	378
Ideal Flow (vphpl)	1900
Lane Util. Factor	1.00
Frt	0.865
Flt Protected	
Satd. Flow (prot)	1611
Flt Permitted	
Satd. Flow (perm)	1611
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Adj. Flow (vph)	420
Shared Lane Traffic (%)	
Lane Group Flow (vph)	420
Turn Type	custom
Protected Phases	Free!
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Minimum Gap (s)	
Time Before Reduce (s)	
Time To Reduce (s)	
Recall Mode	
Act Effct Green (s)	120.0
Actuated g/C Ratio	1.00
v/c Ratio	0.26
Control Delay	0.4
Queue Delay	0.0
Total Delay	0.4
LOS	A
Approach Delay	
Approach LOS	

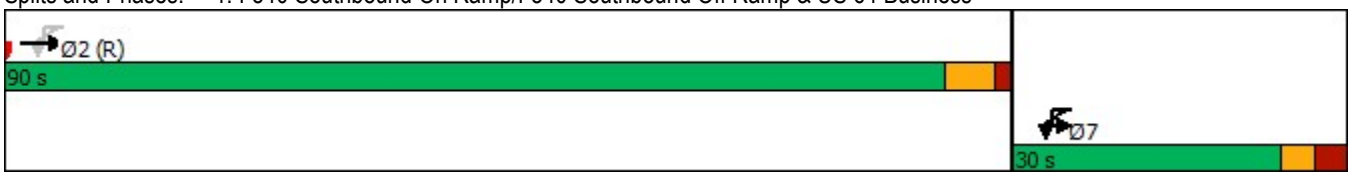
Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Queue Length 50th (ft)		188	0		263	182						
Queue Length 95th (ft)		267	0		m282	m125						
Internal Link Dist (ft)		1733				259			1146			1198
Turn Bay Length (ft)												
Base Capacity (vph)		3620	1583		611	3539						
Starvation Cap Reductn		0	0		0	0						
Spillback Cap Reductn		0	0		0	0						
Storage Cap Reductn		0	0		0	0						
Reduced v/c Ratio		0.42	0.11		0.70	0.54						

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 41 (34%), Referenced to phase 2:EBWB and 6:, Start of Green			
Natural Cycle: 40			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 9.1		Intersection LOS: A	
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.

! Phase conflict between lane groups.

Splits and Phases: 1: I-540 Southbound On Ramp/I-540 Southbound Off Ramp & US 64 Business



Lane Group	SBR
Queue Length 50th (ft)	0
Queue Length 95th (ft)	0
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	1611
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.26

Intersection Summary

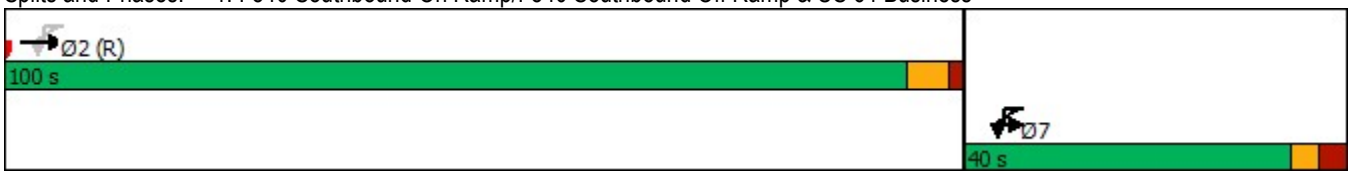
Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	0	2463	102	2	379	1491	0	0	0	0	0	0
Future Volume (vph)	0	2463	102	2	379	1491	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850									
Flt Protected					0.950							
Satd. Flow (prot)	0	5085	1583	0	1770	3539	0	0	0	0	0	0
Flt Permitted					0.041							
Satd. Flow (perm)	0	5085	1583	0	76	3539	0	0	0	0	0	0
Right Turn on Red			No				No			No		
Satd. Flow (RTOR)												
Link Speed (mph)		45				45			35			35
Link Distance (ft)		1813				339			1226			1278
Travel Time (s)		27.5				5.1			23.9			24.9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	2737	113	2	421	1657	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2737	113	0	423	1657	0	0	0	0	0	0
Turn Type		NA	Free	D.P+P	D.P+P	NA						
Protected Phases		2		7	7	Free!						
Permitted Phases			Free	2	2							
Detector Phase		2		7	7							
Switch Phase												
Minimum Initial (s)		12.0		7.0	7.0							
Minimum Split (s)		18.0		13.1	13.1							
Total Split (s)		100.0		40.0	40.0							
Total Split (%)		71.4%		28.6%	28.6%							
Maximum Green (s)		94.0		33.9	33.9							
Yellow Time (s)		4.4		3.0	3.0							
All-Red Time (s)		1.6		3.1	3.1							
Lost Time Adjust (s)		-1.0			-1.1							
Total Lost Time (s)		5.0			5.0							
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		6.0		2.0	2.0							
Minimum Gap (s)		3.2		2.0	2.0							
Time Before Reduce (s)		20.0		0.0	0.0							
Time To Reduce (s)		45.0		0.0	0.0							
Recall Mode		C-Min		None	None							
Act Effct Green (s)		96.6	140.0		130.0	140.0						
Actuated g/C Ratio		0.69	1.00		0.93	1.00						
v/c Ratio		0.78	0.07		0.89	0.47						
Control Delay		16.9	0.1		74.5	2.7						
Queue Delay		0.0	0.0		0.0	0.0						
Total Delay		17.0	0.1		74.5	2.7						
LOS		B	A		E	A						
Approach Delay		16.3				17.3						1.0
Approach LOS		B				B						A

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	701
Future Volume (vph)	701
Ideal Flow (vphpl)	1900
Lane Util. Factor	1.00
Frt	0.865
Flt Protected	
Satd. Flow (prot)	1611
Flt Permitted	
Satd. Flow (perm)	1611
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Adj. Flow (vph)	779
Shared Lane Traffic (%)	
Lane Group Flow (vph)	779
Turn Type	custom
Protected Phases	Free!
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Minimum Gap (s)	
Time Before Reduce (s)	
Time To Reduce (s)	
Recall Mode	
Act Effct Green (s)	140.0
Actuated g/C Ratio	1.00
v/c Ratio	0.48
Control Delay	1.0
Queue Delay	0.0
Total Delay	1.0
LOS	A
Approach Delay	
Approach LOS	

Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Queue Length 50th (ft)		608	0		307	65						
Queue Length 95th (ft)		646	0		#336	44						
Internal Link Dist (ft)		1733				259			1146			1198
Turn Bay Length (ft)												
Base Capacity (vph)		3519	1583		498	3539						
Starvation Cap Reductn		0	0		0	0						
Spillback Cap Reductn		51	0		0	0						
Storage Cap Reductn		0	0		0	0						
Reduced v/c Ratio		0.79	0.07		0.85	0.47						

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 94 (67%), Referenced to phase 2:EBWB and 6:, Start of Green			
Natural Cycle: 45			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 14.6		Intersection LOS: B	
Intersection Capacity Utilization 127.3%		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.			
! Phase conflict between lane groups.			

Splits and Phases: 1: I-540 Southbound On Ramp/I-540 Southbound Off Ramp & US 64 Business



Lane Group	SBR
Queue Length 50th (ft)	0
Queue Length 95th (ft)	0
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	1611
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.48

Intersection Summary

Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	0	1492	163	1	418	1869	0	0	0	0	0	0
Future Volume (vph)	0	1492	163	1	418	1869	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850									
Flt Protected					0.950							
Satd. Flow (prot)	0	5085	1583	0	1770	3539	0	0	0	0	0	0
Flt Permitted					0.107							
Satd. Flow (perm)	0	5085	1583	0	199	3539	0	0	0	0	0	0
Right Turn on Red			No				No			No		
Satd. Flow (RTOR)												
Link Speed (mph)		45				45			35			35
Link Distance (ft)		1813				339			1226			1278
Travel Time (s)		27.5				5.1			23.9			24.9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1658	181	1	464	2077	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1658	181	0	465	2077	0	0	0	0	0	0
Turn Type		NA	Free	D.P+P	D.P+P	NA						
Protected Phases		2		7	7	Free!						
Permitted Phases			Free	2	2							
Detector Phase		2		7	7							
Switch Phase												
Minimum Initial (s)		12.0		7.0	7.0							
Minimum Split (s)		18.0		13.1	13.1							
Total Split (s)		90.0		30.0	30.0							
Total Split (%)		75.0%		25.0%	25.0%							
Maximum Green (s)		84.0		23.9	23.9							
Yellow Time (s)		4.4		3.0	3.0							
All-Red Time (s)		1.6		3.1	3.1							
Lost Time Adjust (s)		-1.0			-1.1							
Total Lost Time (s)		5.0			5.0							
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		6.0		2.0	2.0							
Minimum Gap (s)		3.2		2.0	2.0							
Time Before Reduce (s)		20.0		0.0	0.0							
Time To Reduce (s)		45.0		0.0	0.0							
Recall Mode		C-Min		None	None							
Act Effct Green (s)		77.1	120.0		110.0	120.0						
Actuated g/C Ratio		0.64	1.00		0.92	1.00						
v/c Ratio		0.51	0.11		0.76	0.59						
Control Delay		12.5	0.1		38.0	7.0						
Queue Delay		0.0	0.0		0.0	0.0						
Total Delay		12.5	0.1		38.0	7.0						
LOS		B	A		D	A						
Approach Delay		11.3				12.7						0.4
Approach LOS		B				B						A

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	410
Future Volume (vph)	410
Ideal Flow (vphpl)	1900
Lane Util. Factor	1.00
Frt	0.865
Flt Protected	
Satd. Flow (prot)	1611
Flt Permitted	
Satd. Flow (perm)	1611
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Adj. Flow (vph)	456
Shared Lane Traffic (%)	
Lane Group Flow (vph)	456
Turn Type	custom
Protected Phases	Free!
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Minimum Gap (s)	
Time Before Reduce (s)	
Time To Reduce (s)	
Recall Mode	
Act Effct Green (s)	120.0
Actuated g/C Ratio	1.00
v/c Ratio	0.28
Control Delay	0.4
Queue Delay	0.0
Total Delay	0.4
LOS	A
Approach Delay	
Approach LOS	

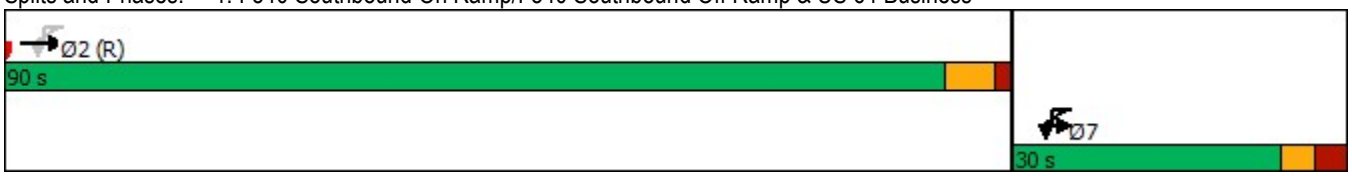
Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Queue Length 50th (ft)		235	0		310	173						
Queue Length 95th (ft)		302	0		m298	m128						
Internal Link Dist (ft)		1733				259			1146			1198
Turn Bay Length (ft)												
Base Capacity (vph)		3601	1583		612	3539						
Starvation Cap Reductn		0	0		0	0						
Spillback Cap Reductn		0	0		0	0						
Storage Cap Reductn		0	0		0	0						
Reduced v/c Ratio		0.46	0.11		0.76	0.59						

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 41 (34%), Referenced to phase 2:EBWB and 6:, Start of Green			
Natural Cycle: 40			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 11.0		Intersection LOS: B	
Intersection Capacity Utilization 68.3%		ICU Level of Service C	
Analysis Period (min) 15			

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

! Phase conflict between lane groups.

Splits and Phases: 1: I-540 Southbound On Ramp/I-540 Southbound Off Ramp & US 64 Business



Lane Group	SBR
Queue Length 50th (ft)	0
Queue Length 95th (ft)	0
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	1611
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.28

Intersection Summary

Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	0	2684	110	2	401	1618	0	0	0	0	0	0
Future Volume (vph)	0	2684	110	2	401	1618	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850									
Flt Protected					0.950							
Satd. Flow (prot)	0	5085	1583	0	1770	3539	0	0	0	0	0	0
Flt Permitted					0.042							
Satd. Flow (perm)	0	5085	1583	0	78	3539	0	0	0	0	0	0
Right Turn on Red			No				No			No		
Satd. Flow (RTOR)												
Link Speed (mph)		45				45			35			35
Link Distance (ft)		1813				339			1226			1278
Travel Time (s)		27.5				5.1			23.9			24.9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	2982	122	2	446	1798	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2982	122	0	448	1798	0	0	0	0	0	0
Turn Type		NA	Free	D.P+P	D.P+P	NA						
Protected Phases		2		7	7	Free!						
Permitted Phases			Free	2	2							
Detector Phase		2		7	7							
Switch Phase												
Minimum Initial (s)		12.0		7.0	7.0							
Minimum Split (s)		18.0		13.1	13.1							
Total Split (s)		100.0		40.0	40.0							
Total Split (%)		71.4%		28.6%	28.6%							
Maximum Green (s)		94.0		33.9	33.9							
Yellow Time (s)		4.4		3.0	3.0							
All-Red Time (s)		1.6		3.1	3.1							
Lost Time Adjust (s)		-1.0			-1.1							
Total Lost Time (s)		5.0			5.0							
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		6.0		2.0	2.0							
Minimum Gap (s)		3.2		2.0	2.0							
Time Before Reduce (s)		20.0		0.0	0.0							
Time To Reduce (s)		45.0		0.0	0.0							
Recall Mode		C-Min		None	None							
Act Effct Green (s)		96.0	140.0		130.0	140.0						
Actuated g/C Ratio		0.69	1.00		0.93	1.00						
v/c Ratio		0.86	0.08		0.93	0.51						
Control Delay		20.3	0.1		72.9	3.4						
Queue Delay		0.6	0.0		0.0	0.0						
Total Delay		20.9	0.1		72.9	3.4						
LOS		C	A		E	A						
Approach Delay		20.1				17.3						1.2
Approach LOS		C				B						A

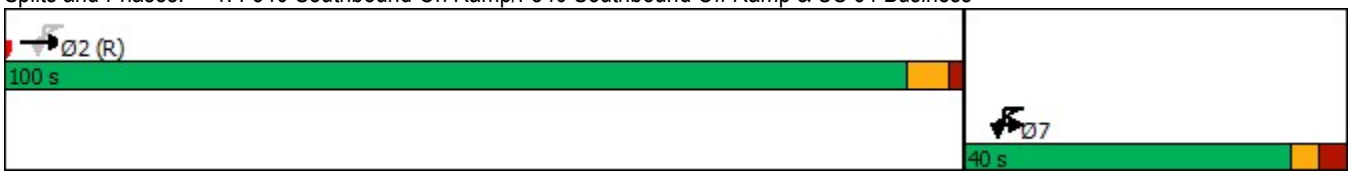
Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	761
Future Volume (vph)	761
Ideal Flow (vphpl)	1900
Lane Util. Factor	1.00
Frt	0.865
Flt Protected	
Satd. Flow (prot)	1611
Flt Permitted	
Satd. Flow (perm)	1611
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Adj. Flow (vph)	846
Shared Lane Traffic (%)	
Lane Group Flow (vph)	846
Turn Type	custom
Protected Phases	Free!
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Minimum Gap (s)	
Time Before Reduce (s)	
Time To Reduce (s)	
Recall Mode	
Act Effct Green (s)	140.0
Actuated g/C Ratio	1.00
v/c Ratio	0.53
Control Delay	1.2
Queue Delay	0.0
Total Delay	1.2
LOS	A
Approach Delay	
Approach LOS	

Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Queue Length 50th (ft)		716	0		224	78						
Queue Length 95th (ft)		784	0		m#366	58						
Internal Link Dist (ft)		1733				259			1146			1198
Turn Bay Length (ft)												
Base Capacity (vph)		3486	1583		496	3539						
Starvation Cap Reductn		0	0		0	0						
Spillback Cap Reductn		187	0		0	0						
Storage Cap Reductn		0	0		0	0						
Reduced v/c Ratio		0.90	0.08		0.90	0.51						

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 94 (67%), Referenced to phase 2:EBWB and 6:, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.93			
Intersection Signal Delay: 16.5		Intersection LOS: B	
Intersection Capacity Utilization 138.3%		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.
! Phase conflict between lane groups.

Splits and Phases: 1: I-540 Southbound On Ramp/I-540 Southbound Off Ramp & US 64 Business



Lane Group	SBR
Queue Length 50th (ft)	0
Queue Length 95th (ft)	0
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	1611
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.53

Intersection Summary

APPENDIX E

CAPACITY ANALYSIS CALCULATIONS

I-540 NORTHBOUND RAMPS

&

US 64 BUSINESS

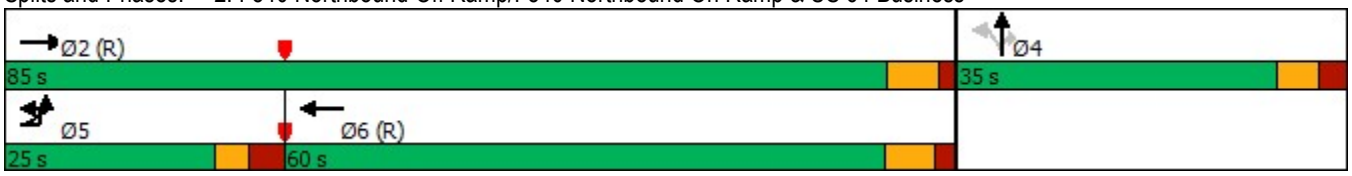
Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	1	395	918	0	0	1561	746	60	4	323	0	0
Future Volume (vph)	1	395	918	0	0	1561	746	60	4	323	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		500		0	0		0	0		400	0	
Storage Lanes		1		0	0		1	0		2	0	
Taper Length (ft)		100			100			100			100	
Lane Util. Factor	0.91	0.97	0.91	1.00	1.00	0.91	1.00	1.00	1.00	0.88	1.00	1.00
Frt							0.850			0.850		
Flt Protected		0.950							0.955			
Satd. Flow (prot)	0	3433	5085	0	0	5085	1583	0	1779	2787	0	0
Flt Permitted		0.950							0.955			
Satd. Flow (perm)	0	3433	5085	0	0	5085	1583	0	1779	2787	0	0
Right Turn on Red				No			No			No		
Satd. Flow (RTOR)												
Link Speed (mph)			45			45			35			35
Link Distance (ft)			755			1135			1321			1258
Travel Time (s)			11.4			17.2			25.7			24.5
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)	1	439	1020	0	0	1734	829	67	4	359	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	440	1020	0	0	1734	829	0	71	359	0	0
Turn Type	Prot	Prot	NA			NA	Free	Perm	NA	Perm		
Protected Phases	5	5	2			6			4			
Permitted Phases							Free	4		4		
Detector Phase	5	5	2			6		4	4	4		
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0			12.0		7.0	7.0	7.0		
Minimum Split (s)	13.3	13.3	18.2			18.4		13.4	13.4	13.4		
Total Split (s)	25.0	25.0	85.0			60.0		35.0	35.0	35.0		
Total Split (%)	20.8%	20.8%	70.8%			50.0%		29.2%	29.2%	29.2%		
Maximum Green (s)	18.7	18.7	78.8			53.6		28.6	28.6	28.6		
Yellow Time (s)	3.0	3.0	4.6			4.4		3.7	3.7	3.7		
All-Red Time (s)	3.3	3.3	1.6			2.0		2.7	2.7	2.7		
Lost Time Adjust (s)		-1.3	-1.2			-1.4			-1.4	-1.4		
Total Lost Time (s)		5.0	5.0			5.0			5.0	5.0		
Lead/Lag	Lead	Lead				Lag						
Lead-Lag Optimize?	Yes	Yes				Yes						
Vehicle Extension (s)	1.0	1.0	6.0			6.0		1.0	1.0	1.0		
Minimum Gap (s)	1.0	1.0	3.2			3.2		1.0	1.0	1.0		
Time Before Reduce (s)	0.0	0.0	15.0			15.0		0.0	0.0	0.0		
Time To Reduce (s)	0.0	0.0	45.0			45.0		0.0	0.0	0.0		
Recall Mode	None	None	C-Min			C-Min		None	None	None		
Act Effct Green (s)		19.9	89.6			64.7	120.0		20.4	20.4		
Actuated g/C Ratio		0.17	0.75			0.54	1.00		0.17	0.17		
v/c Ratio		0.77	0.27			0.63	0.52		0.24	0.76		
Control Delay		72.7	4.6			14.4	2.3		43.5	57.9		
Queue Delay		0.0	0.0			0.0	0.0		0.0	0.0		
Total Delay		72.7	4.6			14.4	2.3		43.5	57.9		

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	0
Future Volume (vph)	0
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	0
Taper Length (ft)	
Lane Util. Factor	1.00
Frt	
Flt Protected	
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Adj. Flow (vph)	0
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Minimum Gap (s)	
Time Before Reduce (s)	
Time To Reduce (s)	
Recall Mode	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
LOS		E	A			B	A		D	E		
Approach Delay			25.1			10.5			55.5			
Approach LOS			C			B			E			
Queue Length 50th (ft)		185	71			236	4		48	152		
Queue Length 95th (ft)		238	74			178	54		87	199		
Internal Link Dist (ft)			675			1055			1241			1178
Turn Bay Length (ft)		500								400		
Base Capacity (vph)		607	3797			2743	1583		444	696		
Starvation Cap Reductn		0	0			0	0		0	0		
Spillback Cap Reductn		0	0			0	0		0	0		
Storage Cap Reductn		0	0			0	0		0	0		
Reduced v/c Ratio		0.72	0.27			0.63	0.52		0.16	0.52		

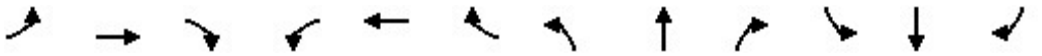
Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 10 (8%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 19.6		Intersection LOS: B	
Intersection Capacity Utilization 59.8%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 2: I-540 Northbound Off Ramp/I-540 Northbound On Ramp & US 64 Business



Lane Group	SBR
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary



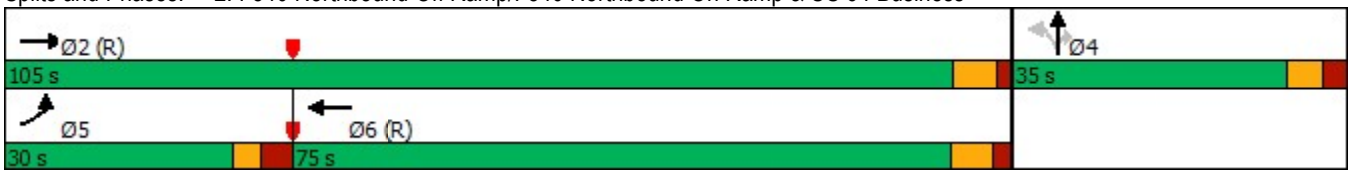
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	347	2514	0	0	1216	494	80	4	611	0	0	0
Future Volume (vph)	347	2514	0	0	1216	494	80	4	611	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	500		0	0		0	0		400	0		0
Storage Lanes	1		0	0		1	0		2	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	1.00	1.00	0.88	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950							0.954				
Satd. Flow (prot)	3433	5085	0	0	5085	1583	0	1777	2787	0	0	0
Flt Permitted	0.950							0.954				
Satd. Flow (perm)	3433	5085	0	0	5085	1583	0	1777	2787	0	0	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		755			1135			1321			1258	
Travel Time (s)		11.4			17.2			25.7			24.5	
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)	386	2793	0	0	1351	549	89	4	679	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	386	2793	0	0	1351	549	0	93	679	0	0	0
Turn Type	Prot	NA			NA	Free	Perm	NA	Perm			
Protected Phases	5	2			6			4				
Permitted Phases						Free	4		4			
Detector Phase	5	2			6		4	4	4			
Switch Phase												
Minimum Initial (s)	7.0	12.0			12.0		7.0	7.0	7.0			
Minimum Split (s)	13.3	18.2			18.4		13.4	13.4	13.4			
Total Split (s)	30.0	105.0			75.0		35.0	35.0	35.0			
Total Split (%)	21.4%	75.0%			53.6%		25.0%	25.0%	25.0%			
Maximum Green (s)	23.7	98.8			68.6		28.6	28.6	28.6			
Yellow Time (s)	3.0	4.6			4.4		3.7	3.7	3.7			
All-Red Time (s)	3.3	1.6			2.0		2.7	2.7	2.7			
Lost Time Adjust (s)	-1.3	-1.2			-1.4			-1.4	-1.4			
Total Lost Time (s)	5.0	5.0			5.0			5.0	5.0			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Vehicle Extension (s)	1.0	6.0			6.0		1.0	1.0	1.0			
Minimum Gap (s)	1.0	3.2			3.2		1.0	1.0	1.0			
Time Before Reduce (s)	0.0	15.0			15.0		0.0	0.0	0.0			
Time To Reduce (s)	0.0	45.0			45.0		0.0	0.0	0.0			
Recall Mode	None	C-Min			C-Min		None	None	None			
Act Effct Green (s)	20.3	97.5			72.2	140.0		32.5	32.5			
Actuated g/C Ratio	0.14	0.70			0.52	1.00		0.23	0.23			
v/c Ratio	0.78	0.79			0.52	0.35		0.23	1.05			
Control Delay	71.9	13.9			12.6	0.7		46.6	100.5			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	71.9	13.9			12.6	0.7		46.6	100.5			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	E	B			B	A		D	F			
Approach Delay		21.0			9.2			94.0				
Approach LOS		C			A			F				
Queue Length 50th (ft)	182	416			90	0		71	~408			
Queue Length 95th (ft)	241	368			101	0		123	#544			
Internal Link Dist (ft)		675			1055			1241			1178	
Turn Bay Length (ft)	500								400			
Base Capacity (vph)	613	3632			2621	1583		412	646			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.63	0.77			0.52	0.35		0.23	1.05			

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 47 (34%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.05			
Intersection Signal Delay: 26.8		Intersection LOS: C	
Intersection Capacity Utilization 78.3%		ICU Level of Service D	
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: 2: I-540 Northbound Off Ramp/I-540 Northbound On Ramp & US 64 Business



Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	1	542	1281	0	0	1988	928	89	5	517	0	0
Future Volume (vph)	1	542	1281	0	0	1988	928	89	5	517	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		500		0	0		0	0		400	0	
Storage Lanes		1		0	0		1	0		2	0	
Taper Length (ft)		100			100			100			100	
Lane Util. Factor	0.91	0.97	0.91	1.00	1.00	0.91	1.00	1.00	1.00	0.88	1.00	1.00
Frt							0.850			0.850		
Flt Protected		0.950							0.955			
Satd. Flow (prot)	0	3433	5085	0	0	5085	1583	0	1779	2787	0	0
Flt Permitted		0.950							0.955			
Satd. Flow (perm)	0	3433	5085	0	0	5085	1583	0	1779	2787	0	0
Right Turn on Red				No			No			No		
Satd. Flow (RTOR)												
Link Speed (mph)			45			45			35			35
Link Distance (ft)			755			1135			1321			1258
Travel Time (s)			11.4			17.2			25.7			24.5
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)	1	602	1423	0	0	2209	1031	99	6	574	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	603	1423	0	0	2209	1031	0	105	574	0	0
Turn Type	Prot	Prot	NA			NA	Free	Perm	NA	Perm		
Protected Phases	5	5	2			6			4			
Permitted Phases							Free	4		4		
Detector Phase	5	5	2			6		4	4	4		
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0			12.0		7.0	7.0	7.0		
Minimum Split (s)	13.3	13.3	18.2			18.4		13.4	13.4	13.4		
Total Split (s)	25.0	25.0	85.0			60.0		35.0	35.0	35.0		
Total Split (%)	20.8%	20.8%	70.8%			50.0%		29.2%	29.2%	29.2%		
Maximum Green (s)	18.7	18.7	78.8			53.6		28.6	28.6	28.6		
Yellow Time (s)	3.0	3.0	4.6			4.4		3.7	3.7	3.7		
All-Red Time (s)	3.3	3.3	1.6			2.0		2.7	2.7	2.7		
Lost Time Adjust (s)		-1.3	-1.2			-1.4			-1.4	-1.4		
Total Lost Time (s)		5.0	5.0			5.0			5.0	5.0		
Lead/Lag	Lead	Lead				Lag						
Lead-Lag Optimize?	Yes	Yes				Yes						
Vehicle Extension (s)	1.0	1.0	6.0			6.0		1.0	1.0	1.0		
Minimum Gap (s)	1.0	1.0	3.2			3.2		1.0	1.0	1.0		
Time Before Reduce (s)	0.0	0.0	15.0			15.0		0.0	0.0	0.0		
Time To Reduce (s)	0.0	0.0	45.0			45.0		0.0	0.0	0.0		
Recall Mode	None	None	C-Min			C-Min		None	None	None		
Act Effct Green (s)		22.1	82.0			55.0	120.0		28.0	28.0		
Actuated g/C Ratio		0.18	0.68			0.46	1.00		0.23	0.23		
v/c Ratio		0.96	0.41			0.95	0.65		0.25	0.88		
Control Delay		84.8	7.6			27.8	3.6		38.5	60.6		
Queue Delay		0.0	0.0			0.0	0.0		0.0	0.0		
Total Delay		84.8	7.6			27.8	3.6		38.5	60.6		

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	0
Future Volume (vph)	0
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	0
Taper Length (ft)	
Lane Util. Factor	1.00
Frt	
Flt Protected	
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Adj. Flow (vph)	0
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Minimum Gap (s)	
Time Before Reduce (s)	
Time To Reduce (s)	
Recall Mode	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
LOS		F	A			C	A		D	E		
Approach Delay			30.6			20.1			57.2			
Approach LOS			C			C			E			
Queue Length 50th (ft)		~269	126			411	30		65	239		
Queue Length 95th (ft)		#389	150			m480	m36		115	#332		
Internal Link Dist (ft)			675			1055			1241			1178
Turn Bay Length (ft)		500								400		
Base Capacity (vph)		631	3475			2330	1583		444	696		
Starvation Cap Reductn		0	0			0	0		0	0		
Spillback Cap Reductn		0	0			0	0		0	0		
Storage Cap Reductn		0	0			0	0		0	0		
Reduced v/c Ratio		0.96	0.41			0.95	0.65		0.24	0.82		

Intersection Summary

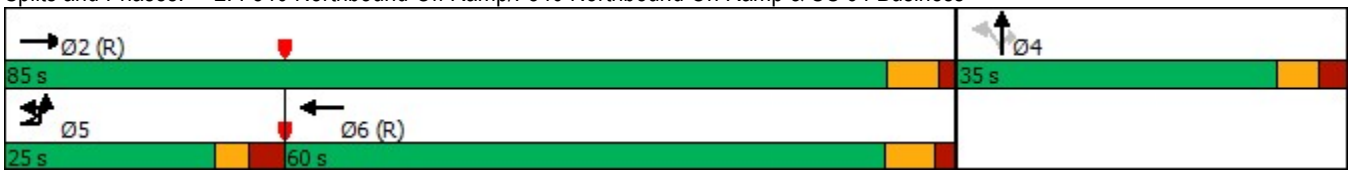
Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 10 (8%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 27.9 Intersection LOS: C
Intersection Capacity Utilization 72.2% ICU Level of Service C
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: 2: I-540 Northbound Off Ramp/I-540 Northbound On Ramp & US 64 Business



Lane Group	SBR
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

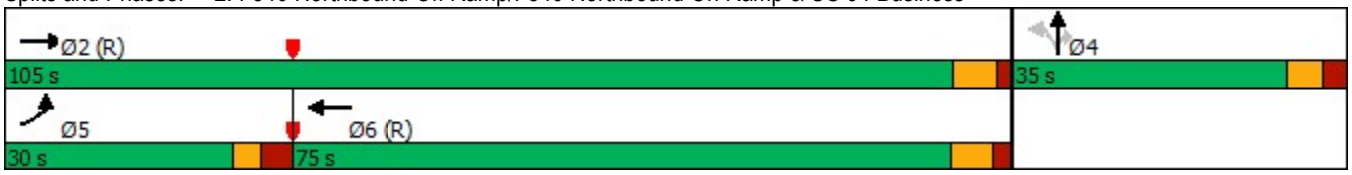
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	469	3163	0	0	1699	663	122	4	782	0	0	0
Future Volume (vph)	469	3163	0	0	1699	663	122	4	782	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	500		0	0		0	0		400	0		0
Storage Lanes	1		0	0		1	0		2	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	1.00	1.00	0.88	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950							0.954				
Satd. Flow (prot)	3433	5085	0	0	5085	1583	0	1777	2787	0	0	0
Flt Permitted	0.950							0.954				
Satd. Flow (perm)	3433	5085	0	0	5085	1583	0	1777	2787	0	0	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		755			1135			1321			1258	
Travel Time (s)		11.4			17.2			25.7			24.5	
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)	521	3514	0	0	1888	737	136	4	869	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	521	3514	0	0	1888	737	0	140	869	0	0	0
Turn Type	Prot	NA			NA	Free	Perm	NA	Perm			
Protected Phases	5	2			6			4				
Permitted Phases						Free	4		4			
Detector Phase	5	2			6		4	4	4			
Switch Phase												
Minimum Initial (s)	7.0	12.0			12.0		7.0	7.0	7.0			
Minimum Split (s)	13.3	18.2			18.4		13.4	13.4	13.4			
Total Split (s)	30.0	105.0			75.0		35.0	35.0	35.0			
Total Split (%)	21.4%	75.0%			53.6%		25.0%	25.0%	25.0%			
Maximum Green (s)	23.7	98.8			68.6		28.6	28.6	28.6			
Yellow Time (s)	3.0	4.6			4.4		3.7	3.7	3.7			
All-Red Time (s)	3.3	1.6			2.0		2.7	2.7	2.7			
Lost Time Adjust (s)	-1.3	-1.2			-1.4			-1.4	-1.4			
Total Lost Time (s)	5.0	5.0			5.0			5.0	5.0			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Vehicle Extension (s)	1.0	6.0			6.0		1.0	1.0	1.0			
Minimum Gap (s)	1.0	3.2			3.2		1.0	1.0	1.0			
Time Before Reduce (s)	0.0	15.0			15.0		0.0	0.0	0.0			
Time To Reduce (s)	0.0	45.0			45.0		0.0	0.0	0.0			
Recall Mode	None	C-Min			C-Min		None	None	None			
Act Effct Green (s)	23.9	100.0			71.1	140.0		30.0	30.0			
Actuated g/C Ratio	0.17	0.71			0.51	1.00		0.21	0.21			
v/c Ratio	0.89	0.97			0.73	0.47		0.37	1.46			
Control Delay	66.6	33.2			14.0	0.7		50.3	253.1			
Queue Delay	0.0	2.5			0.0	0.0		0.0	0.0			
Total Delay	66.6	35.7			14.0	0.7		50.3	253.1			

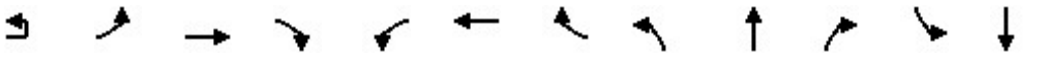
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	E	D			B	A		D	F			
Approach Delay		39.6			10.3			224.9				
Approach LOS		D			B			F				
Queue Length 50th (ft)	239	804			170	0		110	~612			
Queue Length 95th (ft)	#324	1175			m207	m0		177	#757			
Internal Link Dist (ft)		675			1055			1241			1178	
Turn Bay Length (ft)	500								400			
Base Capacity (vph)	613	3632			2582	1583		380	597			
Starvation Cap Reductn	0	77			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.85	0.99			0.73	0.47		0.37	1.46			

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 47 (34%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.46			
Intersection Signal Delay: 54.0		Intersection LOS: D	
Intersection Capacity Utilization 96.8%		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: 2: I-540 Northbound Off Ramp/I-540 Northbound On Ramp & US 64 Business





Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	1	542	1329	0	0	2013	944	89	5	555	0	0
Future Volume (vph)	1	542	1329	0	0	2013	944	89	5	555	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		500		0	0		0	0		400	0	
Storage Lanes		1		0	0		1	0		2	0	
Taper Length (ft)		100			100			100			100	
Lane Util. Factor	0.91	0.97	0.91	1.00	1.00	0.91	1.00	1.00	1.00	0.88	1.00	1.00
Frt							0.850			0.850		
Flt Protected		0.950							0.955			
Satd. Flow (prot)	0	3433	5085	0	0	5085	1583	0	1779	2787	0	0
Flt Permitted		0.950							0.955			
Satd. Flow (perm)	0	3433	5085	0	0	5085	1583	0	1779	2787	0	0
Right Turn on Red				No			No			No		
Satd. Flow (RTOR)												
Link Speed (mph)			45			45			35			35
Link Distance (ft)			755			1135			1321			1258
Travel Time (s)			11.4			17.2			25.7			24.5
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)	1	602	1477	0	0	2237	1049	99	6	617	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	603	1477	0	0	2237	1049	0	105	617	0	0
Turn Type	Prot	Prot	NA			NA	Free	Perm	NA	Perm		
Protected Phases	5	5	2			6			4			
Permitted Phases							Free	4		4		
Detector Phase	5	5	2			6		4	4	4		
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0			12.0		7.0	7.0	7.0		
Minimum Split (s)	13.3	13.3	18.2			18.4		13.4	13.4	13.4		
Total Split (s)	25.0	25.0	85.0			60.0		35.0	35.0	35.0		
Total Split (%)	20.8%	20.8%	70.8%			50.0%		29.2%	29.2%	29.2%		
Maximum Green (s)	18.7	18.7	78.8			53.6		28.6	28.6	28.6		
Yellow Time (s)	3.0	3.0	4.6			4.4		3.7	3.7	3.7		
All-Red Time (s)	3.3	3.3	1.6			2.0		2.7	2.7	2.7		
Lost Time Adjust (s)		-1.3	-1.2			-1.4			-1.4	-1.4		
Total Lost Time (s)		5.0	5.0			5.0			5.0	5.0		
Lead/Lag	Lead	Lead				Lag						
Lead-Lag Optimize?	Yes	Yes				Yes						
Vehicle Extension (s)	1.0	1.0	6.0			6.0		1.0	1.0	1.0		
Minimum Gap (s)	1.0	1.0	3.2			3.2		1.0	1.0	1.0		
Time Before Reduce (s)	0.0	0.0	15.0			15.0		0.0	0.0	0.0		
Time To Reduce (s)	0.0	0.0	45.0			45.0		0.0	0.0	0.0		
Recall Mode	None	None	C-Min			C-Min		None	None	None		
Act Effct Green (s)		21.1	81.1			55.0	120.0		28.9	28.9		
Actuated g/C Ratio		0.18	0.68			0.46	1.00		0.24	0.24		
v/c Ratio		1.00	0.43			0.96	0.66		0.25	0.92		
Control Delay		95.4	7.9			29.4	3.7		38.0	64.2		
Queue Delay		0.0	0.0			0.0	0.0		0.0	0.0		
Total Delay		95.4	7.9			29.4	3.7		38.0	64.2		

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	0
Future Volume (vph)	0
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	0
Taper Length (ft)	
Lane Util. Factor	1.00
Frt	
Flt Protected	
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Adj. Flow (vph)	0
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Minimum Gap (s)	
Time Before Reduce (s)	
Time To Reduce (s)	
Recall Mode	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	

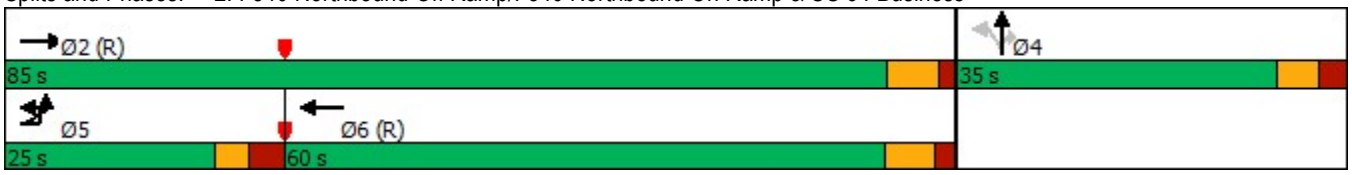
Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
LOS		F	A			C	A		D	E		
Approach Delay			33.3			21.2			60.4			
Approach LOS			C			C			E			
Queue Length 50th (ft)		~270	136			442	32		65	262		
Queue Length 95th (ft)		#389	153			m510	m40		115	#374		
Internal Link Dist (ft)			675			1055			1241			1178
Turn Bay Length (ft)		500								400		
Base Capacity (vph)		602	3435			2330	1583		444	696		
Starvation Cap Reductn		0	0			0	0		0	0		
Spillback Cap Reductn		0	0			0	0		0	0		
Storage Cap Reductn		0	0			0	0		0	0		
Reduced v/c Ratio		1.00	0.43			0.96	0.66		0.24	0.89		

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 10 (8%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.00
Intersection Signal Delay: 30.0 Intersection LOS: C
Intersection Capacity Utilization 72.7% ICU Level of Service C
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: 2: I-540 Northbound Off Ramp/I-540 Northbound On Ramp & US 64 Business



Lane Group	SBR
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

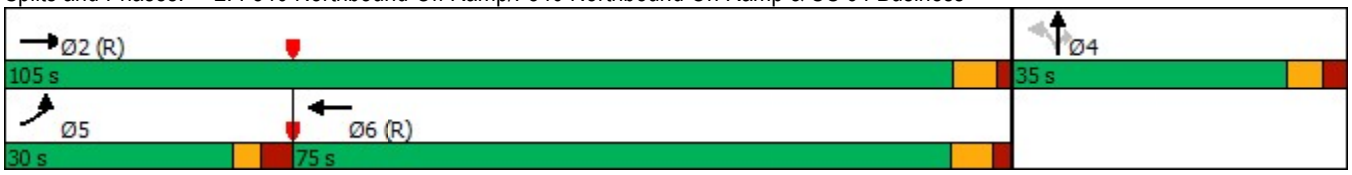
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	469	3163	0	0	1699	663	122	4	782	0	0	0
Future Volume (vph)	469	3163	0	0	1699	663	122	4	782	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	500		0	0		0	0		400	0		0
Storage Lanes	1		0	0		1	0		2	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	1.00	1.00	0.88	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950							0.954				
Satd. Flow (prot)	3433	5085	0	0	5085	1583	0	1777	2787	0	0	0
Flt Permitted	0.950							0.954				
Satd. Flow (perm)	3433	5085	0	0	5085	1583	0	1777	2787	0	0	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		755			1135			1321			1258	
Travel Time (s)		11.4			17.2			25.7			24.5	
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)	521	3514	0	0	1888	737	136	4	869	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	521	3514	0	0	1888	737	0	140	869	0	0	0
Turn Type	Prot	NA			NA	Free	Perm	NA	Perm			
Protected Phases	5	2			6			4				
Permitted Phases						Free	4		4			
Detector Phase	5	2			6		4	4	4			
Switch Phase												
Minimum Initial (s)	7.0	12.0			12.0		7.0	7.0	7.0			
Minimum Split (s)	13.3	18.2			18.4		13.4	13.4	13.4			
Total Split (s)	30.0	105.0			75.0		35.0	35.0	35.0			
Total Split (%)	21.4%	75.0%			53.6%		25.0%	25.0%	25.0%			
Maximum Green (s)	23.7	98.8			68.6		28.6	28.6	28.6			
Yellow Time (s)	3.0	4.6			4.4		3.7	3.7	3.7			
All-Red Time (s)	3.3	1.6			2.0		2.7	2.7	2.7			
Lost Time Adjust (s)	-1.3	-1.2			-1.4			-1.4	-1.4			
Total Lost Time (s)	5.0	5.0			5.0			5.0	5.0			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Vehicle Extension (s)	1.0	6.0			6.0		1.0	1.0	1.0			
Minimum Gap (s)	1.0	3.2			3.2		1.0	1.0	1.0			
Time Before Reduce (s)	0.0	15.0			15.0		0.0	0.0	0.0			
Time To Reduce (s)	0.0	45.0			45.0		0.0	0.0	0.0			
Recall Mode	None	C-Min			C-Min		None	None	None			
Act Effct Green (s)	23.9	100.0			71.1	140.0		30.0	30.0			
Actuated g/C Ratio	0.17	0.71			0.51	1.00		0.21	0.21			
v/c Ratio	0.89	0.97			0.73	0.47		0.37	1.46			
Control Delay	66.6	33.2			14.0	0.7		50.3	253.1			
Queue Delay	0.0	2.5			0.0	0.0		0.0	0.0			
Total Delay	66.6	35.7			14.0	0.7		50.3	253.1			

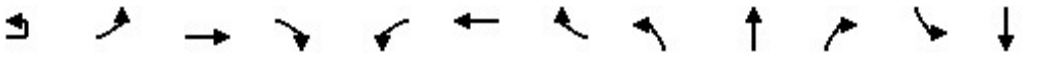
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	E	D			B	A		D	F			
Approach Delay		39.6			10.3			224.9				
Approach LOS		D			B			F				
Queue Length 50th (ft)	239	804			170	0		110	~612			
Queue Length 95th (ft)	#324	1175			m207	m0		177	#757			
Internal Link Dist (ft)		675			1055			1241			1178	
Turn Bay Length (ft)	500								400			
Base Capacity (vph)	613	3632			2582	1583		380	597			
Starvation Cap Reductn	0	77			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.85	0.99			0.73	0.47		0.37	1.46			

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 47 (34%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.46			
Intersection Signal Delay: 54.0		Intersection LOS: D	
Intersection Capacity Utilization 96.8%		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: 2: I-540 Northbound Off Ramp/I-540 Northbound On Ramp & US 64 Business





Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	1	588	1435	0	0	2193	1030	96	5	592	0	0
Future Volume (vph)	1	588	1435	0	0	2193	1030	96	5	592	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		500		0	0		0	0		400	0	
Storage Lanes		1		0	0		1	0		2	0	
Taper Length (ft)		100			100			100			100	
Lane Util. Factor	0.91	0.97	0.91	1.00	1.00	0.91	1.00	1.00	1.00	0.88	1.00	1.00
Frt							0.850			0.850		
Flt Protected		0.950							0.955			
Satd. Flow (prot)	0	3433	5085	0	0	5085	1583	0	1779	2787	0	0
Flt Permitted		0.950							0.955			
Satd. Flow (perm)	0	3433	5085	0	0	5085	1583	0	1779	2787	0	0
Right Turn on Red				No			No			No		
Satd. Flow (RTOR)												
Link Speed (mph)			45			45			35			35
Link Distance (ft)			755			1135			1321			1258
Travel Time (s)			11.4			17.2			25.7			24.5
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)	1	653	1594	0	0	2437	1144	107	6	658	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	654	1594	0	0	2437	1144	0	113	658	0	0
Turn Type	Prot	Prot	NA			NA	Free	Perm	NA	Perm		
Protected Phases	5	5	2			6			4			
Permitted Phases							Free	4		4		
Detector Phase	5	5	2			6		4	4	4		
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0			12.0		7.0	7.0	7.0		
Minimum Split (s)	13.3	13.3	18.2			18.4		13.4	13.4	13.4		
Total Split (s)	25.0	25.0	85.0			60.0		35.0	35.0	35.0		
Total Split (%)	20.8%	20.8%	70.8%			50.0%		29.2%	29.2%	29.2%		
Maximum Green (s)	18.7	18.7	78.8			53.6		28.6	28.6	28.6		
Yellow Time (s)	3.0	3.0	4.6			4.4		3.7	3.7	3.7		
All-Red Time (s)	3.3	3.3	1.6			2.0		2.7	2.7	2.7		
Lost Time Adjust (s)		-1.3	-1.2			-1.4			-1.4	-1.4		
Total Lost Time (s)		5.0	5.0			5.0			5.0	5.0		
Lead/Lag	Lead	Lead				Lag						
Lead-Lag Optimize?	Yes	Yes				Yes						
Vehicle Extension (s)	1.0	1.0	6.0			6.0		1.0	1.0	1.0		
Minimum Gap (s)	1.0	1.0	3.2			3.2		1.0	1.0	1.0		
Time Before Reduce (s)	0.0	0.0	15.0			15.0		0.0	0.0	0.0		
Time To Reduce (s)	0.0	0.0	45.0			45.0		0.0	0.0	0.0		
Recall Mode	None	None	C-Min			C-Min		None	None	None		
Act Effct Green (s)		20.3	80.3			55.0	120.0		29.7	29.7		
Actuated g/C Ratio		0.17	0.67			0.46	1.00		0.25	0.25		
v/c Ratio		1.13	0.47			1.05	0.72		0.26	0.96		
Control Delay		129.5	8.8			50.6	5.7		38.1	69.8		
Queue Delay		0.0	0.0			0.0	0.0		0.0	0.0		
Total Delay		129.5	8.8			50.6	5.7		38.1	69.8		

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	0
Future Volume (vph)	0
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	0
Taper Length (ft)	
Lane Util. Factor	1.00
Frt	
Flt Protected	
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Adj. Flow (vph)	0
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Minimum Gap (s)	
Time Before Reduce (s)	
Time To Reduce (s)	
Recall Mode	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
LOS		F	A			D	A		D	E		
Approach Delay			43.9			36.3			65.1			
Approach LOS			D			D			E			
Queue Length 50th (ft)		~313	157			~739	82		70	285		
Queue Length 95th (ft)		#435	191			m515	m45		123	#413		
Internal Link Dist (ft)			675			1055			1241			1178
Turn Bay Length (ft)		500								400		
Base Capacity (vph)		581	3403			2330	1583		444	696		
Starvation Cap Reductn		0	0			0	0		0	0		
Spillback Cap Reductn		0	0			0	0		0	0		
Storage Cap Reductn		0	0			0	0		0	0		
Reduced v/c Ratio		1.13	0.47			1.05	0.72		0.25	0.95		

Intersection Summary

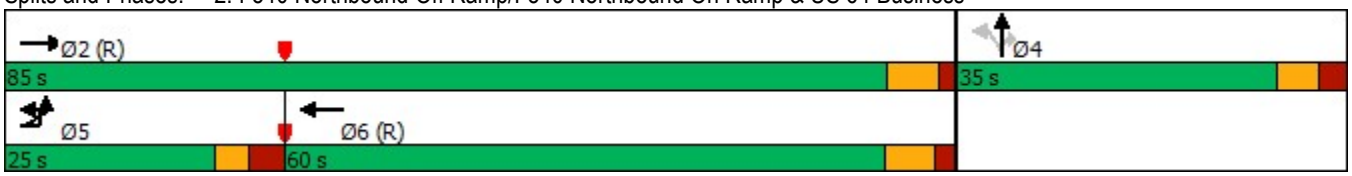
Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 10 (8%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.13
Intersection Signal Delay: 42.2 Intersection LOS: D
Intersection Capacity Utilization 77.5% ICU Level of Service D
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: 2: I-540 Northbound Off Ramp/I-540 Northbound On Ramp & US 64 Business



Lane Group	SBR
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

2038 Build
Timing Plan: PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	509	3466	0	0	1890	752	131	4	862	0	0	0
Future Volume (vph)	509	3466	0	0	1890	752	131	4	862	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	500		0	0		0	0		400	0		0
Storage Lanes	1		0	0		1	0		2	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	1.00	1.00	0.88	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950							0.954				
Satd. Flow (prot)	3433	5085	0	0	5085	1583	0	1777	2787	0	0	0
Flt Permitted	0.950							0.954				
Satd. Flow (perm)	3433	5085	0	0	5085	1583	0	1777	2787	0	0	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		755			1135			1321			1258	
Travel Time (s)		11.4			17.2			25.7			24.5	
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)	566	3851	0	0	2100	836	146	4	958	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	566	3851	0	0	2100	836	0	150	958	0	0	0
Turn Type	Prot	NA			NA	Free	Perm	NA	Perm			
Protected Phases	5	2			6			4				
Permitted Phases						Free	4		4			
Detector Phase	5	2			6		4	4	4			
Switch Phase												
Minimum Initial (s)	7.0	12.0			12.0		7.0	7.0	7.0			
Minimum Split (s)	13.3	18.2			18.4		13.4	13.4	13.4			
Total Split (s)	30.0	105.0			75.0		35.0	35.0	35.0			
Total Split (%)	21.4%	75.0%			53.6%		25.0%	25.0%	25.0%			
Maximum Green (s)	23.7	98.8			68.6		28.6	28.6	28.6			
Yellow Time (s)	3.0	4.6			4.4		3.7	3.7	3.7			
All-Red Time (s)	3.3	1.6			2.0		2.7	2.7	2.7			
Lost Time Adjust (s)	-1.3	-1.2			-1.4			-1.4	-1.4			
Total Lost Time (s)	5.0	5.0			5.0			5.0	5.0			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Vehicle Extension (s)	1.0	6.0			6.0		1.0	1.0	1.0			
Minimum Gap (s)	1.0	3.2			3.2		1.0	1.0	1.0			
Time Before Reduce (s)	0.0	15.0			15.0		0.0	0.0	0.0			
Time To Reduce (s)	0.0	45.0			45.0		0.0	0.0	0.0			
Recall Mode	None	C-Min			C-Min		None	None	None			
Act Effct Green (s)	24.6	100.0			70.4	140.0		30.0	30.0			
Actuated g/C Ratio	0.18	0.71			0.50	1.00		0.21	0.21			
v/c Ratio	0.94	1.06			0.82	0.53		0.39	1.60			
Control Delay	68.3	64.2			17.1	0.8		50.9	315.3			
Queue Delay	0.0	17.1			0.0	0.0		0.0	0.0			
Total Delay	68.3	81.4			17.1	0.8		50.9	315.3			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	E	F			B	A		D	F			
Approach Delay		79.7			12.4			279.5				
Approach LOS		E			B			F				
Queue Length 50th (ft)	262	~1393			297	0		118	~707			
Queue Length 95th (ft)	m#352	#1454			m360	m0		188	#853			
Internal Link Dist (ft)		675			1055			1241			1178	
Turn Bay Length (ft)	500								400			
Base Capacity (vph)	613	3632			2556	1583		380	597			
Starvation Cap Reductn	0	229			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.92	1.13			0.82	0.53		0.39	1.60			

Intersection Summary

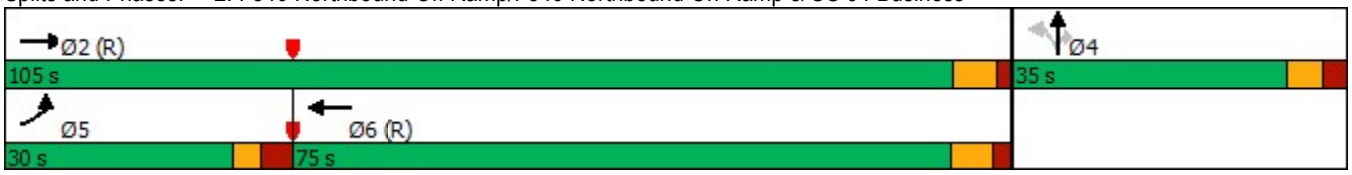
Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 47 (34%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.60
Intersection Signal Delay: 82.5 Intersection LOS: F
Intersection Capacity Utilization 105.5% ICU Level of Service G
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: 2: I-540 Northbound Off Ramp/I-540 Northbound On Ramp & US 64 Business



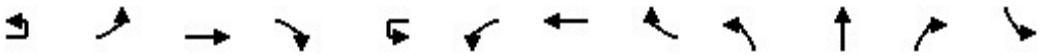
APPENDIX F

CAPACITY ANALYSIS CALCULATIONS

US 64 BUSINESS

&

HINTON OAKS ROAD



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	1	132	953	54	4	18	1919	48	273	5	60	37
Future Volume (vph)	1	132	953	54	4	18	1919	48	273	5	60	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		300		125		200		200	200		125	200
Storage Lanes		2		1		1		1	2		1	2
Taper Length (ft)		100				100			100			100
Lane Util. Factor	0.91	0.97	0.91	1.00	0.91	1.00	0.91	1.00	0.97	1.00	1.00	0.97
Frt				0.850				0.850			0.850	
Flt Protected		0.950				0.950			0.950			0.950
Satd. Flow (prot)	0	3433	5085	1583	0	1770	5085	1583	3433	1863	1583	3433
Flt Permitted		0.950				0.950			0.950			0.950
Satd. Flow (perm)	0	3433	5085	1583	0	1770	5085	1583	3433	1863	1583	3433
Right Turn on Red				No				No			No	
Satd. Flow (RTOR)												
Link Speed (mph)			45				45			35		
Link Distance (ft)			1135				1448			1919		
Travel Time (s)			17.2				21.9			37.4		
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)	1	147	1059	60	4	20	2132	53	303	6	67	41
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	148	1059	60	0	24	2132	53	303	6	67	41
Turn Type	Prot	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot
Protected Phases	5!	5	2	3	1!	1	6	7	3	8	1!	7
Permitted Phases				2				6			8	
Detector Phase	5	5	2	3	1	1	6	7	3	8	1	7
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.6	13.6	18.3	13.8	13.4	13.4	18.0	14.1	13.8	13.6	13.4	14.1
Total Split (s)	17.0	17.0	70.0	18.0	17.0	17.0	70.0	15.0	18.0	18.0	17.0	15.0
Total Split (%)	14.2%	14.2%	58.3%	15.0%	14.2%	14.2%	58.3%	12.5%	15.0%	15.0%	14.2%	12.5%
Maximum Green (s)	10.4	10.4	63.7	11.2	10.6	10.6	64.0	7.9	11.2	11.4	10.6	7.9
Yellow Time (s)	3.6	3.6	4.6	3.8	3.4	3.4	4.4	4.1	3.8	3.6	3.4	4.1
All-Red Time (s)	3.0	3.0	1.7	3.0	3.0	3.0	1.6	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		-1.6	-1.3	-1.8		-1.4	-1.0	-2.1	-1.8	-1.6	-1.4	-2.1
Total Lost Time (s)		5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag	Lead	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0	6.0	1.0	1.0	1.0	6.0	1.0	1.0	1.0	1.0	1.0
Minimum Gap (s)	1.0	1.0	3.3	1.0	1.0	1.0	3.3	1.0	1.0	1.0	1.0	1.0
Time Before Reduce (s)	0.0	0.0	15.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	45.0	0.0	0.0	0.0	45.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	C-Min	None	None	None	C-Min	None	None	None	None	None
Act Effct Green (s)		10.4	78.5	98.6		9.5	74.9	95.4	14.1	9.5	13.1	15.5
Actuated g/C Ratio		0.09	0.65	0.82		0.08	0.62	0.80	0.12	0.08	0.11	0.13
v/c Ratio		0.50	0.32	0.05		0.17	0.67	0.04	0.75	0.04	0.39	0.09
Control Delay		63.8	9.1	4.4		54.5	17.4	4.1	63.7	50.6	54.1	46.0
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		63.8	9.1	4.4		54.5	17.4	4.1	63.7	50.6	54.1	46.0

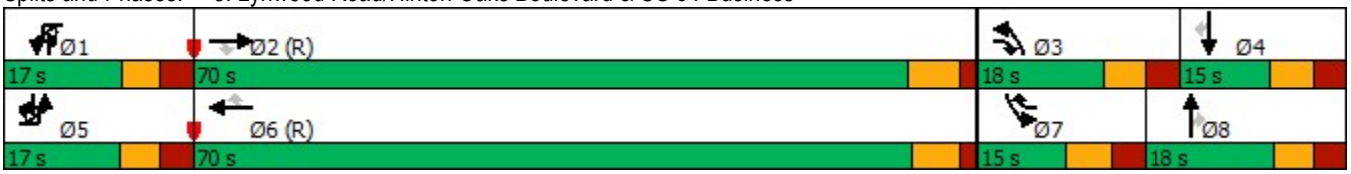
Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	8	25
Future Volume (vph)	8	25
Ideal Flow (vphpl)	1900	1900
Storage Length (ft)		150
Storage Lanes		1
Taper Length (ft)		
Lane Util. Factor	0.95	0.95
Frt	0.921	0.850
Flt Protected		
Satd. Flow (prot)	1630	1504
Flt Permitted		
Satd. Flow (perm)	1630	1504
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	35	
Link Distance (ft)	1833	
Travel Time (s)	35.7	
Peak Hour Factor	0.90	0.90
Adj. Flow (vph)	9	28
Shared Lane Traffic (%)		36%
Lane Group Flow (vph)	19	18
Turn Type	NA	pm+ov
Protected Phases	4	5!
Permitted Phases		4
Detector Phase	4	5
Switch Phase		
Minimum Initial (s)	7.0	7.0
Minimum Split (s)	13.9	13.6
Total Split (s)	15.0	17.0
Total Split (%)	12.5%	14.2%
Maximum Green (s)	8.1	10.4
Yellow Time (s)	3.8	3.6
All-Red Time (s)	3.1	3.0
Lost Time Adjust (s)	-1.9	-1.6
Total Lost Time (s)	5.0	5.0
Lead/Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes
Vehicle Extension (s)	1.0	1.0
Minimum Gap (s)	1.0	1.0
Time Before Reduce (s)	0.0	0.0
Time To Reduce (s)	0.0	0.0
Recall Mode	None	None
Act Effct Green (s)	8.9	16.0
Actuated g/C Ratio	0.07	0.13
v/c Ratio	0.16	0.09
Control Delay	55.4	41.6
Queue Delay	0.0	0.0
Total Delay	55.4	41.6

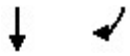
Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
LOS		E	A	A		D	B	A	E	D	D	D
Approach Delay			15.3				17.5			61.7		
Approach LOS			B				B			E		
Queue Length 50th (ft)		59	77	4		18	330	5	116	4	51	14
Queue Length 95th (ft)		95	195	m25		46	520	28	#189	18	84	34
Internal Link Dist (ft)			1055				1368			1839		
Turn Bay Length (ft)		300		125		200		200	200		125	200
Base Capacity (vph)		349	3332	1290		177	3173	1263	409	201	205	454
Starvation Cap Reductn		0	0	0		0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0		0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0		0	0	0	0	0	0	0
Reduced v/c Ratio		0.42	0.32	0.05		0.14	0.67	0.04	0.74	0.03	0.33	0.09

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 1 (1%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 21.6	Intersection LOS: C
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.
m Volume for 95th percentile queue is metered by upstream signal.
! Phase conflict between lane groups.

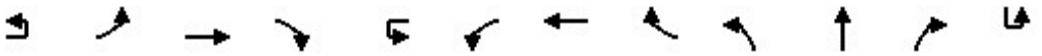
Splits and Phases: 3: Lynwood Road/Hinton Oaks Boulevard & US 64 Business





Lane Group	SBT	SBR
LOS	E	D
Approach Delay	47.3	
Approach LOS	D	
Queue Length 50th (ft)	14	13
Queue Length 95th (ft)	41	32
Internal Link Dist (ft)	1753	
Turn Bay Length (ft)		150
Base Capacity (vph)	135	222
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.14	0.08

Intersection Summary



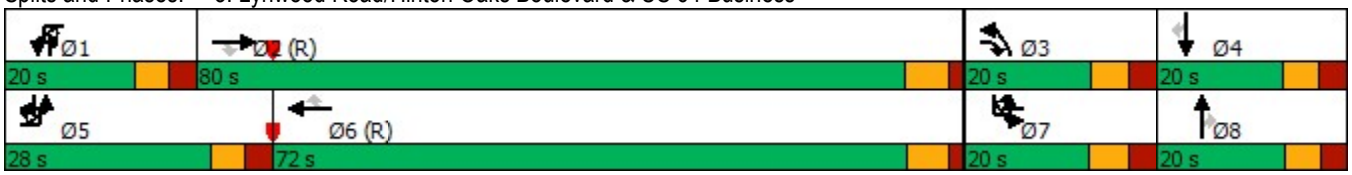
Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	24	403	2334	161	5	35	1375	71	118	27	57	1
Future Volume (vph)	24	403	2334	161	5	35	1375	71	118	27	57	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		300		125		200		200	200		125	
Storage Lanes		2		1		1		1	2		1	
Taper Length (ft)		100				100			100			
Lane Util. Factor	0.91	0.97	0.91	1.00	0.91	1.00	0.91	1.00	0.97	1.00	1.00	1.00
Frt				0.850				0.850			0.850	
Flt Protected		0.950				0.950			0.950			
Satd. Flow (prot)	0	3433	5085	1583	0	1770	5085	1583	3433	1863	1583	0
Flt Permitted		0.950				0.950			0.950			
Satd. Flow (perm)	0	3433	5085	1583	0	1770	5085	1583	3433	1863	1583	0
Right Turn on Red				No				No			No	
Satd. Flow (RTOR)												
Link Speed (mph)			45				45			35		
Link Distance (ft)			1135				1448			1919		
Travel Time (s)			17.2				21.9			37.4		
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)	27	448	2593	179	6	39	1528	79	131	30	63	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	475	2593	179	0	45	1528	79	131	30	63	0
Turn Type	Prot	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot
Protected Phases	5!	5	2	3	1!	1	6	7!	3	8	1!	7!
Permitted Phases				2				6			8	
Detector Phase	5	5	2	3	1	1	6	7	3	8	1	7
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.6	13.6	18.3	13.8	13.4	13.4	18.0	14.1	13.8	13.6	13.4	14.1
Total Split (s)	28.0	28.0	80.0	20.0	20.0	20.0	72.0	20.0	20.0	20.0	20.0	20.0
Total Split (%)	20.0%	20.0%	57.1%	14.3%	14.3%	14.3%	51.4%	14.3%	14.3%	14.3%	14.3%	14.3%
Maximum Green (s)	21.4	21.4	73.7	13.2	13.6	13.6	66.0	12.9	13.2	13.4	13.6	12.9
Yellow Time (s)	3.6	3.6	4.6	3.8	3.4	3.4	4.4	4.1	3.8	3.6	3.4	4.1
All-Red Time (s)	3.0	3.0	1.7	3.0	3.0	3.0	1.6	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		-1.6	-1.3	-1.8		-1.4	-1.0	-2.1	-1.8	-1.6	-1.4	
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	Lag	Lead	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0	6.0	1.0	1.0	1.0	6.0	1.0	1.0	1.0	1.0	1.0
Minimum Gap (s)	1.0	1.0	3.3	1.0	1.0	1.0	3.3	1.0	1.0	1.0	1.0	1.0
Time Before Reduce (s)	0.0	0.0	15.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	45.0	0.0	0.0	0.0	45.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	C-Min	None	None	None	C-Min	None	None	None	None	None
Act Effct Green (s)		23.6	94.1	111.0		9.4	77.2	96.3	10.9	10.6	19.5	
Actuated g/C Ratio		0.17	0.67	0.79		0.07	0.55	0.69	0.08	0.08	0.14	
v/c Ratio		0.82	0.76	0.14		0.38	0.54	0.07	0.49	0.21	0.29	
Control Delay		67.3	14.2	3.7		71.6	22.6	9.5	68.0	63.4	53.6	
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		67.3	14.2	3.7		71.6	22.6	9.5	68.0	63.4	53.6	

Lane Group	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	124	13	91
Future Volume (vph)	124	13	91
Ideal Flow (vphpl)	1900	1900	1900
Storage Length (ft)	200		150
Storage Lanes	2		1
Taper Length (ft)	100		
Lane Util. Factor	0.97	0.95	0.95
Frt		0.886	0.850
Flt Protected	0.950		
Satd. Flow (prot)	3433	1568	1504
Flt Permitted	0.950		
Satd. Flow (perm)	3433	1568	1504
Right Turn on Red			No
Satd. Flow (RTOR)			
Link Speed (mph)		25	
Link Distance (ft)		1833	
Travel Time (s)		50.0	
Peak Hour Factor	0.90	0.90	0.90
Adj. Flow (vph)	138	14	101
Shared Lane Traffic (%)			44%
Lane Group Flow (vph)	139	58	57
Turn Type	Prot	NA	pm+ov
Protected Phases	7	4	5!
Permitted Phases			4
Detector Phase	7	4	5
Switch Phase			
Minimum Initial (s)	7.0	7.0	7.0
Minimum Split (s)	14.1	13.9	13.6
Total Split (s)	20.0	20.0	28.0
Total Split (%)	14.3%	14.3%	20.0%
Maximum Green (s)	12.9	13.1	21.4
Yellow Time (s)	4.1	3.8	3.6
All-Red Time (s)	3.0	3.1	3.0
Lost Time Adjust (s)	-2.1	-1.9	-1.6
Total Lost Time (s)	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0	1.0
Minimum Gap (s)	1.0	1.0	1.0
Time Before Reduce (s)	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0
Recall Mode	None	None	None
Act Effct Green (s)	14.0	11.1	36.9
Actuated g/C Ratio	0.10	0.08	0.26
v/c Ratio	0.40	0.47	0.14
Control Delay	62.9	73.4	37.1
Queue Delay	0.0	0.0	0.0
Total Delay	62.9	73.4	37.1

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU
LOS		E	B	A		E	C	A	E	E	D	
Approach Delay			21.4				23.3			63.4		
Approach LOS			C				C			E		
Queue Length 50th (ft)		218	341	27		40	332	25	60	26	51	
Queue Length 95th (ft)		m272	m685	m47		81	423	50	92	59	90	
Internal Link Dist (ft)			1055				1368			1839		
Turn Bay Length (ft)		300		125		200		200	200		125	
Base Capacity (vph)		599	3417	1288		189	2804	1117	367	199	284	
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		0.79	0.76	0.14		0.24	0.54	0.07	0.36	0.15	0.22	

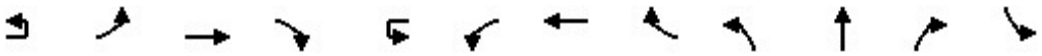
Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 37 (26%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 25.5		Intersection LOS: C	
Intersection Capacity Utilization 79.3%		ICU Level of Service D	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			
! Phase conflict between lane groups.			

Splits and Phases: 3: Lynwood Road/Hinton Oaks Boulevard & US 64 Business



Lane Group	SBL	SBT	SBR
LOS	E	E	D
Approach Delay		59.5	
Approach LOS		E	
Queue Length 50th (ft)	63	54	41
Queue Length 95th (ft)	97	103	75
Internal Link Dist (ft)		1753	
Turn Bay Length (ft)	200		150
Base Capacity (vph)	407	168	405
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.34	0.35	0.14

Intersection Summary



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	1	365	1240	66	5	22	2402	95	336	6	74	53
Future Volume (vph)	1	365	1240	66	5	22	2402	95	336	6	74	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		300		125		200		200	200		125	200
Storage Lanes		2		1		1		1	2		1	2
Taper Length (ft)		100				100			100			100
Lane Util. Factor	0.91	0.97	0.91	1.00	0.91	1.00	0.91	1.00	0.97	1.00	1.00	0.97
Frt				0.850				0.850			0.850	
Flt Protected		0.950				0.950			0.950			0.950
Satd. Flow (prot)	0	3433	5085	1583	0	1770	5085	1583	3433	1863	1583	3433
Flt Permitted		0.950				0.950			0.950			0.950
Satd. Flow (perm)	0	3433	5085	1583	0	1770	5085	1583	3433	1863	1583	3433
Right Turn on Red				No				No			No	
Satd. Flow (RTOR)												
Link Speed (mph)			45				45			35		
Link Distance (ft)			1135				1448			1919		
Travel Time (s)			17.2				21.9			37.4		
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)	1	406	1378	73	6	24	2669	106	373	7	82	59
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	407	1378	73	0	30	2669	106	373	7	82	59
Turn Type	Prot	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot
Protected Phases	5!	5	2	3	1!	1	6	7	3	8	1!	7
Permitted Phases				2				6			8	
Detector Phase	5	5	2	3	1	1	6	7	3	8	1	7
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.6	13.6	18.3	13.8	13.4	13.4	18.0	14.1	13.8	13.6	13.4	14.1
Total Split (s)	17.0	17.0	70.0	18.0	17.0	17.0	70.0	15.0	18.0	18.0	17.0	15.0
Total Split (%)	14.2%	14.2%	58.3%	15.0%	14.2%	14.2%	58.3%	12.5%	15.0%	15.0%	14.2%	12.5%
Maximum Green (s)	10.4	10.4	63.7	11.2	10.6	10.6	64.0	7.9	11.2	11.4	10.6	7.9
Yellow Time (s)	3.6	3.6	4.6	3.8	3.4	3.4	4.4	4.1	3.8	3.6	3.4	4.1
All-Red Time (s)	3.0	3.0	1.7	3.0	3.0	3.0	1.6	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		-1.6	-1.3	-1.8		-1.4	-1.0	-2.1	-1.8	-1.6	-1.4	-2.1
Total Lost Time (s)		5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag	Lead	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0	6.0	1.0	1.0	1.0	6.0	1.0	1.0	1.0	1.0	1.0
Minimum Gap (s)	1.0	1.0	3.3	1.0	1.0	1.0	3.3	1.0	1.0	1.0	1.0	1.0
Time Before Reduce (s)	0.0	0.0	15.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	45.0	0.0	0.0	0.0	45.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	C-Min	None	None	None	C-Min	None	None	None	None	None
Act Effct Green (s)		15.4	73.1	92.1		10.0	65.0	90.9	13.0	9.6	13.7	20.9
Actuated g/C Ratio		0.13	0.61	0.77		0.08	0.54	0.76	0.11	0.08	0.11	0.17
v/c Ratio		0.92	0.44	0.06		0.20	0.97	0.09	1.01	0.05	0.45	0.10
Control Delay		78.5	12.8	5.5		54.5	38.2	4.5	101.5	50.3	55.6	43.1
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		78.5	12.8	5.5		54.5	38.2	4.5	101.5	50.3	55.6	43.1

Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	10	68
Future Volume (vph)	10	68
Ideal Flow (vphpl)	1900	1900
Storage Length (ft)		150
Storage Lanes		1
Taper Length (ft)		
Lane Util. Factor	0.95	0.95
Frt	0.887	0.850
Flt Protected		
Satd. Flow (prot)	1570	1504
Flt Permitted		
Satd. Flow (perm)	1570	1504
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	35	
Link Distance (ft)	1833	
Travel Time (s)	35.7	
Peak Hour Factor	0.90	0.90
Adj. Flow (vph)	11	76
Shared Lane Traffic (%)		44%
Lane Group Flow (vph)	44	43
Turn Type	NA	pm+ov
Protected Phases	4	5!
Permitted Phases		4
Detector Phase	4	5
Switch Phase		
Minimum Initial (s)	7.0	7.0
Minimum Split (s)	13.9	13.6
Total Split (s)	15.0	17.0
Total Split (%)	12.5%	14.2%
Maximum Green (s)	8.1	10.4
Yellow Time (s)	3.8	3.6
All-Red Time (s)	3.1	3.0
Lost Time Adjust (s)	-1.9	-1.6
Total Lost Time (s)	5.0	5.0
Lead/Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes
Vehicle Extension (s)	1.0	1.0
Minimum Gap (s)	1.0	1.0
Time Before Reduce (s)	0.0	0.0
Time To Reduce (s)	0.0	0.0
Recall Mode	None	None
Act Effct Green (s)	9.3	27.0
Actuated g/C Ratio	0.08	0.22
v/c Ratio	0.36	0.13
Control Delay	61.1	38.4
Queue Delay	0.0	0.0
Total Delay	61.1	38.4

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
LOS		E	B	A		D	D	A	F	D	E	D
Approach Delay			26.9				37.1			92.6		
Approach LOS			C				D			F		
Queue Length 50th (ft)		~187	253	17		22	700	14	~152	5	62	18
Queue Length 95th (ft)		m#291	296	m27		54	#852	48	#254	20	98	44
Internal Link Dist (ft)			1055				1368			1839		
Turn Bay Length (ft)		300		125		200		200	200		125	200
Base Capacity (vph)		441	3097	1214		177	2754	1199	371	203	207	599
Starvation Cap Reductn		0	0	0		0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0		0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0		0	0	0	0	0	0	0
Reduced v/c Ratio		0.92	0.44	0.06		0.17	0.97	0.09	1.01	0.03	0.40	0.10

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 1 (1%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.01			
Intersection Signal Delay: 38.6		Intersection LOS: D	
Intersection Capacity Utilization 88.9%		ICU Level of Service E	
Analysis Period (min) 15			

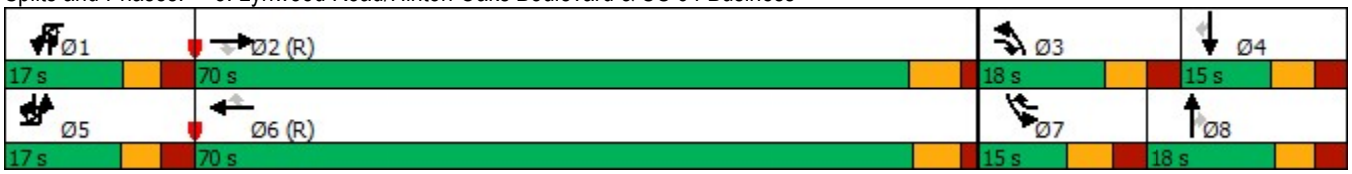
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

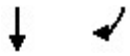
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

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

! Phase conflict between lane groups.

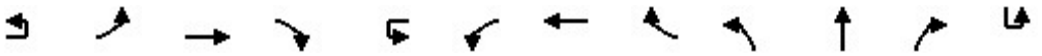
Splits and Phases: 3: Lynwood Road/Hinton Oaks Boulevard & US 64 Business





Lane Group	SBT	SBR
LOS	E	D
Approach Delay	47.2	
Approach LOS	D	
Queue Length 50th (ft)	34	28
Queue Length 95th (ft)	75	62
Internal Link Dist (ft)	1753	
Turn Bay Length (ft)		150
Base Capacity (vph)	130	338
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.34	0.13

Intersection Summary



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	30	548	2921	198	6	43	1763	96	145	33	70	1
Future Volume (vph)	30	548	2921	198	6	43	1763	96	145	33	70	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		300		125		200		200	200		125	
Storage Lanes		2		1		1		1	2		1	
Taper Length (ft)		100				100			100			
Lane Util. Factor	0.91	0.97	0.91	1.00	0.91	1.00	0.91	1.00	0.97	1.00	1.00	1.00
Frt				0.850				0.850			0.850	
Flt Protected		0.950				0.950			0.950			
Satd. Flow (prot)	0	3433	5085	1583	0	1770	5085	1583	3433	1863	1583	0
Flt Permitted		0.950				0.950			0.950			
Satd. Flow (perm)	0	3433	5085	1583	0	1770	5085	1583	3433	1863	1583	0
Right Turn on Red				No				No			No	
Satd. Flow (RTOR)												
Link Speed (mph)			45				45			35		
Link Distance (ft)			1135				1448			1919		
Travel Time (s)			17.2				21.9			37.4		
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)	33	609	3246	220	7	48	1959	107	161	37	78	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	642	3246	220	0	55	1959	107	161	37	78	0
Turn Type	Prot	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot
Protected Phases	5!	5	2	3	1!	1	6	7!	3	8	1!	7!
Permitted Phases				2				6			8	
Detector Phase	5	5	2	3	1	1	6	7	3	8	1	7
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.6	13.6	18.3	13.8	13.4	13.4	18.0	14.1	13.8	13.6	13.4	14.1
Total Split (s)	28.0	28.0	80.0	20.0	20.0	20.0	72.0	20.0	20.0	20.0	20.0	20.0
Total Split (%)	20.0%	20.0%	57.1%	14.3%	14.3%	14.3%	51.4%	14.3%	14.3%	14.3%	14.3%	14.3%
Maximum Green (s)	21.4	21.4	73.7	13.2	13.6	13.6	66.0	12.9	13.2	13.4	13.6	12.9
Yellow Time (s)	3.6	3.6	4.6	3.8	3.4	3.4	4.4	4.1	3.8	3.6	3.4	4.1
All-Red Time (s)	3.0	3.0	1.7	3.0	3.0	3.0	1.6	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		-1.6	-1.3	-1.8		-1.4	-1.0	-2.1	-1.8	-1.6	-1.4	
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	Lag	Lead	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0	6.0	1.0	1.0	1.0	6.0	1.0	1.0	1.0	1.0	1.0
Minimum Gap (s)	1.0	1.0	3.3	1.0	1.0	1.0	3.3	1.0	1.0	1.0	1.0	1.0
Time Before Reduce (s)	0.0	0.0	15.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	45.0	0.0	0.0	0.0	45.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	C-Min	None	None	None	C-Min	None	None	None	None	None
Act Effct Green (s)		23.0	80.1	96.9		9.9	67.0	90.3	11.8	14.4	26.7	
Actuated g/C Ratio		0.16	0.57	0.69		0.07	0.48	0.64	0.08	0.10	0.19	
v/c Ratio		1.14	1.12	0.20		0.44	0.81	0.10	0.56	0.19	0.26	
Control Delay		120.1	80.4	6.7		72.9	34.2	10.9	68.7	59.3	48.0	
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		120.1	80.4	6.7		72.9	34.2	10.9	68.7	59.3	48.0	

Lane Group	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	186	16	298
Future Volume (vph)	186	16	298
Ideal Flow (vphpl)	1900	1900	1900
Storage Length (ft)	200		150
Storage Lanes	2		1
Taper Length (ft)	100		
Lane Util. Factor	0.97	0.95	0.95
Frt		0.865	0.850
Flt Protected	0.950		
Satd. Flow (prot)	3433	1531	1504
Flt Permitted	0.950		
Satd. Flow (perm)	3433	1531	1504
Right Turn on Red			No
Satd. Flow (RTOR)			
Link Speed (mph)		25	
Link Distance (ft)		1833	
Travel Time (s)		50.0	
Peak Hour Factor	0.90	0.90	0.90
Adj. Flow (vph)	207	18	331
Shared Lane Traffic (%)			48%
Lane Group Flow (vph)	208	177	172
Turn Type	Prot	NA	pm+ov
Protected Phases	7	4	5!
Permitted Phases			4
Detector Phase	7	4	5
Switch Phase			
Minimum Initial (s)	7.0	7.0	7.0
Minimum Split (s)	14.1	13.9	13.6
Total Split (s)	20.0	20.0	28.0
Total Split (%)	14.3%	14.3%	20.0%
Maximum Green (s)	12.9	13.1	21.4
Yellow Time (s)	4.1	3.8	3.6
All-Red Time (s)	3.0	3.1	3.0
Lost Time Adjust (s)	-2.1	-1.9	-1.6
Total Lost Time (s)	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0	1.0
Minimum Gap (s)	1.0	1.0	1.0
Time Before Reduce (s)	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0
Recall Mode	None	None	None
Act Effct Green (s)	18.3	18.2	46.2
Actuated g/C Ratio	0.13	0.13	0.33
v/c Ratio	0.46	0.89	0.35
Control Delay	61.9	100.6	38.6
Queue Delay	0.0	0.0	0.0
Total Delay	61.9	100.6	38.6

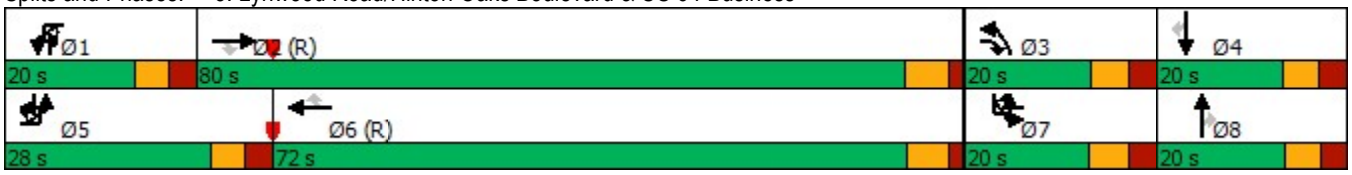
Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU
LOS		F	F	A		E	C	B	E	E	D	
Approach Delay			82.7				34.1			61.6		
Approach LOS			F				C			E		
Queue Length 50th (ft)		~358	~1246	57		49	543	38	73	31	59	
Queue Length 95th (ft)		m#336	m#1196	m53		94	607	64	109	68	105	
Internal Link Dist (ft)			1055				1368			1839		
Turn Bay Length (ft)		300		125		200		200	200		125	
Base Capacity (vph)		563	2907	1131		189	2433	1028	367	209	358	
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		1.14	1.12	0.19		0.29	0.81	0.10	0.44	0.18	0.22	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 37 (26%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.14
Intersection Signal Delay: 66.0 Intersection LOS: E
Intersection Capacity Utilization 90.6% ICU Level of Service E
Analysis Period (min) 15

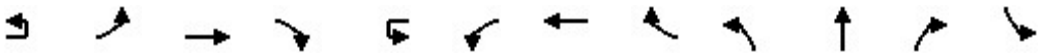
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.
! Phase conflict between lane groups.

Splits and Phases: 3: Lynwood Road/Hinton Oaks Boulevard & US 64 Business



Lane Group	SBL	SBT	SBR
LOS	E	F	D
Approach Delay		67.0	
Approach LOS		E	
Queue Length 50th (ft)	95	169	124
Queue Length 95th (ft)	137	#351	202
Internal Link Dist (ft)		1753	
Turn Bay Length (ft)	200		150
Base Capacity (vph)	465	198	495
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.45	0.89	0.35

Intersection Summary



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	1	451	1240	66	5	22	2402	105	336	6	74	57
Future Volume (vph)	1	451	1240	66	5	22	2402	105	336	6	74	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		300		125		200		200	200		125	200
Storage Lanes		2		1		1		1	2		1	2
Taper Length (ft)		100				100			100			100
Lane Util. Factor	0.91	0.97	0.91	1.00	0.91	1.00	0.91	1.00	0.97	1.00	1.00	0.97
Frt				0.850				0.850			0.850	
Flt Protected		0.950				0.950			0.950			0.950
Satd. Flow (prot)	0	3433	5085	1583	0	1770	5085	1583	3433	1863	1583	3433
Flt Permitted		0.950				0.950			0.950			0.950
Satd. Flow (perm)	0	3433	5085	1583	0	1770	5085	1583	3433	1863	1583	3433
Right Turn on Red				No				No			No	
Satd. Flow (RTOR)												
Link Speed (mph)			45				45			35		
Link Distance (ft)			1135				1448			1919		
Travel Time (s)			17.2				21.9			37.4		
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)	1	501	1378	73	6	24	2669	117	373	7	82	63
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	502	1378	73	0	30	2669	117	373	7	82	63
Turn Type	Prot	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot
Protected Phases	5!	5	2	3	1!	1	6	7	3	8	1!	7
Permitted Phases				2				6			8	
Detector Phase	5	5	2	3	1	1	6	7	3	8	1	7
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.6	13.6	18.3	13.8	13.4	13.4	18.0	14.1	13.8	13.6	13.4	14.1
Total Split (s)	17.0	17.0	70.0	18.0	17.0	17.0	70.0	15.0	18.0	18.0	17.0	15.0
Total Split (%)	14.2%	14.2%	58.3%	15.0%	14.2%	14.2%	58.3%	12.5%	15.0%	15.0%	14.2%	12.5%
Maximum Green (s)	10.4	10.4	63.7	11.2	10.6	10.6	64.0	7.9	11.2	11.4	10.6	7.9
Yellow Time (s)	3.6	3.6	4.6	3.8	3.4	3.4	4.4	4.1	3.8	3.6	3.4	4.1
All-Red Time (s)	3.0	3.0	1.7	3.0	3.0	3.0	1.6	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		-1.6	-1.3	-1.8		-1.4	-1.0	-2.1	-1.8	-1.6	-1.4	-2.1
Total Lost Time (s)		5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag	Lead	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0	6.0	1.0	1.0	1.0	6.0	1.0	1.0	1.0	1.0	1.0
Minimum Gap (s)	1.0	1.0	3.3	1.0	1.0	1.0	3.3	1.0	1.0	1.0	1.0	1.0
Time Before Reduce (s)	0.0	0.0	15.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	45.0	0.0	0.0	0.0	45.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	C-Min	None	None	None	C-Min	None	None	None	None	None
Act Effct Green (s)		15.2	72.9	91.9		10.0	65.0	91.1	13.0	9.5	13.7	21.1
Actuated g/C Ratio		0.13	0.61	0.77		0.08	0.54	0.76	0.11	0.08	0.11	0.18
v/c Ratio		1.15	0.45	0.06		0.20	0.97	0.10	1.01	0.05	0.46	0.10
Control Delay		136.6	13.0	5.5		54.5	38.2	4.4	101.5	50.5	55.7	42.9
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		136.6	13.0	5.5		54.5	38.2	4.4	101.5	50.5	55.7	42.9

Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	10	109
Future Volume (vph)	10	109
Ideal Flow (vphpl)	1900	1900
Storage Length (ft)		150
Storage Lanes		1
Taper Length (ft)		
Lane Util. Factor	0.95	0.95
Frt	0.875	0.850
Flt Protected		
Satd. Flow (prot)	1548	1504
Flt Permitted		
Satd. Flow (perm)	1548	1504
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	35	
Link Distance (ft)	1833	
Travel Time (s)	35.7	
Peak Hour Factor	0.90	0.90
Adj. Flow (vph)	11	121
Shared Lane Traffic (%)		46%
Lane Group Flow (vph)	67	65
Turn Type	NA	pm+ov
Protected Phases	4	5!
Permitted Phases		4
Detector Phase	4	5
Switch Phase		
Minimum Initial (s)	7.0	7.0
Minimum Split (s)	13.9	13.6
Total Split (s)	15.0	17.0
Total Split (%)	12.5%	14.2%
Maximum Green (s)	8.1	10.4
Yellow Time (s)	3.8	3.6
All-Red Time (s)	3.1	3.0
Lost Time Adjust (s)	-1.9	-1.6
Total Lost Time (s)	5.0	5.0
Lead/Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes
Vehicle Extension (s)	1.0	1.0
Minimum Gap (s)	1.0	1.0
Time Before Reduce (s)	0.0	0.0
Time To Reduce (s)	0.0	0.0
Recall Mode	None	None
Act Effct Green (s)	9.6	27.0
Actuated g/C Ratio	0.08	0.22
v/c Ratio	0.54	0.19
Control Delay	69.9	39.6
Queue Delay	0.0	0.0
Total Delay	69.9	39.6

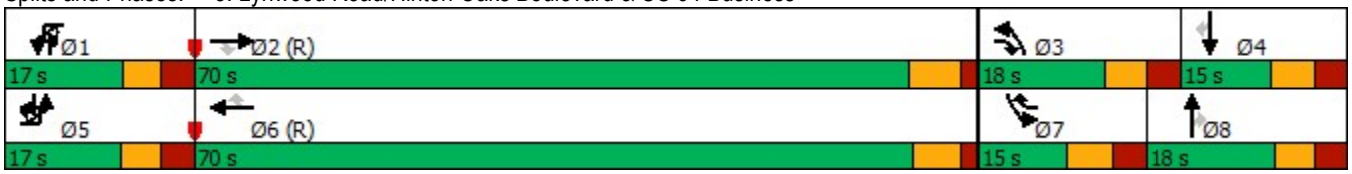
Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
LOS		F	B	A		D	D	A	F	D	E	D
Approach Delay			44.5				37.0			92.6		
Approach LOS			D				D			F		
Queue Length 50th (ft)		~280	258	18		22	700	14	~152	5	62	19
Queue Length 95th (ft)		m#370	302	m27		54	#852	52	#254	20	98	47
Internal Link Dist (ft)			1055				1368			1839		
Turn Bay Length (ft)		300		125		200		200	200		125	200
Base Capacity (vph)		435	3088	1212		177	2754	1202	371	202	206	606
Starvation Cap Reductn		0	0	0		0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0		0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0		0	0	0	0	0	0	0
Reduced v/c Ratio		1.15	0.45	0.06		0.17	0.97	0.10	1.01	0.03	0.40	0.10

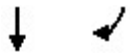
Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 1 (1%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 140
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.15
Intersection Signal Delay: 44.9 Intersection LOS: D
Intersection Capacity Utilization 91.4% 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.
m Volume for 95th percentile queue is metered by upstream signal.
! Phase conflict between lane groups.

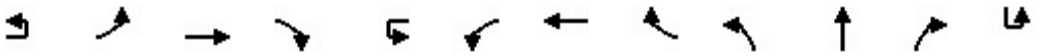
Splits and Phases: 3: Lynwood Road/Hinton Oaks Boulevard & US 64 Business





Lane Group	SBT	SBR
LOS	E	D
Approach Delay	51.1	
Approach LOS	D	
Queue Length 50th (ft)	53	43
Queue Length 95th (ft)	105	86
Internal Link Dist (ft)	1753	
Turn Bay Length (ft)		150
Base Capacity (vph)	129	338
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.52	0.19

Intersection Summary



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	30	571	2921	198	6	43	1763	98	145	33	70	1
Future Volume (vph)	30	571	2921	198	6	43	1763	98	145	33	70	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		300		125		200		200	200		125	
Storage Lanes		2		1		1		1	2		1	
Taper Length (ft)		100				100			100			
Lane Util. Factor	0.91	0.97	0.91	1.00	0.91	1.00	0.91	1.00	0.97	1.00	1.00	1.00
Frt				0.850				0.850			0.850	
Flt Protected		0.950				0.950			0.950			
Satd. Flow (prot)	0	3433	5085	1583	0	1770	5085	1583	3433	1863	1583	0
Flt Permitted		0.950				0.950			0.950			
Satd. Flow (perm)	0	3433	5085	1583	0	1770	5085	1583	3433	1863	1583	0
Right Turn on Red				No				No			No	
Satd. Flow (RTOR)												
Link Speed (mph)			45				45			35		
Link Distance (ft)			1135				1448			1919		
Travel Time (s)			17.2				21.9			37.4		
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)	33	634	3246	220	7	48	1959	109	161	37	78	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	667	3246	220	0	55	1959	109	161	37	78	0
Turn Type	Prot	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot
Protected Phases	5!	5	2	3	1!	1	6	7!	3	8	1!	7!
Permitted Phases				2				6			8	
Detector Phase	5	5	2	3	1	1	6	7	3	8	1	7
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.6	13.6	18.3	13.8	13.4	13.4	18.0	14.1	13.8	13.6	13.4	14.1
Total Split (s)	28.0	28.0	80.0	20.0	20.0	20.0	72.0	20.0	20.0	20.0	20.0	20.0
Total Split (%)	20.0%	20.0%	57.1%	14.3%	14.3%	14.3%	51.4%	14.3%	14.3%	14.3%	14.3%	14.3%
Maximum Green (s)	21.4	21.4	73.7	13.2	13.6	13.6	66.0	12.9	13.2	13.4	13.6	12.9
Yellow Time (s)	3.6	3.6	4.6	3.8	3.4	3.4	4.4	4.1	3.8	3.6	3.4	4.1
All-Red Time (s)	3.0	3.0	1.7	3.0	3.0	3.0	1.6	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		-1.6	-1.3	-1.8		-1.4	-1.0	-2.1	-1.8	-1.6	-1.4	
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	Lag	Lead	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0	6.0	1.0	1.0	1.0	6.0	1.0	1.0	1.0	1.0	1.0
Minimum Gap (s)	1.0	1.0	3.3	1.0	1.0	1.0	3.3	1.0	1.0	1.0	1.0	1.0
Time Before Reduce (s)	0.0	0.0	15.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	45.0	0.0	0.0	0.0	45.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	C-Min	None	None	None	C-Min	None	None	None	None	None
Act Effct Green (s)		23.0	80.1	96.9		9.9	67.0	90.4	11.8	14.3	26.5	
Actuated g/C Ratio		0.16	0.57	0.69		0.07	0.48	0.65	0.08	0.10	0.19	
v/c Ratio		1.18	1.12	0.20		0.44	0.81	0.11	0.56	0.20	0.26	
Control Delay		137.4	80.6	6.7		72.9	34.2	10.8	68.7	59.5	48.1	
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		137.4	80.6	6.7		72.9	34.2	10.8	68.7	59.5	48.1	

Lane Group	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	195	16	381
Future Volume (vph)	195	16	381
Ideal Flow (vphpl)	1900	1900	1900
Storage Length (ft)	200		150
Storage Lanes	2		1
Taper Length (ft)	100		
Lane Util. Factor	0.97	0.95	0.95
Frt		0.862	0.850
Flt Protected	0.950		
Satd. Flow (prot)	3433	1525	1504
Flt Permitted	0.950		
Satd. Flow (perm)	3433	1525	1504
Right Turn on Red			No
Satd. Flow (RTOR)			
Link Speed (mph)		25	
Link Distance (ft)		1833	
Travel Time (s)		50.0	
Peak Hour Factor	0.90	0.90	0.90
Adj. Flow (vph)	217	18	423
Shared Lane Traffic (%)			48%
Lane Group Flow (vph)	218	221	220
Turn Type	Prot	NA	pm+ov
Protected Phases	7	4	5!
Permitted Phases			4
Detector Phase	7	4	5
Switch Phase			
Minimum Initial (s)	7.0	7.0	7.0
Minimum Split (s)	14.1	13.9	13.6
Total Split (s)	20.0	20.0	28.0
Total Split (%)	14.3%	14.3%	20.0%
Maximum Green (s)	12.9	13.1	21.4
Yellow Time (s)	4.1	3.8	3.6
All-Red Time (s)	3.0	3.1	3.0
Lost Time Adjust (s)	-2.1	-1.9	-1.6
Total Lost Time (s)	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0	1.0
Minimum Gap (s)	1.0	1.0	1.0
Time Before Reduce (s)	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0
Recall Mode	None	None	None
Act Effct Green (s)	18.4	18.2	46.2
Actuated g/C Ratio	0.13	0.13	0.33
v/c Ratio	0.48	1.12	0.44
Control Delay	62.2	153.4	41.0
Queue Delay	0.0	0.0	0.0
Total Delay	62.2	153.4	41.0

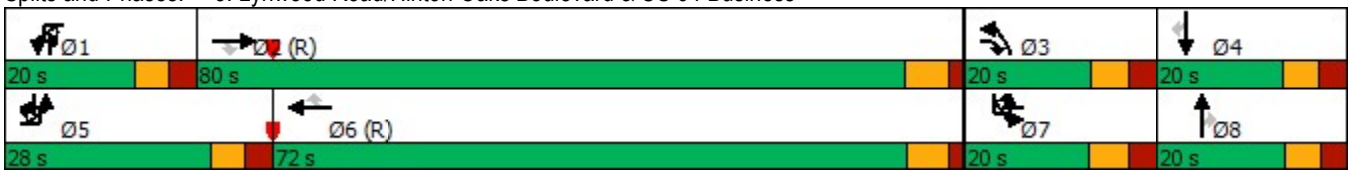
Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU
LOS		F	F	A		E	C	B	E	E	D	
Approach Delay			85.9				34.0			61.6		
Approach LOS			F				C			E		
Queue Length 50th (ft)		~384	~1230	57		49	543	39	73	31	59	
Queue Length 95th (ft)		m#355	m#1187	m53		94	607	65	109	68	105	
Internal Link Dist (ft)			1055				1368			1839		
Turn Bay Length (ft)		300		125		200		200	200		125	
Base Capacity (vph)		563	2907	1131		189	2433	1028	367	206	356	
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		1.18	1.12	0.19		0.29	0.81	0.11	0.44	0.18	0.22	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 37 (26%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.18
Intersection Signal Delay: 69.6 Intersection LOS: E
Intersection Capacity Utilization 93.5% ICU Level of Service F
Analysis Period (min) 15

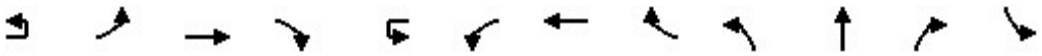
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.
! Phase conflict between lane groups.

Splits and Phases: 3: Lynwood Road/Hinton Oaks Boulevard & US 64 Business



Lane Group	SBL	SBT	SBR
LOS	E	F	D
Approach Delay		85.7	
Approach LOS		F	
Queue Length 50th (ft)	99	~242	165
Queue Length 95th (ft)	143	#455	260
Internal Link Dist (ft)		1753	
Turn Bay Length (ft)	200		150
Base Capacity (vph)	465	197	495
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.47	1.12	0.44

Intersection Summary



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	1	451	1240	66	5	22	2402	105	336	6	74	57
Future Volume (vph)	1	451	1240	66	5	22	2402	105	336	6	74	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		300		125		200		200	200		125	200
Storage Lanes		2		1		1		1	2		1	2
Taper Length (ft)		100				100			100			100
Lane Util. Factor	0.91	0.97	0.91	1.00	0.91	1.00	0.91	1.00	0.97	1.00	1.00	0.97
Frt				0.850				0.850			0.850	
Flt Protected		0.950				0.950			0.950			0.950
Satd. Flow (prot)	0	3433	5085	1583	0	1770	5085	1583	3433	1863	1583	3433
Flt Permitted		0.950				0.950			0.950			0.950
Satd. Flow (perm)	0	3433	5085	1583	0	1770	5085	1583	3433	1863	1583	3433
Right Turn on Red				Yes				Yes			Yes	
Satd. Flow (RTOR)				95				97			95	
Link Speed (mph)			45				45			35		
Link Distance (ft)			1135				1448			1919		
Travel Time (s)			17.2				21.9			37.4		
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)	1	501	1378	73	6	24	2669	117	373	7	82	63
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	502	1378	73	0	30	2669	117	373	7	82	63
Turn Type	Prot	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot
Protected Phases	5!	5	2	3	1!	1	6	7	3	8	1!	7
Permitted Phases				2				6			8	
Detector Phase	5	5	2	3	1	1	6	7	3	8	1	7
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.6	13.6	18.3	13.8	13.4	13.4	18.0	14.1	13.8	13.6	13.4	14.1
Total Split (s)	17.0	17.0	70.0	18.0	17.0	17.0	70.0	15.0	18.0	18.0	17.0	15.0
Total Split (%)	14.2%	14.2%	58.3%	15.0%	14.2%	14.2%	58.3%	12.5%	15.0%	15.0%	14.2%	12.5%
Maximum Green (s)	10.4	10.4	63.7	11.2	10.6	10.6	64.0	7.9	11.2	11.4	10.6	7.9
Yellow Time (s)	3.6	3.6	4.6	3.8	3.4	3.4	4.4	4.1	3.8	3.6	3.4	4.1
All-Red Time (s)	3.0	3.0	1.7	3.0	3.0	3.0	1.6	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		-1.6	-1.3	-1.8		-1.4	-1.0	-2.1	-1.8	-1.6	-1.4	-2.1
Total Lost Time (s)		5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag	Lead	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0	6.0	1.0	1.0	1.0	6.0	1.0	1.0	1.0	1.0	1.0
Minimum Gap (s)	1.0	1.0	3.3	1.0	1.0	1.0	3.3	1.0	1.0	1.0	1.0	1.0
Time Before Reduce (s)	0.0	0.0	15.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	45.0	0.0	0.0	0.0	45.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	C-Min	None	None	None	C-Min	None	None	None	None	None
Act Effct Green (s)		15.7	74.7	93.7		8.6	65.0	90.7	13.0	9.5	12.3	20.7
Actuated g/C Ratio		0.13	0.62	0.78		0.07	0.54	0.76	0.11	0.08	0.10	0.17
v/c Ratio		1.12	0.44	0.06		0.24	0.97	0.10	1.01	0.05	0.33	0.11
Control Delay		125.2	11.8	1.0		57.4	38.2	1.6	101.5	50.5	9.8	43.4
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		125.2	11.8	1.0		57.4	38.2	1.6	101.5	50.5	9.8	43.4

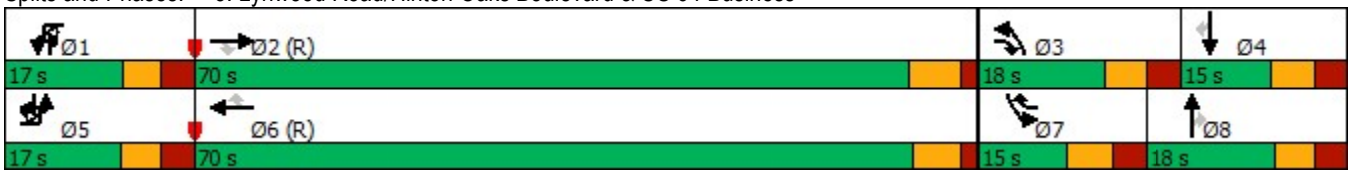
Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	10	109
Future Volume (vph)	10	109
Ideal Flow (vphpl)	1900	1900
Storage Length (ft)		150
Storage Lanes		1
Taper Length (ft)		
Lane Util. Factor	0.95	0.95
Frt	0.875	0.850
Flt Protected		
Satd. Flow (prot)	1548	1504
Flt Permitted		
Satd. Flow (perm)	1548	1504
Right Turn on Red		Yes
Satd. Flow (RTOR)	56	95
Link Speed (mph)	35	
Link Distance (ft)	1833	
Travel Time (s)	35.7	
Peak Hour Factor	0.90	0.90
Adj. Flow (vph)	11	121
Shared Lane Traffic (%)		46%
Lane Group Flow (vph)	67	65
Turn Type	NA	pm+ov
Protected Phases	4	5!
Permitted Phases		4
Detector Phase	4	5
Switch Phase		
Minimum Initial (s)	7.0	7.0
Minimum Split (s)	13.9	13.6
Total Split (s)	15.0	17.0
Total Split (%)	12.5%	14.2%
Maximum Green (s)	8.1	10.4
Yellow Time (s)	3.8	3.6
All-Red Time (s)	3.1	3.0
Lost Time Adjust (s)	-1.9	-1.6
Total Lost Time (s)	5.0	5.0
Lead/Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes
Vehicle Extension (s)	1.0	1.0
Minimum Gap (s)	1.0	1.0
Time Before Reduce (s)	0.0	0.0
Time To Reduce (s)	0.0	0.0
Recall Mode	None	None
Act Effct Green (s)	9.1	27.0
Actuated g/C Ratio	0.08	0.22
v/c Ratio	0.40	0.16
Control Delay	24.8	3.9
Queue Delay	0.0	0.0
Total Delay	24.8	3.9

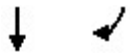
Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
LOS		F	B	A		E	D	A	F	D	A	D
Approach Delay			40.5				36.9			84.5		
Approach LOS			D				D			F		
Queue Length 50th (ft)		~267	186	0		22	700	2	~152	5	0	20
Queue Length 95th (ft)		m#370	302	m8		54	#852	24	#254	20	33	47
Internal Link Dist (ft)			1055				1368			1839		
Turn Bay Length (ft)		300		125		200		200	200		125	200
Base Capacity (vph)		447	3167	1257		177	2754	1220	371	202	288	593
Starvation Cap Reductn		0	0	0		0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0		0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0		0	0	0	0	0	0	0
Reduced v/c Ratio		1.12	0.44	0.06		0.17	0.97	0.10	1.01	0.03	0.28	0.11

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 1 (1%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.12			
Intersection Signal Delay: 41.8		Intersection LOS: D	
Intersection Capacity Utilization 91.4%		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.
m Volume for 95th percentile queue is metered by upstream signal.
! Phase conflict between lane groups.

Splits and Phases: 3: Lynwood Road/Hinton Oaks Boulevard & US 64 Business





Lane Group	SBT	SBR
LOS	C	A
Approach Delay	23.8	
Approach LOS	C	
Queue Length 50th (ft)	8	0
Queue Length 95th (ft)	56	18
Internal Link Dist (ft)	1753	
Turn Bay Length (ft)		150
Base Capacity (vph)	180	412
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.37	0.16

Intersection Summary

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	30	571	2921	198	6	43	1763	98	145	33	70	1
Future Volume (vph)	30	571	2921	198	6	43	1763	98	145	33	70	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		300		125		200		200	200		125	
Storage Lanes		2		1		1		1	2		1	
Taper Length (ft)		100				100			100			
Lane Util. Factor	0.91	0.97	0.91	1.00	0.91	1.00	0.91	1.00	0.97	1.00	1.00	1.00
Frt				0.850				0.850			0.850	
Flt Protected		0.950				0.950			0.950			
Satd. Flow (prot)	0	3433	5085	1583	0	1770	5085	1583	3433	1863	1583	0
Flt Permitted		0.950				0.950			0.950			
Satd. Flow (perm)	0	3433	5085	1583	0	1770	5085	1583	3433	1863	1583	0
Right Turn on Red				Yes				Yes			Yes	
Satd. Flow (RTOR)				89				132			132	
Link Speed (mph)			45				45			35		
Link Distance (ft)			1135				1448			1919		
Travel Time (s)			17.2				21.9			37.4		
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)	33	634	3246	220	7	48	1959	109	161	37	78	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	667	3246	220	0	55	1959	109	161	37	78	0
Turn Type	Prot	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot
Protected Phases	5!	5	2	3	1!	1	6	7!	3	8	1!	7!
Permitted Phases				2				6			8	
Detector Phase	5	5	2	3	1	1	6	7	3	8	1	7
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.6	13.6	18.3	13.8	13.4	13.4	18.0	14.1	13.8	13.6	13.4	14.1
Total Split (s)	28.0	28.0	80.0	20.0	20.0	20.0	72.0	20.0	20.0	20.0	20.0	20.0
Total Split (%)	20.0%	20.0%	57.1%	14.3%	14.3%	14.3%	51.4%	14.3%	14.3%	14.3%	14.3%	14.3%
Maximum Green (s)	21.4	21.4	73.7	13.2	13.6	13.6	66.0	12.9	13.2	13.4	13.6	12.9
Yellow Time (s)	3.6	3.6	4.6	3.8	3.4	3.4	4.4	4.1	3.8	3.6	3.4	4.1
All-Red Time (s)	3.0	3.0	1.7	3.0	3.0	3.0	1.6	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		-1.6	-1.3	-1.8		-1.4	-1.0	-2.1	-1.8	-1.6	-1.4	
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	Lag	Lead	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0	6.0	1.0	1.0	1.0	6.0	1.0	1.0	1.0	1.0	1.0
Minimum Gap (s)	1.0	1.0	3.3	1.0	1.0	1.0	3.3	1.0	1.0	1.0	1.0	1.0
Time Before Reduce (s)	0.0	0.0	15.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	45.0	0.0	0.0	0.0	45.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	C-Min	None	None	None	C-Min	None	None	None	None	None
Act Effct Green (s)		28.6	85.6	102.5		9.9	67.0	88.0	11.8	11.2	23.4	
Actuated g/C Ratio		0.20	0.61	0.73		0.07	0.48	0.63	0.08	0.08	0.17	
v/c Ratio		0.95	1.04	0.19		0.44	0.81	0.10	0.56	0.25	0.21	
Control Delay		62.3	46.4	3.0		72.9	34.2	1.1	68.7	63.4	1.6	
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		62.3	46.4	3.0		72.9	34.2	1.1	68.7	63.4	1.6	

Lane Group	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	195	16	381
Future Volume (vph)	195	16	381
Ideal Flow (vphpl)	1900	1900	1900
Storage Length (ft)	200		150
Storage Lanes	2		1
Taper Length (ft)	100		
Lane Util. Factor	0.97	0.95	0.95
Frt		0.862	0.850
Flt Protected	0.950		
Satd. Flow (prot)	3433	1525	1504
Flt Permitted	0.950		
Satd. Flow (perm)	3433	1525	1504
Right Turn on Red			Yes
Satd. Flow (RTOR)		159	81
Link Speed (mph)		25	
Link Distance (ft)		1833	
Travel Time (s)		50.0	
Peak Hour Factor	0.90	0.90	0.90
Adj. Flow (vph)	217	18	423
Shared Lane Traffic (%)			48%
Lane Group Flow (vph)	218	221	220
Turn Type	Prot	NA	pm+ov
Protected Phases	7	4	5!
Permitted Phases			4
Detector Phase	7	4	5
Switch Phase			
Minimum Initial (s)	7.0	7.0	7.0
Minimum Split (s)	14.1	13.9	13.6
Total Split (s)	20.0	20.0	28.0
Total Split (%)	14.3%	14.3%	20.0%
Maximum Green (s)	12.9	13.1	21.4
Yellow Time (s)	4.1	3.8	3.6
All-Red Time (s)	3.0	3.1	3.0
Lost Time Adjust (s)	-2.1	-1.9	-1.6
Total Lost Time (s)	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0	1.0
Minimum Gap (s)	1.0	1.0	1.0
Time Before Reduce (s)	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0
Recall Mode	None	None	None
Act Effct Green (s)	16.0	12.6	46.2
Actuated g/C Ratio	0.11	0.09	0.33
v/c Ratio	0.56	0.78	0.40
Control Delay	65.3	38.5	25.3
Queue Delay	0.0	0.0	0.0
Total Delay	65.3	38.5	25.3

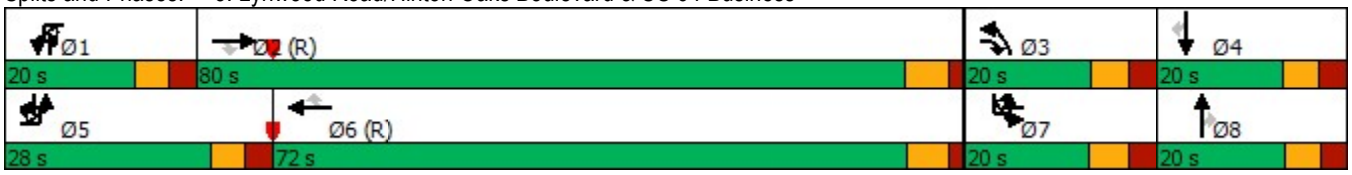
Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU
LOS		E	D	A		E	C	A	E	E	A	
Approach Delay			46.6				33.5			49.0		
Approach LOS			D				C			D		
Queue Length 50th (ft)		320	~1150	21		49	543	0	73	33	0	
Queue Length 95th (ft)		m#355	m#1187	m24		94	607	15	109	68	4	
Internal Link Dist (ft)			1055				1368			1839		
Turn Bay Length (ft)		300		125		200		200	200		125	
Base Capacity (vph)		700	3109	1216		189	2433	1049	367	199	426	
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		0.95	1.04	0.18		0.29	0.81	0.10	0.44	0.19	0.18	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 37 (26%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.04
Intersection Signal Delay: 42.5 Intersection LOS: D
Intersection Capacity Utilization 93.5% ICU Level of Service F
Analysis Period (min) 15

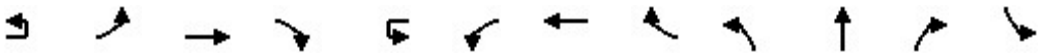
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.
! Phase conflict between lane groups.

Splits and Phases: 3: Lynwood Road/Hinton Oaks Boulevard & US 64 Business



Lane Group	SBL	SBT	SBR
LOS	E	D	C
Approach Delay		42.9	
Approach LOS		D	
Queue Length 50th (ft)	99	57	100
Queue Length 95th (ft)	143	#169	187
Internal Link Dist (ft)		1753	
Turn Bay Length (ft)	200		150
Base Capacity (vph)	405	307	550
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.54	0.72	0.40

Intersection Summary



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	1	466	1350	72	5	24	2623	111	367	7	81	61
Future Volume (vph)	1	466	1350	72	5	24	2623	111	367	7	81	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		400		125		200		200	200		125	200
Storage Lanes		2		1		1		1	2		1	2
Taper Length (ft)		100				100			100			100
Lane Util. Factor	0.91	0.97	0.91	1.00	0.91	1.00	0.91	1.00	0.97	1.00	1.00	0.97
Frt				0.850				0.850			0.850	
Flt Protected		0.950				0.950			0.950			0.950
Satd. Flow (prot)	0	3433	5085	1583	0	1770	5085	1583	3433	1863	1583	3433
Flt Permitted		0.950				0.950			0.950			0.950
Satd. Flow (perm)	0	3433	5085	1583	0	1770	5085	1583	3433	1863	1583	3433
Right Turn on Red				No				No			No	
Satd. Flow (RTOR)												
Link Speed (mph)			45				45			35		
Link Distance (ft)			1135				1448			1919		
Travel Time (s)			17.2				21.9			37.4		
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)	1	518	1500	80	6	27	2914	123	408	8	90	68
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	519	1500	80	0	33	2914	123	408	8	90	68
Turn Type	Prot	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot
Protected Phases	5!	5	2	3	1!	1	6	7	3	8	1!	7
Permitted Phases				2				6			8	
Detector Phase	5	5	2	3	1	1	6	7	3	8	1	7
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.6	13.6	18.3	13.8	13.4	13.4	18.0	14.1	13.8	13.6	13.4	14.1
Total Split (s)	17.0	17.0	70.0	18.0	17.0	17.0	70.0	15.0	18.0	18.0	17.0	15.0
Total Split (%)	14.2%	14.2%	58.3%	15.0%	14.2%	14.2%	58.3%	12.5%	15.0%	15.0%	14.2%	12.5%
Maximum Green (s)	10.4	10.4	63.7	11.2	10.6	10.6	64.0	7.9	11.2	11.4	10.6	7.9
Yellow Time (s)	3.6	3.6	4.6	3.8	3.4	3.4	4.4	4.1	3.8	3.6	3.4	4.1
All-Red Time (s)	3.0	3.0	1.7	3.0	3.0	3.0	1.6	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		-1.6	-1.3	-1.8		-1.4	-1.0	-2.1	-1.8	-1.6	-1.4	-2.1
Total Lost Time (s)		5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag	Lead	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0	6.0	1.0	1.0	1.0	6.0	1.0	1.0	1.0	1.0	1.0
Minimum Gap (s)	1.0	1.0	3.3	1.0	1.0	1.0	3.3	1.0	1.0	1.0	1.0	1.0
Time Before Reduce (s)	0.0	0.0	15.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	45.0	0.0	0.0	0.0	45.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	C-Min	None	None	None	C-Min	None	None	None	None	None
Act Effct Green (s)		15.2	69.9	87.9		10.3	65.0	91.2	13.0	9.5	13.9	21.2
Actuated g/C Ratio		0.13	0.58	0.73		0.09	0.54	0.76	0.11	0.08	0.12	0.18
v/c Ratio		1.19	0.51	0.07		0.22	1.06	0.10	1.10	0.05	0.49	0.11
Control Delay		148.9	16.0	5.5		54.5	62.8	4.5	125.6	50.7	56.9	42.9
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		148.9	16.0	5.5		54.5	62.8	4.5	125.6	50.7	56.9	42.9

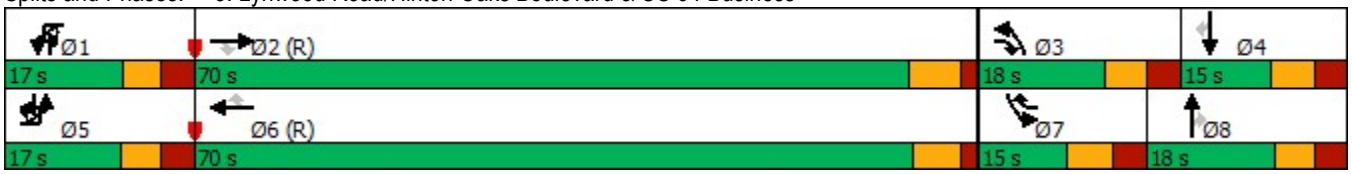
Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	11	112
Future Volume (vph)	11	112
Ideal Flow (vphpl)	1900	1900
Storage Length (ft)		150
Storage Lanes		1
Taper Length (ft)		
Lane Util. Factor	0.95	0.95
Frt	0.876	0.850
Flt Protected		
Satd. Flow (prot)	1550	1504
Flt Permitted		
Satd. Flow (perm)	1550	1504
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	35	
Link Distance (ft)	1833	
Travel Time (s)	35.7	
Peak Hour Factor	0.90	0.90
Adj. Flow (vph)	12	124
Shared Lane Traffic (%)		46%
Lane Group Flow (vph)	69	67
Turn Type	NA	pm+ov
Protected Phases	4	5!
Permitted Phases		4
Detector Phase	4	5
Switch Phase		
Minimum Initial (s)	7.0	7.0
Minimum Split (s)	13.9	13.6
Total Split (s)	15.0	17.0
Total Split (%)	12.5%	14.2%
Maximum Green (s)	8.1	10.4
Yellow Time (s)	3.8	3.6
All-Red Time (s)	3.1	3.0
Lost Time Adjust (s)	-1.9	-1.6
Total Lost Time (s)	5.0	5.0
Lead/Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes
Vehicle Extension (s)	1.0	1.0
Minimum Gap (s)	1.0	1.0
Time Before Reduce (s)	0.0	0.0
Time To Reduce (s)	0.0	0.0
Recall Mode	None	None
Act Effct Green (s)	9.6	27.0
Actuated g/C Ratio	0.08	0.22
v/c Ratio	0.56	0.20
Control Delay	71.0	39.6
Queue Delay	0.0	0.0
Total Delay	71.0	39.6

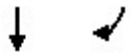
Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
LOS		F	B	A		D	E	A	F	D	E	D
Approach Delay			48.4				60.3			112.2		
Approach LOS			D				E			F		
Queue Length 50th (ft)		~291	288	19		24	~907	15	~184	6	68	21
Queue Length 95th (ft)		m#376	m378	m29		58	#993	55	#286	21	105	49
Internal Link Dist (ft)			1055				1368			1839		
Turn Bay Length (ft)		400		125		200		200	200		125	200
Base Capacity (vph)		435	2961	1159		177	2754	1202	371	201	206	606
Starvation Cap Reductn		0	0	0		0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0		0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0		0	0	0	0	0	0	0
Reduced v/c Ratio		1.19	0.51	0.07		0.19	1.06	0.10	1.10	0.04	0.44	0.11

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 1 (1%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.19			
Intersection Signal Delay: 60.2		Intersection LOS: E	
Intersection Capacity Utilization 97.0%		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.

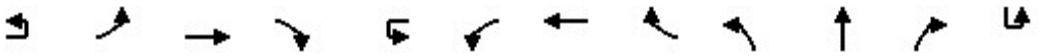
Splits and Phases: 3: Lynwood Road/Hinton Oaks Boulevard & US 64 Business





Lane Group	SBT	SBR
LOS	E	D
Approach Delay	51.3	
Approach LOS	D	
Queue Length 50th (ft)	54	44
Queue Length 95th (ft)	#108	88
Internal Link Dist (ft)	1753	
Turn Bay Length (ft)		150
Base Capacity (vph)	129	338
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.53	0.20

Intersection Summary



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	33	617	3190	217	7	47	1921	106	159	36	77	1
Future Volume (vph)	33	617	3190	217	7	47	1921	106	159	36	77	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		400		125		200		200	200		125	
Storage Lanes		2		1		1		1	2		1	
Taper Length (ft)		100				100			100			
Lane Util. Factor	0.91	0.97	0.91	1.00	0.91	1.00	0.91	1.00	0.97	1.00	1.00	1.00
Frt				0.850				0.850			0.850	
Flt Protected		0.950				0.950			0.950			
Satd. Flow (prot)	0	3433	5085	1583	0	1770	5085	1583	3433	1863	1583	0
Flt Permitted		0.950				0.950			0.950			
Satd. Flow (perm)	0	3433	5085	1583	0	1770	5085	1583	3433	1863	1583	0
Right Turn on Red				No				No			No	
Satd. Flow (RTOR)												
Link Speed (mph)			45				45			35		
Link Distance (ft)			1135				1448			1919		
Travel Time (s)			17.2				21.9			37.4		
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)	37	686	3544	241	8	52	2134	118	177	40	86	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	723	3544	241	0	60	2134	118	177	40	86	0
Turn Type	Prot	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot
Protected Phases	5!	5	2	3	1!	1	6	7!	3	8	1!	7!
Permitted Phases				2				6			8	
Detector Phase	5	5	2	3	1	1	6	7	3	8	1	7
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.6	13.6	18.3	13.8	13.4	13.4	18.0	14.1	13.8	13.6	13.4	14.1
Total Split (s)	28.0	28.0	80.0	20.0	20.0	20.0	72.0	20.0	20.0	20.0	20.0	20.0
Total Split (%)	20.0%	20.0%	57.1%	14.3%	14.3%	14.3%	51.4%	14.3%	14.3%	14.3%	14.3%	14.3%
Maximum Green (s)	21.4	21.4	73.7	13.2	13.6	13.6	66.0	12.9	13.2	13.4	13.6	12.9
Yellow Time (s)	3.6	3.6	4.6	3.8	3.4	3.4	4.4	4.1	3.8	3.6	3.4	4.1
All-Red Time (s)	3.0	3.0	1.7	3.0	3.0	3.0	1.6	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		-1.6	-1.3	-1.8		-1.4	-1.0	-2.1	-1.8	-1.6	-1.4	
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	Lag	Lead	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0	6.0	1.0	1.0	1.0	6.0	1.0	1.0	1.0	1.0	1.0
Minimum Gap (s)	1.0	1.0	3.3	1.0	1.0	1.0	3.3	1.0	1.0	1.0	1.0	1.0
Time Before Reduce (s)	0.0	0.0	15.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	45.0	0.0	0.0	0.0	45.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	C-Min	None	None	None	C-Min	None	None	None	None	None
Act Effct Green (s)		23.0	79.8	97.0		10.2	67.0	90.7	12.2	14.1	26.6	
Actuated g/C Ratio		0.16	0.57	0.69		0.07	0.48	0.65	0.09	0.10	0.19	
v/c Ratio		1.28	1.22	0.22		0.47	0.88	0.12	0.59	0.21	0.29	
Control Delay		177.3	128.5	6.8		73.6	38.0	10.8	69.5	60.1	48.6	
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		177.3	128.5	6.8		73.6	38.0	10.8	69.5	60.1	48.6	

Lane Group	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	209	17	391
Future Volume (vph)	209	17	391
Ideal Flow (vphpl)	1900	1900	1900
Storage Length (ft)	200		150
Storage Lanes	2		1
Taper Length (ft)	100		
Lane Util. Factor	0.97	0.95	0.95
Frt		0.863	0.850
Flt Protected	0.950		
Satd. Flow (prot)	3433	1527	1504
Flt Permitted	0.950		
Satd. Flow (perm)	3433	1527	1504
Right Turn on Red			No
Satd. Flow (RTOR)			
Link Speed (mph)		25	
Link Distance (ft)		1833	
Travel Time (s)		50.0	
Peak Hour Factor	0.90	0.90	0.90
Adj. Flow (vph)	232	19	434
Shared Lane Traffic (%)			48%
Lane Group Flow (vph)	233	227	226
Turn Type	Prot	NA	pm+ov
Protected Phases	7	4	5!
Permitted Phases			4
Detector Phase	7	4	5
Switch Phase			
Minimum Initial (s)	7.0	7.0	7.0
Minimum Split (s)	14.1	13.9	13.6
Total Split (s)	20.0	20.0	28.0
Total Split (%)	14.3%	14.3%	20.0%
Maximum Green (s)	12.9	13.1	21.4
Yellow Time (s)	4.1	3.8	3.6
All-Red Time (s)	3.0	3.1	3.0
Lost Time Adjust (s)	-2.1	-1.9	-1.6
Total Lost Time (s)	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0	1.0
Minimum Gap (s)	1.0	1.0	1.0
Time Before Reduce (s)	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0
Recall Mode	None	None	None
Act Effct Green (s)	18.7	17.8	45.8
Actuated g/C Ratio	0.13	0.13	0.33
v/c Ratio	0.51	1.18	0.46
Control Delay	62.6	170.7	41.7
Queue Delay	0.0	0.0	0.0
Total Delay	62.6	170.7	41.7

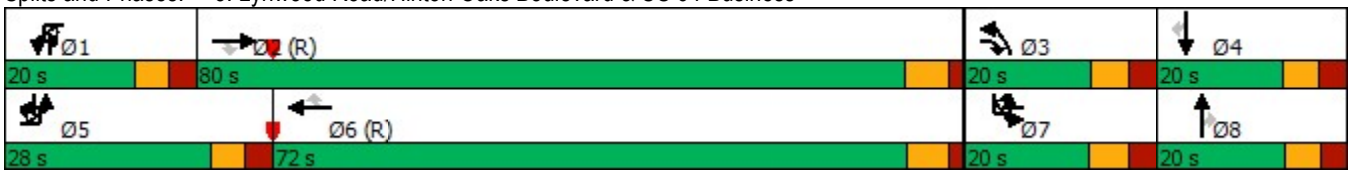
Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU
LOS		F	F	A		E	D	B	E	E	D	
Approach Delay			129.8				37.5			62.3		
Approach LOS			F				D			E		
Queue Length 50th (ft)		~439	~1445	61		54	626	42	81	34	66	
Queue Length 95th (ft)		m#352	m#1195	m54		101	697	70	119	73	113	
Internal Link Dist (ft)			1055				1368			1839		
Turn Bay Length (ft)		400		125		200		200	200		125	
Base Capacity (vph)		563	2897	1128		189	2433	1028	367	204	354	
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		1.28	1.22	0.21		0.32	0.88	0.11	0.48	0.20	0.24	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 37 (26%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.28
Intersection Signal Delay: 96.5 Intersection LOS: F
Intersection Capacity Utilization 98.9% ICU Level of Service F
Analysis Period (min) 15

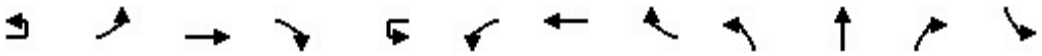
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.
! Phase conflict between lane groups.

Splits and Phases: 3: Lynwood Road/Hinton Oaks Boulevard & US 64 Business



Lane Group	SBL	SBT	SBR
LOS	E	F	D
Approach Delay		91.4	
Approach LOS		F	
Queue Length 50th (ft)	106	~261	171
Queue Length 95th (ft)	152	#469	266
Internal Link Dist (ft)		1753	
Turn Bay Length (ft)	200		150
Base Capacity (vph)	465	193	491
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.50	1.18	0.46

Intersection Summary



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	1	466	1350	72	5	24	2623	111	367	7	81	61
Future Volume (vph)	1	466	1350	72	5	24	2623	111	367	7	81	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		400		125		200		200	200		125	200
Storage Lanes		2		1		1		1	2		1	2
Taper Length (ft)		100				100			100			100
Lane Util. Factor	0.91	0.97	0.91	1.00	0.91	1.00	0.91	1.00	0.97	1.00	1.00	0.97
Frt				0.850				0.850			0.850	
Flt Protected		0.950				0.950			0.950			0.950
Satd. Flow (prot)	0	3433	5085	1583	0	1770	5085	1583	3433	1863	1583	3433
Flt Permitted		0.950				0.950			0.950			0.950
Satd. Flow (perm)	0	3433	5085	1583	0	1770	5085	1583	3433	1863	1583	3433
Right Turn on Red				Yes				Yes			Yes	
Satd. Flow (RTOR)				95				95			95	
Link Speed (mph)			45				45			35		
Link Distance (ft)			1135				1448			1919		
Travel Time (s)			17.2				21.9			37.4		
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)	1	518	1500	80	6	27	2914	123	408	8	90	68
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	519	1500	80	0	33	2914	123	408	8	90	68
Turn Type	Prot	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot
Protected Phases	5!	5	2	3	1!	1	6	7	3	8	1!	7
Permitted Phases				2				6			8	
Detector Phase	5	5	2	3	1	1	6	7	3	8	1	7
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.6	13.6	18.3	13.8	13.4	13.4	18.0	14.1	13.8	13.6	13.4	14.1
Total Split (s)	17.0	17.0	70.0	18.0	17.0	17.0	70.0	15.0	18.0	18.0	17.0	15.0
Total Split (%)	14.2%	14.2%	58.3%	15.0%	14.2%	14.2%	58.3%	12.5%	15.0%	15.0%	14.2%	12.5%
Maximum Green (s)	10.4	10.4	63.7	11.2	10.6	10.6	64.0	7.9	11.2	11.4	10.6	7.9
Yellow Time (s)	3.6	3.6	4.6	3.8	3.4	3.4	4.4	4.1	3.8	3.6	3.4	4.1
All-Red Time (s)	3.0	3.0	1.7	3.0	3.0	3.0	1.6	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		-1.6	-1.3	-1.8		-1.4	-1.0	-2.1	-1.8	-1.6	-1.4	-2.1
Total Lost Time (s)		5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag	Lead	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0	6.0	1.0	1.0	1.0	6.0	1.0	1.0	1.0	1.0	1.0
Minimum Gap (s)	1.0	1.0	3.3	1.0	1.0	1.0	3.3	1.0	1.0	1.0	1.0	1.0
Time Before Reduce (s)	0.0	0.0	15.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	45.0	0.0	0.0	0.0	45.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	C-Min	None	None	None	C-Min	None	None	None	None	None
Act Effct Green (s)		15.7	72.0	90.0		8.7	65.0	90.7	13.0	9.5	12.3	20.7
Actuated g/C Ratio		0.13	0.60	0.75		0.07	0.54	0.76	0.11	0.08	0.10	0.17
v/c Ratio		1.16	0.49	0.07		0.26	1.06	0.10	1.10	0.05	0.36	0.11
Control Delay		136.5	14.6	1.2		57.8	62.8	1.7	125.6	50.7	11.8	43.3
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		136.5	14.6	1.2		57.8	62.8	1.7	125.6	50.7	11.8	43.3

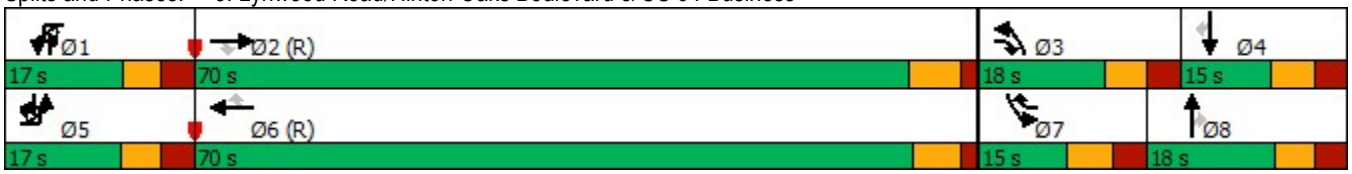
Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	11	112
Future Volume (vph)	11	112
Ideal Flow (vphpl)	1900	1900
Storage Length (ft)		150
Storage Lanes		1
Taper Length (ft)		
Lane Util. Factor	0.95	0.95
Frt	0.876	0.850
Flt Protected		
Satd. Flow (prot)	1550	1504
Flt Permitted		
Satd. Flow (perm)	1550	1504
Right Turn on Red		Yes
Satd. Flow (RTOR)	57	95
Link Speed (mph)	35	
Link Distance (ft)	1833	
Travel Time (s)	35.7	
Peak Hour Factor	0.90	0.90
Adj. Flow (vph)	12	124
Shared Lane Traffic (%)		46%
Lane Group Flow (vph)	69	67
Turn Type	NA	pm+ov
Protected Phases	4	5!
Permitted Phases		4
Detector Phase	4	5
Switch Phase		
Minimum Initial (s)	7.0	7.0
Minimum Split (s)	13.9	13.6
Total Split (s)	15.0	17.0
Total Split (%)	12.5%	14.2%
Maximum Green (s)	8.1	10.4
Yellow Time (s)	3.8	3.6
All-Red Time (s)	3.1	3.0
Lost Time Adjust (s)	-1.9	-1.6
Total Lost Time (s)	5.0	5.0
Lead/Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes
Vehicle Extension (s)	1.0	1.0
Minimum Gap (s)	1.0	1.0
Time Before Reduce (s)	0.0	0.0
Time To Reduce (s)	0.0	0.0
Recall Mode	None	None
Act Effct Green (s)	9.1	27.0
Actuated g/C Ratio	0.08	0.22
v/c Ratio	0.41	0.16
Control Delay	25.1	4.0
Queue Delay	0.0	0.0
Total Delay	25.1	4.0

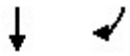
Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
LOS		F	B	A		E	E	A	F	D	B	D
Approach Delay			44.2				60.3			104.2		
Approach LOS			D				E			F		
Queue Length 50th (ft)		~277	225	1		25	~907	3	~184	6	0	21
Queue Length 95th (ft)		m#376	m378	m10		58	#993	27	#286	21	39	49
Internal Link Dist (ft)			1055				1368			1839		
Turn Bay Length (ft)		400		125		200		200	200		125	200
Base Capacity (vph)		447	3050	1210		177	2754	1220	371	201	288	593
Starvation Cap Reductn		0	0	0		0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0		0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0		0	0	0	0	0	0	0
Reduced v/c Ratio		1.16	0.49	0.07		0.19	1.06	0.10	1.10	0.04	0.31	0.11

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 1 (1%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.16			
Intersection Signal Delay: 57.1		Intersection LOS: E	
Intersection Capacity Utilization 97.0%		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: Lynwood Road/Hinton Oaks Boulevard & US 64 Business





Lane Group	SBT	SBR
LOS	C	A
Approach Delay	24.3	
Approach LOS	C	
Queue Length 50th (ft)	9	0
Queue Length 95th (ft)	57	21
Internal Link Dist (ft)	1753	
Turn Bay Length (ft)		150
Base Capacity (vph)	181	412
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.38	0.16

Intersection Summary

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	33	617	3190	217	7	47	1921	106	159	36	77	1
Future Volume (vph)	33	617	3190	217	7	47	1921	106	159	36	77	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		400		125		200		200	200		125	
Storage Lanes		2		1		1		1	2		1	
Taper Length (ft)		100				100			100			
Lane Util. Factor	0.91	0.97	0.91	1.00	0.91	1.00	0.91	1.00	0.97	1.00	1.00	1.00
Frt				0.850				0.850			0.850	
Flt Protected		0.950				0.950			0.950			
Satd. Flow (prot)	0	3433	5085	1583	0	1770	5085	1583	3433	1863	1583	0
Flt Permitted		0.950				0.950			0.950			
Satd. Flow (perm)	0	3433	5085	1583	0	1770	5085	1583	3433	1863	1583	0
Right Turn on Red				Yes				Yes			Yes	
Satd. Flow (RTOR)				89				132			132	
Link Speed (mph)			45				45			35		
Link Distance (ft)			1135				1448			1919		
Travel Time (s)			17.2				21.9			37.4		
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)	37	686	3544	241	8	52	2134	118	177	40	86	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	723	3544	241	0	60	2134	118	177	40	86	0
Turn Type	Prot	Prot	NA	pm+ov	Prot	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot
Protected Phases	5!	5	2	3	1!	1	6	7!	3	8	1!	7!
Permitted Phases				2				6			8	
Detector Phase	5	5	2	3	1	1	6	7	3	8	1	7
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0	7.0	7.0	7.0	12.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	13.6	13.6	18.3	13.8	13.4	13.4	18.0	14.1	13.8	13.6	13.4	14.1
Total Split (s)	28.0	28.0	80.0	20.0	20.0	20.0	72.0	20.0	20.0	20.0	20.0	20.0
Total Split (%)	20.0%	20.0%	57.1%	14.3%	14.3%	14.3%	51.4%	14.3%	14.3%	14.3%	14.3%	14.3%
Maximum Green (s)	21.4	21.4	73.7	13.2	13.6	13.6	66.0	12.9	13.2	13.4	13.6	12.9
Yellow Time (s)	3.6	3.6	4.6	3.8	3.4	3.4	4.4	4.1	3.8	3.6	3.4	4.1
All-Red Time (s)	3.0	3.0	1.7	3.0	3.0	3.0	1.6	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)		-1.6	-1.3	-1.8		-1.4	-1.0	-2.1	-1.8	-1.6	-1.4	
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	Lag	Lead	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0	6.0	1.0	1.0	1.0	6.0	1.0	1.0	1.0	1.0	1.0
Minimum Gap (s)	1.0	1.0	3.3	1.0	1.0	1.0	3.3	1.0	1.0	1.0	1.0	1.0
Time Before Reduce (s)	0.0	0.0	15.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	45.0	0.0	0.0	0.0	45.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	C-Min	None	None	None	C-Min	None	None	None	None	None
Act Effct Green (s)		27.8	84.6	101.8		10.2	67.0	88.2	12.2	11.7	24.2	
Actuated g/C Ratio		0.20	0.60	0.73		0.07	0.48	0.63	0.09	0.08	0.17	
v/c Ratio		1.06	1.15	0.21		0.47	0.88	0.11	0.59	0.26	0.22	
Control Delay		86.9	95.8	3.4		73.6	38.0	1.5	69.5	62.9	2.7	
Queue Delay		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		86.9	95.8	3.4		73.6	38.0	1.5	69.5	62.9	2.7	

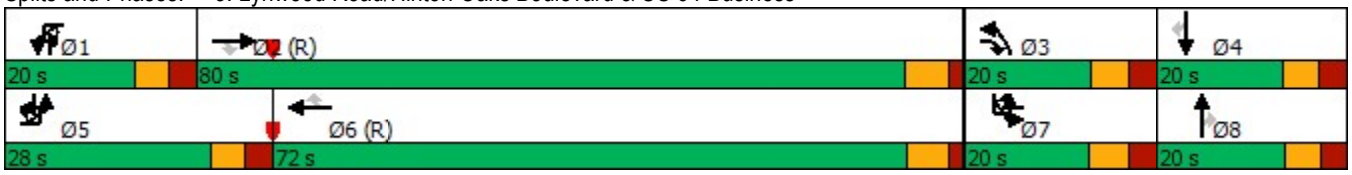
Lane Group	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	209	17	391
Future Volume (vph)	209	17	391
Ideal Flow (vphpl)	1900	1900	1900
Storage Length (ft)	200		150
Storage Lanes	2		1
Taper Length (ft)	100		
Lane Util. Factor	0.97	0.95	0.95
Frt		0.863	0.850
Flt Protected	0.950		
Satd. Flow (prot)	3433	1527	1504
Flt Permitted	0.950		
Satd. Flow (perm)	3433	1527	1504
Right Turn on Red			Yes
Satd. Flow (RTOR)		149	81
Link Speed (mph)		25	
Link Distance (ft)		1833	
Travel Time (s)		50.0	
Peak Hour Factor	0.90	0.90	0.90
Adj. Flow (vph)	232	19	434
Shared Lane Traffic (%)			48%
Lane Group Flow (vph)	233	227	226
Turn Type	Prot	NA	pm+ov
Protected Phases	7	4	5!
Permitted Phases			4
Detector Phase	7	4	5
Switch Phase			
Minimum Initial (s)	7.0	7.0	7.0
Minimum Split (s)	14.1	13.9	13.6
Total Split (s)	20.0	20.0	28.0
Total Split (%)	14.3%	14.3%	20.0%
Maximum Green (s)	12.9	13.1	21.4
Yellow Time (s)	4.1	3.8	3.6
All-Red Time (s)	3.0	3.1	3.0
Lost Time Adjust (s)	-2.1	-1.9	-1.6
Total Lost Time (s)	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0	1.0
Minimum Gap (s)	1.0	1.0	1.0
Time Before Reduce (s)	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0
Recall Mode	None	None	None
Act Effct Green (s)	16.2	13.0	45.8
Actuated g/C Ratio	0.12	0.09	0.33
v/c Ratio	0.59	0.82	0.41
Control Delay	65.9	45.2	26.1
Queue Delay	0.0	0.0	0.0
Total Delay	65.9	45.2	26.1

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU
LOS		F	F	A		E	D	A	E	E	A	
Approach Delay			89.4				37.1			49.7		
Approach LOS			F				D			D		
Queue Length 50th (ft)		~395	~1398	27		54	626	0	81	35	0	
Queue Length 95th (ft)		m#352	m#1195	m25		101	697	19	119	73	11	
Internal Link Dist (ft)			1055				1368			1839		
Turn Bay Length (ft)		400		125		200		200	200		125	
Base Capacity (vph)		681	3071	1204		189	2433	1049	367	199	432	
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		1.06	1.15	0.20		0.32	0.88	0.11	0.48	0.20	0.20	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 37 (26%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.15			
Intersection Signal Delay: 68.6		Intersection LOS: E	
Intersection Capacity Utilization 98.9%		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: Lynwood Road/Hinton Oaks Boulevard & US 64 Business



Lane Group	SBL	SBT	SBR
LOS	E	D	C
Approach Delay		46.0	
Approach LOS		D	
Queue Length 50th (ft)	106	72	106
Queue Length 95th (ft)	152	#202	193
Internal Link Dist (ft)		1753	
Turn Bay Length (ft)	200		150
Base Capacity (vph)	405	298	546
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.58	0.76	0.41

Intersection Summary