F i s c h b a c h
Transportation Group, LLC
Traffic Engineering and Planning

Traffic Impact Study

Epoch Apartments
Oak Meadow Drive
Franklin, TN

Prepared May 2016
(Originally Prepared April 2016)
For Epoch Residential

FTG, LLC
P.O. Box 682736
Franklin, TN 37068
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Traffic Impact Study

Epoch Apartments
Oak Meadow Drive

Franklin, Tennessee

Prepared May 2016
(Originally Prepared April 2016)

PREPARED FOR:
Epoch Residential
359 Carolina Avenue
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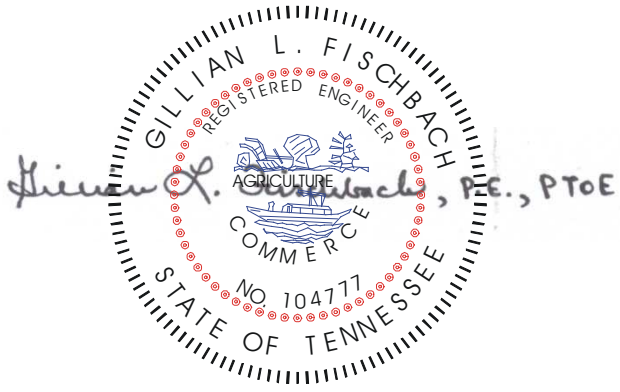

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1. INTRODUCTION

This traffic study has been prepared in order to identify the traffic impacts of a multi-family residential development that is proposed to be constructed on the north and south sides of Oak Meadow Drive, east of S. Royal Oaks Boulevard, in Franklin, Tennessee.

For the purposes of this study, existing and background traffic volumes were established, and capacity analyses were conducted for these conditions. Also, trip generation calculations were performed, and the trips which are expected to be generated by the proposed project were distributed to the roadway system and added to the background traffic volumes. The roadways and intersections which provide access to the site were then re-evaluated to determine the traffic impacts of the proposed project. Access needs for the project were evaluated, and the necessary roadway and/or traffic control improvements were identified. This report presents the results of these analyses and the subsequent recommendations.

It is important to note that the scope of this Traffic Impact Study was provided by the City of Franklin Engineering Department and their third-party private consultant, Neel-Schaffer, Inc. The approved scope is included in in Appendix A.

2. PROJECT DESCRIPTION

The location of the proposed project is shown in Figure 1. As shown, the project site is located on the north and south sides of Oak Meadow Drive, east of S. Royal Oaks Boulevard, in Franklin, Tennessee. The current project site plan is shown in Figures 2A and 2B. As shown, the proposed plan includes 98 apartments on the south side of Oak Meadow Drive and 204 apartments on the north side of Oak Meadow Drive.

Access for the southern portion of the site will be provided at two locations on Oak Meadow Drive, and access for the northern portion of the site will be provided at one location on the eastern access for the Home Depot shopping center on the north side of Oak Meadow Drive. Also, secondary access for the northern portion of the site will be provided at the existing terminus of Riverside Drive.

Also, it is possible that, in the future, a commercial site will be developed in the southeast quadrant of the intersection of S. Royal Oaks Boulevard and Oak Meadow Drive. For the purposes of this study, it was assumed that 15,000 sq.ft. of specialty retail space will be constructed on this site as shown in Figure 2C. Also, for the purposes of this study, it was assumed that sole access for the future commercial site will be provided on Oak Meadow Drive at the western access proposed for the apartments.

In large part, economic and market considerations will dictate the pace and timing with which the proposed project is actually completed. The analyses conducted within this study are based on the estimation that the entire project will be completed within two years.

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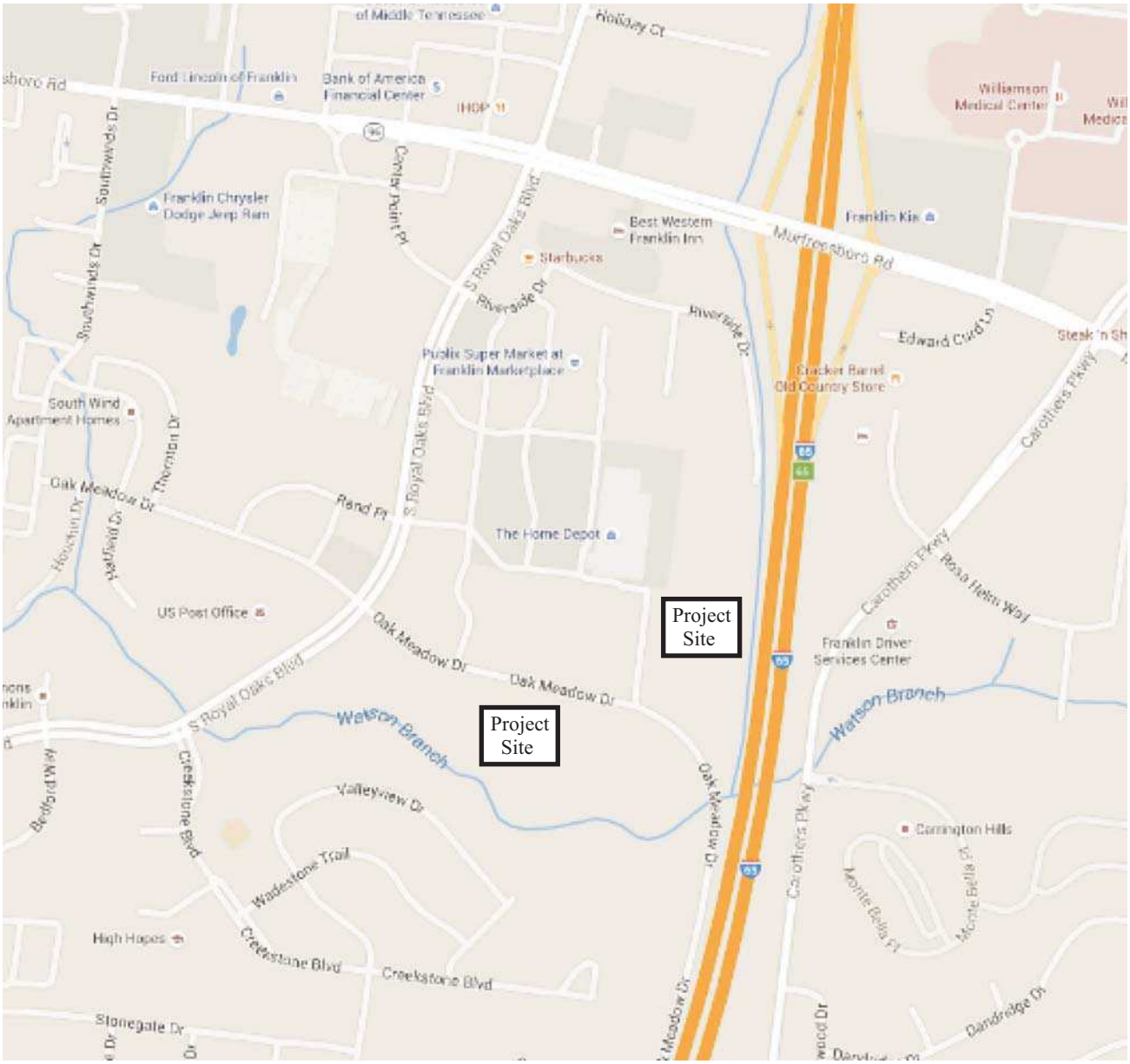

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No Scale

Figure 1.
Location of the Project Site

LINE TABLE		
LINE	BEARING	DISTANCE
L1	N83°48'10"W	161.22'
L2	S61°46'08"W	106.65'
L3	S86°48'30"W	198.12'
L4	N65°28'52"W	120.02'
L5	N24°43'04"W	244.21'
L6	N84°36'00"W	115.35'
L7	N52°04'01"W	87.70'
L8	N57°18'12"W	163.19'
L9	N29°52'55"W	101.80'
L10	N74°02'09"W	41.15'
L11	N48°56'27"W	137.25'
L12	S88°57'25"W	67.60'
L13	S10°32'54"W	26.12'

LINE TABLE		
LINE	BEARING	DISTANCE
L14	S74°19'35"W	89.75'
L15	N75°22'06"W	55.08'
L16	N62°35'03"W	10.27'
L17	N39°40'55"E	27.30'
L18	S89°07'57"E	31.47'
L19	N25°32'12"E	70.78'
L20	N10°00'40"W	49.37'
L21	N54°59'41"E	103.02'
L22	N40°36'36"E	74.71'
L23	N53°28'05"E	164.68'

CURVE TABLE						
CURVE	RADIUS	LENGTH	DELTA	TANGENT	CHORD	CHD BRG
C5	820.00'	330.94'	23°07'24"	167.75	328.69'	S65°21'21"E
C6	537.96'	464.57'	49°28'46"	247.89	450.27'	S52°10'40"E

TOTAL OF 98 UNITS ON SOUTH PARCEL

0 40 80 160
GRAPHIC SCALE

N

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ENGINEERING CRUNK

WILSON COUNTY TENNESSEE AGRICULTURE
JAMES C. No. 114180 STATE OF TENNESSEE
5/9/16

THE EPOCH DEVELOPMENT

PUD SUBDIVISION, DEVELOPMENT PLAN

COF #6086 FRANKLIN, TN

REVISIONS	
No.	DATE

04/07/16 15001

C2.2

SOUTH SITE DEVELOPMENT PLAN

SOUTH PROPERTY
17.33 ACRES AFTER
SUBDIVISION
98 UNITS

ASSISTED LIVING CENTER
(UNDER CONSTRUCTION)
ZONE GC

HOME
DEPOT
ZONE GC

ELK LODGE
ZONE GO

40 FT FRONT SETBACK

EXISTING 20' PUDE

52 UNITS
4 STORY

44 UNITS
4 STORY

44 UNITS
4 STORY

60 UNITS
4 STORY

2 UNITS
2 STORY

2 UNITS
2 STORY

TRASH
COMPACTOR AND
ENCLOSURE

MAINTENANCE
BUILDING

OFFICE
BUILDINGS
ZONE GC

EXISTING 20' PUDE

40 FT FRONT SETBACK

STORMWATER
DETENTION/TREATMENT
AREA

40 FT INTERSTATE
BUFFER

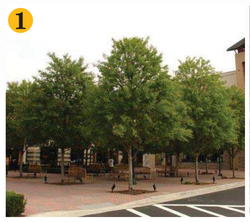
EXISTING TVA
EASEMENT

NORTH PROPERTY
13.06 ACRES
204 UNITS

EXISTING 20' PUDE

RIVERSIDE DR.

INTERSTATE-65



TOTAL OF 204 UNITS ON NORTH PARCEL

CURVE TABLE						
CURVE	RADIUS	LENGTH	DELTA	TANGENT	CHORD	CHD BRG
C1	50.00'	123.89'	141°58'19"	145.10	94.54'	S77°58'06"W
C2	607.96'	443.66'	41°48'42"	232.23	433.88'	N51°57'06"W
C3	11300.00'	470.04'	2°23'00"	235.06	470.01'	S05°13'09"W
C4	11300.00'	112.73'	0°34'18"	56.37	112.73'	S06°41'48"W

0 30 60 120
GRAPHIC SCALE

N

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WILSON CRUNK
REGISTERED
LANDSCAPE
ARCHITECT
AGRICULTURE
COMMERCE
No. 114180
STATE OF TENNESSEE
5/9/16

THE EPOCH DEVELOPMENT

PUD SUBDIVISION, DEVELOPMENT PLAN

COF #6086 FRANKLIN, TN

REVISIONS	
No.	DATE

04/07/16 15001

C2.1

NORTH SITE
DEVELOPMENT
PLAN

SITE DATA TABLE

15,000 SQ-FT RETAIL SPACE
REQUIRED PARKING (3 SPACES PER 1,000 SQ-FT) = 45
PROVIDED PARKING = 55 SPACES
PROPOSED PROPERTY AREA = 3.5± ACRES

S. ROYAL OAKS BLVD

OAK MEADOWS DR.

BUILDING SETBACK

434.01

98.80

220.09

We understand this connection may not be possible, which is why we are proposing access into the Epoch Development site.

New Left Turn Lane

Existing driveway serving Post Office

Full access intersection proposed

60.0 FT

15,000 SQ-FT
RETAIL BUILDING

DETENTION
AREA

DUMPSTER

RETAINING WALL

60-FT STREAM BUFFER

EXISTING STREAM

PROPOSED
PROPERTY LINE

Epoch Development Site

100-YR FLOOD PLAIN

WATSON BRANCH

0 10 20 30 60
GRAPHIC SCALE

N

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PROPOSED RETAIL SITE
AT
ROYAL OAKS & OAK MEADOWS DRIVE
FRANKLIN, TN

REVISIONS

No.	DATE

04/27/15 15001

C1.0
SCHEMATIC
SITE PLAN
OVERALL

3. EXISTING TRAFFIC VOLUMES

In order to quantify the impact of the traffic that will be generated by the proposed project, peak hour traffic volumes were counted at the following locations:

1. Oak Meadow Drive and the project accesses
2. S. Royal Oaks Boulevard and Oak Meadow Drive
3. S. Royal Oaks Boulevard and Rand Place / Access for Home Depot
4. S. Royal Oaks Boulevard and Riverside Drive / Center Point Place

Also, the City of Franklin requested that peak hour traffic counts be collected for signal timing purposes at the following intersections:

5. Murfreesboro Road and Royal Oaks Boulevard
6. Murfreesboro Road and the Ramps for Southbound I-65
7. Murfreesboro Road and the Ramps for Northbound I-65

This data was collected during the morning and afternoon peak hours on typical weekdays in February 2016 when schools were in session. The raw traffic volumes are included in Appendix B. The existing laneage at the intersections within the study area is shown in Figure 3, and the existing peak hour traffic volumes are shown in Figure 4.

Using the existing peak hour traffic volumes shown in Figure 4, capacity analyses were conducted for the intersections counted. Specifically, in order to identify current peak hour levels of operation within the study area, the capacity calculations were performed according to the methods outlined in the Highway Capacity Manual 2010 (HCM2010). These analyses result in the determination of a Level of Service (LOS), which is a measure of evaluation is used to describe how well an intersection or roadway operates. LOS A represents free flow traffic operations, and LOS F suggests that the traffic demand exceeds the available capacity. In an urbanized area, LOS D is typically considered to be the minimum acceptable LOS. Table 1 presents the descriptions of LOS for signalized intersections, and Table 2 presents the descriptions of LOS for unsignalized intersections.

It is important to note that the City of Franklin Engineering Department provided the Synchro software files that were used to identify existing operations at the signalized intersections within the study area. Specifically, the files were updated to include the February 2016 traffic volumes. Also, the files were updated to reflect the recently-approved City ordinance that prohibits right-turns-on-red for the northbound right turns on S. Royal Oaks Boulevard at Murfreesboro Road.

The results of the capacity analyses for the existing peak hour traffic volumes are shown in Table 3, and Appendix C includes the capacity analyses worksheets.

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Traffic Engineering and Planning

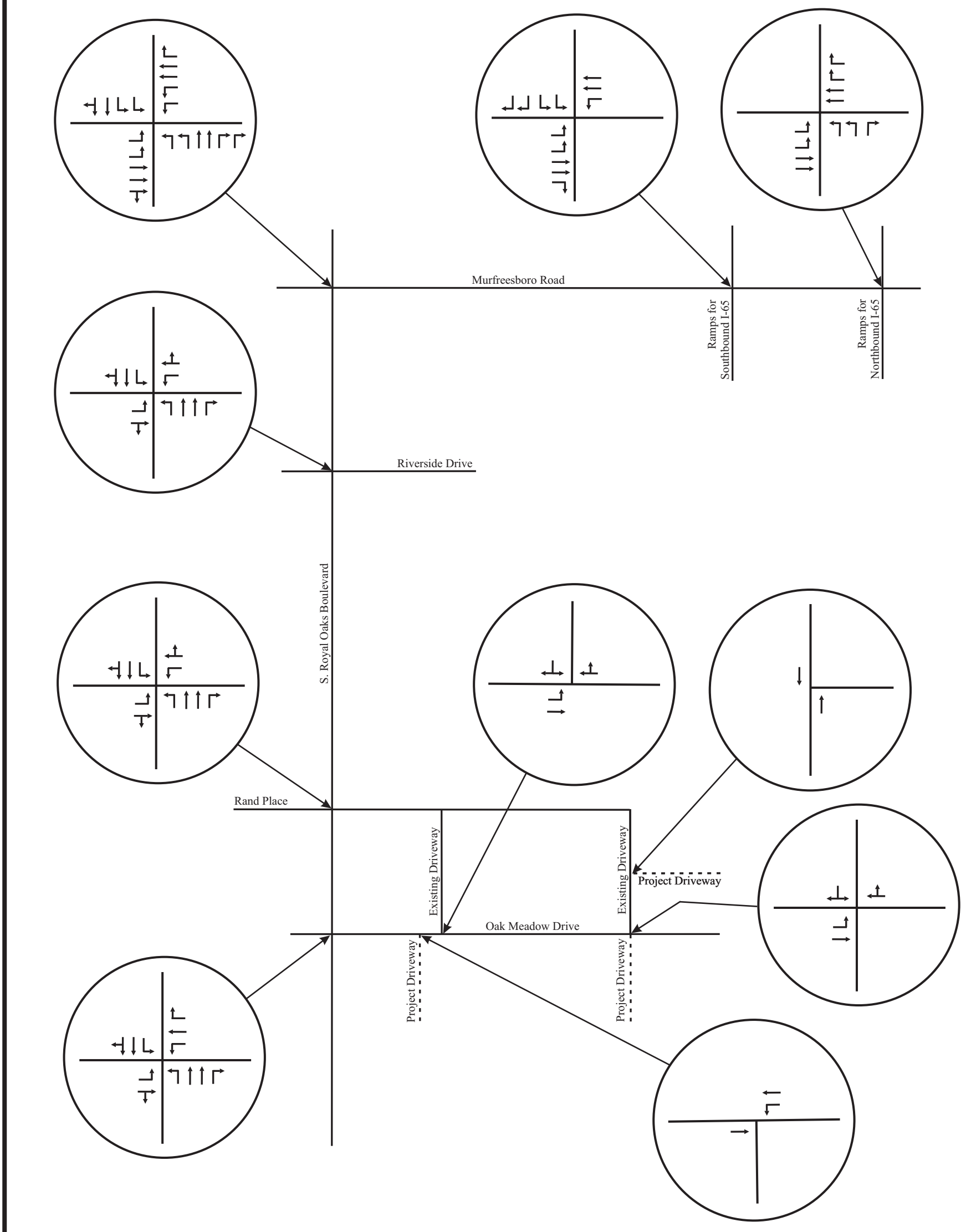

Figure 3.
Existing Laneage at the Intersections within the Study Area

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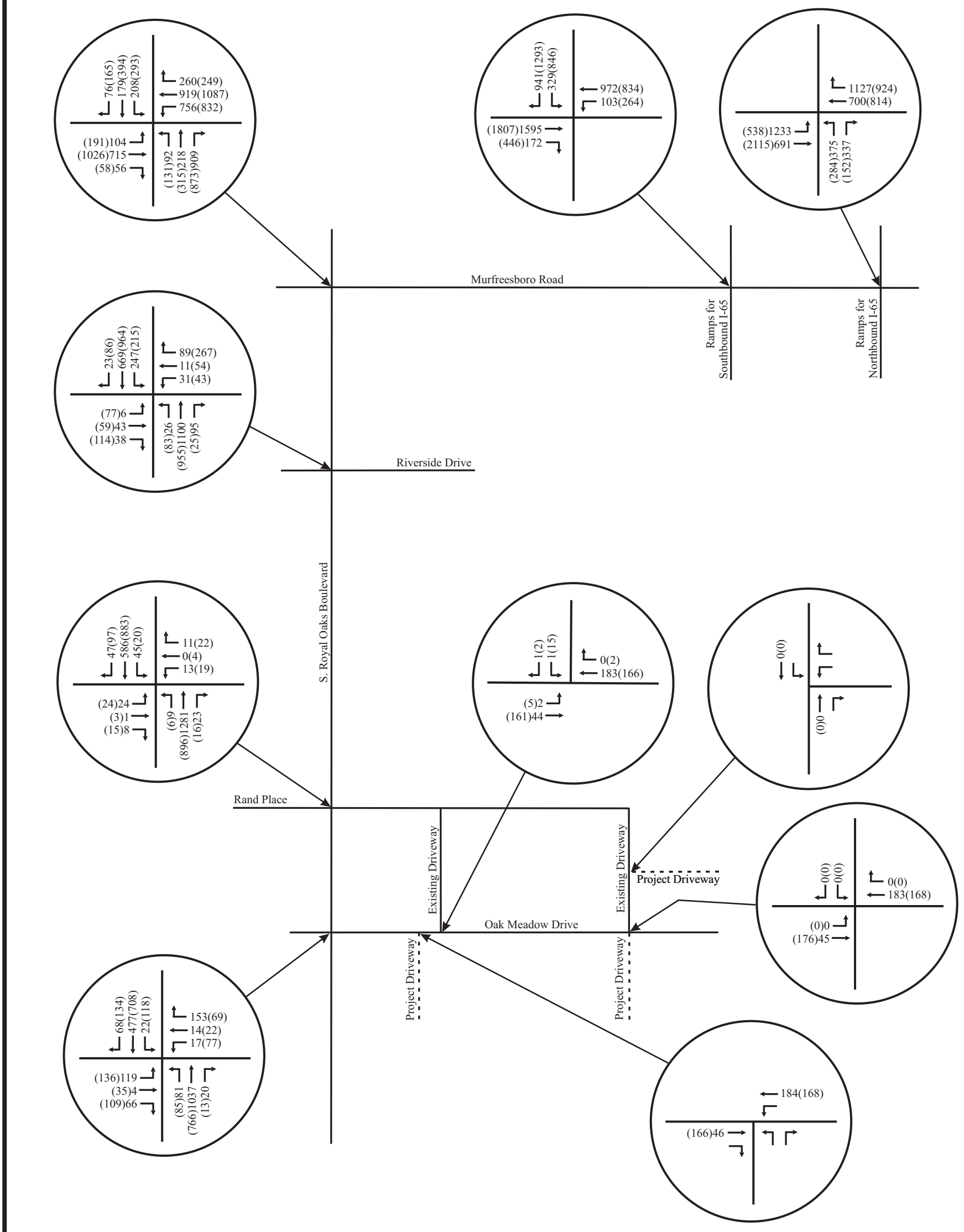

Figure 4.
Existing Peak Hour Traffic Volumes within the Study Area

TABLE 1. DESCRIPTIONS OF LOS FOR SIGNALIZED INTERSECTIONS

Level of Service	Description	Average Control Delay per Vehicle (sec)
A	Operations with very low control delay. Progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	≤ 10
B	Operations with stable flows. This generally occurs with good progression, short cycle lengths, or both. More vehicles stop than for LOS A, causing higher levels of average delay.	> 10 and ≤ 20
C	Operations with stable flow. Occurs with fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, although many still pass through the intersection without stopping.	> 20 and ≤ 35
D	Approaching unstable flow. The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high v/c ratios. Many vehicles stop.	> 35 and ≤ 55
E	Unstable flow. In many cases, this is considered to be the limit for acceptable delay. These high delays generally indicate poor progression, long cycle lengths, and high v/c ratios.	> 55 and ≤ 80
F	Unacceptable delay. This condition often occurs with oversaturation or with high v/c ratios. Poor progression and long cycle lengths may also cause such delay levels.	> 80

Source: Highway Capacity Manual 2010 (HCM2010)

TABLE 2. DESCRIPTIONS OF LOS FOR UNSIGNALIZED INTERSECTIONS

Level of Service	Description	Average Control Delay (sec/veh)
A	Minimal delay	≤ 10
B	Brief delay	> 10 and ≤ 15
C	Average delay	> 15 and ≤ 25
D	Significant delay	> 25 and ≤ 35
E	Long delay	> 35 and ≤ 50
F	Extreme delay	> 50

Source: Highway Capacity Manual 2010 (HCM 2010)

TABLE 3. EXISTING PEAK HOUR LEVELS OF SERVICE

INTERSECTION	TURNING MOVEMENT	AM PEAK HOUR		PM PEAK HOUR	
		LEVEL OF SERVICE	95TH %-ILE QUEUE	LEVEL OF SERVICE	95TH %-ILE QUEUE
Oak Meadow Drive and the Eastern Access for Home Depot	Eastbound Left Turns	LOS A	1 veh	LOS A	1 veh
	Southbound Left and Right Turns	LOS A	1 veh	LOS A	1 veh
Oak Meadow Drive and the Western Access for Home Depot	Eastbound Left Turns	LOS A	1 veh	LOS A	1 veh
	Southbound Left and Right Turns	LOS A	1 veh	LOS B	1 veh
S. Royal Oaks Boulevard and Oak Meadow Drive (signalized)	Northbound Left Turns	LOS A	32 feet	LOS B	47 feet
	Northbound Thrus	LOS B	308 feet	LOS B	268 feet
	Northbound Right Turns	LOS A	0 feet	LOS A	0 feet
	Southbound Left Turns	LOS A	12 feet	LOS A	64 feet
	Southbound Thrus/Right Turns	LOS A	130 feet	LOS C	356 feet
	Eastbound Left Turns	LOS D	120 feet	LOS D	137 feet
	Eastbound Thrus/Right Turns	LOS B	13 feet	LOS C	63 feet
	Westbound Left Turns	LOS C	27 feet	LOS D	82 feet
	Westbound Thrus	LOS D	25 feet	LOS D	35 feet
	Westbound Right Turns	LOS B	88 feet	LOS A	33 feet
	Overall Intersection	**LOS B**		**LOS C**	
S. Royal Oaks Boulevard and Rand Place / Home Depot Access	Northbound Left Turns	LOS A	1 veh	LOS B	1 veh
	Southbound Left Turns	LOS B	1 veh	LOS B	1 veh
	Eastbound Left Turns	LOS D	1 veh	LOS D	1 veh
	Eastbound Thrus/Right Turns	LOS B	1 veh	LOS B	1 veh

	Westbound Left Turns	LOS E	1 veh	LOS D	1 veh
	Westbound Thrus/Right Turns	LOS B	1 veh	LOS B	1 veh
S. Royal Oaks Boulevard and Riverside Drive / Center Point Place (signalized)	Northbound Left Turns	LOS A	11 feet	LOS B	55 feet
	Northbound Thrus	LOS B	320 feet	LOS C	464 feet
	Northbound Right Turns	LOS A	26 feet	LOS A	0 feet
	Southbound Left Turns	LOS D	161 feet	LOS C	91 feet
	Southbound Thrus/Right Turns	LOS A	85 feet	LOS A	161 feet
	Eastbound Left Turns	LOS D	18 feet	LOS F	214 feet
	Eastbound Thrus/Right Turns	LOS D	99 feet	LOS C	141 feet
	Westbound Left Turns	LOS E	58 feet	LOS D	70 veh
	Westbound Thrus/Right Turns	LOS B	24 feet	LOS D	255 veh
	Overall Intersection	**LOS B**		**LOS C**	
Murfreesboro Road and Royal Oaks Boulevard (signalized)	Eastbound Left Turns	LOS E	88 feet	LOS E	144 feet
	Eastbound Thrus / Right Turns	LOS D	310 feet	LOS D	336 feet
	Westbound Left Turns	LOS D	412 feet	LOS F	499 feet
	Westbound Thrus	LOS D	539 feet	LOS D	492 feet
	Westbound Right Turns	LOS A	80 feet	LOS B	120 feet
	Northbound Left Turns	LOS E	73 feet	LOS E	103 feet
	Northbound Thrus	LOS D	146 feet	LOS E	218 feet
	Northbound Right Turns	LOS C	567 feet	LOS D	617 feet
	Southbound Left Turns	LOS E	148 feet	LOS F	242 feet

	Southbound Thrus / Right Turns	LOS D	141 feet	LOS E	398 feet
	Overall Intersection	**LOS D**		**LOS E**	
Murfreesboro Road and Ramps for Southbound I-65 (signalized)	Eastbound Thrus	LOS C	330 feet	LOS E	609 feet
	Eastbound Right Turns	LOS A	51 feet	LOS C	265 feet
	Westbound Left Turns	LOS E	156 feet	LOS F	465 feet
	Westbound Thrus	LOS B	273 feet	LOS C	337 feet
	Southbound Left Turns	LOS D	164 feet	LOS D	465 feet
	Southbound Right Turns	LOS E	617 feet	LOS F	1065 feet
	Overall Intersection	**LOS C**		**LOS E**	
Murfreesboro Road and Ramps for Northbound I-65 (signalized)	Eastbound Left Turns	LOS F	913 feet	LOS E	341 feet
	Eastbound Thrus	LOS A	71 feet	LOS C	370 feet
	Westbound Thrus	LOS D	337 feet	LOS C	406 feet
	Westbound Right Turns	LOS C	502 feet	LOS A	234 feet
	Northbound Left Turns	LOS F	302 feet	LOS E	201 feet
	Northbound Right Turns	LOS C	225 feet	LOS D	172 feet
	Overall Intersection	**LOS E**		**LOS C**	

4. PROJECTION OF BACKGROUND TRAFFIC VOLUMES

In order to account for the traffic growth which will occur within the study area because of typical growth, background traffic volumes were established for the intersections within the study area. Specifically, in order to account for typical growth within the study area, consideration was given to the historical traffic volumes near the project site. The Tennessee Department of Transportation (TDOT) conducts an annual count program throughout the state. This count program includes the annual collection of average daily traffic (ADT) counts at numerous fixed locations. As shown in Table 4, the daily traffic volumes within the study area have increased 2.65% per year since 2006. Based on this information, for the purposes of this study, the existing traffic volumes at the intersections within the study area were increased by 8% to represent initial background traffic volumes in the Year 2018, as shown in Figure 5A.

TABLE 4. HISTORICAL TRAFFIC VOLUMES IN THE STUDY AREA

Year	Station 164 S. Royal Oaks Blvd ADT	Annual Growth	
2006	18,274		
2007	17,787	-2.66%	
2008	20,374	14.54%	
2009	19,666	-3.48%	
2010	19,324	-1.74%	
2011	19,090	-1.21%	
2012	19,435	1.81%	
2013	20,343	4.67%	
2014	22,118	8.73%	**Overall Growth**
2015	22,638	2.35%	**2.65%**

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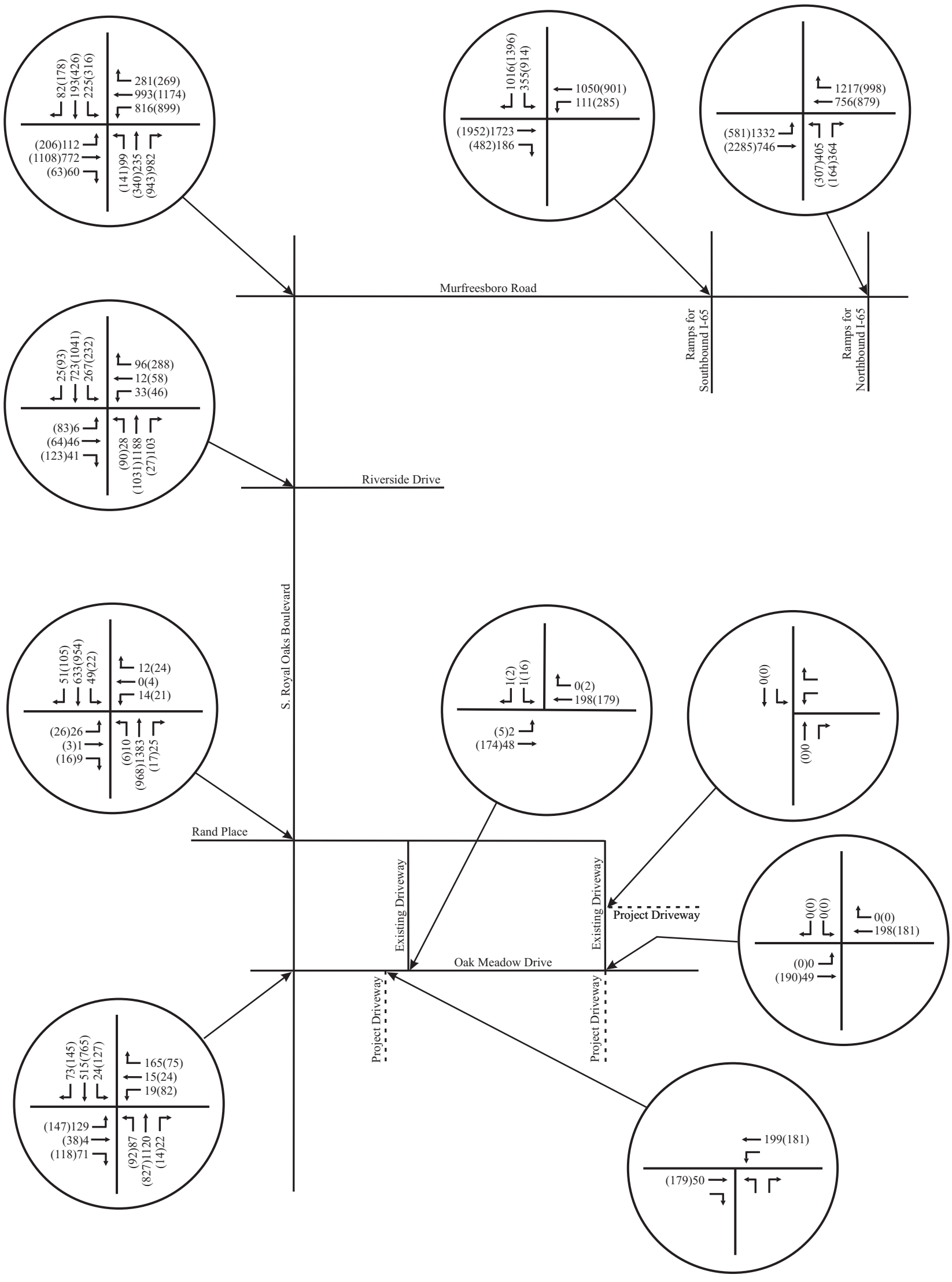

Figure 5A.
Initial Background Peak Hour Traffic Volumes within the Study Area

It is important to note that a day care center is under construction on the north side of S. Royal Oaks Boulevard at Mack Hatcher Parkway, southwest of the proposed project. It is likely that a significant portion of the traffic that will be generated by the day care center will be pass-by traffic that is already traveling on the S. Royal Oaks Boulevard corridor. The 8% growth rate applied to the existing traffic volumes will account for the additional traffic that will be generated by the day care center.

Also, it is important to note that an assisted living facility with 208 beds is under construction on the north side of Oak Meadow Drive, opposite the southern project site for the proposed project. For the purposes of this study, trip generation calculations were conducted in order to identify how much traffic is expected to be generated by the assisted living facility. Trip generation data for daily and peak hour trips were identified from Trip Generation, Ninth Edition, which was published by the Institute of Transportation Engineers (ITE) in 2012. Table 5 presents the daily and peak hour trip generations, and these calculations are included in Appendix D.

TABLE 5. TRIP GENERATION (SOMERBY ASSISTED LIVING FACILITY)

LAND USE	SIZE	DAILY TRAFFIC	GENERATED TRAFFIC			
			AM PEAK HOUR		PM PEAK HOUR	
			ENTER	EXIT	ENTER	EXIT
Assisted Living Facility (LUC 254)	208 beds	570	34	13	30	47

Figures 5B and 5C include the directional distribution and assignment of peak hour traffic volumes that are expected to be generated by the assisted living facility.

The peak hour traffic volumes shown in Figures 5B and 5C were added to the traffic volumes shown in Figure 5A in order to establish the final background traffic volumes shown in Figure 5D. Using the background peak hour traffic volumes, capacity analyses were conducted for the intersections within the study area. For these analyses, it was assumed that all existing laneage and traffic control will be maintained and no improvements will be provided. The results of the capacity analyses for the background peak hour traffic volumes are shown in Table 5, and Appendix C includes the capacity analyses worksheets. These analyses indicate that the background conditions are consistent with the existing conditions within the study area.

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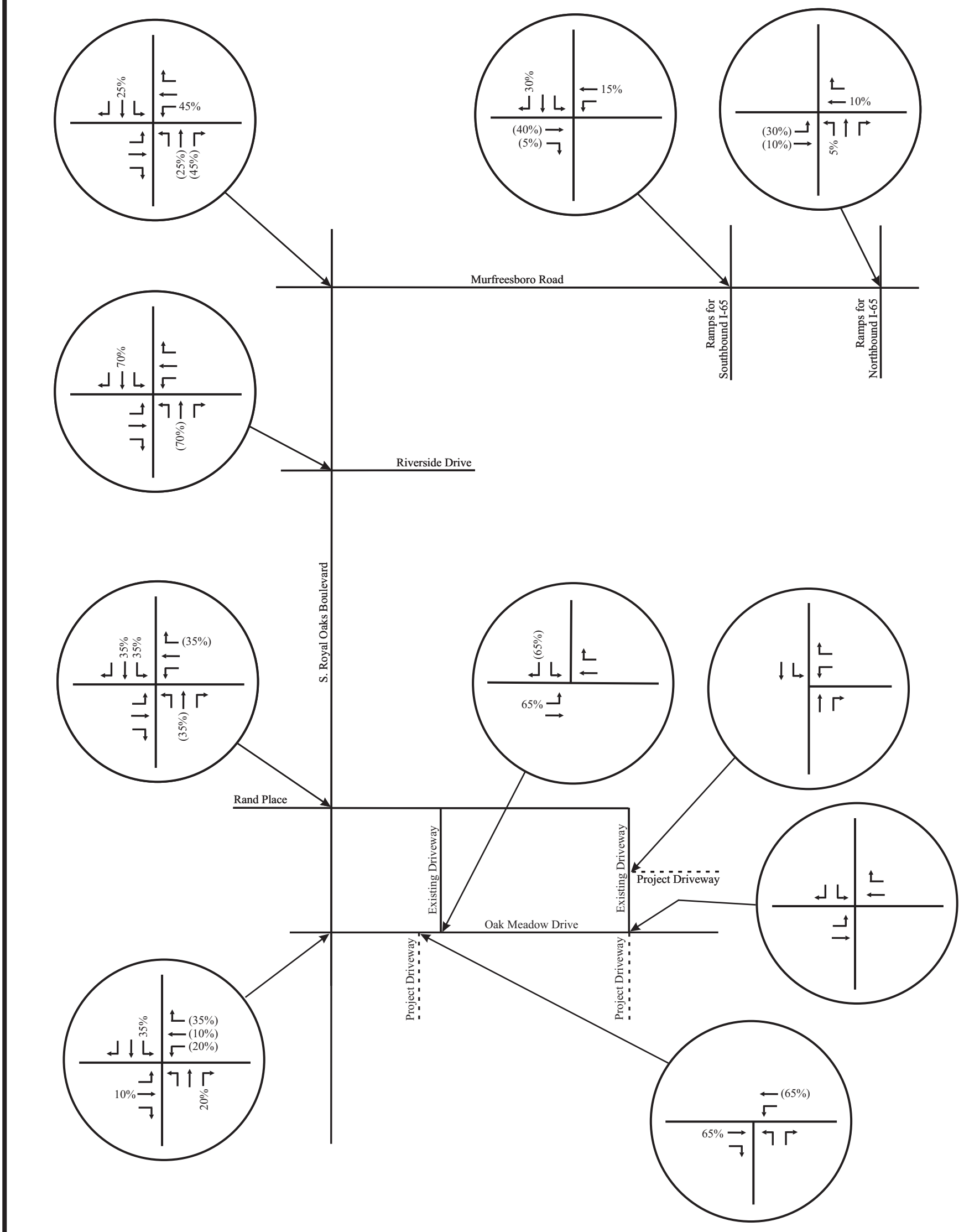

No Scale

XX - Entering Volumes
(XX) - Exiting Volumes

Figure 5B.
Directional Distribution of Peak Hour Traffic Generated by the Somerby Assisted Living Facility

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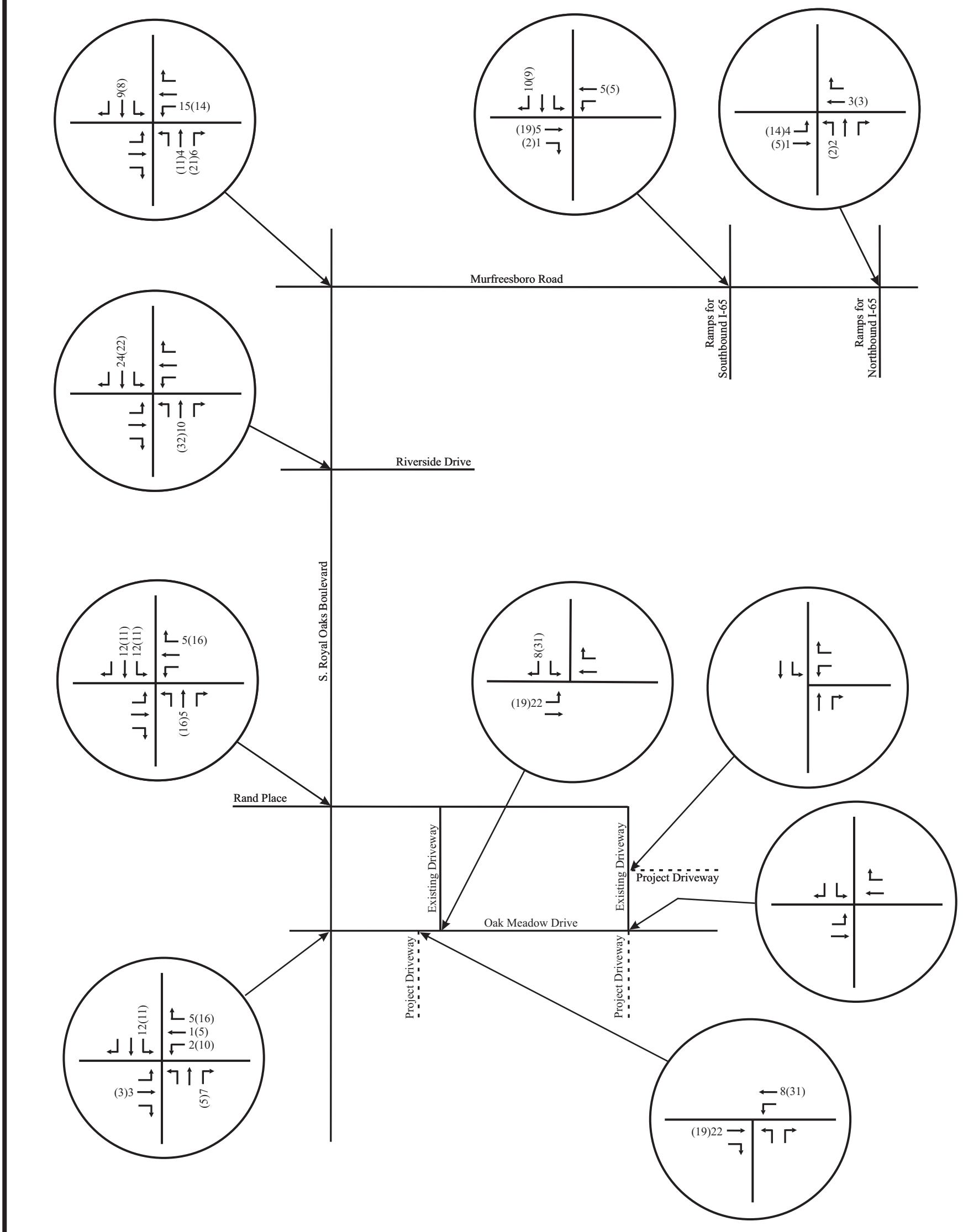

No Scale

N

XX - AM Peak Hour Volumes
(XX) - PM Peak Hour Volumes

Figure 5C.
Peak Hour Traffic Generated by the Somerby Assisted Living Facility

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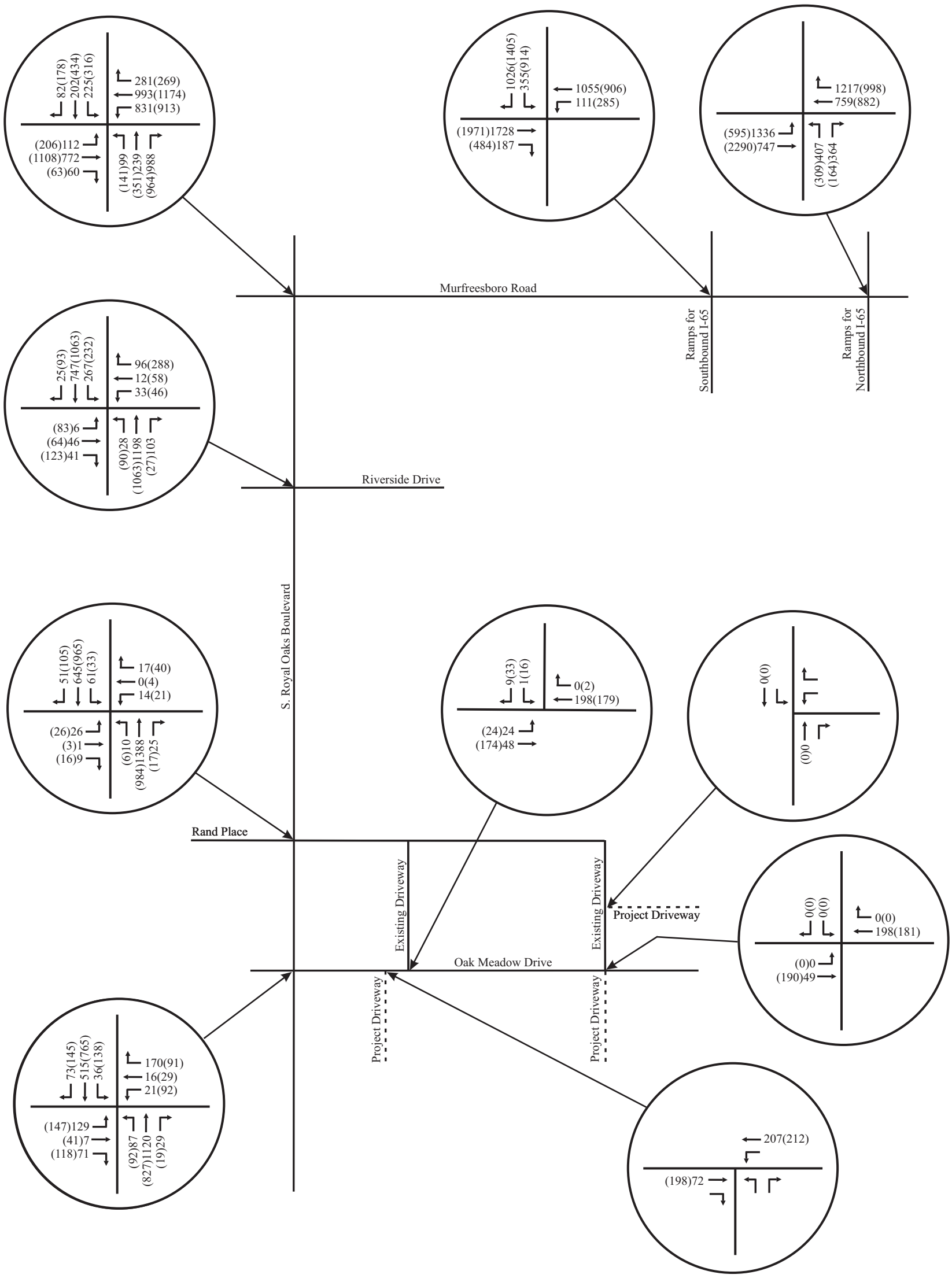

No Scale

XX - AM Peak Hour Volumes
(XX) - PM Peak Hour Volumes

Figure 5D.
Final Background Peak Hour Traffic Volumes within the Study Area

TABLE 5. BACKGROUND PEAK HOUR LEVELS OF SERVICE

INTERSECTION	TURNING MOVEMENT	AM PEAK HOUR		PM PEAK HOUR	
		LEVEL OF SERVICE	95TH %-ILE QUEUE	LEVEL OF SERVICE	95TH %-ILE QUEUE
Oak Meadow Drive and the Eastern Access for Home Depot	Eastbound Left Turns	LOS A	1 veh	LOS A	1 veh
	Southbound Left and Right Turns	LOS A	1 veh	LOS A	1 veh
Oak Meadow Drive and the Western Access for Home Depot	Eastbound Left Turns	LOS A	1 veh	LOS A	1 veh
	Southbound Left and Right Turns	LOS A	1 veh	LOS B	1 veh
S. Royal Oaks Boulevard and Oak Meadow Drive (signalized)	Northbound Left Turns	LOS A	35 feet	LOS C	56 feet
	Northbound Thrus	LOS B	351 feet	LOS B	308 feet
	Northbound Right Turns	LOS A	0 feet	LOS A	0 feet
	Southbound Left Turns	LOS A	18 feet	LOS B	78 feet
	Southbound Thrus/Right Turns	LOS B	147 feet	LOS C	423 feet
	Eastbound Left Turns	LOS D	127 feet	LOS D	142 feet
	Eastbound Thrus/Right Turns	LOS B	15 feet	LOS D	80 feet
	Westbound Left Turns	LOS C	30 feet	LOS D	92 feet
	Westbound Thrus	LOS D	27 feet	LOS D	41 feet
	Westbound Right Turns	LOS B	110 feet	LOS A	37 feet
	Overall Intersection	**LOS B**		**LOS C**	
S. Royal Oaks Boulevard and Rand Place / Home Depot Access	Northbound Left Turns	LOS A	1 veh	LOS B	1 veh
	Southbound Left Turns	LOS B	1 veh	LOS B	1 veh
	Eastbound Left Turns	LOS D	1 veh	LOS D	1 veh
	Eastbound Thrus/Right Turns	LOS B	1 veh	LOS C	1 veh

	Westbound Left Turns	LOS E	1 veh	LOS D	1 veh
	Westbound Thrus/Right Turns	LOS C	1 veh	LOS B	1 veh
S. Royal Oaks Boulevard and Riverside Drive / Center Point Place (signalized)	Northbound Left Turns	LOS A	12 feet	LOS B	59 feet
	Northbound Thrus	LOS B	374 feet	LOS C	538 feet
	Northbound Right Turns	LOS A	31 feet	LOS A	0 feet
	Southbound Left Turns	LOS E	192 feet	LOS D	112 feet
	Southbound Thrus/Right Turns	LOS A	228 feet	LOS A	351 feet
	Eastbound Left Turns	LOS D	18 feet	LOS F	217 feet
	Eastbound Thrus/Right Turns	LOS D	114 feet	LOS C	170 feet
	Westbound Left Turns	LOS E	60 feet	LOS D	74 veh
	Westbound Thrus/Right Turns	LOS B	24 feet	LOS D	289 veh
	Overall Intersection	**LOS B**		**LOS C**	
Murfreesboro Road and Royal Oaks Boulevard (signalized)	Eastbound Left Turns	LOS E	93 feet	LOS E	155 feet
	Eastbound Thrus / Right Turns	LOS D	338 feet	LOS D	369 feet
	Westbound Left Turns	LOS E	435 feet	LOS F	521 feet
	Westbound Thrus	LOS D	554 feet	LOS D	521 feet
	Westbound Right Turns	LOS A	109 feet	LOS B	130 feet
	Northbound Left Turns	LOS D	78 feet	LOS E	109 feet
	Northbound Thrus	LOS D	153 feet	LOS E	236 feet
	Northbound Right Turns	LOS D	655 feet	LOS D	692 feet
	Southbound Left Turns	LOS E	159 feet	LOS F	272 feet

	Southbound Thrus / Right Turns	LOS D	159 feet	LOS E	465 feet
	Overall Intersection	**LOS D**		**LOS E**	
Murfreesboro Road and Ramps for Southbound I-65 (signalized)	Eastbound Thrus	LOS C	388 feet	LOS E	672 feet
	Eastbound Right Turns	LOS A	50 feet	LOS C	295 feet
	Westbound Left Turns	LOS E	163 feet	LOS F	520 feet
	Westbound Thrus	LOS B	294 feet	LOS C	407 feet
	Southbound Left Turns	LOS D	178 feet	LOS D	515 feet
	Southbound Right Turns	LOS F	738 feet	LOS F	1235 feet
	Overall Intersection	**LOS D**		**LOS F**	
Murfreesboro Road and Ramps for Northbound I-65 (signalized)	Eastbound Left Turns	LOS F	1028 feet	LOS E	340 feet
	Eastbound Thrus	LOS A	76 feet	LOS C	518 feet
	Westbound Thrus	LOS D	372 feet	LOS C	467 feet
	Westbound Right Turns	LOS C	573 feet	LOS B	311 feet
	Northbound Left Turns	LOS F	337 feet	LOS E	218 feet
	Northbound Right Turns	LOS D	341 feet	LOS D	190 feet
	Overall Intersection	**LOS F**		**LOS C**	

5. IMPACTS OF PROPOSED DEVELOPMENT

5.1 TRIP GENERATION

Trip generation calculations were conducted in order to identify how much traffic will be generated by the proposed project. Trip generation data for daily and peak hour trips were identified from Trip Generation, Ninth Edition, which was published by the Institute of Transportation Engineers (ITE) in 2012. Table 6A presents the daily and peak hour trip generations for proposed townhomes, and these calculations are included in Appendix D.

TABLE 6A. TRIP GENERATION FOR THE PROPOSED PROJECT

LAND USE	SIZE	DAILY TRAFFIC	GENERATED TRAFFIC			
			AM PEAK HOUR		PM PEAK HOUR	
			ENTER	EXIT	ENTER	EXIT
Multi-Family (LUC 220) **South Site**	98 units	652	10	40	39	21
Multi-Family (LUC 220) **North Site**	204 units	1,356	21	83	82	44
TOTAL	**302 units**	**2,008**	**31**	**123**	**121**	**65**
Future Commercial Development	15,000 sq.ft.	664	49	53	18	23

Also, trip generation calculations were conducted in order to identify how much traffic might be generated by office and retail land uses that could be developed on the project sites instead of multi-family residential. For purposes of these analyses, two land use scenarios were considered:

1. **40,000 sq.ft.** office space on the southern project site and **100,000 sq.ft** of office space on the northern project site

2. **30,000 sq.ft.** retail space on the southern project site and **60,000 sq.ft** of retail space on the northern project site

Table 6B presents the daily and peak hour trip generations for these alternative land uses.

TABLE 6B. TRIP GENERATION FOR ALTERNATIVE LAND USES

LAND USE	SIZE	DAILY TRAFFIC	GENERATED TRAFFIC			
			AM PEAK HOUR		PM PEAK HOUR	
			ENTER	EXIT	ENTER	EXIT
Office (LUC 710)	140,000 sq.ft.	1,696	220	30	40	195
Retail (LUC 820)	90,000 sq.ft.	6,342	91	56	268	290

5.2 TRIP DISTRIBUTION AND TRAFFIC ASSIGNMENT

For the purposes of this study, it was estimated that the trips generated by the proposed project and the future commercial development will access the project site according to the directional distribution shown in Figures 6A, 6B, and 6C. It is important to note that these directional distributions were prepared with input and approval from the City of Franklin Engineering Department and their third-party private consultant, Neel-Schaffer, Inc. The development of these distributions was based on the following factors:

- existing land use characteristics,
- the directions of approach of the existing traffic,
- the access proposed for the project, and
- the locations of population centers in the area.

The peak hour trip generations and directional distributions were used to add the site-generated trips to the roadway system. Figures 7A, 7B, 7C, and 7D include the peak hour traffic volumes that are expected to be generated by the proposed project and the future commercial development.

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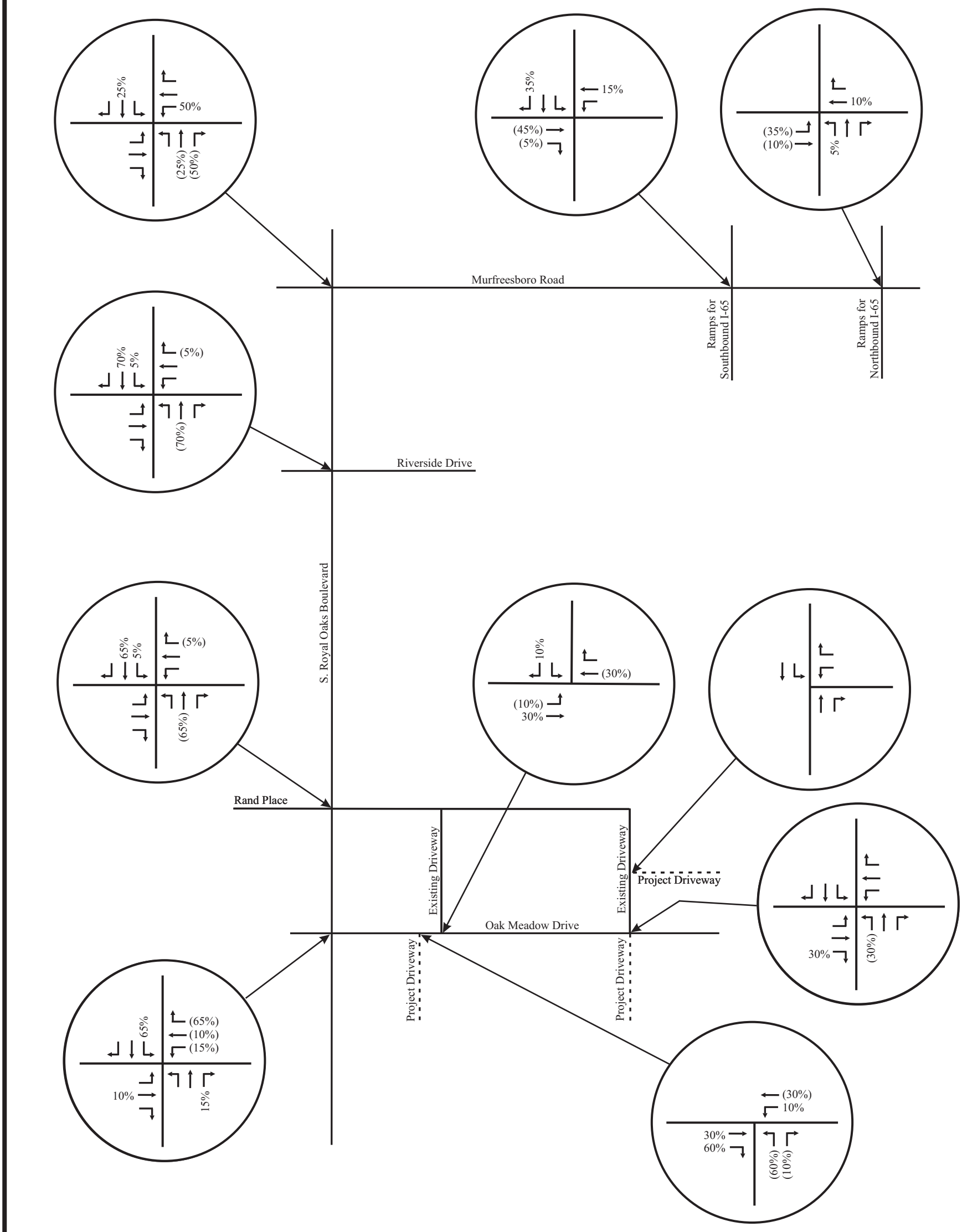

No Scale

XX - Entering Volumes
(XX) - Exiting Volumes

Figure 6A.
Directional Distribution of Peak Hour Traffic Volumes Generated by the Proposed Apartments (Southern Site)

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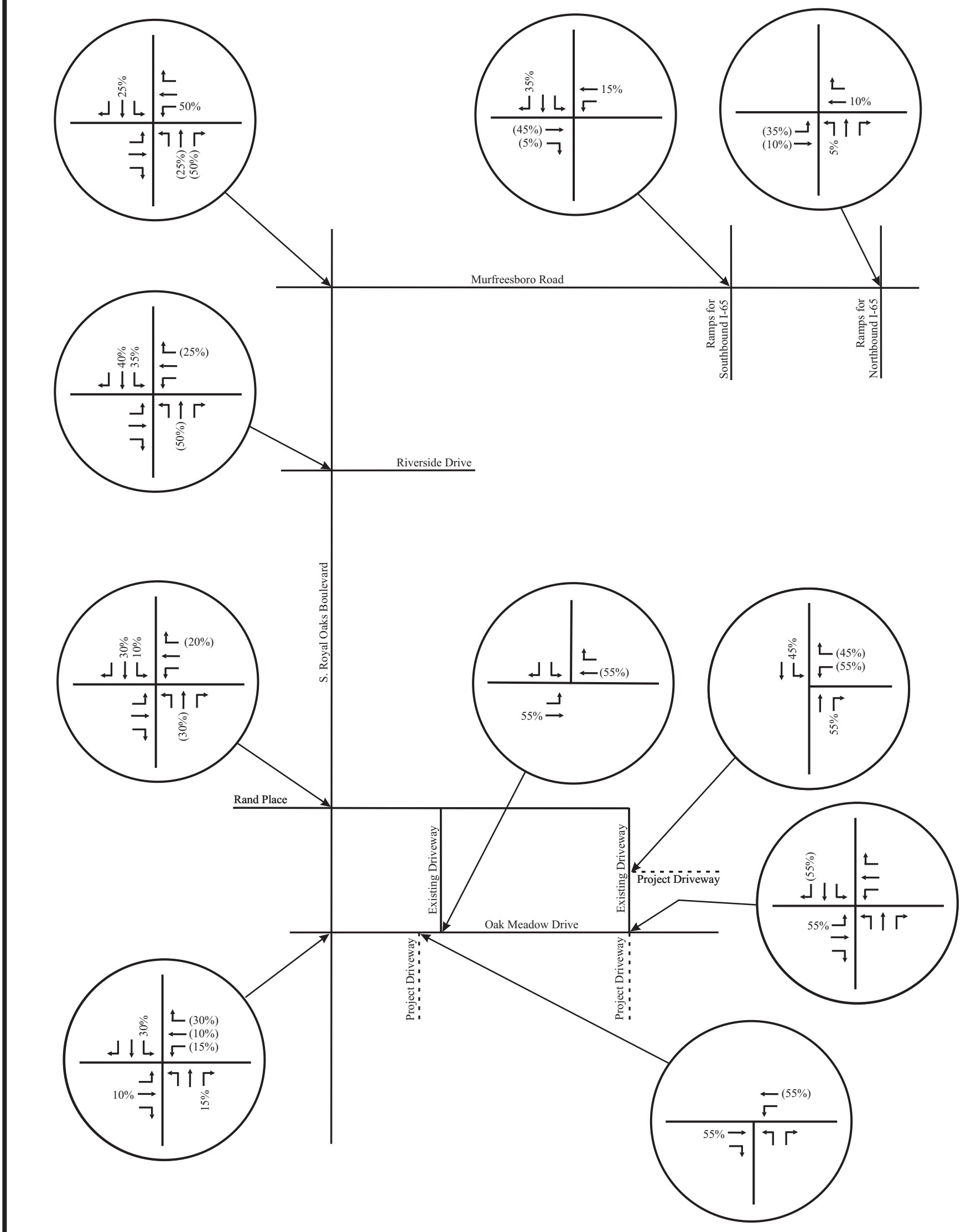
Traffic Engineering and Planning



No Scale

XX - Entering Volumes
(XX) - Exiting Volumes

Figure 6B.
Directional Distribution of Peak Hour Traffic Volumes Generated by the Proposed Apartments (Northern Site)

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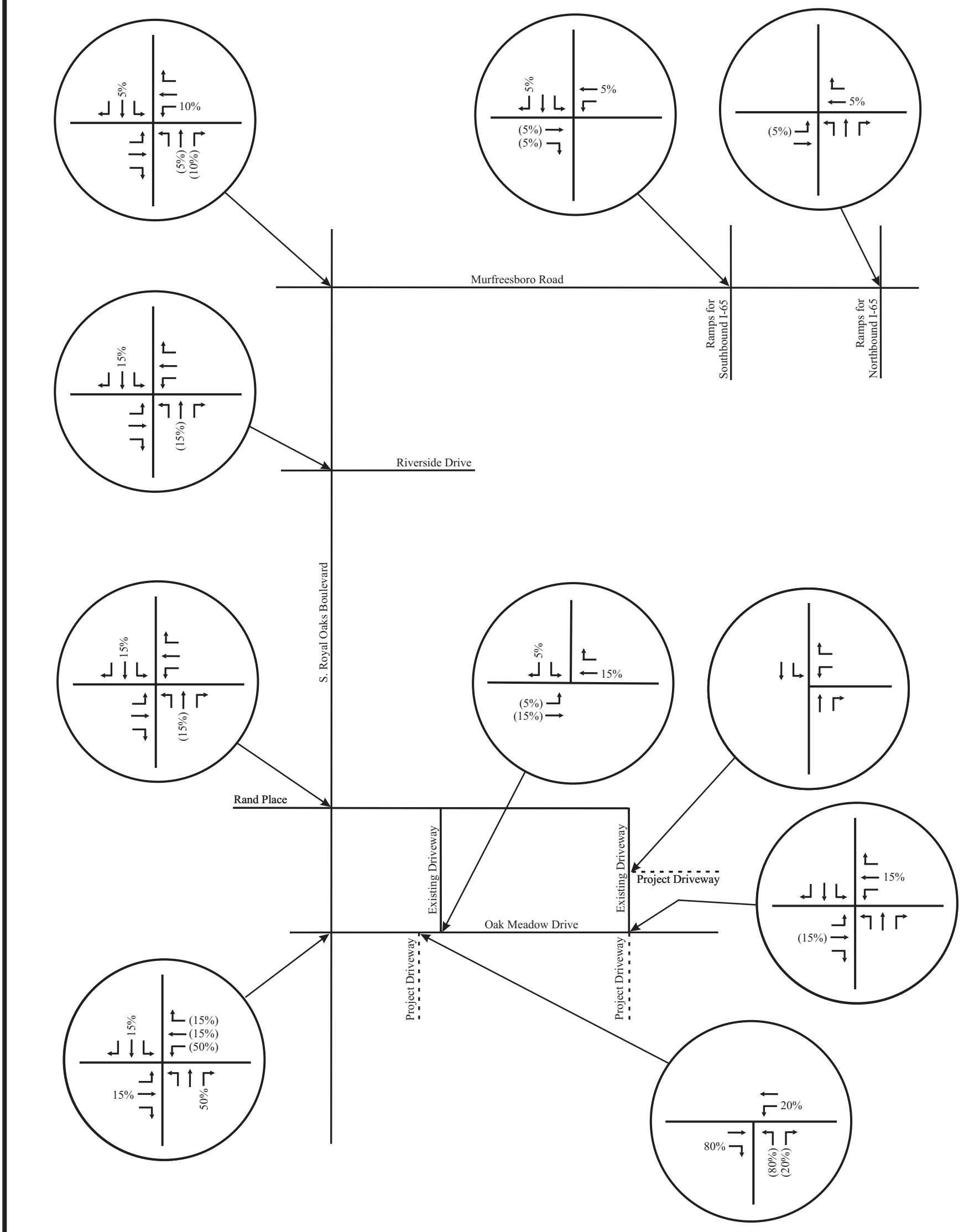
Traffic Engineering and Planning



No Scale

XX - Entering Volumes
(XX) - Exiting Volumes

Figure 6C.
Directional Distribution of Peak Hour Traffic Volumes Generated by the Future Retail Center

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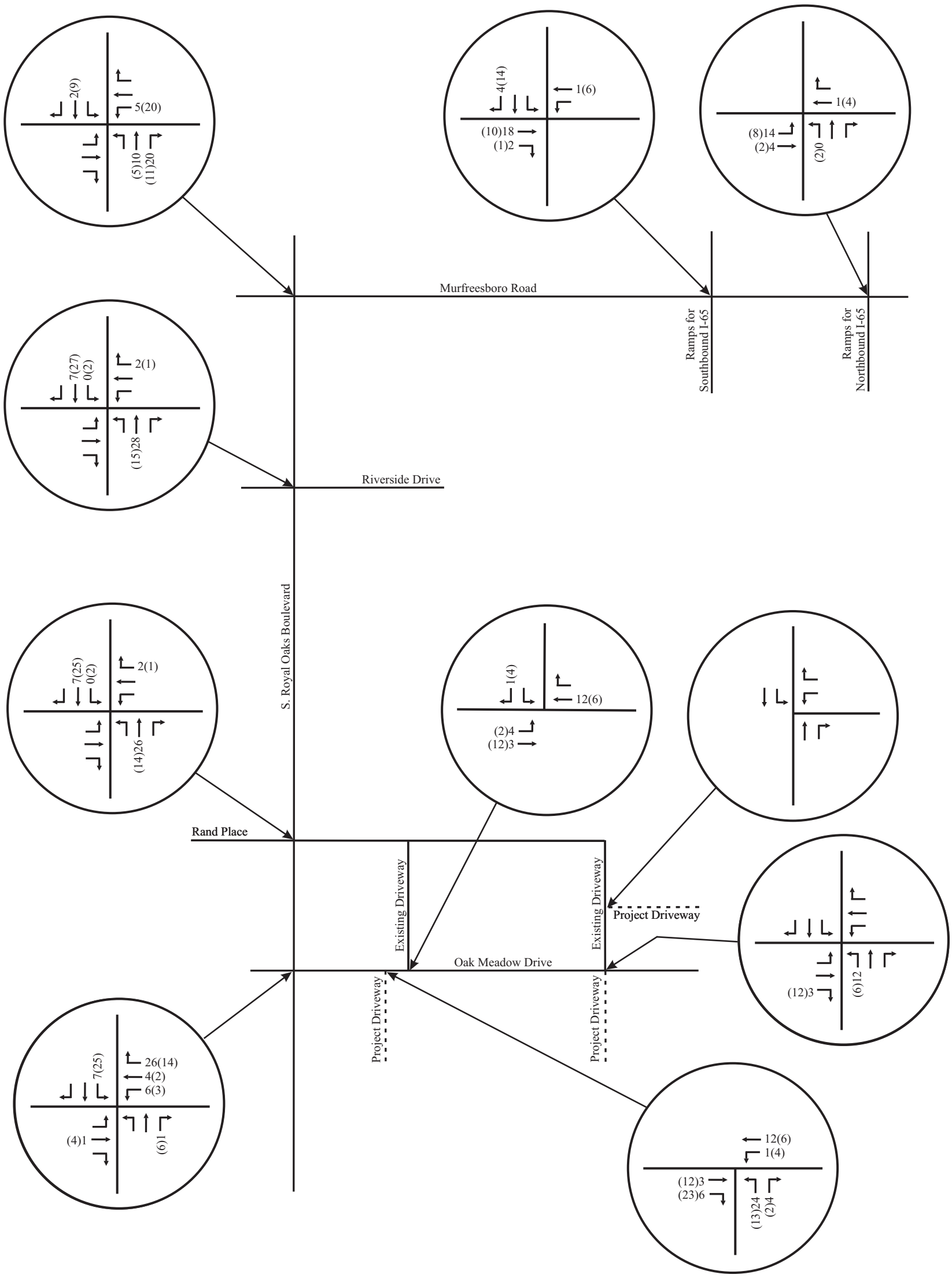

No Scale

XX - AM Peak Hour Volumes
(XX) - PM Peak Hour Volumes

Figure 7A.
Peak Hour Traffic Volumes Generated by the Proposed Apartments (Southern Site)

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Traffic Engineering and Planning

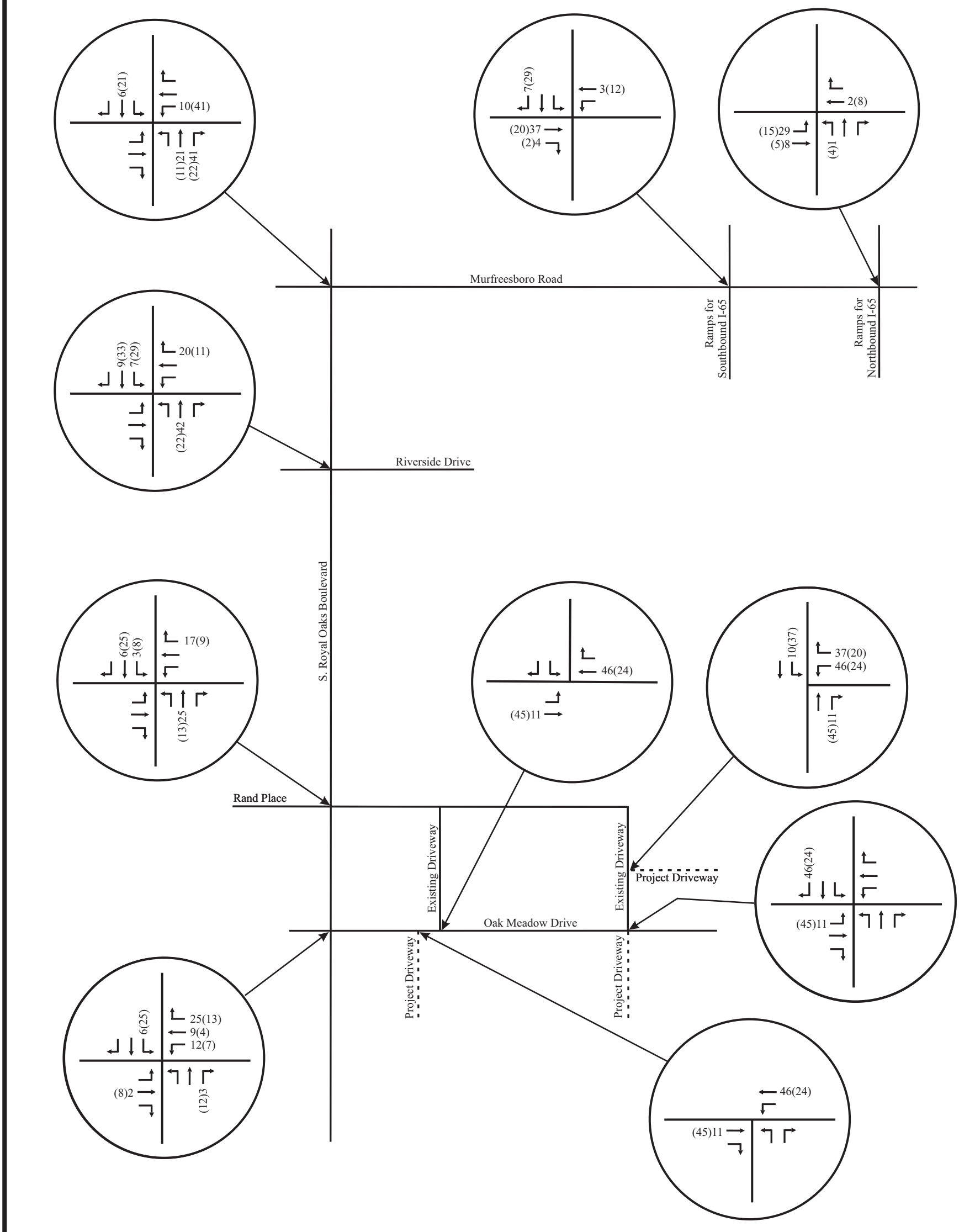
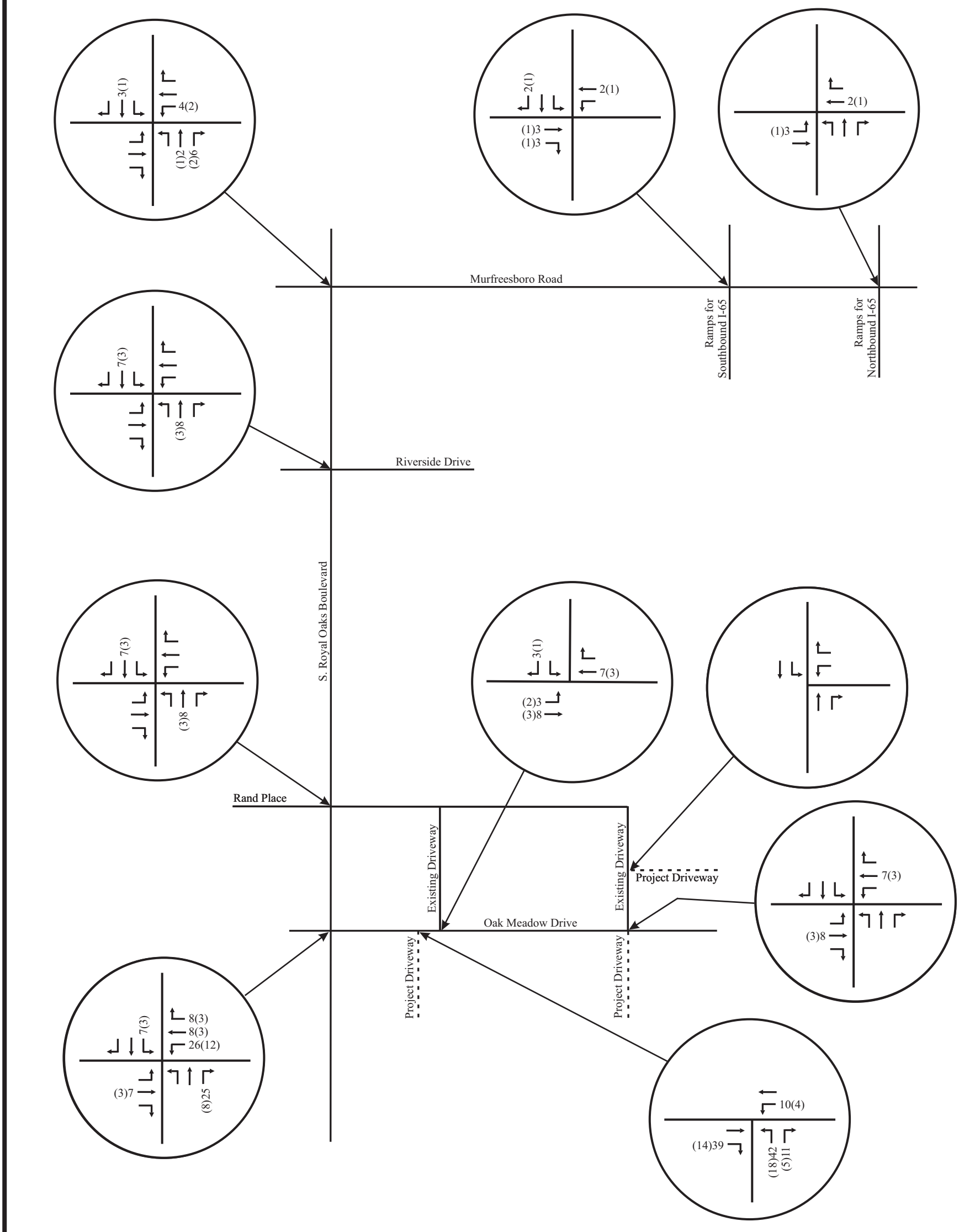


Figure 7B.
Peak Hour Traffic Volumes Generated by the Proposed Apartments (Northern Site)

Fischbach
Transportation Group, LLC
Traffic Engineering and Planning



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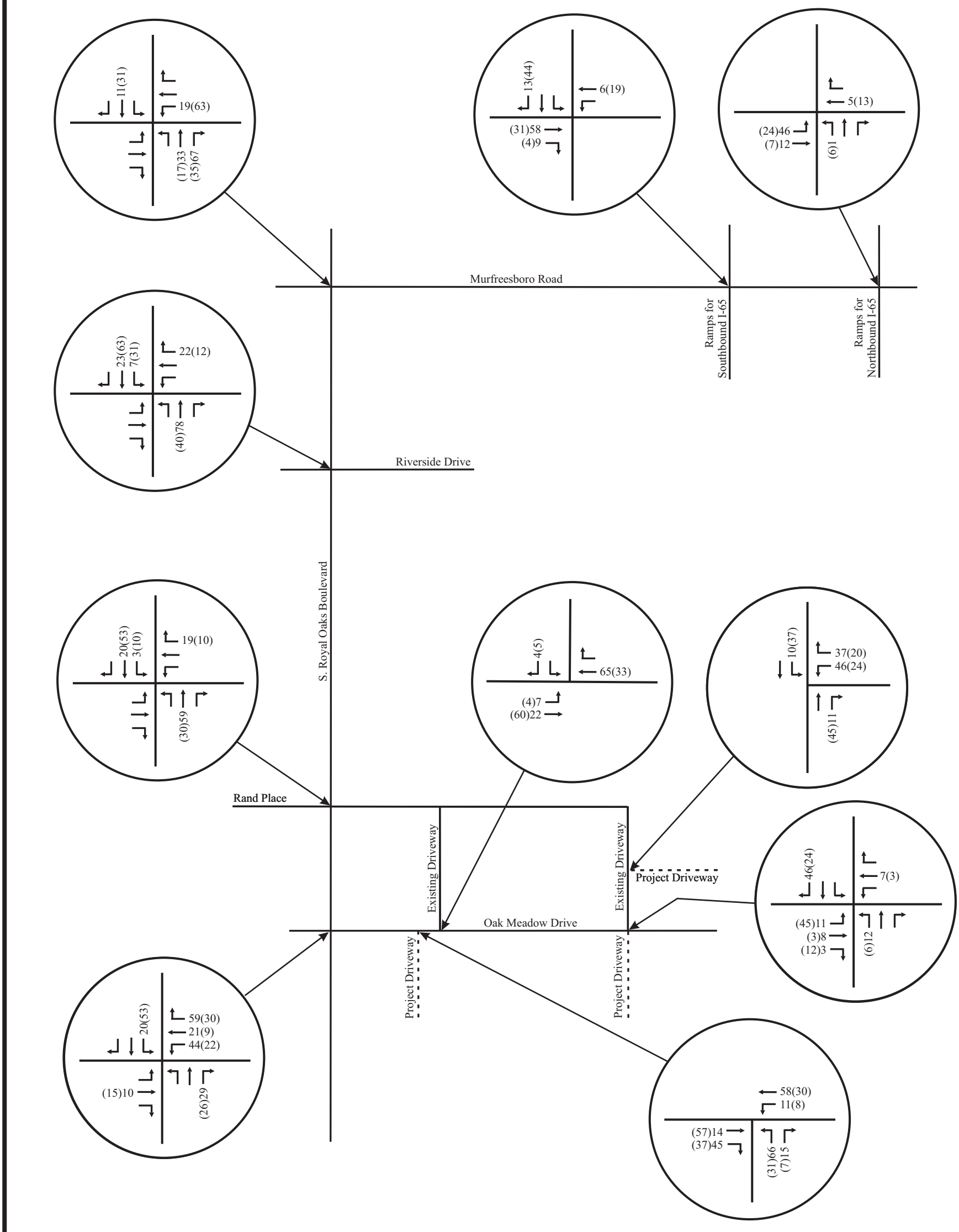
No Scale

XX - AM Peak Hour Volumes
(XX) - PM Peak Hour Volumes

Figure 7C.
Peak Hour Traffic Volumes Generated by the Future Retail Center

Fischbach
Transportation Group, LLC
Traffic Engineering and Planning



No Scale

XX - AM Peak Hour Volumes
(XX) - PM Peak Hour Volumes

Figure 7D.
Total Peak Hour Traffic Volumes Generated by the Proposed Apartments (Total Both Sites) and Future Retail

5.3 CAPACITY ANALYSES

In order to identify the projected peak hour traffic volumes at the completion of the proposed project, the trips generated by the project were added to the background peak hour traffic volumes. The resulting peak hour volumes are shown in Figure 8.

Using the total projected peak hour traffic volumes, capacity analyses were conducted in order to determine the impact of the project on the roadway system. Specifically, these capacity analyses were used to evaluate the need for roadway and traffic control improvements within the study area. For these analyses, the following assumptions were made:

- All existing laneage and traffic control will be maintained and no improvements will be provided.

- Each of the project accesses on Oak Meadow Drive will be constructed to include one entering lane and one exiting lane.

- The access on S. Royal Oaks Boulevard for the future commercial project will be constructed to include one entering lane and two exiting lanes, striped as a separate left turn lane and a shared through/right turn lane.

The results of the capacity analyses for the total projected peak hour traffic volumes are shown in Table 7, and Appendix C includes the capacity analyses worksheets. These analyses indicate that the total projected conditions with full build-out of the project are consistent with the existing and background conditions within the study area.

Also, additional analyses were conducted in order to identify how well the intersection of S. Royal Oaks Boulevard and Riverside Drive / Center Point Place would operate if the traffic signal were modified to include protected signal phases for eastbound and westbound motorists. The results of these analyses are shown in Table 7, and Appendix C includes the capacity analyses worksheets. As shown, the additional signal phases would marginally reduce the level of service at this intersection during the PM peak hour.

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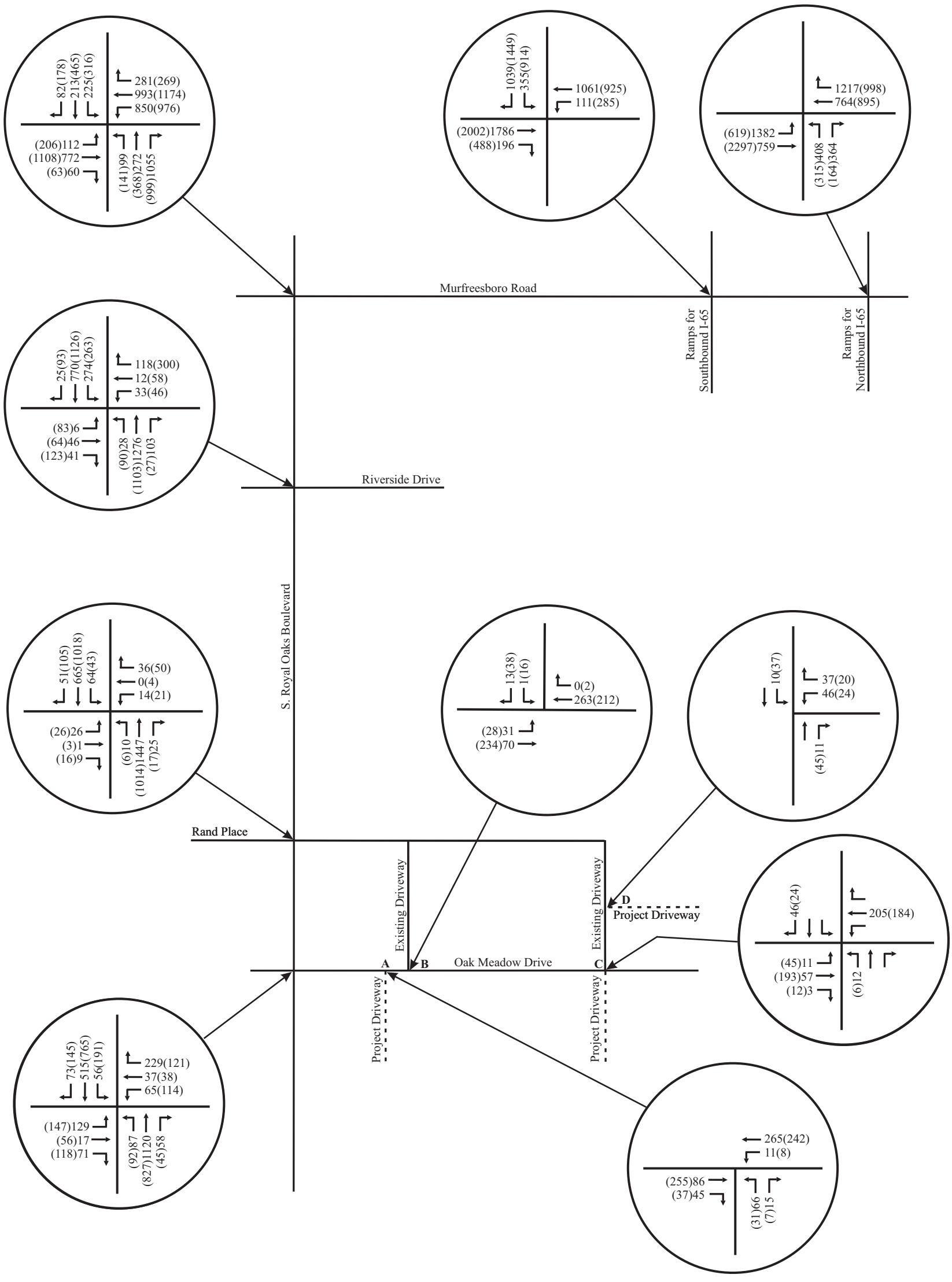


No Scale

XX - AM Peak Hour Volumes
(XX) - PM Peak Hour Volumes

Figure 8.
Total Projected Peak Hour Traffic Volumes at the Completion of the Proposed Apartments and Future Retail

TABLE 7. PROJECTED PEAK HOUR LEVELS OF SERVICE

INTERSECTION	TURNING MOVEMENT	AM PEAK HOUR		PM PEAK HOUR	
		LEVEL OF SERVICE	95TH %-ILE QUEUE	LEVEL OF SERVICE	95TH %-ILE QUEUE
A - Oak Meadow Drive and the Western Access for the Apartments / Retail	Westbound Left Turns	LOS A	1 veh	LOS A	1 veh
	Northbound Left and Right Turns	LOS B	1 veh	LOS B	1 veh
B - Oak Meadow Drive and the Western Access for Home Depot	Eastbound Left Turns	LOS A	1 veh	LOS A	1 veh
	Southbound Left and Right Turns	LOS B	1 veh	LOS B	1 veh
C - Oak Meadow Drive and the Eastern Access for Home Depot / Apartments	Eastbound Left Turns	LOS A	1 veh	LOS A	1 veh
	Westbound Left Turns	LOS A	1 veh	LOS A	1 veh
	Northbound Left/Thru/Right Turns	LOS B	1 veh	LOS B	1 veh
	Southbound Left/Thru/Right Turns	LOS A	1 veh	LOS A	1 veh
D - Eastern Access for Home Depot / Access for Northern Apartments	Southbound Left Turns / Thrus	LOS A	1 veh	LOS A	1 veh
	Westbound Left and Right Turns	LOS A	1 veh	LOS A	1 veh
S. Royal Oaks Boulevard and Oak Meadow Drive (signalized)	Northbound Left Turns	LOS A	37 feet	LOS C	70 feet
	Northbound Thrus	LOS B	362 feet	LOS C	328 feet
	Northbound Right Turns	LOS A	0 feet	LOS A	0 feet
	Southbound Left Turns	LOS A	26 feet	LOS C	116 feet
	Southbound Thrus/Right Turns	LOS B	152 feet	LOS C	447 feet
	Eastbound Left Turns	LOS D	124 feet	LOS C	135 feet
	Eastbound Thrus/Right Turns	LOS B	22 feet	LOS D	108 feet
	Westbound Left Turns	LOS C	69 feet	LOS D	105 feet
	Westbound	LOS D	48 feet	LOS D	49 feet

	Thrus				
	Westbound Right Turns	LOS C	161 feet	LOS A	40 feet
	Overall Intersection	**LOS B**		**LOS C**	
S. Royal Oaks Boulevard and Rand Place / Home Depot Access	Northbound Left Turns	LOS A	1 veh	LOS B	1 veh
	Southbound Left Turns	LOS B	1 veh	LOS B	1 veh
	Eastbound Left Turns	LOS D	1 veh	LOS E	1 veh
	Eastbound Thrus/Right Turns	LOS B	1 veh	LOS C	1 veh
	Westbound Left Turns	LOS E	1 veh	LOS D	1 veh
	Westbound Thrus/Right Turns	LOS C	1 veh	LOS B	1 veh
S. Royal Oaks Boulevard and Riverside Drive / Center Point Place (signalized)	Northbound Left Turns	LOS A	12 feet	LOS C	59 feet
	Northbound Thrus	LOS B	414 feet	LOS C	567 feet
	Northbound Right Turns	LOS A	31 feet	LOS A	0 feet
	Southbound Left Turns	LOS F	181 feet	LOS D	133 feet
	Southbound Thrus/Right Turns	LOS A	343 feet	LOS B	599 feet
	Eastbound Left Turns	LOS E	18 feet	LOS F	217 feet
	Eastbound Thrus/Right Turns	LOS D	114 feet	LOS C	176 feet
	Westbound Left Turns	LOS E	60 feet	LOS D	74 veh
	Westbound Thrus/Right Turns	LOS B	21 feet	LOS D	300 veh
	Overall Intersection	**LOS C**		**LOS C**	
S. Royal Oaks Boulevard and Riverside Drive / Center Point Place (signalized and with protected left turn signal	Northbound Left Turns	LOS A	19 feet	LOS C	70 feet
	Northbound Thrus	LOS B	571 feet	LOS D	636 feet
	Northbound	LOS A	31 feet	LOS A	0 feet

phases for eastbound and westbound motorists)	Right Turns				
	Southbound Left Turns	LOS F	405 feet	LOS F	334 feet
	Southbound Thrus/Right Turns	LOS B	262 feet	LOS C	671 feet
	Eastbound Left Turns	LOS D	14 feet	LOS D	110 feet
	Eastbound Thrus/Right Turns	LOS E	105 feet	LOS D	181 feet
	Westbound Left Turns	LOS D	52 feet	LOS D	65 veh
	Westbound Thrus/Right Turns	LOS B	21 feet	LOS D	340 veh
	Overall Intersection	**LOS C**		**LOS D**	
Murfreesboro Road and Royal Oaks Boulevard (signalized)	Eastbound Left Turns	LOS E	93 feet	LOS E	155 feet
	Eastbound Thrus / Right Turns	LOS D	338 feet	LOS D	368 feet
	Westbound Left Turns	LOS E	446 feet	LOS F	567 feet
	Westbound Thrus	LOS D	544 feet	LOS D	517 feet
	Westbound Right Turns	LOS A	122 feet	LOS B	125 feet
	Northbound Left Turns	LOS D	76 feet	LOS E	105 feet
	Northbound Thrus	LOS D	174 feet	LOS E	249 feet
	Northbound Right Turns	LOS D	696 feet	LOS D	716 feet
	Southbound Left Turns	LOS E	159 feet	LOS F	272 feet
	Southbound Thrus / Right Turns	LOS D	167 feet	LOS F	505 feet
	Overall Intersection	**LOS D**		**LOS F**	
Murfreesboro Road and Ramps for Southbound I-65 (signalized)	Eastbound Thrus	LOS C	406 feet	LOS E	692 feet
	Eastbound Right Turns	LOS A	47 feet	LOS C	295 feet
	Westbound	LOS E	164 feet	LOS F	521 feet

	Left Turns				
	Westbound Thrus	LOS B	297 feet	LOS C	430 feet
	Southbound Left Turns	LOS D	178 feet	LOS D	515 feet
	Southbound Right Turns	LOS F	754 feet	LOS F	1297 feet
	Overall Intersection	**LOS D**		**LOS F**	
Murfreesboro Road and Ramps for Northbound I-65 (signalized)	Eastbound Left Turns	LOS F	1078 feet	LOS E	344 feet
	Eastbound Thrus	LOS A	75 feet	LOS C	499 feet
	Westbound Thrus	LOS D	375 feet	LOS C	485 feet
	Westbound Right Turns	LOS C	573 feet	LOS B	327 feet
	Northbound Left Turns	LOS F	338 feet	LOS E	222 feet
	Northbound Right Turns	LOS E	351 feet	LOS D	190 feet
	Overall Intersection	**LOS F**		**LOS D**	

5.4 CAPACITY ANALYSIS COMPARISON

The results of the capacity analyses for the existing, background, and total projected peak hour traffic volumes are included in Tables 8 and 9 for comparison purposes. Also, the levels of service that worsen from background conditions to total projected conditions with the proposed project are highlighted in red. Finally, additional analyses were conducted in order to identify how well the intersections within the study area would operate if a third northbound through lane were provided on S. Royal Oaks between Oak Meadow Drive and Murfreesboro Road. Specifically, for these analyses, the northbound right turn lanes at Oak Meadow Drive, Rand Place, and Riverside Drive were converted to shared through/right turn lanes. Also, the analyses included the modification of the existing traffic signal at the intersection of S. Royal Oaks Boulevard and Riverside Drive / Center Point Place to include protected signal phases for eastbound and westbound motorists. The results of these additional analyses are shown in Tables 8 and 9. These comparisons and analyses that reveal poor levels of service are described below:

S. Royal Oaks Boulevard and Oak Meadow Drive
This intersection operates at LOS B during the AM peak hour and LOS C during the PM peak hour under existing, background, and total projected conditions.

S. Royal Oaks Boulevard and Riverside Drive / Center Point Place
This intersection operates at LOS B during the AM peak hour and LOS C during the PM peak hour under existing and background conditions. With the proposed project, this intersection will operate at LOS C during both peak hours. Also, if the existing traffic signal were modified to include protected signal phases for eastbound and westbound motorists, this intersection would operate at LOS C during the AM peak hour and LOS D during the PM peak hour.

Murfreesboro Road and Royal Oaks Boulevard
This intersection operates poorly during the PM peak hour under existing, background, and total projected conditions. Specifically, the traffic volumes for the eastbound throughs, westbound throughs, westbound left turns, and northbound right turns are all approximately equal during both peak hours. Although some of these turning movements can operate during the same signal phases, the total time needed to serve all of the turning movements is significantly high. These conditions will persist unless the Murfreesboro Road corridor is widened to include three travel lanes in each direction.

Murfreesboro Road and the Ramps for Southbound I-65
This intersection operates poorly during the PM peak hour under existing, background, and total projected conditions. Specifically, the traffic volumes for the eastbound throughs, westbound throughs, and southbound right turns are all significantly high during both peak hours, and the traffic volume for the southbound left turns are significantly high during the PM peak hour. Although some of these turning movements can operate during the same signal phases, the total time needed to serve all of the turning movements is significantly high. These conditions will persist unless the Murfreesboro Road corridor is widened to include three travel lanes in each direction.

Murfreesboro Road and the Ramps for Northbound I-65

This intersection operates poorly during the AM peak hour under existing, background, and total projected conditions. Specifically, the traffic volumes for the eastbound left turns and westbound right turns are significantly high during the AM peak hour, and the traffic volumes for the eastbound throughs and westbound right turns are significantly high during the PM peak hour. These turning movements cannot operate during the same signal phases, and the total time needed to serve all of the turning movements is significantly high. These conditions will persist unless the Murfreesboro Road corridor is widened to include three travel lanes in each direction.

TABLE 8. COMPARISON OF AM PEAK HOUR LEVELS OF SERVICE

INTERSECTION	TURNING MOVEMENT	LEVELS OF SERVICE			
		EXISTING CONDITIONS	BACKGROUND CONDITIONS	TOTAL PROJECTED CONDITIONS	WITH THIRD NORTHBOUND TRAVEL LANE
S. Royal Oaks Boulevard and Oak Meadow Drive	Overall Intersection	LOS B (13.9 sec/veh)	LOS B (15.4 sec/veh)	LOS B (17.6 sec/veh)	LOS B (16.0 sec/veh)
S. Royal Oaks Boulevard and Riverside Drive / Center Point Place	Overall Intersection	LOS B (14.0 sec/veh)	**LOS B** (17.3 sec/veh)	**LOS C** (20.5 sec/veh)	LOS C (30.8 sec/veh)
Murfreesboro Road and Royal Oaks Boulevard	Overall Intersection	LOS D (42.0 sec/veh)	LOS D (44.9 sec/veh)	LOS D (46.1 sec/veh)	LOS D (44.4 sec/veh)
Murfreesboro Road and Ramps for Southbound I-65	Overall Intersection	LOS C (31.7 sec/veh)	LOS D (39.6 sec/veh)	LOS D (41.2 sec/veh)	LOS D (41.6 sec/veh)
Murfreesboro Road and Ramps for Northbound I-65	Overall Intersection	LOS E (64.7 sec/veh)	LOS F (81.2 sec/veh)	LOS F (87.9 sec/veh)	LOS F (87.9 sec/veh)

TABLE 9. COMPARISON OF PM PEAK HOUR LEVELS OF SERVICE

INTERSECTION	TURNING MOVEMENT	LEVELS OF SERVICE			
		EXISTING CONDITIONS	BACKGROUND CONDITIONS	TOTAL PROJECTED CONDITIONS	WITH THIRD NORTHBOUND TRAVEL LANE
S. Royal Oaks Boulevard and Oak Meadow Drive	Overall Intersection	LOS C (21.9 sec/veh)	LOS C (25.3 sec/veh)	LOS C (28.1 sec/veh)	LOS C (26.9 sec/veh)
S. Royal Oaks Boulevard and Riverside Drive / Center Point Place	Overall Intersection	LOS C (27.4 sec/veh)	LOS C (29.0 sec/veh)	**LOS C** (31.3 sec/veh)	**LOS D** (36.8 sec/veh)
Murfreesboro Road and Royal Oaks Boulevard	Overall Intersection	LOS E (61.2 sec/veh)	**LOS E** (72.3 sec/veh)	**LOS F** (80.6 sec/veh)	LOS E (78.8 sec/veh)
Murfreesboro Road and Ramps for Southbound I-65	Overall Intersection	LOS E (78.4 sec/veh)	LOS F (97.4 sec/veh)	LOS F (103.7 sec/veh)	LOS F (103.9 sec/veh)
Murfreesboro Road and Ramps for Northbound I-65	Overall Intersection	LOS C (29.5 sec/veh)	**LOS C** (34.2 sec/veh)	**LOS D** (35.1 sec/veh)	LOS D (35.1 sec/veh)

6. CONCLUSIONS AND RECOMMENDATIONS

The analyses presented in this study indicate the following information for the intersections that provide direct access to the project sites:

Oak Meadow Drive and the Western Project Access
At this intersection, the new project access should be constructed to include one entering lane and one exiting lane, and a stop sign should be installed on the northbound approach of the new access. The capacity analyses indicate that all of the vehicle queues and vehicle delays at this intersection will be very low.

The existing center turn lane on Oak Meadow Drive should be restriped to provide a dedicated westbound left turn lane with 50 feet of storage for motorists turning onto the project access.

In order to identify the sight distances that will be available at the project access, sight triangles should be provided in conjunction with construction documents for the proposed project. These sight triangles should be developed based on guidelines that are included in A Policy on Geometric Design of Highways and Streets, which is published by the American Association of State Highway and Transportation Officials (AASHTO) and commonly known as The Green Book. Specifically, The Green Book indicates that for a speed of 40 mph, the minimum stopping sight distance is 305 feet. This is the distance that a motorist on Oak Meadow Drive needs to come to a stop if a vehicle turning from the project access creates a conflict. Also, based on The Green Book, the minimum intersection sight distance is 445 feet. This is the distance that a motorist exiting the project access needs to safely complete turns onto Oak Meadow Drive.

Oak Meadow Drive and the Western Home Depot Access
The capacity analyses indicate that all of the vehicle queues and vehicle delays at this intersection will remain very low. However, double yellow pavement markings should be provided on the Home Depot access in order to delineate travel lanes. Also, the existing center turn lane on Oak Meadow Drive should be restriped to provide a dedicated eastbound left turn lane with 50 feet of storage for motorists turning onto the Home Depot access.

Oak Meadow Drive and the Eastern Project Access / Home Depot Access
At this intersection, the new project access should be constructed to include one entering lane and one exiting lane, and a stop sign should be installed on the northbound approach of the new access. The capacity analyses indicate that all of the vehicle queues and vehicle delays at this intersection will be very low.

At the completion of the proposed project, the existing double yellow pavement markings on the Home Depot access should be reapplied in order to delineate travel lanes. The existing center turn lane on Oak Meadow Drive should be restriped to provide a dedicated eastbound and westbound left turn lanes for motorists turning onto the Home Depot access and the project access. Each of these turn lanes should include at least 50 feet of storage.

In order to identify the sight distances that will be available at the project access, sight triangles should be provided in conjunction with construction documents for the proposed project. These sight triangles should be developed based on guidelines that are included in A Policy on Geometric Design of Highways and Streets, which is published by the American Association of State Highway and Transportation Officials (AASHTO) and commonly known as The Green Book. Specifically, The Green Book indicates that for a speed of 40 mph, the minimum stopping sight distance is 305 feet. This is the distance that a motorist on Oak Meadow Drive needs to come to a stop if a vehicle turning from the project access creates a conflict. Also, based on The Green Book, the minimum intersection sight distance is 445 feet. This is the distance that a motorist exiting the project access needs to safely complete turns onto Oak Meadow Drive.

Also, sight distance should be maximized for northbound/westbound motorists on Oak Meadow Drive by removing foliage and vegetation from the south side of Oak Meadow Drive.

Eastern Home Depot Access and the Project Access for the Northern Apartments

At this intersection, the new project access should be constructed to include one entering lane and one exiting lane, and a stop sign should be installed on the westbound approach of the new access. The capacity analyses indicate that all of the vehicle queues and vehicle delays at this intersection will be very low. At the completion of the proposed project, the existing double yellow pavement markings on the Home Depot access should be reapplied in order to delineate travel lanes.

S. Royal Oaks Boulevard and Oak Meadow Drive

The capacity analyses indicate that all of the turning movements at this intersection will operate at acceptable levels of service. Also, the existing lengths of the turn lanes are adequate to accommodate the total projected traffic volumes with the completion of the proposed project. Finally, it is important to note that the westbound approach of Oak Meadow Drive already includes separate left, through, and right turn lanes at the intersection with S. Royal Oaks Boulevard, and the existing traffic signal already includes a right turn overlap signal phase for westbound motorists. Therefore, there are no additional dedicated turn lanes or traffic control modifications that can be provided at this location. Field observations and traffic counts confirm that the northbound and southbound through volumes are significant, particularly the northbound through movement during the AM peak hour. However, the proposed project will have a minimal impact on these conditions.

S. Royal Oaks Boulevard and Rand Place / Access for Home Depot

The capacity analyses indicate that all of the critical turning movements at this unsignalized intersection will operate at acceptable levels of service. Also, the existing lengths of the turn lanes are adequate to accommodate the total projected traffic volumes with the completion of the proposed project. Field observations and traffic counts confirm that the northbound and southbound through volumes are significant, particularly the northbound through movement during the AM peak hour. In addition, the field observations and traffic counts confirm that the eastbound and westbound left turn volumes are relatively low, presumably because left turns are challenging when the northbound and southbound through volumes are high. Finally, the

eastbound and westbound motorists have access to the existing traffic signal at Oak Meadow Drive. It is important to note that proposed project will have a minimal impact on these conditions. Also, it is important to note that this intersection is not an appropriate location for a traffic signal installation because of its proximity to the existing traffic signal at Oak Meadow Drive.

At the completion of the proposed project, the existing pavement markings on the Home Depot access should be reapplied in order to delineate travel lanes. At that time, consideration should be given to restriping the westbound travel lanes in order to provide a shared left turn / through lane and a separate right turn lane. This modification would reduce delays for the westbound right turns, which occur approximately twice as frequently as the westbound left turns.

S. Royal Oaks Boulevard and Riverside Drive / Center Point Place

The capacity analyses indicate that several turning movements at this intersection will operate at LOS C or better during both peak hours under existing, background, and total projected conditions. If the existing traffic signal were modified to include protected signal phases for eastbound and westbound motorists, this intersection would operate at LOS C during the AM peak hour and LOS D during the PM peak hour. However, this modification would reduce the potential for vehicle conflicts for eastbound and westbound motorists.

Also, it is important to note that the analyses indicate that providing a third northbound through lane on S. Royal Oaks Boulevard would not significantly reduce delays at this intersection.

Access for the Future Retail Site

Currently, the future retail parcel is not included in the site plan for the proposed apartments. Since building sizes, land uses, parking provisions, and driveways have not be established for this future development, no recommendations are made for the number and location of driveways or the laneage and traffic control that will be needed at the intersections that will provide access to the future retail development.

APPENDIX A
TRAFFIC IMPACT STUDY SCOPE PROVIDED BY
THE CITY OF FRANKLIN AND NEEL-SCHAFFER, INC.

Exhibit B

City of Franklin
Engineering Department

APPLICATION FORM
REQUEST FOR APPROVED TRANSPORTATION IMPACT ANALYSIS REPORT

APPROVED
By Carl Baughman at 4:26 pm, Jan 28, 2016

Applicant Name:	Crunk Engineering .	Applicant Name:	Epoch Residential .
Address:	1894 Gen. George Patton.	Address:	359 Carolina Avenue .
	Franklin, TN 37067 .		Winter Park, FL 32789 .
Phone #:	(615) 873-1795 .	Phone #:	(321) 316-6005 .
e-mail address:	adam@crunkeng.com .	e-mail address:	mccarley@epochresidential.com .

PROCESS OVERVIEW

A Transportation Impact Analysis shall be prepared by the Applicant's Consultant or the City's Traffic Consultant using the standard format specified by the Institute of Transportation Engineers in accordance with the following:

(i) The applicant shall submit a completed *Request for Transportation Impact Analysis Application Form* to the Engineering Department.

(ii) Scope of Services
   a. Following initial review of the application form, the Engineering Department shall prepare and submit a Scope of Services and schedule to the Applicant. If necessary a meeting will be scheduled to review and discuss the Scope of Services in detail.
   b. Following approval the applicant will pay the City 90% of the estimated cost of the traffic impact study. At the completion of the study the City shall reimburse the applicant all remaining fees.

(iii) Transportation impact analyses shall be prepared utilizing traffic data that are consistent with:
   a. The land use and density data as referenced in the most current edition of Trip Generation, published by the Institute of Transportation Engineers;
   b. Current city and state traffic counts for surrounding streets;
   c. Any additional traffic counts performed as a part of preparing the study.

Attachment A

City of Franklin Review Process for Transportation Impact Analysis

Step 1 – Preliminary discussion with Consultant/Developer on project description including site plan.
Step 2 – Scoping of Transportation Impact Analysis between the City of Franklin and Consultant/Developer.
Step 3 – Consultant, Traffic Engineer and Director of Engineering execute a MOU (Fees may apply per COF Ordinance 2015-64.
Step 4 – Consultant/Developer pays review fee and submits Transportation Impact Analysis.
Step 5 – City of Franklin prepares initial comments on the transportation impact analysis, if necessary.

Step 6 – Consultant submits corrections/revisions to the transportation impact analysis, if necessary.
Step 7 – City of Franklin prepares initial comments on proposed mitigation measures, if necessary
Step 8 – Consultant submits corrections/revisions on proposed mitigation measures, if necessary and electronic copy of the transportation impact analysis.
Step 9 – City of Franklin issues an assessment letter

Attachment B

Transportation Impact Analysis – Memorandum of Understanding (MOU)

This MOU acknowledges that the transportation impact analysis for the following project will be prepared in accordance with the latest version of City of Franklin Zoning Ordinance.

Project Name: Epoch Franklin .
Project Address: Oak Meadow Drive, east of S. Royal Oaks Boulevard .
Project Description: 352 apartments (240 units on north side, 112 apts on the south side) .

Attach a site map and a trip generation table with a description of the proposed land uses, ITE rates, estimated daily, morning, midday and afternoon peak hour volumes (ins/outs/totals), proposed trip credits, etc.

Project Buildout Year: 2018 Ambient or CMP Growth Rate: : 4 % Per Yr.

Study Intersections:

1. Oak Meadow Drive and Private Road for Home Depot / western project access	9. Oak Meadow Drive and the eastern project accesses
2. S. Royal Oaks Blvd and Oak Meadow Dr	10.
3. S. Royal Oaks Blvd and Center Point Pl / Riverside Dr	11.
4. Highway 96E and Royal Oaks Blvd (for data collection and signal timing purposes only)	12.
5. Highway 96E and Ramps for SB I-65(for data collection and signal timing purposes only)	13.
6. Highway 96E and Ramps for NB I-65(for data collection and signal timing purposes only)	14.

Trip Credits: (Exact amount of credit subject to approval by City of Franklin)

	Yes	No
Transit Usage		X
Existing Active Land Use		X
Previous Land Use		X
Internal Trip		X
Pass-By Trip		X

Exhibit B

Consultant:	FTG, LLC	Developer:	Epoch Residential
Address:	PO Box 682736	Address:	359 Carolina Avenue
	Franklin, TN 37068		Winter Park, FL 32789
Phone #:	(615) 771-8022	Phone #:	(321) 316-6005
e-mail address:	Gillian@FTGtraffic.com	e-mail address:	mccarley@epochresidential.com

Approved By: _____ _____

City of Franklin Traffic Engineer Director of Engineering

Reason for Request: (Planned Unit Development, Site Plan, Rezoning)

site plan

Description of Proposed Project (Address, Map/Parcel Number, etc.) (Attach a conceptual development plans showing all access points and adjacent streets.):

079 08800 00009079

079 10105 00109079

Existing Land Use (be specific):

undeveloped

Proposed Land Use (be specific):

240 apartments on 13.06 acres (north) and 112 apartments on 18.87 acres (south)

Potential Development Yield (number of residential units; building square footage, projected number of employees, hours of operations):

352 apartments

As applicant, I agree to pay to the City of Franklin 90% of the entire cost of the Transportation Impact Analysis.

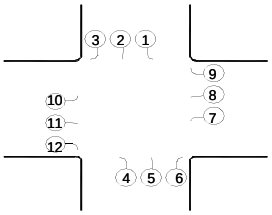
Property Owner Signature: _____

Property Owner Title: _____

Date: _____

The information above shall be submitted to the Engineering Department (109 3rd Ave South; Franklin, TN 37064) to review and provide estimated cost along with a proposed scope of services. All questions should be directed to Carl Baughman, Traffic Engineer III (615-791-3218).

APPENDIX B
EXISTING TRAFFIC COUNTS

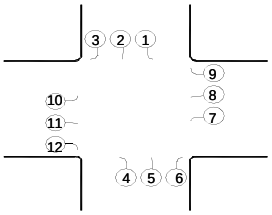


INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION: Oak Meadow Dr and Eastern Home Depot Access
DATE: 23-Feb-16 Tue
RECORDER: FTG
NOTES: unsignalized

LOCATION	S/B Home Depot Access			N/B			W/B Oak Meadow Dr			E/B Oak Meadow Dr				
TIME	1	2	3	4	5	6	7	8	9	10	11	12		
6:30-6:45								24			7		209	31
6:45-7:00								**54**			**13**		**228**	**67**
7:00-7:15								**50**			**13**		209	63
7:15-7:30								**36**			**12**		189	48
7:30-7:45								**43**			**7**		179	50
7:45-8:00								41			7			48
8:00-8:15								33			10			43
8:15-8:30								29			9			38
4:30-4:45								**46**			**33**		**344**	79
4:45-5:00								**33**			**49**		336	82
5:00-5:15								**41**			**48**		346	89
5:15-5:30								**48**			**46**		329	**94**
5:30-5:45								33			38		309	71
5:45-6:00								34			58			92
6:00-6:15								25			47			72
6:15-6:30								32			42			74
TOTAL								**602**			**439**			
AM PK HR								183			45		**6:45-7:45**	
PM PK HR								168			176		**4:30-5:30**	

AM PK PHF								0.85			0.87		**0.85**
PM PK PHF								0.88			0.90		**0.91**

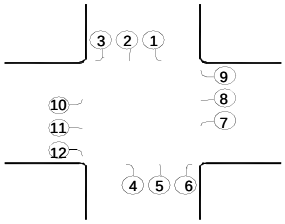


INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION: Oak Meadow Dr and Western Home Depot Access
DATE: 23-Feb-16 Tue
RECORDER: FTG
NOTES: unsignalized

LOCATION	S/B Home Depot Access			N/B			W/B Oak Meadow Dr			E/B Oak Meadow Dr				
TIME	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**		
6:30-6:45			1					24			7		213	32
6:45-7:00								**54**			**13**		**231**	**67**
7:00-7:15								**50**		**1**	**13**		213	64
7:15-7:30			**1**					**36**		**1**	**12**		192	50
7:30-7:45	**1**							**43**			**6**		180	50
7:45-8:00								41		1	7			49
8:00-8:15	1							33			9			43
8:15-8:30								29			9			38
4:30-4:45	**3**							**46**		**1**	**30**		**351**	80
4:45-5:00	**4**							**33**		**1**	**45**		343	83
5:00-5:15	**3**		**1**					**40**	**1**	**2**	**45**		354	92
5:15-5:30	**5**		**1**					**47**	**1**	**1**	**41**		335	**96**
5:30-5:45	3							33		1	35		314	72
5:45-6:00	6							34		2	52			94
6:00-6:15	7							25		1	40			73
6:15-6:30	5							32		1	37			75
TOTAL	**38**		**4**					**600**	**2**	**13**	**401**			
AM PK HR	1		1					183		2	44		**6:45-7:45**	
PM PK HR	15		2					166	2	5	161		**4:30-5:30**	

AM PK PHF	0.25		0.25					0.85		0.50	0.85		**0.86**
PM PK PHF	0.75		0.50					0.88	0.50	0.63	0.89		**0.91**

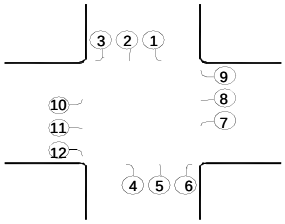


INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION: S. Royal Oaks Blvd and Oak Meadow Dr
DATE: 4-Feb-16 Thu
RECORDER: Burns
NOTES: signalized

LOCATION	S/B S. Royal Oaks Blvd			N/B S. Royal Oaks Blvd			W/B Oak Meadow Dr			E/B Oak Meadow Dr			
TIME	1	2	3	4	5	6	7	8	9	10	11	12	
6:30-6:45	1	96	15	17	231	2	2	2	21	28	4	9	1,978
6:45-7:00	**4**	**88**	**17**	**17**	**270**	**7**	**1**	**4**	**49**	**31**	**2**	**12**	**2,078**
7:00-7:15	**6**	**115**	**15**	**14**	**300**	**6**	**5**	**2**	**43**	**26**	**2**	**16**	2,071
7:15-7:30	**9**	**117**	**15**	**23**	**242**	**4**	**4**		**33**	**34**		**17**	1,995
7:30-7:45	**3**	**157**	**21**	**27**	**225**	**3**	**7**	**8**	**28**	**28**		**21**	1,972
7:45-8:00	5	172	15	17	199	2	8	4	29	30	1	13	
8:00-8:15	3	123	22	22	214	4	8	8	17	29	2	22	
8:15-8:30	6	142	19	18	213	3	7	3	19	24		21	
4:30-4:45	**25**	**187**	**40**	**17**	**169**		**20**	**9**	**17**	**44**	**6**	**26**	**2,272**
4:45-5:00	**29**	**179**	**29**	**18**	**200**	**6**	**17**	**2**	**14**	**25**	**11**	**31**	2,225
5:00-5:15	**32**	**170**	**33**	**28**	**222**	**5**	**19**	**5**	**17**	**35**	**10**	**29**	2,170
5:15-5:30	**32**	**172**	**32**	**22**	**175**	**2**	**21**	**6**	**21**	**32**	**8**	**23**	2,016
5:30-5:45	27	150	29	16	188	4	14	3	16	33	5	28	1,932
5:45-6:00	33	158	33	8	162	11	12	7	15	35	10	22	
6:00-6:15	34	164	16	20	138	3	10	9	6	22	4	25	
6:15-6:30	33	175	18	9	148	1	17	6	9	23	4	19	
TOTAL	**282**	**2,365**	**369**	**293**	**3,296**	**63**	**172**	**78**	**354**	**479**	**69**	**334**	
AM PK HR	22	477	68	81	1,037	20	17	14	153	119	4	66	**6:45-7:45**
PM PK HR	118	708	134	85	766	13	77	22	69	136	35	109	**4:30-5:30**

AM PK PHF	0.61	0.76	0.81	0.75	0.86	0.71	0.61	0.44	0.78	0.88	0.50	0.79	**0.94**
PM PK PHF	0.92	0.95	0.84	0.76	0.86	0.54	0.92	0.61	0.82	0.77	0.80	0.88	**0.94**

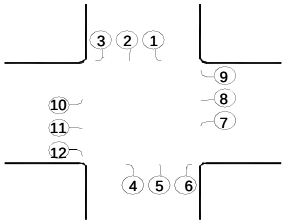


INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION: S. Royal Oaks Blvd and Rand Place / Home Depot
DATE: 23-Feb-16 Tue
RECORDER: Burns
NOTES: unsignalized

LOCATION	S/B S. Royal Oaks Blvd			N/B S. Royal Oaks Blvd			W/B Home Depot Access			E/B Rand Place			
TIME	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	
6:30-6:45	13	93	10	3	279	11	2	1	2	6	1		1,934
6:45-7:00	**10**	**132**	**8**	**2**	**358**	**6**	**2**		**1**	**5**		**1**	**2,048**
7:00-7:15	**15**	**119**	**12**		**364**	**5**	**1**		**1**	**8**	**1**	**1**	2,029
7:15-7:30	**9**	**153**	**9**	**4**	**264**	**5**	**2**		**7**	**4**		**4**	1,968
7:30-7:45	**11**	**182**	**18**	**3**	**295**	**7**	**8**		**2**	**7**		**2**	1,986
7:45-8:00	6	188	6	4	279	9	3		5	2		4	
8:00-8:15	13	172	14	4	240	6	2	1	3	5		6	
8:15-8:30	11	123	11	7	307	7	2		4	7			
4:30-4:45	**5**	**207**	**19**	**1**	**218**	**5**	**11**		**6**	**8**	**1**	**4**	**2,005**
4:45-5:00	**5**	**211**	**27**	**1**	**209**	**3**	**3**		**8**	**6**	**1**	**6**	1,987
5:00-5:15	**5**	**228**	**26**	**2**	**235**	**4**	**4**	**3**	**3**	**5**		**2**	1,967
5:15-5:30	**5**	**237**	**25**	**2**	**234**	**4**	**1**	**1**	**5**	**5**	**1**	**3**	1,888
5:30-5:45	2	262	17	4	156	1	5	1	3	12		4	1,720
5:45-6:00	3	211	23	4	196	2	3	1	4	7		6	
6:00-6:15	3	213	18	2	168	3	5	1	4	12	2	7	
6:15-6:30	1	204	17	2	115	3	2			8		3	
TOTAL	**117**	**2,935**	**260**	**45**	**3,917**	**81**	**56**	**9**	**58**	**107**	**7**	**53**	
AM PK HR	45	586	47	9	1,281	23	13		11	24	1	8	**6:45-7:45**
PM PK HR	20	883	97	6	896	16	19	4	22	24	3	15	**4:30-5:30**

AM PK PHF	0.75	0.80	0.65	0.56	0.88	0.82	0.41		0.39	0.75	0.25	0.50	**0.97**
PM PK PHF	1.00	0.93	0.90	0.75	0.95	0.80	0.43	0.33	0.69	0.75	0.75	0.63	**0.96**

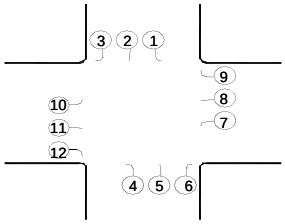


INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION: S. Royal Oaks Blvd and Center Point Pl and Riverside Dr
DATE: 4-Feb-16 Thu
RECORDER: Burns
NOTES: signalized

LOCATION	S/B S. Royal Oaks Blvd			N/B S. Royal Oaks Blvd			W/B Riverside Dr			E/B Cener Point Pl			
TIME	1	2	3	4	5	6	7	8	9	10	11	12	
6:30-6:45	50	105	4	3	226	24	6	2	13	0	3	6	2,202
6:45-7:00	45	113	5	2	335	22	5	0	23	2	9	3	2,321
7:00-7:15	**63**	**130**	**4**	**3**	**306**	**22**	**4**	**4**	**26**	**0**	**7**	**10**	**2,378**
7:15-7:30	**59**	**161**	**8**	**7**	**297**	**30**	**10**	**4**	**20**	**0**	**14**	**7**	2,372
7:30-7:45	**63**	**158**	**4**	**8**	**253**	**16**	**12**	**2**	**21**	**3**	**12**	**9**	2,375
7:45-8:00	**62**	**220**	**7**	**8**	**244**	**27**	**5**	**1**	**22**	**3**	**10**	**12**	
8:00-8:15	74	161	8	7	232	19	11	3	33	4	14	7	
8:15-8:30	70	194	6	7	231	25	13	5	31	10	10	18	
4:30-4:45	**56**	**255**	**24**	**19**	**240**	**6**	**11**	**15**	**59**	**21**	**14**	**38**	**2,942**
4:45-5:00	**48**	**243**	**16**	**30**	**228**	**4**	**13**	**14**	**67**	**15**	**15**	**29**	2,865
5:00-5:15	**47**	**233**	**28**	**12**	**247**	**7**	**11**	**20**	**71**	**28**	**13**	**30**	2,829
5:15-5:30	**64**	**233**	**18**	**22**	**240**	**8**	**8**	**5**	**70**	**13**	**17**	**17**	2,730
5:30-5:45	60	223	25	14	221	9	8	8	47	15	29	22	2,571
5:45-6:00	55	206	23	20	228	13	6	7	52	25	22	29	
6:00-6:15	61	200	19	19	199	6	7	10	63	25	14	25	
6:15-6:30	37	184	21	17	166	6	11	10	33	25	17	29	
TOTAL	**914**	**3,019**	**220**	**198**	**3,893**	**244**	**141**	**110**	**651**	**189**	**220**	**291**	
AM PK HR	247	669	23	26	1,100	95	31	11	89	6	43	38	**7:00-8:00**
PM PK HR	215	964	86	83	955	25	43	54	267	77	59	114	**4:30-5:30**

AM PK PHF	0.98	0.76	0.72	0.81	0.90	0.79	0.65	0.69	0.86	0.50	0.77	0.79	**0.96**
PM PK PHF	0.84	0.95	0.77	0.69	0.97	0.78	0.83	0.68	0.94	0.69	0.87	0.75	**0.97**

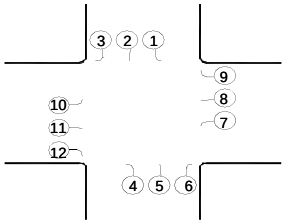


INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION: Murfreesboro Road and Royal Oaks Blvd
DATE: 11-Feb-16 Thu
RECORDER: Burns
NOTES: signalized

LOCATION	S/B N. Royal Oaks Blvd			N/B S. Royal Oaks Blvd			W/B Murfreesboro Road			E/B Murfreesboro Road			
TIME	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	
6:30-6:45	21	26	8	14	38	211	99	137	37	4	118	7	3,669
6:45-7:00	29	17	4	24	80	244	123	193	43	15	168	8	4,005
7:00-7:15	48	27	5	28	119	253	107	159	37	20	166	13	4,252
7:15-7:30	51	25	14	22	53	236	160	204	57	21	163	13	4,384
7:30-7:45	**53**	**39**	**18**	**25**	**70**	**213**	**162**	**210**	**58**	**29**	**165**	**14**	**4,492**
7:45-8:00	**50**	**43**	**20**	**26**	**56**	**267**	**210**	**234**	**72**	**25**	**181**	**11**	
8:00-8:15	**53**	**36**	**19**	**14**	**48**	**205**	**193**	**249**	**61**	**23**	**202**	**11**	
8:15-8:30	**52**	**61**	**19**	**27**	**44**	**224**	**191**	**226**	**69**	**27**	**167**	**20**	
4:30-4:45	**71**	**94**	**37**	**28**	**90**	**220**	**195**	**284**	**54**	**45**	**238**	**15**	**5,614**
4:45-5:00	**67**	**103**	**47**	**32**	**78**	**213**	**198**	**252**	**61**	**50**	**275**	**17**	5,552
5:00-5:15	**78**	**90**	**39**	**38**	**74**	**235**	**222**	**272**	**60**	**41**	**267**	**12**	5,358
5:15-5:30	**77**	**107**	**42**	**33**	**73**	**205**	**217**	**279**	**74**	**55**	**246**	**14**	5,160
5:30-5:45	81	101	41	22	74	187	199	271	60	42	211	20	4,965
5:45-6:00	68	78	47	25	72	157	175	208	119	33	197	20	
6:00-6:15	80	89	44	32	65	169	169	234	60	42	229	17	
6:15-6:30	72	87	38	19	54	175	183	260	58	49	219	13	
TOTAL	**951**	**1,023**	**442**	**409**	**1,088**	**3,414**	**2,803**	**3,672**	**980**	**521**	**3,212**	**225**	
AM PK HR	208	179	76	92	218	909	756	919	260	104	715	56	**7:30-8:30**
PM PK HR	293	394	165	131	315	873	832	1,087	249	191	1,026	58	**4:30-5:30**

AM PK PHF	0.98	0.73	0.95	0.85	0.78	0.85	0.90	0.92	0.90	0.90	0.88	0.70	**0.94**
PM PK PHF	0.94	0.92	0.88	0.86	0.88	0.93	0.94	0.96	0.84	0.87	0.93	0.85	**0.98**

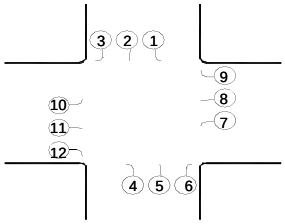


INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION: Murfreesboro Road and the Ramps for Southbound I-65
DATE: 11-Feb-16 Thu
RECORDER: Burns
NOTES: signalized

LOCATION	S/B Ramps			N/B			W/B Murfreesboro Road			E/B Murfreesboro Road			
TIME	1	2	3	4	5	6	7	8	9	10	11	12	
6:30-6:45	63		148				11				369	34	2,929
6:45-7:00	69		181				31				406	47	3,112
7:00-7:15	66		139				30				471	49	3,159
7:15-7:30	**73**		**196**				**37**				**452**	**57**	**3,168**
7:30-7:45	**61**		**237**				**32**				**432**	**46**	3,140
7:45-8:00	**91**		**245**				**18**				**385**	**42**	
8:00-8:15	**86**		**219**				**29**				**385**	**45**	
8:15-8:30	91		240				24				393	39	
4:30-4:45	**205**		**299**				**71**				**480**	**114**	**4,656**
4:45-5:00	**222**		**322**				**48**				**388**	**95**	4,524
5:00-5:15	**197**		**298**				**76**				**470**	**119**	4,499
5:15-5:30	**222**		**374**				**69**				**469**	**118**	4,376
5:30-5:45	175		319				56				385	102	4,089
5:45-6:00	181		349				44				383	93	
6:00-6:15	196		290				43				408	100	
6:15-6:30	178		256				40				414	77	
TOTAL	**2,176**		**4,112**				**659**				**6,690**	**1,177**	
AM PK HR	311		897				116				1,654	190	**7:15-8:15**
PM PK HR	846		1,293				264				1,807	446	**4:30-5:30**

AM PK PHF	0.85		0.92				0.91				0.96	1.03	**0.97**
PM PK PHF	0.95		0.86				0.87				0.94	0.94	**0.93**



INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION: Murfreesboro Road and the Ramps for Northbound I-65
DATE: 11-Feb-16 Thu
RECORDER: Burns
NOTES: signalized

LOCATION	S/B Ramps			N/B			W/B Murfreesboro Road			E/B Murfreesboro Road			
TIME	1	2	3	4	5	6	7	8	9	10	11	12	
6:30-6:45				74		78		144	286	278			3,695
6:45-7:00				**109**		**94**		**150**	**306**	**319**			**3,772**
7:00-7:15				**65**		**66**		**183**	**306**	**331**			3,689
7:15-7:30				**94**		**92**		**154**	**267**	**299**			3,592
7:30-7:45				**107**		**85**		**213**	**248**	**284**			3,508
7:45-8:00				72		101		243	236	243			
8:00-8:15				108		82		182	223	259			
8:15-8:30				91		67		234	223	207			
4:30-4:45				**80**		**40**		**229**	**138**	**215**			**2,712**
4:45-5:00				**75**		**39**		**231**	**134**	**187**			2,597
5:00-5:15				**63**		**39**		**251**	**123**	**208**			2,490
5:15-5:30				**66**		**34**		**213**	**143**	**204**			2,376
5:30-5:45				49		40		200	105	193			2,230
5:45-6:00				79		46		161	101	172			
6:00-6:15				71		44		183	106	166			
6:15-6:30				52		44		176	89	153			
TOTAL				**1,255**		**991**		**1,503**	**3,034**	**3,718**			
AM PK HR				375		337		700	1,127	1,233			**6:45-7:45**
PM PK HR				284		152		814	924	538			**4:30-5:30**

AM PK PHF				0.86		0.90		0.82	0.92	0.93	#DIV/0!		**0.96**
PM PK PHF				0.89		0.95		0.95	0.92	0.94	#DIV/0!		**0.97**

APPENDIX C
CAPACITY ANALYSES

EXISTING CONDITIONS

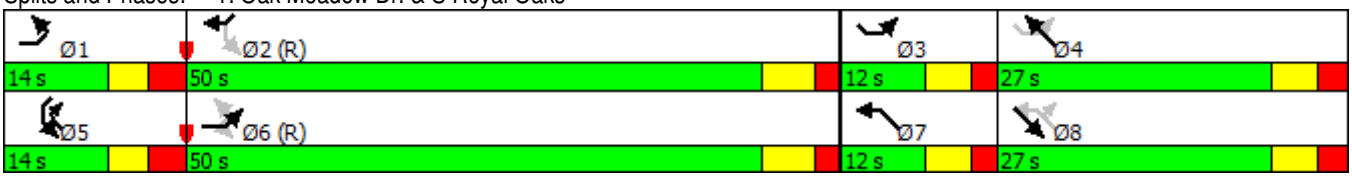
Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Lane Configurations												
Traffic Volume (vph)	81	1037	20	119	4	66	17	14	153	22	477	68
Future Volume (vph)	81	1037	20	119	4	66	17	14	153	22	477	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	11	11	11	11	12	12	13	12	12	12	12
Storage Length (ft)		70	150	75		0	100		195	180	0	
Storage Lanes		3	0	1		0	1		1	1	2	
Taper Length (ft)		50		50			50			50		
Lane Util. Factor	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88	1.00
Frt			0.850		0.861				0.850		0.850	
Flt Protected	0.950	0.950		0.950			0.950			0.950		
Satd. Flow (prot)	1534	3319	1531	1711	1550	0	1770	1925	1583	1770	2787	0
Flt Permitted	0.308	0.950		0.742			0.583			0.208		
Satd. Flow (perm)	497	3319	1531	1336	1550	0	1086	1925	1583	387	2787	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			154		90				101		154	
Link Speed (mph)		30			25			40		30		
Link Distance (ft)		552			721			918		1624		
Travel Time (s)		12.5			19.7			15.6		36.9		
Peak Hour Factor	0.67	0.94	0.63	0.79	0.58	0.73	0.75	0.58	0.92	0.75	0.75	0.69
Adj. Flow (vph)	121	1103	32	151	7	90	23	24	166	29	636	99
Shared Lane Traffic (%)												
Lane Group Flow (vph)	121	1103	32	151	97	0	23	24	166	29	735	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Right	Right
Median Width(ft)		30			12			12		12		
Link Offset(ft)		0			0			0		0		
Crosswalk Width(ft)		16			16			16		16		
Two way Left Turn Lane												
Headway Factor	1.20	1.04	1.04	1.04	1.04	1.00	1.00	0.96	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	9	15		9	15		9	15	9	9
Number of Detectors	1	1	1	1	1		1	1	1	1	1	
Detector Template												
Leading Detector (ft)	42	42	42	42	42		42	42	42	42	42	
Trailing Detector (ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	45	45	45	45		45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	pm+pt	Prot	Perm	D.P+P	NA		D.P+P	NA	custom	pm+pt	Prot	
Protected Phases	1	6		3	8		7	4	5	5	2	
Permitted Phases	6		6	4			8		8	2		
Detector Phase	1	6		3	8		7	4	5	5	2	
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	7.0		7.0	7.0	7.0	7.0	20.0	
Minimum Split (s)	13.0	26.0	26.0	12.5	20.0		12.5	20.0	13.0	13.0	26.0	

Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Total Split (s)	14.0	50.0	50.0	12.0	27.0		12.0	27.0	14.0	14.0	50.0	
Total Split (%)	13.6%	48.5%	48.5%	11.7%	26.2%		11.7%	26.2%	13.6%	13.6%	48.5%	
Maximum Green (s)	8.0	44.0	44.0	6.5	21.0		6.5	21.0	8.0	8.0	44.0	
Yellow Time (s)	3.0	4.0	4.0	3.5	3.5		3.5	3.5	3.0	3.0	4.0	
All-Red Time (s)	3.0	2.0	2.0	2.0	2.5		2.0	2.5	3.0	3.0	2.0	
Lost Time Adjust (s)	-2.5	-1.5	-1.5	-2.5	-2.5		-2.5	-2.5	-2.5	-2.5	-1.5	
Total Lost Time (s)	3.5	4.5	4.5	3.0	3.5		3.0	3.5	3.5	3.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.0	5.0	1.5	3.5		1.5	3.5	1.5	1.5	5.0	
Recall Mode	None	C-Min	C-Min	None	None		None	None	None	None	C-Min	
Act Effct Green (s)	77.4	66.6	66.6	14.7	10.8		14.7	10.8	21.2	76.9	66.4	
Actuated g/C Ratio	0.75	0.65	0.65	0.14	0.10		0.14	0.10	0.21	0.75	0.64	
v/c Ratio	0.26	0.51	0.03	0.67	0.40		0.11	0.12	0.41	0.07	0.40	
Control Delay	5.3	12.0	0.1	54.1	15.7		34.1	42.2	16.9	4.5	8.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	5.3	12.0	0.1	54.1	15.7		34.1	42.2	16.9	4.5	8.6	
LOS	A	B	A	D	B		C	D	B	A	A	
Approach Delay		11.1			39.0			21.6		8.4		
Approach LOS		B			D			C		A		
90th %ile Green (s)	8.0	54.3	54.3	6.5	11.7		6.5	11.7	7.0	7.0	53.3	
90th %ile Term Code	Max	Coord	Coord	Max	Gap		Max	Hold	Min	Min	Coord	
70th %ile Green (s)	7.3	57.4	57.4	6.5	8.6		6.5	8.6	7.0	7.0	57.1	
70th %ile Term Code	Gap	Coord	Coord	Max	Gap		Max	Hold	Min	Min	Coord	
50th %ile Green (s)	7.0	71.0	71.0	7.5	7.0		0.0	0.0	7.0	7.0	71.0	
50th %ile Term Code	Min	Coord	Coord	Hold	Min		Skip	Skip	Min	Min	Coord	
30th %ile Green (s)	7.0	71.0	71.0	7.5	7.0		0.0	0.0	7.0	7.0	71.0	
30th %ile Term Code	Min	Coord	Coord	Hold	Min		Skip	Skip	Min	Min	Coord	
10th %ile Green (s)	7.0	72.0	72.0	6.5	0.0		0.0	0.0	7.0	7.0	72.0	
10th %ile Term Code	Min	Coord	Coord	Max	Skip		Skip	Skip	Min	Min	Coord	
Stops (vph)	21	538	0	110	17		15	14	53	7	205	
Fuel Used(gal)	1	10	0	2	1		0	0	2	0	9	
CO Emissions (g/hr)	39	697	6	172	50		26	24	140	24	628	
NOx Emissions (g/hr)	8	136	1	33	10		5	5	27	5	122	
VOC Emissions (g/hr)	9	162	1	40	12		6	6	32	5	146	
Dilemma Vehicles (#)	0	0	0	0	0		0	1	0	0	0	
Queue Length 50th (ft)	10	145	0	100	4		14	15	35	2	71	
Queue Length 95th (ft)	32	308	0	120	13		27	25	88	12	130	
Internal Link Dist (ft)		472			641			838		1544		
Turn Bay Length (ft)	70	70	150	75			100		195	180		
Base Capacity (vph)	482	2147	1044	224	423		214	439	420	433	1850	
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	0.25	0.51	0.03	0.67	0.23		0.11	0.05	0.40	0.07	0.40	

Intersection Summary	
Area Type:	Other
Cycle Length: 103	

Actuated Cycle Length: 103	
Offset: 0 (0%), Referenced to phase 2:SWL and 6:EBL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 13.9	Intersection LOS: B
Intersection Capacity Utilization 59.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: Oak Meadow Dr. & S Royal Oaks



Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	26	1100	95	247	669	23	6	43	38	31	11	89
Future Volume (vph)	26	1100	95	247	669	23	6	43	38	31	11	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	12	11	12	11	11	12	12	11	12
Grade (%)		1%			-2%			-1%			2%	
Storage Length (ft)	80		135	220		0	100		0	120		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.993			0.934			0.871	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	3438	1607	1787	3428	0	1754	1624	0	1787	1523	0
Flt Permitted	0.377			0.182			0.489			0.520		
Satd. Flow (perm)	665	3438	1607	342	3428	0	903	1624	0	978	1523	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			82		5			30			103	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1624			792			957			515	
Travel Time (s)		36.9			18.0			21.8			11.7	
Peak Hour Factor	0.63	0.92	0.87	0.80	0.99	0.67	0.58	0.68	0.77	0.67	0.63	0.86
Heavy Vehicles (%)	0%	1%	0%	2%	2%	4%	0%	11%	0%	0%	10%	3%
Adj. Flow (vph)	41	1196	109	309	676	34	10	63	49	46	17	103
Shared Lane Traffic (%)												
Lane Group Flow (vph)	41	1196	109	309	710	0	10	112	0	46	120	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.10	1.05	1.01	0.99	1.03	0.99	1.04	1.04	0.99	1.01	1.06	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	0	1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	42	226	0	42	226		42	42		42	42	
Trailing Detector (ft)	-3	220	0	-3	220		-3	-3		-3	-3	
Detector 1 Position(ft)	-3	220	0	-3	220		-3	-3		-3	-3	
Detector 1 Size(ft)	45	6	50	45	6		45	45		45	45	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA		D.Pm	NA		D.Pm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6		6	2			8			4		
Detector Phase	1	6		5	2		8	4		4	8	
Switch Phase												

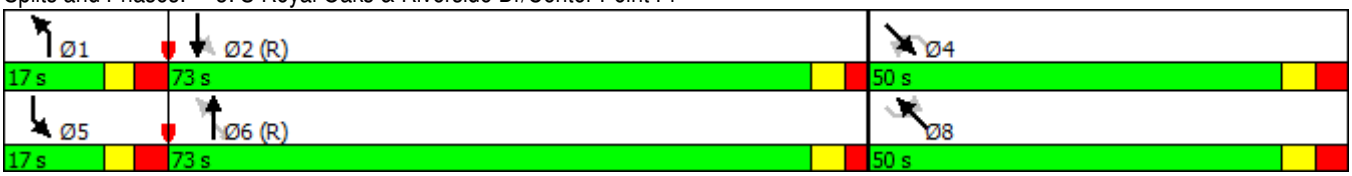
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	17.0	73.0	73.0	17.0	73.0		50.0	50.0		50.0	50.0	
Total Split (s)	17.0	73.0	73.0	17.0	73.0		50.0	50.0		50.0	50.0	
Total Split (%)	12.1%	52.1%	52.1%	12.1%	52.1%		35.7%	35.7%		35.7%	35.7%	
Maximum Green (s)	10.5	67.0	67.0	10.5	67.0		43.0	43.0		43.0	43.0	
Yellow Time (s)	3.0	3.5	3.5	3.0	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	3.5	2.5	2.5	3.5	2.5		3.5	3.5		3.5	3.5	
Lost Time Adjust (s)	-1.0	-3.0	-3.0	-1.0	-3.0		-2.5	-2.5		-2.5	-2.5	
Total Lost Time (s)	5.5	3.0	3.0	5.5	3.0		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
Recall Mode	None	C-Min	C-Min	None	C-Min		None	None		None	None	
Walk Time (s)		7.0	7.0		7.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)		16.0	16.0		20.0		35.0	32.0		32.0	35.0	
Pedestrian Calls (#/hr)		0	0		0		0	0		0	0	
Act Effct Green (s)	105.1	99.9	99.9	112.9	106.2		15.6	15.6		15.6	15.6	
Actuated g/C Ratio	0.75	0.71	0.71	0.81	0.76		0.11	0.11		0.11	0.11	
v/c Ratio	0.07	0.49	0.09	0.78	0.27		0.10	0.54		0.43	0.46	
Control Delay	3.6	10.1	2.5	37.9	2.9		49.5	43.9		68.5	19.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	3.6	10.1	2.5	37.9	2.9		49.5	43.9		68.5	19.4	
LOS	A	B	A	D	A		D	D		E	B	
Approach Delay		9.2			13.5			44.3			33.0	
Approach LOS		A			B			D			C	
90th %ile Green (s)	7.6	90.9	90.9	10.5	93.8		19.1	19.1		19.1	19.1	
90th %ile Term Code	Gap	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
70th %ile Green (s)	7.0	94.5	94.5	10.5	98.0		15.5	15.5		15.5	15.5	
70th %ile Term Code	Gap	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
50th %ile Green (s)	6.6	96.9	96.9	10.5	100.8		13.1	13.1		13.1	13.1	
50th %ile Term Code	Gap	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
30th %ile Green (s)	6.3	99.4	99.4	10.5	103.6		10.6	10.6		10.6	10.6	
30th %ile Term Code	Gap	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
10th %ile Green (s)	0.0	102.9	102.9	10.5	119.9		7.1	7.1		7.1	7.1	
10th %ile Term Code	Skip	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
Stops (vph)	6	463	9	181	127		7	63		28	22	
Fuel Used(gal)	0	19	1	4	5		0	2		1	1	
CO Emissions (g/hr)	27	1310	91	310	376		10	117		50	64	
NOx Emissions (g/hr)	5	255	18	60	73		2	23		10	12	
VOC Emissions (g/hr)	6	304	21	72	87		2	27		12	15	
Dilemma Vehicles (#)	0	0	0	0	0		0	0		0	0	
Queue Length 50th (ft)	6	228	7	124	63		9	77		40	14	
Queue Length 95th (ft)	11	320	26	m161	m85		18	99		58	24	
Internal Link Dist (ft)		1544			712			877			435	
Turn Bay Length (ft)	80		135	220			100			120		
Base Capacity (vph)	600	2453	1170	394	2601		293	548		317	564	
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	

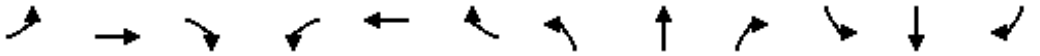
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Reduced v/c Ratio	0.07	0.49	0.09	0.78	0.27		0.03	0.20		0.15	0.21	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 139 (99%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 14.0		Intersection LOS: B	
Intersection Capacity Utilization 64.1%		ICU Level of Service C	
Analysis Period (min) 15			

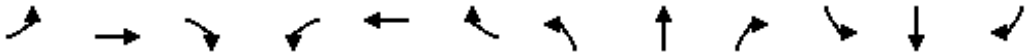
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: S Royal Oaks & Riverside Dr/Center Point Pl





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	104	715	56	756	919	260	92	218	909	208	179	76
Future Volume (vph)	104	715	56	756	919	260	92	218	909	208	179	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	11	12	13	12	13	13	11	11	11
Grade (%)		0%			0%			1%			0%	
Storage Length (ft)	200		300	285		0	195		450	220		650
Storage Lanes	2		1	2		1	2		2	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.95	0.88	0.97	0.95	0.95
Frt		0.988				0.850			0.850		0.958	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3400	4688	0	3286	3406	1620	3350	3639	2865	3319	3232	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3400	4688	0	3286	3406	1620	3350	3639	2865	3319	3232	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		10				201					36	
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		700			691			792			964	
Travel Time (s)		11.9			11.8			18.0			21.9	
Peak Hour Factor	0.80	0.90	0.80	0.93	0.91	0.88	0.82	0.80	0.93	0.92	0.74	0.81
Heavy Vehicles (%)	3%	6%	2%	3%	6%	3%	4%	2%	2%	2%	4%	2%
Adj. Flow (vph)	130	794	70	813	1010	295	112	273	977	226	242	94
Shared Lane Traffic (%)												
Lane Group Flow (vph)	130	864	0	813	1010	295	112	273	977	226	336	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		30			24			30			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.04	1.00	1.04	1.00	0.96	1.01	0.96	0.96	1.04	1.04	1.04
Turning Speed (mph)	18		10	18		10	18		10	18		10
Number of Detectors	1	1		1	1	0	1	2	1	1	2	
Detector Template												
Leading Detector (ft)	42	236		42	236	0	42	146	42	42	146	
Trailing Detector (ft)	-3	230		-3	230	0	-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	230		-3	230	230	-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	6		45	6	6	45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)								140			140	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	

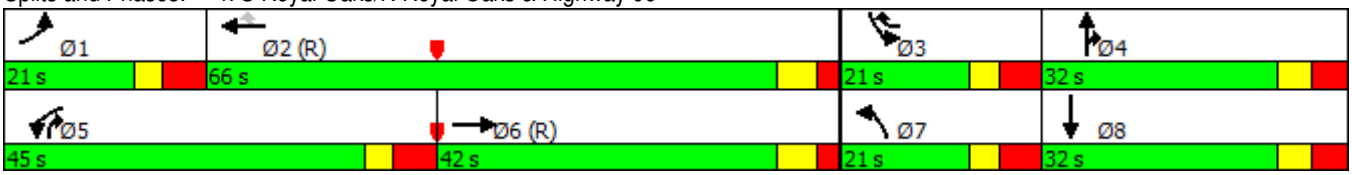


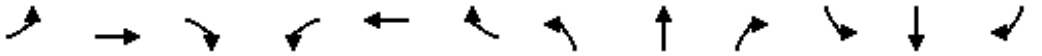
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	1	6		5	2	3	7	4	4 5	3	8	
Permitted Phases						2						
Detector Phase	1	6		5	2	3	7	4	4 5	3	8	
Switch Phase												
Minimum Initial (s)	6.0	13.0		6.0	13.0	6.0	6.0	10.0		6.0	10.0	
Minimum Split (s)	21.0	42.0		45.0	66.0	21.0	21.0	32.0		21.0	32.0	
Total Split (s)	21.0	42.0		45.0	66.0	21.0	21.0	32.0		21.0	32.0	
Total Split (%)	15.0%	30.0%		32.1%	47.1%	15.0%	15.0%	22.9%		15.0%	22.9%	
Maximum Green (s)	13.5	35.5		37.5	59.5	13.5	13.5	24.5		13.5	24.5	
Yellow Time (s)	3.0	4.0		3.0	4.0	3.0	3.0	3.5		3.0	3.5	
All-Red Time (s)	4.5	2.5		4.5	2.5	4.5	4.5	4.0		4.5	4.0	
Lost Time Adjust (s)	-2.5	-2.5		-2.5	-2.5	-2.0	-2.0	-3.0		-2.0	-3.0	
Total Lost Time (s)	5.0	4.0		5.0	4.0	5.5	5.5	4.5		5.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	6.0		3.0	6.0	3.0	3.0	4.5		3.0	4.5	
Recall Mode	None	C-Min		None	C-Min	None	None	None		None	None	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		37.0			24.0			36.0			36.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	13.2	38.9		39.8	65.4	84.3	12.0	27.5	71.8	14.9	30.3	
Actuated g/C Ratio	0.09	0.28		0.28	0.47	0.60	0.09	0.20	0.51	0.11	0.22	
v/c Ratio	0.40	0.66		0.87	0.63	0.28	0.39	0.38	0.67	0.64	0.46	
Control Delay	77.5	38.6		49.2	40.8	6.0	55.8	51.9	34.8	68.9	45.0	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	77.5	38.6		49.2	40.8	6.0	55.8	51.9	34.8	68.9	45.0	
LOS	E	D		D	D	A	E	D	C	E	D	
Approach Delay		43.7			39.2			40.0			54.6	
Approach LOS		D			D			D			D	
90th %ile Green (s)	13.5	35.5		37.5	59.5	13.5	12.9	24.5		13.5	25.1	
90th %ile Term Code	Max	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
70th %ile Green (s)	12.0	35.5		37.5	61.0	13.5	11.2	24.5		13.5	26.8	
70th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
50th %ile Green (s)	10.8	35.5		37.5	62.2	13.5	10.0	24.5		13.5	28.0	
50th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
30th %ile Green (s)	9.6	35.9		37.5	63.8	13.1	8.9	24.5		13.1	28.7	
30th %ile Term Code	Gap	Coord		Max	Coord	Gap	Gap	Max		Gap	Hold	
10th %ile Green (s)	7.8	39.4		36.4	68.0	10.7	7.2	24.5		10.7	28.0	
10th %ile Term Code	Gap	Coord		Gap	Coord	Gap	Gap	Max		Gap	Hold	
Stops (vph)	104	667		657	884	60	85	201	635	196	196	
Fuel Used(gal)	3	16		20	24	3	2	5	16	6	5	
CO Emissions (g/hr)	221	1137		1407	1661	210	146	333	1088	389	373	
NOx Emissions (g/hr)	43	221		274	323	41	28	65	212	76	73	
VOC Emissions (g/hr)	51	264		326	385	49	34	77	252	90	86	
Dilemma Vehicles (#)	0	26		0	34	0	0	0	0	0	0	
Queue Length 50th (ft)	63	260		352	503	50	50	128	322	103	125	
Queue Length 95th (ft)	88	310		m412	m539	m80	73	146	567	148	141	
Internal Link Dist (ft)		620			611			712			884	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	200			285			195		450	220		
Base Capacity (vph)	388	1308		938	1591	1061	370	714	1473	367	728	
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	0.34	0.66		0.87	0.63	0.28	0.30	0.38	0.66	0.62	0.46	

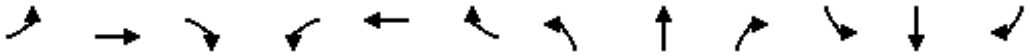
Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 116 (83%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.87			
Intersection Signal Delay: 42.0		Intersection LOS: D	
Intersection Capacity Utilization 66.7%		ICU Level of Service C	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 4: S Royal Oaks/N Royal Oaks & Highway 96





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1595	172	103	972	0	0	0	0	329	0	941
Future Volume (vph)	0	1595	172	103	972	0	0	0	0	329	0	941
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	12	12	12	12	12	12	11
Grade (%)		0%			0%			0%			1%	
Storage Length (ft)	0		0	420		0	0		0	350		0
Storage Lanes	0		1	0		0	0		0	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.86	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	0.88
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	6346	1509	1787	3388	0	0	0	0	3287	0	2654
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	6346	1509	1787	3388	0	0	0	0	3287	0	2654
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			181									147
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		501			556			756			888	
Travel Time (s)		8.5			9.5			20.6			24.2	
Peak Hour Factor	1.00	0.91	0.90	0.86	0.87	1.00	1.00	1.00	1.00	0.85	1.00	0.94
Heavy Vehicles (%)	2%	3%	7%	1%	3%	2%	2%	2%	2%	6%	2%	3%
Adj. Flow (vph)	0	1753	191	120	1117	0	0	0	0	387	0	1001
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1753	191	120	1117	0	0	0	0	387	0	1001
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.04	1.00	1.00	1.00	1.00	1.01	1.01	1.05
Turning Speed (mph)	15		12	15		9	15		9	18		12
Number of Detectors		1	0	1	1					1		1
Detector Template												
Leading Detector (ft)		300	0	42	300					42		42
Trailing Detector (ft)		294	0	-3	294					-3		-3
Detector 1 Position(ft)		294	-3	-3	294					-3		-3
Detector 1 Size(ft)		6	45	45	6					45		45
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Turn Type		NA	Perm	Prot	NA					Prot		Prot
Protected Phases		6		5	2					4		4
Permitted Phases			6									
Detector Phase		6	6	5	2					4		4
Switch Phase												



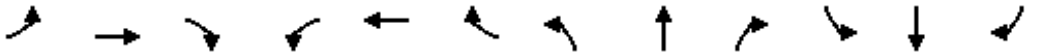
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		25.0	25.0	5.0	25.0					15.0		15.0
Minimum Split (s)		62.0	62.0	23.0	85.0					55.0		55.0
Total Split (s)		62.0	62.0	23.0	85.0					55.0		55.0
Total Split (%)		44.3%	44.3%	16.4%	60.7%					39.3%		39.3%
Maximum Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
Yellow Time (s)		4.0	4.0	3.0	4.0					4.0		4.0
All-Red Time (s)		2.0	2.0	3.0	2.0					3.5		3.5
Lost Time Adjust (s)		-2.0	-2.0	-1.0	-2.0					-2.0		-2.0
Total Lost Time (s)		4.0	4.0	5.0	4.0					5.5		5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		4.5	4.5	3.0	4.5					3.0		3.0
Recall Mode		C-Min	C-Min	None	C-Min					None		None
Act Effct Green (s)		60.9	60.9	15.1	81.0					49.5		49.5
Actuated g/C Ratio		0.44	0.44	0.11	0.58					0.35		0.35
v/c Ratio		0.64	0.25	0.62	0.57					0.33		0.97
Control Delay		23.9	4.3	69.3	18.2					34.2		59.3
Queue Delay		0.1	0.0	0.0	0.3					1.2		0.0
Total Delay		24.0	4.3	69.3	18.5					35.3		59.3
LOS		C	A	E	B					D		E
Approach Delay		22.0			23.5							
Approach LOS		C			C							
90th %ile Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
90th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
70th %ile Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
70th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
50th %ile Green (s)		58.2	58.2	14.8	79.0					47.5		47.5
50th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
30th %ile Green (s)		60.5	60.5	12.5	79.0					47.5		47.5
30th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
10th %ile Green (s)		63.7	63.7	9.3	79.0					47.5		47.5
10th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
Stops (vph)		879	29	103	466					235		753
Fuel Used(gal)		29	2	3	12					6		21
CO Emissions (g/hr)		2048	128	199	828					397		1494
NOx Emissions (g/hr)		398	25	39	161					77		291
VOC Emissions (g/hr)		475	30	46	192					92		346
Dilemma Vehicles (#)		41	0	0	24					0		0
Queue Length 50th (ft)		231	16	116	273					132		451
Queue Length 95th (ft)		330	51	m156	m273					164		#617
Internal Link Dist (ft)		421			476			676			808	
Turn Bay Length (ft)				420						350		
Base Capacity (vph)		2759	758	229	1960					1162		1033
Starvation Cap Reductn		0	0	0	305					0		0
Spillback Cap Reductn		150	0	0	0					537		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.67	0.25	0.52	0.67					0.62		0.97

Intersection Summary

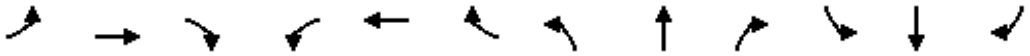
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 106 (76%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.97			
Intersection Signal Delay: 31.7		Intersection LOS: C	
Intersection Capacity Utilization 100.3%		ICU Level of Service G	
Analysis Period (min) 15			

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

Splits and Phases: 5: Ent ramp to I-65/Exit ramp from I-65 & Highway 96



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1233	691	0	0	700	1127	375	0	337	0	0	0
Future Volume (vph)	1233	691	0	0	700	1127	375	0	337	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12	11	12	13	12	12	12
Grade (%)		1%			0%			1%			0%	
Storage Length (ft)	0		0	0		0	270		0	0		0
Storage Lanes	2		0	0		2	2		1	0		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	0.88	0.97	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	3302	3307	0	0	3539	2814	3302	0	1628	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	3302	3307	0	0	3539	2814	3302	0	1628	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						23			289			
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		556			311			685			941	
Travel Time (s)		9.5			5.3			18.7			25.7	
Peak Hour Factor	0.88	0.86	0.95	1.00	0.95	0.98	0.95	0.25	0.92	1.00	1.00	0.95
Heavy Vehicles (%)	2%	5%	2%	2%	2%	1%	2%	0%	2%	2%	2%	2%
Adj. Flow (vph)	1401	803	0	0	737	1150	395	0	366	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1401	803	0	0	737	1150	395	0	366	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			26			22			22	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.05	1.05	1.01	1.00	1.00	1.00	1.05	1.01	0.96	1.00	1.00	1.00
Turning Speed (mph)	18		9	15		10	15		15	15		9
Number of Detectors	1	1			1	0	1		1			
Detector Template												
Leading Detector (ft)	42	300			300	0	42		50			
Trailing Detector (ft)	-3	294			294	0	-3		0			
Detector 1 Position(ft)	-3	294			294	0	-3		0			
Detector 1 Size(ft)	45	6			6	50	45		50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Turn Type	Prot	NA			NA	custom	Prot		Perm			
Protected Phases	1	6			2	2 4	4					
Permitted Phases									4			
Detector Phase	1	6			2	2 4	4		4			
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	12.0	18.0			18.0		7.0		7.0			
Minimum Split (s)	56.0	116.0			60.0		24.0		24.0			
Total Split (s)	56.0	116.0			60.0		24.0		24.0			
Total Split (%)	40.0%	82.9%			42.9%		17.1%		17.1%			
Maximum Green (s)	50.0	110.0			53.5		16.5		16.5			
Yellow Time (s)	3.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	3.0	2.0			2.5		3.5		3.5			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.5		7.5		7.5			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	4.0	4.5			4.5		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Act Effct Green (s)	50.0	110.0			53.5	79.5	16.5		16.5			
Actuated g/C Ratio	0.36	0.79			0.38	0.57	0.12		0.12			
v/c Ratio	1.19	0.31			0.55	0.72	1.02		0.82			
Control Delay	144.4	2.7			35.6	24.7	109.7		29.7			
Queue Delay	0.3	0.1			0.0	0.0	0.0		0.0			
Total Delay	144.7	2.8			35.6	24.7	109.7		29.7			
LOS	F	A			D	C	F		C			
Approach Delay		93.0			28.9							
Approach LOS		F			C							
90th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
90th %ile Term Code	Max	Coord			Coord		Max		Max			
70th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
70th %ile Term Code	Max	Coord			Coord		Max		Max			
50th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
50th %ile Term Code	Max	Coord			Coord		Max		Max			
30th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
30th %ile Term Code	Max	Coord			Coord		Max		Max			
10th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
10th %ile Term Code	Max	Coord			Coord		Max		Max			
Stops (vph)	894	79			533	785	332		80			
Fuel Used(gal)	50	4			12	16	12		4			
CO Emissions (g/hr)	3473	263			824	1101	827		301			
NOx Emissions (g/hr)	676	51			160	214	161		59			
VOC Emissions (g/hr)	805	61			191	255	192		70			
Dilemma Vehicles (#)	0	18			25	0	0		0			
Queue Length 50th (ft)	~756	47			273	409	~195		66			
Queue Length 95th (ft)	#913	71			337	502	#302		#225			
Internal Link Dist (ft)		476			231			605			861	
Turn Bay Length (ft)							270					
Base Capacity (vph)	1179	2598			1352	1607	389		446			
Starvation Cap Reductn	67	590			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	1.26	0.40			0.55	0.72	1.02		0.82			

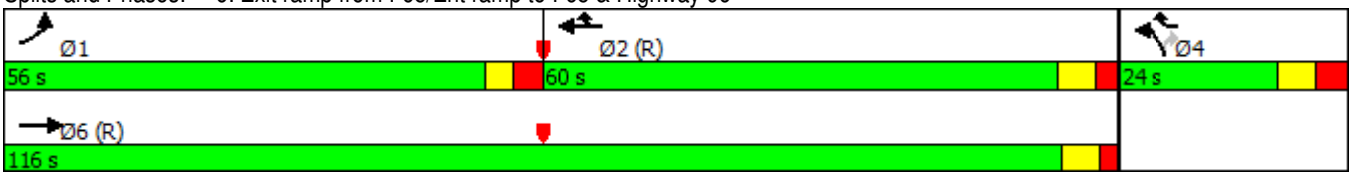
Intersection Summary

Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 122 (87%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.19			
Intersection Signal Delay: 64.7		Intersection LOS: E	
Intersection Capacity Utilization 100.3%		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.

Splits and Phases: 6: Exit ramp from I-65/Ent ramp to I-65 & Highway 96



Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Lane Configurations												
Traffic Volume (vph)	85	766	13	136	35	109	77	22	69	118	708	134
Future Volume (vph)	85	766	13	136	35	109	77	22	69	118	708	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	11	11	11	11	12	12	13	12	12	12	12
Storage Length (ft)		70	150	75		0	100		195	180	0	
Storage Lanes		3	0	1		0	1		1	1	2	
Taper Length (ft)		50		50			50			50		
Lane Util. Factor	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88	1.00
Frt			0.850		0.893				0.850		0.850	
Flt Protected	0.950	0.950		0.950			0.950			0.950		
Satd. Flow (prot)	1534	3319	1531	1711	1608	0	1770	1925	1583	1770	2787	0
Flt Permitted	0.128	0.950		0.732			0.317			0.294		
Satd. Flow (perm)	207	3319	1531	1318	1608	0	590	1925	1583	548	2787	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			132		101				77		132	
Link Speed (mph)		30			25			40		30		
Link Distance (ft)		552			721			918		1624		
Travel Time (s)		12.5			19.7			15.6		36.9		
Peak Hour Factor	0.67	0.94	0.63	0.79	0.58	0.73	0.75	0.58	0.92	0.75	0.75	0.69
Adj. Flow (vph)	127	815	21	172	60	149	103	38	75	157	944	194
Shared Lane Traffic (%)												
Lane Group Flow (vph)	127	815	21	172	209	0	103	38	75	157	1138	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Right	Right
Median Width(ft)		30			12			12		12		
Link Offset(ft)		0			0			0		0		
Crosswalk Width(ft)		16			16			16		16		
Two way Left Turn Lane												
Headway Factor	1.20	1.04	1.04	1.04	1.04	1.00	1.00	0.96	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	9	15		9	15		9	15	9	9
Number of Detectors	1	1	1	1	1		1	1	1	1	1	
Detector Template												
Leading Detector (ft)	42	42	42	42	42		42	42	42	42	42	
Trailing Detector (ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	45	45	45	45		45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	pm+pt	Prot	Perm	D.P+P	NA		D.P+P	NA	custom	pm+pt	Prot	
Protected Phases	1	6		3	8		7	4	5	5	2	
Permitted Phases	6		6	4			8		8	2		
Detector Phase	1	6		3	8		7	4	5	5	2	
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	7.0		7.0	7.0	7.0	7.0	20.0	
Minimum Split (s)	18.0	57.0	57.0	14.0	35.0		14.0	35.0	14.0	14.0	53.0	

Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Total Split (s)	18.0	57.0	57.0	14.0	35.0		14.0	35.0	14.0	14.0	53.0	
Total Split (%)	15.0%	47.5%	47.5%	11.7%	29.2%		11.7%	29.2%	11.7%	11.7%	44.2%	
Maximum Green (s)	12.0	51.0	51.0	8.5	29.0		8.5	29.0	8.0	8.0	47.0	
Yellow Time (s)	3.0	4.0	4.0	3.5	3.5		3.5	3.5	3.0	3.0	4.0	
All-Red Time (s)	3.0	2.0	2.0	2.0	2.5		2.0	2.5	3.0	3.0	2.0	
Lost Time Adjust (s)	-2.5	-1.5	-1.5	-2.5	-2.5		-2.5	-2.5	-2.5	-2.5	-1.5	
Total Lost Time (s)	3.5	4.5	4.5	3.0	3.5		3.0	3.5	3.5	3.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.0	5.0	1.5	3.5		1.5	3.5	1.5	1.5	5.0	
Recall Mode	None	C-Min	C-Min	None	None		None	None	None	None	C-Min	
Act Effct Green (s)	80.5	67.8	67.8	29.4	17.1		28.2	16.3	30.6	76.9	65.9	
Actuated g/C Ratio	0.67	0.56	0.56	0.24	0.14		0.24	0.14	0.26	0.64	0.55	
v/c Ratio	0.47	0.43	0.02	0.46	0.66		0.42	0.15	0.16	0.35	0.72	
Control Delay	13.5	17.0	0.1	39.6	34.2		38.6	43.7	7.1	9.9	22.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	13.5	17.0	0.1	39.6	34.2		38.6	43.7	7.1	9.9	22.3	
LOS	B	B	A	D	C		D	D	A	A	C	
Approach Delay		16.2			36.6			28.6		20.8		
Approach LOS		B			D			C		C		
90th %ile Green (s)	12.0	57.5	57.5	8.5	22.5		8.5	22.5	8.0	8.0	53.5	
90th %ile Term Code	Max	Coord	Coord	Max	Gap		Max	Hold	Max	Max	Coord	
70th %ile Green (s)	11.6	62.2	62.2	8.5	17.8		8.5	17.8	8.0	8.0	58.6	
70th %ile Term Code	Gap	Coord	Coord	Max	Gap		Max	Hold	Max	Max	Coord	
50th %ile Green (s)	9.2	65.9	65.9	8.5	14.5		8.5	14.5	7.6	7.6	64.3	
50th %ile Term Code	Gap	Coord	Coord	Max	Gap		Max	Hold	Gap	Gap	Coord	
30th %ile Green (s)	7.0	70.2	70.2	25.3	11.2		8.1	0.0	7.0	7.0	70.2	
30th %ile Term Code	Min	Coord	Coord	Hold	Gap		Gap	Skip	Min	Min	Coord	
10th %ile Green (s)	7.0	75.5	75.5	20.0	7.0		7.0	0.0	7.0	7.0	75.5	
10th %ile Term Code	Min	Coord	Coord	Hold	Min		Min	Skip	Min	Min	Coord	
Stops (vph)	29	432	0	111	70		58	19	10	44	562	
Fuel Used(gal)	1	8	0	2	2		2	1	1	2	18	
CO Emissions (g/hr)	53	583	4	165	151		116	36	44	138	1229	
NOx Emissions (g/hr)	10	113	1	32	29		23	7	9	27	239	
VOC Emissions (g/hr)	12	135	1	38	35		27	8	10	32	285	
Dilemma Vehicles (#)	0	0	0	0	0		0	1	0	0	0	
Queue Length 50th (ft)	31	180	0	109	79		63	26	0	38	318	
Queue Length 95th (ft)	47	268	0	137	63		82	35	33	64	356	
Internal Link Dist (ft)		472			641			838		1544		
Turn Bay Length (ft)	70	70	150	75			100		195	180		
Base Capacity (vph)	302	1874	921	377	496		248	505	467	460	1590	
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	0.43	0.02	0.46	0.42		0.42	0.08	0.16	0.34	0.72	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	

Actuated Cycle Length: 120	
Offset: 117 (98%), Referenced to phase 2:SWL and 6:EBL, Start of Green	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 21.9	Intersection LOS: C
Intersection Capacity Utilization 56.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: Oak Meadow Dr. & S Royal Oaks

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	83	955	25	215	964	86	77	59	114	43	54	267
Future Volume (vph)	83	955	25	215	964	86	77	59	114	43	54	267
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	12	11	12	11	11	12	12	11	12
Grade (%)		1%			-2%			-1%			2%	
Storage Length (ft)	80		135	220		0	100		0	120		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.986			0.906			0.877	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	3438	1575	1805	3444	0	1736	1672	0	1752	1595	0
Flt Permitted	0.192			0.198			0.147			0.385		
Satd. Flow (perm)	339	3438	1575	376	3444	0	269	1672	0	710	1595	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			124		12			57			159	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1624			792			957			515	
Travel Time (s)		36.9			18.0			21.8			11.7	
Peak Hour Factor	0.79	0.95	0.64	0.75	0.90	0.76	0.86	0.71	0.82	0.75	0.88	0.94
Heavy Vehicles (%)	0%	1%	2%	1%	1%	0%	1%	0%	0%	2%	0%	0%
Adj. Flow (vph)	105	1005	39	287	1071	113	90	83	139	57	61	284
Shared Lane Traffic (%)												
Lane Group Flow (vph)	105	1005	39	287	1184	0	90	222	0	57	345	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.10	1.05	1.01	0.99	1.03	0.99	1.04	1.04	0.99	1.01	1.06	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	0	1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	42	226	0	42	226		42	42		42	42	
Trailing Detector (ft)	-3	220	0	-3	220		-3	-3		-3	-3	
Detector 1 Position(ft)	-3	220	0	-3	220		-3	-3		-3	-3	
Detector 1 Size(ft)	45	6	50	45	6		45	45		45	45	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA		D.Pm	NA		D.Pm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6		6	2			8			4		
Detector Phase	1	6		5	2		8	4		4	8	
Switch Phase												

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	15.0	70.0	70.0	30.0	85.0		50.0	50.0		50.0	50.0	
Total Split (s)	14.0	72.0	72.0	29.0	87.0		49.0	49.0		49.0	49.0	
Total Split (%)	9.3%	48.0%	48.0%	19.3%	58.0%		32.7%	32.7%		32.7%	32.7%	
Maximum Green (s)	7.5	66.0	66.0	22.5	81.0		42.0	42.0		42.0	42.0	
Yellow Time (s)	3.0	3.5	3.5	3.0	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	3.5	2.5	2.5	3.5	2.5		3.5	3.5		3.5	3.5	
Lost Time Adjust (s)	-1.0	-3.0	-3.0	-1.0	-3.0		-2.5	-2.5		-2.5	-2.5	
Total Lost Time (s)	5.5	3.0	3.0	5.5	3.0		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
Recall Mode	None	C-Min	C-Min	None	C-Min		None	None		None	None	
Walk Time (s)		7.0	7.0		7.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)		16.0	16.0		20.0		35.0	32.0		32.0	35.0	
Pedestrian Calls (#/hr)		0	0		0		0	0		0	0	
Act Effct Green (s)	94.1	88.3	88.3	107.0	96.6		32.0	32.0		32.0	32.0	
Actuated g/C Ratio	0.63	0.59	0.59	0.71	0.64		0.21	0.21		0.21	0.21	
v/c Ratio	0.37	0.50	0.04	0.67	0.53		1.58	0.55		0.38	0.74	
Control Delay	13.2	21.7	0.1	26.3	3.4		363.3	32.8		54.2	37.7	
Queue Delay	0.0	0.0	0.0	0.0	0.3		0.0	0.0		0.0	0.0	
Total Delay	13.2	21.7	0.1	26.3	3.7		363.3	32.8		54.2	37.7	
LOS	B	C	A	C	A		F	C		D	D	
Approach Delay		20.2			8.1			128.1			40.0	
Approach LOS		C			A			F			D	
90th %ile Green (s)	7.5	66.0	66.0	22.5	81.0		42.0	42.0		42.0	42.0	
90th %ile Term Code	Max	Coord	Coord	Max	Coord		Max	Hold		Hold	Max	
70th %ile Green (s)	7.5	73.1	73.1	20.4	86.0		37.0	37.0		37.0	37.0	
70th %ile Term Code	Max	Coord	Coord	Gap	Coord		Gap	Hold		Hold	Gap	
50th %ile Green (s)	7.5	84.8	84.8	15.1	92.4		30.6	30.6		30.6	30.6	
50th %ile Term Code	Max	Coord	Coord	Gap	Coord		Gap	Hold		Hold	Gap	
30th %ile Green (s)	7.5	94.9	94.9	11.6	99.0		24.0	24.0		24.0	24.0	
30th %ile Term Code	Max	Coord	Coord	Gap	Coord		Gap	Hold		Hold	Gap	
10th %ile Green (s)	6.6	107.5	107.5	8.9	109.8		14.1	14.1		14.1	14.1	
10th %ile Term Code	Gap	Coord	Coord	Gap	Coord		Gap	Hold		Hold	Gap	
Stops (vph)	34	560	0	149	255		56	115		35	165	
Fuel Used(gal)	1	19	0	3	9		7	3		1	5	
CO Emissions (g/hr)	102	1356	22	231	603		460	215		59	326	
NOx Emissions (g/hr)	20	264	4	45	117		89	42		11	63	
VOC Emissions (g/hr)	24	314	5	54	140		107	50		14	76	
Dilemma Vehicles (#)	0	0	0	0	0		0	0		0	0	
Queue Length 50th (ft)	29	292	0	101	33		~122	118		48	174	
Queue Length 95th (ft)	55	464	0	m91	m161		#214	141		70	255	
Internal Link Dist (ft)		1544			712			877			435	
Turn Bay Length (ft)	80		135	220			100			120		
Base Capacity (vph)	288	2022	977	494	2222		79	536		210	585	
Starvation Cap Reductn	0	0	0	0	423		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	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Reduced v/c Ratio	0.36	0.50	0.04	0.58	0.66		1.14	0.41		0.27	0.59	

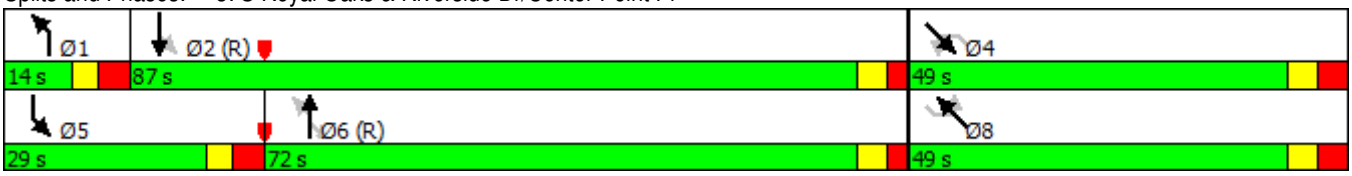
Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 123 (82%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.58			
Intersection Signal Delay: 27.4		Intersection LOS: C	
Intersection Capacity Utilization 78.9%		ICU Level of Service D	
Analysis Period (min) 15			

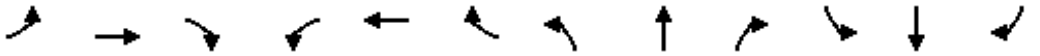
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

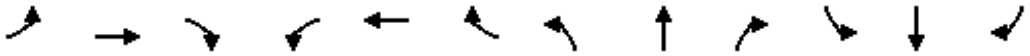
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: S Royal Oaks & Riverside Dr/Center Point Pl





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	191	1026	58	832	1087	249	131	315	873	293	394	165
Future Volume (vph)	191	1026	58	832	1087	249	131	315	873	293	394	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	11	12	13	12	13	13	11	11	11
Grade (%)		0%			0%			1%			0%	
Storage Length (ft)	200		300	285		0	195		450	220		650
Storage Lanes	2		1	2		1	2		2	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.95	0.88	0.97	0.95	0.95
Frt		0.991				0.850			0.850		0.950	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3467	4923	0	3351	3539	1652	3484	3712	2894	3385	3315	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3467	4923	0	3351	3539	1652	3484	3712	2894	3385	3315	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		7				106					51	
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		700			691			792			964	
Travel Time (s)		11.9			11.8			18.0			21.9	
Peak Hour Factor	0.92	0.93	0.81	0.87	0.91	0.89	0.74	0.83	0.89	0.83	0.95	0.80
Heavy Vehicles (%)	1%	1%	0%	1%	2%	1%	0%	0%	1%	0%	0%	0%
Adj. Flow (vph)	208	1103	72	956	1195	280	177	380	981	353	415	206
Shared Lane Traffic (%)												
Lane Group Flow (vph)	208	1175	0	956	1195	280	177	380	981	353	621	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		30			24			30			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.04	1.00	1.04	1.00	0.96	1.01	0.96	0.96	1.04	1.04	1.04
Turning Speed (mph)	18		10	18		10	18		10	18		10
Number of Detectors	1	1		1	1	0	1	2	1	1	2	
Detector Template												
Leading Detector (ft)	42	236		42	236	0	42	146	42	42	146	
Trailing Detector (ft)	-3	230		-3	230	0	-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	230		-3	230	230	-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	6		45	6	6	45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)								140			140	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	

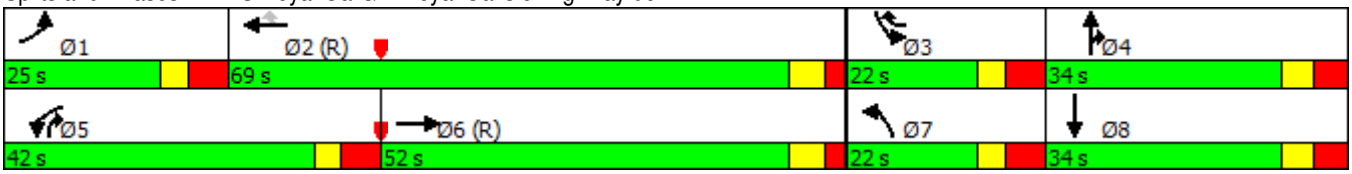


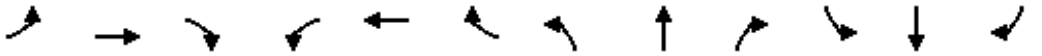
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	1	6		5	2	3	7	4	4 5	3	8	
Permitted Phases						2						
Detector Phase	1	6		5	2	3	7	4	4 5	3	8	
Switch Phase												
Minimum Initial (s)	6.0	13.0		6.0	13.0	6.0	6.0	10.0		6.0	10.0	
Minimum Split (s)	25.0	52.0		42.0	69.0	22.0	22.0	34.0		22.0	34.0	
Total Split (s)	25.0	52.0		42.0	69.0	22.0	22.0	34.0		22.0	34.0	
Total Split (%)	16.7%	34.7%		28.0%	46.0%	14.7%	14.7%	22.7%		14.7%	22.7%	
Maximum Green (s)	17.5	45.5		34.5	62.5	14.5	14.5	26.5		14.5	26.5	
Yellow Time (s)	3.0	4.0		3.0	4.0	3.0	3.0	3.5		3.0	3.5	
All-Red Time (s)	4.5	2.5		4.5	2.5	4.5	4.5	4.0		4.5	4.0	
Lost Time Adjust (s)	-2.5	-2.5		-2.5	-2.5	-2.0	-2.0	-3.0		-2.0	-3.0	
Total Lost Time (s)	5.0	4.0		5.0	4.0	5.5	5.5	4.5		5.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	6.0		3.0	6.0	3.0	3.0	4.5		3.0	4.5	
Recall Mode	None	C-Min		None	C-Min	None	None	None		None	None	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		37.0			24.0			36.0			36.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	16.7	48.0		37.0	68.3	88.8	14.5	29.5	71.0	16.5	31.5	
Actuated g/C Ratio	0.11	0.32		0.25	0.46	0.59	0.10	0.20	0.47	0.11	0.21	
v/c Ratio	0.54	0.74		1.16	0.74	0.27	0.53	0.52	0.72	0.95	0.84	
Control Delay	68.8	41.9		119.7	46.5	14.5	65.6	61.5	39.5	100.9	63.9	
Queue Delay	0.0	0.0		0.0	0.5	0.0	0.1	0.0	0.0	0.0	0.0	
Total Delay	68.8	41.9		119.7	46.9	14.5	65.7	61.5	39.5	100.9	63.9	
LOS	E	D		F	D	B	E	E	D	F	E	
Approach Delay		45.9			71.8			47.9			77.3	
Approach LOS		D			E			D			E	
90th %ile Green (s)	17.5	45.5		34.5	62.5	14.5	14.5	26.5		14.5	26.5	
90th %ile Term Code	Max	Coord		Max	Coord	Max	Max	Max		Max	Max	
70th %ile Green (s)	15.9	45.5		34.5	64.1	14.5	14.4	26.5		14.5	26.6	
70th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
50th %ile Green (s)	14.4	45.5		34.5	65.6	14.5	12.9	26.5		14.5	28.1	
50th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
30th %ile Green (s)	12.8	45.5		34.5	67.2	14.5	11.5	26.5		14.5	29.5	
30th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
10th %ile Green (s)	10.5	45.5		34.5	69.5	14.5	9.4	26.5		14.5	31.6	
10th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
Stops (vph)	177	770		714	982	166	124	280	638	266	474	
Fuel Used(gal)	5	22		34	29	4	3	7	16	10	14	
CO Emissions (g/hr)	372	1535		2378	2008	306	227	520	1114	677	985	
NOx Emissions (g/hr)	72	299		463	391	60	44	101	217	132	192	
VOC Emissions (g/hr)	86	356		551	465	71	53	120	258	157	228	
Dilemma Vehicles (#)	0	41		0	37	0	0	0	0	0	0	
Queue Length 50th (ft)	100	266		~580	551	113	85	202	283	179	287	
Queue Length 95th (ft)	m144	336		m#499	m492	m120	m103	m218	m617	#242	#398	
Internal Link Dist (ft)		620			611			712			884	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	200			285			195		450	220		
Base Capacity (vph)	462	1580		826	1610	1021	383	730	1369	372	735	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	1		0	114	0	9	0	0	0	1	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.45	0.74		1.16	0.80	0.27	0.47	0.52	0.72	0.95	0.85	

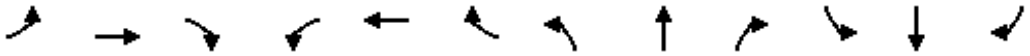
Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 133 (89%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.16			
Intersection Signal Delay: 61.2		Intersection LOS: E	
Intersection Capacity Utilization 81.9%		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: 4: S Royal Oaks/N Royal Oaks & Highway 96





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1807	446	264	834	0	0	0	0	846	0	1293
Future Volume (vph)	0	1807	446	264	834	0	0	0	0	846	0	1293
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	12	12	12	12	12	12	11
Grade (%)		0%			0%			0%			1%	
Storage Length (ft)	0		0	420		0	0		0	350		0
Storage Lanes	0		1	0		0	0		0	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.86	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	0.88
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	6408	1583	1787	3455	0	0	0	0	3450	0	2707
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	6408	1583	1787	3455	0	0	0	0	3450	0	2707
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			405									177
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		501			556			756			888	
Travel Time (s)		8.5			9.5			20.6			24.2	
Peak Hour Factor	1.00	0.93	0.78	0.71	0.86	1.00	1.00	1.00	1.00	0.87	1.00	0.88
Heavy Vehicles (%)	2%	2%	2%	1%	1%	2%	2%	2%	2%	1%	2%	1%
Adj. Flow (vph)	0	1943	572	372	970	0	0	0	0	972	0	1469
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1943	572	372	970	0	0	0	0	972	0	1469
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.04	1.00	1.00	1.00	1.00	1.01	1.01	1.05
Turning Speed (mph)	15		12	15		9	15		9	18		12
Number of Detectors		1	0	1	1					1		1
Detector Template												
Leading Detector (ft)		300	0	42	300					42		42
Trailing Detector (ft)		294	0	-3	294					-3		-3
Detector 1 Position(ft)		294	-3	-3	294					-3		-3
Detector 1 Size(ft)		6	45	45	6					45		45
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Turn Type		NA	Perm	Prot	NA					Prot		Prot
Protected Phases		6		5	2					4		4
Permitted Phases			6									
Detector Phase		6	6	5	2					4		4
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		25.0	25.0	5.0	25.0					15.0		15.0
Minimum Split (s)		55.0	55.0	30.0	85.0					65.0		65.0
Total Split (s)		55.0	55.0	30.0	85.0					65.0		65.0
Total Split (%)		36.7%	36.7%	20.0%	56.7%					43.3%		43.3%
Maximum Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
Yellow Time (s)		4.0	4.0	3.0	4.0					4.0		4.0
All-Red Time (s)		2.0	2.0	3.0	2.0					3.5		3.5
Lost Time Adjust (s)		-2.0	-2.0	-1.0	-2.0					-2.0		-2.0
Total Lost Time (s)		4.0	4.0	5.0	4.0					5.5		5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		4.5	4.5	3.0	4.5					3.0		3.0
Recall Mode		C-Min	C-Min	None	C-Min					None		None
Act Effct Green (s)		51.0	51.0	25.0	81.0					59.5		59.5
Actuated g/C Ratio		0.34	0.34	0.17	0.54					0.40		0.40
v/c Ratio		0.89	0.71	1.25	0.52					0.71		1.24
Control Delay		63.2	26.8	190.8	21.8					41.5		151.8
Queue Delay		0.0	0.0	0.0	0.3					0.2		0.0
Total Delay		63.2	26.8	190.8	22.1					41.8		151.8
LOS		E	C	F	C					D		F
Approach Delay		54.9			68.9							
Approach LOS		D			E							
90th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
90th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
70th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
70th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
50th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
50th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
30th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
30th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
10th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
10th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
Stops (vph)		1693	363	205	393					695		956
Fuel Used(gal)		54	10	13	11					16		53
CO Emissions (g/hr)		3809	671	927	748					1134		3733
NOx Emissions (g/hr)		741	131	180	146					221		726
VOC Emissions (g/hr)		883	156	215	173					263		865
Dilemma Vehicles (#)		108	0	0	34					0		0
Queue Length 50th (ft)		565	221	~464	239					409		~953
Queue Length 95th (ft)		m609	265	#465	337					465		#1065
Internal Link Dist (ft)		421			476			676			808	
Turn Bay Length (ft)				420						350		
Base Capacity (vph)		2178	805	297	1865					1368		1180
Starvation Cap Reductn		0	0	0	353					0		0
Spillback Cap Reductn		0	0	0	0					57		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.89	0.71	1.25	0.64					0.74		1.24

Intersection Summary

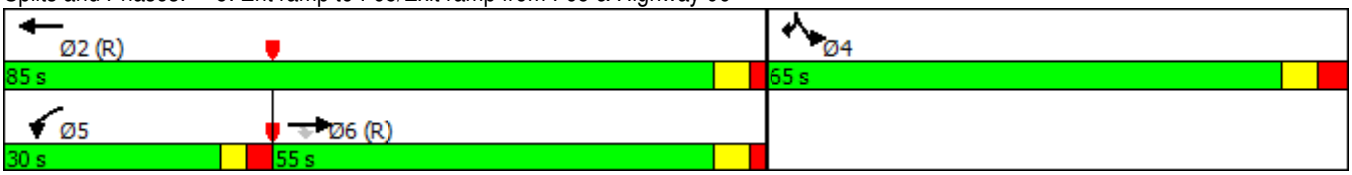
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 104 (69%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.25			
Intersection Signal Delay: 78.4		Intersection LOS: E	
Intersection Capacity Utilization 79.1%		ICU Level of Service D	
Analysis Period (min) 15			

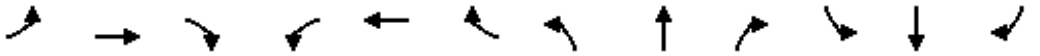
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

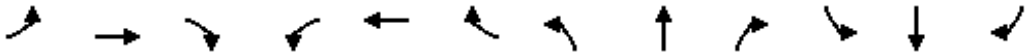
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Ent ramp to I-65/Exit ramp from I-65 & Highway 96





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	538	2115	0	0	814	924	284	0	152	0	0	0
Future Volume (vph)	538	2115	0	0	814	924	284	0	152	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12	11	12	13	12	12	12
Grade (%)		1%			0%			1%			0%	
Storage Length (ft)	0		0	0		0	270		0	0		0
Storage Lanes	2		0	0		2	2		1	0		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	0.88	0.97	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	3270	3371	0	0	3539	2787	3302	0	1597	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	3270	3371	0	0	3539	2787	3302	0	1597	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						301			69			
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		556			1845			685			941	
Travel Time (s)		9.5			31.4			18.7			25.7	
Peak Hour Factor	0.97	0.98	1.00	0.25	0.91	0.93	0.92	1.00	0.87	1.00	1.00	1.00
Heavy Vehicles (%)	3%	3%	2%	0%	2%	2%	2%	2%	4%	2%	2%	2%
Adj. Flow (vph)	555	2158	0	0	895	994	309	0	175	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	555	2158	0	0	895	994	309	0	175	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			26			22			22	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.05	1.05	1.01	1.00	1.00	1.00	1.05	1.01	0.96	1.00	1.00	1.00
Turning Speed (mph)	18		9	15		10	15		15	15		9
Number of Detectors	1	1			1	0	1		1			
Detector Template												
Leading Detector (ft)	42	300			300	0	42		50			
Trailing Detector (ft)	-3	294			294	0	-3		0			
Detector 1 Position(ft)	-3	294			294	0	-3		0			
Detector 1 Size(ft)	45	6			6	50	45		50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Turn Type	Prot	NA			NA	custom	Prot		Perm			
Protected Phases	1	6			2	2 4	4					
Permitted Phases									4			
Detector Phase	1	6			2	2 4	4		4			
Switch Phase												

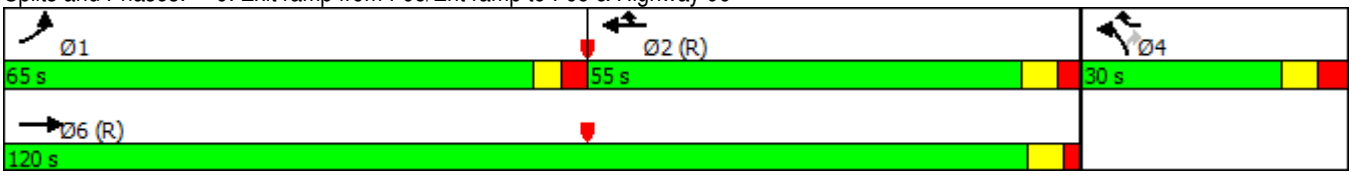


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	12.0	18.0			18.0		7.0		7.0			
Minimum Split (s)	65.0	120.0			55.0		30.0		30.0			
Total Split (s)	65.0	120.0			55.0		30.0		30.0			
Total Split (%)	43.3%	80.0%			36.7%		20.0%		20.0%			
Maximum Green (s)	59.0	114.0			48.5		22.5		22.5			
Yellow Time (s)	3.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	3.0	2.0			2.5		3.5		3.5			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.5		7.5		7.5			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	4.0	4.5			4.5		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Act Effct Green (s)	33.1	115.2			75.6	106.4	21.3		21.3			
Actuated g/C Ratio	0.22	0.77			0.50	0.71	0.14		0.14			
v/c Ratio	0.77	0.83			0.50	0.48	0.66		0.61			
Control Delay	78.2	19.8			27.0	7.5	68.0		45.7			
Queue Delay	0.0	1.5			0.0	0.0	0.0		0.0			
Total Delay	78.2	21.3			27.0	7.5	68.0		45.7			
LOS	E	C			C	A	E		D			
Approach Delay		33.0			16.8							
Approach LOS		C			B							
90th %ile Green (s)	40.9	114.0			66.6		22.5		22.5			
90th %ile Term Code	Gap	Coord			Coord		Max		Max			
70th %ile Green (s)	36.1	114.0			71.4		22.5		22.5			
70th %ile Term Code	Gap	Coord			Coord		Max		Max			
50th %ile Green (s)	33.3	114.0			74.2		22.5		22.5			
50th %ile Term Code	Gap	Coord			Coord		Max		Max			
30th %ile Green (s)	29.6	114.7			78.6		21.8		21.8			
30th %ile Term Code	Gap	Coord			Coord		Gap		Gap			
10th %ile Green (s)	25.4	119.3			87.4		17.2		17.2			
10th %ile Term Code	Gap	Coord			Coord		Gap		Gap			
Stops (vph)	537	1521			532	278	266		86			
Fuel Used(gal)	16	31			20	16	7		3			
CO Emissions (g/hr)	1110	2200			1390	1099	462		184			
NOx Emissions (g/hr)	216	428			270	214	90		36			
VOC Emissions (g/hr)	257	510			322	255	107		43			
Dilemma Vehicles (#)	0	77			27	0	0		0			
Queue Length 50th (ft)	297	362			305	150	148		97			
Queue Length 95th (ft)	m341	370			406	234	201		172			
Internal Link Dist (ft)		476			1765			605			861	
Turn Bay Length (ft)							270					
Base Capacity (vph)	1286	2588			1784	2085	495		298			
Starvation Cap Reductn	0	244			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	0.43	0.92			0.50	0.48	0.62		0.59			

Intersection Summary

Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 138 (92%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.83			
Intersection Signal Delay: 29.5		Intersection LOS: C	
Intersection Capacity Utilization 79.1%		ICU Level of Service D	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 6: Exit ramp from I-65/Ent ramp to I-65 & Highway 96



HCS 2010 Two-Way Stop Control Summary Report

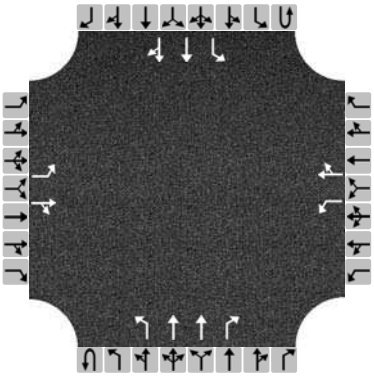
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	Mar 2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Intersection Orientation	North-South
Project Description	10728 (Existing)

Site Information

Intersection	S. Royal Oaks and Rand
Jurisdiction	Franklin, TN
East/West Street	Rand Pl / Home Depot
North/South Street	S. Royal Oaks Blvd
Peak Hour Factor	0.97
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	0		1	1	0	0	1	2	1	0	1	2	0
Configuration		L		TR		L		TR		L	T	R		L	T	TR
Volume (veh/h)		24	1	8		13	0	11		9	1281	23		45	586	47
Percent Heavy Vehicles		0	0	0		0	0	0		0				0		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left + Thru															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		25		9		13		11		9				46		
Capacity		203		461		130		410		944				519		
v/c Ratio		0.12		0.02		0.10		0.03		0.01				0.09		
95% Queue Length		0.4		0.1		0.3		0.1		0.0				0.3		
Control Delay (s/veh)		25.2		13.0		35.8		14.0		8.8				12.6		
Level of Service (LOS)		D		B		E		B		A				B		
Approach Delay (s/veh)	21.9				25.8				0.1				0.8			
Approach LOS	C				D				A				A			

HCS 2010 Two-Way Stop Control Summary Report

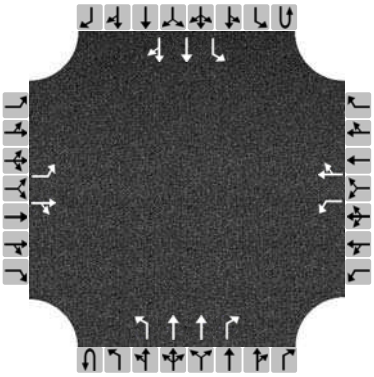
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	Mar 2016
Analysis Year	2016
Time Analyzed	PM Peak Hour
Intersection Orientation	North-South
Project Description	10728 (Existing)

Site Information

Intersection	S. Royal Oaks and Rand
Jurisdiction	Franklin, TN
East/West Street	Rand Pl / Home Depot
North/South Street	S. Royal Oaks Blvd
Peak Hour Factor	0.96
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	0		1	1	0	0	1	2	1	0	1	2	0
Configuration		L		TR		L		TR		L	T	R		L	T	TR
Volume (veh/h)		24	3	15		19	4	22		6	896	16		20	883	97
Percent Heavy Vehicles		0	0	0		0	0	0		0				0		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left + Thru															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		25		19		20		27		6				21		
Capacity		183		391		199		411		688				731		
v/c Ratio		0.14		0.05		0.10		0.07		0.01				0.03		
95% Queue Length		0.5		0.2		0.3		0.2		0.0				0.1		
Control Delay (s/veh)		27.7		14.7		25.1		14.4		10.3				10.1		
Level of Service (LOS)		D		B		D		B		B				B		
Approach Delay (s/veh)	22.1				18.9				0.1				0.2			
Approach LOS	C				C				A				A			

HCS 2010 Two-Way Stop Control Summary Report

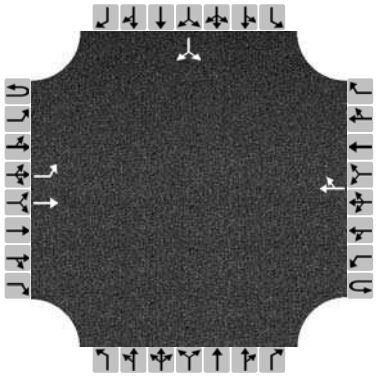
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	Mar 2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Intersection Orientation	East-West
Project Description	10728 (Existing)

Site Information

Intersection	Oak Meadow Dr and dwy
Jurisdiction	Franklin, TN
East/West Street	Oak Meadow Drive
North/South Street	Western Home Depot dwy
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	0	1	0		0	0	0		0	0	0
Configuration		L	T					TR							LR	
Volume (veh/h)		2	44				183	0						1		1
Percent Heavy Vehicles		0												0		0
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		2													2	
Capacity		1351													761	
v/c Ratio		0.00													0.00	
95% Queue Length		0.0													0.0	
Control Delay (s/veh)		7.7													9.7	
Level of Service (LOS)		A													A	
Approach Delay (s/veh)	0.3												9.7			
Approach LOS	A												A			

HCS 2010 Two-Way Stop Control Summary Report

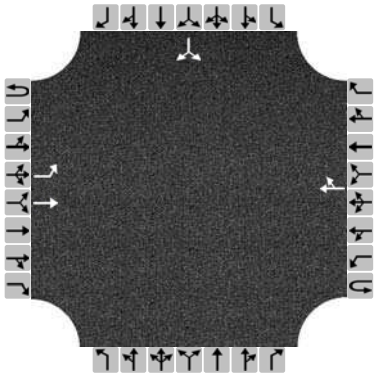
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	Mar 2016
Analysis Year	2016
Time Analyzed	PM Peak Hour
Intersection Orientation	East-West
Project Description	10728 (Existing)

Site Information

Intersection	Oak Meadow Dr and dwy
Jurisdiction	Franklin, TN
East/West Street	Oak Meadow Drive
North/South Street	Western Home Depot dwy
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	0	1	0		0	0	0		0	0	0
Configuration		L	T					TR							LR	
Volume (veh/h)		5	161				166	2						15		2
Percent Heavy Vehicles		0												0		0
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		6													21	
Capacity		1373													660	
v/c Ratio		0.00													0.03	
95% Queue Length		0.0													0.1	
Control Delay (s/veh)		7.6													10.6	
Level of Service (LOS)		A													B	
Approach Delay (s/veh)	0.2												10.6			
Approach LOS	A												B			

BACKGROUND CONDITIONS

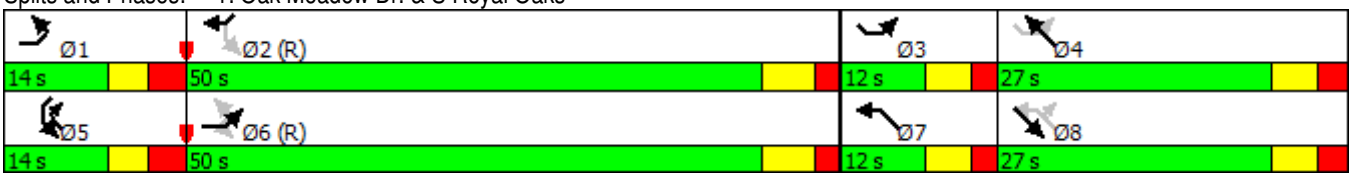
Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Lane Configurations												
Traffic Volume (vph)	87	1120	29	129	7	71	21	16	170	36	515	73
Future Volume (vph)	87	1120	29	129	7	71	21	16	170	36	515	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	11	11	11	11	12	12	13	12	12	12	12
Storage Length (ft)		70	150	75		0	100		195	180	0	
Storage Lanes		3	0	1		0	1		1	1	2	
Taper Length (ft)		50		50			50			50		
Lane Util. Factor	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88	1.00
Frt			0.850		0.867				0.850		0.850	
Flt Protected	0.950	0.950		0.950			0.950			0.950		
Satd. Flow (prot)	1534	3319	1531	1711	1561	0	1770	1925	1583	1770	2787	0
Flt Permitted	0.278	0.950		0.739			0.540			0.177		
Satd. Flow (perm)	449	3319	1531	1331	1561	0	1006	1925	1583	330	2787	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			154		97				90		154	
Link Speed (mph)		30			25			40		30		
Link Distance (ft)		552			721			918		1624		
Travel Time (s)		12.5			19.7			15.6		36.9		
Peak Hour Factor	0.67	0.94	0.63	0.79	0.58	0.73	0.75	0.58	0.92	0.75	0.75	0.69
Adj. Flow (vph)	130	1191	46	163	12	97	28	28	185	48	687	106
Shared Lane Traffic (%)												
Lane Group Flow (vph)	130	1191	46	163	109	0	28	28	185	48	793	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Right	Right
Median Width(ft)		30			12			12		12		
Link Offset(ft)		0			0			0		0		
Crosswalk Width(ft)		16			16			16		16		
Two way Left Turn Lane												
Headway Factor	1.20	1.04	1.04	1.04	1.04	1.00	1.00	0.96	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	9	15		9	15		9	15	9	9
Number of Detectors	1	1	1	1	1		1	1	1	1	1	
Detector Template												
Leading Detector (ft)	42	42	42	42	42		42	42	42	42	42	
Trailing Detector (ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	45	45	45	45		45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	pm+pt	Prot	Perm	D.P+P	NA		D.P+P	NA	custom	pm+pt	Prot	
Protected Phases	1	6		3	8		7	4	5	5	2	
Permitted Phases	6		6	4			8		8	2		
Detector Phase	1	6		3	8		7	4	5	5	2	
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	7.0		7.0	7.0	7.0	7.0	20.0	
Minimum Split (s)	13.0	26.0	26.0	12.5	20.0		12.5	20.0	13.0	13.0	26.0	

Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Total Split (s)	14.0	50.0	50.0	12.0	27.0		12.0	27.0	14.0	14.0	50.0	
Total Split (%)	13.6%	48.5%	48.5%	11.7%	26.2%		11.7%	26.2%	13.6%	13.6%	48.5%	
Maximum Green (s)	8.0	44.0	44.0	6.5	21.0		6.5	21.0	8.0	8.0	44.0	
Yellow Time (s)	3.0	4.0	4.0	3.5	3.5		3.5	3.5	3.0	3.0	4.0	
All-Red Time (s)	3.0	2.0	2.0	2.0	2.5		2.0	2.5	3.0	3.0	2.0	
Lost Time Adjust (s)	-2.5	-1.5	-1.5	-2.5	-2.5		-2.5	-2.5	-2.5	-2.5	-1.5	
Total Lost Time (s)	3.5	4.5	4.5	3.0	3.5		3.0	3.5	3.5	3.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.0	5.0	1.5	3.5		1.5	3.5	1.5	1.5	5.0	
Recall Mode	None	C-Min	C-Min	None	None		None	None	None	None	C-Min	
Act Effct Green (s)	74.6	63.7	63.7	17.0	11.1		17.0	11.1	24.1	73.9	63.4	
Actuated g/C Ratio	0.72	0.62	0.62	0.17	0.11		0.17	0.11	0.23	0.72	0.62	
v/c Ratio	0.30	0.58	0.05	0.64	0.43		0.12	0.14	0.42	0.13	0.45	
Control Delay	6.5	14.4	0.1	48.7	16.3		32.2	42.1	19.9	5.6	10.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	6.5	14.4	0.1	48.7	16.3		32.2	42.1	19.9	5.6	10.3	
LOS	A	B	A	D	B		C	D	B	A	B	
Approach Delay		13.2			35.7			23.9		10.0		
Approach LOS		B			D			C		A		
90th %ile Green (s)	8.0	53.7	53.7	6.5	12.3		6.5	12.3	7.0	7.0	52.7	
90th %ile Term Code	Max	Coord	Coord	Max	Gap		Max	Hold	Min	Min	Coord	
70th %ile Green (s)	7.6	57.0	57.0	6.5	9.0		6.5	9.0	7.0	7.0	56.4	
70th %ile Term Code	Gap	Coord	Coord	Max	Gap		Max	Hold	Min	Min	Coord	
50th %ile Green (s)	7.0	58.5	58.5	6.5	7.5		6.5	7.5	7.0	7.0	58.5	
50th %ile Term Code	Min	Coord	Coord	Max	Hold		Max	Gap	Min	Min	Coord	
30th %ile Green (s)	7.0	71.0	71.0	7.5	7.0		0.0	0.0	7.0	7.0	71.0	
30th %ile Term Code	Min	Coord	Coord	Hold	Min		Skip	Skip	Min	Min	Coord	
10th %ile Green (s)	7.0	71.0	71.0	7.5	7.0		0.0	0.0	7.0	7.0	71.0	
10th %ile Term Code	Min	Coord	Coord	Hold	Min		Skip	Skip	Min	Min	Coord	
Stops (vph)	25	656	0	116	19		17	15	74	11	250	
Fuel Used(gal)	1	12	0	3	1		0	0	2	1	10	
CO Emissions (g/hr)	44	821	9	176	57		30	27	173	39	703	
NOx Emissions (g/hr)	9	160	2	34	11		6	5	34	8	137	
VOC Emissions (g/hr)	10	190	2	41	13		7	6	40	9	163	
Dilemma Vehicles (#)	0	0	0	0	0		0	1	0	0	0	
Queue Length 50th (ft)	23	246	0	93	7		15	17	52	8	125	
Queue Length 95th (ft)	35	351	0	127	15		30	27	110	18	147	
Internal Link Dist (ft)		472			641			838		1544		
Turn Bay Length (ft)	70	70	150	75			100		195	180		
Base Capacity (vph)	438	2054	1006	254	431		232	439	453	386	1775	
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	0.30	0.58	0.05	0.64	0.25		0.12	0.06	0.41	0.12	0.45	

Intersection Summary	
Area Type:	Other
Cycle Length: 103	

Actuated Cycle Length: 103	
Offset: 0 (0%), Referenced to phase 2:SWL and 6:EBL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 15.4	Intersection LOS: B
Intersection Capacity Utilization 62.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: Oak Meadow Dr. & S Royal Oaks



Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	28	1198	103	267	747	25	6	46	41	33	12	96
Future Volume (vph)	28	1198	103	267	747	25	6	46	41	33	12	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	12	11	12	11	11	12	12	11	12
Grade (%)		1%			-2%			-1%			2%	
Storage Length (ft)	80		135	220		0	100		0	120		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.993			0.934			0.872	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	3438	1607	1787	3428	0	1754	1624	0	1787	1524	0
Flt Permitted	0.341			0.156			0.460			0.497		
Satd. Flow (perm)	602	3438	1607	293	3428	0	849	1624	0	935	1524	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			82		5			30			112	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1624			792			957			515	
Travel Time (s)		36.9			18.0			21.8			11.7	
Peak Hour Factor	0.63	0.92	0.87	0.80	0.99	0.67	0.58	0.68	0.77	0.67	0.63	0.86
Heavy Vehicles (%)	0%	1%	0%	2%	2%	4%	0%	11%	0%	0%	10%	3%
Adj. Flow (vph)	44	1302	118	334	755	37	10	68	53	49	19	112
Shared Lane Traffic (%)												
Lane Group Flow (vph)	44	1302	118	334	792	0	10	121	0	49	131	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.10	1.05	1.01	0.99	1.03	0.99	1.04	1.04	0.99	1.01	1.06	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	0	1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	42	226	0	42	226		42	42		42	42	
Trailing Detector (ft)	-3	220	0	-3	220		-3	-3		-3	-3	
Detector 1 Position(ft)	-3	220	0	-3	220		-3	-3		-3	-3	
Detector 1 Size(ft)	45	6	50	45	6		45	45		45	45	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA		D.Pm	NA		D.Pm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6		6	2			8			4		
Detector Phase	1	6		5	2		8	4		4	8	
Switch Phase												

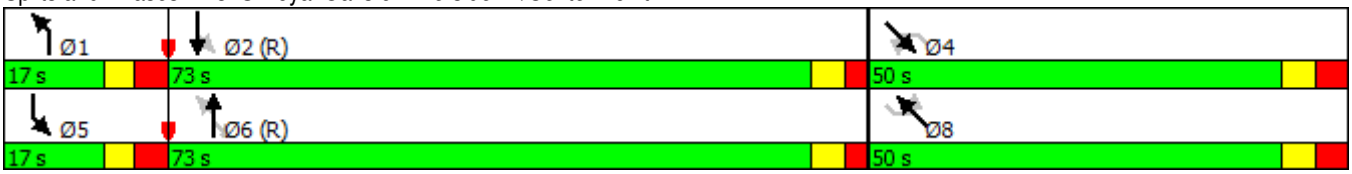
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	17.0	73.0	73.0	17.0	73.0		50.0	50.0		50.0	50.0	
Total Split (s)	17.0	73.0	73.0	17.0	73.0		50.0	50.0		50.0	50.0	
Total Split (%)	12.1%	52.1%	52.1%	12.1%	52.1%		35.7%	35.7%		35.7%	35.7%	
Maximum Green (s)	10.5	67.0	67.0	10.5	67.0		43.0	43.0		43.0	43.0	
Yellow Time (s)	3.0	3.5	3.5	3.0	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	3.5	2.5	2.5	3.5	2.5		3.5	3.5		3.5	3.5	
Lost Time Adjust (s)	-1.0	-3.0	-3.0	-1.0	-3.0		-2.5	-2.5		-2.5	-2.5	
Total Lost Time (s)	5.5	3.0	3.0	5.5	3.0		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
Recall Mode	None	C-Min	C-Min	None	C-Min		None	None		None	None	
Walk Time (s)		7.0	7.0		7.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)		16.0	16.0		20.0		35.0	32.0		32.0	35.0	
Pedestrian Calls (#/hr)		0	0		0		0	0		0	0	
Act Effct Green (s)	104.4	99.1	99.1	112.1	105.4		16.4	16.4		16.4	16.4	
Actuated g/C Ratio	0.75	0.71	0.71	0.80	0.75		0.12	0.12		0.12	0.12	
v/c Ratio	0.09	0.53	0.10	0.94	0.31		0.10	0.56		0.45	0.47	
Control Delay	3.9	11.1	2.9	57.5	4.9		52.5	47.4		69.1	18.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	3.9	11.1	2.9	57.5	4.9		52.5	47.4		69.1	18.8	
LOS	A	B	A	E	A		D	D		E	B	
Approach Delay		10.2			20.5			47.8			32.5	
Approach LOS		B			C			D			C	
90th %ile Green (s)	7.7	89.8	89.8	10.5	92.6		20.2	20.2		20.2	20.2	
90th %ile Term Code	Gap	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
70th %ile Green (s)	7.1	93.6	93.6	10.5	97.0		16.4	16.4		16.4	16.4	
70th %ile Term Code	Gap	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
50th %ile Green (s)	6.7	96.1	96.1	10.5	99.9		13.9	13.9		13.9	13.9	
50th %ile Term Code	Gap	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
30th %ile Green (s)	6.3	98.7	98.7	10.5	102.9		11.3	11.3		11.3	11.3	
30th %ile Term Code	Gap	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
10th %ile Green (s)	0.0	102.4	102.4	10.5	119.4		7.6	7.6		7.6	7.6	
10th %ile Term Code	Skip	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
Stops (vph)	7	543	11	209	252		7	68		30	24	
Fuel Used(gal)	0	21	1	6	7		0	2		1	1	
CO Emissions (g/hr)	29	1459	100	414	485		10	130		53	69	
NOx Emissions (g/hr)	6	284	19	81	94		2	25		10	13	
VOC Emissions (g/hr)	7	338	23	96	112		2	30		12	16	
Dilemma Vehicles (#)	0	0	0	0	0		0	0		0	0	
Queue Length 50th (ft)	6	267	9	156	75		9	83		42	16	
Queue Length 95th (ft)	12	374	31	m#192	m228		18	114		60	24	
Internal Link Dist (ft)		1544			712			877			435	
Turn Bay Length (ft)	80		135	220			100			120		
Base Capacity (vph)	553	2434	1161	357	2581		275	548		303	570	
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	

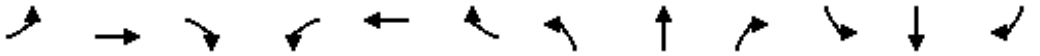
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Reduced v/c Ratio	0.08	0.53	0.10	0.94	0.31		0.04	0.22		0.16	0.23	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 139 (99%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.94			
Intersection Signal Delay: 17.3		Intersection LOS: B	
Intersection Capacity Utilization 68.1%		ICU Level of Service C	
Analysis Period (min) 15			

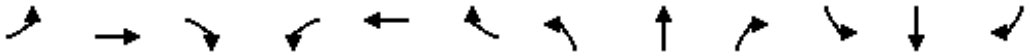
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: S Royal Oaks & Riverside Dr/Center Point Pl





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	112	772	60	831	993	281	99	239	988	225	202	82
Future Volume (vph)	112	772	60	831	993	281	99	239	988	225	202	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	11	12	13	12	13	13	11	11	11
Grade (%)		0%			0%			1%			0%	
Storage Length (ft)	200		300	285		0	195		450	220		650
Storage Lanes	2		1	2		1	2		2	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.95	0.88	0.97	0.95	0.95
Frt		0.988				0.850			0.850		0.959	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3400	4688	0	3286	3406	1620	3350	3639	2865	3319	3235	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3400	4688	0	3286	3406	1620	3350	3639	2865	3319	3235	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		10				173					34	
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		700			691			792			964	
Travel Time (s)		11.9			11.8			18.0			21.9	
Peak Hour Factor	0.80	0.90	0.80	0.93	0.91	0.88	0.82	0.80	0.93	0.92	0.74	0.81
Heavy Vehicles (%)	3%	6%	2%	3%	6%	3%	4%	2%	2%	2%	4%	2%
Adj. Flow (vph)	140	858	75	894	1091	319	121	299	1062	245	273	101
Shared Lane Traffic (%)												
Lane Group Flow (vph)	140	933	0	894	1091	319	121	299	1062	245	374	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		30			24			30			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.04	1.00	1.04	1.00	0.96	1.01	0.96	0.96	1.04	1.04	1.04
Turning Speed (mph)	18		10	18		10	18		10	18		10
Number of Detectors	1	1		1	1	0	1	2	1	1	2	
Detector Template												
Leading Detector (ft)	42	236		42	236	0	42	146	42	42	146	
Trailing Detector (ft)	-3	230		-3	230	0	-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	230		-3	230	230	-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	6		45	6	6	45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)								140			140	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	

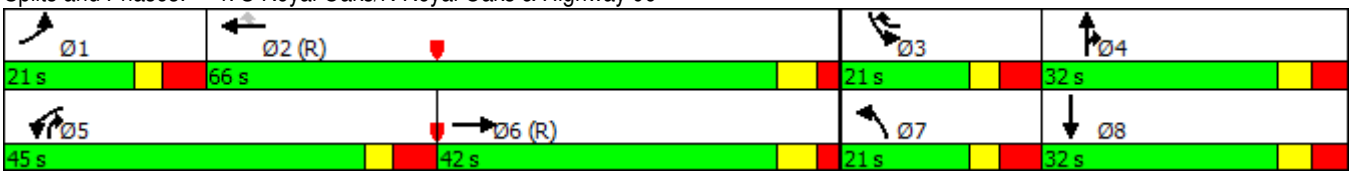


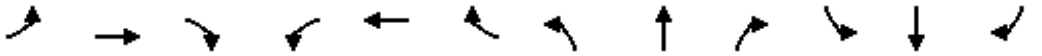
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	1	6		5	2	3	7	4	4 5	3	8	
Permitted Phases						2						
Detector Phase	1	6		5	2	3	7	4	4 5	3	8	
Switch Phase												
Minimum Initial (s)	6.0	13.0		6.0	13.0	6.0	6.0	10.0		6.0	10.0	
Minimum Split (s)	21.0	42.0		45.0	66.0	21.0	21.0	32.0		21.0	32.0	
Total Split (s)	21.0	42.0		45.0	66.0	21.0	21.0	32.0		21.0	32.0	
Total Split (%)	15.0%	30.0%		32.1%	47.1%	15.0%	15.0%	22.9%		15.0%	22.9%	
Maximum Green (s)	13.5	35.5		37.5	59.5	13.5	13.5	24.5		13.5	24.5	
Yellow Time (s)	3.0	4.0		3.0	4.0	3.0	3.0	3.5		3.0	3.5	
All-Red Time (s)	4.5	2.5		4.5	2.5	4.5	4.5	4.0		4.5	4.0	
Lost Time Adjust (s)	-2.5	-2.5		-2.5	-2.5	-2.0	-2.0	-3.0		-2.0	-3.0	
Total Lost Time (s)	5.0	4.0		5.0	4.0	5.5	5.5	4.5		5.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	6.0		3.0	6.0	3.0	3.0	4.5		3.0	4.5	
Recall Mode	None	C-Min		None	C-Min	None	None	None		None	None	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		37.0			24.0			36.0			36.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	13.5	38.4		40.0	64.9	84.0	12.4	27.5	72.0	15.1	30.2	
Actuated g/C Ratio	0.10	0.27		0.29	0.46	0.60	0.09	0.20	0.51	0.11	0.22	
v/c Ratio	0.43	0.72		0.95	0.69	0.31	0.41	0.42	0.72	0.69	0.52	
Control Delay	76.9	41.3		57.0	40.9	7.8	54.7	49.3	39.6	70.7	47.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	76.9	41.3		57.0	40.9	7.8	54.7	49.3	39.6	70.7	47.1	
LOS	E	D		E	D	A	D	D	D	E	D	
Approach Delay		45.9			42.6			42.8			56.4	
Approach LOS		D			D			D			E	
90th %ile Green (s)	13.5	35.5		37.5	59.5	13.5	13.3	24.5		13.5	24.7	
90th %ile Term Code	Max	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
70th %ile Green (s)	12.4	35.5		37.5	60.6	13.5	11.6	24.5		13.5	26.4	
70th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
50th %ile Green (s)	11.2	35.5		37.5	61.8	13.5	10.4	24.5		13.5	27.6	
50th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
30th %ile Green (s)	9.9	35.5		37.5	63.1	13.5	9.2	24.5		13.5	28.8	
30th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
10th %ile Green (s)	8.1	37.6		37.5	67.0	11.4	7.5	24.5		11.4	28.4	
10th %ile Term Code	Gap	Coord		Max	Coord	Gap	Gap	Max		Gap	Hold	
Stops (vph)	110	737		736	955	86	92	218	750	214	225	
Fuel Used(gal)	3	18		24	26	4	2	5	18	6	6	
CO Emissions (g/hr)	235	1271		1650	1796	249	155	355	1273	427	427	
NOx Emissions (g/hr)	46	247		321	349	48	30	69	248	83	83	
VOC Emissions (g/hr)	55	295		382	416	58	36	82	295	99	99	
Dilemma Vehicles (#)	0	28		0	36	0	0	0	0	0	0	
Queue Length 50th (ft)	69	284		409	535	65	55	140	395	112	144	
Queue Length 95th (ft)	93	338		m435	m554	m109	78	153	655	159	159	
Internal Link Dist (ft)		620			611			712			884	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	200			285			195		450	220		
Base Capacity (vph)	388	1293		938	1578	1045	370	714	1473	367	724	
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	0.36	0.72		0.95	0.69	0.31	0.33	0.42	0.72	0.67	0.52	

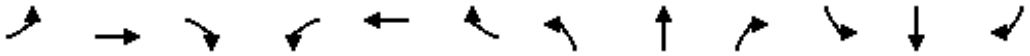
Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 116 (83%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.95			
Intersection Signal Delay: 44.9		Intersection LOS: D	
Intersection Capacity Utilization 70.5%		ICU Level of Service C	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 4: S Royal Oaks/N Royal Oaks & Highway 96





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1728	187	111	1055	0	0	0	0	355	0	1026
Future Volume (vph)	0	1728	187	111	1055	0	0	0	0	355	0	1026
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	12	12	12	12	12	12	11
Grade (%)		0%			0%			0%			1%	
Storage Length (ft)	0		0	420		0	0		0	350		0
Storage Lanes	0		1	0		0	0		0	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.86	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	0.88
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	6346	1509	1787	3388	0	0	0	0	3287	0	2654
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	6346	1509	1787	3388	0	0	0	0	3287	0	2654
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			182									117
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		501			556			756			888	
Travel Time (s)		8.5			9.5			20.6			24.2	
Peak Hour Factor	1.00	0.91	0.90	0.86	0.87	1.00	1.00	1.00	1.00	0.85	1.00	0.94
Heavy Vehicles (%)	2%	3%	7%	1%	3%	2%	2%	2%	2%	6%	2%	3%
Adj. Flow (vph)	0	1899	208	129	1213	0	0	0	0	418	0	1091
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1899	208	129	1213	0	0	0	0	418	0	1091
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.04	1.00	1.00	1.00	1.00	1.01	1.01	1.05
Turning Speed (mph)	15		12	15		9	15		9	18		12
Number of Detectors		1	0	1	1					1		1
Detector Template												
Leading Detector (ft)		300	0	42	300					42		42
Trailing Detector (ft)		294	0	-3	294					-3		-3
Detector 1 Position(ft)		294	-3	-3	294					-3		-3
Detector 1 Size(ft)		6	45	45	6					45		45
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Turn Type		NA	Perm	Prot	NA					Prot		Prot
Protected Phases		6		5	2					4		4
Permitted Phases			6									
Detector Phase		6	6	5	2					4		4
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		25.0	25.0	5.0	25.0					15.0		15.0
Minimum Split (s)		62.0	62.0	23.0	85.0					55.0		55.0
Total Split (s)		62.0	62.0	23.0	85.0					55.0		55.0
Total Split (%)		44.3%	44.3%	16.4%	60.7%					39.3%		39.3%
Maximum Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
Yellow Time (s)		4.0	4.0	3.0	4.0					4.0		4.0
All-Red Time (s)		2.0	2.0	3.0	2.0					3.5		3.5
Lost Time Adjust (s)		-2.0	-2.0	-1.0	-2.0					-2.0		-2.0
Total Lost Time (s)		4.0	4.0	5.0	4.0					5.5		5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		4.5	4.5	3.0	4.5					3.0		3.0
Recall Mode		C-Min	C-Min	None	C-Min					None		None
Act Effct Green (s)		60.5	60.5	15.5	81.0					49.5		49.5
Actuated g/C Ratio		0.43	0.43	0.11	0.58					0.35		0.35
v/c Ratio		0.69	0.28	0.65	0.62					0.36		1.08
Control Delay		25.9	4.8	71.1	19.1					34.6		89.4
Queue Delay		0.5	0.0	0.0	0.3					2.1		0.0
Total Delay		26.3	4.8	71.1	19.4					36.7		89.4
LOS		C	A	E	B					D		F
Approach Delay		24.2			24.3							
Approach LOS		C			C							
90th %ile Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
90th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
70th %ile Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
70th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
50th %ile Green (s)		57.6	57.6	15.4	79.0					47.5		47.5
50th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
30th %ile Green (s)		59.8	59.8	13.2	79.0					47.5		47.5
30th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
10th %ile Green (s)		63.2	63.2	9.8	79.0					47.5		47.5
10th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
Stops (vph)		1020	34	111	500					256		827
Fuel Used(gal)		33	2	3	13					6		30
CO Emissions (g/hr)		2313	142	218	908					431		2069
NOx Emissions (g/hr)		450	28	42	177					84		403
VOC Emissions (g/hr)		536	33	50	211					100		480
Dilemma Vehicles (#)		50	0	0	33					0		0
Queue Length 50th (ft)		295	20	125	282					144		~586
Queue Length 95th (ft)		388	m50	m163	m294					178		#738
Internal Link Dist (ft)		421			476			676			808	
Turn Bay Length (ft)				420						350		
Base Capacity (vph)		2743	755	229	1960					1162		1014
Starvation Cap Reductn		0	0	0	217					0		0
Spillback Cap Reductn		376	0	0	0					581		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.80	0.28	0.56	0.70					0.72		1.08

Intersection Summary

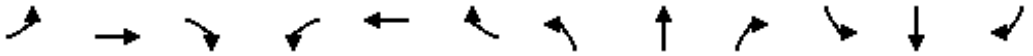
Area Type:	Other
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 106 (76%), Referenced to phase 2:WBT and 6:EBT, Start of Green	
Natural Cycle: 140	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.08	
Intersection Signal Delay: 39.6	Intersection LOS: D
Intersection Capacity Utilization 107.3%	ICU Level of Service G
Analysis Period (min) 15	

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

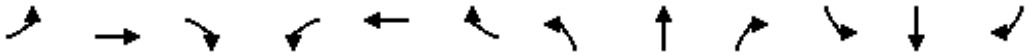
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

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

Splits and Phases: 5: Ent ramp to I-65/Exit ramp from I-65 & Highway 96



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1336	747	0	0	759	1217	407	0	364	0	0	0
Future Volume (vph)	1336	747	0	0	759	1217	407	0	364	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12	11	12	13	12	12	12
Grade (%)		1%			0%			1%			0%	
Storage Length (ft)	0		0	0		0	270		0	0		0
Storage Lanes	2		0	0		2	2		1	0		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	0.88	0.97	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	3302	3307	0	0	3539	2814	3302	0	1628	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	3302	3307	0	0	3539	2814	3302	0	1628	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						23			258			
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		556			311			685			941	
Travel Time (s)		9.5			5.3			18.7			25.7	
Peak Hour Factor	0.88	0.86	0.95	1.00	0.95	0.98	0.95	0.25	0.92	1.00	1.00	0.95
Heavy Vehicles (%)	2%	5%	2%	2%	2%	1%	2%	0%	2%	2%	2%	2%
Adj. Flow (vph)	1518	869	0	0	799	1242	428	0	396	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1518	869	0	0	799	1242	428	0	396	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			26			22			22	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.05	1.05	1.01	1.00	1.00	1.00	1.05	1.01	0.96	1.00	1.00	1.00
Turning Speed (mph)	18		9	15		10	15		15	15		9
Number of Detectors	1	1			1	0	1		1			
Detector Template												
Leading Detector (ft)	42	300			300	0	42		50			
Trailing Detector (ft)	-3	294			294	0	-3		0			
Detector 1 Position(ft)	-3	294			294	0	-3		0			
Detector 1 Size(ft)	45	6			6	50	45		50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Turn Type	Prot	NA			NA	custom	Prot		Perm			
Protected Phases	1	6			2	2 4	4					
Permitted Phases									4			
Detector Phase	1	6			2	2 4	4		4			
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	12.0	18.0			18.0		7.0		7.0			
Minimum Split (s)	56.0	116.0			60.0		24.0		24.0			
Total Split (s)	56.0	116.0			60.0		24.0		24.0			
Total Split (%)	40.0%	82.9%			42.9%		17.1%		17.1%			
Maximum Green (s)	50.0	110.0			53.5		16.5		16.5			
Yellow Time (s)	3.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	3.0	2.0			2.5		3.5		3.5			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.5		7.5		7.5			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	4.0	4.5			4.5		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Act Effct Green (s)	50.0	110.0			53.5	79.5	16.5		16.5			
Actuated g/C Ratio	0.36	0.79			0.38	0.57	0.12		0.12			
v/c Ratio	1.29	0.33			0.59	0.77	1.10		0.95			
Control Delay	186.0	3.2			36.7	27.0	131.0		53.3			
Queue Delay	0.7	0.1			0.0	0.0	0.0		0.0			
Total Delay	186.7	3.3			36.7	27.0	131.0		53.3			
LOS	F	A			D	C	F		D			
Approach Delay		119.9			30.8							
Approach LOS		F			C							
90th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
90th %ile Term Code	Max	Coord			Coord		Max		Max			
70th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
70th %ile Term Code	Max	Coord			Coord		Max		Max			
50th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
50th %ile Term Code	Max	Coord			Coord		Max		Max			
30th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
30th %ile Term Code	Max	Coord			Coord		Max		Max			
10th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
10th %ile Term Code	Max	Coord			Coord		Max		Max			
Stops (vph)	979	101			591	899	348		115			
Fuel Used(gal)	65	4			13	18	15		7			
CO Emissions (g/hr)	4561	300			914	1264	1018		455			
NOx Emissions (g/hr)	887	58			178	246	198		89			
VOC Emissions (g/hr)	1057	70			212	293	236		105			
Dilemma Vehicles (#)	0	17			27	0	0		0			
Queue Length 50th (ft)	~899	68			303	468	~227		135			
Queue Length 95th (ft)	#1028	76			372	573	#337		#341			
Internal Link Dist (ft)		476			231			605			861	
Turn Bay Length (ft)							270					
Base Capacity (vph)	1179	2598			1352	1607	389		419			
Starvation Cap Reductn	163	612			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	1.49	0.44			0.59	0.77	1.10		0.95			

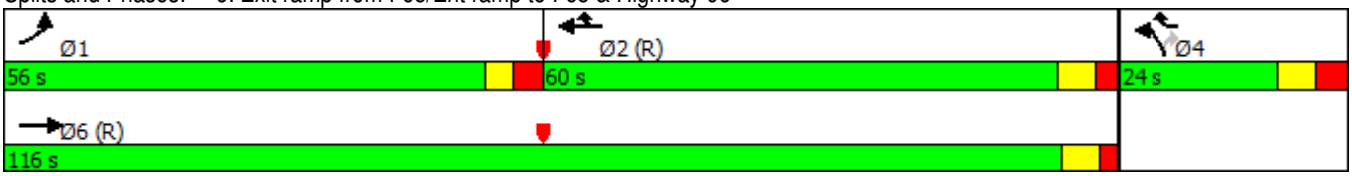
Intersection Summary

Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 122 (87%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.29			
Intersection Signal Delay: 81.2		Intersection LOS: F	
Intersection Capacity Utilization 107.3%		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.

Splits and Phases: 6: Exit ramp from I-65/Ent ramp to I-65 & Highway 96



Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Lane Configurations												
Traffic Volume (vph)	92	827	19	147	41	118	92	29	91	138	765	145
Future Volume (vph)	92	827	19	147	41	118	92	29	91	138	765	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	11	11	11	11	12	12	13	12	12	12	12
Storage Length (ft)		70	150	75		0	100		195	180	0	
Storage Lanes		3	0	1		0	1		1	1	2	
Taper Length (ft)		50		50			50			50		
Lane Util. Factor	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88	1.00
Frt			0.850		0.896				0.850		0.850	
Flt Protected	0.950	0.950		0.950			0.950			0.950		
Satd. Flow (prot)	1534	3319	1531	1711	1613	0	1770	1925	1583	1770	2787	0
Flt Permitted	0.097	0.950		0.724			0.278			0.265		
Satd. Flow (perm)	157	3319	1531	1304	1613	0	518	1925	1583	494	2787	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			132		93				99		132	
Link Speed (mph)		30			25			40		30		
Link Distance (ft)		552			721			918		1624		
Travel Time (s)		12.5			19.7			15.6		36.9		
Peak Hour Factor	0.67	0.94	0.63	0.79	0.58	0.73	0.75	0.58	0.92	0.75	0.75	0.69
Adj. Flow (vph)	137	880	30	186	71	162	123	50	99	184	1020	210
Shared Lane Traffic (%)												
Lane Group Flow (vph)	137	880	30	186	233	0	123	50	99	184	1230	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Right	Right
Median Width(ft)		30			12			12		12		
Link Offset(ft)		0			0			0		0		
Crosswalk Width(ft)		16			16			16		16		
Two way Left Turn Lane												
Headway Factor	1.20	1.04	1.04	1.04	1.04	1.00	1.00	0.96	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	9	15		9	15		9	15	9	9
Number of Detectors	1	1	1	1	1		1	1	1	1	1	
Detector Template												
Leading Detector (ft)	42	42	42	42	42		42	42	42	42	42	
Trailing Detector (ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	45	45	45	45		45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	pm+pt	Prot	Perm	D.P+P	NA		D.P+P	NA	custom	pm+pt	Prot	
Protected Phases	1	6		3	8		7	4	5	5	2	
Permitted Phases	6		6	4			8		8	2		
Detector Phase	1	6		3	8		7	4	5	5	2	
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	7.0		7.0	7.0	7.0	7.0	20.0	
Minimum Split (s)	18.0	57.0	57.0	14.0	35.0		14.0	35.0	14.0	14.0	53.0	

Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Total Split (s)	18.0	57.0	57.0	14.0	35.0		14.0	35.0	14.0	14.0	53.0	
Total Split (%)	15.0%	47.5%	47.5%	11.7%	29.2%		11.7%	29.2%	11.7%	11.7%	44.2%	
Maximum Green (s)	12.0	51.0	51.0	8.5	29.0		8.5	29.0	8.0	8.0	47.0	
Yellow Time (s)	3.0	4.0	4.0	3.5	3.5		3.5	3.5	3.0	3.0	4.0	
All-Red Time (s)	3.0	2.0	2.0	2.0	2.5		2.0	2.5	3.0	3.0	2.0	
Lost Time Adjust (s)	-2.5	-1.5	-1.5	-2.5	-2.5		-2.5	-2.5	-2.5	-2.5	-1.5	
Total Lost Time (s)	3.5	4.5	4.5	3.0	3.5		3.0	3.5	3.5	3.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.0	5.0	1.5	3.5		1.5	3.5	1.5	1.5	5.0	
Recall Mode	None	C-Min	C-Min	None	None		None	None	None	None	C-Min	
Act Effct Green (s)	78.4	65.3	65.3	31.2	19.4		30.6	19.1	33.0	74.3	63.1	
Actuated g/C Ratio	0.65	0.54	0.54	0.26	0.16		0.26	0.16	0.28	0.62	0.53	
v/c Ratio	0.56	0.49	0.03	0.48	0.69		0.51	0.16	0.20	0.45	0.80	
Control Delay	22.4	19.3	0.1	38.4	38.0		39.3	41.7	6.4	12.4	27.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	22.4	19.3	0.1	38.4	38.0		39.3	41.7	6.4	12.4	27.4	
LOS	C	B	A	D	D		D	D	A	B	C	
Approach Delay		19.1			38.2			27.8		25.5		
Approach LOS		B			D			C		C		
90th %ile Green (s)	12.0	54.9	54.9	8.5	25.1		8.5	25.1	8.0	8.0	50.9	
90th %ile Term Code	Max	Coord	Coord	Max	Gap		Max	Hold	Max	Max	Coord	
70th %ile Green (s)	12.0	59.7	59.7	8.5	20.3		8.5	20.3	8.0	8.0	55.7	
70th %ile Term Code	Max	Coord	Coord	Max	Gap		Max	Hold	Max	Max	Coord	
50th %ile Green (s)	10.3	63.1	63.1	8.5	16.9		8.5	16.9	8.0	8.0	60.8	
50th %ile Term Code	Gap	Coord	Coord	Max	Gap		Max	Hold	Max	Max	Coord	
30th %ile Green (s)	7.7	67.2	67.2	8.5	13.5		8.5	13.5	7.3	7.3	66.8	
30th %ile Term Code	Gap	Coord	Coord	Max	Gap		Max	Hold	Gap	Gap	Coord	
10th %ile Green (s)	7.0	73.9	73.9	21.6	8.6		7.0	0.0	7.0	7.0	73.9	
10th %ile Term Code	Min	Coord	Coord	Hold	Gap		Min	Skip	Min	Min	Coord	
Stops (vph)	40	507	0	118	89		69	23	12	56	640	
Fuel Used(gal)	1	10	0	3	3		2	1	1	2	20	
CO Emissions (g/hr)	72	671	6	175	178		139	46	56	168	1408	
NOx Emissions (g/hr)	14	131	1	34	35		27	9	11	33	274	
VOC Emissions (g/hr)	17	156	1	41	41		32	11	13	39	326	
Dilemma Vehicles (#)	0	0	0	0	0		0	1	0	0	0	
Queue Length 50th (ft)	36	211	0	116	103		74	34	0	49	395	
Queue Length 95th (ft)	56	308	0	142	80		92	41	37	78	423	
Internal Link Dist (ft)		472			641			838		1544		
Turn Bay Length (ft)	70	70	150	75			100		195	180		
Base Capacity (vph)	270	1804	892	385	492		248	505	512	418	1528	
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	0.51	0.49	0.03	0.48	0.47		0.50	0.10	0.19	0.44	0.80	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	

Actuated Cycle Length: 120	
Offset: 117 (98%), Referenced to phase 2:SWL and 6:EBL, Start of Green	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 25.3	Intersection LOS: C
Intersection Capacity Utilization 60.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: Oak Meadow Dr. & S Royal Oaks

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	90	1063	27	232	1063	93	83	64	123	46	58	288
Future Volume (vph)	90	1063	27	232	1063	93	83	64	123	46	58	288
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	12	11	12	11	11	12	12	11	12
Grade (%)		1%			-2%			-1%			2%	
Storage Length (ft)	80		135	220		0	100		0	120		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.986			0.906			0.877	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	3438	1575	1805	3444	0	1736	1672	0	1752	1595	0
Flt Permitted	0.156			0.144			0.168			0.392		
Satd. Flow (perm)	275	3438	1575	274	3444	0	307	1672	0	723	1595	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			124		12			57			158	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1624			792			957			515	
Travel Time (s)		36.9			18.0			21.8			11.7	
Peak Hour Factor	0.79	0.95	0.64	0.75	0.90	0.76	0.86	0.71	0.82	0.75	0.88	0.94
Heavy Vehicles (%)	0%	1%	2%	1%	1%	0%	1%	0%	0%	2%	0%	0%
Adj. Flow (vph)	114	1119	42	309	1181	122	97	90	150	61	66	306
Shared Lane Traffic (%)												
Lane Group Flow (vph)	114	1119	42	309	1303	0	97	240	0	61	372	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.10	1.05	1.01	0.99	1.03	0.99	1.04	1.04	0.99	1.01	1.06	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	0	1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	42	226	0	42	226		42	42		42	42	
Trailing Detector (ft)	-3	220	0	-3	220		-3	-3		-3	-3	
Detector 1 Position(ft)	-3	220	0	-3	220		-3	-3		-3	-3	
Detector 1 Size(ft)	45	6	50	45	6		45	45		45	45	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA		D.Pm	NA		D.Pm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6		6	2			8			4		
Detector Phase	1	6		5	2		8	4		4	8	
Switch Phase												

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	15.0	70.0	70.0	30.0	85.0		50.0	50.0		50.0	50.0	
Total Split (s)	14.0	72.0	72.0	29.0	87.0		49.0	49.0		49.0	49.0	
Total Split (%)	9.3%	48.0%	48.0%	19.3%	58.0%		32.7%	32.7%		32.7%	32.7%	
Maximum Green (s)	7.5	66.0	66.0	22.5	81.0		42.0	42.0		42.0	42.0	
Yellow Time (s)	3.0	3.5	3.5	3.0	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	3.5	2.5	2.5	3.5	2.5		3.5	3.5		3.5	3.5	
Lost Time Adjust (s)	-1.0	-3.0	-3.0	-1.0	-3.0		-2.5	-2.5		-2.5	-2.5	
Total Lost Time (s)	5.5	3.0	3.0	5.5	3.0		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
Recall Mode	None	C-Min	C-Min	None	C-Min		None	None		None	None	
Walk Time (s)		7.0	7.0		7.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)		16.0	16.0		20.0		35.0	32.0		32.0	35.0	
Pedestrian Calls (#/hr)		0	0		0		0	0		0	0	
Act Effct Green (s)	86.2	80.3	80.3	103.3	92.2		36.4	36.4		36.4	36.4	
Actuated g/C Ratio	0.57	0.54	0.54	0.69	0.61		0.24	0.24		0.24	0.24	
v/c Ratio	0.49	0.61	0.05	0.78	0.61		1.31	0.53		0.35	0.73	
Control Delay	18.9	28.2	0.1	40.9	7.1		246.3	34.1		49.9	37.3	
Queue Delay	0.0	0.0	0.0	0.0	1.1		0.0	0.0		0.0	0.0	
Total Delay	18.9	28.2	0.1	40.9	8.2		246.3	34.1		49.9	37.3	
LOS	B	C	A	D	A		F	C		D	D	
Approach Delay		26.4			14.5			95.2			39.1	
Approach LOS		C			B			F			D	
90th %ile Green (s)	7.5	66.0	66.0	22.5	81.0		42.0	42.0		42.0	42.0	
90th %ile Term Code	Max	Coord	Coord	Max	Coord		Max	Hold		Hold	Max	
70th %ile Green (s)	7.5	66.0	66.0	22.5	81.0		42.0	42.0		42.0	42.0	
70th %ile Term Code	Max	Coord	Coord	Max	Coord		Max	Hold		Hold	Max	
50th %ile Green (s)	7.5	70.5	70.5	22.5	85.5		37.5	37.5		37.5	37.5	
50th %ile Term Code	Max	Coord	Coord	Max	Coord		Gap	Hold		Hold	Gap	
30th %ile Green (s)	7.5	82.8	82.8	17.8	93.1		29.9	29.9		29.9	29.9	
30th %ile Term Code	Max	Coord	Coord	Gap	Coord		Gap	Hold		Hold	Gap	
10th %ile Green (s)	6.8	101.4	101.4	10.8	105.4		18.3	18.3		18.3	18.3	
10th %ile Term Code	Gap	Coord	Coord	Gap	Coord		Gap	Hold		Hold	Gap	
Stops (vph)	41	735	0	224	525		67	124		37	188	
Fuel Used(gal)	2	24	0	5	12		5	3		1	5	
CO Emissions (g/hr)	120	1651	24	322	819		360	236		60	353	
NOx Emissions (g/hr)	23	321	5	63	159		70	46		12	69	
VOC Emissions (g/hr)	28	383	6	75	190		83	55		14	82	
Dilemma Vehicles (#)	0	0	0	0	0		0	0		0	0	
Queue Length 50th (ft)	37	427	0	146	64		~113	157		48	193	
Queue Length 95th (ft)	59	538	0	m112	m351		#217	170		74	289	
Internal Link Dist (ft)		1544			712			877			435	
Turn Bay Length (ft)	80		135	220			100			120		
Base Capacity (vph)	237	1841	900	429	2121		91	536		214	584	
Starvation Cap Reductn	0	0	0	0	527		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	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Reduced v/c Ratio	0.48	0.61	0.05	0.72	0.82		1.07	0.45		0.29	0.64	

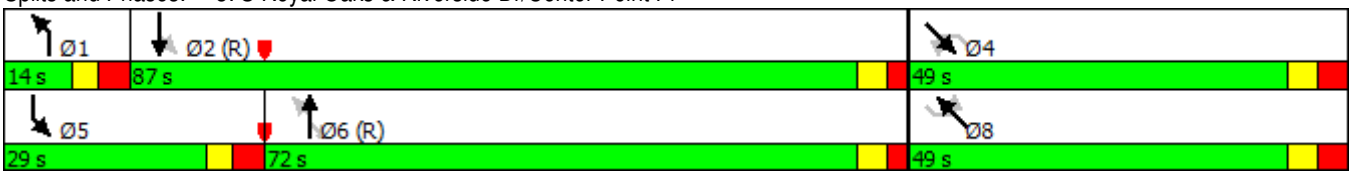
Intersection Summary		
Area Type:	Other	
Cycle Length: 150		
Actuated Cycle Length: 150		
Offset: 123 (82%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green		
Natural Cycle: 150		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.31		
Intersection Signal Delay: 29.0	Intersection LOS: C	
Intersection Capacity Utilization 84.3%	ICU Level of Service E	
Analysis Period (min) 15		

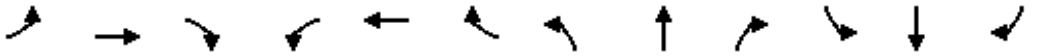
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

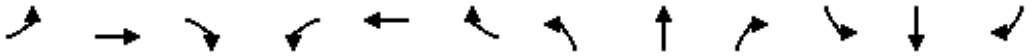
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: S Royal Oaks & Riverside Dr/Center Point Pl





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	206	1108	63	913	1174	269	141	351	964	316	434	178
Future Volume (vph)	206	1108	63	913	1174	269	141	351	964	316	434	178
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	11	12	13	12	13	13	11	11	11
Grade (%)		0%			0%			1%			0%	
Storage Length (ft)	200		300	285		0	195		450	220		650
Storage Lanes	2		1	2		1	2		2	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.95	0.88	0.97	0.95	0.95
Frt		0.991				0.850			0.850		0.951	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3467	4923	0	3351	3539	1652	3484	3712	2894	3385	3319	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3467	4923	0	3351	3539	1652	3484	3712	2894	3385	3319	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		7				87					49	
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		700			691			792			964	
Travel Time (s)		11.9			11.8			18.0			21.9	
Peak Hour Factor	0.92	0.93	0.81	0.87	0.91	0.89	0.74	0.83	0.89	0.83	0.95	0.80
Heavy Vehicles (%)	1%	1%	0%	1%	2%	1%	0%	0%	1%	0%	0%	0%
Adj. Flow (vph)	224	1191	78	1049	1290	302	191	423	1083	381	457	223
Shared Lane Traffic (%)												
Lane Group Flow (vph)	224	1269	0	1049	1290	302	191	423	1083	381	680	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		30			24			30			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.04	1.00	1.04	1.00	0.96	1.01	0.96	0.96	1.04	1.04	1.04
Turning Speed (mph)	18		10	18		10	18		10	18		10
Number of Detectors	1	1		1	1	0	1	2	1	1	2	
Detector Template												
Leading Detector (ft)	42	236		42	236	0	42	146	42	42	146	
Trailing Detector (ft)	-3	230		-3	230	0	-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	230		-3	230	230	-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	6		45	6	6	45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)								140			140	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	

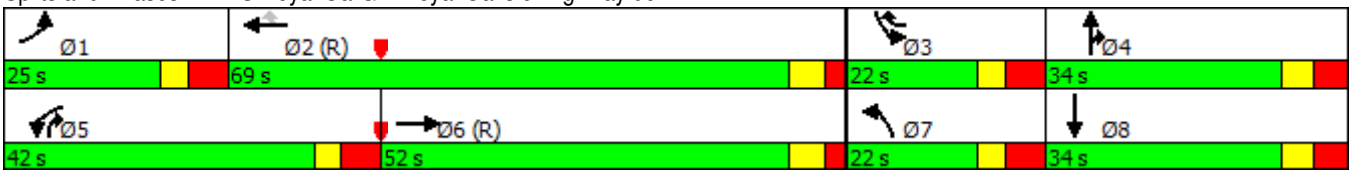


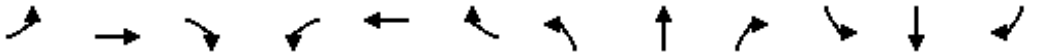
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	1	6		5	2	3	7	4	4 5	3	8	
Permitted Phases						2						
Detector Phase	1	6		5	2	3	7	4	4 5	3	8	
Switch Phase												
Minimum Initial (s)	6.0	13.0		6.0	13.0	6.0	6.0	10.0		6.0	10.0	
Minimum Split (s)	25.0	52.0		42.0	69.0	22.0	22.0	34.0		22.0	34.0	
Total Split (s)	25.0	52.0		42.0	69.0	22.0	22.0	34.0		22.0	34.0	
Total Split (%)	16.7%	34.7%		28.0%	46.0%	14.7%	14.7%	22.7%		14.7%	22.7%	
Maximum Green (s)	17.5	45.5		34.5	62.5	14.5	14.5	26.5		14.5	26.5	
Yellow Time (s)	3.0	4.0		3.0	4.0	3.0	3.0	3.5		3.0	3.5	
All-Red Time (s)	4.5	2.5		4.5	2.5	4.5	4.5	4.0		4.5	4.0	
Lost Time Adjust (s)	-2.5	-2.5		-2.5	-2.5	-2.0	-2.0	-3.0		-2.0	-3.0	
Total Lost Time (s)	5.0	4.0		5.0	4.0	5.5	5.5	4.5		5.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	6.0		3.0	6.0	3.0	3.0	4.5		3.0	4.5	
Recall Mode	None	C-Min		None	C-Min	None	None	None		None	None	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		37.0			24.0			36.0			36.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	17.3	48.0		37.0	67.7	88.2	14.9	29.5	71.0	16.5	31.1	
Actuated g/C Ratio	0.12	0.32		0.25	0.45	0.59	0.10	0.20	0.47	0.11	0.21	
v/c Ratio	0.56	0.80		1.27	0.81	0.30	0.55	0.58	0.79	1.02	0.94	
Control Delay	68.7	44.7		163.5	48.8	16.5	60.9	58.9	49.2	117.0	74.6	
Queue Delay	0.0	0.2		0.2	0.6	0.0	0.1	0.0	0.0	0.0	0.3	
Total Delay	68.7	44.9		163.7	49.4	16.5	61.1	58.9	49.2	117.0	74.9	
LOS	E	D		F	D	B	E	E	D	F	E	
Approach Delay		48.5			91.1			53.0			90.0	
Approach LOS		D			F			D			F	
90th %ile Green (s)	17.5	45.5		34.5	62.5	14.5	14.5	26.5		14.5	26.5	
90th %ile Term Code	Max	Coord		Max	Coord	Max	Max	Max		Max	Max	
70th %ile Green (s)	16.7	45.5		34.5	63.3	14.5	14.5	26.5		14.5	26.5	
70th %ile Term Code	Gap	Coord		Max	Coord	Max	Max	Max		Max	Max	
50th %ile Green (s)	15.1	45.5		34.5	64.9	14.5	13.5	26.5		14.5	27.5	
50th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
30th %ile Green (s)	13.4	45.5		34.5	66.6	14.5	12.0	26.5		14.5	29.0	
30th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
10th %ile Green (s)	11.1	45.5		34.5	68.9	14.5	9.8	26.5		14.5	31.2	
10th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
Stops (vph)	191	937		743	1069	205	134	321	787	280	514	
Fuel Used(gal)	6	25		45	32	5	3	8	20	11	17	
CO Emissions (g/hr)	401	1777		3150	2214	356	235	570	1395	800	1171	
NOx Emissions (g/hr)	78	346		613	431	69	46	111	271	156	228	
VOC Emissions (g/hr)	93	412		730	513	83	54	132	323	185	271	
Dilemma Vehicles (#)	0	44		0	44	0	0	0	0	0	0	
Queue Length 50th (ft)	107	315		~680	582	137	94	220	490	~203	327	
Queue Length 95th (ft)	155	369		m#521	m521	m130	m109	m236	m692	#272	#465	
Internal Link Dist (ft)		620			611			712			884	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	200			285			195		450	220		
Base Capacity (vph)	462	1580		826	1598	1007	383	730	1369	372	727	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	34		29	84	0	10	0	0	0	2	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.48	0.82		1.32	0.85	0.30	0.51	0.58	0.79	1.02	0.94	

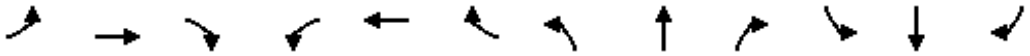
Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 133 (89%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.27			
Intersection Signal Delay: 72.3		Intersection LOS: E	
Intersection Capacity Utilization 87.4%		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.			

Splits and Phases: 4: S Royal Oaks/N Royal Oaks & Highway 96





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1971	484	285	906	0	0	0	0	914	0	1405
Future Volume (vph)	0	1971	484	285	906	0	0	0	0	914	0	1405
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	12	12	12	12	12	12	11
Grade (%)		0%			0%			0%			1%	
Storage Length (ft)	0		0	420		0	0		0	350		0
Storage Lanes	0		1	0		0	0		0	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.86	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	0.88
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	6408	1583	1787	3455	0	0	0	0	3450	0	2707
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	6408	1583	1787	3455	0	0	0	0	3450	0	2707
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			403									143
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		501			556			756			888	
Travel Time (s)		8.5			9.5			20.6			24.2	
Peak Hour Factor	1.00	0.93	0.78	0.71	0.86	1.00	1.00	1.00	1.00	0.87	1.00	0.88
Heavy Vehicles (%)	2%	2%	2%	1%	1%	2%	2%	2%	2%	1%	2%	1%
Adj. Flow (vph)	0	2119	621	401	1053	0	0	0	0	1051	0	1597
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2119	621	401	1053	0	0	0	0	1051	0	1597
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.04	1.00	1.00	1.00	1.00	1.01	1.01	1.05
Turning Speed (mph)	15		12	15		9	15		9	18		12
Number of Detectors		1	0	1	1					1		1
Detector Template												
Leading Detector (ft)		300	0	42	300					42		42
Trailing Detector (ft)		294	0	-3	294					-3		-3
Detector 1 Position(ft)		294	-3	-3	294					-3		-3
Detector 1 Size(ft)		6	45	45	6					45		45
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Turn Type		NA	Perm	Prot	NA					Prot		Prot
Protected Phases		6		5	2					4		4
Permitted Phases			6									
Detector Phase		6	6	5	2					4		4
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		25.0	25.0	5.0	25.0					15.0		15.0
Minimum Split (s)		55.0	55.0	30.0	85.0					65.0		65.0
Total Split (s)		55.0	55.0	30.0	85.0					65.0		65.0
Total Split (%)		36.7%	36.7%	20.0%	56.7%					43.3%		43.3%
Maximum Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
Yellow Time (s)		4.0	4.0	3.0	4.0					4.0		4.0
All-Red Time (s)		2.0	2.0	3.0	2.0					3.5		3.5
Lost Time Adjust (s)		-2.0	-2.0	-1.0	-2.0					-2.0		-2.0
Total Lost Time (s)		4.0	4.0	5.0	4.0					5.5		5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		4.5	4.5	3.0	4.5					3.0		3.0
Recall Mode		C-Min	C-Min	None	C-Min					None		None
Act Effct Green (s)		51.0	51.0	25.0	81.0					59.5		59.5
Actuated g/C Ratio		0.34	0.34	0.17	0.54					0.40		0.40
v/c Ratio		0.97	0.77	1.35	0.56					0.77		1.38
Control Delay		69.9	30.6	226.6	25.0					43.9		207.9
Queue Delay		0.8	0.0	0.0	0.7					1.7		0.0
Total Delay		70.7	30.6	226.6	25.7					45.6		207.9
LOS		E	C	F	C					D		F
Approach Delay		61.6			81.1							
Approach LOS		E			F							
90th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
90th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
70th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
70th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
50th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
50th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
30th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
30th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
10th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
10th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
Stops (vph)		1855	462	222	472					776		985
Fuel Used(gal)		62	11	16	13					18		74
CO Emissions (g/hr)		4349	802	1147	886					1262		5163
NOx Emissions (g/hr)		846	156	223	172					246		1005
VOC Emissions (g/hr)		1008	186	266	205					292		1197
Dilemma Vehicles (#)		105	0	0	45					0		0
Queue Length 50th (ft)		619	296	~524	272					457		~1127
Queue Length 95th (ft)		m#672	m295	#520	407					515		#1235
Internal Link Dist (ft)		421			476			676			808	
Turn Bay Length (ft)				420						350		
Base Capacity (vph)		2178	804	297	1865					1368		1160
Starvation Cap Reductn		0	0	0	446					0		0
Spillback Cap Reductn		14	0	0	0					166		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.98	0.77	1.35	0.74					0.87		1.38

Intersection Summary

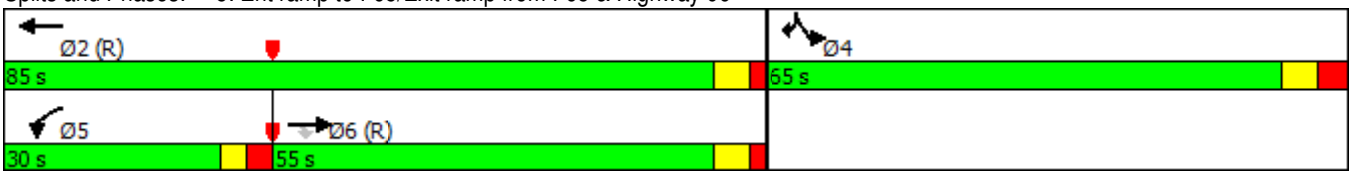
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 104 (69%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.38			
Intersection Signal Delay: 97.4		Intersection LOS: F	
Intersection Capacity Utilization 84.7%		ICU Level of Service E	
Analysis Period (min) 15			

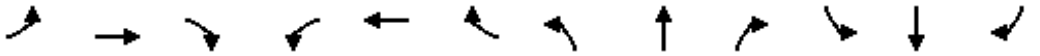
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

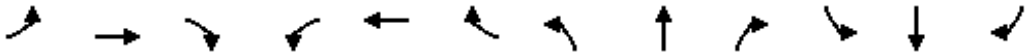
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Ent ramp to I-65/Exit ramp from I-65 & Highway 96





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	595	2290	0	0	882	998	309	0	164	0	0	0
Future Volume (vph)	595	2290	0	0	882	998	309	0	164	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12	11	12	13	12	12	12
Grade (%)		1%			0%			1%			0%	
Storage Length (ft)	0		0	0		0	270		0	0		0
Storage Lanes	2		0	0		2	2		1	0		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	0.88	0.97	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	3270	3371	0	0	3539	2787	3302	0	1597	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	3270	3371	0	0	3539	2787	3302	0	1597	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						246			69			
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		556			1845			685			941	
Travel Time (s)		9.5			31.4			18.7			25.7	
Peak Hour Factor	0.97	0.98	1.00	0.25	0.91	0.93	0.92	1.00	0.87	1.00	1.00	1.00
Heavy Vehicles (%)	3%	3%	2%	0%	2%	2%	2%	2%	4%	2%	2%	2%
Adj. Flow (vph)	613	2337	0	0	969	1073	336	0	189	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	613	2337	0	0	969	1073	336	0	189	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			26			22			22	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.05	1.05	1.01	1.00	1.00	1.00	1.05	1.01	0.96	1.00	1.00	1.00
Turning Speed (mph)	18		9	15		10	15		15	15		9
Number of Detectors	1	1			1	0	1		1			
Detector Template												
Leading Detector (ft)	42	300			300	0	42		50			
Trailing Detector (ft)	-3	294			294	0	-3		0			
Detector 1 Position(ft)	-3	294			294	0	-3		0			
Detector 1 Size(ft)	45	6			6	50	45		50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Turn Type	Prot	NA			NA	custom	Prot		Perm			
Protected Phases	1	6			2	2 4	4					
Permitted Phases									4			
Detector Phase	1	6			2	2 4	4		4			
Switch Phase												

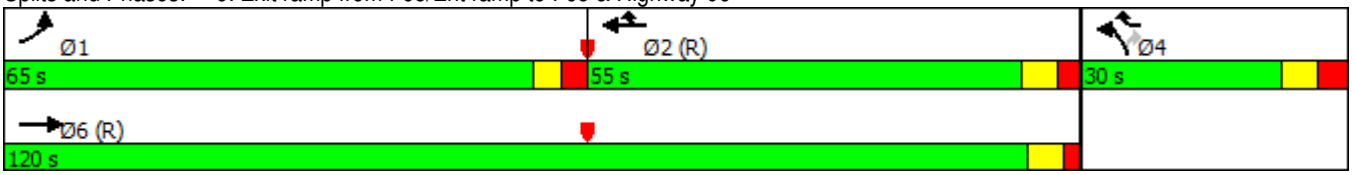


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	12.0	18.0			18.0		7.0		7.0			
Minimum Split (s)	65.0	120.0			55.0		30.0		30.0			
Total Split (s)	65.0	120.0			55.0		30.0		30.0			
Total Split (%)	43.3%	80.0%			36.7%		20.0%		20.0%			
Maximum Green (s)	59.0	114.0			48.5		22.5		22.5			
Yellow Time (s)	3.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	3.0	2.0			2.5		3.5		3.5			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.5		7.5		7.5			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	4.0	4.5			4.5		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Act Effct Green (s)	35.9	114.7			72.3	103.6	21.8		21.8			
Actuated g/C Ratio	0.24	0.76			0.48	0.69	0.15		0.15			
v/c Ratio	0.78	0.91			0.57	0.54	0.70		0.65			
Control Delay	79.7	23.8			30.4	10.0	69.4		49.0			
Queue Delay	0.0	4.8			0.0	0.0	0.0		0.0			
Total Delay	79.7	28.6			30.4	10.0	69.4		49.0			
LOS	E	C			C	B	E		D			
Approach Delay		39.2			19.7							
Approach LOS		D			B							
90th %ile Green (s)	43.9	114.0			63.6		22.5		22.5			
90th %ile Term Code	Gap	Coord			Coord		Max		Max			
70th %ile Green (s)	39.0	114.0			68.5		22.5		22.5			
70th %ile Term Code	Gap	Coord			Coord		Max		Max			
50th %ile Green (s)	36.0	114.0			71.5		22.5		22.5			
50th %ile Term Code	Gap	Coord			Coord		Max		Max			
30th %ile Green (s)	33.0	114.0			74.5		22.5		22.5			
30th %ile Term Code	Gap	Coord			Coord		Max		Max			
10th %ile Green (s)	27.8	117.5			83.2		19.0		19.0			
10th %ile Term Code	Gap	Coord			Coord		Gap		Gap			
Stops (vph)	588	1844			621	375	290		100			
Fuel Used(gal)	18	38			23	18	7		3			
CO Emissions (g/hr)	1236	2645			1580	1273	509		208			
NOx Emissions (g/hr)	240	515			307	248	99		40			
VOC Emissions (g/hr)	286	613			366	295	118		48			
Dilemma Vehicles (#)	0	83			29	0	0		0			
Queue Length 50th (ft)	329	582			353	205	162		112			
Queue Length 95th (ft)	m340	m518			467	311	218		190			
Internal Link Dist (ft)		476			1765			605			861	
Turn Bay Length (ft)							270					
Base Capacity (vph)	1286	2577			1704	2012	495		298			
Starvation Cap Reductn	0	197			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	0.48	0.98			0.57	0.53	0.68		0.63			

Intersection Summary

Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 138 (92%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.91			
Intersection Signal Delay: 34.2		Intersection LOS: C	
Intersection Capacity Utilization 84.7%		ICU Level of Service E	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 6: Exit ramp from I-65/Ent ramp to I-65 & Highway 96



HCS 2010 Two-Way Stop Control Summary Report

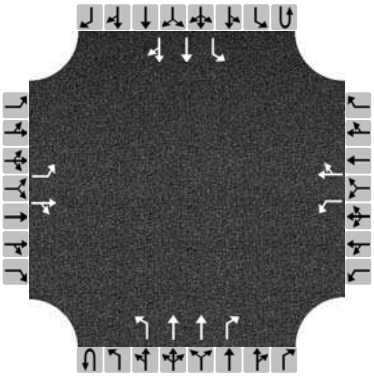
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	Mar 2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Intersection Orientation	North-South
Project Description	10728 (Background)

Site Information

Intersection	S. Royal Oaks and Rand
Jurisdiction	Franklin, TN
East/West Street	Rand Pl / Home Depot
North/South Street	S. Royal Oaks Blvd
Peak Hour Factor	0.97
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	0		1	1	0	0	1	2	1	0	1	2	0
Configuration		L		TR		L		TR		L	T	R		L	T	TR
Volume (veh/h)		26	1	9		14	0	17		10	1388	25		61	645	51
Percent Heavy Vehicles		0	0	0		0	0	0		0				0		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left + Thru															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		27		10		14		18		10				63		
Capacity		165		416		108		377		893				470		
v/c Ratio		0.16		0.02		0.13		0.05		0.01				0.13		
95% Queue Length		0.6		0.1		0.4		0.1		0.0				0.5		
Control Delay (s/veh)		31.0		13.9		43.1		15.0		9.1				13.8		
Level of Service (LOS)		D		B		E		C		A				B		
Approach Delay (s/veh)	26.4				27.3				0.1				1.1			
Approach LOS	D				D				A				A			

HCS 2010 Two-Way Stop Control Summary Report

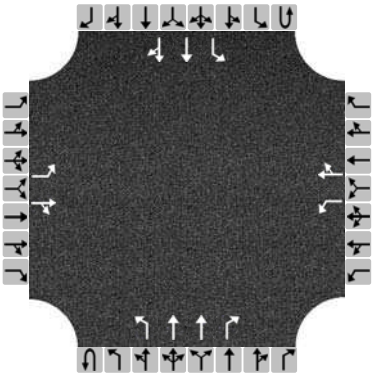
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	Mar 2016
Analysis Year	2016
Time Analyzed	PM Peak Hour
Intersection Orientation	North-South
Project Description	10728 (Background)

Site Information

Intersection	S. Royal Oaks and Rand
Jurisdiction	Franklin, TN
East/West Street	Rand Pl / Home Depot
North/South Street	S. Royal Oaks Blvd
Peak Hour Factor	0.96
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	0		1	1	0	0	1	2	1	0	1	2	0
Configuration		L		TR		L		TR		L	T	R		L	T	TR
Volume (veh/h)		26	3	16		21	4	40		6	984	17		33	965	105
Percent Heavy Vehicles		0	0	0		0	0	0		0				0		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left + Thru															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		27		20		22		46		6				34		
Capacity		150		355		170		419		635				675		
v/c Ratio		0.18		0.06		0.13		0.11		0.01				0.05		
95% Queue Length		0.6		0.2		0.4		0.4		0.0				0.2		
Control Delay (s/veh)		34.1		15.7		29.2		14.7		10.7				10.6		
Level of Service (LOS)		D		C		D		B		B				B		
Approach Delay (s/veh)	26.3				19.4				0.1				0.3			
Approach LOS	D				C				A				A			

HCS 2010 Two-Way Stop Control Summary Report

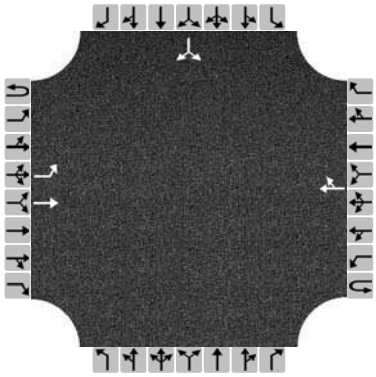
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	Mar 2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Intersection Orientation	East-West
Project Description	10728 (Background)

Site Information

Intersection	Oak Meadow Dr and dwy
Jurisdiction	Franklin, TN
East/West Street	Oak Meadow Drive
North/South Street	Western Home Depot dwy
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	0	1	0		0	0	0		0	0	0
Configuration		L	T					TR							LR	
Volume (veh/h)		24	48				198	0						1		9
Percent Heavy Vehicles		0												0		0
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		30													12	
Capacity		1330													782	
v/c Ratio		0.02													0.02	
95% Queue Length		0.1													0.0	
Control Delay (s/veh)		7.8													9.7	
Level of Service (LOS)		A													A	
Approach Delay (s/veh)	2.6												9.7			
Approach LOS	A												A			

HCS 2010 Two-Way Stop Control Summary Report

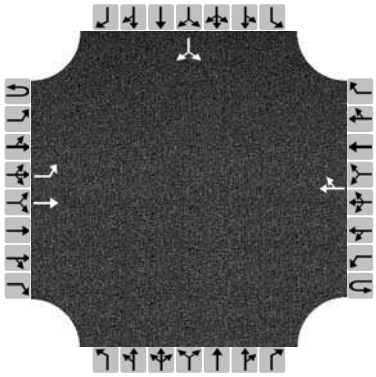
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	Mar 2016
Analysis Year	2016
Time Analyzed	PM Peak Hour
Intersection Orientation	East-West
Project Description	10728 (Background)

Site Information

Intersection	Oak Meadow Dr and dwy
Jurisdiction	Franklin, TN
East/West Street	Oak Meadow Drive
North/South Street	Western Home Depot dwy
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	0	1	0		0	0	0		0	0	0
Configuration		L	T					TR							LR	
Volume (veh/h)		24	174				179	2						16		33
Percent Heavy Vehicles		0												0		0
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		30													61	
Capacity		1355													726	
v/c Ratio		0.02													0.08	
95% Queue Length		0.1													0.3	
Control Delay (s/veh)		7.7													10.4	
Level of Service (LOS)		A													B	
Approach Delay (s/veh)	0.9												10.4			
Approach LOS	A												B			

TOTAL PROJECTED CONDITIONS

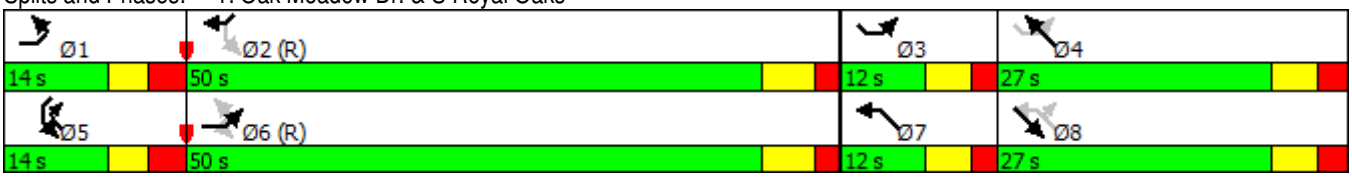
Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Lane Configurations												
Traffic Volume (vph)	87	1120	58	129	17	71	65	37	229	56	515	73
Future Volume (vph)	87	1120	58	129	17	71	65	37	229	56	515	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	11	11	11	11	12	12	13	12	12	12	12
Storage Length (ft)		70	150	75		0	100		195	180	0	
Storage Lanes		3	0	1		0	1		1	1	2	
Taper Length (ft)		50		50			50			50		
Lane Util. Factor	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88	1.00
Frt			0.850		0.885				0.850		0.850	
Flt Protected	0.950	0.950		0.950			0.950			0.950		
Satd. Flow (prot)	1534	3319	1531	1711	1594	0	1770	1925	1583	1770	2787	0
Flt Permitted	0.271	0.950		0.715			0.495			0.170		
Satd. Flow (perm)	437	3319	1531	1287	1594	0	922	1925	1583	317	2787	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			154		97				90		154	
Link Speed (mph)		30			25			40		30		
Link Distance (ft)		552			721			918		1624		
Travel Time (s)		12.5			19.7			15.6		36.9		
Peak Hour Factor	0.67	0.94	0.63	0.79	0.58	0.73	0.75	0.58	0.92	0.75	0.75	0.69
Adj. Flow (vph)	130	1191	92	163	29	97	87	64	249	75	687	106
Shared Lane Traffic (%)												
Lane Group Flow (vph)	130	1191	92	163	126	0	87	64	249	75	793	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Right	Right
Median Width(ft)		30			12			12		12		
Link Offset(ft)		0			0			0		0		
Crosswalk Width(ft)		16			16			16		16		
Two way Left Turn Lane												
Headway Factor	1.20	1.04	1.04	1.04	1.04	1.00	1.00	0.96	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	9	15		9	15		9	15	9	9
Number of Detectors	1	1	1	1	1		1	1	1	1	1	
Detector Template												
Leading Detector (ft)	42	42	42	42	42		42	42	42	42	42	
Trailing Detector (ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	45	45	45	45		45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	pm+pt	Prot	Perm	D.P+P	NA		D.P+P	NA	custom	pm+pt	Prot	
Protected Phases	1	6		3	8		7	4	5	5	2	
Permitted Phases	6		6	4			8		8	2		
Detector Phase	1	6		3	8		7	4	5	5	2	
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	7.0		7.0	7.0	7.0	7.0	20.0	
Minimum Split (s)	13.0	26.0	26.0	12.5	20.0		12.5	20.0	13.0	13.0	26.0	

Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Total Split (s)	14.0	50.0	50.0	12.0	27.0		12.0	27.0	14.0	14.0	50.0	
Total Split (%)	13.6%	48.5%	48.5%	11.7%	26.2%		11.7%	26.2%	13.6%	13.6%	48.5%	
Maximum Green (s)	8.0	44.0	44.0	6.5	21.0		6.5	21.0	8.0	8.0	44.0	
Yellow Time (s)	3.0	4.0	4.0	3.5	3.5		3.5	3.5	3.0	3.0	4.0	
All-Red Time (s)	3.0	2.0	2.0	2.0	2.5		2.0	2.5	3.0	3.0	2.0	
Lost Time Adjust (s)	-2.5	-1.5	-1.5	-2.5	-2.5		-2.5	-2.5	-2.5	-2.5	-1.5	
Total Lost Time (s)	3.5	4.5	4.5	3.0	3.5		3.0	3.5	3.5	3.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.0	5.0	1.5	3.5		1.5	3.5	1.5	1.5	5.0	
Recall Mode	None	C-Min	C-Min	None	None		None	None	None	None	C-Min	
Act Effct Green (s)	71.0	60.1	60.1	20.0	12.3		20.0	12.3	25.3	70.3	59.8	
Actuated g/C Ratio	0.69	0.58	0.58	0.19	0.12		0.19	0.12	0.25	0.68	0.58	
v/c Ratio	0.32	0.61	0.10	0.57	0.46		0.34	0.28	0.55	0.21	0.47	
Control Delay	7.7	16.8	0.5	41.9	18.6		34.8	43.6	25.6	7.0	11.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	7.7	16.8	0.5	41.9	18.6		34.8	43.6	25.6	7.0	11.8	
LOS	A	B	A	D	B		C	D	C	A	B	
Approach Delay		14.9			31.7			30.5		11.4		
Approach LOS		B			C			C		B		
90th %ile Green (s)	8.0	52.3	52.3	6.5	13.7		6.5	13.7	7.0	7.0	51.3	
90th %ile Term Code	Max	Coord	Coord	Max	Gap		Max	Hold	Min	Min	Coord	
70th %ile Green (s)	7.8	55.3	55.3	6.5	10.7		6.5	10.7	7.0	7.0	54.5	
70th %ile Term Code	Gap	Coord	Coord	Max	Hold		Max	Gap	Min	Min	Coord	
50th %ile Green (s)	7.0	56.6	56.6	6.5	9.4		6.5	9.4	7.0	7.0	56.6	
50th %ile Term Code	Min	Coord	Coord	Max	Hold		Max	Gap	Min	Min	Coord	
30th %ile Green (s)	7.0	57.9	57.9	6.5	8.1		6.5	8.1	7.0	7.0	57.9	
30th %ile Term Code	Min	Coord	Coord	Max	Hold		Max	Gap	Min	Min	Coord	
10th %ile Green (s)	7.0	71.0	71.0	7.5	7.0		0.0	0.0	7.0	7.0	71.0	
10th %ile Term Code	Min	Coord	Coord	Hold	Min		Skip	Skip	Min	Min	Coord	
Stops (vph)	27	714	1	112	27		51	33	126	18	271	
Fuel Used(gal)	1	13	0	2	1		1	1	4	1	10	
CO Emissions (g/hr)	46	880	18	162	68		96	62	270	62	724	
NOx Emissions (g/hr)	9	171	4	32	13		19	12	52	12	141	
VOC Emissions (g/hr)	11	204	4	38	16		22	14	63	14	168	
Dilemma Vehicles (#)	0	0	0	0	0		0	2	0	0	0	
Queue Length 50th (ft)	25	258	0	91	17		46	39	90	14	131	
Queue Length 95th (ft)	37	362	0	124	22		69	48	161	26	152	
Internal Link Dist (ft)		472			641			838		1544		
Turn Bay Length (ft)	70	70	150	75			100		195	180		
Base Capacity (vph)	415	1937	957	287	438		253	439	470	367	1681	
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	0.31	0.61	0.10	0.57	0.29		0.34	0.15	0.53	0.20	0.47	

Intersection Summary	
Area Type:	Other
Cycle Length: 103	

Actuated Cycle Length: 103	
Offset: 0 (0%), Referenced to phase 2:SWL and 6:EBL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 17.6	Intersection LOS: B
Intersection Capacity Utilization 62.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: Oak Meadow Dr. & S Royal Oaks



Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	28	1276	103	274	770	25	6	46	41	33	12	118
Future Volume (vph)	28	1276	103	274	770	25	6	46	41	33	12	118
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	12	11	12	11	11	12	12	11	12
Grade (%)		1%			-2%			-1%			2%	
Storage Length (ft)	80		135	220		0	100		0	120		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.993			0.934			0.868	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	3438	1607	1787	3428	0	1754	1624	0	1787	1520	0
Flt Permitted	0.332			0.138			0.368			0.497		
Satd. Flow (perm)	586	3438	1607	260	3428	0	679	1624	0	935	1520	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			82		5			30			137	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1624			792			957			515	
Travel Time (s)		36.9			18.0			21.8			11.7	
Peak Hour Factor	0.63	0.92	0.87	0.80	0.99	0.67	0.58	0.68	0.77	0.67	0.63	0.86
Heavy Vehicles (%)	0%	1%	0%	2%	2%	4%	0%	11%	0%	0%	10%	3%
Adj. Flow (vph)	44	1387	118	343	778	37	10	68	53	49	19	137
Shared Lane Traffic (%)												
Lane Group Flow (vph)	44	1387	118	343	815	0	10	121	0	49	156	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.10	1.05	1.01	0.99	1.03	0.99	1.04	1.04	0.99	1.01	1.06	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	0	1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	42	226	0	42	226		42	42		42	42	
Trailing Detector (ft)	-3	220	0	-3	220		-3	-3		-3	-3	
Detector 1 Position(ft)	-3	220	0	-3	220		-3	-3		-3	-3	
Detector 1 Size(ft)	45	6	50	45	6		45	45		45	45	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA		D.Pm	NA		D.Pm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6		6	2			8			4		
Detector Phase	1	6		5	2		8	4		4	8	
Switch Phase												

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	17.0	73.0	73.0	17.0	73.0		50.0	50.0		50.0	50.0	
Total Split (s)	17.0	73.0	73.0	17.0	73.0		50.0	50.0		50.0	50.0	
Total Split (%)	12.1%	52.1%	52.1%	12.1%	52.1%		35.7%	35.7%		35.7%	35.7%	
Maximum Green (s)	10.5	67.0	67.0	10.5	67.0		43.0	43.0		43.0	43.0	
Yellow Time (s)	3.0	3.5	3.5	3.0	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	3.5	2.5	2.5	3.5	2.5		3.5	3.5		3.5	3.5	
Lost Time Adjust (s)	-1.0	-3.0	-3.0	-1.0	-3.0		-2.5	-2.5		-2.5	-2.5	
Total Lost Time (s)	5.5	3.0	3.0	5.5	3.0		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
Recall Mode	None	C-Min	C-Min	None	C-Min		None	None		None	None	
Walk Time (s)		7.0	7.0		7.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)		16.0	16.0		20.0		35.0	32.0		32.0	35.0	
Pedestrian Calls (#/hr)		0	0		0		0	0		0	0	
Act Effct Green (s)	104.4	99.1	99.1	112.1	105.4		16.4	16.4		16.4	16.4	
Actuated g/C Ratio	0.75	0.71	0.71	0.80	0.75		0.12	0.12		0.12	0.12	
v/c Ratio	0.09	0.57	0.10	1.03	0.32		0.13	0.56		0.45	0.52	
Control Delay	3.9	11.7	2.9	80.0	6.7		55.7	49.1		69.1	18.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	3.9	11.7	2.9	80.0	6.7		55.7	49.1		69.1	18.2	
LOS	A	B	A	F	A		E	D		E	B	
Approach Delay		10.8			28.4			49.6			30.4	
Approach LOS		B			C			D			C	
90th %ile Green (s)	7.7	89.8	89.8	10.5	92.6		20.2	20.2		20.2	20.2	
90th %ile Term Code	Gap	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
70th %ile Green (s)	7.1	93.6	93.6	10.5	97.0		16.4	16.4		16.4	16.4	
70th %ile Term Code	Gap	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
50th %ile Green (s)	6.7	96.1	96.1	10.5	99.9		13.9	13.9		13.9	13.9	
50th %ile Term Code	Gap	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
30th %ile Green (s)	6.3	98.7	98.7	10.5	102.9		11.3	11.3		11.3	11.3	
30th %ile Term Code	Gap	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
10th %ile Green (s)	0.0	102.4	102.4	10.5	119.4		7.6	7.6		7.6	7.6	
10th %ile Term Code	Skip	Coord	Coord	Max	Coord		Hold	Gap		Gap	Hold	
Stops (vph)	7	603	11	227	286		7	68		30	26	
Fuel Used(gal)	0	23	1	7	8		0	2		1	1	
CO Emissions (g/hr)	29	1574	100	518	529		11	132		53	80	
NOx Emissions (g/hr)	6	306	19	101	103		2	26		10	16	
VOC Emissions (g/hr)	7	365	23	120	123		2	31		12	19	
Dilemma Vehicles (#)	0	0	0	0	0		0	0		0	0	
Queue Length 50th (ft)	6	296	9	~180	83		9	82		42	16	
Queue Length 95th (ft)	12	414	31	m#181	m343		18	114		60	21	
Internal Link Dist (ft)		1544			712			877			435	
Turn Bay Length (ft)	80		135	220			100			120		
Base Capacity (vph)	542	2434	1161	333	2581		220	548		303	586	
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	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Reduced v/c Ratio	0.08	0.57	0.10	1.03	0.32		0.05	0.22		0.16	0.27	

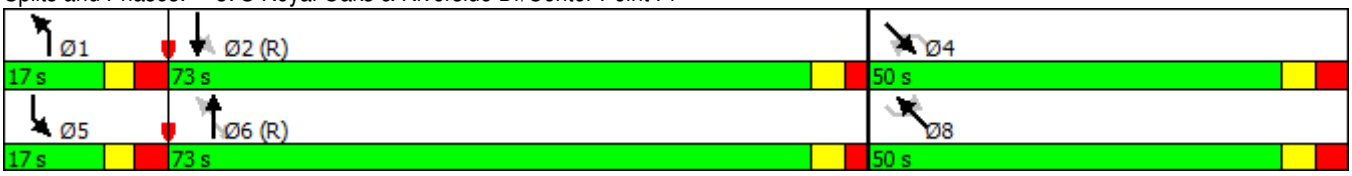
Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 139 (99%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.03			
Intersection Signal Delay: 20.5		Intersection LOS: C	
Intersection Capacity Utilization 70.6%		ICU Level of Service C	
Analysis Period (min) 15			

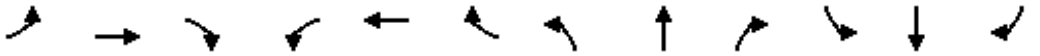
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

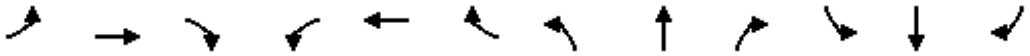
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: S Royal Oaks & Riverside Dr/Center Point Pl





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	112	772	60	850	993	281	99	272	1055	225	213	82
Future Volume (vph)	112	772	60	850	993	281	99	272	1055	225	213	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	11	12	13	12	13	13	11	11	11
Grade (%)		0%			0%			1%			0%	
Storage Length (ft)	200		300	285		0	195		450	220		650
Storage Lanes	2		1	2		1	2		2	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.95	0.88	0.97	0.95	0.95
Frt		0.988				0.850			0.850		0.961	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3400	4688	0	3286	3406	1620	3350	3639	2865	3319	3241	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3400	4688	0	3286	3406	1620	3350	3639	2865	3319	3241	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		10				149					31	
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		700			691			792			964	
Travel Time (s)		11.9			11.8			18.0			21.9	
Peak Hour Factor	0.80	0.90	0.80	0.93	0.91	0.88	0.82	0.80	0.93	0.92	0.74	0.81
Heavy Vehicles (%)	3%	6%	2%	3%	6%	3%	4%	2%	2%	2%	4%	2%
Adj. Flow (vph)	140	858	75	914	1091	319	121	340	1134	245	288	101
Shared Lane Traffic (%)												
Lane Group Flow (vph)	140	933	0	914	1091	319	121	340	1134	245	389	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		30			24			30			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.04	1.00	1.04	1.00	0.96	1.01	0.96	0.96	1.04	1.04	1.04
Turning Speed (mph)	18		10	18		10	18		10	18		10
Number of Detectors	1	1		1	1	0	1	2	1	1	2	
Detector Template												
Leading Detector (ft)	42	236		42	236	0	42	146	42	42	146	
Trailing Detector (ft)	-3	230		-3	230	0	-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	230		-3	230	230	-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	6		45	6	6	45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)								140			140	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	

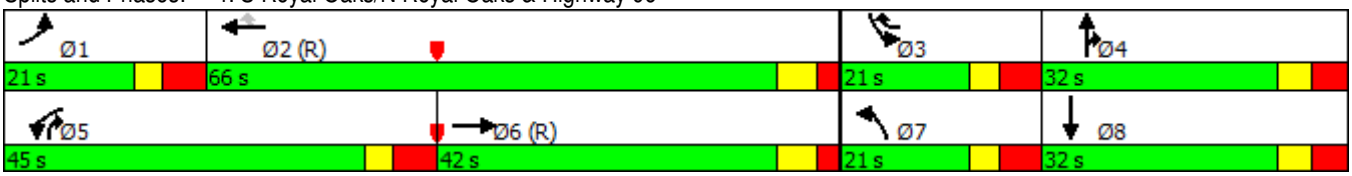


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	1	6		5	2	3	7	4	4 5	3	8	
Permitted Phases						2						
Detector Phase	1	6		5	2	3	7	4	4 5	3	8	
Switch Phase												
Minimum Initial (s)	6.0	13.0		6.0	13.0	6.0	6.0	10.0		6.0	10.0	
Minimum Split (s)	21.0	42.0		45.0	66.0	21.0	21.0	32.0		21.0	32.0	
Total Split (s)	21.0	42.0		45.0	66.0	21.0	21.0	32.0		21.0	32.0	
Total Split (%)	15.0%	30.0%		32.1%	47.1%	15.0%	15.0%	22.9%		15.0%	22.9%	
Maximum Green (s)	13.5	35.5		37.5	59.5	13.5	13.5	24.5		13.5	24.5	
Yellow Time (s)	3.0	4.0		3.0	4.0	3.0	3.0	3.5		3.0	3.5	
All-Red Time (s)	4.5	2.5		4.5	2.5	4.5	4.5	4.0		4.5	4.0	
Lost Time Adjust (s)	-2.5	-2.5		-2.5	-2.5	-2.0	-2.0	-3.0		-2.0	-3.0	
Total Lost Time (s)	5.0	4.0		5.0	4.0	5.5	5.5	4.5		5.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	6.0		3.0	6.0	3.0	3.0	4.5		3.0	4.5	
Recall Mode	None	C-Min		None	C-Min	None	None	None		None	None	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		37.0			24.0			36.0			36.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	13.5	38.4		40.0	64.9	84.0	12.4	27.5	72.0	15.1	30.2	
Actuated g/C Ratio	0.10	0.27		0.29	0.46	0.60	0.09	0.20	0.51	0.11	0.22	
v/c Ratio	0.43	0.72		0.97	0.69	0.31	0.41	0.48	0.77	0.69	0.54	
Control Delay	76.9	41.3		61.0	40.4	8.7	54.2	48.5	43.0	70.7	48.2	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	76.9	41.3		61.0	40.4	8.7	54.2	48.5	43.0	70.7	48.2	
LOS	E	D		E	D	A	D	D	D	E	D	
Approach Delay		45.9			44.1			45.0			56.9	
Approach LOS		D			D			D			E	
90th %ile Green (s)	13.5	35.5		37.5	59.5	13.5	13.3	24.5		13.5	24.7	
90th %ile Term Code	Max	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
70th %ile Green (s)	12.4	35.5		37.5	60.6	13.5	11.6	24.5		13.5	26.4	
70th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
50th %ile Green (s)	11.2	35.5		37.5	61.8	13.5	10.4	24.5		13.5	27.6	
50th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
30th %ile Green (s)	9.9	35.5		37.5	63.1	13.5	9.2	24.5		13.5	28.8	
30th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
10th %ile Green (s)	8.1	37.6		37.5	67.0	11.4	7.5	24.5		11.4	28.4	
10th %ile Term Code	Gap	Coord		Max	Coord	Gap	Gap	Max		Gap	Hold	
Stops (vph)	110	736		759	947	98	92	248	849	214	238	
Fuel Used(gal)	3	18		25	25	4	2	6	20	6	6	
CO Emissions (g/hr)	235	1270		1740	1782	261	155	401	1428	427	449	
NOx Emissions (g/hr)	46	247		338	347	51	30	78	278	83	87	
VOC Emissions (g/hr)	55	294		403	413	60	36	93	331	99	104	
Dilemma Vehicles (#)	0	28		0	36	0	0	0	0	0	0	
Queue Length 50th (ft)	69	284		419	535	78	54	156	475	112	153	
Queue Length 95th (ft)	93	338		m#446	m544	m122	76	174	696	159	167	
Internal Link Dist (ft)		620			611			712			884	

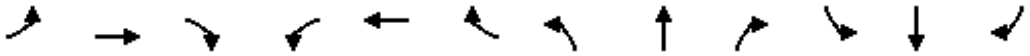
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	200			285			195		450	220		
Base Capacity (vph)	388	1293		938	1578	1035	370	714	1473	367	723	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.36	0.72		0.97	0.69	0.31	0.33	0.48	0.77	0.67	0.54	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 116 (83%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.97			
Intersection Signal Delay: 46.1		Intersection LOS: D	
Intersection Capacity Utilization 71.7%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 4: S Royal Oaks/N Royal Oaks & Highway 96



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1786	196	111	1061	0	0	0	0	355	0	1039
Future Volume (vph)	0	1786	196	111	1061	0	0	0	0	355	0	1039
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	12	12	12	12	12	12	11
Grade (%)		0%			0%			0%			1%	
Storage Length (ft)	0		0	420		0	0		0	350		0
Storage Lanes	0		1	0		0	0		0	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.86	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	0.88
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	6346	1509	1787	3388	0	0	0	0	3287	0	2654
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	6346	1509	1787	3388	0	0	0	0	3287	0	2654
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			184									115
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		501			556			756			888	
Travel Time (s)		8.5			9.5			20.6			24.2	
Peak Hour Factor	1.00	0.91	0.90	0.86	0.87	1.00	1.00	1.00	1.00	0.85	1.00	0.94
Heavy Vehicles (%)	2%	3%	7%	1%	3%	2%	2%	2%	2%	6%	2%	3%
Adj. Flow (vph)	0	1963	218	129	1220	0	0	0	0	418	0	1105
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1963	218	129	1220	0	0	0	0	418	0	1105
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.04	1.00	1.00	1.00	1.00	1.01	1.01	1.05
Turning Speed (mph)	15		12	15		9	15		9	18		12
Number of Detectors		1	0	1	1					1		1
Detector Template												
Leading Detector (ft)		300	0	42	300					42		42
Trailing Detector (ft)		294	0	-3	294					-3		-3
Detector 1 Position(ft)		294	-3	-3	294					-3		-3
Detector 1 Size(ft)		6	45	45	6					45		45
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Turn Type		NA	Perm	Prot	NA					Prot		Prot
Protected Phases		6		5	2					4		4
Permitted Phases			6									
Detector Phase		6	6	5	2					4		4
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		25.0	25.0	5.0	25.0					15.0		15.0
Minimum Split (s)		62.0	62.0	23.0	85.0					55.0		55.0
Total Split (s)		62.0	62.0	23.0	85.0					55.0		55.0
Total Split (%)		44.3%	44.3%	16.4%	60.7%					39.3%		39.3%
Maximum Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
Yellow Time (s)		4.0	4.0	3.0	4.0					4.0		4.0
All-Red Time (s)		2.0	2.0	3.0	2.0					3.5		3.5
Lost Time Adjust (s)		-2.0	-2.0	-1.0	-2.0					-2.0		-2.0
Total Lost Time (s)		4.0	4.0	5.0	4.0					5.5		5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		4.5	4.5	3.0	4.5					3.0		3.0
Recall Mode		C-Min	C-Min	None	C-Min					None		None
Act Effct Green (s)		60.5	60.5	15.5	81.0					49.5		49.5
Actuated g/C Ratio		0.43	0.43	0.11	0.58					0.35		0.35
v/c Ratio		0.72	0.29	0.65	0.62					0.36		1.09
Control Delay		26.6	4.9	71.8	19.3					34.6		94.9
Queue Delay		0.8	0.0	0.0	0.3					2.1		0.0
Total Delay		27.3	4.9	71.8	19.5					36.7		94.9
LOS		C	A	E	B					D		F
Approach Delay		25.1			24.5							
Approach LOS		C			C							
90th %ile Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
90th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
70th %ile Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
70th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
50th %ile Green (s)		57.6	57.6	15.4	79.0					47.5		47.5
50th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
30th %ile Green (s)		59.8	59.8	13.2	79.0					47.5		47.5
30th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
10th %ile Green (s)		63.2	63.2	9.8	79.0					47.5		47.5
10th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
Stops (vph)		1114	37	111	497					256		836
Fuel Used(gal)		35	2	3	13					6		31
CO Emissions (g/hr)		2450	150	219	912					431		2177
NOx Emissions (g/hr)		477	29	43	177					84		423
VOC Emissions (g/hr)		568	35	51	211					100		504
Dilemma Vehicles (#)		50	0	0	34					0		0
Queue Length 50th (ft)		324	26	124	283					144		~602
Queue Length 95th (ft)		406	m47	m164	m297					178		#754
Internal Link Dist (ft)		421			476			676			808	
Turn Bay Length (ft)				420						350		
Base Capacity (vph)		2743	756	229	1960					1162		1012
Starvation Cap Reductn		0	0	0	215					0		0
Spillback Cap Reductn		420	0	0	0					581		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.85	0.29	0.56	0.70					0.72		1.09

Intersection Summary

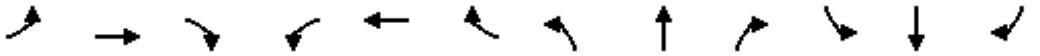
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 106 (76%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.09			
Intersection Signal Delay: 41.2		Intersection LOS: D	
Intersection Capacity Utilization 108.6%		ICU Level of Service G	
Analysis Period (min) 15			

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

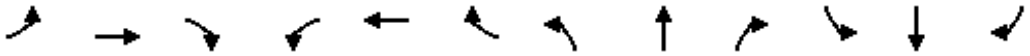
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

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

Splits and Phases: 5: Ent ramp to I-65/Exit ramp from I-65 & Highway 96



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1382	759	0	0	764	1217	408	0	364	0	0	0
Future Volume (vph)	1382	759	0	0	764	1217	408	0	364	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12	11	12	13	12	12	12
Grade (%)		1%			0%			1%			0%	
Storage Length (ft)	0		0	0		0	270		0	0		0
Storage Lanes	2		0	0		2	2		1	0		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	0.88	0.97	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	3302	3307	0	0	3539	2814	3302	0	1628	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	3302	3307	0	0	3539	2814	3302	0	1628	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						23			252			
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		556			311			685			941	
Travel Time (s)		9.5			5.3			18.7			25.7	
Peak Hour Factor	0.88	0.86	0.95	1.00	0.95	0.98	0.95	0.25	0.92	1.00	1.00	0.95
Heavy Vehicles (%)	2%	5%	2%	2%	2%	1%	2%	0%	2%	2%	2%	2%
Adj. Flow (vph)	1570	883	0	0	804	1242	429	0	396	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1570	883	0	0	804	1242	429	0	396	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			26			22			22	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.05	1.05	1.01	1.00	1.00	1.00	1.05	1.01	0.96	1.00	1.00	1.00
Turning Speed (mph)	18		9	15		10	15		15	15		9
Number of Detectors	1	1			1	0	1		1			
Detector Template												
Leading Detector (ft)	42	300			300	0	42		50			
Trailing Detector (ft)	-3	294			294	0	-3		0			
Detector 1 Position(ft)	-3	294			294	0	-3		0			
Detector 1 Size(ft)	45	6			6	50	45		50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Turn Type	Prot	NA			NA	custom	Prot		Perm			
Protected Phases	1	6			2	2 4	4					
Permitted Phases									4			
Detector Phase	1	6			2	2 4	4		4			
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	12.0	18.0			18.0		7.0		7.0			
Minimum Split (s)	56.0	116.0			60.0		24.0		24.0			
Total Split (s)	56.0	116.0			60.0		24.0		24.0			
Total Split (%)	40.0%	82.9%			42.9%		17.1%		17.1%			
Maximum Green (s)	50.0	110.0			53.5		16.5		16.5			
Yellow Time (s)	3.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	3.0	2.0			2.5		3.5		3.5			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.5		7.5		7.5			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	4.0	4.5			4.5		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Act Effct Green (s)	50.0	110.0			53.5	79.5	16.5		16.5			
Actuated g/C Ratio	0.36	0.79			0.38	0.57	0.12		0.12			
v/c Ratio	1.33	0.34			0.59	0.77	1.10		0.96			
Control Delay	204.9	3.4			36.8	27.0	131.8		56.6			
Queue Delay	0.7	0.1			0.0	0.0	0.0		0.0			
Total Delay	205.5	3.5			36.8	27.0	131.8		56.6			
LOS	F	A			D	C	F		E			
Approach Delay		132.8			30.8							
Approach LOS		F			C							
90th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
90th %ile Term Code	Max	Coord			Coord		Max		Max			
70th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
70th %ile Term Code	Max	Coord			Coord		Max		Max			
50th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
50th %ile Term Code	Max	Coord			Coord		Max		Max			
30th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
30th %ile Term Code	Max	Coord			Coord		Max		Max			
10th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
10th %ile Term Code	Max	Coord			Coord		Max		Max			
Stops (vph)	1007	107			597	899	350		119			
Fuel Used(gal)	73	4			13	18	15		7			
CO Emissions (g/hr)	5085	310			923	1264	1025		474			
NOx Emissions (g/hr)	989	60			180	246	200		92			
VOC Emissions (g/hr)	1179	72			214	293	238		110			
Dilemma Vehicles (#)	0	18			27	0	0		0			
Queue Length 50th (ft)	~952	67			306	468	~228		142			
Queue Length 95th (ft)	#1078	75			375	573	#338		#351			
Internal Link Dist (ft)		476			231			605			861	
Turn Bay Length (ft)							270					
Base Capacity (vph)	1179	2598			1352	1607	389		414			
Starvation Cap Reductn	163	623			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	1.55	0.45			0.59	0.77	1.10		0.96			

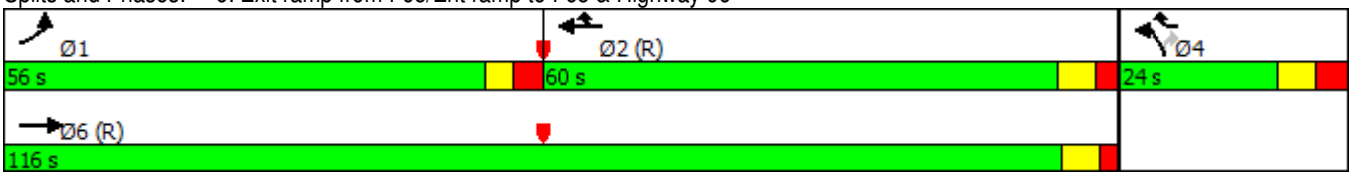
Intersection Summary

Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 122 (87%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.33			
Intersection Signal Delay: 87.9		Intersection LOS: F	
Intersection Capacity Utilization 108.6%		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.

Splits and Phases: 6: Exit ramp from I-65/Ent ramp to I-65 & Highway 96



Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Lane Configurations												
Traffic Volume (vph)	92	827	45	147	56	118	114	38	121	191	765	145
Future Volume (vph)	92	827	45	147	56	118	114	38	121	191	765	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	11	11	11	11	12	12	13	12	12	12	12
Storage Length (ft)		70	150	75		0	100		195	180	0	
Storage Lanes		3	0	1		0	1		1	1	2	
Taper Length (ft)		50		50			50			50		
Lane Util. Factor	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88	1.00
Frt			0.850		0.906				0.850		0.850	
Flt Protected	0.950	0.950		0.950			0.950			0.950		
Satd. Flow (prot)	1534	3319	1531	1711	1631	0	1770	1925	1583	1770	2787	0
Flt Permitted	0.083	0.950		0.704			0.285			0.252		
Satd. Flow (perm)	134	3319	1531	1268	1631	0	531	1925	1583	469	2787	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			132		68				132		132	
Link Speed (mph)		30			25			40		30		
Link Distance (ft)		552			721			918		1624		
Travel Time (s)		12.5			19.7			15.6		36.9		
Peak Hour Factor	0.67	0.94	0.63	0.79	0.58	0.73	0.75	0.58	0.92	0.75	0.75	0.69
Adj. Flow (vph)	137	880	71	186	97	162	152	66	132	255	1020	210
Shared Lane Traffic (%)												
Lane Group Flow (vph)	137	880	71	186	259	0	152	66	132	255	1230	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Right	Right
Median Width(ft)		30			12			12		12		
Link Offset(ft)		0			0			0		0		
Crosswalk Width(ft)		16			16			16		16		
Two way Left Turn Lane												
Headway Factor	1.20	1.04	1.04	1.04	1.04	1.00	1.00	0.96	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	9	15		9	15		9	15	9	9
Number of Detectors	1	1	1	1	1		1	1	1	1	1	
Detector Template												
Leading Detector (ft)	42	42	42	42	42		42	42	42	42	42	
Trailing Detector (ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	-3	-3	-3	-3		-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	45	45	45	45		45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	pm+pt	Prot	Perm	D.P+P	NA		D.P+P	NA	custom	pm+pt	Prot	
Protected Phases	1	6		3	8		7	4	5	5	2	
Permitted Phases	6		6	4			8		8	2		
Detector Phase	1	6		3	8		7	4	5	5	2	
Switch Phase												
Minimum Initial (s)	7.0	20.0	20.0	7.0	7.0		7.0	7.0	7.0	7.0	20.0	
Minimum Split (s)	18.0	57.0	57.0	14.0	35.0		14.0	35.0	14.0	14.0	53.0	

Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Total Split (s)	18.0	57.0	57.0	14.0	35.0		14.0	35.0	14.0	14.0	53.0	
Total Split (%)	15.0%	47.5%	47.5%	11.7%	29.2%		11.7%	29.2%	11.7%	11.7%	44.2%	
Maximum Green (s)	12.0	51.0	51.0	8.5	29.0		8.5	29.0	8.0	8.0	47.0	
Yellow Time (s)	3.0	4.0	4.0	3.5	3.5		3.5	3.5	3.0	3.0	4.0	
All-Red Time (s)	3.0	2.0	2.0	2.0	2.5		2.0	2.5	3.0	3.0	2.0	
Lost Time Adjust (s)	-2.5	-1.5	-1.5	-2.5	-2.5		-2.5	-2.5	-2.5	-2.5	-1.5	
Total Lost Time (s)	3.5	4.5	4.5	3.0	3.5		3.0	3.5	3.5	3.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.0	5.0	1.5	3.5		1.5	3.5	1.5	1.5	5.0	
Recall Mode	None	C-Min	C-Min	None	None		None	None	None	None	C-Min	
Act Effct Green (s)	74.5	61.4	61.4	34.8	22.9		34.2	21.9	36.8	70.9	59.5	
Actuated g/C Ratio	0.62	0.51	0.51	0.29	0.19		0.28	0.18	0.31	0.59	0.50	
v/c Ratio	0.61	0.52	0.08	0.44	0.71		0.58	0.19	0.23	0.65	0.85	
Control Delay	29.2	22.0	0.2	34.6	43.2		39.1	39.7	5.3	20.8	31.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	29.2	22.0	0.2	34.6	43.2		39.1	39.7	5.3	20.8	31.8	
LOS	C	C	A	C	D		D	D	A	C	C	
Approach Delay		21.5			39.6			26.5		29.9		
Approach LOS		C			D			C		C		
90th %ile Green (s)	12.0	51.3	51.3	8.5	28.7		8.5	28.7	8.0	8.0	47.3	
90th %ile Term Code	Max	Coord	Coord	Max	Gap		Max	Hold	Max	Max	Coord	
70th %ile Green (s)	12.0	56.1	56.1	8.5	23.9		8.5	23.9	8.0	8.0	52.1	
70th %ile Term Code	Max	Coord	Coord	Max	Gap		Max	Hold	Max	Max	Coord	
50th %ile Green (s)	10.3	59.6	59.6	8.5	20.4		8.5	20.4	8.0	8.0	57.3	
50th %ile Term Code	Gap	Coord	Coord	Max	Gap		Max	Hold	Max	Max	Coord	
30th %ile Green (s)	7.7	63.0	63.0	8.5	17.0		8.5	17.0	8.0	8.0	63.3	
30th %ile Term Code	Gap	Coord	Coord	Max	Gap		Max	Hold	Max	Max	Coord	
10th %ile Green (s)	7.0	69.4	69.4	25.5	11.9		7.6	0.0	7.6	7.6	70.0	
10th %ile Term Code	Min	Coord	Coord	Hold	Gap		Gap	Skip	Gap	Gap	Coord	
Stops (vph)	47	542	0	112	120		84	31	14	89	658	
Fuel Used(gal)	1	10	0	2	3		2	1	1	4	21	
CO Emissions (g/hr)	84	717	14	165	215		171	59	71	260	1472	
NOx Emissions (g/hr)	16	139	3	32	42		33	12	14	51	286	
VOC Emissions (g/hr)	19	166	3	38	50		40	14	17	60	341	
Dilemma Vehicles (#)	0	0	0	0	0		0	2	0	0	0	
Queue Length 50th (ft)	42	226	0	111	140		88	43	0	78	422	
Queue Length 95th (ft)	70	328	0	135	108		105	49	40	116	447	
Internal Link Dist (ft)		472			641			838		1544		
Turn Bay Length (ft)	70	70	150	75			100		195	180		
Base Capacity (vph)	254	1697	847	421	478		265	505	578	391	1448	
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	0.54	0.52	0.08	0.44	0.54		0.57	0.13	0.23	0.65	0.85	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	

Actuated Cycle Length: 120	
Offset: 117 (98%), Referenced to phase 2:SWL and 6:EBL, Start of Green	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 28.1	Intersection LOS: C
Intersection Capacity Utilization 64.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: Oak Meadow Dr. & S Royal Oaks

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	90	1103	27	263	1126	93	83	64	123	46	58	300
Future Volume (vph)	90	1103	27	263	1126	93	83	64	123	46	58	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	12	11	12	11	11	12	12	11	12
Grade (%)		1%			-2%			-1%			2%	
Storage Length (ft)	80		135	220		0	100		0	120		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.987			0.906			0.876	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	3438	1575	1805	3447	0	1736	1672	0	1752	1593	0
Flt Permitted	0.138			0.121			0.168			0.405		
Satd. Flow (perm)	243	3438	1575	230	3447	0	307	1672	0	747	1593	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			124		11			57			165	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1624			792			957			515	
Travel Time (s)		36.9			18.0			21.8			11.7	
Peak Hour Factor	0.79	0.95	0.64	0.75	0.90	0.76	0.86	0.71	0.82	0.75	0.88	0.94
Heavy Vehicles (%)	0%	1%	2%	1%	1%	0%	1%	0%	0%	2%	0%	0%
Adj. Flow (vph)	114	1161	42	351	1251	122	97	90	150	61	66	319
Shared Lane Traffic (%)												
Lane Group Flow (vph)	114	1161	42	351	1373	0	97	240	0	61	385	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.10	1.05	1.01	0.99	1.03	0.99	1.04	1.04	0.99	1.01	1.06	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	0	1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	42	226	0	42	226		42	42		42	42	
Trailing Detector (ft)	-3	220	0	-3	220		-3	-3		-3	-3	
Detector 1 Position(ft)	-3	220	0	-3	220		-3	-3		-3	-3	
Detector 1 Size(ft)	45	6	50	45	6		45	45		45	45	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA		D.Pm	NA		D.Pm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6		6	2			8			4		
Detector Phase	1	6		5	2		8	4		4	8	
Switch Phase												

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	15.0	70.0	70.0	30.0	85.0		50.0	50.0		50.0	50.0	
Total Split (s)	14.0	72.0	72.0	29.0	87.0		49.0	49.0		49.0	49.0	
Total Split (%)	9.3%	48.0%	48.0%	19.3%	58.0%		32.7%	32.7%		32.7%	32.7%	
Maximum Green (s)	7.5	66.0	66.0	22.5	81.0		42.0	42.0		42.0	42.0	
Yellow Time (s)	3.0	3.5	3.5	3.0	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	3.5	2.5	2.5	3.5	2.5		3.5	3.5		3.5	3.5	
Lost Time Adjust (s)	-1.0	-3.0	-3.0	-1.0	-3.0		-2.5	-2.5		-2.5	-2.5	
Total Lost Time (s)	5.5	3.0	3.0	5.5	3.0		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
Recall Mode	None	C-Min	C-Min	None	C-Min		None	None		None	None	
Walk Time (s)		7.0	7.0		7.0		8.0	8.0		8.0	8.0	
Flash Dont Walk (s)		16.0	16.0		20.0		35.0	32.0		32.0	35.0	
Pedestrian Calls (#/hr)		0	0		0		0	0		0	0	
Act Effct Green (s)	82.2	76.3	76.3	102.1	90.7		37.9	37.9		37.9	37.9	
Actuated g/C Ratio	0.55	0.51	0.51	0.68	0.60		0.25	0.25		0.25	0.25	
v/c Ratio	0.54	0.66	0.05	0.89	0.66		1.26	0.52		0.32	0.73	
Control Delay	22.5	31.3	0.1	50.6	9.5		225.4	33.3		48.0	36.4	
Queue Delay	0.0	0.0	0.0	0.0	2.5		0.0	0.0		0.0	0.0	
Total Delay	22.5	31.3	0.1	50.6	11.9		225.4	33.3		48.0	36.4	
LOS	C	C	A	D	B		F	C		D	D	
Approach Delay		29.5			19.8			88.6			38.0	
Approach LOS		C			B			F			D	
90th %ile Green (s)	7.5	66.0	66.0	22.5	81.0		42.0	42.0		42.0	42.0	
90th %ile Term Code	Max	Coord	Coord	Max	Coord		Max	Hold		Hold	Max	
70th %ile Green (s)	7.5	66.0	66.0	22.5	81.0		42.0	42.0		42.0	42.0	
70th %ile Term Code	Max	Coord	Coord	Max	Coord		Max	Hold		Hold	Max	
50th %ile Green (s)	7.5	67.5	67.5	22.5	82.5		40.5	40.5		40.5	40.5	
50th %ile Term Code	Max	Coord	Coord	Max	Coord		Gap	Hold		Hold	Gap	
30th %ile Green (s)	7.5	75.6	75.6	22.5	90.6		32.4	32.4		32.4	32.4	
30th %ile Term Code	Max	Coord	Coord	Max	Coord		Gap	Hold		Hold	Gap	
10th %ile Green (s)	6.9	91.3	91.3	19.2	103.6		20.0	20.0		20.0	20.0	
10th %ile Term Code	Gap	Coord	Coord	Gap	Coord		Gap	Hold		Hold	Gap	
Stops (vph)	43	813	0	282	618		68	125		35	193	
Fuel Used(gal)	2	25	0	6	13		5	3		1	5	
CO Emissions (g/hr)	125	1781	24	412	929		336	234		58	360	
NOx Emissions (g/hr)	24	347	5	80	181		65	46		11	70	
VOC Emissions (g/hr)	29	413	6	95	215		78	54		13	84	
Dilemma Vehicles (#)	0	0	0	0	0		0	0		0	0	
Queue Length 50th (ft)	40	471	0	205	162		~107	158		47	194	
Queue Length 95th (ft)	59	567	0	m133	m599		#217	176		74	300	
Internal Link Dist (ft)		1544			712			877			435	
Turn Bay Length (ft)	80		135	220			100			120		
Base Capacity (vph)	214	1748	861	403	2089		91	536		221	588	
Starvation Cap Reductn	0	0	0	0	562		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	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Reduced v/c Ratio	0.53	0.66	0.05	0.87	0.90		1.07	0.45		0.28	0.65	

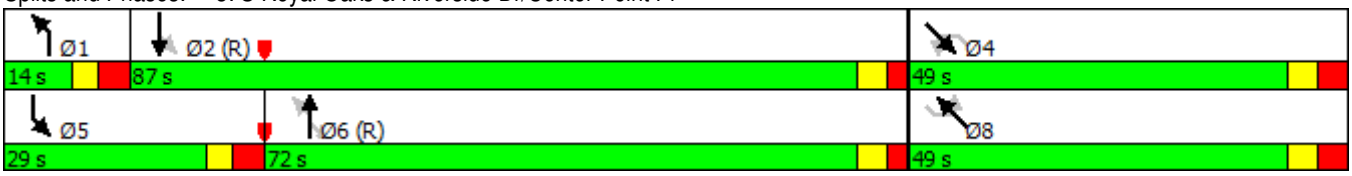
Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 123 (82%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.26			
Intersection Signal Delay: 31.3		Intersection LOS: C	
Intersection Capacity Utilization 87.9%		ICU Level of Service E	
Analysis Period (min) 15			

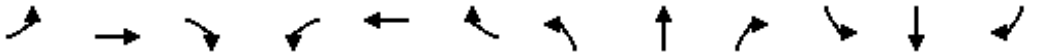
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

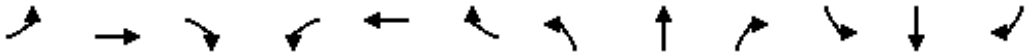
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: S Royal Oaks & Riverside Dr/Center Point Pl





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	206	1108	63	976	1174	269	141	368	999	316	465	178
Future Volume (vph)	206	1108	63	976	1174	269	141	368	999	316	465	178
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	11	12	13	12	13	13	11	11	11
Grade (%)		0%			0%			1%			0%	
Storage Length (ft)	200		300	285		0	195		450	220		650
Storage Lanes	2		1	2		1	2		2	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.95	0.88	0.97	0.95	0.95
Frt		0.991				0.850			0.850		0.953	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3467	4923	0	3351	3539	1652	3484	3712	2894	3385	3326	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3467	4923	0	3351	3539	1652	3484	3712	2894	3385	3326	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		7				87					44	
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		700			691			792			964	
Travel Time (s)		11.9			11.8			18.0			21.9	
Peak Hour Factor	0.92	0.93	0.81	0.87	0.91	0.89	0.74	0.83	0.89	0.83	0.95	0.80
Heavy Vehicles (%)	1%	1%	0%	1%	2%	1%	0%	0%	1%	0%	0%	0%
Adj. Flow (vph)	224	1191	78	1122	1290	302	191	443	1122	381	489	223
Shared Lane Traffic (%)												
Lane Group Flow (vph)	224	1269	0	1122	1290	302	191	443	1122	381	712	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		30			24			30			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.04	1.00	1.04	1.00	0.96	1.01	0.96	0.96	1.04	1.04	1.04
Turning Speed (mph)	18		10	18		10	18		10	18		10
Number of Detectors	1	1		1	1	0	1	2	1	1	2	
Detector Template												
Leading Detector (ft)	42	236		42	236	0	42	146	42	42	146	
Trailing Detector (ft)	-3	230		-3	230	0	-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	230		-3	230	230	-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	6		45	6	6	45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)								140			140	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	

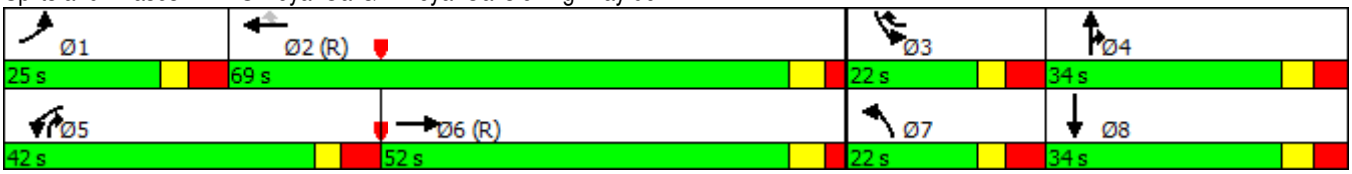


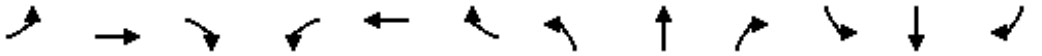
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	1	6		5	2	3	7	4	4 5	3	8	
Permitted Phases						2						
Detector Phase	1	6		5	2	3	7	4	4 5	3	8	
Switch Phase												
Minimum Initial (s)	6.0	13.0		6.0	13.0	6.0	6.0	10.0		6.0	10.0	
Minimum Split (s)	25.0	52.0		42.0	69.0	22.0	22.0	34.0		22.0	34.0	
Total Split (s)	25.0	52.0		42.0	69.0	22.0	22.0	34.0		22.0	34.0	
Total Split (%)	16.7%	34.7%		28.0%	46.0%	14.7%	14.7%	22.7%		14.7%	22.7%	
Maximum Green (s)	17.5	45.5		34.5	62.5	14.5	14.5	26.5		14.5	26.5	
Yellow Time (s)	3.0	4.0		3.0	4.0	3.0	3.0	3.5		3.0	3.5	
All-Red Time (s)	4.5	2.5		4.5	2.5	4.5	4.5	4.0		4.5	4.0	
Lost Time Adjust (s)	-2.5	-2.5		-2.5	-2.5	-2.0	-2.0	-3.0		-2.0	-3.0	
Total Lost Time (s)	5.0	4.0		5.0	4.0	5.5	5.5	4.5		5.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	6.0		3.0	6.0	3.0	3.0	4.5		3.0	4.5	
Recall Mode	None	C-Min		None	C-Min	None	None	None		None	None	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		37.0			24.0			36.0			36.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	17.3	48.0		37.0	67.7	88.2	14.9	29.5	71.0	16.5	31.1	
Actuated g/C Ratio	0.12	0.32		0.25	0.45	0.59	0.10	0.20	0.47	0.11	0.21	
v/c Ratio	0.56	0.80		1.36	0.81	0.30	0.55	0.61	0.82	1.02	0.98	
Control Delay	68.7	44.7		200.8	49.2	16.6	58.5	59.9	52.2	117.0	84.1	
Queue Delay	0.0	0.3		0.3	0.6	0.0	0.1	0.0	0.1	0.0	0.5	
Total Delay	68.7	45.0		201.1	49.8	16.6	58.6	59.9	52.3	117.0	84.6	
LOS	E	D		F	D	B	E	E	D	F	F	
Approach Delay		48.6			108.6			54.9			95.9	
Approach LOS		D			F			D			F	
90th %ile Green (s)	17.5	45.5		34.5	62.5	14.5	14.5	26.5		14.5	26.5	
90th %ile Term Code	Max	Coord		Max	Coord	Max	Max	Max		Max	Max	
70th %ile Green (s)	16.7	45.5		34.5	63.3	14.5	14.5	26.5		14.5	26.5	
70th %ile Term Code	Gap	Coord		Max	Coord	Max	Max	Max		Max	Max	
50th %ile Green (s)	15.1	45.5		34.5	64.9	14.5	13.5	26.5		14.5	27.5	
50th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
30th %ile Green (s)	13.4	45.5		34.5	66.6	14.5	12.0	26.5		14.5	29.0	
30th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
10th %ile Green (s)	11.1	45.5		34.5	68.9	14.5	9.8	26.5		14.5	31.2	
10th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
Stops (vph)	191	938		759	1064	208	133	346	815	280	539	
Fuel Used(gal)	6	25		55	32	5	3	9	21	11	19	
CO Emissions (g/hr)	401	1778		3861	2216	359	230	606	1488	800	1315	
NOx Emissions (g/hr)	78	346		751	431	70	45	118	289	156	256	
VOC Emissions (g/hr)	93	412		895	514	83	53	140	345	185	305	
Dilemma Vehicles (#)	0	44		0	45	0	0	0	0	0	0	
Queue Length 50th (ft)	107	316		~759	580	139	94	228	581	~203	~352	
Queue Length 95th (ft)	155	368		m#567	m517	m125	m105	m249	m716	#272	#505	
Internal Link Dist (ft)		620			611			712			884	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	200			285			195		450	220		
Base Capacity (vph)	462	1580		826	1598	1007	383	730	1369	372	725	
Starvation Cap Reductn	0	0		0	0	0	0	0	11	0	0	
Spillback Cap Reductn	0	48		46	84	0	10	0	0	0	2	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.48	0.83		1.44	0.85	0.30	0.51	0.61	0.83	1.02	0.98	

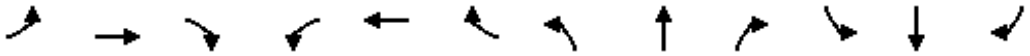
Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 133 (89%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.36			
Intersection Signal Delay: 80.6		Intersection LOS: F	
Intersection Capacity Utilization 90.0%		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.			

Splits and Phases: 4: S Royal Oaks/N Royal Oaks & Highway 96





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	2002	488	285	925	0	0	0	0	914	0	1449
Future Volume (vph)	0	2002	488	285	925	0	0	0	0	914	0	1449
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	12	12	12	12	12	12	11
Grade (%)		0%			0%			0%			1%	
Storage Length (ft)	0		0	420		0	0		0	350		0
Storage Lanes	0		1	0		0	0		0	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.86	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	0.88
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	6408	1583	1787	3455	0	0	0	0	3450	0	2707
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	6408	1583	1787	3455	0	0	0	0	3450	0	2707
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			400									135
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		501			556			756			888	
Travel Time (s)		8.5			9.5			20.6			24.2	
Peak Hour Factor	1.00	0.93	0.78	0.71	0.86	1.00	1.00	1.00	1.00	0.87	1.00	0.88
Heavy Vehicles (%)	2%	2%	2%	1%	1%	2%	2%	2%	2%	1%	2%	1%
Adj. Flow (vph)	0	2153	626	401	1076	0	0	0	0	1051	0	1647
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2153	626	401	1076	0	0	0	0	1051	0	1647
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.04	1.00	1.00	1.00	1.00	1.01	1.01	1.05
Turning Speed (mph)	15		12	15		9	15		9	18		12
Number of Detectors		1	0	1	1					1		1
Detector Template												
Leading Detector (ft)		300	0	42	300					42		42
Trailing Detector (ft)		294	0	-3	294					-3		-3
Detector 1 Position(ft)		294	-3	-3	294					-3		-3
Detector 1 Size(ft)		6	45	45	6					45		45
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Turn Type		NA	Perm	Prot	NA					Prot		Prot
Protected Phases		6		5	2					4		4
Permitted Phases			6									
Detector Phase		6	6	5	2					4		4
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		25.0	25.0	5.0	25.0					15.0		15.0
Minimum Split (s)		55.0	55.0	30.0	85.0					65.0		65.0
Total Split (s)		55.0	55.0	30.0	85.0					65.0		65.0
Total Split (%)		36.7%	36.7%	20.0%	56.7%					43.3%		43.3%
Maximum Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
Yellow Time (s)		4.0	4.0	3.0	4.0					4.0		4.0
All-Red Time (s)		2.0	2.0	3.0	2.0					3.5		3.5
Lost Time Adjust (s)		-2.0	-2.0	-1.0	-2.0					-2.0		-2.0
Total Lost Time (s)		4.0	4.0	5.0	4.0					5.5		5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		4.5	4.5	3.0	4.5					3.0		3.0
Recall Mode		C-Min	C-Min	None	C-Min					None		None
Act Effct Green (s)		51.0	51.0	25.0	81.0					59.5		59.5
Actuated g/C Ratio		0.34	0.34	0.17	0.54					0.40		0.40
v/c Ratio		0.99	0.78	1.35	0.58					0.77		1.43
Control Delay		71.6	30.4	226.4	26.5					43.9		229.0
Queue Delay		1.3	0.0	0.0	0.9					1.8		0.0
Total Delay		72.9	30.4	226.4	27.4					45.7		229.0
LOS		E	C	F	C					D		F
Approach Delay		63.3			81.4							
Approach LOS		E			F							
90th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
90th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
70th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
70th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
50th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
50th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
30th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
30th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
10th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
10th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
Stops (vph)		1873	465	222	498					776		998
Fuel Used(gal)		64	12	16	13					18		82
CO Emissions (g/hr)		4459	807	1146	935					1262		5755
NOx Emissions (g/hr)		868	157	223	182					246		1120
VOC Emissions (g/hr)		1033	187	266	217					292		1334
Dilemma Vehicles (#)		105	0	0	51					0		0
Queue Length 50th (ft)		634	325	~525	287					457		~1192
Queue Length 95th (ft)		m#692	m295	#521	430					515		#1297
Internal Link Dist (ft)		421			476			676			808	
Turn Bay Length (ft)				420						350		
Base Capacity (vph)		2178	802	297	1865					1368		1155
Starvation Cap Reductn		0	0	0	464					0		0
Spillback Cap Reductn		14	0	0	0					172		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.99	0.78	1.35	0.77					0.88		1.43

Intersection Summary

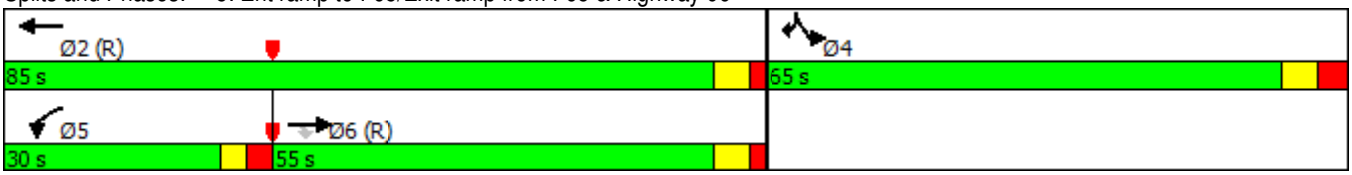
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 104 (69%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.43			
Intersection Signal Delay: 103.7		Intersection LOS: F	
Intersection Capacity Utilization 84.9%		ICU Level of Service E	
Analysis Period (min) 15			

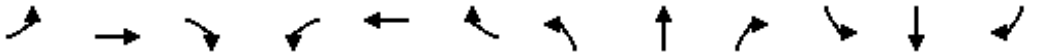
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

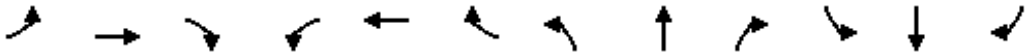
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Ent ramp to I-65/Exit ramp from I-65 & Highway 96





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	619	2297	0	0	895	998	315	0	164	0	0	0
Future Volume (vph)	619	2297	0	0	895	998	315	0	164	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12	11	12	13	12	12	12
Grade (%)		1%			0%			1%			0%	
Storage Length (ft)	0		0	0		0	270		0	0		0
Storage Lanes	2		0	0		2	2		1	0		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	0.88	0.97	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	3270	3371	0	0	3539	2787	3302	0	1597	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	3270	3371	0	0	3539	2787	3302	0	1597	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						226			69			
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		556			1845			685			941	
Travel Time (s)		9.5			31.4			18.7			25.7	
Peak Hour Factor	0.97	0.98	1.00	0.25	0.91	0.93	0.92	1.00	0.87	1.00	1.00	1.00
Heavy Vehicles (%)	3%	3%	2%	0%	2%	2%	2%	2%	4%	2%	2%	2%
Adj. Flow (vph)	638	2344	0	0	984	1073	342	0	189	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	638	2344	0	0	984	1073	342	0	189	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			26			22			22	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.05	1.05	1.01	1.00	1.00	1.00	1.05	1.01	0.96	1.00	1.00	1.00
Turning Speed (mph)	18		9	15		10	15		15	15		9
Number of Detectors	1	1			1	0	1		1			
Detector Template												
Leading Detector (ft)	42	300			300	0	42		50			
Trailing Detector (ft)	-3	294			294	0	-3		0			
Detector 1 Position(ft)	-3	294			294	0	-3		0			
Detector 1 Size(ft)	45	6			6	50	45		50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Turn Type	Prot	NA			NA	custom	Prot		Perm			
Protected Phases	1	6			2	2 4	4					
Permitted Phases									4			
Detector Phase	1	6			2	2 4	4		4			
Switch Phase												

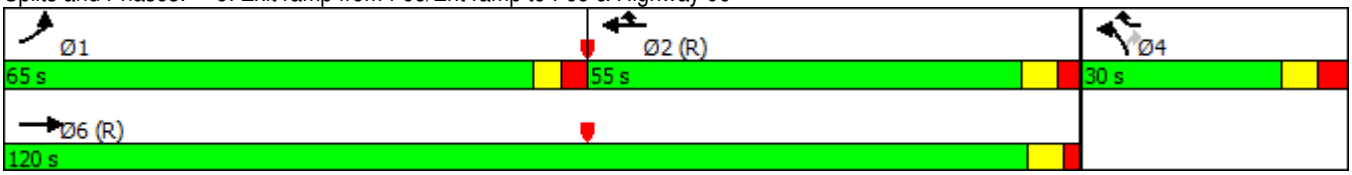


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	12.0	18.0			18.0		7.0		7.0			
Minimum Split (s)	65.0	120.0			55.0		30.0		30.0			
Total Split (s)	65.0	120.0			55.0		30.0		30.0			
Total Split (%)	43.3%	80.0%			36.7%		20.0%		20.0%			
Maximum Green (s)	59.0	114.0			48.5		22.5		22.5			
Yellow Time (s)	3.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	3.0	2.0			2.5		3.5		3.5			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.5		7.5		7.5			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	4.0	4.5			4.5		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Act Effct Green (s)	37.2	114.6			70.9	102.3	21.9		21.9			
Actuated g/C Ratio	0.25	0.76			0.47	0.68	0.15		0.15			
v/c Ratio	0.79	0.91			0.59	0.54	0.71		0.65			
Control Delay	79.7	23.9			31.8	10.9	69.9		48.9			
Queue Delay	0.0	5.4			0.0	0.0	0.0		0.0			
Total Delay	79.7	29.3			31.8	10.9	69.9		48.9			
LOS	E	C			C	B	E		D			
Approach Delay		40.1			20.9							
Approach LOS		D			C							
90th %ile Green (s)	45.2	114.0			62.3		22.5		22.5			
90th %ile Term Code	Gap	Coord			Coord		Max		Max			
70th %ile Green (s)	40.9	114.0			66.6		22.5		22.5			
70th %ile Term Code	Gap	Coord			Coord		Max		Max			
50th %ile Green (s)	37.2	114.0			70.3		22.5		22.5			
50th %ile Term Code	Gap	Coord			Coord		Max		Max			
30th %ile Green (s)	34.1	114.0			73.4		22.5		22.5			
30th %ile Term Code	Gap	Coord			Coord		Max		Max			
10th %ile Green (s)	28.8	117.2			81.9		19.3		19.3			
10th %ile Term Code	Gap	Coord			Coord		Gap		Gap			
Stops (vph)	610	1847			646	395	295		100			
Fuel Used(gal)	18	38			23	19	7		3			
CO Emissions (g/hr)	1284	2656			1632	1299	521		208			
NOx Emissions (g/hr)	250	517			317	253	101		40			
VOC Emissions (g/hr)	298	615			378	301	121		48			
Dilemma Vehicles (#)	0	83			30	0	0		0			
Queue Length 50th (ft)	342	589			366	218	165		112			
Queue Length 95th (ft)	m344	m499			485	327	222		190			
Internal Link Dist (ft)		476			1765			605			861	
Turn Bay Length (ft)							270					
Base Capacity (vph)	1286	2575			1672	1982	495		298			
Starvation Cap Reductn	0	199			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	0.50	0.99			0.59	0.54	0.69		0.63			

Intersection Summary

Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 138 (92%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.91			
Intersection Signal Delay: 35.1		Intersection LOS: D	
Intersection Capacity Utilization 84.9%		ICU Level of Service E	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 6: Exit ramp from I-65/Ent ramp to I-65 & Highway 96



HCS 2010 Two-Way Stop Control Summary Report

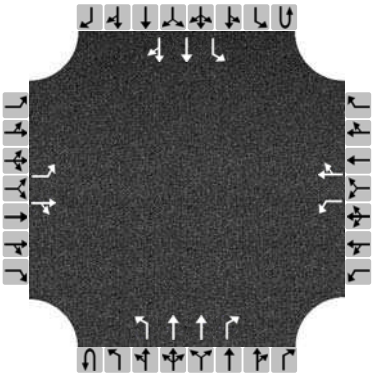
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	May 2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Intersection Orientation	North-South
Project Description	10728 (Total)

Site Information

Intersection	S. Royal Oaks and Rand
Jurisdiction	Franklin, TN
East/West Street	Rand Pl / Home Depot
North/South Street	S. Royal Oaks Blvd
Peak Hour Factor	0.97
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	0		1	1	0	0	1	2	1	0	1	2	0
Configuration		L		TR		L		TR		L	T	R		L	T	TR
Volume (veh/h)		26	1	9		14	0	36		10	1447	25		64	665	51
Percent Heavy Vehicles		0	0	0		0	0	0		0				0		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left + Thru															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		27		10		14		37		10				66		
Capacity		148		392		99		361		877				446		
v/c Ratio		0.18		0.03		0.14		0.10		0.01				0.15		
95% Queue Length		0.6		0.1		0.5		0.3		0.0				0.5		
Control Delay (s/veh)		34.6		14.4		47.0		16.1		9.2				14.5		
Level of Service (LOS)		D		B		E		C		A				B		
Approach Delay (s/veh)	29.2				24.6				0.1				1.2			
Approach LOS	D				C				A				A			

HCS 2010 Two-Way Stop Control Summary Report

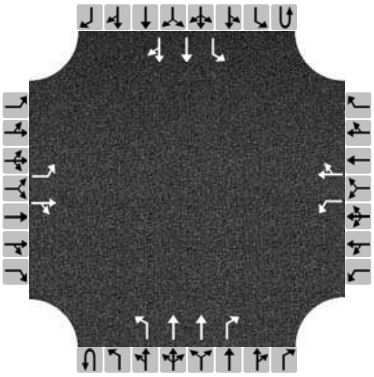
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	May 2016
Analysis Year	2016
Time Analyzed	PM Peak Hour
Intersection Orientation	North-South
Project Description	10728 (Total)

Site Information

Intersection	S. Royal Oaks and Rand
Jurisdiction	Franklin, TN
East/West Street	Rand Pl / Home Depot
North/South Street	S. Royal Oaks Blvd
Peak Hour Factor	0.96
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	0		1	1	0	0	1	2	1	0	1	2	0
Configuration		L		TR		L		TR		L	T	R		L	T	TR
Volume (veh/h)		26	3	16		21	4	50		6	1014	17		43	1018	105
Percent Heavy Vehicles		0	0	0		0	0	0		0				0		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left + Thru															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		27		20		22		56		6				45		
Capacity		132		333		158		417		605				657		
v/c Ratio		0.20		0.06		0.14		0.13		0.01				0.07		
95% Queue Length		0.7		0.2		0.5		0.5		0.0				0.2		
Control Delay (s/veh)		39.0		16.5		31.4		15.0		11.0				10.9		
Level of Service (LOS)		E		C		D		B		B				B		
Approach Delay (s/veh)	29.4				19.6				0.1				0.4			
Approach LOS	D				C				A				A			

HCS 2010 Two-Way Stop Control Summary Report

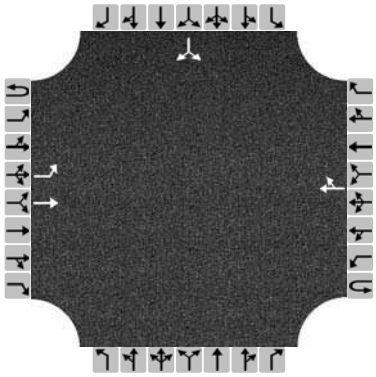
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	May 2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Intersection Orientation	East-West
Project Description	10728 (Total)

Site Information

Intersection	Oak Meadow Dr and dwy
Jurisdiction	Franklin, TN
East/West Street	Oak Meadow Drive
North/South Street	Western Home Depot dwy
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	0	1	0		0	0	0		0	0	0
Configuration		L	T					TR							LR	
Volume (veh/h)		31	70				263	0						1		13
Percent Heavy Vehicles		0												0		0
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		39													17	
Capacity		1242													708	
v/c Ratio		0.03													0.02	
95% Queue Length		0.1													0.1	
Control Delay (s/veh)		8.0													10.2	
Level of Service (LOS)		A													B	
Approach Delay (s/veh)	2.5												10.2			
Approach LOS	A												B			

HCS 2010 Two-Way Stop Control Summary Report

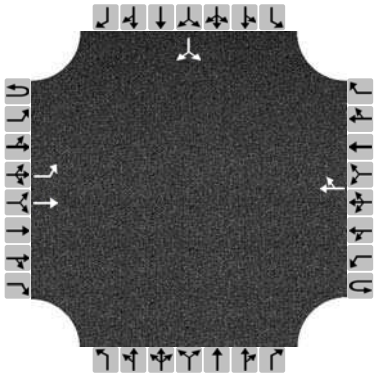
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	May 2016
Analysis Year	2016
Time Analyzed	PM Peak Hour
Intersection Orientation	East-West
Project Description	10728 (Total)

Site Information

Intersection	Oak Meadow Dr and dwy
Jurisdiction	Franklin, TN
East/West Street	Oak Meadow Drive
North/South Street	Western Home Depot dwy
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	0	1	0		0	0	0		0	0	0
Configuration		L	T					TR							LR	
Volume (veh/h)		28	234				212	2						16		38
Percent Heavy Vehicles		0												0		0
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		35													68	
Capacity		1309													681	
v/c Ratio		0.03													0.10	
95% Queue Length		0.1													0.3	
Control Delay (s/veh)		7.8													10.9	
Level of Service (LOS)		A													B	
Approach Delay (s/veh)	0.8												10.9			
Approach LOS	A												B			

HCS 2010 Two-Way Stop Control Summary Report

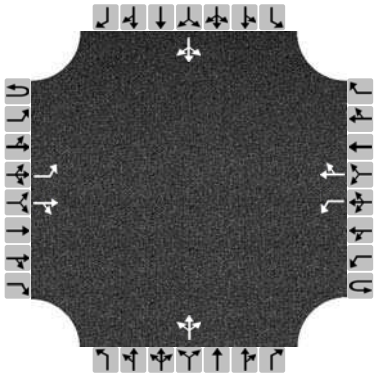
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	May 2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Intersection Orientation	East-West
Project Description	10728 (Total)

Site Information

Intersection	Oak Meadow Dr and east dw
Jurisdiction	Franklin, TN
East/West Street	Oak Meadow Drive
North/South Street	Eastern Home Depot dwy
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	1	1	0		0	1	0		0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		11	57	3		0	205	0		12	0	0		0	0	46
Percent Heavy Vehicles		0				0				0	0	0		0	0	0
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		14									15				58	
Capacity		1321				1537					571				788	
v/c Ratio		0.01									0.03				0.07	
95% Queue Length		0.0									0.1				0.2	
Control Delay (s/veh)		7.8				7.3					11.5				9.9	
Level of Service (LOS)		A				A					B				A	
Approach Delay (s/veh)	1.2								11.5				9.9			
Approach LOS	A								B				A			

HCS 2010 Two-Way Stop Control Summary Report

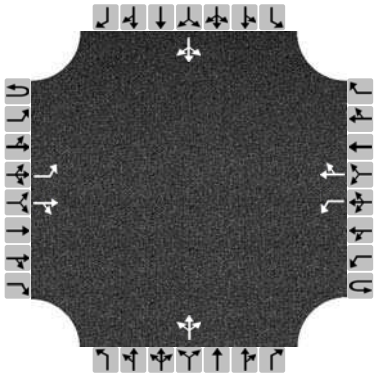
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	May 2016
Analysis Year	2016
Time Analyzed	PM Peak Hour
Intersection Orientation	East-West
Project Description	10728 (Total)

Site Information

Intersection	Oak Meadow Dr and east dw
Jurisdiction	Franklin, TN
East/West Street	Oak Meadow Drive
North/South Street	Eastern Home Depot dwy
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	1	1	0		0	1	0		0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		45	193	12		0	184	0		6	0	0		0	0	24
Percent Heavy Vehicles		0				0				0	0	0		0	0	0
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		56									8				30	
Capacity		1350				1321					475				814	
v/c Ratio		0.04									0.02				0.04	
95% Queue Length		0.1									0.1				0.1	
Control Delay (s/veh)		7.8				7.7					12.7				9.6	
Level of Service (LOS)		A				A					B				A	
Approach Delay (s/veh)	1.4								12.7				9.6			
Approach LOS	A								B				A			

HCS 2010 Two-Way Stop Control Summary Report

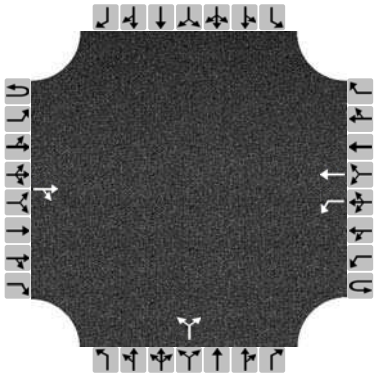
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	May 2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Intersection Orientation	East-West
Project Description	10728 (Total)

Site Information

Intersection	Oak Meadow Dr and west dw
Jurisdiction	Franklin, TN
East/West Street	Oak Meadow Drive
North/South Street	Western project dwy
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	1	1	0		0	0	0		0	0	0
Configuration				TR		L	T				LR					
Volume (veh/h)			86	45		11	265			66		15				
Percent Heavy Vehicles						0				0		0				
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)						14					101					
Capacity						1427					596					
v/c Ratio						0.01					0.17					
95% Queue Length						0.0					0.6					
Control Delay (s/veh)						7.5					12.3					
Level of Service (LOS)						A					B					
Approach Delay (s/veh)					0.3				12.3							
Approach LOS					A				B							

HCS 2010 Two-Way Stop Control Summary Report

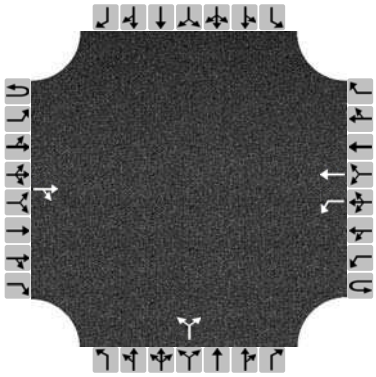
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	May 2016
Analysis Year	2016
Time Analyzed	PM Peak Hour
Intersection Orientation	East-West
Project Description	10728 (Total)

Site Information

Intersection	Oak Meadow Dr and west dw
Jurisdiction	Franklin, TN
East/West Street	Oak Meadow Drive
North/South Street	Western project dwy
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	1	1	0		0	0	0		0	0	0
Configuration				TR		L	T				LR					
Volume (veh/h)			255	37		8	242			31		7				
Percent Heavy Vehicles						0				0		0				
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left Only															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)						10					48					
Capacity						1205					513					
v/c Ratio						0.01					0.09					
95% Queue Length						0.0					0.3					
Control Delay (s/veh)						8.0					12.7					
Level of Service (LOS)						A					B					
Approach Delay (s/veh)					0.3				12.7							
Approach LOS					A				B							

HCS 2010 Two-Way Stop Control Summary Report

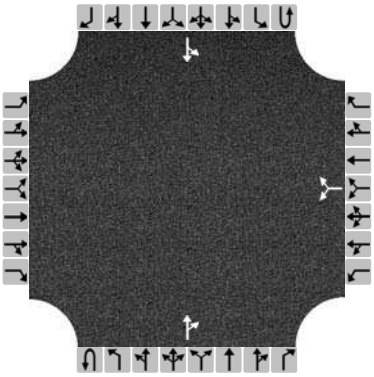
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	May 2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Intersection Orientation	North-South
Project Description	10728 (Total)

Site Information

Intersection	Home Depot and Apt Dwy
Jurisdiction	Franklin, TN
East/West Street	Project Driveway
North/South Street	Home Depot Access
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	0	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						46		37			0	11		10	0	
Percent Heavy Vehicles						0		0						0		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)							104							12		
Capacity							1023							1618		
v/c Ratio							0.10							0.01		
95% Queue Length							0.3							0.0		
Control Delay (s/veh)							8.9							7.2		
Level of Service (LOS)							A							A		
Approach Delay (s/veh)					8.9								7.2			
Approach LOS					A								A			

HCS 2010 Two-Way Stop Control Summary Report

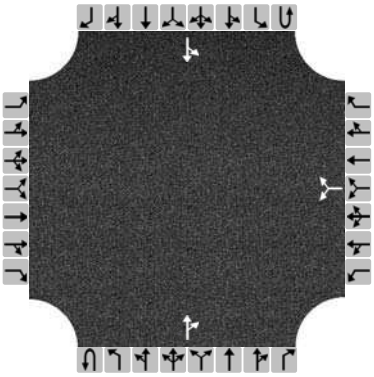
General Information

Analyst	FTG
Agency/Co.	FTG
Date Performed	May 2016
Analysis Year	2016
Time Analyzed	PM Peak Hour
Intersection Orientation	North-South
Project Description	10728 (Total)

Site Information

Intersection	Home Depot and Apt Dwy
Jurisdiction	Franklin, TN
East/West Street	Project Driveway
North/South Street	Home Depot Access
Peak Hour Factor	0.80
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	0	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						24		20			0	45		37	0	
Percent Heavy Vehicles						0		0						0		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)							55							46		
Capacity							935							1562		
v/c Ratio							0.06							0.03		
95% Queue Length							0.2							0.1		
Control Delay (s/veh)							9.1							7.4		
Level of Service (LOS)							A							A		
Approach Delay (s/veh)					9.1								7.4			
Approach LOS					A								A			

TOTAL PROJECTED CONDITIONS
With a third northbound through lane

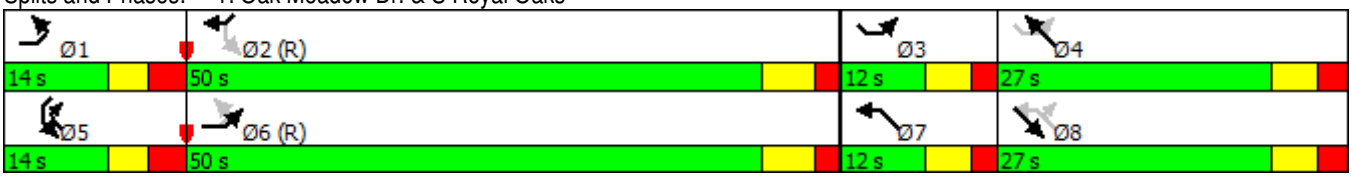
Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Lane Configurations												
Traffic Volume (vph)	87	1120	58	129	17	71	65	37	229	56	515	73
Future Volume (vph)	87	1120	58	129	17	71	65	37	229	56	515	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	11	11	11	11	12	12	13	12	12	12	12
Storage Length (ft)		70	150	75		0	100		195	180	0	
Storage Lanes		2	0	1		0	1		1	1	2	
Taper Length (ft)		50		50			50			50		
Lane Util. Factor	1.00	0.94	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88	1.00
Frt		0.989			0.885				0.850		0.850	
Flt Protected	0.950	0.956		0.950			0.950			0.950		
Satd. Flow (prot)	1534	4801	0	1711	1594	0	1770	1925	1583	1770	2787	0
Flt Permitted	0.271	0.956		0.715			0.495			0.177		
Satd. Flow (perm)	437	4801	0	1287	1594	0	922	1925	1583	330	2787	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		154			97				90		154	
Link Speed (mph)		30			25			40		30		
Link Distance (ft)		552			721			918		1624		
Travel Time (s)		12.5			19.7			15.6		36.9		
Peak Hour Factor	0.67	0.94	0.63	0.79	0.58	0.73	0.75	0.58	0.92	0.75	0.75	0.69
Adj. Flow (vph)	130	1191	92	163	29	97	87	64	249	75	687	106
Shared Lane Traffic (%)												
Lane Group Flow (vph)	130	1283	0	163	126	0	87	64	249	75	793	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Right	Right
Median Width(ft)		41			12			12		12		
Link Offset(ft)		0			0			0		0		
Crosswalk Width(ft)		16			16			16		16		
Two way Left Turn Lane												
Headway Factor	1.20	1.04	1.04	1.04	1.04	1.00	1.00	0.96	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	9	15		9	15		9	15	9	9
Number of Detectors	1	1		1	1		1	1	1	1	1	
Detector Template												
Leading Detector (ft)	42	42		42	42		42	42	42	42	42	
Trailing Detector (ft)	-3	-3		-3	-3		-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	-3		-3	-3		-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	45		45	45		45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	pm+pt	Prot		D.P+P	NA		D.P+P	NA	custom	pm+pt	Prot	
Protected Phases	1	6		3	8		7	4	5	5	2	
Permitted Phases	6			4			8		8	2		
Detector Phase	1	6		3	8		7	4	5	5	2	
Switch Phase												
Minimum Initial (s)	7.0	20.0		7.0	7.0		7.0	7.0	7.0	7.0	20.0	
Minimum Split (s)	13.0	26.0		12.5	20.0		12.5	20.0	13.0	13.0	26.0	

Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Total Split (s)	14.0	50.0		12.0	27.0		12.0	27.0	14.0	14.0	50.0	
Total Split (%)	13.6%	48.5%		11.7%	26.2%		11.7%	26.2%	13.6%	13.6%	48.5%	
Maximum Green (s)	8.0	44.0		6.5	21.0		6.5	21.0	8.0	8.0	44.0	
Yellow Time (s)	3.0	4.0		3.5	3.5		3.5	3.5	3.0	3.0	4.0	
All-Red Time (s)	3.0	2.0		2.0	2.5		2.0	2.5	3.0	3.0	2.0	
Lost Time Adjust (s)	-2.5	-1.5		-2.5	-2.5		-2.5	-2.5	-2.5	-2.5	-1.5	
Total Lost Time (s)	3.5	4.5		3.0	3.5		3.0	3.5	3.5	3.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.0		1.5	3.5		1.5	3.5	1.5	1.5	5.0	
Recall Mode	None	C-Min		None	None		None	None	None	None	C-Min	
Act Effct Green (s)	71.0	60.1		20.0	12.3		20.0	12.3	25.3	70.3	59.8	
Actuated g/C Ratio	0.69	0.58		0.19	0.12		0.19	0.12	0.25	0.68	0.58	
v/c Ratio	0.32	0.45		0.57	0.46		0.34	0.28	0.55	0.21	0.47	
Control Delay	7.7	11.8		41.9	18.6		34.8	43.6	25.6	6.9	11.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	7.7	11.8		41.9	18.6		34.8	43.6	25.6	6.9	11.8	
LOS	A	B		D	B		C	D	C	A	B	
Approach Delay		11.4			31.7			30.5		11.4		
Approach LOS		B			C			C		B		
90th %ile Green (s)	8.0	52.3		6.5	13.7		6.5	13.7	7.0	7.0	51.3	
90th %ile Term Code	Max	Coord		Max	Gap		Max	Hold	Min	Min	Coord	
70th %ile Green (s)	7.8	55.3		6.5	10.7		6.5	10.7	7.0	7.0	54.5	
70th %ile Term Code	Gap	Coord		Max	Hold		Max	Gap	Min	Min	Coord	
50th %ile Green (s)	7.0	56.6		6.5	9.4		6.5	9.4	7.0	7.0	56.6	
50th %ile Term Code	Min	Coord		Max	Hold		Max	Gap	Min	Min	Coord	
30th %ile Green (s)	7.0	57.9		6.5	8.1		6.5	8.1	7.0	7.0	57.9	
30th %ile Term Code	Min	Coord		Max	Hold		Max	Gap	Min	Min	Coord	
10th %ile Green (s)	7.0	71.0		7.5	7.0		0.0	0.0	7.0	7.0	71.0	
10th %ile Term Code	Min	Coord		Hold	Min		Skip	Skip	Min	Min	Coord	
Stops (vph)	27	567		112	27		51	33	126	18	271	
Fuel Used(gal)	1	11		2	1		1	1	4	1	10	
CO Emissions (g/hr)	46	771		162	68		96	62	270	62	724	
NOx Emissions (g/hr)	9	150		32	13		19	12	52	12	141	
VOC Emissions (g/hr)	11	179		38	16		22	14	63	14	168	
Dilemma Vehicles (#)	0	0		0	0		0	2	0	0	0	
Queue Length 50th (ft)	25	144		91	17		46	39	90	14	131	
Queue Length 95th (ft)	37	198		124	22		69	48	161	26	152	
Internal Link Dist (ft)		472			641			838		1544		
Turn Bay Length (ft)	70	70		75			100		195	180		
Base Capacity (vph)	415	2866		287	438		253	439	470	374	1681	
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	0.31	0.45		0.57	0.29		0.34	0.15	0.53	0.20	0.47	

Intersection Summary	
Area Type:	Other
Cycle Length: 103	

Actuated Cycle Length: 103	
Offset: 0 (0%), Referenced to phase 2:SWL and 6:EBL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.57	
Intersection Signal Delay: 16.0	Intersection LOS: B
Intersection Capacity Utilization 52.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Oak Meadow Dr. & S Royal Oaks



Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	28	1276	103	274	770	25	6	46	41	33	12	118
Future Volume (vph)	28	1276	103	274	770	25	6	46	41	33	12	118
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	12	11	12	11	11	12	12	11	12
Grade (%)		1%			-2%			-1%			2%	
Storage Length (ft)	80		135	220		0	100		0	120		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988			0.993			0.934			0.868	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	4884	0	1787	3428	0	1754	1624	0	1787	1520	0
Flt Permitted	0.315			0.119			0.552			0.463		
Satd. Flow (perm)	556	4884	0	224	3428	0	1019	1624	0	871	1520	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			4			27			137	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1624			792			957			515	
Travel Time (s)		36.9			18.0			21.8			11.7	
Peak Hour Factor	0.63	0.92	0.87	0.80	0.99	0.67	0.58	0.68	0.77	0.67	0.63	0.86
Heavy Vehicles (%)	0%	1%	0%	2%	2%	4%	0%	11%	0%	0%	10%	3%
Adj. Flow (vph)	44	1387	118	343	778	37	10	68	53	49	19	137
Shared Lane Traffic (%)												
Lane Group Flow (vph)	44	1505	0	343	815	0	10	121	0	49	156	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.10	1.05	1.01	0.99	1.03	0.99	1.04	1.04	0.99	1.01	1.06	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	42	226		42	226		42	42		42	42	
Trailing Detector (ft)	-3	220		-3	220		-3	-3		-3	-3	
Detector 1 Position(ft)	-3	220		-3	220		-3	-3		-3	-3	
Detector 1 Size(ft)	45	6		45	6		45	45		45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2			4			8		
Detector Phase	1	6		5	2		7	4		3	8	
Switch Phase												

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Minimum Initial (s)	5.0	10.0		5.0	10.0		6.0	7.0		6.0	7.0	
Minimum Split (s)	17.0	73.0		17.0	73.0		10.0	50.0		10.0	50.0	
Total Split (s)	17.0	73.0		17.0	73.0		10.0	50.0		10.0	50.0	
Total Split (%)	11.3%	48.7%		11.3%	48.7%		6.7%	33.3%		6.7%	33.3%	
Maximum Green (s)	10.5	67.0		10.5	67.0		6.0	43.0		6.0	43.0	
Yellow Time (s)	3.0	3.5		3.0	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	3.5	2.5		3.5	2.5		0.5	3.5		0.5	3.5	
Lost Time Adjust (s)	-1.0	-3.0		-1.0	-3.0		-2.5	-2.5		-2.5	-2.5	
Total Lost Time (s)	5.5	3.0		5.5	3.0		1.5	4.5		1.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5		3.5	3.5		3.0	3.5		3.0	3.5	
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	
Walk Time (s)		7.0			7.0			8.0			8.0	
Flash Dont Walk (s)		16.0			20.0			32.0			35.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	103.4	97.8		110.4	103.7		27.4	17.2		30.7	23.3	
Actuated g/C Ratio	0.69	0.65		0.74	0.69		0.18	0.11		0.20	0.16	
v/c Ratio	0.10	0.47		1.21	0.34		0.04	0.58		0.20	0.44	
Control Delay	7.4	14.7		144.4	11.7		42.7	58.7		46.7	15.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	7.4	14.7		144.4	11.7		42.7	58.7		46.7	15.6	
LOS	A	B		F	B		D	E		D	B	
Approach Delay		14.5			51.0			57.5			23.0	
Approach LOS		B			D			E			C	
90th %ile Green (s)	8.6	83.8		10.5	85.7		7.3	21.2		11.0	24.9	
90th %ile Term Code	Gap	Coord		Max	Coord		Gap	Gap		Gap	Hold	
70th %ile Green (s)	7.6	89.2		10.5	92.1		6.6	17.3		9.5	20.2	
70th %ile Term Code	Gap	Coord		Max	Coord		Gap	Gap		Gap	Hold	
50th %ile Green (s)	7.0	92.8		10.5	96.3		0.0	14.7		8.5	27.2	
50th %ile Term Code	Gap	Coord		Max	Coord		Skip	Gap		Gap	Hold	
30th %ile Green (s)	6.5	96.5		10.5	100.5		0.0	12.1		7.4	23.5	
30th %ile Term Code	Gap	Coord		Max	Coord		Skip	Gap		Gap	Hold	
10th %ile Green (s)	0.0	111.7		10.5	128.7		0.0	8.3		0.0	8.3	
10th %ile Term Code	Skip	Coord		Max	Coord		Skip	Gap		Skip	Hold	
Stops (vph)	9	673		99	323		5	63		26	25	
Fuel Used(gal)	0	25		10	9		0	2		1	1	
CO Emissions (g/hr)	31	1769		720	601		9	142		41	75	
NOx Emissions (g/hr)	6	344		140	117		2	28		8	15	
VOC Emissions (g/hr)	7	410		167	139		2	33		10	17	
Dilemma Vehicles (#)	0	0		0	0		0	0		0	0	
Queue Length 50th (ft)	11	264		~167	174		8	88		39	15	
Queue Length 95th (ft)	19	354		#399	261		14	105		52	21	
Internal Link Dist (ft)		1544			712			877			435	
Turn Bay Length (ft)	80			220			100			120		
Base Capacity (vph)	481	3188		284	2370		229	511		245	556	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	

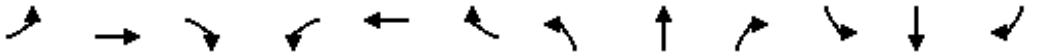
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Reduced v/c Ratio	0.09	0.47		1.21	0.34		0.04	0.24		0.20	0.28	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 139 (93%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.21			
Intersection Signal Delay: 30.8		Intersection LOS: C	
Intersection Capacity Utilization 62.3%		ICU Level of Service B	
Analysis Period (min) 15			

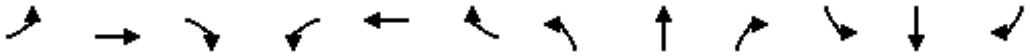
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Splits and Phases: 3: S Royal Oaks & Riverside Dr/Center Point Pl



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	112	772	60	850	993	281	99	272	1055	225	213	82
Future Volume (vph)	112	772	60	850	993	281	99	272	1055	225	213	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	11	12	13	12	13	13	11	11	11
Grade (%)		0%			0%			1%			0%	
Storage Length (ft)	200		300	285		0	195		450	220		650
Storage Lanes	2		1	2		1	2		2	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.95	0.88	0.97	0.95	0.95
Frt		0.988				0.850			0.850		0.961	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3400	4688	0	3286	3406	1620	3350	3639	2865	3319	3241	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3400	4688	0	3286	3406	1620	3350	3639	2865	3319	3241	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		10				149					31	
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		700			691			792			964	
Travel Time (s)		11.9			11.8			18.0			21.9	
Peak Hour Factor	0.80	0.90	0.80	0.93	0.91	0.88	0.82	0.80	0.93	0.92	0.74	0.81
Heavy Vehicles (%)	3%	6%	2%	3%	6%	3%	4%	2%	2%	2%	4%	2%
Adj. Flow (vph)	140	858	75	914	1091	319	121	340	1134	245	288	101
Shared Lane Traffic (%)												
Lane Group Flow (vph)	140	933	0	914	1091	319	121	340	1134	245	389	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		30			24			30			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.04	1.00	1.04	1.00	0.96	1.01	0.96	0.96	1.04	1.04	1.04
Turning Speed (mph)	18		10	18		10	18		10	18		10
Number of Detectors	1	1		1	1	0	1	2	1	1	2	
Detector Template												
Leading Detector (ft)	42	236		42	236	0	42	146	42	42	146	
Trailing Detector (ft)	-3	230		-3	230	0	-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	230		-3	230	230	-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	6		45	6	6	45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)								140			140	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	

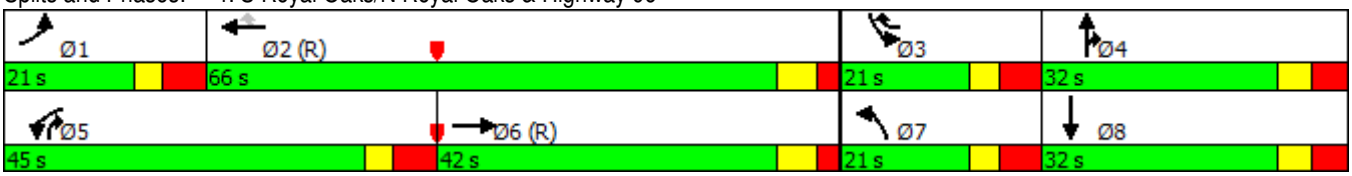


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	1	6		5	2	3	7	4	4 5	3	8	
Permitted Phases						2						
Detector Phase	1	6		5	2	3	7	4	4 5	3	8	
Switch Phase												
Minimum Initial (s)	6.0	13.0		6.0	13.0	6.0	6.0	10.0		6.0	10.0	
Minimum Split (s)	21.0	42.0		45.0	66.0	21.0	21.0	32.0		21.0	32.0	
Total Split (s)	21.0	42.0		45.0	66.0	21.0	21.0	32.0		21.0	32.0	
Total Split (%)	15.0%	30.0%		32.1%	47.1%	15.0%	15.0%	22.9%		15.0%	22.9%	
Maximum Green (s)	13.5	35.5		37.5	59.5	13.5	13.5	24.5		13.5	24.5	
Yellow Time (s)	3.0	4.0		3.0	4.0	3.0	3.0	3.5		3.0	3.5	
All-Red Time (s)	4.5	2.5		4.5	2.5	4.5	4.5	4.0		4.5	4.0	
Lost Time Adjust (s)	-2.5	-2.5		-2.5	-2.5	-2.0	-2.0	-3.0		-2.0	-3.0	
Total Lost Time (s)	5.0	4.0		5.0	4.0	5.5	5.5	4.5		5.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	6.0		3.0	6.0	3.0	3.0	4.5		3.0	4.5	
Recall Mode	None	C-Min		None	C-Min	None	None	None		None	None	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		37.0			24.0			36.0			36.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	13.5	38.4		40.0	64.9	84.0	12.4	27.5	72.0	15.1	30.2	
Actuated g/C Ratio	0.10	0.27		0.29	0.46	0.60	0.09	0.20	0.51	0.11	0.22	
v/c Ratio	0.43	0.72		0.97	0.69	0.31	0.41	0.48	0.77	0.69	0.54	
Control Delay	76.8	41.3		61.0	40.4	8.7	64.1	52.4	31.8	70.7	48.2	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	76.8	41.3		61.0	40.4	8.7	64.1	52.4	31.8	70.7	48.2	
LOS	E	D		E	D	A	E	D	C	E	D	
Approach Delay		46.0			44.1			38.6			56.9	
Approach LOS		D			D			D			E	
90th %ile Green (s)	13.5	35.5		37.5	59.5	13.5	13.3	24.5		13.5	24.7	
90th %ile Term Code	Max	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
70th %ile Green (s)	12.4	35.5		37.5	60.6	13.5	11.6	24.5		13.5	26.4	
70th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
50th %ile Green (s)	11.2	35.5		37.5	61.8	13.5	10.4	24.5		13.5	27.6	
50th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
30th %ile Green (s)	9.9	35.5		37.5	63.1	13.5	9.2	24.5		13.5	28.8	
30th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
10th %ile Green (s)	8.1	37.6		37.5	67.0	11.4	7.5	24.5		11.4	28.4	
10th %ile Term Code	Gap	Coord		Max	Coord	Gap	Gap	Max		Gap	Hold	
Stops (vph)	110	737		759	947	98	92	236	829	214	238	
Fuel Used(gal)	3	18		25	25	4	2	6	18	6	6	
CO Emissions (g/hr)	235	1272		1740	1782	261	169	412	1253	427	449	
NOx Emissions (g/hr)	46	247		338	347	51	33	80	244	83	87	
VOC Emissions (g/hr)	54	295		403	413	60	39	95	290	99	104	
Dilemma Vehicles (#)	0	28		0	36	0	0	0	0	0	0	
Queue Length 50th (ft)	69	285		419	535	78	54	145	459	112	153	
Queue Length 95th (ft)	93	338		m#446	m544	m122	78	172	561	159	167	
Internal Link Dist (ft)		620			611			712			884	

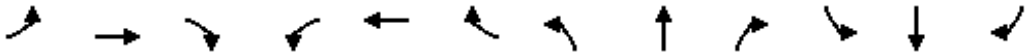
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	200			285			195		450	220		
Base Capacity (vph)	388	1293		938	1578	1035	370	714	1473	367	723	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.36	0.72		0.97	0.69	0.31	0.33	0.48	0.77	0.67	0.54	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 116 (83%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.97			
Intersection Signal Delay: 44.4		Intersection LOS: D	
Intersection Capacity Utilization 71.7%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 4: S Royal Oaks/N Royal Oaks & Highway 96



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1786	196	111	1061	0	0	0	0	355	0	1039
Future Volume (vph)	0	1786	196	111	1061	0	0	0	0	355	0	1039
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	12	12	12	12	12	12	11
Grade (%)		0%			0%			0%			1%	
Storage Length (ft)	0		0	420		0	0		0	350		0
Storage Lanes	0		1	0		0	0		0	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.86	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	0.88
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	6346	1509	1787	3388	0	0	0	0	3287	0	2654
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	6346	1509	1787	3388	0	0	0	0	3287	0	2654
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			184									115
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		501			556			756			888	
Travel Time (s)		8.5			9.5			20.6			24.2	
Peak Hour Factor	1.00	0.91	0.90	0.86	0.87	1.00	1.00	1.00	1.00	0.85	1.00	0.94
Heavy Vehicles (%)	2%	3%	7%	1%	3%	2%	2%	2%	2%	6%	2%	3%
Adj. Flow (vph)	0	1963	218	129	1220	0	0	0	0	418	0	1105
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1963	218	129	1220	0	0	0	0	418	0	1105
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.04	1.00	1.00	1.00	1.00	1.01	1.01	1.05
Turning Speed (mph)	15		12	15		9	15		9	18		12
Number of Detectors		1	0	1	1					1		1
Detector Template												
Leading Detector (ft)		300	0	42	300					42		42
Trailing Detector (ft)		294	0	-3	294					-3		-3
Detector 1 Position(ft)		294	-3	-3	294					-3		-3
Detector 1 Size(ft)		6	45	45	6					45		45
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Turn Type		NA	Perm	Prot	NA					Prot		Prot
Protected Phases		6		5	2					4		4
Permitted Phases			6									
Detector Phase		6	6	5	2					4		4
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		25.0	25.0	5.0	25.0					15.0		15.0
Minimum Split (s)		62.0	62.0	23.0	85.0					55.0		55.0
Total Split (s)		62.0	62.0	23.0	85.0					55.0		55.0
Total Split (%)		44.3%	44.3%	16.4%	60.7%					39.3%		39.3%
Maximum Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
Yellow Time (s)		4.0	4.0	3.0	4.0					4.0		4.0
All-Red Time (s)		2.0	2.0	3.0	2.0					3.5		3.5
Lost Time Adjust (s)		-2.0	-2.0	-1.0	-2.0					-2.0		-2.0
Total Lost Time (s)		4.0	4.0	5.0	4.0					5.5		5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		4.5	4.5	3.0	4.5					3.0		3.0
Recall Mode		C-Min	C-Min	None	C-Min					None		None
Act Effct Green (s)		60.5	60.5	15.5	81.0					49.5		49.5
Actuated g/C Ratio		0.43	0.43	0.11	0.58					0.35		0.35
v/c Ratio		0.72	0.29	0.65	0.62					0.36		1.09
Control Delay		27.6	5.1	71.8	19.3					34.6		94.9
Queue Delay		0.8	0.0	0.0	0.3					2.1		0.0
Total Delay		28.3	5.1	71.8	19.5					36.7		94.9
LOS		C	A	E	B					D		F
Approach Delay		26.0			24.5							
Approach LOS		C			C							
90th %ile Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
90th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
70th %ile Green (s)		56.0	56.0	17.0	79.0					47.5		47.5
70th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
50th %ile Green (s)		57.6	57.6	15.4	79.0					47.5		47.5
50th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
30th %ile Green (s)		59.8	59.8	13.2	79.0					47.5		47.5
30th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
10th %ile Green (s)		63.2	63.2	9.8	79.0					47.5		47.5
10th %ile Term Code		Coord	Coord	Gap	Coord					Max		Max
Stops (vph)		1165	39	111	497					256		836
Fuel Used(gal)		36	2	3	13					6		31
CO Emissions (g/hr)		2510	152	219	912					431		2177
NOx Emissions (g/hr)		488	30	43	177					84		423
VOC Emissions (g/hr)		582	35	51	211					100		504
Dilemma Vehicles (#)		50	0	0	34					0		0
Queue Length 50th (ft)		346	27	124	283					144		~602
Queue Length 95th (ft)		406	m47	m164	m297					178		#754
Internal Link Dist (ft)		421			476			676			808	
Turn Bay Length (ft)				420						350		
Base Capacity (vph)		2743	756	229	1960					1162		1012
Starvation Cap Reductn		0	0	0	215					0		0
Spillback Cap Reductn		420	0	0	0					581		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.85	0.29	0.56	0.70					0.72		1.09

Intersection Summary

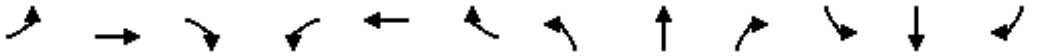
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 106 (76%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.09			
Intersection Signal Delay: 41.6		Intersection LOS: D	
Intersection Capacity Utilization 108.6%		ICU Level of Service G	
Analysis Period (min) 15			

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

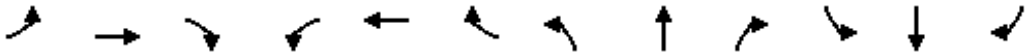
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

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

Splits and Phases: 5: Ent ramp to I-65/Exit ramp from I-65 & Highway 96



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1382	759	0	0	764	1217	408	0	364	0	0	0
Future Volume (vph)	1382	759	0	0	764	1217	408	0	364	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12	11	12	13	12	12	12
Grade (%)		1%			0%			1%			0%	
Storage Length (ft)	0		0	0		0	270		0	0		0
Storage Lanes	2		0	0		2	2		1	0		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	0.88	0.97	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	3302	3307	0	0	3539	2814	3302	0	1628	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	3302	3307	0	0	3539	2814	3302	0	1628	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						23			252			
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		556			311			685			941	
Travel Time (s)		9.5			5.3			18.7			25.7	
Peak Hour Factor	0.88	0.86	0.95	1.00	0.95	0.98	0.95	0.25	0.92	1.00	1.00	0.95
Heavy Vehicles (%)	2%	5%	2%	2%	2%	1%	2%	0%	2%	2%	2%	2%
Adj. Flow (vph)	1570	883	0	0	804	1242	429	0	396	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1570	883	0	0	804	1242	429	0	396	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			26			22			22	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.05	1.05	1.01	1.00	1.00	1.00	1.05	1.01	0.96	1.00	1.00	1.00
Turning Speed (mph)	18		9	15		10	15		15	15		9
Number of Detectors	1	1			1	0	1		1			
Detector Template												
Leading Detector (ft)	42	300			300	0	42		50			
Trailing Detector (ft)	-3	294			294	0	-3		0			
Detector 1 Position(ft)	-3	294			294	0	-3		0			
Detector 1 Size(ft)	45	6			6	50	45		50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Turn Type	Prot	NA			NA	custom	Prot		Perm			
Protected Phases	1	6			2	2 4	4					
Permitted Phases									4			
Detector Phase	1	6			2	2 4	4		4			
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	12.0	18.0			18.0		7.0		7.0			
Minimum Split (s)	56.0	116.0			60.0		24.0		24.0			
Total Split (s)	56.0	116.0			60.0		24.0		24.0			
Total Split (%)	40.0%	82.9%			42.9%		17.1%		17.1%			
Maximum Green (s)	50.0	110.0			53.5		16.5		16.5			
Yellow Time (s)	3.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	3.0	2.0			2.5		3.5		3.5			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.5		7.5		7.5			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	4.0	4.5			4.5		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Act Effct Green (s)	50.0	110.0			53.5	79.5	16.5		16.5			
Actuated g/C Ratio	0.36	0.79			0.38	0.57	0.12		0.12			
v/c Ratio	1.33	0.34			0.59	0.77	1.10		0.96			
Control Delay	204.9	3.4			36.8	27.0	131.8		56.6			
Queue Delay	0.7	0.1			0.0	0.0	0.0		0.0			
Total Delay	205.5	3.5			36.8	27.0	131.8		56.6			
LOS	F	A			D	C	F		E			
Approach Delay		132.8			30.8							
Approach LOS		F			C							
90th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
90th %ile Term Code	Max	Coord			Coord		Max		Max			
70th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
70th %ile Term Code	Max	Coord			Coord		Max		Max			
50th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
50th %ile Term Code	Max	Coord			Coord		Max		Max			
30th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
30th %ile Term Code	Max	Coord			Coord		Max		Max			
10th %ile Green (s)	50.0	110.0			53.5		16.5		16.5			
10th %ile Term Code	Max	Coord			Coord		Max		Max			
Stops (vph)	1003	107			597	899	350		119			
Fuel Used(gal)	73	4			13	18	15		7			
CO Emissions (g/hr)	5083	310			923	1264	1025		474			
NOx Emissions (g/hr)	989	60			180	246	200		92			
VOC Emissions (g/hr)	1178	72			214	293	238		110			
Dilemma Vehicles (#)	0	18			27	0	0		0			
Queue Length 50th (ft)	~951	67			306	468	~228		142			
Queue Length 95th (ft)	#1078	75			375	573	#338		#351			
Internal Link Dist (ft)		476			231			605			861	
Turn Bay Length (ft)							270					
Base Capacity (vph)	1179	2598			1352	1607	389		414			
Starvation Cap Reductn	163	623			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	1.55	0.45			0.59	0.77	1.10		0.96			

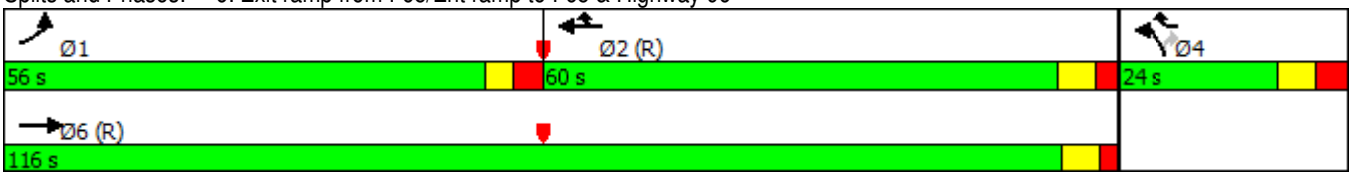
Intersection Summary

Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 122 (87%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.33			
Intersection Signal Delay: 87.9		Intersection LOS: F	
Intersection Capacity Utilization 108.6%		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.

Splits and Phases: 6: Exit ramp from I-65/Ent ramp to I-65 & Highway 96



Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Lane Configurations												
Traffic Volume (vph)	92	827	45	147	56	118	114	38	121	191	765	145
Future Volume (vph)	92	827	45	147	56	118	114	38	121	191	765	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	8	11	11	11	11	12	12	13	12	12	12	12
Storage Length (ft)		70	150	75		0	100		195	180	0	
Storage Lanes		2	0	1		0	1		1	1	2	
Taper Length (ft)		50		50			50			50		
Lane Util. Factor	1.00	0.94	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.88	1.00
Frt		0.989			0.906				0.850		0.850	
Flt Protected	0.950	0.956		0.950			0.950			0.950		
Satd. Flow (prot)	1534	4801	0	1711	1631	0	1770	1925	1583	1770	2787	0
Flt Permitted	0.083	0.956		0.704			0.285			0.261		
Satd. Flow (perm)	134	4801	0	1268	1631	0	531	1925	1583	486	2787	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		132			68				132		132	
Link Speed (mph)		30			25			40		30		
Link Distance (ft)		552			721			918		1624		
Travel Time (s)		12.5			19.7			15.6		36.9		
Peak Hour Factor	0.67	0.94	0.63	0.79	0.58	0.73	0.75	0.58	0.92	0.75	0.75	0.69
Adj. Flow (vph)	137	880	71	186	97	162	152	66	132	255	1020	210
Shared Lane Traffic (%)												
Lane Group Flow (vph)	137	951	0	186	259	0	152	66	132	255	1230	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Right	Right
Median Width(ft)		41			12			12		12		
Link Offset(ft)		0			0			0		0		
Crosswalk Width(ft)		16			16			16		16		
Two way Left Turn Lane												
Headway Factor	1.20	1.04	1.04	1.04	1.04	1.00	1.00	0.96	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	9	15		9	15		9	15	9	9
Number of Detectors	1	1		1	1		1	1	1	1	1	
Detector Template												
Leading Detector (ft)	42	42		42	42		42	42	42	42	42	
Trailing Detector (ft)	-3	-3		-3	-3		-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	-3		-3	-3		-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	45		45	45		45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	pm+pt	Prot		D.P+P	NA		D.P+P	NA	custom	pm+pt	Prot	
Protected Phases	1	6		3	8		7	4	5	5	2	
Permitted Phases	6			4			8		8	2		
Detector Phase	1	6		3	8		7	4	5	5	2	
Switch Phase												
Minimum Initial (s)	7.0	20.0		7.0	7.0		7.0	7.0	7.0	7.0	20.0	
Minimum Split (s)	18.0	57.0		14.0	35.0		14.0	35.0	14.0	14.0	53.0	

Lane Group	EBL2	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR	SWR2
Total Split (s)	18.0	57.0		14.0	35.0		14.0	35.0	14.0	14.0	53.0	
Total Split (%)	15.0%	47.5%		11.7%	29.2%		11.7%	29.2%	11.7%	11.7%	44.2%	
Maximum Green (s)	12.0	51.0		8.5	29.0		8.5	29.0	8.0	8.0	47.0	
Yellow Time (s)	3.0	4.0		3.5	3.5		3.5	3.5	3.0	3.0	4.0	
All-Red Time (s)	3.0	2.0		2.0	2.5		2.0	2.5	3.0	3.0	2.0	
Lost Time Adjust (s)	-2.5	-1.5		-2.5	-2.5		-2.5	-2.5	-2.5	-2.5	-1.5	
Total Lost Time (s)	3.5	4.5		3.0	3.5		3.0	3.5	3.5	3.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lead	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.0		1.5	3.5		1.5	3.5	1.5	1.5	5.0	
Recall Mode	None	C-Min		None	None		None	None	None	None	C-Min	
Act Effct Green (s)	74.5	61.4		34.8	22.9		34.2	21.9	36.7	70.9	59.5	
Actuated g/C Ratio	0.62	0.51		0.29	0.19		0.28	0.18	0.31	0.59	0.50	
v/c Ratio	0.61	0.38		0.44	0.71		0.58	0.19	0.23	0.64	0.85	
Control Delay	29.2	16.3		34.6	43.2		39.1	39.7	5.3	20.1	31.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	29.2	16.3		34.6	43.2		39.1	39.7	5.3	20.1	31.8	
LOS	C	B		C	D		D	D	A	C	C	
Approach Delay		17.9			39.6			26.5		29.8		
Approach LOS		B			D			C		C		
90th %ile Green (s)	12.0	51.3		8.5	28.7		8.5	28.7	8.0	8.0	47.3	
90th %ile Term Code	Max	Coord		Max	Gap		Max	Hold	Max	Max	Coord	
70th %ile Green (s)	12.0	56.1		8.5	23.9		8.5	23.9	8.0	8.0	52.1	
70th %ile Term Code	Max	Coord		Max	Gap		Max	Hold	Max	Max	Coord	
50th %ile Green (s)	10.3	59.6		8.5	20.4		8.5	20.4	8.0	8.0	57.3	
50th %ile Term Code	Gap	Coord		Max	Gap		Max	Hold	Max	Max	Coord	
30th %ile Green (s)	7.7	63.0		8.5	17.0		8.5	17.0	8.0	8.0	63.3	
30th %ile Term Code	Gap	Coord		Max	Gap		Max	Hold	Max	Max	Coord	
10th %ile Green (s)	7.0	69.7		25.5	11.9		7.6	0.0	7.3	7.3	70.0	
10th %ile Term Code	Min	Coord		Hold	Gap		Gap	Skip	Gap	Gap	Coord	
Stops (vph)	47	445		112	120		84	31	14	91	658	
Fuel Used(gal)	1	9		2	3		2	1	1	4	21	
CO Emissions (g/hr)	84	637		165	215		171	59	71	259	1472	
NOx Emissions (g/hr)	16	124		32	42		33	12	14	50	286	
VOC Emissions (g/hr)	19	148		38	50		40	14	17	60	341	
Dilemma Vehicles (#)	0	0		0	0		0	2	0	0	0	
Queue Length 50th (ft)	42	130		111	140		88	43	0	78	422	
Queue Length 95th (ft)	70	188		135	108		105	49	40	116	447	
Internal Link Dist (ft)		472			641			838		1544		
Turn Bay Length (ft)	70	70		75			100		195	180		
Base Capacity (vph)	254	2522		421	478		265	505	578	400	1448	
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	0.54	0.38		0.44	0.54		0.57	0.13	0.23	0.64	0.85	

Intersection Summary	
Area Type:	Other
Cycle Length: 120	

Actuated Cycle Length: 120	
Offset: 117 (98%), Referenced to phase 2:SWL and 6:EBL, Start of Green	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 26.9	Intersection LOS: C
Intersection Capacity Utilization 58.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: Oak Meadow Dr. & S Royal Oaks

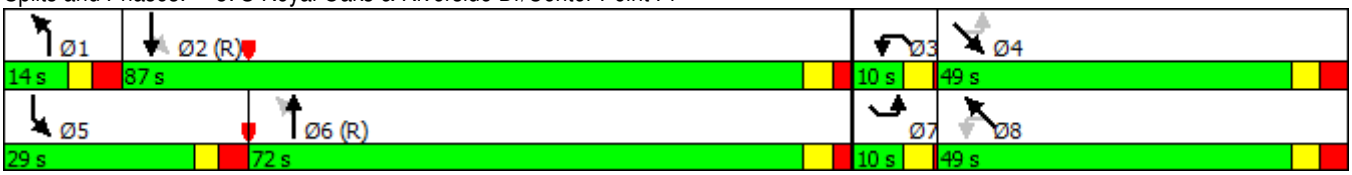
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	90	1103	27	263	1126	93	83	64	123	46	58	300
Future Volume (vph)	90	1103	27	263	1126	93	83	64	123	46	58	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	12	12	11	12	11	11	12	12	11	12
Grade (%)		1%			-2%			-1%			2%	
Storage Length (ft)	80		135	220		0	100		0	120		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.91	0.91	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995			0.987			0.906			0.876	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	4913	0	1805	3447	0	1736	1672	0	1752	1593	0
Flt Permitted	0.116			0.138			0.111			0.421		
Satd. Flow (perm)	205	4913	0	262	3447	0	203	1672	0	776	1593	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			10			52			151	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1624			792			957			515	
Travel Time (s)		36.9			18.0			21.8			11.7	
Peak Hour Factor	0.79	0.95	0.64	0.75	0.90	0.76	0.86	0.71	0.82	0.75	0.88	0.94
Heavy Vehicles (%)	0%	1%	2%	1%	1%	0%	1%	0%	0%	2%	0%	0%
Adj. Flow (vph)	114	1161	42	351	1251	122	97	90	150	61	66	319
Shared Lane Traffic (%)												
Lane Group Flow (vph)	114	1203	0	351	1373	0	97	240	0	61	385	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.10	1.05	1.01	0.99	1.03	0.99	1.04	1.04	0.99	1.01	1.06	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1		1	1		1	1		1	1	
Detector Template												
Leading Detector (ft)	42	226		42	226		42	42		42	42	
Trailing Detector (ft)	-3	220		-3	220		-3	-3		-3	-3	
Detector 1 Position(ft)	-3	220		-3	220		-3	-3		-3	-3	
Detector 1 Size(ft)	45	6		45	6		45	45		45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2			4			8		
Detector Phase	1	6		5	2		7	4		3	8	
Switch Phase												

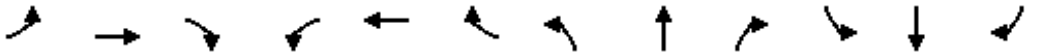
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Minimum Initial (s)	5.0	10.0		5.0	10.0		6.0	7.0		6.0	7.0	
Minimum Split (s)	15.0	70.0		30.0	85.0		10.0	50.0		10.0	50.0	
Total Split (s)	14.0	72.0		29.0	87.0		10.0	49.0		10.0	49.0	
Total Split (%)	8.8%	45.0%		18.1%	54.4%		6.3%	30.6%		6.3%	30.6%	
Maximum Green (s)	7.5	66.0		22.5	81.0		6.0	42.0		6.0	42.0	
Yellow Time (s)	3.0	3.5		3.0	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	3.5	2.5		3.5	2.5		0.5	3.5		0.5	3.5	
Lost Time Adjust (s)	-1.0	-3.0		-1.0	-3.0		-2.5	-2.5		-2.5	-2.5	
Total Lost Time (s)	5.5	3.0		5.5	3.0		1.5	4.5		1.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.5	3.5		3.5	3.5		3.0	3.5		3.0	3.5	
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	
Walk Time (s)		7.0			7.0			8.0			8.0	
Flash Dont Walk (s)		16.0			20.0			32.0			35.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	82.3	76.3		101.9	90.4		50.8	38.1		47.3	33.7	
Actuated g/C Ratio	0.51	0.48		0.64	0.56		0.32	0.24		0.30	0.21	
v/c Ratio	0.62	0.51		0.91	0.70		0.52	0.55		0.21	0.85	
Control Delay	33.6	31.2		56.7	28.8		47.7	45.7		37.6	53.0	
Queue Delay	0.0	0.0		0.0	1.2		0.0	0.0		0.0	0.0	
Total Delay	33.6	31.2		56.7	30.0		47.7	45.7		37.6	53.0	
LOS	C	C		E	C		D	D		D	D	
Approach Delay		31.4			35.4			46.2			50.9	
Approach LOS		C			D			D			D	
90th %ile Green (s)	7.5	65.5		22.5	80.5		6.5	42.0		6.5	42.0	
90th %ile Term Code	Max	Coord		Max	Coord		Max	Hold		Max	Max	
70th %ile Green (s)	7.5	62.9		22.5	77.9		14.1	40.7		10.4	37.0	
70th %ile Term Code	Max	Coord		Max	Coord		Gap	Hold		Gap	Gap	
50th %ile Green (s)	7.5	69.8		22.5	84.8		12.4	34.9		9.3	31.8	
50th %ile Term Code	Max	Coord		Max	Coord		Gap	Hold		Gap	Gap	
30th %ile Green (s)	7.5	76.8		22.5	91.8		10.8	29.1		8.1	26.4	
30th %ile Term Code	Max	Coord		Max	Coord		Gap	Hold		Gap	Gap	
10th %ile Green (s)	7.5	91.6		17.8	101.9		8.5	31.1		0.0	18.6	
10th %ile Term Code	Max	Coord		Gap	Coord		Gap	Hold		Skip	Gap	
Stops (vph)	47	770		142	868		57	127		30	220	
Fuel Used(gal)	2	26		5	19		2	4		1	7	
CO Emissions (g/hr)	141	1800		381	1361		122	268		49	456	
NOx Emissions (g/hr)	27	350		74	265		24	52		10	89	
VOC Emissions (g/hr)	33	417		88	315		28	62		11	106	
Dilemma Vehicles (#)	0	0		0	0		0	0		0	0	
Queue Length 50th (ft)	47	327		224	547		72	175		44	248	
Queue Length 95th (ft)	70	394		262	676		110	181		65	340	
Internal Link Dist (ft)		1544			712			877			435	
Turn Bay Length (ft)	80			220			100			120		
Base Capacity (vph)	183	2367		393	1967		188	502		294	552	
Starvation Cap Reductn	0	0		0	349		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Reduced v/c Ratio	0.62	0.51		0.89	0.85		0.52	0.48		0.21	0.70	

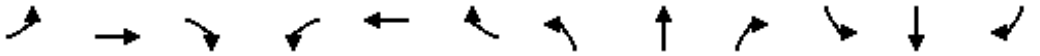
Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 123 (77%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 160			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.91			
Intersection Signal Delay: 36.8		Intersection LOS: D	
Intersection Capacity Utilization 80.6%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 3: S Royal Oaks & Riverside Dr/Center Point Pl





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	206	1108	63	976	1174	269	141	368	999	316	465	178
Future Volume (vph)	206	1108	63	976	1174	269	141	368	999	316	465	178
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	11	12	13	12	13	13	11	11	11
Grade (%)		0%			0%			1%			0%	
Storage Length (ft)	200		300	285		0	195		450	220		650
Storage Lanes	2		1	2		1	2		2	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.91	0.91	0.97	0.95	1.00	0.97	0.95	0.88	0.97	0.95	0.95
Frt		0.991				0.850			0.850		0.953	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3467	4923	0	3351	3539	1652	3484	3712	2894	3385	3326	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3467	4923	0	3351	3539	1652	3484	3712	2894	3385	3326	0
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)		7				87					44	
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		700			691			792			964	
Travel Time (s)		11.9			11.8			18.0			21.9	
Peak Hour Factor	0.92	0.93	0.81	0.87	0.91	0.89	0.74	0.83	0.89	0.83	0.95	0.80
Heavy Vehicles (%)	1%	1%	0%	1%	2%	1%	0%	0%	1%	0%	0%	0%
Adj. Flow (vph)	224	1191	78	1122	1290	302	191	443	1122	381	489	223
Shared Lane Traffic (%)												
Lane Group Flow (vph)	224	1269	0	1122	1290	302	191	443	1122	381	712	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		30			24			30			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.04	1.00	1.04	1.00	0.96	1.01	0.96	0.96	1.04	1.04	1.04
Turning Speed (mph)	18		10	18		10	18		10	18		10
Number of Detectors	1	1		1	1	0	1	2	1	1	2	
Detector Template												
Leading Detector (ft)	42	236		42	236	0	42	146	42	42	146	
Trailing Detector (ft)	-3	230		-3	230	0	-3	-3	-3	-3	-3	
Detector 1 Position(ft)	-3	230		-3	230	230	-3	-3	-3	-3	-3	
Detector 1 Size(ft)	45	6		45	6	6	45	45	45	45	45	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)								140			140	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	

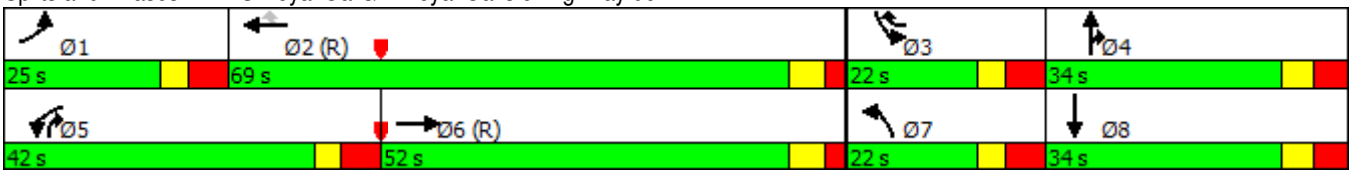


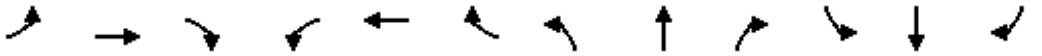
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	
Protected Phases	1	6		5	2	3	7	4	4 5	3	8	
Permitted Phases						2						
Detector Phase	1	6		5	2	3	7	4	4 5	3	8	
Switch Phase												
Minimum Initial (s)	6.0	13.0		6.0	13.0	6.0	6.0	10.0		6.0	10.0	
Minimum Split (s)	25.0	52.0		42.0	69.0	22.0	22.0	34.0		22.0	34.0	
Total Split (s)	25.0	52.0		42.0	69.0	22.0	22.0	34.0		22.0	34.0	
Total Split (%)	16.7%	34.7%		28.0%	46.0%	14.7%	14.7%	22.7%		14.7%	22.7%	
Maximum Green (s)	17.5	45.5		34.5	62.5	14.5	14.5	26.5		14.5	26.5	
Yellow Time (s)	3.0	4.0		3.0	4.0	3.0	3.0	3.5		3.0	3.5	
All-Red Time (s)	4.5	2.5		4.5	2.5	4.5	4.5	4.0		4.5	4.0	
Lost Time Adjust (s)	-2.5	-2.5		-2.5	-2.5	-2.0	-2.0	-3.0		-2.0	-3.0	
Total Lost Time (s)	5.0	4.0		5.0	4.0	5.5	5.5	4.5		5.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	6.0		3.0	6.0	3.0	3.0	4.5		3.0	4.5	
Recall Mode	None	C-Min		None	C-Min	None	None	None		None	None	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		37.0			24.0			36.0			36.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	17.3	48.0		37.0	67.7	88.2	14.9	29.5	71.0	16.5	31.1	
Actuated g/C Ratio	0.12	0.32		0.25	0.45	0.59	0.10	0.20	0.47	0.11	0.21	
v/c Ratio	0.56	0.80		1.36	0.81	0.30	0.55	0.61	0.82	1.02	0.98	
Control Delay	68.7	44.7		200.8	49.2	16.6	70.5	59.0	40.1	117.0	84.1	
Queue Delay	0.0	0.0		0.0	0.6	0.0	0.1	0.0	0.1	0.0	0.0	
Total Delay	68.7	44.7		200.8	49.8	16.6	70.7	59.0	40.3	117.0	84.1	
LOS	E	D		F	D	B	E	E	D	F	F	
Approach Delay		48.3			108.5			48.3			95.5	
Approach LOS		D			F			D			F	
90th %ile Green (s)	17.5	45.5		34.5	62.5	14.5	14.5	26.5		14.5	26.5	
90th %ile Term Code	Max	Coord		Max	Coord	Max	Max	Max		Max	Max	
70th %ile Green (s)	16.7	45.5		34.5	63.3	14.5	14.5	26.5		14.5	26.5	
70th %ile Term Code	Gap	Coord		Max	Coord	Max	Max	Max		Max	Max	
50th %ile Green (s)	15.1	45.5		34.5	64.9	14.5	13.5	26.5		14.5	27.5	
50th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
30th %ile Green (s)	13.4	45.5		34.5	66.6	14.5	12.0	26.5		14.5	29.0	
30th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
10th %ile Green (s)	11.1	45.5		34.5	68.9	14.5	9.8	26.5		14.5	31.2	
10th %ile Term Code	Gap	Coord		Max	Coord	Max	Gap	Max		Max	Hold	
Stops (vph)	191	938		759	1064	208	131	330	843	280	539	
Fuel Used(gal)	6	25		55	32	5	4	9	19	11	19	
CO Emissions (g/hr)	401	1778		3861	2216	359	253	595	1327	800	1315	
NOx Emissions (g/hr)	78	346		751	431	70	49	116	258	156	256	
VOC Emissions (g/hr)	93	412		895	514	83	59	138	308	185	305	
Dilemma Vehicles (#)	0	44		0	45	0	0	0	0	0	0	
Queue Length 50th (ft)	107	316		~759	580	139	92	210	528	~203	~352	
Queue Length 95th (ft)	155	368		m#567	m517	m125	108	246	624	#272	#505	
Internal Link Dist (ft)		620			611			712			884	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	200			285			195		450	220		
Base Capacity (vph)	462	1580		826	1598	1007	383	730	1369	372	725	
Starvation Cap Reductn	0	0		0	0	0	0	0	15	0	0	
Spillback Cap Reductn	0	0		0	84	0	10	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.48	0.80		1.36	0.85	0.30	0.51	0.61	0.83	1.02	0.98	

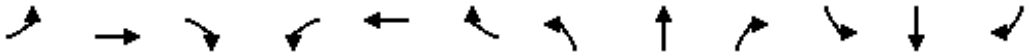
Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 133 (89%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.36			
Intersection Signal Delay: 78.8		Intersection LOS: E	
Intersection Capacity Utilization 90.0%		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.			

Splits and Phases: 4: S Royal Oaks/N Royal Oaks & Highway 96





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	2002	488	285	925	0	0	0	0	914	0	1449
Future Volume (vph)	0	2002	488	285	925	0	0	0	0	914	0	1449
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	11	12	12	12	12	12	12	11
Grade (%)		0%			0%			0%			1%	
Storage Length (ft)	0		0	420		0	0		0	350		0
Storage Lanes	0		1	0		0	0		0	2		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	1.00	0.86	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	0.88
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	6408	1583	1787	3455	0	0	0	0	3450	0	2707
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	6408	1583	1787	3455	0	0	0	0	3450	0	2707
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			400									135
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		501			556			756			888	
Travel Time (s)		8.5			9.5			20.6			24.2	
Peak Hour Factor	1.00	0.93	0.78	0.71	0.86	1.00	1.00	1.00	1.00	0.87	1.00	0.88
Heavy Vehicles (%)	2%	2%	2%	1%	1%	2%	2%	2%	2%	1%	2%	1%
Adj. Flow (vph)	0	2153	626	401	1076	0	0	0	0	1051	0	1647
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2153	626	401	1076	0	0	0	0	1051	0	1647
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.04	1.00	1.00	1.00	1.00	1.01	1.01	1.05
Turning Speed (mph)	15		12	15		9	15		9	18		12
Number of Detectors		1	0	1	1					1		1
Detector Template												
Leading Detector (ft)		300	0	42	300					42		42
Trailing Detector (ft)		294	0	-3	294					-3		-3
Detector 1 Position(ft)		294	-3	-3	294					-3		-3
Detector 1 Size(ft)		6	45	45	6					45		45
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0		0.0
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0		0.0
Turn Type		NA	Perm	Prot	NA					Prot		Prot
Protected Phases		6		5	2					4		4
Permitted Phases			6									
Detector Phase		6	6	5	2					4		4
Switch Phase												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)		25.0	25.0	5.0	25.0					15.0		15.0
Minimum Split (s)		55.0	55.0	30.0	85.0					65.0		65.0
Total Split (s)		55.0	55.0	30.0	85.0					65.0		65.0
Total Split (%)		36.7%	36.7%	20.0%	56.7%					43.3%		43.3%
Maximum Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
Yellow Time (s)		4.0	4.0	3.0	4.0					4.0		4.0
All-Red Time (s)		2.0	2.0	3.0	2.0					3.5		3.5
Lost Time Adjust (s)		-2.0	-2.0	-1.0	-2.0					-2.0		-2.0
Total Lost Time (s)		4.0	4.0	5.0	4.0					5.5		5.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		4.5	4.5	3.0	4.5					3.0		3.0
Recall Mode		C-Min	C-Min	None	C-Min					None		None
Act Effct Green (s)		51.0	51.0	25.0	81.0					59.5		59.5
Actuated g/C Ratio		0.34	0.34	0.17	0.54					0.40		0.40
v/c Ratio		0.99	0.78	1.35	0.58					0.77		1.43
Control Delay		72.0	30.6	226.4	26.5					43.9		229.0
Queue Delay		1.3	0.0	0.0	0.9					1.8		0.0
Total Delay		73.3	30.6	226.4	27.4					45.7		229.0
LOS		E	C	F	C					D		F
Approach Delay		63.7			81.4							
Approach LOS		E			F							
90th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
90th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
70th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
70th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
50th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
50th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
30th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
30th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
10th %ile Green (s)		49.0	49.0	24.0	79.0					57.5		57.5
10th %ile Term Code		Coord	Coord	Max	Coord					Max		Max
Stops (vph)		1876	474	222	498					776		998
Fuel Used(gal)		64	12	16	13					18		82
CO Emissions (g/hr)		4472	814	1146	935					1262		5755
NOx Emissions (g/hr)		870	158	223	182					246		1120
VOC Emissions (g/hr)		1036	189	266	217					292		1334
Dilemma Vehicles (#)		105	0	0	51					0		0
Queue Length 50th (ft)		637	324	~525	287					457		~1192
Queue Length 95th (ft)		m#693	m295	#521	430					515		#1297
Internal Link Dist (ft)		421			476			676			808	
Turn Bay Length (ft)				420						350		
Base Capacity (vph)		2178	802	297	1865					1368		1155
Starvation Cap Reductn		0	0	0	464					0		0
Spillback Cap Reductn		14	0	0	0					172		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.99	0.78	1.35	0.77					0.88		1.43

Intersection Summary

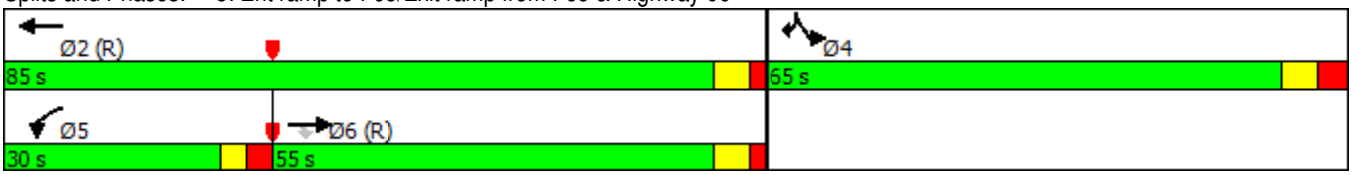
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 104 (69%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.43			
Intersection Signal Delay: 103.9		Intersection LOS: F	
Intersection Capacity Utilization 84.9%		ICU Level of Service E	
Analysis Period (min) 15			

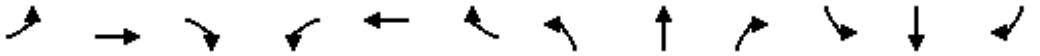
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

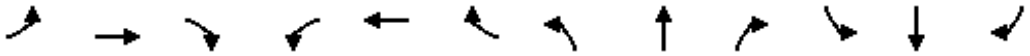
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Ent ramp to I-65/Exit ramp from I-65 & Highway 96





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	619	2297	0	0	895	998	315	0	164	0	0	0
Future Volume (vph)	619	2297	0	0	895	998	315	0	164	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12	11	12	13	12	12	12
Grade (%)		1%			0%			1%			0%	
Storage Length (ft)	0		0	0		0	270		0	0		0
Storage Lanes	2		0	0		2	2		1	0		0
Taper Length (ft)	50			50			50			50		
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	0.88	0.97	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	3270	3371	0	0	3539	2787	3302	0	1597	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	3270	3371	0	0	3539	2787	3302	0	1597	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						226			69			
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		556			1845			685			941	
Travel Time (s)		9.5			31.4			18.7			25.7	
Peak Hour Factor	0.97	0.98	1.00	0.25	0.91	0.93	0.92	1.00	0.87	1.00	1.00	1.00
Heavy Vehicles (%)	3%	3%	2%	0%	2%	2%	2%	2%	4%	2%	2%	2%
Adj. Flow (vph)	638	2344	0	0	984	1073	342	0	189	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	638	2344	0	0	984	1073	342	0	189	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			26			22			22	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.05	1.05	1.01	1.00	1.00	1.00	1.05	1.01	0.96	1.00	1.00	1.00
Turning Speed (mph)	18		9	15		10	15		15	15		9
Number of Detectors	1	1			1	0	1		1			
Detector Template												
Leading Detector (ft)	42	300			300	0	42		50			
Trailing Detector (ft)	-3	294			294	0	-3		0			
Detector 1 Position(ft)	-3	294			294	0	-3		0			
Detector 1 Size(ft)	45	6			6	50	45		50			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Queue (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Detector 1 Delay (s)	0.0	0.0			0.0	0.0	0.0		0.0			
Turn Type	Prot	NA			NA	custom	Prot		Perm			
Protected Phases	1	6			2	2 4	4					
Permitted Phases									4			
Detector Phase	1	6			2	2 4	4		4			
Switch Phase												

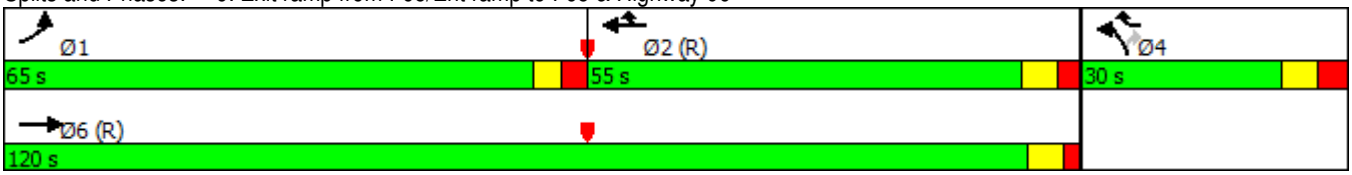


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	12.0	18.0			18.0		7.0		7.0			
Minimum Split (s)	65.0	120.0			55.0		30.0		30.0			
Total Split (s)	65.0	120.0			55.0		30.0		30.0			
Total Split (%)	43.3%	80.0%			36.7%		20.0%		20.0%			
Maximum Green (s)	59.0	114.0			48.5		22.5		22.5			
Yellow Time (s)	3.0	4.0			4.0		4.0		4.0			
All-Red Time (s)	3.0	2.0			2.5		3.5		3.5			
Lost Time Adjust (s)	0.0	0.0			0.0		0.0		0.0			
Total Lost Time (s)	6.0	6.0			6.5		7.5		7.5			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	4.0	4.5			4.5		3.0		3.0			
Recall Mode	None	C-Min			C-Min		None		None			
Act Effct Green (s)	37.2	114.6			70.9	102.3	21.9		21.9			
Actuated g/C Ratio	0.25	0.76			0.47	0.68	0.15		0.15			
v/c Ratio	0.79	0.91			0.59	0.54	0.71		0.65			
Control Delay	79.7	23.9			31.8	10.9	69.9		48.9			
Queue Delay	0.0	5.4			0.0	0.0	0.0		0.0			
Total Delay	79.7	29.3			31.8	10.9	69.9		48.9			
LOS	E	C			C	B	E		D			
Approach Delay		40.1			20.9							
Approach LOS		D			C							
90th %ile Green (s)	45.2	114.0			62.3		22.5		22.5			
90th %ile Term Code	Gap	Coord			Coord		Max		Max			
70th %ile Green (s)	40.9	114.0			66.6		22.5		22.5			
70th %ile Term Code	Gap	Coord			Coord		Max		Max			
50th %ile Green (s)	37.2	114.0			70.3		22.5		22.5			
50th %ile Term Code	Gap	Coord			Coord		Max		Max			
30th %ile Green (s)	34.1	114.0			73.4		22.5		22.5			
30th %ile Term Code	Gap	Coord			Coord		Max		Max			
10th %ile Green (s)	28.8	117.2			81.9		19.3		19.3			
10th %ile Term Code	Gap	Coord			Coord		Gap		Gap			
Stops (vph)	610	1847			646	395	295		100			
Fuel Used(gal)	18	38			23	19	7		3			
CO Emissions (g/hr)	1284	2656			1632	1299	521		208			
NOx Emissions (g/hr)	250	517			317	253	101		40			
VOC Emissions (g/hr)	298	615			378	301	121		48			
Dilemma Vehicles (#)	0	83			30	0	0		0			
Queue Length 50th (ft)	342	589			366	218	165		112			
Queue Length 95th (ft)	m344	m499			485	327	222		190			
Internal Link Dist (ft)		476			1765			605			861	
Turn Bay Length (ft)							270					
Base Capacity (vph)	1286	2575			1672	1982	495		298			
Starvation Cap Reductn	0	199			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	0.50	0.99			0.59	0.54	0.69		0.63			

Intersection Summary

Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 138 (92%), Referenced to phase 2:WBT and 6:EBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.91			
Intersection Signal Delay: 35.1		Intersection LOS: D	
Intersection Capacity Utilization 84.9%		ICU Level of Service E	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 6: Exit ramp from I-65/Ent ramp to I-65 & Highway 96



APPENDIX D
TRIP GENERATION

TRIP GENERATION CALCULATIONS – Assisted Living

The following calculations are based on the data compiled for ITE Land Use Code 254.

Average Daily Traffic

T = 2.74 (X)
T = 2.74 (**208**)
T = 570 vehicles

Enter = 0.50 (570) = 285 vehicles
Exit = 0.50 (570) = 285 vehicles

AM traffic during peak hour of adjacent street

T = 0.23 (X)
T = 0.23 (**208**)
T = 47 vehicles

Enter = 0.72 (47) = 34 vehicles
Exit = 0.28 (47) = 13 vehicles

PM traffic during peak hour of adjacent street

T = 0.37 (X)
T = 0.37 (**208**)
T = 77 vehicles

Enter = 0.39 (77) = 30 vehicles
Exit = 0.61 (77) = 47 vehicles

TRIP GENERATION CALCULATIONS – Multi-Family (South)

The following calculations are based on the data compiled for ITE Land Use Code 220.

Average Daily Traffic

T = 6.65 (X)
T = 6.65 (**98**)
T = 652 vehicle-trips

Enter = 0.50 (652) = 326 vehicles
Exit = 0.50 (652) = 326 vehicles

A.M. traffic during peak hour of adjacent street

T = 0.51 (X)
T = 0.51 (**98**)
T = 50 vehicle-trips

Enter = 0.20 (50) = 10 vehicles
Exit = 0.80 (50) = 40 vehicles

P.M. traffic during peak hour of adjacent street

T = 0.62 (X)
T = 0.62 (**98**)
T = 60 vehicle-trips

Enter = 0.65 (60) = 39 vehicles
Exit = 0.35 (60) = 21 vehicles

TRIP GENERATION CALCULATIONS – Multi-Family (North)

The following calculations are based on the data compiled for ITE Land Use Code 220.

Average Daily Traffic

T = 6.65 (X)
T = 6.65 (**204**)
T = 1,356 vehicle-trips

Enter = 0.50 (1,356) = 678 vehicles
Exit = 0.50 (1,356) = 678 vehicles

A.M. traffic during peak hour of adjacent street

T = 0.51 (X)
T = 0.51 (**204**)
T = 104 vehicle-trips

Enter = 0.20 (104) = 21 vehicles
Exit = 0.80 (104) = 83 vehicles

P.M. traffic during peak hour of adjacent street

T = 0.62 (X)
T = 0.62 (**204**)
T = 126 vehicle-trips

Enter = 0.65 (126) = 82 vehicles
Exit = 0.35 (126) = 44 vehicles

TRIP GENERATION CALCULATIONS – Specialty Retail

The following calculations are based on the data compiled for ITE Land Use Code 826.

Average Daily Traffic

T = 44.32 (X)
T = 44.32 (**15.000**)
T = 664 vehicle-trips

Enter = 0.50 (664) = 332 vehicles
Exit = 0.50 (664) = 332 vehicles

A.M. traffic during peak hour of adjacent street

T = 6.84 (X)
T = 6.84 (**15.000**)
T = 102 vehicle-trips

Enter = 0.48 (102) = 49 vehicles
Exit = 0.52 (102) = 53 vehicles

P.M. traffic during peak hour of adjacent street

T = 2.71 (X)
T = 2.71 (**15.000**)
T = 41 vehicle-trips

Enter = 0.44 (41) = 18 vehicles
Exit = 0.56 (41) = 23 vehicles