



SAIN
ASSOCIATES

March 6, 2020
St. Clair County Industrial Park
Moody, AL
Traffic Impact Analysis

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SAIN PROJECT #:

190119



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- A. Proposed Site Development Plan
- B. Raw Traffic Count Data
- C. Description of Levels of Service
- D. Background Conditions Capacity Analysis
- E. Future Conditions Capacity Analysis
- F. Turn Lane Warrant Evaluations

Other Information

Sources of information other than Sain Associates used in preparation of this traffic impact analysis include:

- Alabama Department of Transportation (ALDOT)
- Transportation Research Board (TRB)
- Traffic Data, LLC
- Google Earth
- Capstone Real Estate Investments

Executive Summary

Sain Associates examined the traffic impacts associated with a proposed industrial park in Moody, Alabama. The purpose of this study is to analyze the traffic conditions in the vicinity of the proposed development, determine any impact that the proposed development may have on the existing traffic network, and recommend any improvements that may be necessary to mitigate any impacts.

The proposed development is located on the northwestern side of Kelly Creek Road, approximately 1.25 miles north of the I-20/Kelly Creek Road interchange. The site is currently a wooded area. According to the site plan, the proposed facility will be located on a 172 acre site and will have one access on Kelly Creek Road.

Based on our observations and analysis documented in this report, Sain Associates makes the following recommendations/conclusions:

- The study intersections are projected to continue to operate with acceptable LOS during the future peak periods, except for the Park Avenue approaches to Kelly Creek Road.
- Construct a right turn lane on the southbound Kelly Creek Road approach to the Proposed Driveway. The turn lane should be at least 275 feet in length, with 175 feet of storage length and 100 feet of taper length.
- Construct a left turn lane on the northbound Kelly Creek Road approach to the Proposed Driveway. The turn lane should be at least 275 feet in length, with 175 feet of storage length and 100 feet of taper length.

Purpose

Sain Associates examined the traffic impacts associated with a proposed industrial park development in Moody, Alabama. The purpose of this study is to analyze the traffic conditions in the vicinity of the proposed development, determine any impact that the proposed development may have on the existing traffic network, and recommend any improvements that may be necessary to mitigate any impacts.

Existing Conditions

Site Description

The proposed development site is located on the northwestern side of Kelly Creek Road, approximately 1.25 miles north of the I-20/Kelly Creek Road interchange. The site is currently a wooded land use. According to the site plan, the proposed facility will be located on a 172 acre site and will have one full-directional access on Kelly Creek Road. We assumed approximately 142 acres were developable.

Figure 1 shows the site location as it relates to the surrounding roadway network. The full site plan is included in Appendix A.

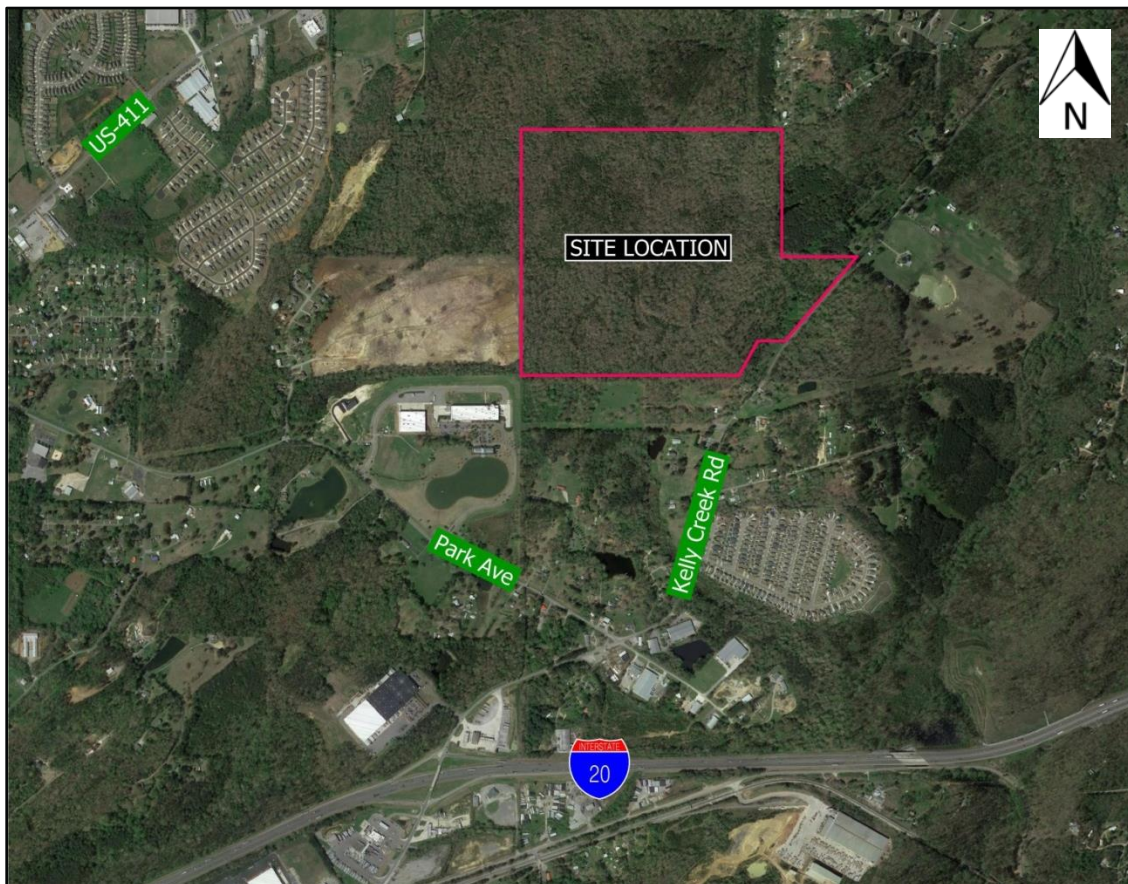


Figure 1: Site Location

Analysis Boundaries

Our analysis includes a review of traffic operations at the following locations:

- Kelly Creek Road at Proposed Driveway
- Kelly Creek Road at Park Avenue
- Kelly Creek Road at I-20 Westbound Ramp
- Kelly Creek Road at I-20 Eastbound Ramp

Roadway Characteristics

Roadways within the study boundary exhibit the following characteristics:

- Kelly Creek Road is a two-lane, undivided, north-south roadway that is classified as a major collector. It has a posted speed limit ranging between 30-35 miles per hour within the study area, with the 35 miles per hour posted speed limit at the site location.
- Park Avenue is a two-lane, east-west roadway that is classified as a major collector. It has a posted speed limit of 45 miles per hour.
- I-20 is a six-lane, east-west roadway that is classified as an interstate. It has a posted speed limit of 70 miles per hour.

Site Accessibility

Currently, there is one unpaved access connection to the proposed industrial park site on Kelly Creek Road. It is proposed that there will be one full access connection to the site under post-development conditions as well.

Existing Traffic Volumes

Sain Associates, Inc. performed traffic data collection through sub-consultant Traffic Data, LLC. The turning movement count data was collected at the study intersections from 7:00 – 9:00 AM and from 4:00 – 6:00 PM on Wednesday, January 8, 2020. The AM and PM peak hours of traffic flow during these study periods were determined to be 7:00 – 8:00 AM and 4:30 – 5:30 PM.

Additionally, 24-hour bi-directional machine counts were collected on Kelly Creek Road, in front of the proposed access connection. These counts were also collected on Wednesday, January 8, 2019 and included vehicle, speed, and classification counts.

The existing 24-hour volumes are summarized in Table 1, the existing peak hour traffic volumes are illustrated in Figure 2, and the raw traffic count reports are included as Appendix B.

Table 1: Existing 24-hour Volumes

Location	Northbound	Southbound	Total
Kelly Creek Rd, between Park Ave and Kerr Rd	2,493	2,552	5,045

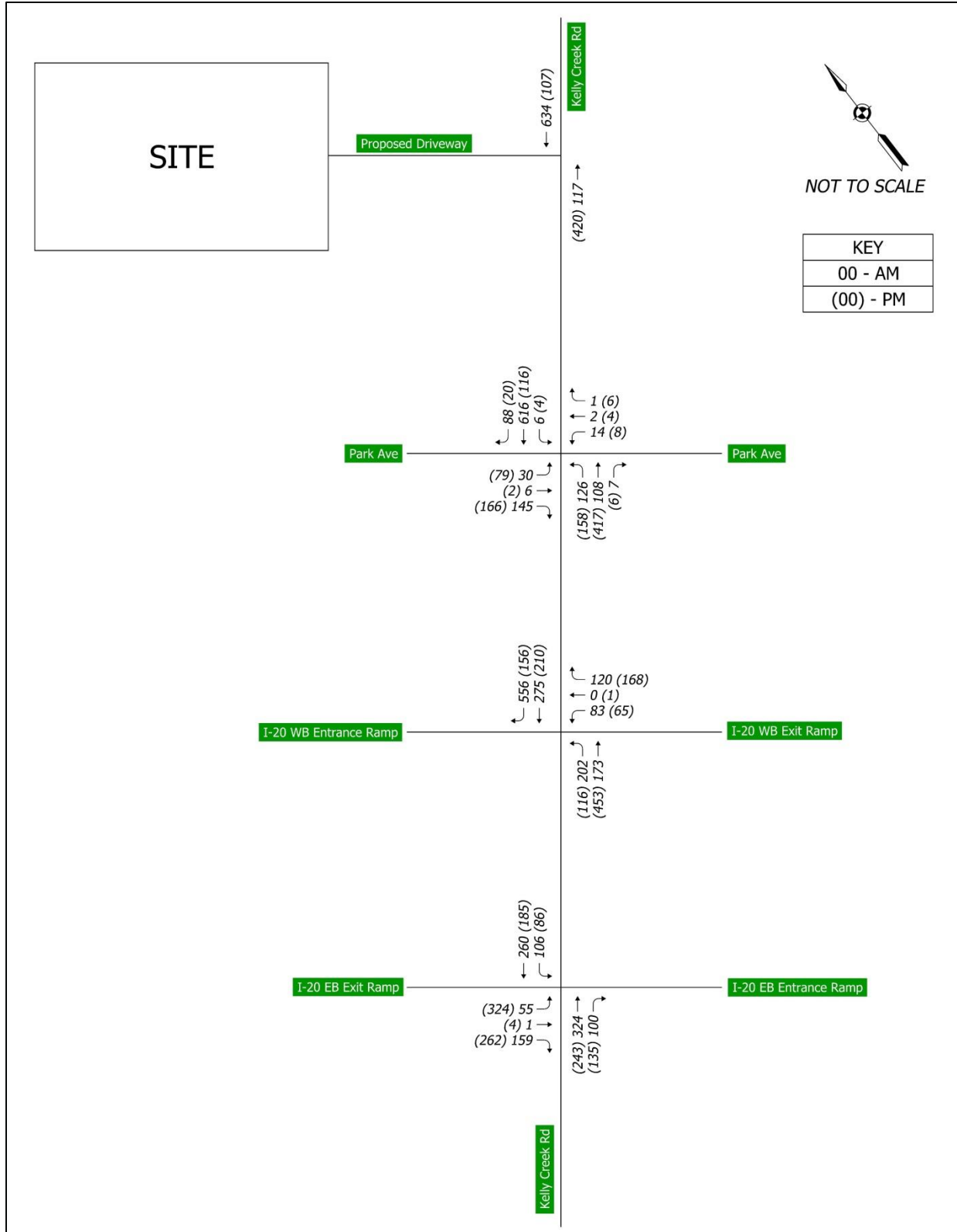


Figure 2: Existing Traffic Volumes

Capacity Analysis and Levels of Service

Using the methods described in the *Highway Capacity Manual*, published by the Transportation Research Board, we analyzed the existing traffic conditions within the study area.

According to this method of analysis, traffic capacities are expressed as levels of service (LOS) ranging from "A" to "F." A detailed description of each LOS designation is included in Appendix C. Generally, LOS "C" is considered desirable, while LOS "D" is considered acceptable during peak hours of traffic flow.

There is a planned improvement project at the interchange of Kelly Creek Road and I-20 that will widen both exit ramps to two lanes. Because this interchange project is expected to be constructed prior to the Industrial Park becoming operational, the future geometry was considered the "background" condition for this analysis.

Full printouts of the background conditions capacity analysis are provided in Appendix D, with the results summarized in Table 2.

Table 2: Background Levels of Service

Intersection	Approach		Level of Service	
			AM Peak	PM Peak
Kelly Creek Rd @ Park Ave	EB	Park Ave	D	C
	WB	Park Ave	F	C
	NB	Kelly Creek Rd	A	A
	SB	Kelly Creek Rd	A	A
Kelly Creek Rd @ I-20 WB Ramps	WB	I-20 WB Exit Ramp	C	C
	NB	Kelly Creek Rd	A	A
	SB	Kelly Creek Rd	A	A
Kelly Creek Rd @ I-20 EB Ramps	EB	I-20 EB Exit Ramp	B	C
	NB	Kelly Creek Rd	C	C
	SB	Kelly Creek Rd	C	C
	Total Intersection LOS		C	C

The study intersections are projected to operate with acceptable LOS for the background conditions, except for the westbound Park Avenue approach during the AM peak hour. It is not uncommon for a side-street stop controlled intersection to have an unacceptable LOS on the side-street approaches when volumes on a two-lane road are high.

Future Traffic Operations Analysis

Trip Generation

Sain Associates, Inc. estimated the number of vehicle trips to be generated by the proposed development using traffic counts collected at the existing Jefferson Metropolitan Industrial Park in McCalla, Alabama. It was assumed that there would be 10,000 gross square feet per developable acre. Traffic generated by a proposed development is often classified in two ways: new trips or pass-by trips. New trips are defined as vehicles whose primary destination is the proposed development; these trips are assumed to return to the same direction in which they arrived. Pass-by trips are defined as vehicles that stop into a development while headed to another destination. For the proposed industrial park facility there were assumed to be no pass-by trips during the peak study hours. A summary of the trip generation estimate is shown in Table 3.

Table 3: Trip Generation

Peak Period	IN	OUT	TOTAL
AM	127	72	199
PM	108	176	284

Trip Distribution

The directional distribution of the new trips expected to be generated by the proposed development was estimated based on the population distribution within a 15-mile radius of the proposed industrial park.

The directional distribution percentages of site-generated trips are illustrated in Figure 3.

Trip Assignment

Using the aforementioned patterns of distribution, Sain Associates assigned the projected new trips to the site's proposed access system. The assigned volumes were then added to the background traffic volumes in order to produce future traffic volumes. The assigned traffic is illustrated in the following figures:

- Figure 4 – New Trips
- Figure 5 – Future Traffic Volumes

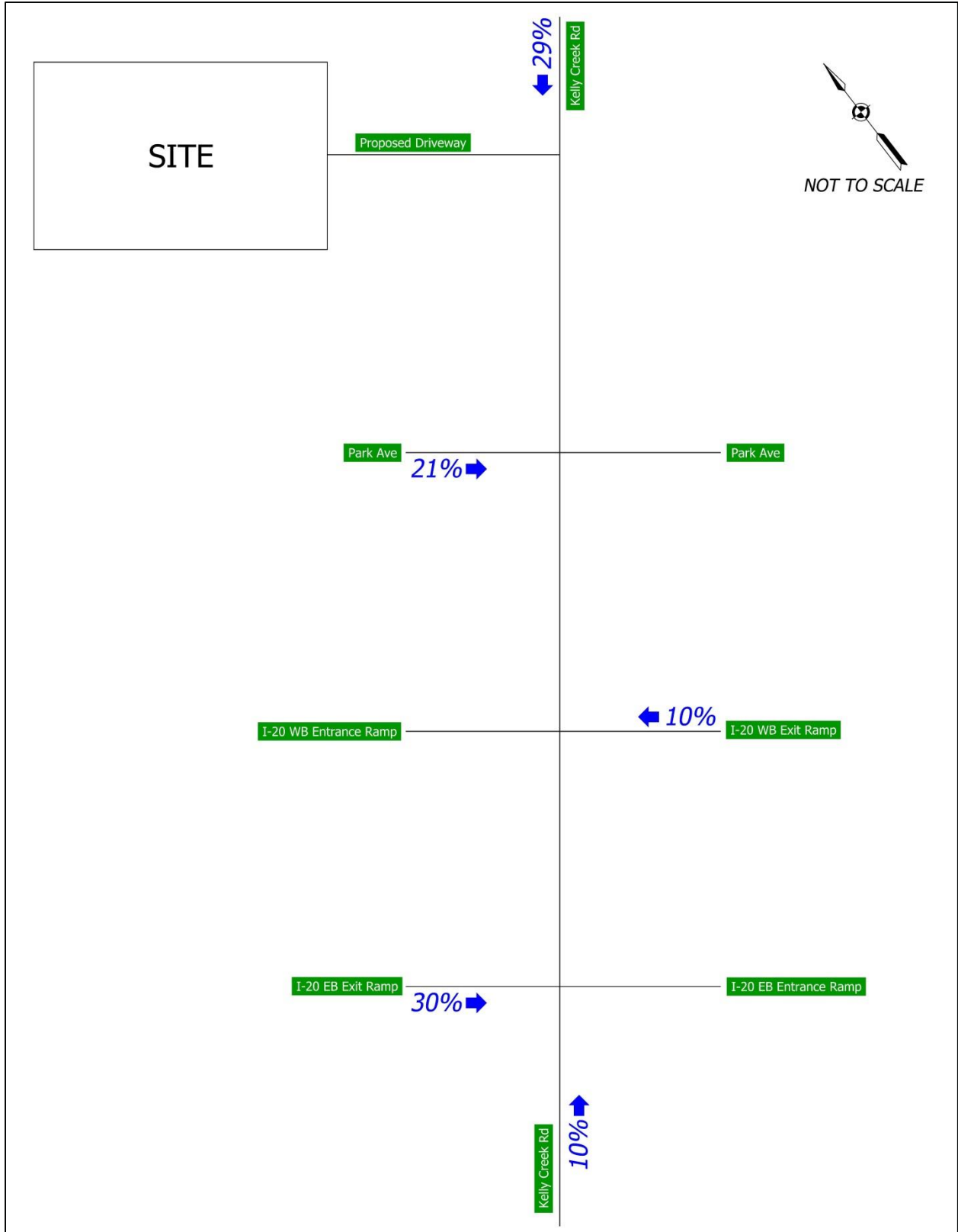


Figure 3: New Trip Distribution

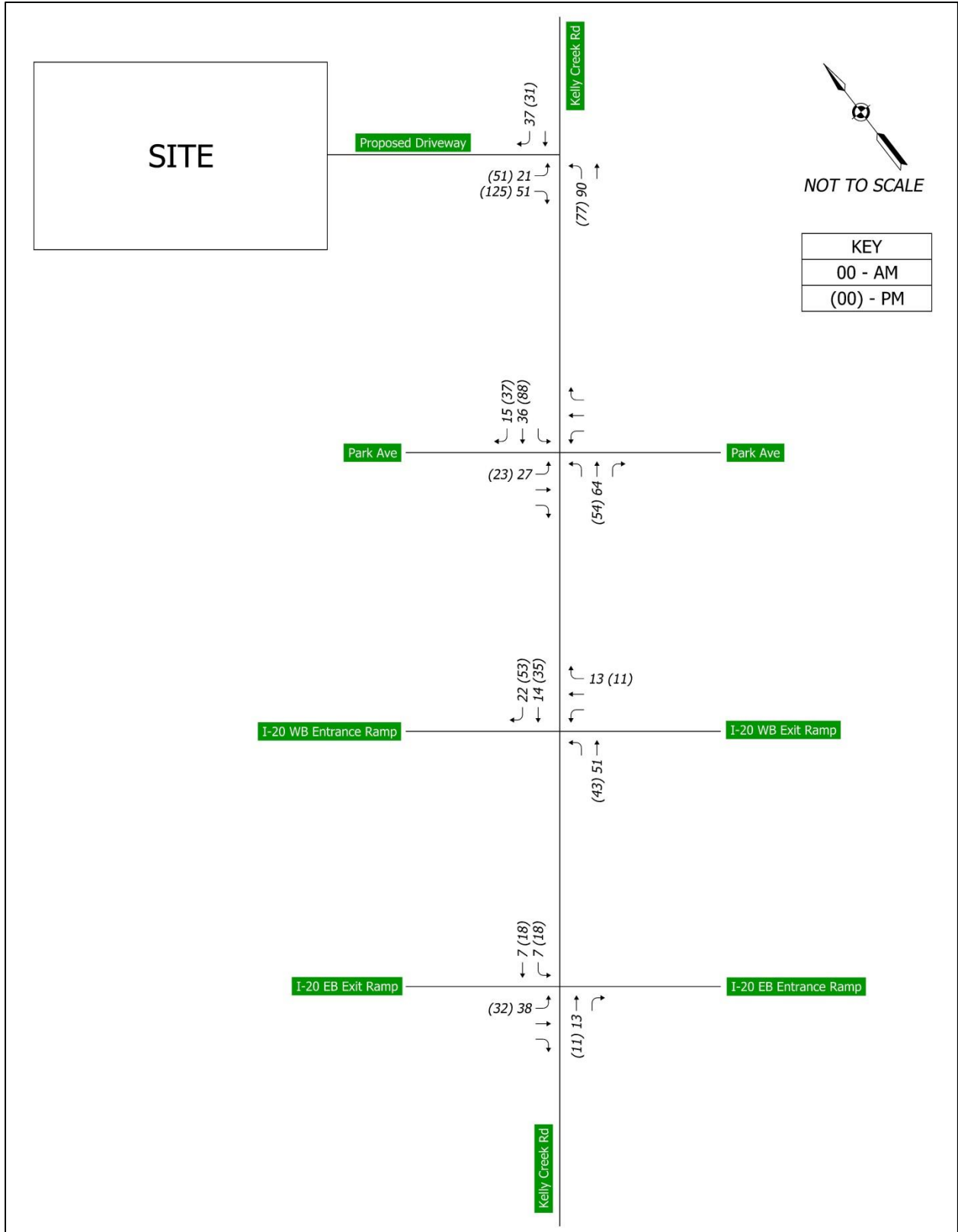


Figure 4: New Trips

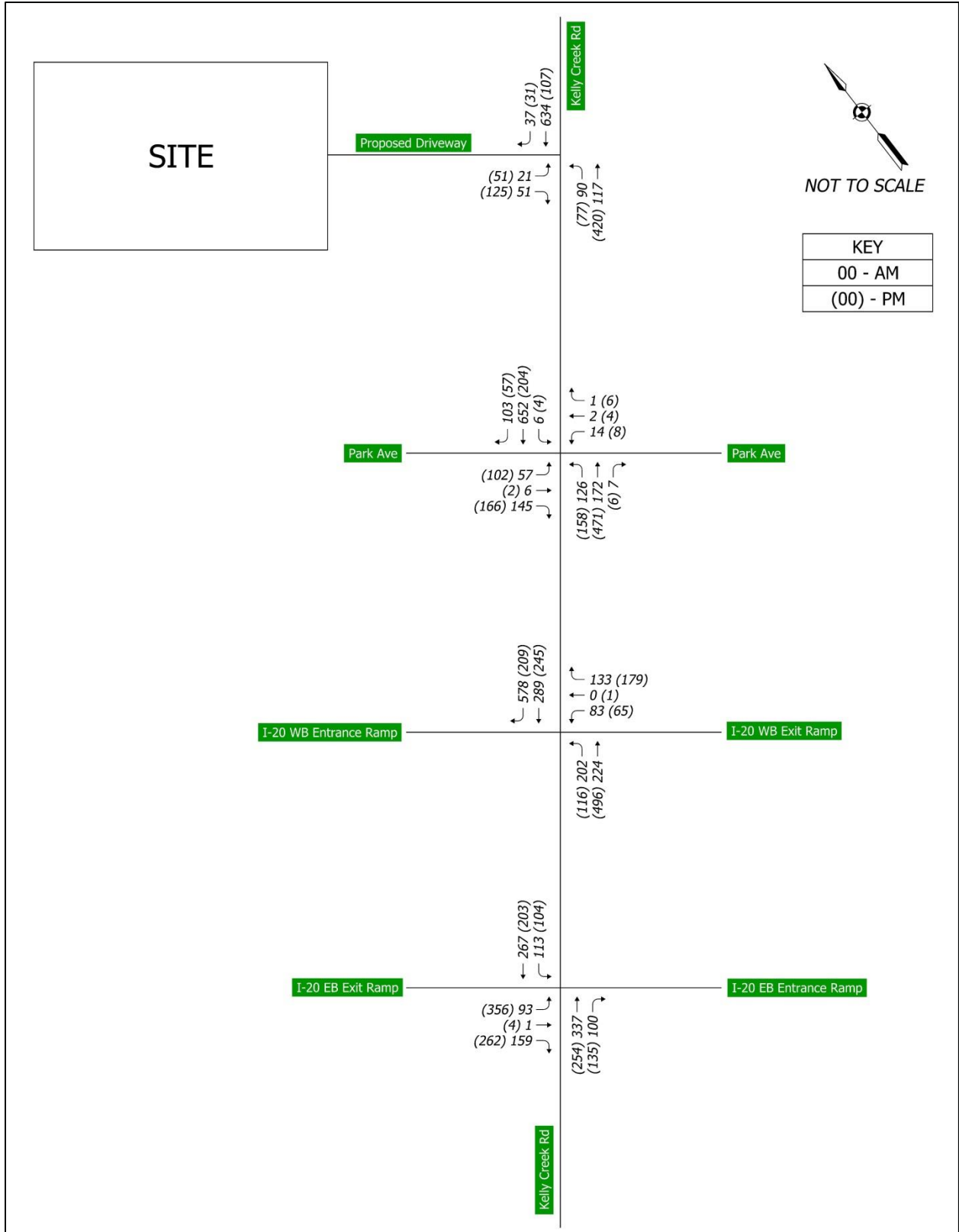


Figure 5: Future Traffic Volumes

Capacity Analysis & Levels of Service

Using the *Highway Capacity Manual* methods previously described for background capacity analysis, future traffic conditions within the study area were analyzed. Capacity analysis of future traffic conditions include our recommended geometric and traffic control improvements, which will be described in detail later in this report.

Full printouts of the future conditions capacity analysis are provided in Appendix E, with the LOS results summarized in Table 4.

Table 4: Future Levels of Service

Intersection	Approach		Level of Service	
			AM Peak	PM Peak
Kelly Creek Rd @ Proposed Driveway	EB	Prop. Driveway	C	B
	NB	Kelly Creek Rd	A	A
	SB	Kelly Creek Rd	A	A
Kelly Creek Rd @ Park Ave	EB	Park Ave	E	E
	WB	Park Ave	F	D
	NB	Kelly Creek Rd	A	A
	SB	Kelly Creek Rd	A	A
Kelly Creek Rd @ I-20 WB Ramps	WB	I-20 WB Exit Ramp	C	C
	NB	Kelly Creek Rd	A	A
	SB	Kelly Creek Rd	A	A
Kelly Creek Rd @ I-20 EB Ramps	EB	I-20 EB Exit Ramp	B	D
	NB	Kelly Creek Rd	C	C
	SB	Kelly Creek Rd	D	C
	Total Intersection LOS		C	C

According to our capacity analysis, the study intersections are projected to continue to operate with acceptable LOS during the future AM peak period, except for the eastbound and westbound approaches at the intersection of Kelly Creek Road and Park Avenue. During the PM peak period, all of the study intersections are projected to continue to operate with acceptable LOS with the exception of the eastbound Park Avenue approach to the Kelly Creek Road intersection. As previously stated, it is not uncommon for stop-controlled side street approaches to have unacceptable LOS during peak periods of traffic. It should be noted that the westbound Park Avenue approach only had 17 vehicles during the AM peak hour.

Turn Lane Warrants

Utilizing the information contained in NCHRP Report 457, turn lane warrant analyses were performed using the projected future volumes at the Proposed Driveway. Although the posted speed limit on this segment of Kelly Creek Road is 35 miles per hour, the collected speed data showed an 85th percentile speed of 48 mph. For the purposes of this turn lane warrant analyses, a 45 mph speed was used. The inputs and results from those warrants are summarized in Table 5 and Table 6. Full printouts of the turn lane warrant analysis are provided in Appendix F.

Table 5: Right Turn Lane Warrant Evaluation

Approach	Peak Period	Major Road Volume (veh/h)	Turn Volume (veh/h)	Turn Lane Warranted?
SB Kelly Creek Rd @ Prop. Driveway	AM	671	37	YES
	PM	138	31	NO

Table 6: Left Turn Lane Warrant Evaluation

Approach	Peak Period	Major Road Volume (veh/h)	Turn Volume (veh/h)	Opposing Volume (veh/h)	Turn Lane Warranted?
NB Kelly Creek Rd @ Prop. Driveway	AM	207	90	671	YES
	PM	497	77	138	YES

Based on the projected future conditions, a right turn lane is warranted on the southbound approach, and a left turn lane is warranted on the northbound approach of Kelly Creek Road at the Proposed Driveway.

Recommendations

Based on our observations and analysis documented in this report, Sain Associates makes the following recommendations/conclusions:

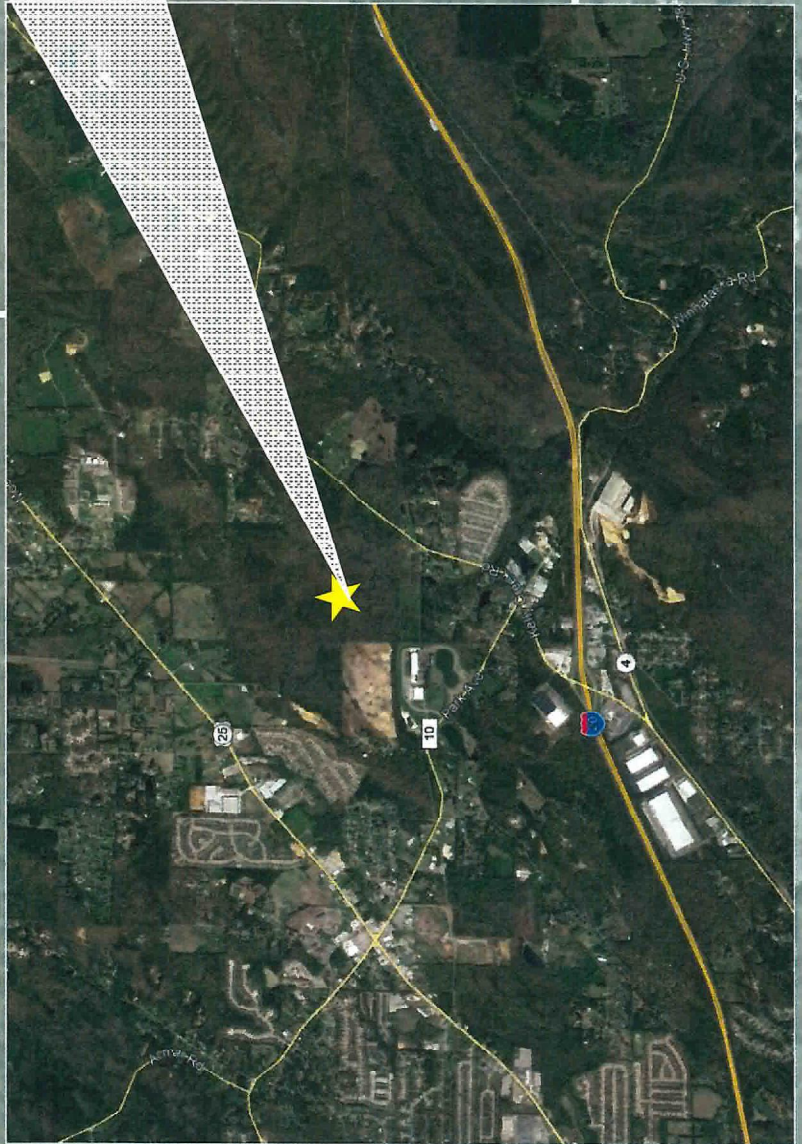
- The study intersections are projected to continue to operate with acceptable LOS during the future peak periods, except for the Park Avenue approaches to Kelly Creek Road.
- Construct a right turn lane on the southbound Kelly Creek Road approach to the Proposed Driveway. The turn lane should be at least 275 feet in length, with 175 feet of storage length and 100 feet of taper length.
- Construct a left turn lane on the northbound Kelly Creek Road approach to the Proposed Driveway. The turn lane should be at least 275 feet in length, with 175 feet of storage length and 100 feet of taper length.

APPENDIX A
Proposed Site Development Plan

**Kelly Creek Road
Moody, AL**



Graham & Co



APPENDIX B
Raw Traffic Count Data

TRAFFIC DATA, LLC

1409 Turnham Lane
Birmingham, AL 35216
205-824-0125

Moody, AL

File Name : moody03
Site Code : 00000000
Start Date : 01/08/2020
Page No : 1

Groups Printed- Unshifted

Start Time	KELLY CREEK PKWY Southbound		KELLY CREEK PKWY Northbound		I-20 EB EXIT RAMP Eastbound			Int. Total
	Left	Thru	Thru	Right	Left	Thru	Right	
07:00 AM	28	60	90	29	10	0	45	262
07:15 AM	29	71	95	20	16	1	32	264
07:30 AM	31	63	87	25	14	0	39	259
07:45 AM	18	66	52	26	15	0	43	220
Total	106	260	324	100	55	1	159	1005
08:00 AM	6	61	74	27	18	0	30	216
08:15 AM	20	39	47	21	15	0	30	172
09:30 AM	21	43	60	23	13	0	33	193
08:45 AM	14	38	54	25	14	0	33	178
Total	61	181	235	96	60	0	126	759
04:00 PM	19	39	61	41	60	0	59	279
04:15 PM	30	51	67	28	71	0	74	321
04:30 PM	20	45	61	33	68	2	73	302
04:45 PM	17	52	61	41	81	1	70	323
Total	86	187	250	143	280	3	276	1225
05:00 PM	22	43	63	25	91	1	57	302
05:15 PM	27	45	58	36	84	0	62	312
05:30 PM	15	49	83	19	78	1	56	301
05:45 PM	17	43	70	28	81	1	70	310
Total	81	180	274	108	334	3	245	1225
Grand Total	334	808	1083	447	729	7	806	4214
Apprch %	29.2	70.8	70.8	29.2	47.3	0.5	52.3	
Total %	7.9	19.2	25.7	10.6	17.3	0.2	19.1	

Start Time	KELLY CREEK PKWY Southbound			KELLY CREEK PKWY Northbound			I-20 EB EXIT RAMP Eastbound				Int. Total	
	Left	Thru	App. Total	Thru	Right	App. Total	Left	Thru	Right	App. Total		
Peak Hour From 07:00 AM to 08:45 AM - Peak 1 of 1												
Intersection	07:00 AM											
Volume	106	260	366	0	324	100	424	55	1	159	215	1005
Percent	29.0	71.0		0	76.4	23.6		25.6	0.5	74.0		
07:15 Volume	29	71	100	0	95	20	115	16	1	32	49	264
Peak Factor												0.952
High Int.	07:15 AM			6:45:00 AM	07:00 AM			07:45 AM				
Volume	29	71	100	0	90	29	119	15	0	43	58	
Peak Factor			0.915				0.891				0.927	
Peak Hour From 07:00 AM to 08:45 AM - Peak 1 of 1												
By Approach	07:00 AM			07:00 AM	07:00 AM			07:00 AM				
Volume	106	260	366	0	324	100	424	55	1	159	215	
Percent	29.0	71.0		-	76.4	23.6		25.6	0.5	74.0		
High Int.	07:15 AM			-	07:00 AM			07:45 AM				
Volume	29	71	100	-	90	29	119	15	0	43	58	
Peak Factor			0.915	-			0.891				0.927	

TRAFFIC DATA, LLC

1409 Turnham Lane
Birmingham, AL 35216
205-824-0125

File Name : moody03
Site Code : 00000000
Start Date : 01/08/2020
Page No : 2

Start Time	KELLY CREEK PKWY Southbound			App. Total	KELLY CREEK PKWY Northbound			I-20 EB EXIT RAMP Eastbound				Int. Total
	Left	Thru	App. Total		Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour From 04:00 PM to 05:45 PM - Peak 1 of 1												
Intersection	04:15 PM											
Volume	89	191	280	0	252	127	379	311	4	274	589	1248
Percent	31.8	68.2			66.5	33.5		52.8	0.7	46.5		
04:45 Volume	17	52	69	0	61	41	102	81	1	70	152	323
Peak Factor												0.966
High Int.	04:15 PM				04:45 PM			04:45 PM				
Volume	30	51	81	0	61	41	102	81	1	70	152	
Peak Factor			0.864				0.929				0.969	
Peak Hour From 04:00 PM to 05:45 PM - Peak 1 of 1												
By Approach	04:15 PM			04:00 PM	04:00 PM			04:30 PM				
Volume	89	191	280	0	250	143	393	324	4	262	590	
Percent	31.8	68.2			63.6	36.4		54.9	0.7	44.4		
High Int.	04:15 PM			-	04:00 PM			04:45 PM				
Volume	30	51	81	-	61	41	102	81	1	70	152	
Peak Factor			0.864	-			0.963				0.970	

TRAFFIC DATA, LLC

1409 Turnham Lane
Birmingham, AL 35216
205-824-0125

Moody, AL

File Name : moody02
Site Code : 00000000
Start Date : 01/08/2020
Page No : 1

Groups Printed- Unshifted

Start Time	KELLY CREEK PKWY Southbound		I-20 WB EXIT RAMP Westbound			KELLY CREEK PKWY Northbound			Int. Total
	Thru	Right	Left	Thru	Right	Left	Thru		
07:00 AM	62	119	19	0	31	62	35	328	
07:15 AM	84	155	19	0	28	56	53	395	
07:30 AM	70	158	22	0	34	51	51	386	
07:45 AM	59	124	23	0	27	33	34	300	
Total	275	556	83	0	120	202	173	1409	
08:00 AM	44	72	21	0	25	36	55	253	
08:15 AM	49	46	20	0	22	33	26	196	
08:30 AM	38	41	22	0	30	37	40	208	
08:45 AM	35	32	17	1	16	32	37	170	
Total	166	191	80	1	93	138	158	827	
04:00 PM	44	18	19	0	26	19	99	225	
04:15 PM	70	28	12	0	33	37	97	277	
04:30 PM	48	41	19	0	45	23	107	283	
04:45 PM	54	34	18	1	46	29	108	290	
Total	216	121	68	1	150	108	411	1075	
05:00 PM	49	48	11	0	24	37	121	290	
05:15 PM	59	33	17	0	53	27	117	306	
05:30 PM	50	27	15	0	31	26	129	278	
05:45 PM	41	31	17	0	25	29	129	272	
Total	199	139	60	0	133	119	496	1146	
Grand Total	856	1007	291	2	496	567	1238	4457	
Apprch %	45.9	54.1	36.9	0.3	62.9	31.4	68.6		
Total %	19.2	22.6	6.5	0.0	11.1	12.7	27.8		

Start Time	KELLY CREEK PKWY Southbound			I-20 WB EXIT RAMP Westbound				KELLY CREEK PKWY Northbound			App. Total	Int. Total
	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	App. Total		
Peak Hour From 07:00 AM to 08:45 AM - Peak 1 of 1												
Intersection	07:00 AM											
Volume	275	556	831	83	0	120	203	202	173	375	0	1409
Percent	33.1	66.9		40.9	0.0	59.1		53.9	46.1			
07:15 Volume	84	155	239	19	0	28	47	56	53	109	0	395
Peak Factor												0.892
High Int.	07:15 AM			07:30 AM				07:15 AM			6:45:00 AM	
Volume	84	155	239	22	0	34	56	56	53	109		
Peak Factor			0.869				0.906			0.860		
Peak Hour From 07:00 AM to 08:45 AM - Peak 1 of 1												
By Approach	07:00 AM			07:00 AM				07:00 AM			07:00 AM	
Volume	275	556	831	83	0	120	203	202	173	375	0	
Percent	33.1	66.9		40.9	0.0	59.1		53.9	46.1			
High Int.	07:15 AM			07:30 AM				07:15 AM			-	
Volume	84	155	239	22	0	34	56	56	53	109	-	
Peak Factor			0.869				0.906			0.860	-	

TRAFFIC DATA, LLC

1409 Turnham Lane
Birmingham, AL 35216
205-824-0125

File Name : moody02
Site Code : 00000000
Start Date : 01/08/2020
Page No : 2

Start Time	KELLY CREEK PKWY Southbound			I-20 WB EXIT RAMP Westbound				KELLY CREEK PKWY Northbound			App. Total	Int. Total
	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	App. Total		
Peak Hour From 04:00 PM to 05:45 PM - Peak 1 of 1												
Intersection	04:30 PM							05:00 PM				
Volume	210	156	366	65	1	168	234	116	453	569	0	1169
Percent	57.4	42.6		27.8	0.4	71.8		20.4	79.6			
05:15 Volume	59	33	92	17	0	53	70	27	117	144	0	306
Peak Factor												0.955
High Int.	05:00 PM			05:15 PM				05:00 PM				
Volume	49	48	97	17	0	53	70	37	121	158		
Peak Factor	0.943							0.836			0.900	
Peak Hour From 04:00 PM to 05:45 PM - Peak 1 of 1												
By Approach	04:15 PM			04:30 PM				05:00 PM			04:00 PM	
Volume	221	151	372	65	1	168	234	119	496	615	0	
Percent	59.4	40.6		27.8	0.4	71.8		19.3	80.7			
High Int.	04:15 PM			05:15 PM				05:00 PM			-	
Volume	70	28	98	17	0	53	70	37	121	158	-	-
Peak Factor	0.949							0.836			0.973	-

TRAFFIC DATA, LLC

1409 Turnham Lane
Birmingham, AL 35216
205-824-0125

Moody, AL

File Name : moody01
Site Code : 00000000
Start Date : 01/08/2020
Page No : 1

Groups Printed- Unshifted

Start Time	KELLY CREEK PKWY Southbound			CR 10 Westbound			KELLY CREEK PKWY Northbound				PARK AVE Eastbound				Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	L Int	Left	Thru	Right	R Int	
07:00 AM	3	154	11	8	1	0	35	25	1	4	8	0	28	0	278
07:15 AM	2	166	24	2	0	0	29	41	2	0	13	3	58	1	341
07:30 AM	1	165	30	1	0	0	33	23	3	0	8	0	32	0	296
07:45 AM	0	131	23	3	1	1	24	19	1	1	1	3	26	0	234
Total	6	616	88	14	2	1	121	108	7	5	30	6	144	1	1149
08:00 AM	0	65	15	1	0	0	33	23	2	0	4	1	32	0	176
08:15 AM	1	54	9	2	0	0	24	14	1	0	4	0	17	1	127
09:30 AM	1	43	4	1	1	1	31	22	0	0	4	0	17	0	125
08:45 AM	0	35	7	0	4	1	20	24	2	1	4	0	9	0	107
Total	2	197	35	4	5	2	108	83	5	1	16	1	75	1	535
04:00 PM	0	21	9	3	2	2	38	92	0	1	20	0	38	0	226
04:15 PM	0	29	5	3	0	3	33	68	1	0	15	0	34	0	191
04:30 PM	0	31	3	4	1	4	36	103	1	3	16	0	42	0	244
04:45 PM	0	28	2	1	0	1	36	93	1	3	22	0	44	0	231
Total	0	109	19	11	3	10	143	356	3	7	73	0	158	0	892
05:00 PM	3	28	11	2	2	1	35	106	2	2	13	0	39	0	244
05:15 PM	1	29	4	1	1	0	41	115	2	2	28	2	41	0	267
05:30 PM	0	25	8	2	0	0	35	116	2	1	30	0	34	0	253
05:45 PM	0	23	9	2	0	0	41	105	0	0	16	1	42	0	239
Total	4	105	32	7	3	1	152	442	6	5	87	3	156	0	1003
Grand Total	12	1027	174	36	13	14	524	989	21	18	206	10	533	2	3579
Apprch %	1.0	84.7	14.3	57.1	20.6	22.2	33.8	63.7	1.4	1.2	27.4	1.3	71.0	0.3	
Total %	0.3	28.7	4.9	1.0	0.4	0.4	14.6	27.6	0.6	0.5	5.8	0.3	14.9	0.1	

Start Time	KELLY CREEK PKWY Southbound				CR 10 Westbound				KELLY CREEK PKWY Northbound					PARK AVE Eastbound					Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	L Int	App. Total	Left	Thru	Right	R Int	App. Total	

Peak Hour From 07:00 AM to 08:45 AM - Peak 1 of 1

Intersection																			
07:00 AM	07:00 AM				07:00 AM				07:15 AM					07:15 AM					
Volume	6	616	88	710	14	2	1	17	121	108	7	5	241	30	6	144	1	181	1149
Percent	0.8	86.8	12.4		82.4	11.8	5.9		50.2	44.8	2.9	2.1		16.6	3.3	79.6	0.6		0.842
07:15 AM	07:30 AM				07:00 AM				07:15 AM					07:15 AM					
Volume	2	166	24	192	8	1	0	9	29	41	2	0	72	13	3	58	1	75	341
Peak Factor	0.906				0.472				0.837					0.603					

Peak Hour From 07:00 AM to 08:45 AM - Peak 1 of 1

By Approach																			
07:00 AM	07:00 AM				07:00 AM				07:00 AM					07:15 AM					
Volume	6	616	88	710	14	2	1	17	121	108	7	5	241	26	7	148	1	182	
Percent	0.8	86.8	12.4		82.4	11.8	5.9		50.2	44.8	2.9	2.1		14.3	3.8	81.3	0.5		
07:30 AM	07:00 AM				07:15 AM				07:15 AM					07:15 AM					
Volume	1	165	30	196	8	1	0	9	29	41	2	0	72	13	3	58	1	75	
Peak Factor	0.906				0.472				0.837					0.607					

TRAFFIC DATA, LLC

1409 Turnham Lane
Birmingham, AL 35216
205-824-0125

File Name : moody01
Site Code : 00000000
Start Date : 01/08/2020
Page No : 2

Start Time	KELLY CREEK PKWY Southbound				CR 10 Westbound				KELLY CREEK PKWY Northbound					PARK AVE Eastbound					Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	L Int	App. Total	Left	Thru	Right	R Int	App. Total	

Peak Hour From 04:00 PM to 05:45 PM - Peak 1 of 1

Intersection	05:00 PM				05:00 PM				05:15 PM					05:15 PM					
Volume	4	105	32	141	7	3	1	11	152	442	6	5	605	87	3	156	0	246	1003
Percent	2.8	74.5	22.7		63.6	27.3	9.1		25.1	73.1	1.0	0.8		35.4	1.2	63.4	0.0		
05:15 Volume	1	29	4	34	1	1	0	2	41	115	2	2	160	28	2	41	0	71	267
Peak Factor	0.839				0.550				0.945					0.866					0.939
High Int. Volume	3	28	11	42	2	2	1	5	41	115	2	2	160	28	2	41	0	71	
Peak Factor	0.839				0.550				0.945					0.866					

Peak Hour From 04:00 PM to 05:45 PM - Peak 1 of 1

By Approach	05:00 PM				04:00 PM				05:00 PM					04:45 PM					
Volume	4	105	32	141	11	3	10	24	152	442	6	5	605	93	2	158	0	253	
Percent	2.8	74.5	22.7		45.8	12.5	41.7		25.1	73.1	1.0	0.8		36.8	0.8	62.5	0.0		
High Int. Volume	3	28	11	42	4	1	4	9	41	115	2	2	160	28	2	41	0	71	
Peak Factor	0.839				0.667				0.945					0.891					

TRAFFIC DATA, LLC
1409 Turnham Lane, Birmingham, AL 35216
205-824-0125

Location: KELLY CREEK PKWY north of HAYNES DR
City, State: MOODY, AL
Speed Limit: 35 mph

Date: 1/8/2020
Wednesday

		24 Hour Volume				1/9/2020					
Begin	SB	NB	Combined	Begin	SB	NB	Combined	Begin	SB	NB	Combined
7:00 AM	143	26	169	7:00 PM	11	40	25	102	36	142	
7:15 AM	166	37	203	7:15 PM	7	31	38				
7:30 AM	184	32	216	7:30 PM	13	17	30				
7:45 AM	141	22	163	7:45 PM	9	29	38				
8:00 AM	76	17	93	8:00 PM	12	39	29	89	41	128	
8:15 AM	57	23	80	8:15 PM	15	23	38				
8:30 AM	41	26	67	8:30 PM	3	17	26				
8:45 AM	39	27	66	8:45 PM	3	20	23				
9:00 AM	35	16	51	9:00 PM	7	34	19	75	26	109	
9:15 AM	31	23	54	9:15 PM	7	16	23				
9:30 AM	32	11	43	9:30 PM	11	25	36				
9:45 AM	21	15	36	9:45 PM	9	15	24				
10:00 AM	28	21	49	10:00 PM	3	18	18	40	21	58	
10:15 AM	24	17	41	10:15 PM	2	9	11				
10:30 AM	20	10	30	10:30 PM	6	7	13				
10:45 AM	25	22	47	10:45 PM	7	6	13				
11:00 AM	22	18	40	11:00 PM	2	5	25				
11:15 AM	23	17	40	11:15 PM	0	3	10				
11:30 AM	14	16	30	11:30 PM	2	9	11				
11:45 AM	21	20	41	11:45 PM	1	5	6				
12:00 PM	14	21	35	12:00 AM	1	4	27				
12:15 PM	19	13	32	12:15 AM	0	9	9				
12:30 PM	18	26	44	12:30 AM	2	8	10				
12:45 PM	26	26	52	12:45 AM	1	3	4				
1:00 PM	38	28	66	1:00 AM	0	1	15				
1:15 PM	17	25	42	1:15 AM	1	6	7				
1:30 PM	23	24	47	1:30 AM	0	0	0				
1:45 PM	25	22	47	1:45 AM	0	3	3				
2:00 PM	20	35	55	2:00 AM	1	8	7				
2:15 PM	37	32	69	2:15 AM	3	4	7				
2:30 PM	29	48	77	2:30 AM	2	0	2				
2:45 PM	30	51	81	2:45 AM	2	0	2				
3:00 PM	63	58	121	3:00 AM	2	12	3				
3:15 PM	35	59	94	3:15 AM	1	0	1				
3:30 PM	34	64	98	3:30 AM	4	2	6				
3:45 PM	26	73	99	3:45 AM	5	2	7				
4:00 PM	27	94	121	4:00 AM	4	48	9				
4:15 PM	29	71	100	4:15 AM	17	0	4				
4:30 PM	32	92	124	4:30 AM	18	3	19				
4:45 PM	18	95	113	4:45 AM	9	4	13				
5:00 PM	30	104	134	5:00 AM	18	129	20				
5:15 PM	27	107	134	5:15 AM	17	3	21				
5:30 PM	16	129	145	5:30 AM	44	6	50				
5:45 PM	23	104	127	5:45 AM	50	8	58				
6:00 PM	30	80	110	6:00 AM	41	306	11	64	52	370	
6:15 PM	29	52	81	6:15 AM	69	9	9				
6:30 PM	25	34	59	6:30 AM	91	11	102				
6:45 PM	25	32	57	6:45 AM	105	33	138				
24 Hour Volume		SB 2552 (50.6%)		NB 2493 (49.4%)		Combined 5045					

12:00 AM - 12:00 PM

12:00 PM - 12:00 AM

Count	SB	NB	Combined	Count	SB	NB	Combined
1651	553	2214	2767	901	1930	2831	4731
74.6 %	25.4 %			31.8 %	68.2 %		
Peak Hour Volume	7:00 AM	7:00 AM	7:00 AM	2:45 PM	5:00 PM	5:00 PM	
634	117	751	868	162	444	606	
0.86	0.79	0.87	0.86	0.64	0.86	0.93	

Location: :
 City, State: :
 Speed Limit: :

KELLY CREEK PKWY north of HAYNES DR
 MOODY, AL
 35 mph

TRAFFIC DATA, LLC
 1409 Turnham Lane, Birmingham, AL 35216
 205-824-0125

24 Hour Speed
 Combined Channels

mph	Total	0 - < 15	15 - < 20	20 - < 25	25 - < 30	30 - < 35	35 - < 40	40 - < 45	45 - < 50	50 - < 55	55 - < 60	60 - < 65	65 - < 70	70 - < 200
7:00 AM	751	3	2	2	0	11	79	280	340	26	5	0	2	1
8:00 AM	306	1	2	1	0	6	33	111	123	23	6	0	0	0
9:00 AM	184	0	0	0	0	1	36	70	56	15	6	0	0	0
10:00 AM	167	0	0	1	1	4	24	64	53	16	3	1	0	0
11:00 AM	151	0	1	0	1	1	40	48	49	8	2	0	0	1
12:00 PM	163	0	0	1	1	4	31	52	61	8	5	0	0	0
1:00 PM	202	3	0	0	2	4	37	69	76	9	2	0	0	0
2:00 PM	282	0	0	1	2	9	55	108	98	9	0	0	0	0
3:00 PM	412	6	2	1	1	21	74	171	124	11	1	0	0	0
4:00 PM	458	0	0	0	2	18	79	185	154	19	1	0	0	0
5:00 PM	540	4	1	0	1	14	122	259	124	13	1	0	0	1
6:00 PM	307	0	0	0	1	13	86	142	56	6	1	0	0	0
7:00 PM	142	0	0	0	0	8	39	57	33	4	1	0	0	0
8:00 PM	128	0	0	0	0	9	35	57	22	3	2	0	0	0
9:00 PM	109	0	0	0	0	5	30	44	27	2	1	0	0	0
10:00 PM	58	0	0	1	1	1	16	27	11	0	1	0	0	0
11:00 PM	30	0	0	0	0	3	9	9	8	1	0	0	0	0
1/9/2020														
12:00 AM	31	0	0	0	0	2	10	10	8	0	1	0	0	0
1:00 AM	16	0	0	0	1	2	5	5	3	0	0	0	0	0
2:00 AM	15	0	0	0	0	2	6	2	5	0	0	0	0	0
3:00 AM	17	0	0	0	0	2	3	4	6	1	1	0	0	0
4:00 AM	57	0	0	0	0	1	18	17	19	1	1	0	0	0
5:00 AM	149	0	0	0	0	6	22	64	50	6	1	0	0	0
6:00 AM	370	1	0	0	0	8	70	157	118	10	5	1	0	0
Total	5045	18	8	8	14	155	959	2012	1626	191	47	2	2	3
%		0.4	0.2	0.2	0.3	3.1	19.0	39.9	32.2	3.8	0.9	0.0	0.0	0.1

Percentile Speeds
 (mph)

10%	37.2
15%	38.2
50%	42.6
85%	48.0
90%	48.0

10 mph Pace Speed
 Number In Pace

38.2 - 48.2
 3965 (78.6%)

Average
 Minimum
 Maximum

42.9 mph
 5.4 mph
 82.7 mph

Speeds Exceeded

25 mph	99.3%
35 mph	96.0%
45 mph	37.1%

Count

5011
4842
1871

Location: :
 City, State: :
 Speed Limit: :

KELLY CREEK PKWY north of HAYNES DR
 MOODY, AL
 35 mph

TRAFFIC DATA, LLC
 1409 Turnham Lane, Birmingham, AL 35216
 205-824-0125

24 Hour Vehicle Classification
 Combined Channels

Date: 1/8/2020
 Wednesday

Time	Total	Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi
7:00 AM	751	1	545	4	26	0	0	3	8	2	0	0	1
8:00 AM	306	1	209	2	13	1	0	6	8	1	0	0	0
9:00 AM	184	1	107	0	15	0	0	3	12	2	0	0	0
10:00 AM	167	1	104	0	12	0	0	1	4	2	0	0	0
11:00 AM	151	0	85	2	12	0	0	2	8	2	0	0	0
12:00 PM	163	1	104	0	13	0	0	0	9	1	0	0	0
1:00 PM	202	0	118	2	18	1	0	4	7	1	0	0	0
2:00 PM	282	2	187	1	19	2	0	1	7	1	2	0	0
3:00 PM	412	1	255	8	20	0	0	0	3	1	0	0	0
4:00 PM	458	1	290	3	33	1	0	1	0	0	0	0	0
5:00 PM	540	1	349	3	27	0	0	3	0	0	0	0	0
6:00 PM	307	0	217	0	16	0	0	2	0	0	0	0	0
7:00 PM	142	0	111	0	3	0	0	0	0	0	0	0	0
8:00 PM	128	0	86	0	7	0	0	1	0	0	0	0	0
9:00 PM	109	0	83	0	1	0	0	0	0	0	0	0	0
10:00 PM	58	0	39	0	2	0	0	0	0	0	0	0	0
11:00 PM	30	0	22	0	0	0	0	0	0	0	0	0	0
1/9/2020													
12:00 AM	31	0	26	0	0	0	0	0	0	0	0	0	0
1:00 AM	16	0	8	1	0	0	0	0	0	0	0	0	0
2:00 AM	15	0	13	0	0	0	0	0	0	0	0	0	0
3:00 AM	17	0	12	0	1	0	0	0	0	0	0	0	0
4:00 AM	57	0	27	0	1	0	0	0	0	0	0	0	0
5:00 AM	149	0	83	0	13	1	0	1	1	0	0	0	0
6:00 AM	370	0	239	4	24	3	0	4	2	0	0	0	0
Total	5045	10	3319	30	276	9	0	32	69	13	2	0	1
%		0.2	65.8	0.6	5.5	0.2	0.0	0.6	1.4	0.3	0.0	0.0	0.0

APPENDIX C
Description of Levels of Service

Levels of Service Unsignalized Intersections

Level of service criteria for unsignalized intersections is stated in terms of average control delay. Control delay is defined as the total elapsed time from a vehicle joining the queue until its departure from the stopped position at the head of the queue. The criteria for each level of service are cited in the table below.

Level of Service	Average Control Delay (seconds/vehicle)
A	0 - 10
B	> 10 - 15
C	> 15 - 25
D	> 25 - 35
E	> 35 - 50
F	> 50

APPENDIX D
Existing Conditions Capacity Analysis

Intersection	
Intersection Delay, s/veh	17.4
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔		↔					↑	↔		↔	
Traffic Vol, veh/h	55	1	159	0	0	0	0	324	100	106	260	0
Future Vol, veh/h	55	1	159	0	0	0	0	324	100	106	260	0
Peak Hour Factor	0.93	0.93	0.93	0.92	0.92	0.92	0.89	0.89	0.89	0.92	0.92	0.92
Heavy Vehicles, %	21	21	21	2	2	2	2	21	21	10	10	2
Mvmt Flow	59	1	171	0	0	0	0	364	112	115	283	0
Number of Lanes	1	0	1	0	0	0	0	1	1	0	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	2
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	2	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	2	0	2
HCM Control Delay	12	16.6	21.5
HCM LOS	B	C	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	SBLn1
Vol Left, %	0%	0%	100%	0%	29%
Vol Thru, %	100%	0%	0%	1%	71%
Vol Right, %	0%	100%	0%	99%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	324	100	55	160	366
LT Vol	0	0	55	0	106
Through Vol	324	0	0	1	260
RT Vol	0	100	0	159	0
Lane Flow Rate	364	112	59	172	398
Geometry Grp	7	7	7	7	6
Degree of Util (X)	0.626	0.171	0.127	0.311	0.683
Departure Headway (Hd)	6.194	5.484	7.727	6.508	6.178
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	582	654	464	552	585
Service Time	3.931	3.221	5.477	4.258	4.214
HCM Lane V/C Ratio	0.625	0.171	0.127	0.312	0.68
HCM Control Delay	18.8	9.4	11.6	12.2	21.5
HCM Lane LOS	C	A	B	B	C
HCM 95th-tile Q	4.3	0.6	0.4	1.3	5.3

Intersection												
Int Delay, s/veh	8.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↕			↕	↕		↕	↕		↕	
Traffic Vol, veh/h	126	108	7	6	616	88	30	6	145	14	2	1
Future Vol, veh/h	126	108	7	6	616	88	30	6	145	14	2	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Yield	-	-	Yield	-	-	None
Storage Length	-	-	-	-	-	95	-	-	150	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	91	91	91	60	60	60	47	47	47
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	150	129	8	7	677	97	50	10	242	30	4	2

Major/Minor	Major1		Major2			Minor2			Minor1			
Conflicting Flow All	677	0	0	137	0	0	1127	1128	677	1129	1124	133
Stage 1	-	-	-	-	-	-	691	691	-	433	433	-
Stage 2	-	-	-	-	-	-	436	437	-	696	691	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	915	-	-	1447	-	-	182	204	453	181	205	916
Stage 1	-	-	-	-	-	-	435	446	-	601	582	-
Stage 2	-	-	-	-	-	-	599	579	-	432	446	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	915	-	-	1447	-	-	153	166	453	69	167	916
Mov Cap-2 Maneuver	-	-	-	-	-	-	153	166	-	69	167	-
Stage 1	-	-	-	-	-	-	358	442	-	494	478	-
Stage 2	-	-	-	-	-	-	487	476	-	195	442	-

Approach	EB		WB			SE			NW		
HCM Control Delay, s	5.1		0.1			25.8			84.4		
HCM LOS						D			F		

Minor Lane/Major Mvmt	NWLn1	EBL	EBT	EBR	WBL	WBT	WBR	SELn1	SELn2
Capacity (veh/h)	79	915	-	-	1447	-	-	155	453
HCM Lane V/C Ratio	0.458	0.164	-	-	0.005	-	-	0.387	0.533
HCM Control Delay (s)	84.4	9.7	0	-	7.5	0	-	42.2	21.7
HCM Lane LOS	F	A	A	-	A	A	-	E	C
HCM 95th %tile Q(veh)	1.9	0.6	-	-	0	-	-	1.7	3.1

Intersection												
Int Delay, s/veh	4.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖		↖		↖			↗	
Traffic Vol, veh/h	0	0	0	83	0	120	202	173	0	0	275	556
Future Vol, veh/h	0	0	0	83	0	120	202	173	0	0	275	556
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	-	0	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	2	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	-3	-
Peak Hour Factor	92	92	92	91	91	91	86	86	86	87	87	87
Heavy Vehicles, %	2	2	2	13	2	13	12	12	2	2	5	5
Mvmt Flow	0	0	0	91	0	132	235	201	0	0	316	639

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	987	- 201 316	0 - - 0
Stage 1	671	- - -	- - - -
Stage 2	316	- - -	- - - -
Critical Hdwy	6.53	- 6.33 4.22	- - - -
Critical Hdwy Stg 1	5.53	- - -	- - - -
Critical Hdwy Stg 2	5.53	- - -	- - - -
Follow-up Hdwy	3.617	- 3.417 2.308	- - - -
Pot Cap-1 Maneuver	262	0 813 1190	- 0 0 - -
Stage 1	488	0 - -	- 0 0 - -
Stage 2	715	0 - -	- 0 0 - -
Platoon blocked, %			- - - -
Mov Cap-1 Maneuver	204	0 813 1190	- - - -
Mov Cap-2 Maneuver	204	0 - -	- - - -
Stage 1	380	0 - -	- - - -
Stage 2	715	0 - -	- - - -

Approach	WB	NB	SB
HCM Control Delay, s	20.9	4.7	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBTWBLn1WBLn2	SBT	SBR
Capacity (veh/h)	1190	- 204 813	- -	- -
HCM Lane V/C Ratio	0.197	- 0.447 0.162	- -	- -
HCM Control Delay (s)	8.8	0 36.2 10.3	- -	- -
HCM Lane LOS	A	A E B	- -	- -
HCM 95th %tile Q(veh)	0.7	- 2.1 0.6	- -	- -

Intersection	
Intersection Delay, s/veh	18.9
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘		↗					↑	↗		↘	
Traffic Vol, veh/h	324	4	262	0	0	0	0	243	135	86	185	0
Future Vol, veh/h	324	4	262	0	0	0	0	243	135	86	185	0
Peak Hour Factor	0.97	0.97	0.97	0.92	0.92	0.92	0.93	0.93	0.93	0.94	0.94	0.94
Heavy Vehicles, %	21	21	21	2	2	2	2	21	21	10	10	2
Mvmt Flow	334	4	270	0	0	0	0	261	145	91	197	0
Number of Lanes	1	0	1	0	0	0	0	1	1	0	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	2
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	2	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	2	0	2
HCM Control Delay	20.9	15.7	19.3
HCM LOS	C	C	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	SBLn1
Vol Left, %	0%	0%	100%	0%	32%
Vol Thru, %	100%	0%	0%	2%	68%
Vol Right, %	0%	100%	0%	98%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	243	135	324	266	271
LT Vol	0	0	324	0	86
Through Vol	243	0	0	4	185
RT Vol	0	135	0	262	0
Lane Flow Rate	261	145	334	274	288
Geometry Grp	7	7	7	7	6
Degree of Util (X)	0.527	0.264	0.697	0.48	0.571
Departure Headway (Hd)	7.266	6.551	7.508	6.299	7.132
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	494	546	481	570	505
Service Time	5.038	4.322	5.268	4.058	5.196
HCM Lane V/C Ratio	0.528	0.266	0.694	0.481	0.57
HCM Control Delay	17.9	11.7	25.9	14.8	19.3
HCM Lane LOS	C	B	D	B	C
HCM 95th-tile Q	3	1.1	5.3	2.6	3.5

Intersection												
Int Delay, s/veh	7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↕			↕	↕		↕	↕		↕	
Traffic Vol, veh/h	158	417	6	4	116	20	79	2	166	8	4	6
Future Vol, veh/h	158	417	6	4	116	20	79	2	166	8	4	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Yield	-	-	Yield	-	-	None
Storage Length	-	-	-	-	-	95	-	-	150	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	83	83	83	87	87	87	50	50	50
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	174	458	7	5	140	24	91	2	191	16	8	12

Major/Minor	Major1		Major2		Minor2		Minor1					
Conflicting Flow All	140	0	0	465	0	0	970	963	140	961	960	462
Stage 1	-	-	-	-	-	-	150	150	-	810	810	-
Stage 2	-	-	-	-	-	-	820	813	-	151	150	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1443	-	-	1096	-	-	233	256	908	236	257	600
Stage 1	-	-	-	-	-	-	853	773	-	374	393	-
Stage 2	-	-	-	-	-	-	369	392	-	851	773	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1443	-	-	1096	-	-	193	213	908	161	214	600
Mov Cap-2 Maneuver	-	-	-	-	-	-	193	213	-	161	214	-
Stage 1	-	-	-	-	-	-	714	769	-	313	329	-
Stage 2	-	-	-	-	-	-	295	328	-	667	769	-

Approach	EB		WB		SE		NW	
HCM Control Delay, s	2.1		0.2		19.8		23.5	
HCM LOS					C		C	

Minor Lane/Major Mvmt	NWLn1	EBL	EBT	EBR	WBL	WBT	WBR	SELn1	SELn2
Capacity (veh/h)	230	1443	-	-	1096	-	-	193	908
HCM Lane V/C Ratio	0.157	0.12	-	-	0.004	-	-	0.482	0.21
HCM Control Delay (s)	23.5	7.8	0	-	8.3	0	-	39.9	10
HCM Lane LOS	C	A	A	-	A	A	-	E	B
HCM 95th %tile Q(veh)	0.5	0.4	-	-	0	-	-	2.4	0.8

Intersection												
Int Delay, s/veh	4.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↶		↶		↶			↷	
Traffic Vol, veh/h	0	0	0	65	1	168	116	453	0	0	210	156
Future Vol, veh/h	0	0	0	65	1	168	116	453	0	0	210	156
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	-	0	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	2	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	-3	-
Peak Hour Factor	92	92	92	84	84	84	90	90	90	94	94	94
Heavy Vehicles, %	2	2	2	13	2	13	12	12	2	2	5	5
Mvmt Flow	0	0	0	77	1	200	129	503	0	0	223	166

Major/Minor	Minor1	Major1	Major2				
Conflicting Flow All	984	984	503	223	0	-	-
Stage 1	761	761	-	-	-	-	-
Stage 2	223	223	-	-	-	-	-
Critical Hdwy	6.53	6.52	6.33	4.22	-	-	-
Critical Hdwy Stg 1	5.53	5.52	-	-	-	-	-
Critical Hdwy Stg 2	5.53	5.52	-	-	-	-	-
Follow-up Hdwy	3.617	4.018	3.417	2.308	-	-	-
Pot Cap-1 Maneuver	263	248	547	1289	-	0	0
Stage 1	442	414	-	-	-	0	0
Stage 2	789	719	-	-	-	0	0
Platoon blocked, %					-	-	-
Mov Cap-1 Maneuver	226	0	547	1289	-	-	-
Mov Cap-2 Maneuver	226	0	-	-	-	-	-
Stage 1	381	0	-	-	-	-	-
Stage 2	789	0	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19.1	1.7	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBTWBLn1	WBLn2	SBT	SBR
Capacity (veh/h)	1289	-	226	547	-
HCM Lane V/C Ratio	0.1	-	0.342	0.366	-
HCM Control Delay (s)	8.1	0	29	15.3	-
HCM Lane LOS	A	A	D	C	-
HCM 95th %tile Q(veh)	0.3	-	1.4	1.7	-

APPENDIX E
Future Conditions Capacity Analysis

Intersection	
Intersection Delay, s/veh	19.5
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗		↗					↑	↗		↖	
Traffic Vol, veh/h	93	1	159	0	0	0	0	337	100	113	267	0
Future Vol, veh/h	93	1	159	0	0	0	0	337	100	113	267	0
Peak Hour Factor	0.93	0.93	0.93	0.92	0.92	0.92	0.89	0.89	0.89	0.92	0.92	0.92
Heavy Vehicles, %	21	21	21	2	2	2	2	21	21	10	10	2
Mvmt Flow	100	1	171	0	0	0	0	379	112	123	290	0
Number of Lanes	1	0	1	0	0	0	0	1	1	0	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	2
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	2	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	2	0	2
HCM Control Delay	12.6	18.7	24.9
HCM LOS	B	C	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	SBLn1
Vol Left, %	0%	0%	100%	0%	30%
Vol Thru, %	100%	0%	0%	1%	70%
Vol Right, %	0%	100%	0%	99%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	337	100	93	160	380
LT Vol	0	0	93	0	113
Through Vol	337	0	0	1	267
RT Vol	0	100	0	159	0
Lane Flow Rate	379	112	100	172	413
Geometry Grp	7	7	7	7	6
Degree of Util (X)	0.673	0.178	0.218	0.317	0.731
Departure Headway (Hd)	6.402	5.69	7.852	6.632	6.367
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	564	629	456	540	566
Service Time	4.151	3.439	5.613	4.392	4.414
HCM Lane V/C Ratio	0.672	0.178	0.219	0.319	0.73
HCM Control Delay	21.4	9.7	12.8	12.5	24.9
HCM Lane LOS	C	A	B	B	C
HCM 95th-tile Q	5.1	0.6	0.8	1.4	6.1

Intersection						
Int Delay, s/veh	2.4					
Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Vol, veh/h	21	51	90	117	634	37
Future Vol, veh/h	21	51	90	117	634	37
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	84	84	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	23	55	107	139	697	41

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1071	718	738	0	-	0
Stage 1	718	-	-	-	-	-
Stage 2	353	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	244	429	868	-	-	-
Stage 1	483	-	-	-	-	-
Stage 2	711	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	211	429	868	-	-	-
Mov Cap-2 Maneuver	211	-	-	-	-	-
Stage 1	418	-	-	-	-	-
Stage 2	711	-	-	-	-	-

Approach	SE	NE	SW
HCM Control Delay, s	19.3	4.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NEL	NET	SELn1	SWT	SWR
Capacity (veh/h)	868	-	330	-	-
HCM Lane V/C Ratio	0.123	-	0.237	-	-
HCM Control Delay (s)	9.7	0	19.3	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.4	-	0.9	-	-

Intersection												
Int Delay, s/veh	14.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↕			↕	↕		↕	↕		↕	
Traffic Vol, veh/h	126	172	7	6	652	103	57	6	145	14	2	1
Future Vol, veh/h	126	172	7	6	652	103	57	6	145	14	2	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Yield	-	-	Yield	-	-	None
Storage Length	-	-	-	-	-	95	-	-	150	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	91	91	91	60	60	60	47	47	47
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	150	205	8	7	716	113	95	10	242	30	4	2

Major/Minor	Major1		Major2			Minor2			Minor1			
Conflicting Flow All	716	0	0	213	0	0	1242	1243	716	1244	1239	209
Stage 1	-	-	-	-	-	-	730	730	-	509	509	-
Stage 2	-	-	-	-	-	-	512	513	-	735	730	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	885	-	-	1357	-	-	152	174	430	151	175	831
Stage 1	-	-	-	-	-	-	414	428	-	547	538	-
Stage 2	-	-	-	-	-	-	545	536	-	411	428	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	885	-	-	1357	-	-	125	139	430	53	140	831
Mov Cap-2 Maneuver	-	-	-	-	-	-	125	139	-	53	140	-
Stage 1	-	-	-	-	-	-	335	424	-	442	435	-
Stage 2	-	-	-	-	-	-	435	433	-	174	424	-

Approach	EB		WB			SE			NW		
HCM Control Delay, s	4.1		0.1			48.6			127.8		
HCM LOS						E			F		

Minor Lane/Major Mvmt	NWLn1	EBL	EBT	EBR	WBL	WBT	WBR	SELn1	SELn2
Capacity (veh/h)	61	885	-	-	1357	-	-	126	430
HCM Lane V/C Ratio	0.593	0.169	-	-	0.005	-	-	0.833	0.562
HCM Control Delay (s)	127.8	9.9	0	-	7.7	0	-	106.2	23.6
HCM Lane LOS	F	A	A	-	A	A	-	F	C
HCM 95th %tile Q(veh)	2.4	0.6	-	-	0	-	-	5.1	3.4

Intersection												
Int Delay, s/veh	4.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖		↖		↖			↖	
Traffic Vol, veh/h	0	0	0	83	0	133	202	224	0	0	289	578
Future Vol, veh/h	0	0	0	83	0	133	202	224	0	0	289	578
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	-	0	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	2	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	-3	-
Peak Hour Factor	92	92	92	91	91	91	86	86	86	87	87	87
Heavy Vehicles, %	2	2	2	13	2	13	12	12	2	2	5	5
Mvmt Flow	0	0	0	91	0	146	235	260	0	0	332	664

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1062	- 260 332	0 - - 0
Stage 1	730	- - -	- - - -
Stage 2	332	- - -	- - - -
Critical Hdwy	6.53	- 6.33 4.22	- - - -
Critical Hdwy Stg 1	5.53	- - -	- - - -
Critical Hdwy Stg 2	5.53	- - -	- - - -
Follow-up Hdwy	3.617	- 3.417 2.308	- - - -
Pot Cap-1 Maneuver	236	0 753 1173	- 0 0 - -
Stage 1	458	0 - -	- 0 0 - -
Stage 2	703	0 - -	- 0 0 - -
Platoon blocked, %			- - -
Mov Cap-1 Maneuver	181	0 753 1173	- - - -
Mov Cap-2 Maneuver	181	0 - -	- - - -
Stage 1	351	0 - -	- - - -
Stage 2	703	0 - -	- - - -

Approach	WB	NB	SB
HCM Control Delay, s	23.4	4.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBTWBLn1WBLn2	SBT	SBR
Capacity (veh/h)	1173	- 181 753	- -	- -
HCM Lane V/C Ratio	0.2	- 0.504 0.194	- -	- -
HCM Control Delay (s)	8.8	0 43.5 10.9	- -	- -
HCM Lane LOS	A	A E B	- -	- -
HCM 95th %tile Q(veh)	0.7	- 2.5 0.7	- -	- -

Intersection	
Intersection Delay, s/veh	22.5
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘		↗					↑	↗		↘	
Traffic Vol, veh/h	356	4	262	0	0	0	0	254	135	104	203	0
Future Vol, veh/h	356	4	262	0	0	0	0	254	135	104	203	0
Peak Hour Factor	0.97	0.97	0.97	0.92	0.92	0.92	0.93	0.93	0.93	0.94	0.94	0.94
Heavy Vehicles, %	21	21	21	2	2	2	2	21	21	10	10	2
Mvmt Flow	367	4	270	0	0	0	0	273	145	111	216	0
Number of Lanes	1	0	1	0	0	0	0	1	1	0	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	2
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	2	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	2	0	2
HCM Control Delay	25.6	17.1	23.5
HCM LOS	D	C	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	SBLn1
Vol Left, %	0%	0%	100%	0%	34%
Vol Thru, %	100%	0%	0%	2%	66%
Vol Right, %	0%	100%	0%	98%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	254	135	356	266	307
LT Vol	0	0	356	0	104
Through Vol	254	0	0	4	203
RT Vol	0	135	0	262	0
Lane Flow Rate	273	145	367	274	327
Geometry Grp	7	7	7	7	6
Degree of Util (X)	0.568	0.273	0.783	0.493	0.66
Departure Headway (Hd)	7.481	6.764	7.685	6.474	7.28
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	481	528	470	554	493
Service Time	5.264	4.546	5.457	4.244	5.351
HCM Lane V/C Ratio	0.568	0.275	0.781	0.495	0.663
HCM Control Delay	19.7	12.1	33.2	15.4	23.5
HCM Lane LOS	C	B	D	C	C
HCM 95th-tile Q	3.5	1.1	7	2.7	4.7

Intersection						
Int Delay, s/veh	3.6					
Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations	T			T		T
Traffic Vol, veh/h	51	125	77	420	107	31
Future Vol, veh/h	51	125	77	420	107	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	91	91	83	83
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	55	136	85	462	129	37

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	780	148	166	0	0
Stage 1	148	-	-	-	-
Stage 2	632	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	364	899	1412	-	-
Stage 1	880	-	-	-	-
Stage 2	530	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	335	899	1412	-	-
Mov Cap-2 Maneuver	335	-	-	-	-
Stage 1	809	-	-	-	-
Stage 2	530	-	-	-	-

Approach	SE	NE	SW
HCM Control Delay, s	13.7	1.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NEL	NET	SELn1	SWT	SWR
Capacity (veh/h)	1412	-	604	-	-
HCM Lane V/C Ratio	0.06	-	0.317	-	-
HCM Control Delay (s)	7.7	0	13.7	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.2	-	1.4	-	-

Intersection												
Int Delay, s/veh	11.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↕			↕	↕		↕	↕		↕	
Traffic Vol, veh/h	158	471	6	4	204	57	102	2	166	8	4	6
Future Vol, veh/h	158	471	6	4	204	57	102	2	166	8	4	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Yield	-	-	Yield	-	-	None
Storage Length	-	-	-	-	-	95	-	-	150	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	83	83	83	87	87	87	50	50	50
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	174	518	7	5	246	69	117	2	191	16	8	12

Major/Minor	Major1		Major2		Minor2		Minor1					
Conflicting Flow All	246	0	0	525	0	0	1136	1129	246	1127	1126	522
Stage 1	-	-	-	-	-	-	256	256	-	870	870	-
Stage 2	-	-	-	-	-	-	880	873	-	257	256	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1320	-	-	1042	-	-	179	204	793	182	205	555
Stage 1	-	-	-	-	-	-	749	696	-	346	369	-
Stage 2	-	-	-	-	-	-	342	368	-	748	696	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1320	-	-	1042	-	-	144	165	793	117	166	555
Mov Cap-2 Maneuver	-	-	-	-	-	-	144	165	-	117	166	-
Stage 1	-	-	-	-	-	-	610	692	-	282	300	-
Stage 2	-	-	-	-	-	-	265	300	-	563	692	-

Approach	EB		WB		SE		NW	
HCM Control Delay, s	2		0.1		43.6		31	
HCM LOS					E		D	

Minor Lane/Major Mvmt	NWLn1	EBL	EBT	EBR	WBL	WBT	WBR	SELn1	SELn2
Capacity (veh/h)	174	1320	-	-	1042	-	-	144	793
HCM Lane V/C Ratio	0.207	0.132	-	-	0.005	-	-	0.83	0.241
HCM Control Delay (s)	31	8.1	0	-	8.5	0	-	95.7	11
HCM Lane LOS	D	A	A	-	A	A	-	F	B
HCM 95th %tile Q(veh)	0.8	0.5	-	-	0	-	-	5.3	0.9

Intersection												
Int Delay, s/veh	5.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↶		↶		↶			↷	
Traffic Vol, veh/h	0	0	0	65	1	179	116	496	0	0	245	209
Future Vol, veh/h	0	0	0	65	1	179	116	496	0	0	245	209
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	-	0	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	2	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	-3	-
Peak Hour Factor	92	92	92	84	84	84	90	90	90	94	94	94
Heavy Vehicles, %	2	2	2	13	2	13	12	12	2	2	5	5
Mvmt Flow	0	0	0	77	1	213	129	551	0	0	261	222

Major/Minor	Minor1	Major1	Major2						
Conflicting Flow All	1070	1070	551	261	0	-	-	-	0
Stage 1	809	809	-	-	-	-	-	-	-
Stage 2	261	261	-	-	-	-	-	-	-
Critical Hdwy	6.53	6.52	6.33	4.22	-	-	-	-	-
Critical Hdwy Stg 1	5.53	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.53	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.617	4.018	3.417	2.308	-	-	-	-	-
Pot Cap-1 Maneuver	233	221	513	1247	-	0	0	-	-
Stage 1	420	394	-	-	-	0	0	-	-
Stage 2	758	692	-	-	-	0	0	-	-
Platoon blocked, %					-			-	-
Mov Cap-1 Maneuver	198	0	513	1247	-	-	-	-	-
Mov Cap-2 Maneuver	198	0	-	-	-	-	-	-	-
Stage 1	357	0	-	-	-	-	-	-	-
Stage 2	758	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	21.6	1.6	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBTWBLn1	WBLn2	SBT	SBR
Capacity (veh/h)	1247	-	198	513	-
HCM Lane V/C Ratio	0.103	-	0.391	0.415	-
HCM Control Delay (s)	8.2	0	34.4	16.9	-
HCM Lane LOS	A	A	D	C	-
HCM 95th %tile Q(veh)	0.3	-	1.7	2	-

APPENDIX F
Turn Lane Warrant Evaluations

Kelly Creek Rd at Proposed Driveway
 NB Left Turn Lane Warrant
 AM - Future Volumes

Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.

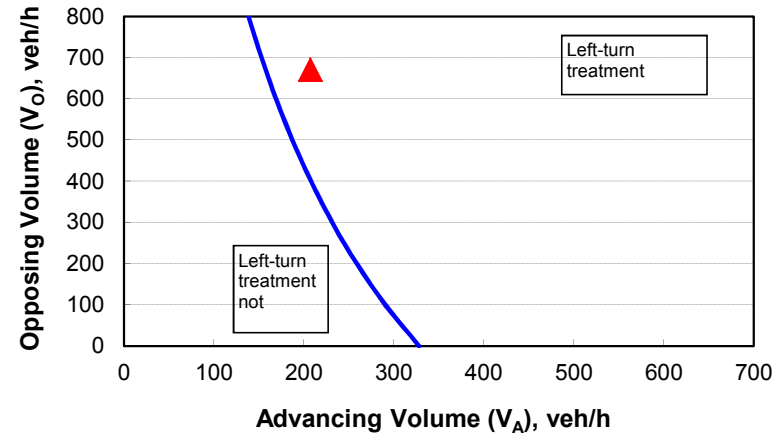
2-lane roadway (English)

INPUT

Variable	Value
85 th percentile speed, mph:	45
Percent of left-turns in advancing volume (V_A), %:	44%
Advancing volume (V_A), veh/h:	207
Opposing volume (V_O), veh/h:	671

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	157
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Kelly Creek Rd at Proposed Driveway
 NB Left Turn Lane Warrant
 PM - Future Volumes

Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.

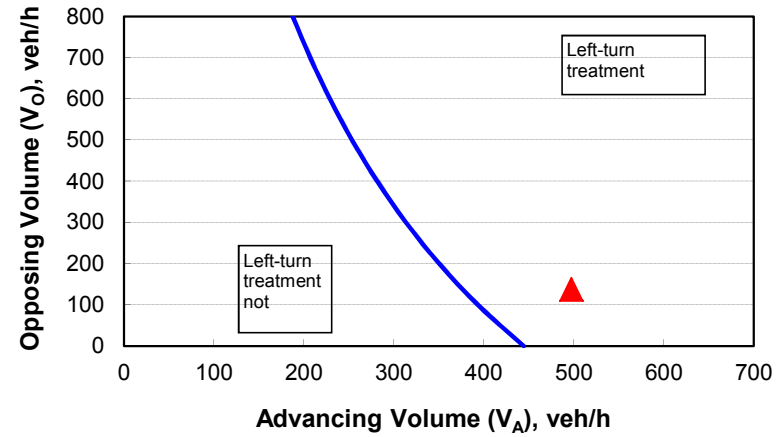
2-lane roadway (English)

INPUT

Variable	Value
85 th percentile speed, mph:	45
Percent of left-turns in advancing volume (V_A), %:	16%
Advancing volume (V_A), veh/h:	497
Opposing volume (V_O), veh/h:	138

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	376
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Kelly Creek Rd at Proposed Driveway
 SB Right Turn Lane Warrant
 AM - Future Volumes

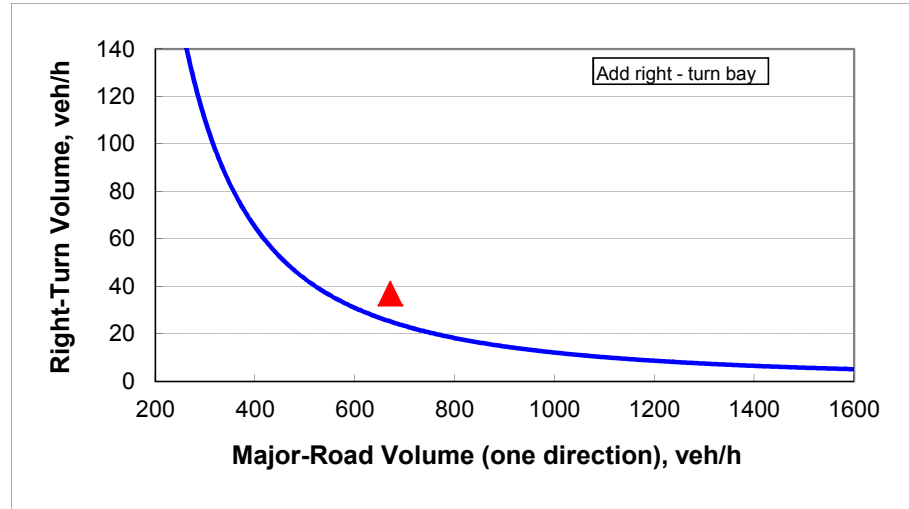
Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

INPUT

Roadway geometry:	2-lane roadway	
Variable	Value	
Major-road speed, mph:	45	
Major-road volume (one direction), veh/h:	671	
Right-turn volume, veh/h:	37	

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	25
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Add right-turn bay.	



Kelly Creek Rd at Proposed Driveway
 SB Right Turn Lane Warrant
 PM - Future Volumes

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

INPUT

Roadway geometry:	2-lane roadway
Variable	Value
Major-road speed, mph:	45
Major-road volume (one direction), veh/h:	138
Right-turn volume, veh/h:	31

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	457
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	

