

# **Polytainers Lot 2**

## **TRAFFIC IMPACT STUDY**

January 24, 2017

Prepared For:  
Olsson Associates  
1301 Burlington Street, Suite 100  
North Kansas City, MO 64116

Prepared By:  
Priority Engineers, Inc.  
PO Box 563  
Garden City, MO 64747





January 24, 2017

Mr. Paul Osborne  
Olsson Associates  
1301 Burlington Street, Suite 100  
North Kansas City, MO 64116

Re: Polytians Lot 2 – Lee's Summit, MO

Dear Mr. Osborne:

In response to your request, Priority Engineers, Inc. has completed a traffic impact study for the above referenced project. The purpose of the analysis is to determine the potential traffic impacts associated with this development on the intersections and streets surrounding this site, primarily during the AM and PM peak hours. The following report documents our analysis and recommendations.

We appreciate the opportunity to work with you on this project. Please contact us with any questions or if you require additional information.

Sincerely,

PRIORITY ENGINEERS, INC.

A handwritten signature in blue ink, appearing to read 'Kristin L. Skinner', is written over the typed name.

Kristin L. Skinner, P.E., PTOE  
President

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## 1) INTRODUCTION

The purpose of this study is to examine the potential traffic impacts associated with the proposed Polytainer Lot 2 development located at the northwest corner of NE Douglas Street and NE Victoria Drive. The development will have two right-in/right-out entrances onto Douglas Street, and will also access the existing Polytainer Drive.

The study area is shown in Figure 1. The site layout is shown in Figure 2.

## 2) EXISTING CONDITIONS

The existing site is located on the northwest corner of NE Douglas Street and NE Victoria Drive. The property is currently vacant.

Douglas Street is a four lane arterial adjacent to this property with a posted speed limit of 45 miles per hour. Victoria Drive is a two lane collector that intersects Douglas at a signalized intersection.

To the west and adjacent to this site is the existing Polytainer site. To the south are light industrial uses. To the north is the St. Luke's East Hospital. On the east side of Douglas are existing restaurants and retail uses and the B & B Lee's Summit 16 Theater.

Peak Hour turning movement traffic counts for the intersections of Douglas Street with Mulberry Street, Victoria Drive, and Sycamore Street and the intersection of Victoria Drive with the existing Polytainer entrance were collected between November 15<sup>th</sup> and 17<sup>th</sup> of this year between the hours of 7:00 and 9:00 AM and from 4:00 to 6:00 PM. The peak hours were determined to be 7:00 to 8:00 AM and from 4:30 to 5:30 PM. The complete traffic counts are shown in Appendix II. The peak hour traffic volumes and existing lane configurations are shown in Figures 3-7.

## 3) PROPOSED DEVELOPMENT

The proposed site plan is shown in Figure 2. The site will contain a variety of uses. To the western edge of the property, there will be two office buildings, each 10,000 square feet. Adjacent to Douglas Street, there will be two fast-food restaurants, each 2,500 square feet, a 5,000 square foot sit-down restaurant, and a 16,000 square foot pharmacy with a drive through window.

The proposed site will include two right-in/right-out entrances onto Douglas Street. Access to these drives will be limited by the existing concrete median on Douglas Street. Access will also be provided through the existing Polytainer drive onto Victoria Drive.

## 4) TRIP GENERATION

The vehicle trips generated by the proposed development were estimated using the Institute of Transportation Engineers' Trip Generation, 9<sup>th</sup> Edition. Land Use 710, General Office Building was used for the two office buildings. Pharmacy/Drugstore with Drive-Through Window (Land Use 881), High-Turnover Sit-Down Restaurant (Land Use 932), and Fast-Food Restaurant with Drive-Through Window (Land Use 934) were used for the remaining uses. The estimated AM and PM peak hour traffic volumes associated with these uses are shown in Table 1.

Table 1: Trip Generation								
Land Use	Intensity	Daily	AM Peak			PM Peak		
			Total	In	Out	Total	In	Out
General Office Building	20,000 SF	386	53	47	6	101	17	84
Pharmacy/Drugstore with Drive-Through Window	16,000 SF	1551	55	29	26	159	79	80
High-Turnover (Sit-Down) Restaurant	5,000 SF	636	54	30	24	49	29	20
Fast-Food Restaurant with Drive-Through Window	5,000 SF	2481	227	116	111	163	85	78
<b>Total</b>		<b>5054</b>	<b>389</b>	<b>222</b>	<b>167</b>	<b>472</b>	<b>210</b>	<b>262</b>

**5) PASS-BY TRIPS**

Pass-by trips are made as intermediate stops on the way from an origin to a primary trip destination without a route diversion. For this site, pass-by trips are those drivers who are already traveling north and southbound on Douglas Street who will stop at this development. Pass-by trips were estimated utilizing the Tables provided in Chapter 5 of the Trip Generation Handbook. The 85 percent of the average was used for the Pharmacy and Restaurant uses. The results of the pass-by trip calculations are shown below in Table 2.

Table 2: Trip Generation (Pass-By)								
Land Use	Intensity	AM Peak			PM Peak			
		Total	In	Out	Total	In	Out	
General Office Building	20,000 SF	53	47	6	101	17	84	
Pharmacy/Drugstore with Drive-Through Window	16,000 SF	55	29	26	159	79	80	
					-66	-33	-33	
High-Turnover (Sit-Down) Restaurant	5,000 SF	54	30	24	49	29	20	
					-14	-7	-7	
Fast-Food Restaurant with Drive-Through Window	5,000 SF	227	116	111	163	85	78	
		-94	-47	-47	-68	-34	-34	
<b>Total External Trips</b>		<b>389</b>	<b>222</b>	<b>167</b>	<b>472</b>	<b>210</b>	<b>262</b>	
<b>Pass-By Trips</b>		<b>-94</b>	<b>-47</b>	<b>-47</b>	<b>-148</b>	<b>-74</b>	<b>-74</b>	
<b>Total New Trips</b>		<b>295</b>	<b>175</b>	<b>120</b>	<b>324</b>	<b>136</b>	<b>188</b>	

**6) TRIP DISTRIBUTION**

Trips generated by the Polytainer Lot 2 development were distributed based on existing traffic flows and a general analysis of the surrounding area. The trips were distributed onto the existing street system approximately as follows:

- 52 percent to/from the north on Douglas Street
- 30 percent to/from the south on Douglas Street
- 5 percent to/from the east on Mulberry Street
- 2 percent to/from the west on Mulberry Street (St. Luke's Hospital)
- 5 percent to/from the east on Victoria Drive
- 2 percent to/from the west on Victoria Drive
- 2 percent to/from the east on Sycamore Street
- 2 percent to/from the west on Sycamore Street

The proposed development trips are shown in Figures 7-8.

**7) LEVEL OF SERVICE AND VOLUME/CAPACITY ANALYSES**

Capacity analysis was used to quantify the impacts of the increased traffic on the intersections studied. The methodology outlined in the Highway Capacity Manual, 2000 Edition, was used as a basis to perform the analysis for this study. Capacity analysis defines the quality of traffic operation for an intersection using a grading system called Level of Service (LOS). The LOS is defined in terms of average vehicle delay. Levels of service A through F have been established with A representing the best and F the worst.

Table 4: Level of Service Definitions		
<i>Level of Service</i>	<i>Unsignalized Intersection</i>	<i>Signalized Intersection</i>
A	< 10 Seconds	< 10 Seconds
B	< 15 Seconds	< 20 Seconds
C	< 25 Seconds	< 35 Seconds
D	< 35 Seconds	< 55 Seconds
E	< 50 Seconds	< 80 Seconds
F	≥ 50 Seconds	≥ 80 Seconds

The study intersections were evaluated using Synchro, an analysis package based in part on Highway Capacity Manual methods. The analysis reports are included in Appendix II.

**Existing Conditions**

The levels of service, lane configuration, and queue lengths for existing conditions are shown in Figures 5 and 6 in Appendix I.

The overall levels of service at each of the signalized intersections was a C or better in both the AM and PM Peak Hour. Individual movements are all a level of service D or better with queues that are contained within the existing turn lanes.

The existing Polytainer Drive has a level of service of A for the stop controlled movement with a design queue of less than one vehicle.

### **Proposed Conditions**

The levels of service, lane configuration, and queue lengths for the proposed conditions are shown in Figures 9 and 10 in Appendix I.

The overall levels of service at each of the signalized intersections was a C or better in both the AM and PM Peak Hour. Individual movements are all a level of service D or better with queues that are contained within the existing turn lanes.

The stop controlled movement at the Polytainer Drive has a level of service of B during both the AM and PM Peak Hours with a design queue of less than one vehicle.

### **8) TURN LANES & ACCESS MANAGEMENT**

According to the Lee's Summit Access Management Code, right turn lanes are required at each driveway onto an arterial street. Because Douglas Street is an arterial, both the North Entrance and the South Entrance should be constructed with a 150' southbound right turn lane. The South Entrance will be located within the existing southbound right turn lane for the intersection of Victoria Drive and Douglas Street. This turn lane is 250' in length, which exceeds the 150' required by the Access Management Code or the storage required by the relatively low number of right turning vehicles utilizing this lane. To avoid a continuous right-turn lane, it is recommended that the southbound right turn lane at the Victoria Drive intersection be shortened.

The Access Management Code indicated that a Polytainer Drive should include a throat length of 125'. The driveway configuration into the existing site to the west limits the ability to meet this requirement. The proposed throat length will be approximately 70'.

According to the Access Management Code, the drives from Douglas Street should include a throat length of 100'. In order to place the proposed buildings near Douglas Street, as directed by staff, shorter throat lengths were incorporated into the plan, and a variance will be sought.

Overall, the site circulation is good, with clear travel lanes between the various lots. The final plan should consider access for delivery and trash trucks and include minor adjustments to curb radii.

### **9) RECOMMENDATIONS & CONCLUSIONS**

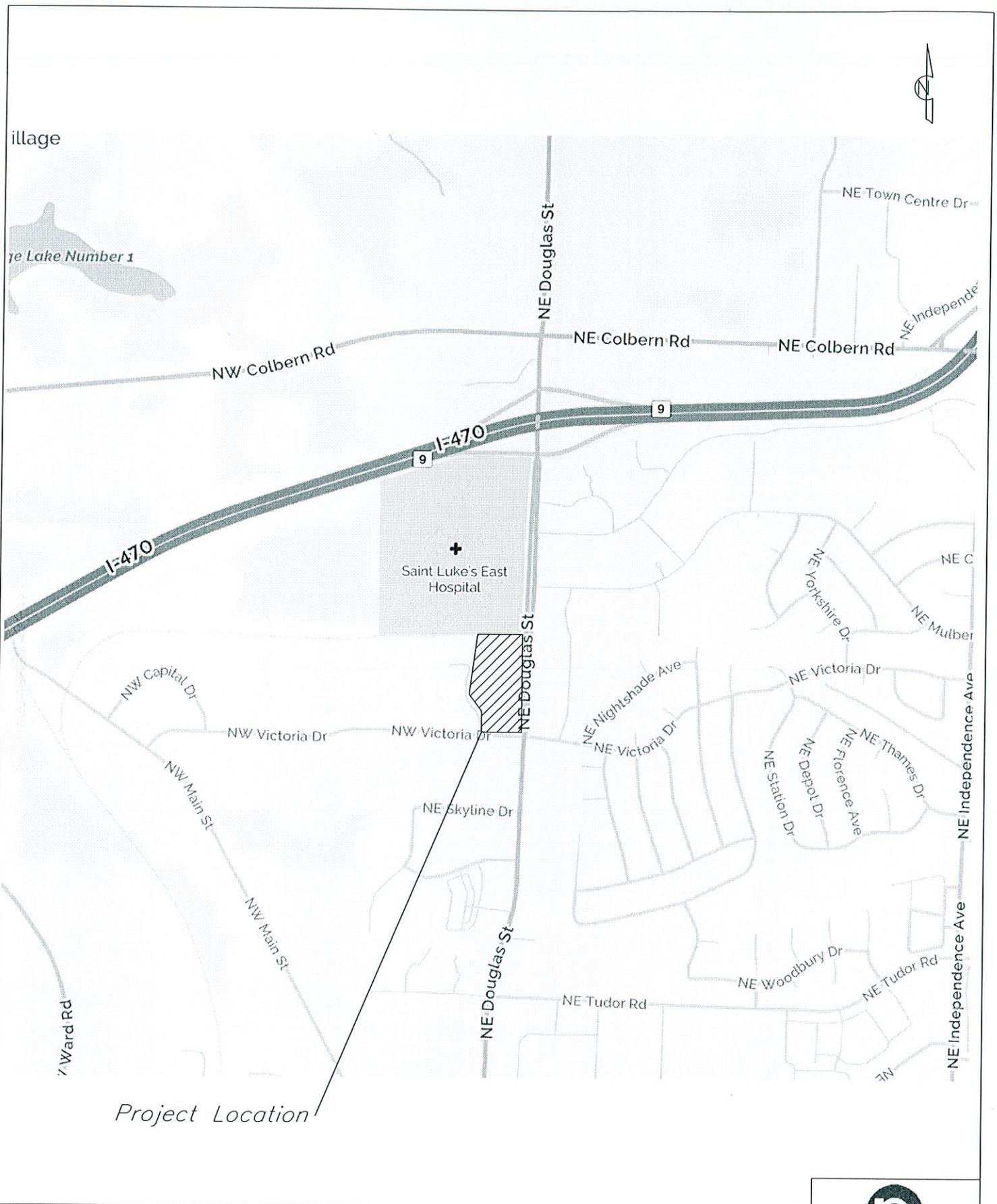
This study documents the impact of the proposed Polytainer Lot 2 development on adjacent intersections during the AM and PM peak hours. Based on the findings of this report, the following improvements are recommended:

- Construction of a 150' southbound right-turn lane into the North Entrance
- Construction of a 150' southbound right-turn lane into the South Entrance
- Modify the existing southbound right-turn lane at the intersection of Victoria Drive and Douglas Street

No additional improvements are necessary as a result of this development.

## APPENDIX I

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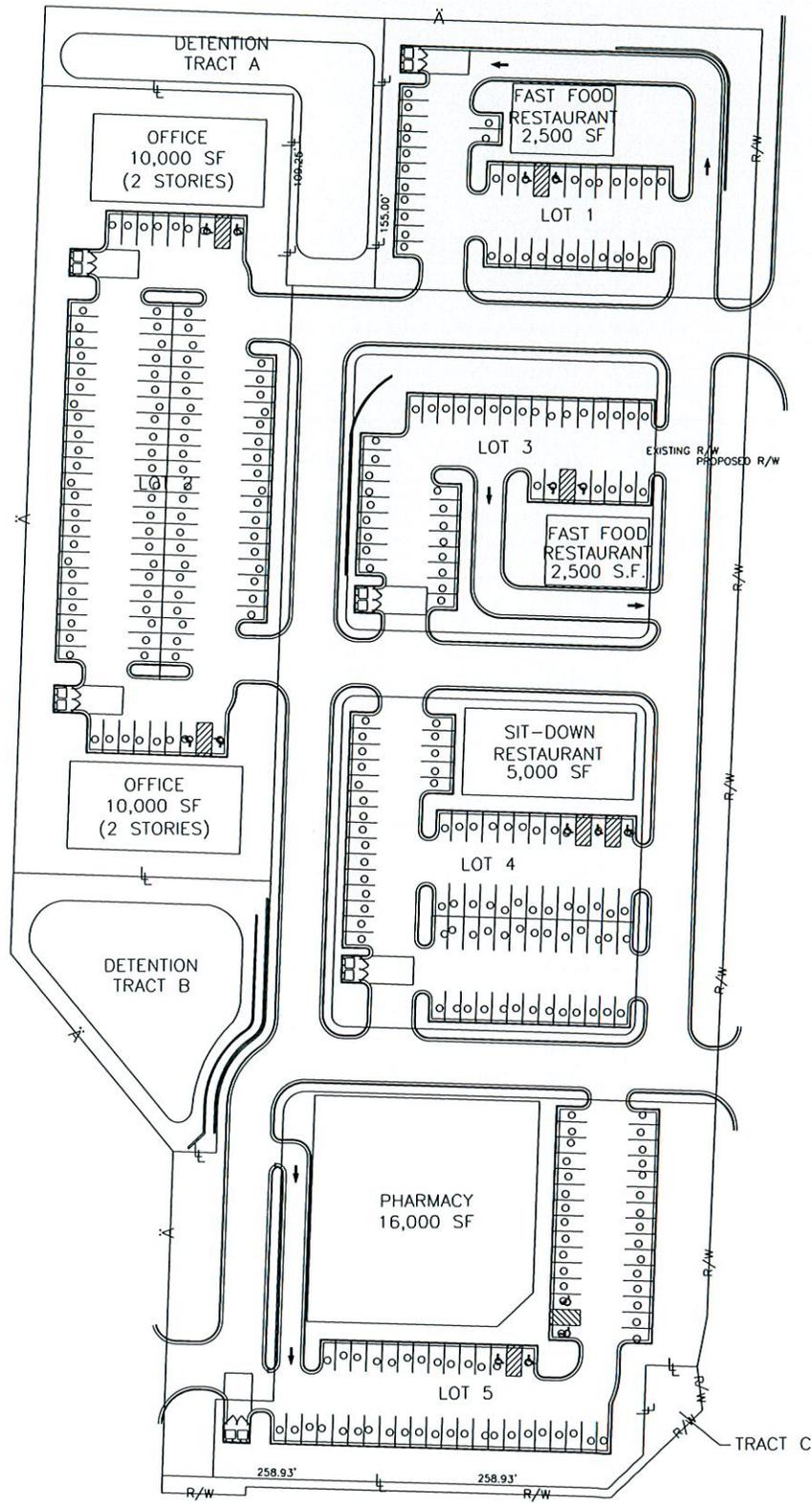


Project Location

Polyainers  
 Lot 2  
 Lee's Summit, MO

No Scale  
 Figure 1





Site Plan

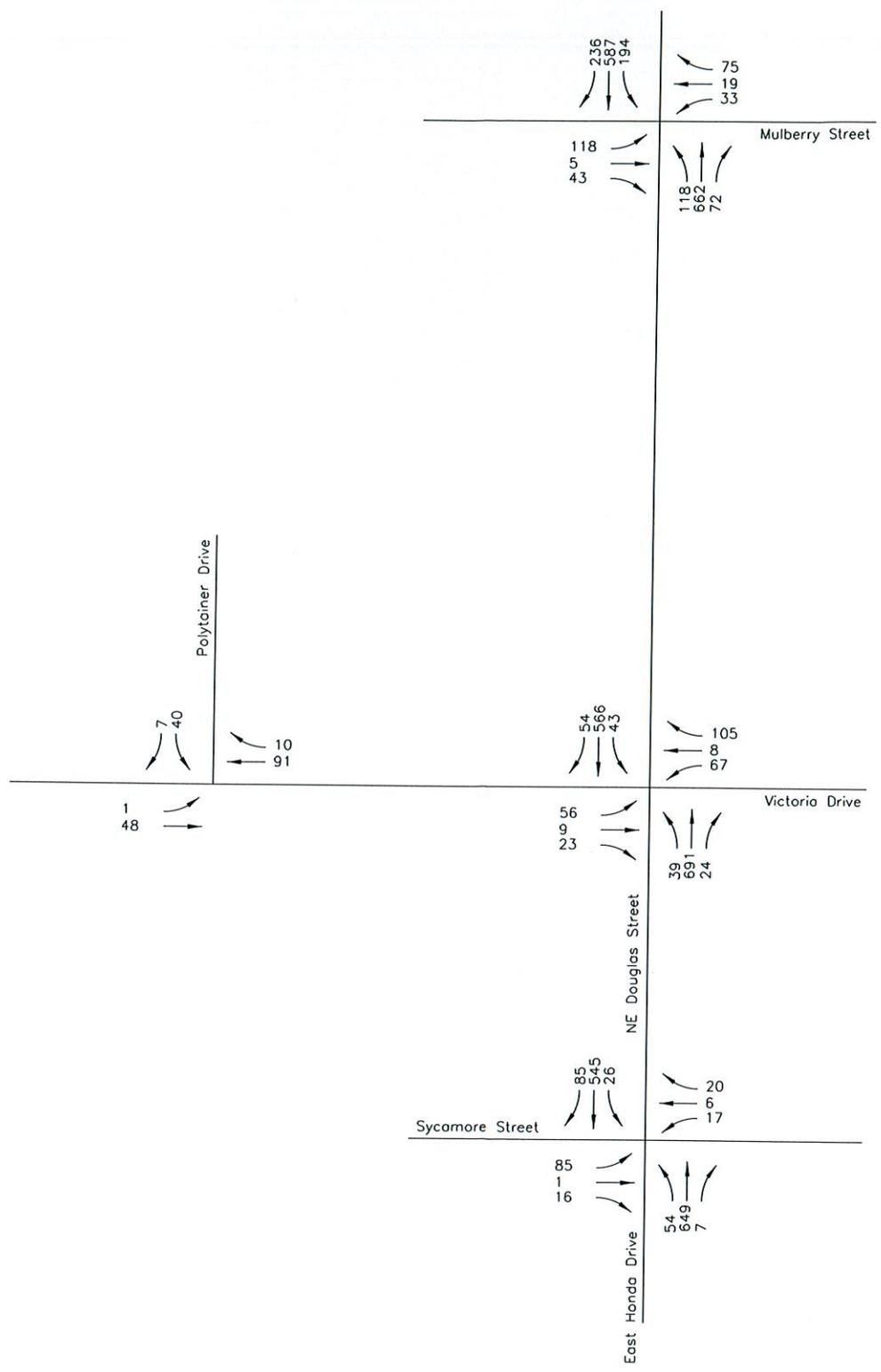
Polytainers  
Lot 2  
Lee's Summit, MO

No Scale

Figure 2



Priority  
ENGINEERS



LEGEND

Total Volume

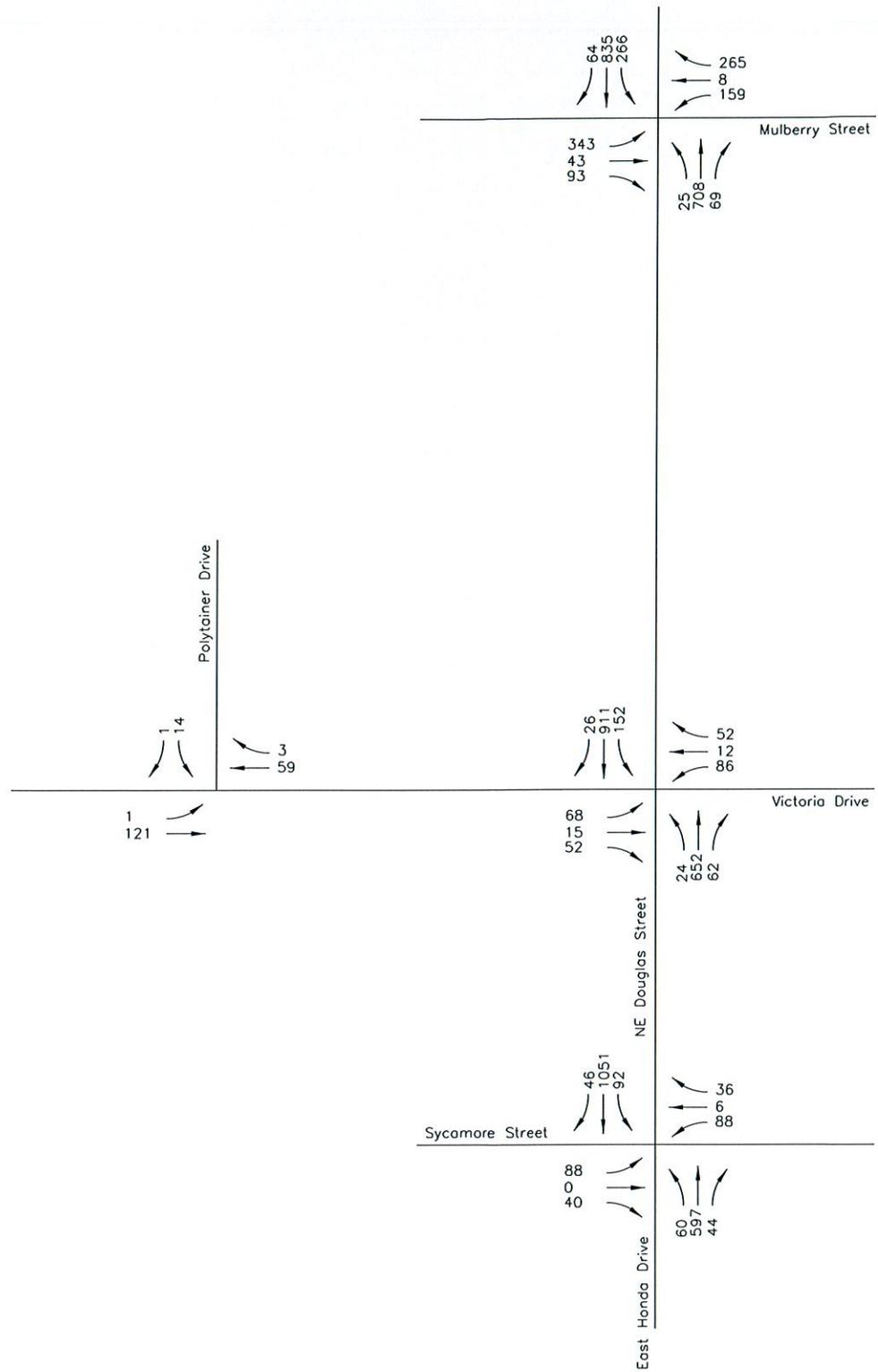
Existing AM Peak Hour  
Traffic Volumes

Polytainers  
Lot 2  
Lee's Summit, MO

No Scale

Figure 3





LEGEND

 Total Volume

Existing PM Peak Hour  
Traffic Volumes

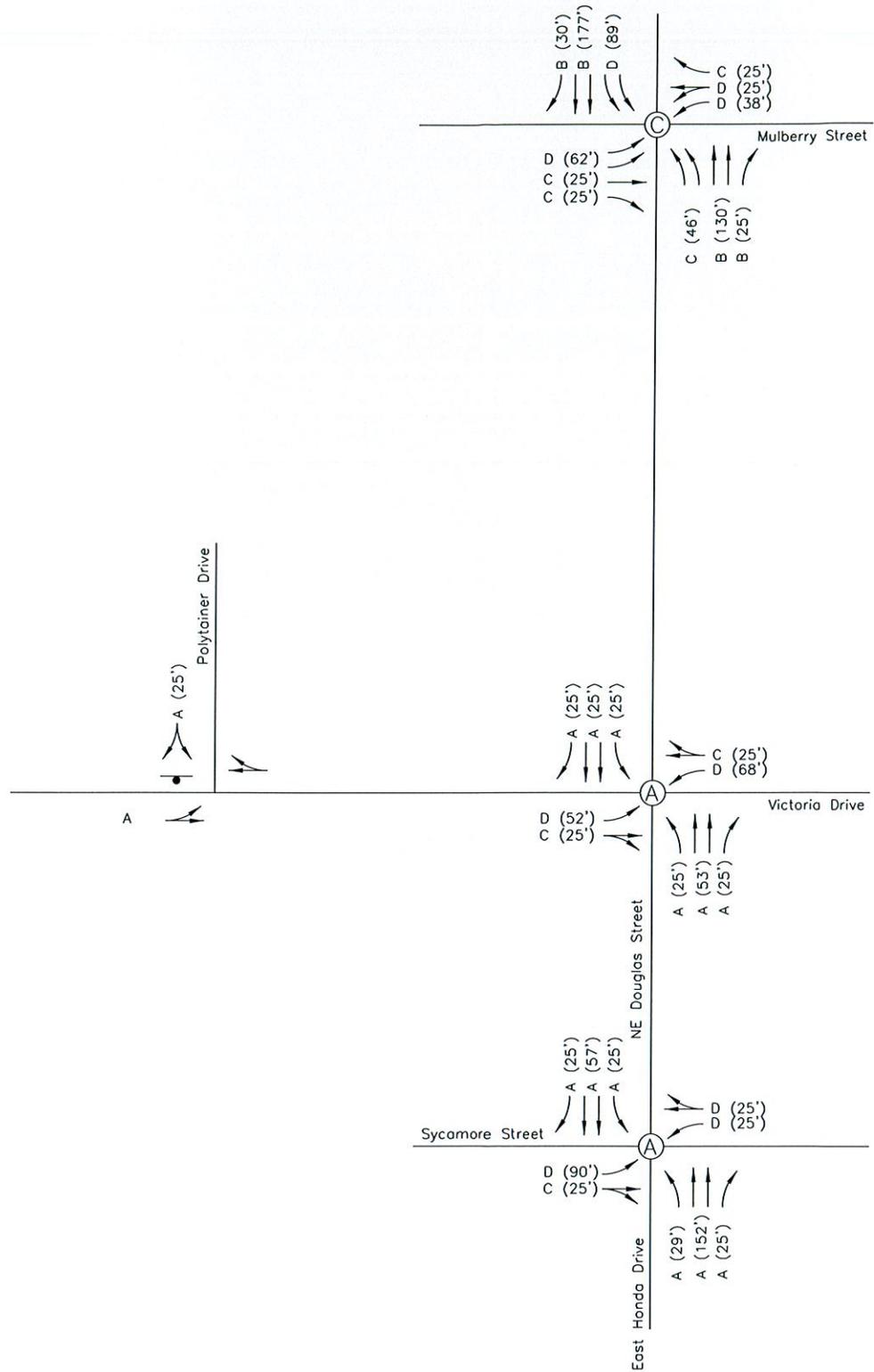
Polytainers  
Lot 2  
Lee's Summit, MO

No Scale

Figure 4



Priority  
ENGINEERS



**LEGEND**

- HCM LOS (95th Percentile Queue in Vehicles)
- Stop Sign
- Traffic Signal LOS

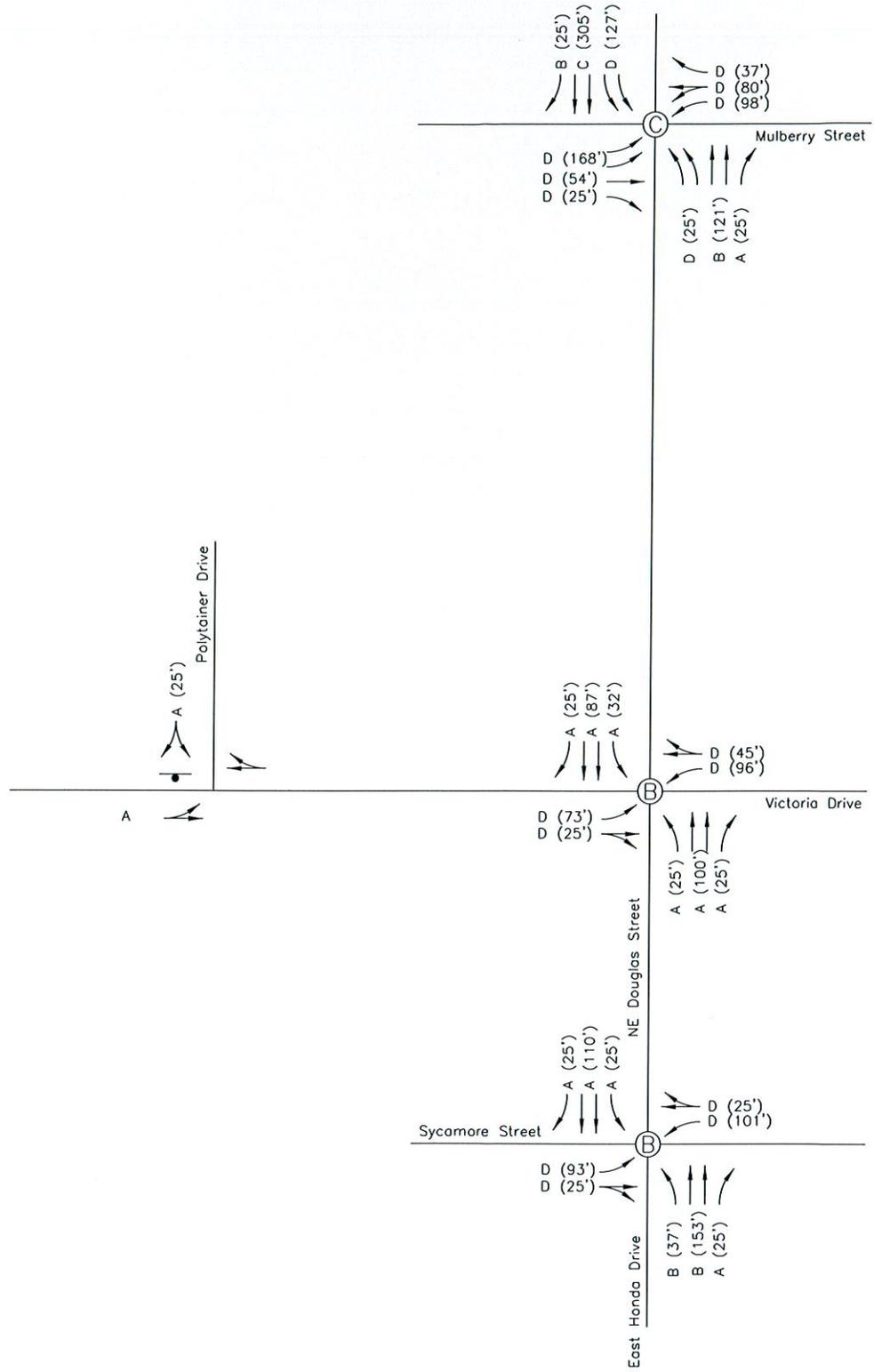
Existing AM Peak Hour  
Lane Configurations &  
Levels of Service

Polytainers  
Lot 2  
Lee's Summit, MO

No Scale

Figure 5





**LEGEND**

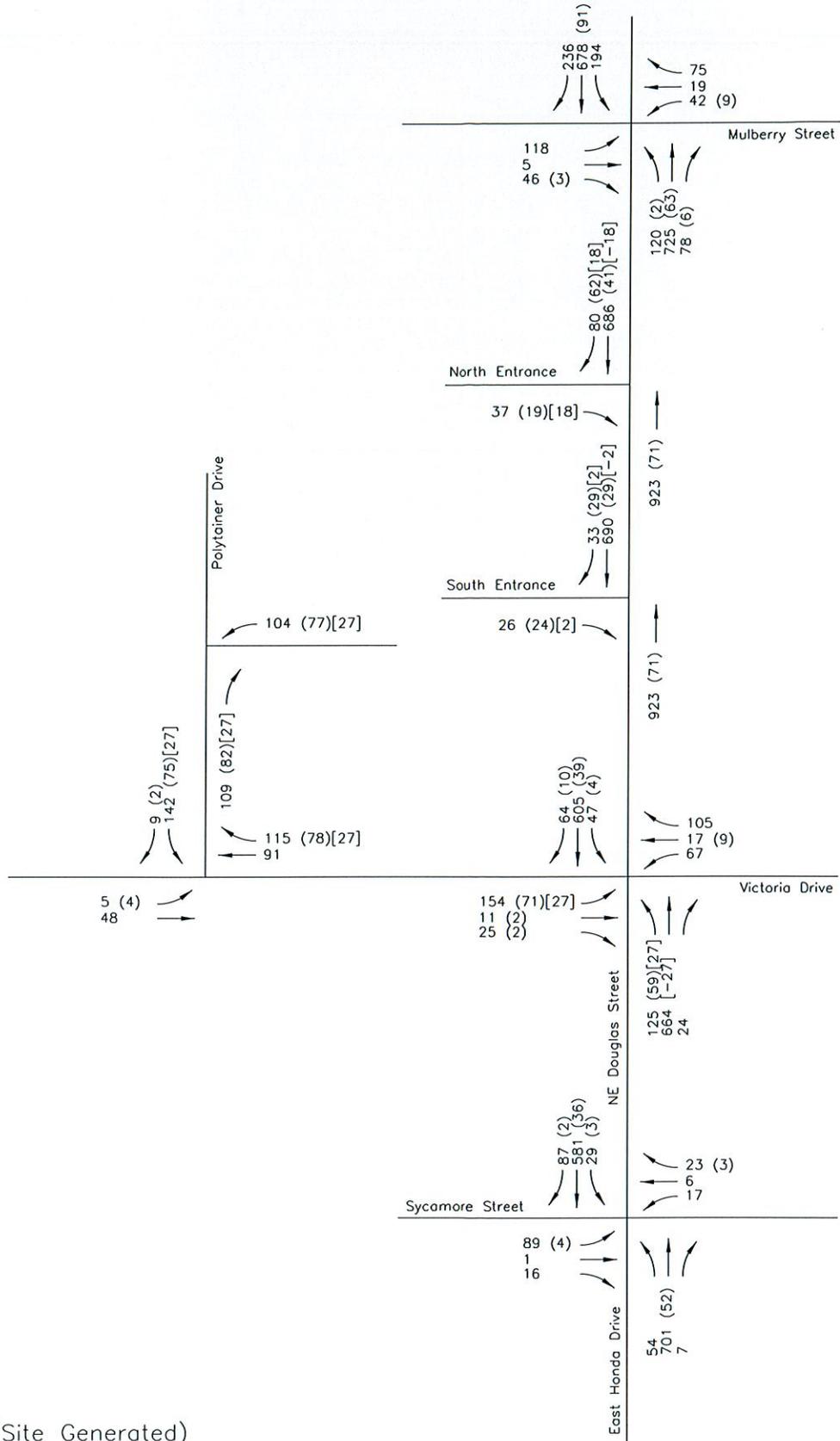
- HCM LOS (95th Percentile Queue in Vehicles)
- Stop Sign
- Traffic Signal LOS

Existing PM Peak Hour  
Lane Configurations &  
Levels of Service

Polytainers  
Lot 2  
Lee's Summit, MO

No Scale  
Figure 6





Existing + Proposed Development  
 AM Peak Hour Traffic Volumes

Polyainers  
 Lot 2  
 Lee's Summit, MO

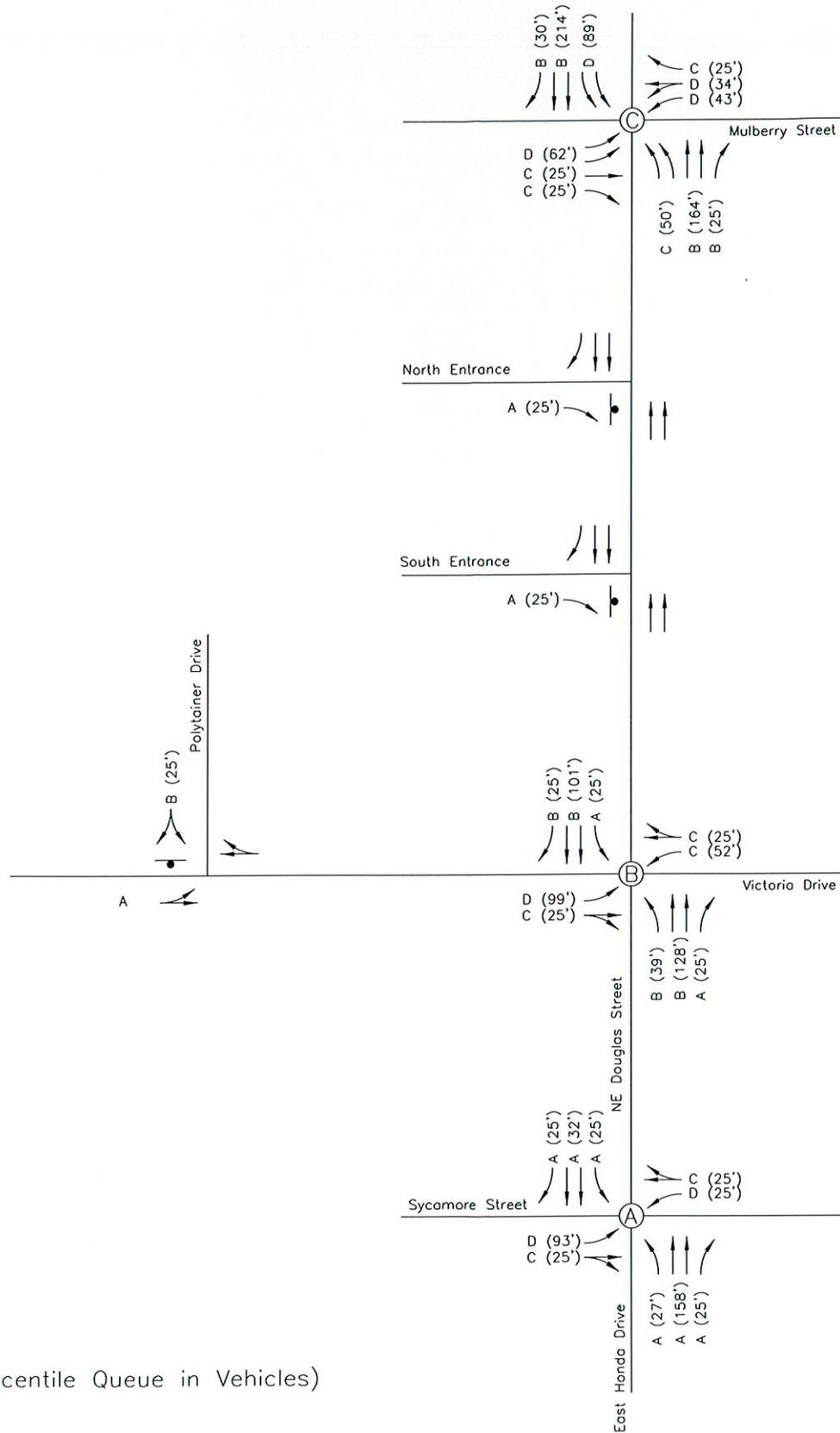
No Scale

Figure 7



Priority  
 ENGINEERS





**LEGEND**

- HCM LOS (95th Percentile Queue in Vehicles)
- Stop Sign
- Traffic Signal LOS

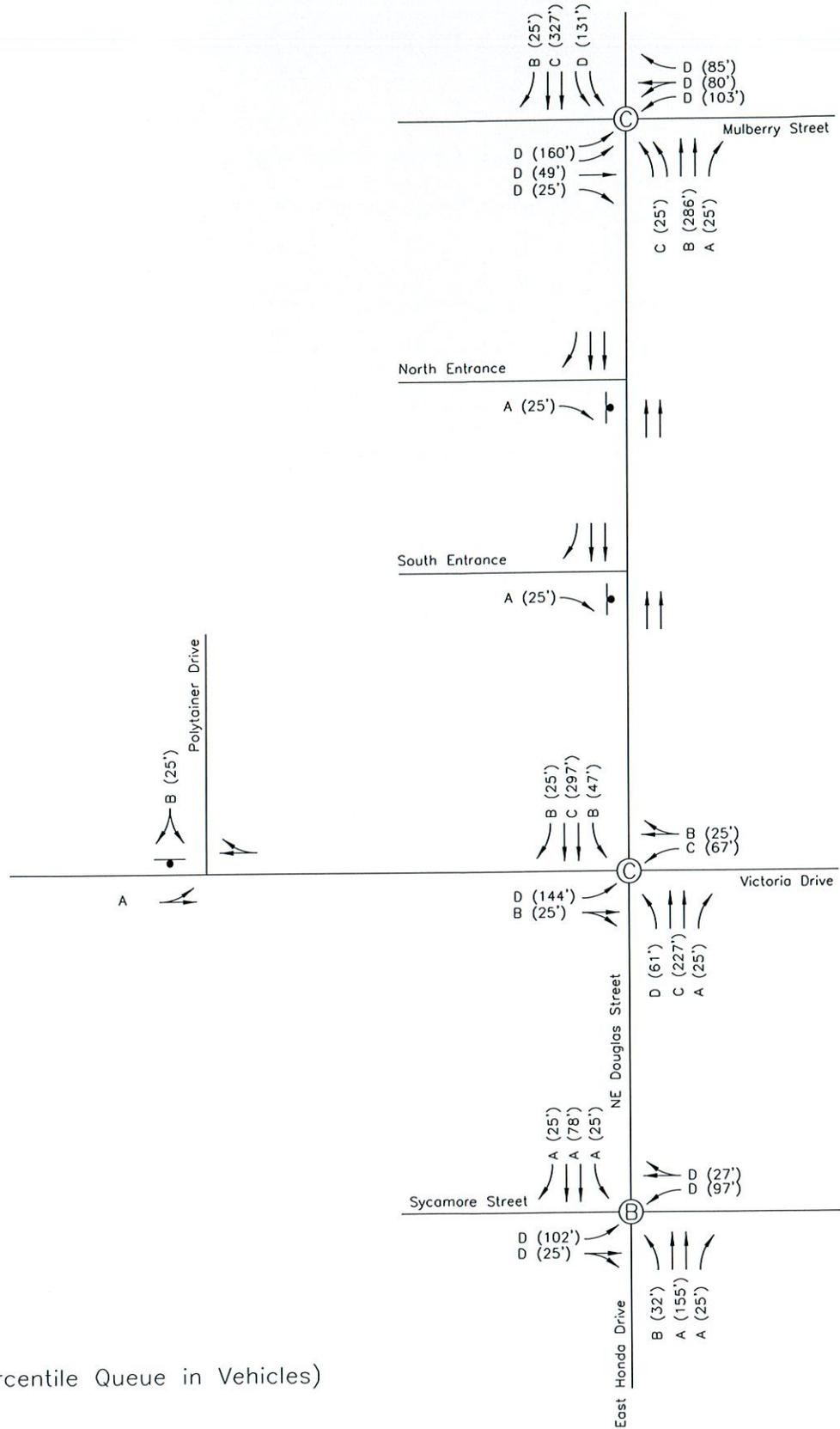
Existing + Proposed Development  
AM Peak Hour Lane Configurations  
& Levels of Service

Polyainers  
Lot 2  
Lee's Summit, MO

No Scale

Figure 9





Existing + Proposed Development  
PM Peak Hour Lane Configurations  
& Levels of Service

Polyainers  
Lot 2  
Lee's Summit, MO

No Scale  
Figure 10



## APPENDIX II

Peak Hour Traffic Counts

Synchro Reports

Existing AM Peak Hour

Pages 1-7

Existing PM Peak Hour

Pages 8-14

Proposed AM Peak Hour

Pages 15-23

Proposed PM Peak Hour

Pages 24-32

Douglas & Mulberry  
11/15/2016

Start Time	Eastbound		Westbound		Northbound		Southbound		Totals
	Left	Right	Left	Right	Left	Right	Left	Right	
7:00	22	5	2	21	180	11	30	125	40
7:15	31	13	7	16	178	12	41	176	62
7:30	41	14	2	21	158	22	58	120	61
7:45	24	11	8	17	146	27	65	151	73
8:00	18	4	10	20	119	15	72	139	52
8:15	27	9	4	14	168	19	62	127	59
8:30	30	5	3	22	141	18	55	124	56
8:45	36	14	5	17	124	17	63	134	59
Totals	118	43	33	75	662	72	194	572	236
PHF	0.72	0.42	0.75	0.59	0.72	0.67	0.75	0.81	0.81

Douglas & Victoria  
11/15/2016

Start Time	Eastbound		Westbound		Northbound		Southbound		Totals
	Left	Right	Left	Right	Left	Right	Left	Right	
7:00	32	7	1	26	158	6	6	114	12
7:15	11	6	2	27	169	11	9	162	11
7:30	9	4	2	27	160	2	17	134	12
7:45	4	6	3	25	160	5	11	156	14
8:00	7	1	13	26	127	8	21	142	14
8:15	7	2	11	19	182	7	13	140	15
8:30	5	7	10	23	154	6	18	117	17
8:45	11	4	7	8	140	9	12	153	12
Totals	56	23	67	105	647	24	43	566	49
PHF	0.44	0.50	0.70	0.67	0.64	0.55	0.63	0.87	0.88

Douglas & Sycamore  
11/17/2016

Start Time	Eastbound		Westbound		Northbound		Southbound		Totals
	Left	Right	Left	Right	Left	Right	Left	Right	
7:00	12	3	4	4	159	2	1	119	20
7:15	21	6	3	7	179	3	8	144	19
7:30	25	3	6	6	162	1	9	112	18
7:45	27	4	4	3	149	1	7	138	23
8:00	22	1	1	7	133	2	15	109	29
8:15	24	2	4	7	136	4	9	118	31
8:30	30	11	4	4	91	1	7	110	28
8:45	21	10	4	2	118	4	4	143	32
Totals	85	16	17	20	649	7	25	513	80
PHF	0.79	0.25	0.71	0.75	0.56	0.91	0.69	0.89	0.87

Douglas & Mulberry  
11/15/2016

Start Time	Eastbound			Westbound			Northbound			Southbound			Totals
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	
16:00	87	1	20	28	1	74	4	201	8	57	205	17	17
16:15	79	3	33	43	4	55	7	134	17	52	196	16	16
16:30	89	8	19	46	0	54	7	177	15	50	206	21	21
16:45	68	5	21	23	3	63	6	163	60	60	197	26	26
17:00	100	20	33	49	3	92	8	185	17	63	199	12	12
17:15	86	10	20	41	2	56	4	183	24	93	233	5	5
17:30	57	4	21	34	1	64	7	164	12	61	245	5	5
17:45	32	3	22	23	3	34	2	152	21	87	223	10	10
Totals	343	43	93	159	8	265	25	708	69	266	835	64	1234
PHF	0.86	0.54	0.70	0.81	0.67	0.72	0.78	0.96	0.72	0.72	0.90	0.62	

Douglas & Victoria  
11/15/2016

Start Time	Eastbound			Westbound			Northbound			Southbound			Totals
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	
16:00	30	4	13	13	3	8	9	158	18	16	204	5	5
16:15	11	3	14	13	3	12	8	131	8	31	226	9	9
16:30	14	0	10	16	2	16	7	152	20	43	209	7	7
16:45	14	6	13	22	3	14	4	153	17	33	197	7	7
17:00	29	5	19	19	3	10	4	168	32	32	245	5	5
17:15	9	3	9	29	3	12	7	179	15	44	233	5	5
17:30	10	4	5	11	8	13	4	146	11	41	228	7	7
17:45	14	3	12	30	5	8	5	151	10	48	213	2	2
Totals	66	14	51	86	11	52	22	652	62	152	884	24	885
PHF	0.57	0.58	0.67	0.74	0.92	0.81	0.79	0.91	0.78	0.86	0.90	0.86	

Douglas & Sycamore  
11/17/2016

Start Time	Eastbound			Westbound			Northbound			Southbound			Totals
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	
16:00	9	0	11	14	0	12	15	152	8	15	210	10	10
16:15	22	0	5	17	0	8	13	122	6	27	224	13	13
16:30	15	0	9	21	0	6	15	168	13	23	273	12	12
16:45	19	0	12	22	0	12	15	139	7	31	255	14	14
17:00	34	0	14	20	0	5	21	149	10	21	262	6	6
17:15	20	0	5	25	6	13	9	141	14	17	261	14	14
17:30	25	2	8	18	0	11	17	149	10	8	250	17	17
17:45	10	3	6	14	3	2	10	147	7	12	230	16	16
Totals	88	0	40	88	6	36	60	597	44	92	1051	46	831
PHF	0.65		0.71	0.88	0.25	0.69	0.71	0.89	0.79	0.74	0.96	0.82	

Douglas & Mulberry  
11/15/2016

Start Time	Eastbound		Westbound		Northbound		Southbound		Totals	
	Left	Through	Right	Left	Through	Right	Left	Through		Right
7:00	22	3	5	4	2	180	11	30	125	40
7:15	31	0	13	11	7	178	12	41	176	62
7:30	41	0	14	10	2	158	22	58	120	61
7:45	24	2	11	8	8	146	27	65	151	73
8:00	18	4	4	10	4	119	15	72	139	52
8:15	27	2	9	14	4	168	19	62	127	59
8:30	30	3	5	10	3	141	18	55	124	56
8:45	36	6	14	13	5	124	17	63	134	59
Totals	118	5	43	33	19	662	72	194	572	236
PHF	0.72	0.42	0.77	0.75	0.59	0.72	0.92	0.67	0.81	0.81

Douglas & Victoria  
11/15/2016

Start Time	Eastbound		Westbound		Northbound		Southbound		Totals	
	Left	Through	Right	Left	Through	Right	Left	Through		Right
7:00	32	4	7	24	1	158	6	6	114	12
7:15	11	3	6	20	9	169	11	9	162	11
7:30	9	0	4	13	2	160	2	17	134	12
7:45	4	1	6	10	3	160	5	11	156	14
8:00	7	0	1	13	1	127	8	21	142	14
8:15	7	3	2	11	2	182	8	13	140	15
8:30	5	1	7	10	2	154	6	18	117	17
8:45	11	1	4	7	2	140	9	12	153	12
Totals	56	8	23	67	8	647	24	43	566	49
PHF	0.44	0.50	0.82	0.70	0.67	0.64	0.96	0.55	0.63	0.87

Douglas & Sycamore  
11/17/2016

Start Time	Eastbound		Westbound		Northbound		Southbound		Totals	
	Left	Through	Right	Left	Through	Right	Left	Through		Right
7:00	12	1	3	4	1	159	2	1	119	20
7:15	21	0	6	3	2	179	3	8	144	19
7:30	25	0	3	6	1	162	1	9	112	18
7:45	27	0	4	4	2	149	1	7	138	23
8:00	22	1	1	1	1	133	2	15	109	29
8:15	24	0	2	4	1	136	4	9	118	31
8:30	30	0	11	4	1	91	1	7	110	28
8:45	21	0	10	4	0	118	4	4	143	32
Totals	85	1	16	17	6	649	7	25	513	80
PHF	0.79	0.25	0.67	0.71	0.75	0.56	0.91	0.58	0.89	0.87

Victoria & Polytainer  
11/17/2016

Start Time	Eastbound		Westbound		Northbound		Southbound		Totals
	Left	Right	Left	Right	Left	Right	Left	Right	
7:00	1	0	0	1	0	0	35	7	7
7:15	0	0	31	4	0	0	2	0	0
7:30	0	0	16	1	0	0	3	0	0
7:45	0	0	29	4	0	0	0	0	7
8:00	0	0	18	3	0	0	1	0	0
8:15	1	0	18	2	0	0	1	0	0
8:30	0	0	22	2	0	0	0	0	0
8:45	2	0	18	3	0	0	2	0	0
<b>Totals</b>	<b>1</b>	<b>0</b>	<b>91</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>40</b>	<b>7</b>	<b>7</b>
PHF	0.25	0.86	0.73	0.63	0	0	0.29	0.25	

Douglas & Mulberry  
11/15/2016

Start Time	Eastbound			Westbound			Northbound			Southbound			Totals
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	
16:00	87	1	20	28	1	74	4	201	8	57	205	17	17
16:15	79	3	33	43	4	55	7	134	17	52	196	16	16
16:30	89	8	19	46	0	54	7	177	15	50	206	21	21
16:45	68	5	21	23	3	63	6	163	13	60	197	26	26
17:00	100	20	33	49	3	92	8	185	17	63	199	12	12
17:15	86	10	20	41	2	56	4	163	24	93	233	5	5
17:30	57	4	21	34	1	64	7	164	12	61	245	5	5
17:45	32	3	22	23	3	34	2	152	21	87	223	10	10
Totals	343	43	93	159	8	265	25	708	69	266	835	64	1234
PHF	0.86	0.54	0.70	0.81	0.67	0.72	0.78	0.96	0.72	0.72	0.90	0.62	

Douglas & Victoria  
11/15/2016

Start Time	Eastbound			Westbound			Northbound			Southbound			Totals
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	
16:00	30	4	13	13	3	8	9	158	18	16	204	5	5
16:15	11	3	14	13	3	12	8	131	8	31	226	9	9
16:30	14	0	10	16	2	16	7	152	20	43	209	7	7
16:45	14	6	13	22	3	14	4	153	17	33	197	7	7
17:00	29	5	19	19	3	10	4	168	10	32	245	5	5
17:15	9	3	9	29	3	12	7	179	15	44	233	5	5
17:30	10	4	5	11	8	13	4	146	11	41	228	7	7
17:45	14	3	12	30	5	8	5	151	10	48	213	2	2
Totals	66	14	51	86	11	52	22	652	62	152	884	24	885
PHF	0.57	0.58	0.67	0.74	0.92	0.81	0.79	0.91	0.78	0.86	0.90	0.86	

Douglas & Sycamore  
11/17/2016

Start Time	Eastbound			Westbound			Northbound			Southbound			Totals
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	
16:00	9	0	11	14	0	12	15	152	8	15	210	10	10
16:15	22	0	5	17	0	8	13	122	6	27	224	13	13
16:30	15	0	9	21	0	6	15	168	13	23	273	12	12
16:45	19	0	12	22	0	12	15	139	7	31	255	14	14
17:00	34	0	14	20	0	5	21	149	10	21	262	6	6
17:15	20	0	5	25	6	13	9	141	14	17	261	14	14
17:30	25	2	8	18	0	11	17	149	10	8	250	17	17
17:45	10	3	6	14	3	2	10	147	7	12	230	16	16
Totals	88	0	40	88	6	36	60	597	44	92	1051	46	831
PHF	0.65		0.71	0.88	0.25	0.69	0.71	0.89	0.79	0.74	0.96	0.82	

Victoria & Polytainer  
11/17/2016

Start Time	Eastbound			Westbound			Northbound			Southbound			Camera	Totals
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right		
16:00	0	31		12		0							1	
16:15	0	25		19		1							0	
16:30	0	23		23		1							0	
16:45	0	28		15		1							0	1
17:00	1	46		15		1							0	0
17:15	0	24		6		0							1	1
17:30	2	23		6		3							1	2
17:45	0	13		2		1							0	2
Totals	1	121		59		3							1	62
	0.25	0.66		0.64		0.75							0.70	0.25

3: Douglas Street & Sycamore Street

Existing AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	108	28	24	36	96	713	12	38	612	98
v/c Ratio	0.57	0.11	0.13	0.15	0.17	0.29	0.01	0.07	0.26	0.09
Control Delay	47.4	15.4	33.4	16.2	8.5	8.1	0.0	4.7	4.1	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.4	15.4	33.4	16.2	8.5	8.1	0.0	4.7	4.1	0.5
Queue Length 50th (ft)	58	2	12	4	21	95	0	3	24	0
Queue Length 95th (ft)	90	0	25	22	29	152	0	8	57	4
Internal Link Dist (ft)		198		232		346			1013	
Turn Bay Length (ft)	100		60		250		120	220		120
Base Capacity (vph)	379	467	382	477	589	2484	1136	564	2382	1097
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	0.28	0.06	0.06	0.08	0.16	0.29	0.01	0.07	0.26	0.09

Intersection Summary

3: Douglas Street & Sycamore Street

Existing AM Peak Hour

	↖	→	↘	↙	←	↖	↘	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗	↗	↖	↗	↖
Volume (vph)	85	1	16	17	6	20	54	649	7	26	545	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.87		1.00	0.88		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1623		1770	1645		1770	3539	1583	1770	3539	1583
Flt Permitted	0.73	1.00		0.74	1.00		0.36	1.00	1.00	0.38	1.00	1.00
Satd. Flow (perm)	1367	1623		1377	1645		678	3539	1583	709	3539	1583
Peak-hour factor, PHF	0.79	0.25	0.67	0.71	0.75	0.71	0.56	0.91	0.58	0.69	0.89	0.87
Adj. Flow (vph)	108	4	24	24	8	28	96	713	12	38	612	98
RTOR Reduction (vph)	0	21	0	0	25	0	0	0	4	0	0	35
Lane Group Flow (vph)	108	7	0	24	11	0	96	713	8	38	612	63
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1		6
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	11.0	11.0		11.0	11.0		59.2	59.2	59.2	57.6	57.6	57.6
Effective Green, g (s)	11.0	11.0		11.0	11.0		59.2	59.2	59.2	57.6	57.6	57.6
Actuated g/C Ratio	0.12	0.12		0.12	0.12		0.66	0.66	0.66	0.64	0.64	0.64
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	167	198		168	201		523	2327	1041	510	2264	1013
v/s Ratio Prot		0.00			0.01		0.01	c0.20		0.00	c0.17	
v/s Ratio Perm	c0.08			0.02			0.11		0.00	0.04		0.04
v/c Ratio	0.65	0.04		0.14	0.06		0.18	0.31	0.01	0.07	0.27	0.06
Uniform Delay, d1	37.6	34.8		35.3	34.9		5.9	6.6	5.3	6.2	7.1	6.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.48	0.45	0.15
Incremental Delay, d2	8.3	0.1		0.4	0.1		0.2	0.3	0.0	0.1	0.3	0.1
Delay (s)	46.0	34.9		35.7	35.0		6.1	6.9	5.3	3.0	3.4	1.0
Level of Service	D	C		D	D		A	A	A	A	A	A
Approach Delay (s)		43.7			35.3			6.8			3.1	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	45.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

6: Douglas Street & Victoria Drive

Existing AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	127	46	96	120	61	720	44	68	651	61
v/c Ratio	0.65	0.16	0.45	0.35	0.11	0.32	0.04	0.13	0.29	0.06
Control Delay	50.2	17.3	39.5	10.7	2.6	4.0	0.2	1.4	1.4	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.2	17.3	39.5	10.7	2.6	4.0	0.2	1.4	1.4	0.1
Queue Length 50th (ft)	69	9	50	6	5	39	0	3	15	1
Queue Length 95th (ft)	52	14	68	22	9	53	0	4	19	1
Internal Link Dist (ft)		298		505		1013			1224	
Turn Bay Length (ft)	125		200		250		135	210		285
Base Capacity (vph)	341	490	376	525	630	2247	1036	592	2247	1036
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	0.37	0.09	0.26	0.23	0.10	0.32	0.04	0.11	0.29	0.06

Intersection Summary

6: Douglas Street & Victoria Drive

Existing AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	56	9	23	67	8	105	39	691	24	43	566	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.91		1.00	0.86		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1693		1770	1611		1770	3539	1583	1770	3539	1583
Flt Permitted	0.66	1.00		0.73	1.00		0.38	1.00	1.00	0.35	1.00	1.00
Satd. Flow (perm)	1230	1693		1354	1611		713	3539	1583	653	3539	1583
Peak-hour factor, PHF	0.44	0.50	0.82	0.70	0.67	0.97	0.64	0.96	0.55	0.63	0.87	0.88
Adj. Flow (vph)	127	18	28	96	12	108	61	720	44	68	651	61
RTOR Reduction (vph)	0	24	0	0	91	0	0	0	17	0	0	23
Lane Group Flow (vph)	127	22	0	96	29	0	61	720	27	68	651	38
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	14.3	14.3		14.3	14.3		60.7	56.1	56.1	60.7	56.1	56.1
Effective Green, g (s)	14.3	14.3		14.3	14.3		60.7	56.1	56.1	60.7	56.1	56.1
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.67	0.62	0.62	0.67	0.62	0.62
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	195	268		215	255		534	2205	986	497	2205	986
v/s Ratio Prot		0.01			0.02		0.01	0.20		0.01	0.18	
v/s Ratio Perm	0.10			0.07			0.07		0.02	0.09		0.02
v/c Ratio	0.65	0.08		0.45	0.11		0.11	0.33	0.03	0.14	0.30	0.04
Uniform Delay, d1	35.5	32.3		34.3	32.4		6.3	8.0	6.5	6.8	7.8	6.5
Progression Factor	1.00	1.00		1.00	1.00		0.45	0.41	0.29	0.18	0.13	0.02
Incremental Delay, d2	7.6	0.1		1.5	0.2		0.1	0.4	0.1	0.1	0.3	0.1
Delay (s)	43.1	32.4		35.7	32.6		2.9	3.7	1.9	1.4	1.3	0.2
Level of Service	D	C		D	C		A	A	A	A	A	A
Approach Delay (s)		40.2			34.0			3.5			1.2	
Approach LOS		D			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	45.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

9: Douglas Street & Mulberry Street

Existing AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	164	12	56	37	39	84	164	720	107	259	725	291
v/c Ratio	0.55	0.05	0.15	0.19	0.24	0.22	0.54	0.45	0.13	0.59	0.41	0.31
Control Delay	46.8	39.4	0.8	35.2	36.0	1.3	35.7	12.3	0.4	42.7	16.9	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	39.4	0.8	35.2	36.0	1.3	35.7	12.3	0.4	42.7	16.9	3.1
Queue Length 50th (ft)	46	7	0	21	22	0	48	68	0	72	118	0
Queue Length 95th (ft)	62	11	0	38	31	0	46	130	1	89	177	30
Internal Link Dist (ft)		394			570			1224			433	
Turn Bay Length (ft)	200		200			225	165		115	375		200
Base Capacity (vph)	305	418	515	201	162	450	305	1612	833	495	1750	929
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.03	0.11	0.18	0.24	0.19	0.54	0.45	0.13	0.52	0.41	0.31

Intersection Summary

9: Douglas Street & Mulberry Street

Existing AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	118	5	43	33	19	75	118	662	72	194	587	236
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Flt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583	1681	1754	1583	3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	1863	1583	1681	1770	1583	3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.72	0.42	0.77	0.75	0.59	0.89	0.72	0.92	0.67	0.75	0.81	0.81
Adj. Flow (vph)	164	12	56	44	32	84	164	720	107	259	725	291
RTOR Reduction (vph)	0	0	49	0	0	73	0	0	61	0	0	154
Lane Group Flow (vph)	164	12	7	37	39	11	164	720	46	259	725	137
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	7.8	11.2	11.2	8.3	11.7	11.7	8.0	39.0	39.0	11.5	42.5	42.5
Effective Green, g (s)	7.8	11.2	11.2	8.3	11.7	11.7	8.0	39.0	39.0	11.5	42.5	42.5
Actuated g/C Ratio	0.09	0.12	0.12	0.09	0.13	0.13	0.09	0.43	0.43	0.13	0.47	0.47
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	297	231	196	155	230	205	305	1533	685	438	1671	747
v/s Ratio Prot	c0.05	0.01		c0.02	0.02		0.05	c0.20		c0.08	0.20	
v/s Ratio Perm			0.00		c0.01	0.01			0.03			0.09
v/c Ratio	0.55	0.05	0.04	0.24	0.17	0.05	0.54	0.47	0.07	0.59	0.43	0.18
Uniform Delay, d1	39.4	34.7	34.7	37.9	34.8	34.3	39.2	18.1	14.9	37.0	15.8	13.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.74	0.61	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.2	0.1	0.1	0.8	0.4	0.1	1.8	1.0	0.2	2.1	0.8	0.5
Delay (s)	41.6	34.8	34.7	38.7	35.2	34.4	30.7	12.0	15.1	39.2	16.6	14.3
Level of Service	D	C	C	D	D	C	C	B	B	D	B	B
Approach Delay (s)		39.6			35.6			15.4			20.6	
Approach LOS		D			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	21.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	46.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

12: Victoria Drive & Polytainer Drive

Existing AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Volume (veh/h)	1	48	91	10	40	7
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	52	99	11	43	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)			378			
pX, platoon unblocked						
vC, conflicting volume	110				159	104
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	110				159	104
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				95	99
cM capacity (veh/h)	1480				832	950

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	53	110	51
Volume Left	1	0	43
Volume Right	0	11	8
cSH	1480	1700	848
Volume to Capacity	0.00	0.06	0.06
Queue Length 95th (ft)	0	0	5
Control Delay (s)	0.2	0.0	9.5
Lane LOS	A		A
Approach Delay (s)	0.2	0.0	9.5
Approach LOS			A

Intersection Summary			
Average Delay		2.3	
Intersection Capacity Utilization		15.4%	ICU Level of Service: A
Analysis Period (min)		15	

3: Douglas Street & Sycamore Street

Existing PM Peak Hour

										
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	135	56	100	76	85	671	56	124	1095	56
v/c Ratio	0.66	0.13	0.48	0.25	0.27	0.31	0.06	0.22	0.48	0.05
Control Delay	54.6	0.6	45.2	16.6	11.2	10.3	1.6	5.6	5.4	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.6	0.6	45.2	16.6	11.2	10.3	1.6	5.6	5.4	0.3
Queue Length 50th (ft)	82	0	59	13	20	98	0	13	82	0
Queue Length 95th (ft)	93	0	101	0	37	153	7	25	110	2
Internal Link Dist. (ft)		198		232		346			1013	
Turn Bay Length (ft)	100		60		250		120	220		120
Base Capacity (vph)	303	541	308	424	334	2177	1003	556	2269	1042
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	0.45	0.10	0.32	0.18	0.25	0.31	0.06	0.22	0.48	0.05
Intersection Summary										

3: Douglas Street & Sycamore Street

Existing PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↕	↗	↖	↕	↗
Volume (vph)	88	0	40	88	6	36	60	597	44	92	1051	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.85		1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1583		1770	1672		1770	3539	1583	1770	3539	1583
Flt Permitted	0.71	1.00		0.72	1.00		0.18	1.00	1.00	0.40	1.00	1.00
Satd. Flow (perm)	1318	1583		1342	1672		330	3539	1583	739	3539	1583
Peak-hour factor, PHF	0.65	0.25	0.71	0.88	0.25	0.69	0.71	0.89	0.79	0.74	0.96	0.82
Adj. Flow (vph)	135	0	56	100	24	52	85	671	56	124	1095	56
RTOR Reduction (vph)	0	47	0	0	44	0	0	0	22	0	0	21
Lane Group Flow (vph)	135	9	0	100	32	0	85	671	34	124	1095	35
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1		6
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	15.5	15.5		15.5	15.5		60.5	60.5	60.5	63.1	63.1	63.1
Effective Green, g (s)	15.5	15.5		15.5	15.5		60.5	60.5	60.5	63.1	63.1	63.1
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.60	0.60	0.60	0.63	0.63	0.63
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	204	245		208	259		291	2141	957	559	2233	998
v/s Ratio Prot		0.01			0.02		0.02	0.19		0.02	0.31	
v/s Ratio Perm	0.10			0.07			0.16		0.02	0.12		0.02
v/c Ratio	0.66	0.04		0.48	0.12		0.29	0.31	0.04	0.22	0.49	0.04
Uniform Delay, d1	39.8	35.9		38.6	36.4		10.0	9.6	8.0	8.2	9.9	7.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.44	0.43	0.14
Incremental Delay, d2	7.8	0.1		1.7	0.2		0.6	0.4	0.1	0.2	0.7	0.1
Delay (s)	47.6	36.0		40.3	36.6		10.6	10.0	8.0	3.8	4.9	1.0
Level of Service	D	D		D	D		B	B	A	A	A	A
Approach Delay (s)		44.2			38.7			9.9			4.6	
Approach LOS		D			D			A			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay	11.9		HCM 2000 Level of Service		B							
HCM 2000 Volume to Capacity ratio	0.52											
Actuated Cycle Length (s)	100.0		Sum of lost time (s)		15.0							
Intersection Capacity Utilization	56.4%		ICU Level of Service		B							
Analysis Period (min)	15											
c Critical Lane Group												

6: Douglas Street & Victoria Drive

Existing PM Peak Hour

										
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	119	104	116	77	30	716	79	177	1012	30
v/c Ratio	0.63	0.34	0.64	0.27	0.08	0.34	0.08	0.29	0.41	0.03
Control Delay	54.4	15.7	55.6	14.2	3.0	6.3	0.5	3.1	2.6	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.4	15.7	55.6	14.2	3.0	6.3	0.5	3.1	2.6	0.2
Queue Length 50th (ft)	72	15	71	7	2	76	1	20	68	0
Queue Length 95th (ft)	73	21	96	45	7	100	0	32	87	m0
Internal Link Dist (ft)		298		505		1013			1224	
Turn Bay Length (ft)	125		200		250		135	210		285
Base Capacity (vph)	316	455	303	439	374	2129	1004	664	2448	1118
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	0.38	0.23	0.38	0.18	0.08	0.34	0.08	0.27	0.41	0.03
<b>Intersection Summary</b>										
m Volume for 95th percentile queue is metered by upstream signal.										

6: Douglas Street & Victoria Drive

Existing PM Peak Hour

	↖	→	↗	↖	←	↖	↗	↑	↖	↗	↓	↖
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗	↖	↗	↗	↖
Volume (vph)	68	15	52	86	12	52	24	652	62	152	911	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.89		1.00	0.88		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1653		1770	1631		1770	3539	1583	1770	3539	1583
Flt Permitted	0.71	1.00		0.68	1.00		0.24	1.00	1.00	0.34	1.00	1.00
Satd. Flow (perm)	1317	1653		1262	1631		448	3539	1583	639	3539	1583
Peak-hour factor, PHF	0.57	0.58	0.67	0.74	0.92	0.81	0.79	0.91	0.78	0.86	0.90	0.86
Adj. Flow (vph)	119	26	78	116	13	64	30	716	79	177	1012	30
RTOR Reduction (vph)	0	67	0	0	55	0	0	0	33	0	0	10
Lane Group Flow (vph)	119	37	0	116	22	0	30	716	46	177	1012	20
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	14.3	14.3		14.3	14.3		61.7	58.2	58.2	75.7	67.2	67.2
Effective Green, g (s)	14.3	14.3		14.3	14.3		61.7	58.2	58.2	75.7	67.2	67.2
Actuated g/C Ratio	0.14	0.14		0.14	0.14		0.62	0.58	0.58	0.76	0.67	0.67
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	188	236		180	233		322	2059	921	625	2378	1063
v/s Ratio Prot		0.02			0.01		0.00	0.20		0.04	0.29	
v/s Ratio Perm	0.09			0.09			0.05		0.03	0.18		0.01
v/c Ratio	0.63	0.16		0.64	0.10		0.09	0.35	0.05	0.28	0.43	0.02
Uniform Delay, d1	40.4	37.6		40.5	37.2		11.8	11.0	9.0	6.2	7.5	5.4
Progression Factor	1.00	1.00		1.00	1.00		0.80	0.52	0.70	0.37	0.25	1.00
Incremental Delay, d2	6.8	0.3		7.7	0.2		0.1	0.4	0.1	0.2	0.5	0.0
Delay (s)	47.2	37.9		48.1	37.4		6.0	6.1	6.4	2.5	2.4	5.5
Level of Service	D	D		D	D		A	A	A	A	A	A
Approach Delay (s)		42.8			43.9			6.1			2.5	
Approach LOS		D			D			A			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			10.6			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.46									
Actuated Cycle Length (s)			100.0			Sum of lost time (s)			15.0			
Intersection Capacity Utilization			52.4%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

9: Douglas Street & Mulberry Street

Existing PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	399	80	133	104	104	368	32	738	96	369	928	103
v/c Ratio	0.77	0.26	0.32	0.40	0.43	0.72	0.23	0.58	0.15	0.73	0.52	0.12
Control Delay	51.5	43.3	4.2	40.7	41.3	14.9	35.2	16.4	0.9	49.6	19.5	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.5	43.3	4.2	40.7	41.3	14.9	35.2	16.4	0.9	49.6	19.5	2.1
Queue Length 50th (ft)	126	49	0	64	64	21	10	95	1	115	196	0
Queue Length 95th (ft)	168	54	0	98	80	37	19	121	0	127	305	0
Internal Link Dist (ft)		394			570			1224			433	
Turn Bay Length (ft)	200		200			225	165		115	375		200
Base Capacity (vph)	549	458	528	284	241	567	137	1266	650	549	1774	858
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.17	0.25	0.37	0.43	0.65	0.23	0.58	0.15	0.67	0.52	0.12
Intersection Summary												

9: Douglas Street & Mulberry Street

Existing PM Peak Hour

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↔	↑	↗	↖	↑	↗	↔	↑↑	↗	↖	↑↑	↗	
Volume (vph)	343	43	93	159	8	265	25	708	69	266	835	64	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	3433	1863	1583	1681	1695	1583	3433	3539	1583	3433	3539	1583	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	3433	1863	1583	1681	1770	1583	3433	3539	1583	3433	3539	1583	
Peak-hour factor, PHF	0.86	0.54	0.70	0.81	0.67	0.72	0.78	0.96	0.72	0.72	0.90	0.62	
Adj. Flow (vph)	399	80	133	196	12	368	32	738	96	369	928	103	
RTOR Reduction (vph)	0	0	111	0	0	283	0	0	63	0	0	54	
Lane Group Flow (vph)	399	80	22	104	104	85	32	738	33	369	928	49	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	
Protected Phases	7	4		3	8		5	2		1	6		
Permitted Phases			4			8			2			6	
Actuated Green, G (s)	15.1	16.2	16.2	14.2	15.3	15.3	2.4	34.8	34.8	14.8	47.2	47.2	
Effective Green, g (s)	15.1	16.2	16.2	14.2	15.3	15.3	2.4	34.8	34.8	14.8	47.2	47.2	
Actuated g/C Ratio	0.15	0.16	0.16	0.14	0.15	0.15	0.02	0.35	0.35	0.15	0.47	0.47	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	518	301	256	238	270	242	82	1231	550	508	1670	747	
v/s Ratio Prot	c0.12	0.04		c0.06	0.05		0.01	c0.21		c0.11	0.26		
v/s Ratio Perm			0.01		0.01	0.05			0.02			0.03	
v/c Ratio	0.77	0.27	0.08	0.44	0.39	0.35	0.39	0.60	0.06	0.73	0.56	0.07	
Uniform Delay, d1	40.8	36.7	35.6	39.2	38.1	37.9	48.1	26.9	21.7	40.7	18.9	14.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.53	0.21	1.00	1.00	1.00	
Incremental Delay, d2	7.0	0.5	0.1	1.3	0.9	0.9	2.9	2.1	0.2	5.1	1.3	0.2	
Delay (s)	47.7	37.2	35.7	40.5	39.0	38.8	35.1	16.4	4.7	45.8	20.2	14.5	
Level of Service	D	D	D	D	D	D	D	B	A	D	C	B	
Approach Delay (s)		43.8			39.2			15.8			26.6		
Approach LOS		D			D			B			C		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			29.0			HCM 2000 Level of Service							C
HCM 2000 Volume to Capacity ratio			0.62										
Actuated Cycle Length (s)			100.0			Sum of lost time (s)							20.0
Intersection Capacity Utilization			58.3%			ICU Level of Service							B
Analysis Period (min)			15										
c Critical Lane Group													

12: Victoria Drive & Polytainer Drive

Existing PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	1	121	59	3	14	1
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	132	64	3	15	1
<b>Pedestrians</b>						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)	378					
pX, platoon unblocked						
vC, conflicting volume	67				199	66
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	67				199	66
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				98	100
cM capacity (veh/h)	1534				789	998
<b>Direction, Lane #</b>						
	EB 1	WB 1	SB 1			
Volume Total	133	67	16			
Volume Left	1	0	15			
Volume Right	0	3	1			
cSH	1534	1700	800			
Volume to Capacity	0.00	0.04	0.02			
Queue Length 95th (ft)	0	0	2			
Control Delay (s)	0.1	0.0	9.6			
Lane LOS	A		A			
Approach Delay (s)	0.1	0.0	9.6			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			0.8			
Intersection Capacity Utilization			17.2%	ICU Level of Service	A	
Analysis Period (min)			15			

### 3: Douglas Street & Sycamore Street

Proposed AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	113	28	24	40	96	770	12	42	653	100
v/c Ratio	0.59	0.11	0.13	0.16	0.18	0.31	0.01	0.08	0.28	0.09
Control Delay	47.6	15.2	32.9	15.2	7.9	7.6	0.0	2.1	1.8	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.6	15.2	32.9	15.2	7.9	7.6	0.0	2.1	1.8	0.5
Queue Length 50th (ft)	61	2	12	4	20	100	0	3	23	0
Queue Length 95th (ft)	93	0	25	23	27	158	0	6	32	3
Internal Link Dist. (ft)		198		232		346			1013	
Turn Bay Length (ft)	100		60		250		120	220		120
Base Capacity (vph)	363	450	367	460	577	2519	1151	515	2372	1094
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	0.06	0.07	0.09	0.17	0.31	0.01	0.08	0.28	0.09

#### Intersection Summary

3: Douglas Street & Sycamore Street

Proposed AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↑↑	↗	↖	↑↑	↗
Volume (vph)	89	1	16	17	6	23	54	701	7	29	581	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.87		1.00	0.88		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1623		1770	1639		1770	3539	1583	1770	3539	1583
Flt Permitted	0.73	1.00		0.74	1.00		0.35	1.00	1.00	0.36	1.00	1.00
Satd. Flow (perm)	1362	1623		1377	1639		644	3539	1583	670	3539	1583
Peak-hour factor, PHF	0.79	0.25	0.67	0.71	0.75	0.71	0.56	0.91	0.58	0.69	0.89	0.87
Adj. Flow (vph)	113	4	24	24	8	32	96	770	12	42	653	100
RTOR Reduction (vph)	0	21	0	0	28	0	0	0	4	0	0	36
Lane Group Flow (vph)	113	7	0	24	12	0	96	770	8	42	653	64
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	11.3	11.3		11.3	11.3		60.1	60.1	60.1	57.4	57.4	57.4
Effective Green, g (s)	11.3	11.3		11.3	11.3		60.1	60.1	60.1	57.4	57.4	57.4
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.67	0.67	0.67	0.64	0.64	0.64
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	171	203		172	205		508	2363	1057	471	2257	1009
v/s Ratio Prot		0.00			0.01		0.01	0.22		0.00	0.18	
v/s Ratio Perm	0.08			0.02			0.11		0.01	0.05		0.04
v/c Ratio	0.66	0.03		0.14	0.06		0.19	0.33	0.01	0.09	0.29	0.06
Uniform Delay, d1	37.5	34.6		35.0	34.7		5.6	6.3	5.0	6.3	7.2	6.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.19	0.17	0.15
Incremental Delay, d2	9.2	0.1		0.4	0.1		0.2	0.4	0.0	0.1	0.3	0.1
Delay (s)	46.7	34.6		35.4	34.8		5.8	6.7	5.0	1.3	1.6	1.0
Level of Service	D	C		D	C		A	A	A	A	A	A
Approach Delay (s)		44.3			35.0			6.6			1.5	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	46.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

6: Douglas Street & Victoria Drive

Proposed AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	350	52	96	133	195	692	44	75	695	73
v/c Ratio	0.85	0.09	0.22	0.22	0.43	0.42	0.06	0.24	0.51	0.10
Control Delay	46.8	10.0	21.1	6.4	15.6	13.1	0.3	5.7	14.1	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	10.0	21.1	6.4	15.6	13.1	0.3	5.7	14.1	0.5
Queue Length 50th (ft)	180	8	38	9	36	70	0	6	71	0
Queue Length 95th (ft)	99	12	52	21	39	128	0	9	101	0
Internal Link Dist (ft)		298		505		1013			155	
Turn Bay Length (ft)	125		200		250		135	210		285
Base Capacity (vph)	500	698	538	718	477	1666	790	316	1363	699
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	0.70	0.07	0.18	0.19	0.41	0.42	0.06	0.24	0.51	0.10
Intersection Summary										

6: Douglas Street & Victoria Drive

Proposed AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗	↗	↖	↗	↖
Volume (vph)	154	11	25	67	17	105	125	664	24	47	605	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Flt	1.00	0.91		1.00	0.88		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1702		1770	1636		1770	3539	1583	1770	3539	1583
Flt Permitted	0.67	1.00		0.72	1.00		0.29	1.00	1.00	0.30	1.00	1.00
Satd. Flow (perm)	1252	1702		1347	1636		547	3539	1583	566	3539	1583
Peak-hour factor, PHF	0.44	0.50	0.82	0.70	0.67	0.97	0.64	0.96	0.55	0.63	0.87	0.88
Adj. Flow (vph)	350	22	30	96	25	108	195	692	44	75	695	73
RTOR Reduction (vph)	0	20	0	0	72	0	0	0	24	0	0	46
Lane Group Flow (vph)	350	32	0	96	61	0	195	692	20	75	695	27
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	29.6	29.6		29.6	29.6		50.4	41.4	41.4	37.7	33.7	33.7
Effective Green, g (s)	29.6	29.6		29.6	29.6		50.4	41.4	41.4	37.7	33.7	33.7
Actuated g/C Ratio	0.33	0.33		0.33	0.33		0.56	0.46	0.46	0.42	0.37	0.37
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	411	559		443	538		465	1627	728	290	1325	592
v/s Ratio Prot		0.02			0.04		0.05	0.20		0.01	0.20	
v/s Ratio Perm	0.28			0.07			0.18		0.01	0.10		0.02
v/c Ratio	0.85	0.06		0.22	0.11		0.42	0.43	0.03	0.26	0.52	0.05
Uniform Delay, d1	28.2	20.7		21.8	21.0		18.2	16.3	13.3	22.0	21.9	17.9
Progression Factor	1.00	1.00		1.00	1.00		0.72	0.69	0.14	0.29	0.55	1.00
Incremental Delay, d2	15.5	0.0		0.2	0.1		0.6	0.8	0.1	0.4	1.4	0.1
Delay (s)	43.7	20.7		22.1	21.1		13.8	12.1	2.0	6.9	13.4	18.1
Level of Service	D	C		C	C		B	B	A	A	B	B
Approach Delay (s)		40.7			21.5			11.9			13.2	
Approach LOS		D			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

9: Douglas Street & Mulberry Street

Proposed AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	164	12	60	43	45	84	167	788	116	259	837	291
v/c Ratio	0.55	0.05	0.16	0.21	0.28	0.22	0.49	0.49	0.14	0.59	0.49	0.32
Control Delay	46.8	39.4	0.9	35.8	37.1	1.3	32.9	12.2	0.5	42.7	18.5	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.8	39.4	0.9	35.8	37.1	1.3	32.9	12.2	0.5	42.7	18.5	3.2
Queue Length 50th (ft)	46	7	0	24	26	0	46	88	0	72	146	0
Queue Length 95th (ft)	62	11	0	43	34	0	50	164	0	89	214	30
Internal Link Dist (ft)		394			570			510			433	
Turn Bay Length (ft)	200		200			225	165		115	375		200
Base Capacity (vph)	305	418	515	202	161	450	343	1612	833	495	1710	915
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.03	0.12	0.21	0.28	0.19	0.49	0.49	0.14	0.52	0.49	0.32
Intersection Summary												

9: Douglas Street & Mulberry Street

Proposed AM Peak Hour

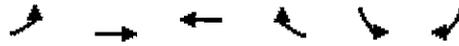


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↑	↗	↖	↖	↗	↔	↕	↗	↖	↕	↗
Volume (vph)	118	5	46	42	19	75	120	725	78	194	678	236
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583	1681	1744	1583	3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	1863	1583	1681	1730	1583	3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.72	0.42	0.77	0.75	0.59	0.89	0.72	0.92	0.67	0.75	0.81	0.81
Adj. Flow (vph)	164	12	60	56	32	84	167	788	116	259	837	291
RTOR Reduction (vph)	0	0	53	0	0	73	0	0	66	0	0	157
Lane Group Flow (vph)	164	12	7	43	45	11	167	788	50	259	837	134
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	7.8	11.2	11.2	8.3	11.7	11.7	9.0	39.0	39.0	11.5	41.5	41.5
Effective Green, g (s)	7.8	11.2	11.2	8.3	11.7	11.7	9.0	39.0	39.0	11.5	41.5	41.5
Actuated g/C Ratio	0.09	0.12	0.12	0.09	0.13	0.13	0.10	0.43	0.43	0.13	0.46	0.46
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	297	231	196	155	226	205	343	1533	685	438	1631	729
v/s Ratio Prot	c0.05	0.01		c0.03	0.02		0.05	c0.22		0.08	c0.24	
v/s Ratio Perm			0.00		c0.01	0.01			0.03			0.08
v/c Ratio	0.55	0.05	0.04	0.28	0.20	0.05	0.49	0.51	0.07	0.59	0.51	0.18
Uniform Delay, d1	39.4	34.7	34.7	38.1	35.0	34.3	38.3	18.6	14.9	37.0	17.1	14.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.74	0.58	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.2	0.1	0.1	1.0	0.4	0.1	1.0	1.1	0.2	2.1	1.2	0.6
Delay (s)	41.6	34.8	34.7	39.0	35.4	34.4	39.2	11.9	15.1	39.2	18.3	14.8
Level of Service	D	C	C	D	D	C	C	B	B	D	B	B
Approach Delay (s)		39.5			35.8			15.0			21.5	
Approach LOS		D			D			B			C	

Intersection Summary		
HCM 2000 Control Delay	21.4	HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio	0.49	
Actuated Cycle Length (s)	90.0	Sum of lost time (s) 20.0
Intersection Capacity Utilization	48.1%	ICU Level of Service A
Analysis Period (min)	15	
c Critical Lane Group		

12: Victoria Drive & Polytainer Drive

Proposed AM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		←	←		←	
Volume (veh/h)	5	48	91	115	142	9
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	52	99	125	154	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)			378			
pX, platoon unblocked	0.97				0.97	0.97
vC, conflicting volume	224				224	161
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	185				186	121
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				80	99
cM capacity (veh/h)	1348				777	903
Direction, Lane #						
	EB 1	WB 1	SB 1			
Volume Total	58	224	164			
Volume Left	5	0	154			
Volume Right	0	125	10			
cSH	1348	1700	783			
Volume to Capacity	0.00	0.13	0.21			
Queue Length 95th (ft)	0	0	20			
Control Delay (s)	0.8	0.0	10.8			
Lane LOS	A		B			
Approach Delay (s)	0.8	0.0	10.8			
Approach LOS			B			
Intersection Summary						
Average Delay			4.1			
Intersection Capacity Utilization		26.9%		ICU Level of Service		A
Analysis Period (min)			15			

14: Douglas Street & North Entrance

Proposed AM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑↑	↑↑	↗
Volume (veh/h)	0	37	0	923	686	80
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	40	0	1003	746	87
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (ft)				714	590	
pX, platoon unblocked	0.92	0.86	0.86			
vC, conflicting volume	1247	373	833			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	530	0	476			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	96	100			
cM capacity (veh/h)	438	931	929			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	40	502	502	373	373	87
Volume Left	0	0	0	0	0	0
Volume Right	40	0	0	0	0	87
cSH	931	1700	1700	1700	1700	1700
Volume to Capacity	0.04	0.30	0.30	0.22	0.22	0.05
Queue Length 95th (ft)	3	0	0	0	0	0
Control Delay (s)	9.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A					
Approach Delay (s)	9.0	0.0		0.0		
Approach LOS	A					

Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			29.0%	ICU Level of Service		A
Analysis Period (min)			15			

16: Douglas Street & South Entrance

Proposed AM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑↑	↑↑	↗
Volume (veh/h)	0	26	0	923	690	33
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	28	0	1003	750	36
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				235	1069	
pX, platoon unblocked	0.93	0.89	0.89			
vC, conflicting volume	1252	375	786			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	588	49	511			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	97	100			
cM capacity (veh/h)	410	898	935			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	28	502	502	375	375	36
Volume Left	0	0	0	0	0	0
Volume Right	28	0	0	0	0	36
cSH	898	1700	1700	1700	1700	1700
Volume to Capacity	0.03	0.30	0.30	0.22	0.22	0.02
Queue Length 95th (ft)	2	0	0	0	0	0
Control Delay (s)	9.1	0.0	0.0	0.0	0.0	0.0
Lane LOS	A					
Approach Delay (s)	9.1	0.0		0.0		
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.1			
Intersection Capacity Utilization			29.1%		ICU Level of Service	A
Analysis Period (min)			15			

3: Douglas Street & Sycamore Street

Proposed PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	114	60	124	63	107	701	76	139	1245	56
v/c Ratio	0.60	0.14	0.65	0.23	0.38	0.32	0.07	0.26	0.56	0.05
Control Delay	52.2	0.7	55.3	13.8	12.4	9.7	2.4	3.7	3.5	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.2	0.7	55.3	13.8	12.4	9.7	2.4	3.7	3.5	0.2
Queue Length 50th (ft)	69	0	75	5	25	100	0	11	57	0
Queue Length 95th (ft)	102	0	97	27	32	155	5	m17	78	m0
Internal Link Dist (ft)		198		232		346			1013	
Turn Bay Length (ft)	100		60		250		120	220		120
Base Capacity (vph)	266	497	267	367	311	2217	1020	533	2219	1021
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	0.43	0.12	0.46	0.17	0.34	0.32	0.07	0.26	0.56	0.05

Intersection Summary

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

### 3: Douglas Street & Sycamore Street

Proposed PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	→	↔	↔	→	↔	↔	↑↑	↔	↔	↑↑	↔
Volume (vph)	90	0	40	88	6	39	60	638	44	96	1108	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.85		1.00	0.87		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1583		1770	1619		1770	3539	1583	1770	3539	1583
Flt Permitted	0.72	1.00		0.72	1.00		0.14	1.00	1.00	0.39	1.00	1.00
Satd. Flow (perm)	1334	1583		1337	1619		256	3539	1583	717	3539	1583
Peak-hour factor, PHF	0.79	0.25	0.67	0.71	0.75	0.71	0.56	0.91	0.58	0.69	0.89	0.87
Adj. Flow (vph)	114	0	60	124	8	55	107	701	76	139	1245	56
RTOR Reduction (vph)	0	51	0	0	47	0	0	0	28	0	0	21
Lane Group Flow (vph)	114	9	0	124	16	0	107	701	48	139	1245	35
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	14.3	14.3		14.3	14.3		62.7	62.7	62.7	62.8	62.8	62.8
Effective Green, g (s)	14.3	14.3		14.3	14.3		62.7	62.7	62.7	62.8	62.8	62.8
Actuated g/C Ratio	0.14	0.14		0.14	0.14		0.63	0.63	0.63	0.63	0.63	0.63
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	190	226		191	231		280	2218	992	534	2222	994
v/s Ratio Prot		0.01			0.01		0.03	0.20		0.02	0.35	
v/s Ratio Perm	0.09			0.09			0.21		0.03	0.14		0.02
v/c Ratio	0.60	0.04		0.65	0.07		0.38	0.32	0.05	0.26	0.56	0.04
Uniform Delay, d1	40.2	36.9		40.5	37.1		10.5	8.7	7.2	8.6	10.7	7.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.26	0.23	0.07
Incremental Delay, d2	5.0	0.1		7.4	0.1		0.9	0.4	0.1	0.2	0.8	0.0
Delay (s)	45.2	37.0		47.9	37.2		11.3	9.1	7.3	2.5	3.3	0.5
Level of Service	D	D		D	D		B	A	A	A	A	A
Approach Delay (s)		42.4			44.3			9.2			3.1	
Approach LOS		D			D			A			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay	10.5			HCM 2000 Level of Service			B					
HCM 2000 Volume to Capacity ratio	0.56											
Actuated Cycle Length (s)	100.0			Sum of lost time (s)			15.0					
Intersection Capacity Utilization	58.1%			ICU Level of Service			B					
Analysis Period (min)	15											
c Critical Lane Group												

6: Douglas Street & Victoria Drive

Proposed PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NET	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	477	121	123	82	159	646	113	241	1114	39
v/c Ratio	0.92	0.17	0.25	0.12	0.80	0.58	0.19	0.55	0.82	0.06
Control Delay	54.1	9.0	21.0	8.2	56.9	24.4	1.8	17.7	25.6	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.1	9.0	21.0	8.2	56.9	24.4	1.8	17.7	25.6	1.2
Queue Length 50th (ft)	271	19	49	10	58	195	1	47	338	0
Queue Length 95th (ft)	144	16	67	23	61	227	0	47	297	m2
Internal Link Dist (ft)		298		505		1013			155	
Turn Bay Length (ft)	125		200		250		135	210		285
Base Capacity (vph)	550	754	531	736	198	1117	589	442	1365	657
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	0.87	0.16	0.23	0.11	0.80	0.58	0.19	0.55	0.82	0.06

Intersection Summary

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

6: Douglas Street & Victoria Drive

Proposed PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↑↑	↖	↖	↑↑	↖
Volume (vph)	210	25	58	86	19	52	102	620	62	152	969	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Flt	1.00	0.91		1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1699		1770	1679		1770	3539	1583	1770	3539	1583
Flt Permitted	0.70	1.00		0.68	1.00		0.13	1.00	1.00	0.29	1.00	1.00
Satd. Flow (perm)	1311	1699		1265	1679		236	3539	1583	531	3539	1583
Peak-hour factor, PHF	0.44	0.50	0.82	0.70	0.67	0.97	0.64	0.96	0.55	0.63	0.87	0.88
Adj. Flow (vph)	477	50	71	123	28	54	159	646	113	241	1114	39
RTOR Reduction (vph)	0	43	0	0	33	0	0	0	77	0	0	24
Lane Group Flow (vph)	477	78	0	123	49	0	159	646	36	241	1114	15
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	39.4	39.4		39.4	39.4		38.6	31.6	31.6	50.6	38.6	38.6
Effective Green, g (s)	39.4	39.4		39.4	39.4		38.6	31.6	31.6	50.6	38.6	38.6
Actuated g/C Ratio	0.39	0.39		0.39	0.39		0.39	0.32	0.32	0.51	0.39	0.39
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	516	669		498	661		198	1118	500	442	1366	611
v/s Ratio Prot		0.05			0.03		0.06	0.18		0.08	0.31	
v/s Ratio Perm	0.36			0.10			0.25		0.02	0.20		0.01
v/c Ratio	0.92	0.12		0.25	0.07		0.80	0.58	0.07	0.55	0.82	0.02
Uniform Delay, d1	28.9	19.2		20.3	18.9		41.1	28.6	23.9	26.1	27.5	19.0
Progression Factor	1.00	1.00		1.00	1.00		0.85	0.75	0.29	0.55	0.70	0.95
Incremental Delay, d2	22.4	0.1		0.3	0.0		19.9	2.1	0.3	1.2	5.0	0.1
Delay (s)	51.3	19.3		20.6	19.0		54.7	23.6	7.2	15.5	24.3	18.1
Level of Service	D	B		C	B		D	C	A	B	C	B
Approach Delay (s)		44.8			19.9			26.9			22.6	
Approach LOS		D			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	28.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	63.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

9: Douglas Street & Mulberry Street

Proposed PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	476	102	123	117	118	298	39	876	116	355	1119	79
v/c Ratio	0.84	0.51	0.37	0.38	0.38	0.67	0.28	0.67	0.17	0.75	0.63	0.09
Control Delay	54.9	50.3	4.5	40.9	40.9	14.3	34.0	14.8	1.9	51.9	21.1	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.9	50.3	4.5	40.9	40.9	14.3	34.0	14.8	1.9	51.9	21.1	0.9
Queue Length 50th (ft)	152	62	0	74	75	11	12	143	1	110	249	0
Queue Length 95th (ft)	160	49	0	103	80	85	m17	m186	m5	131	327	1
Internal Link Dist (ft)		394			570			510			433	
Turn Bay Length (ft)	200		200			225	165		115	375		200
Base Capacity (vph)	583	372	464	307	309	494	137	1312	669	492	1789	865
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.27	0.27	0.38	0.38	0.60	0.28	0.67	0.17	0.72	0.63	0.09

Intersection Summary

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

9: Douglas Street & Mulberry Street

Proposed PM Peak Hour

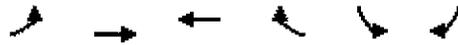


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑	↗	↖	↑	↗	↔↔	↕↕	↗	↔↔	↕↕	↗
Volume (vph)	343	43	95	166	8	265	28	806	78	266	906	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583	1681	1695	1583	3433	3539	1583	3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	0.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	1863	1583	1681	0	1583	3433	3539	1583	3433	3539	1583
Peak-hour factor, PHF	0.72	0.42	0.77	0.75	0.59	0.89	0.72	0.92	0.67	0.75	0.81	0.81
Adj. Flow (vph)	476	102	123	221	14	298	39	876	116	355	1119	79
RTOR Reduction (vph)	0	0	110	0	0	245	0	0	73	0	0	41
Lane Group Flow (vph)	476	102	13	117	118	53	39	876	43	355	1119	38
Turn Type	Prot	NA	Perm									
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	16.5	10.8	10.8	18.2	18.2	12.5	2.4	37.1	37.1	13.9	48.6	48.6
Effective Green, g (s)	16.5	10.8	10.8	18.2	18.2	12.5	2.4	37.1	37.1	13.9	48.6	48.6
Actuated g/C Ratio	0.16	0.11	0.11	0.18	0.18	0.12	0.02	0.37	0.37	0.14	0.49	0.49
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	566	201	170	305	308	197	82	1312	587	477	1719	769
v/s Ratio Prot	0.14	0.05		0.07	0.07		0.01	0.25		0.10	0.32	
v/s Ratio Perm			0.01			0.03			0.03			0.02
v/c Ratio	0.84	0.51	0.08	0.38	0.38	0.27	0.48	0.67	0.07	0.74	0.65	0.05
Uniform Delay, d1	40.5	42.1	40.1	36.0	36.0	39.6	48.2	26.3	20.3	41.3	19.3	13.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.64	0.47	0.43	1.00	1.00	1.00
Incremental Delay, d2	10.9	2.0	0.2	0.8	0.8	0.7	3.3	2.1	0.2	6.2	1.9	0.1
Delay (s)	51.3	44.1	40.3	36.8	36.8	40.4	34.2	14.4	8.9	47.6	21.3	13.7
Level of Service	D	D	D	D	D	D	C	B	A	D	C	B
Approach Delay (s)		48.4			38.8			14.5			26.9	
Approach LOS		D			D			B			C	

Intersection Summary	
HCM 2000 Control Delay	29.1
HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69
Actuated Cycle Length (s)	100.0
Sum of lost time (s)	20.0
Intersection Capacity Utilization	61.0%
ICU Level of Service	B
Analysis Period (min)	15
c Critical Lane Group	

12: Victoria Drive & Polytainer Drive

Proposed PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Volume (veh/h)	4	121	59	96	172	5
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	132	64	104	187	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)			378			
pX, platoon unblocked	0.97				0.97	0.97
vC, conflicting volume	168				257	116
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	126				216	72
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				75	99
cM capacity (veh/h)	1415				745	960

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	136	168	192
Volume Left	4	0	187
Volume Right	0	104	5
cSH	1415	1700	750
Volume to Capacity	0.00	0.10	0.26
Queue Length 95th (ft)	0	0	25
Control Delay (s)	0.3	0.0	11.4
Lane LOS	A		B
Approach Delay (s)	0.3	0.0	11.4
Approach LOS			B

Intersection Summary			
Average Delay		4.5	
Intersection Capacity Utilization		26.1%	ICU Level of Service A
Analysis Period (min)		15	

14: Douglas Street & North Entrance

Proposed PM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑↑	↑↑	↗
Volume (veh/h)	0	47	0	912	1098	69
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	51	0	991	1193	75
<b>Pedestrians</b>						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				714	590	
pX, platoon unblocked	0.84	0.78	0.78			
vC, conflicting volume	1689	597	1268			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	742	0	776			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	94	100			
cM capacity (veh/h)	297	844	651			
<b>Direction, Lane #</b>						
	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	51	496	496	597	597	75
Volume Left	0	0	0	0	0	0
Volume Right	51	0	0	0	0	75
cSH	844	1700	1700	1700	1700	1700
Volume to Capacity	0.06	0.29	0.29	0.35	0.35	0.04
Queue Length 95th (ft)	5	0	0	0	0	0
Control Delay (s)	9.5	0.0	0.0	0.0	0.0	0.0
Lane LOS	A					
Approach Delay (s)	9.5	0.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay	0.2					
Intersection Capacity Utilization	40.4%			ICU Level of Service	A	
Analysis Period (min)	15					

16: Douglas Street & South Entrance

Proposed PM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑↑	↑↑	↗
Volume (veh/h)	0	53	0	912	1100	45
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	58	0	991	1196	49
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				235	1069	
pX, platoon unblocked	0.87	0.80	0.80			
vC, conflicting volume	1691	598	1245			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	749	0	801			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	93	100			
cM capacity (veh/h)	302	865	653			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	58	496	496	598	598	49
Volume Left	0	0	0	0	0	0
Volume Right	58	0	0	0	0	49
cSH	865	1700	1700	1700	1700	1700
Volume to Capacity	0.07	0.29	0.29	0.35	0.35	0.03
Queue Length 95th (ft)	5	0	0	0	0	0
Control Delay (s)	9.5	0.0	0.0	0.0	0.0	0.0
Lane LOS	A					
Approach Delay (s)	9.5	0.0		0.0		
Approach LOS	A					

Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			40.4%	ICU Level of Service		A
Analysis Period (min)			15			