

final report

June 16, 2021

Traffic Impact Study

*Jaggers
Indian Lake Drive
Louisville, KY*

Prepared for

Louisville Metro Planning Commission
Kentucky Transportation Cabinet



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INTRODUCTION

The development plan for Jagers on Indian Lake Drive in Louisville, KY shows a restaurant with 2,824 square feet. **Figure 1** displays a map of the site. Access to the site will be from a full access driveway on Indian Lake Drive. This driveway is shared with Aloft Hotel. The purpose of this study is to examine the traffic impacts of the development upon the adjacent highway system. For this study, the impact area was defined to be the intersection of Westport Road with Indian Lake Drive, and Indian Lake Drive at Aloft/Aldi entrance.

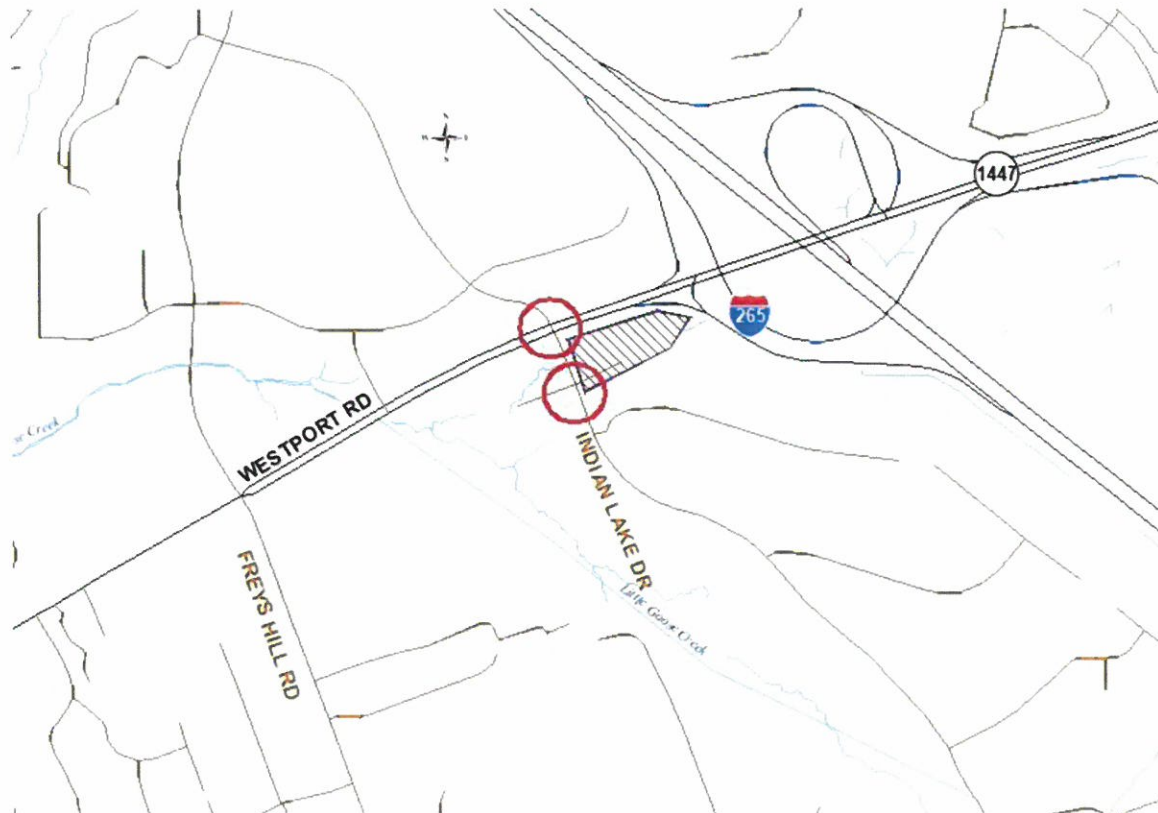


Figure 1. Site Map

EXISTING CONDITIONS

Westport Road, KY 1447, is maintained by the Kentucky Transportation Cabinet (KYTC) with an estimated 2021 ADT of 38,700 vehicles per day between Hurstbourne Parkway and I 265, as estimated from the 2019 count at station 096. The road is a four-lane highway with twelve-foot lanes, a center turn lane and eight-foot paved shoulders. The speed limit is 45 mph. There are sidewalks west of Indian Lake Drive and to the Aloft Hotel. The intersection with Indian Springs Drive is controlled with a traffic signal. There are dual left turn lanes on the southbound approach and a left turn lanes on the east and westbound approaches. All approaches have right turn lanes.

Indian Lake Drive has two twenty-foot lanes with an eighteen-foot median. There are sidewalks on both sides. The posted speed limit is 25 mph. The intersection with Aloft and Aldi is controlled with a stop sign for Aloft and Aldi.

Peak hour traffic counts were obtained February 25, 2021. The a.m. peak hour occurred between 7:45 and 8:45 a.m. The p.m. peak occurred between 4:45 and 5:45 p.m. for Westport Road. **Figure 2** illustrates the existing a.m. and p.m. peak hour traffic volumes. The full counts are included in the appendix.

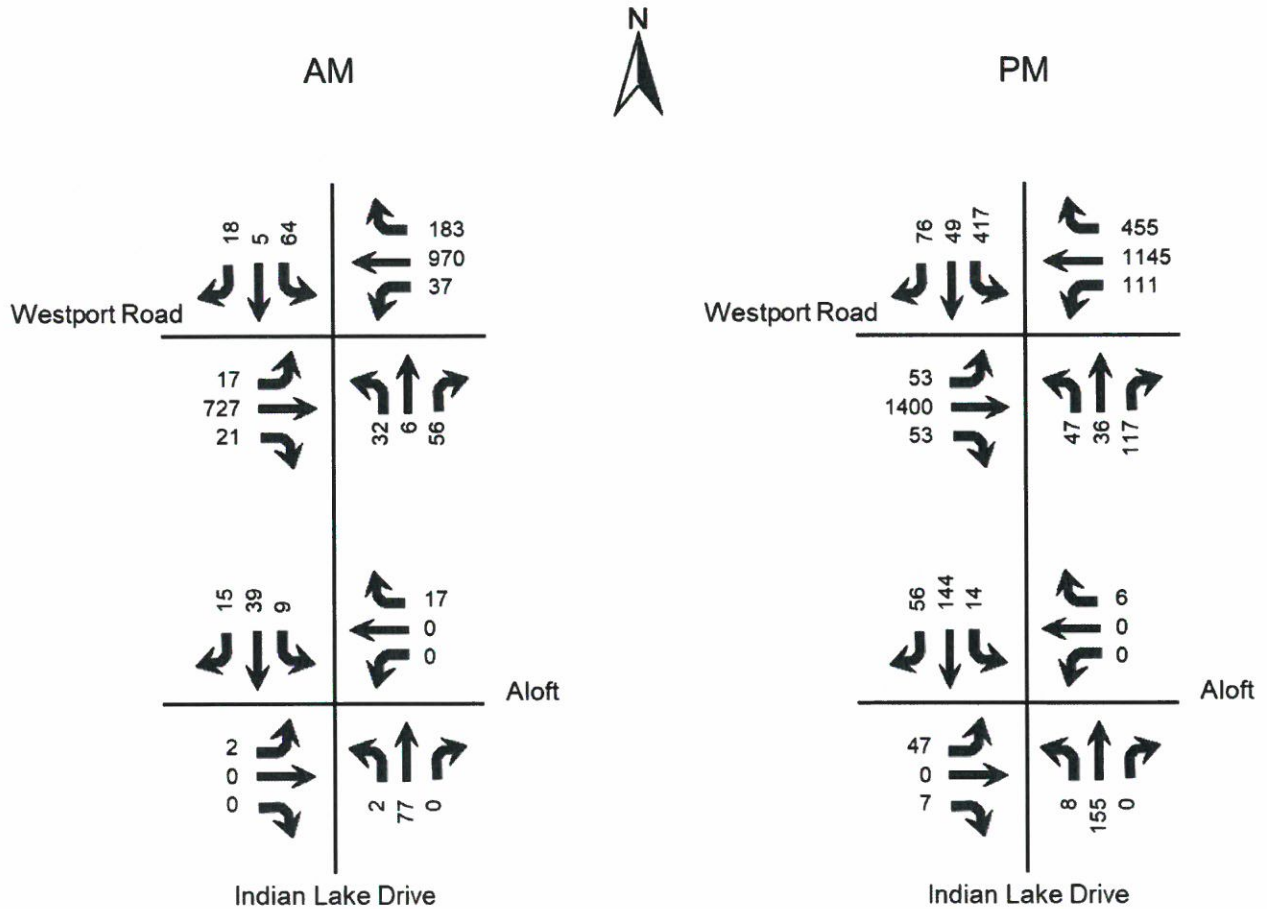


Figure 2. Existing (2021) Peak Hour Volumes

FUTURE CONDITIONS

The project completion date is 2022. The 2021 count is 15% below a KYTC count from December 2019. The 2021 volumes by 15.5% to reflect pre-Covid volumes and an annual growth rate of 0.5 percent for 2021 to 2022. This is based upon a review of historical traffic counts at station 096. **Figure 3** displays the 2022 No Build peak hour volumes.

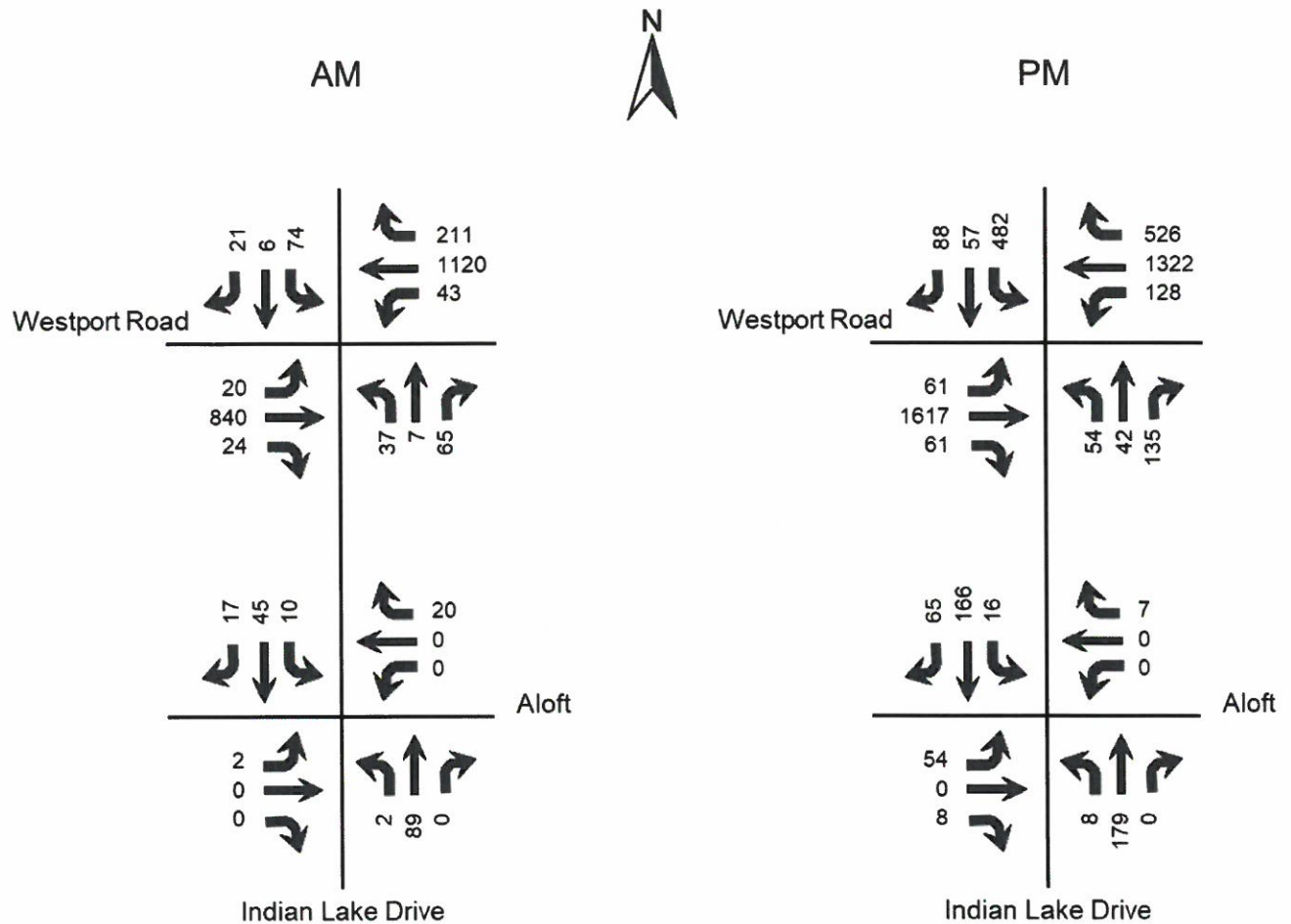


Figure 3. No Build 2022 Peak Hour Volumes

TRIP GENERATION

The Institute of Transportation Engineers Trip Generation Manual, 10th Edition contains trip generation rates for a wide range of land uses. The land use of “Fast-Food Restaurant with Drive-Through Window (934)” was reviewed and determined to be the best match. The trip generation results are listed in **Table 1**. The new trips were assigned to the highway network with the percentages shown in **Figure 4**. **Figure 5** shows the trips generated by this development and distributed throughout the road network during the peak hours. **Figure 6** displays the individual turning movements for the peak hours when the development is completed.

Table 1. Peak Hour Trips Generated by Site

Land Use	A.M. Peak Hour			P.M. Peak Hour		
	Trips	In	Out	Trips	In	Out
Fast-Food (2,824 sq. ft.)	113	58	55	92	48	44
Pass-by	55	28	27	46	24	22
New Trips	58	30	28	46	24	22

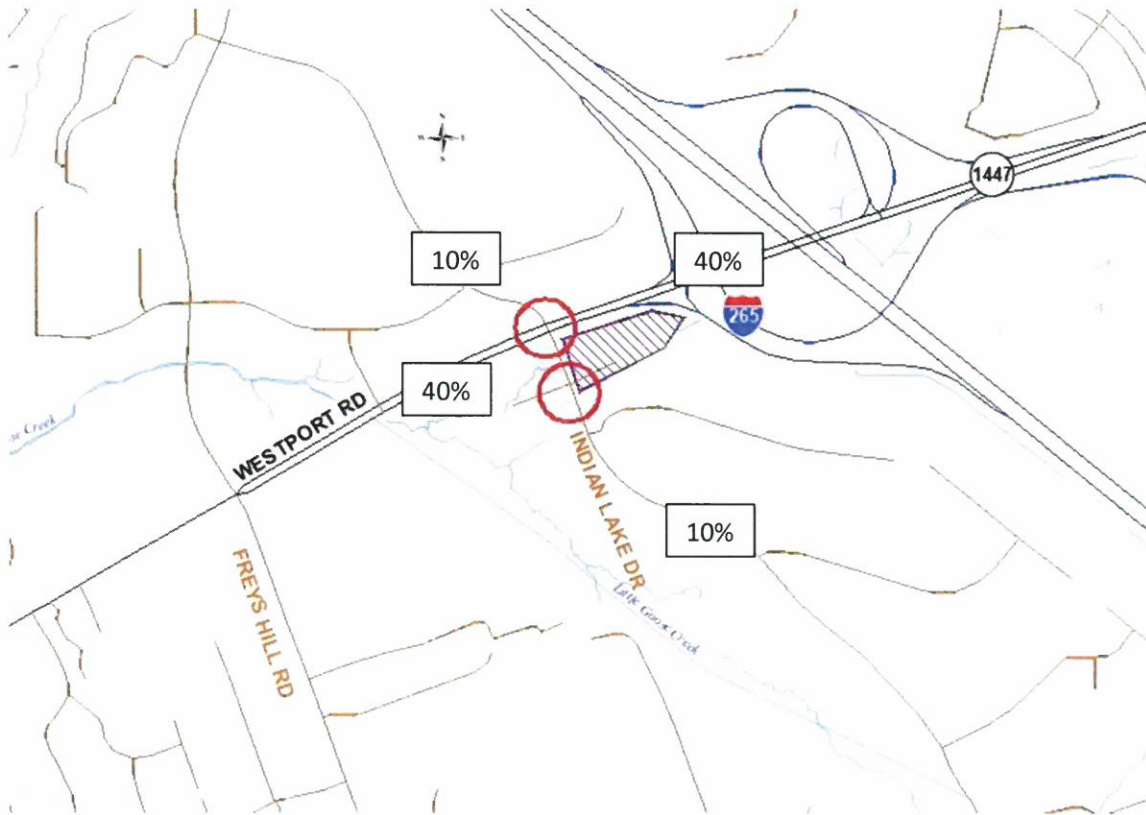


Figure 4. Trip Distribution Percentages

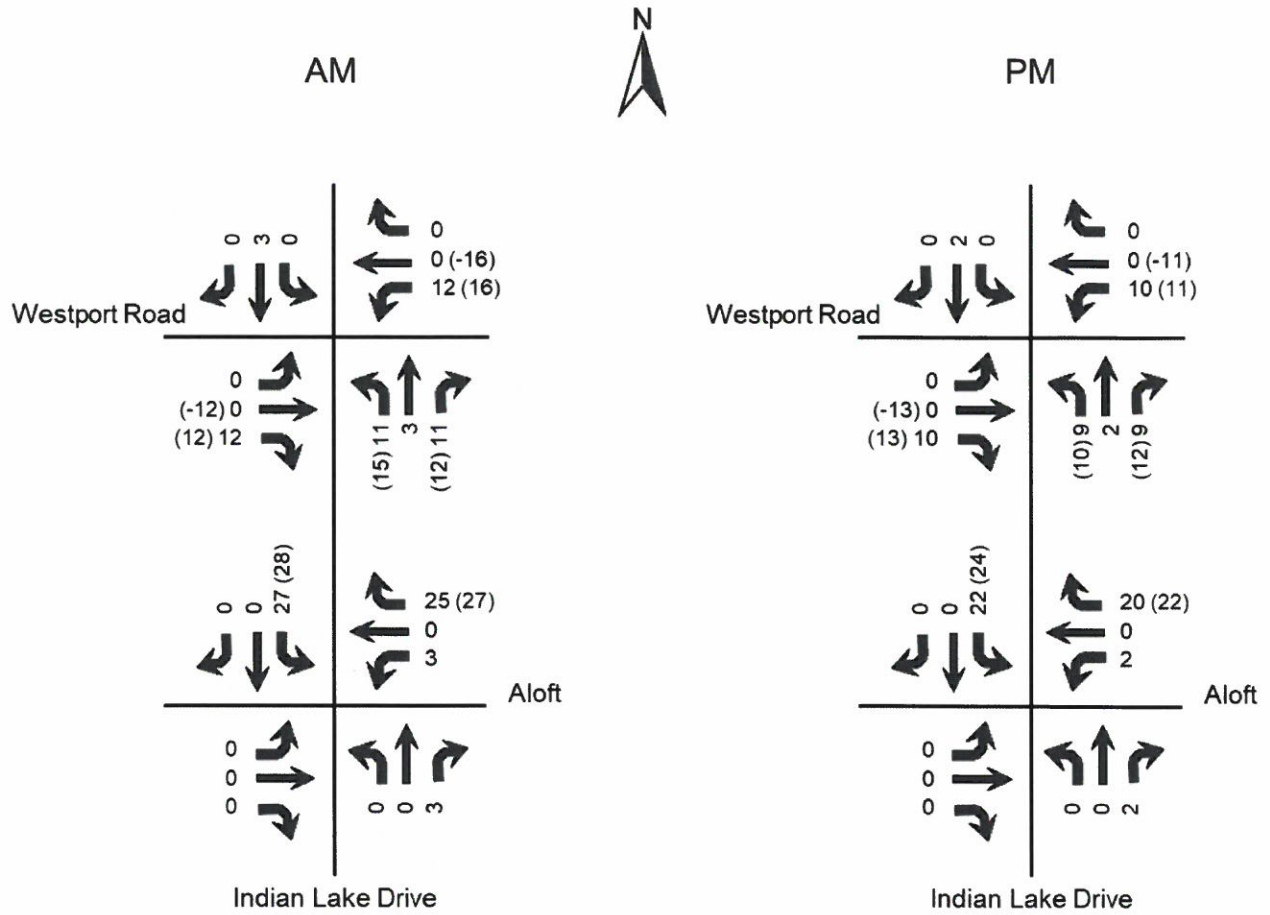


Figure 5. Peak Hour Trips Generated by Site

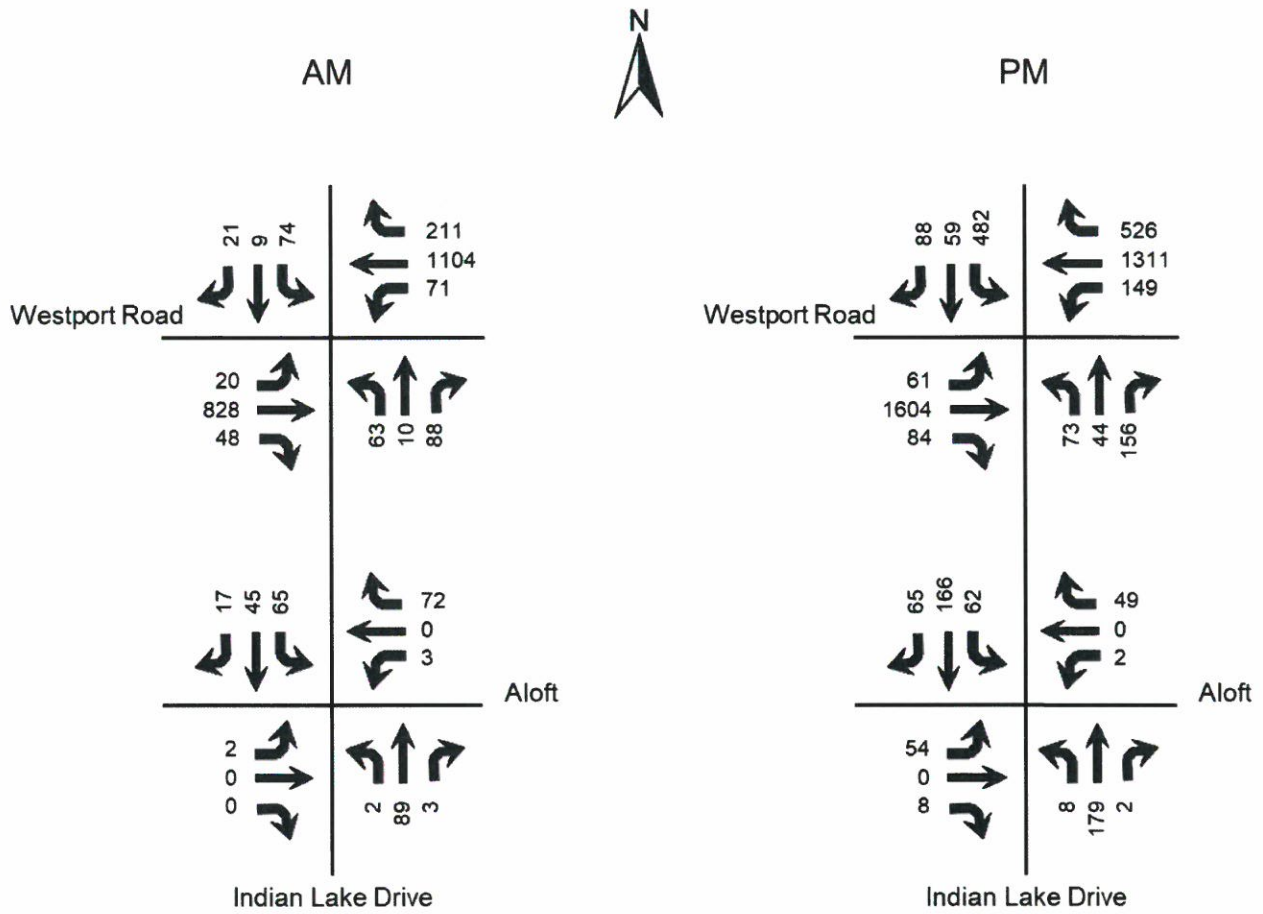


Figure 6. Build 2022 Peak Hour Volumes

ANALYSIS

The qualitative measure of operation for a roadway facility or intersection is evaluated by assigning a “Level of Service”. Level of Service is a ranking scale from A through F, “A” is the best operating condition and “F” is the worst. Level of Service results depend upon the facility that is analyzed. In this case, the Level of Service is based upon the total delay experienced at an intersection.

To evaluate the impact of the proposed development, the vehicle delays at the intersections were determined using procedures detailed in the Highway Capacity Manual, 6th edition. Future delays and Level of Service were determined for the intersections using the HCS Streets (version 7.9.5) software. The delays and Level of Service are summarized in **Table 2**.

Table 2. Peak Hour Level of Service

Approach	A.M.			P.M.		
	2021	2022 No Build	2022 Build	2021	2022 No Build	2022 Build
Westport Road at Indian Lake Drive	B 13.4	B 14.7	B 16.6	D 37.0	D 42.6	D 44.2
Westport Road Eastbound	A 9.3	B 10.5	B 12.0	C 30.4	D 36.3	D 36.6
Westport Road Westbound	A 9.0	B 10.6	B 11.8	C 28.8	C 33.9	D 35.1
Indian Lake Drive Northbound	D 43.3	D 43.1	D 45.7	E 59.3	E 64.7	E 79.2
Towne Center Drive Southbound	E 76.5	E 76.4	E 76.4	E 72.5	E 79.1	E 79.0
Indian Lake Drive at Entrances						
Aldi Eastbound	B 10.4	B 10.6	B 12.3	B 11.2	B 11.7	B 13.2
Aloft Westbound	A 8.8	A 8.8	A 9.2	A 9.1	A 9.2	A 9.6
Indian Lake Drive Northbound	A 7.3	A 7.3	A 7.3	A 7.6	A 7.7	A 7.7
Indian Lake Drive Southbound	A 7.4	A 7.4	A 7.5	A 8.0	A 8.0	A 7.8

Key: Level of Service, Delay in seconds per vehicle

The entrance was evaluated for turn lanes using the Kentucky Transportation Cabinet [Highway Design Guidance Manual](#) dated July 2020. The volumes do not meet the thresholds for turn lanes at the entrance on Indian Lake Drive.

CONCLUSIONS

Based upon the volume of traffic generated by the development and the amount of traffic forecasted for the year 2022 there will be an impact to the existing highway network. The delays experienced in the area will increase within acceptable limits. No turn lanes are recommended at the entrance.

APPENDIX

Jagers
Indian Lake Drive
Traffic Impact Study

Traffic Counts

Louisville, KY
Classified Turn Movement Count

Site 1 of 2
Indian Lake Dr
Towne Center Dr
KY-1447 Westport Rd (West)
KY-1447 Westport Rd (East)

Lat/Long
38,296176°, -85,553341°

Date
Thursday, February 25, 2021

Weather
Fair
43°F



Marr Traffic Inc
www.marrtraffic.com

0700 - 0900 (Weekday 2h Session) (25-02-2021)
All vehicles

TIME	Northbound					Southbound					Eastbound					Westbound					int	Total
	Indian Lake Dr					Towne Center Dr					KY-1447 Westport Rd (West)					KY-1447 Westport Rd (East)						
	Left	Thru	Right	U-Turn	App Total	Left	Thru	Right	U-Turn	App Total	Left	Thru	Right	U-Turn	App Total	Left	Thru	Right	U-Turn	App Total		
0700 - 0715	7	2	12	0	21	11	0	4	0	15	4	98	4	0	106	1	156	19	0	176	318	
0715 - 0730	7	1	16	0	24	13	1	4	0	18	2	136	3	0	141	1	215	20	0	236	419	
0730 - 0745	9	7	11	0	27	19	0	3	0	22	7	144	3	0	154	4	245	33	0	282	485	
0745 - 0800	8	1	14	0	23	11	0	3	0	14	9	220	4	0	233	10	274	54	0	338	608	
Hourly Total	31	11	53	0	95	54	1	14	0	69	22	598	14	0	634	16	890	126	0	1032	1830	
0800 - 0815	9	4	17	0	30	22	0	6	0	28	5	206	5	0	216	6	201	32	0	239	513	
0815 - 0830	12	1	11	0	24	14	1	8	0	23	3	161	9	0	173	12	247	48	0	307	527	
0830 - 0845	3	0	14	0	17	17	4	1	0	22	0	140	3	0	143	9	248	49	0	306	488	
0845 - 0900	5	6	7	0	18	21	2	4	0	27	11	173	7	0	191	10	217	70	0	297	533	
Hourly Total	29	11	49	0	89	74	7	19	0	100	19	680	24	0	723	37	913	199	0	1149	2061	
Grand Total	60	22	102	0	184	128	8	33	0	169	41	1278	38	0	1357	53	1803	325	0	2181	3891	
Approach %	32.61	11.96	55.43	0.00	-	75.74	4.73	19.53	0.00	-	3.02	94.18	2.80	0.00	-	2.43	82.67	14.90	0.00	-	-	
Intersection %	1.54	0.57	2.62	0.00	4.73	3.29	0.21	0.85	0.00	4.34	1.05	32.85	0.98	0.00	34.88	1.36	46.34	8.35	0.00	56.05	-	
PHF	0.67	0.38	0.82	0.00	0.78	0.73	0.31	0.56	0.00	0.78	0.47	0.83	0.58	0.00	0.82	0.77	0.89	0.85	0.00	0.88	0.88	

1600 - 1800 (Weekday 2h Session) (25-02-2021)
All vehicles

TIME	Northbound					Southbound					Eastbound					Westbound					int	Total
	Indian Lake Dr					Towne Center Dr					KY-1447 Westport Rd (West)					KY-1447 Westport Rd (East)						
	Left	Thru	Right	U-Turn	App Total	Left	Thru	Right	U-Turn	App Total	Left	Thru	Right	U-Turn	App Total	Left	Thru	Right	U-Turn	App Total		
1600 - 1615	14	7	28	0	49	97	7	29	0	133	13	271	11	0	295	19	282	86	1	388	865	
1615 - 1630	14	9	24	0	47	83	12	18	0	113	20	296	6	0	322	29	241	95	1	366	848	
1630 - 1645	14	11	32	0	57	104	11	21	0	136	17	343	8	0	368	27	278	105	0	410	971	
1645 - 1700	11	14	25	0	50	109	12	18	0	139	15	312	12	0	339	24	309	107	2	442	970	
Hourly Total	53	41	109	0	203	393	42	86	0	521	65	1222	37	0	1324	99	1110	393	4	1606	3654	
1700 - 1715	11	6	32	0	49	100	20	15	0	135	11	367	9	0	387	30	285	136	1	452	1023	
1715 - 1730	12	9	32	0	53	111	4	24	0	139	12	361	15	0	388	26	272	112	2	412	992	
1730 - 1745	13	7	28	0	48	97	13	19	0	129	15	360	17	0	392	26	279	100	0	405	974	
1745 - 1800	10	9	44	0	63	93	13	23	0	129	15	336	10	1	362	32	272	88	0	392	946	
Hourly Total	46	31	136	0	213	401	50	81	0	532	53	1424	51	1	1529	114	1108	436	3	1661	3935	
Grand Total	99	72	245	0	416	794	92	167	0	1053	118	2646	88	1	2853	213	2218	829	7	3267	7589	
Approach %	23.80	17.31	58.89	0.00	-	75.40	8.74	15.86	0.00	-	4.14	92.74	3.08	0.04	-	6.52	67.89	25.37	0.21	-	-	
Intersection %	1.30	0.95	3.23	0.00	5.48	10.46	1.21	2.20	0.00	13.88	1.55	34.87	1.16	0.01	37.59	2.81	29.23	10.92	0.09	43.05	-	
PHF	0.90	0.64	0.91	0.00	0.94	0.94	0.61	0.79	0.00	0.97	0.88	0.95	0.78	0.00	0.96	0.88	0.93	0.84	0.63	0.95	0.97	

Jagers Indian Lake Drive Traffic Impact Study

Louisville, KY
Classified Turn Movement Count



Marr Traffic Inc
www.marrtraffic.com

Site 2 of 2
Indian Lake Dr (South)
Indian Lake Dr (North)
Driveway (West)
Driveway (East)

Lat/Long
38,295245°, -85,552835°

Date
Thursday, February 25, 2021

Weather
Fair
43°F

0700 - 0900 (Weekday 2h Session) (25-02-2021)
All vehicles

TIME	Northbound Indian Lake Dr (South)					Southbound Indian Lake Dr (North)					Eastbound Driveway (West)					Westbound Driveway (East)					Int Total
	Left	Thru	Right	U-Turn	App Total	Left	Thru	Right	U-Turn	App Total	Left	Thru	Right	U-Turn	App Total	Left	Thru	Right	U-Turn	App Total	
	2.1	2.2	2.3	2.4		2.5	2.6	2.7	2.8		2.9	2.10	2.11	2.12		2.13	2.14	2.15	2.16		
0700 - 0715	1	19	0	0	20	4	1	0	0	5	0	0	0	0	0	0	0	2	0	2	27
0715 - 0730	0	20	0	0	20	2	3	0	0	5	0	0	0	0	0	0	0	4	0	4	29
0730 - 0745	2	22	0	0	24	1	4	0	2	7	0	0	0	0	0	0	0	2	0	2	33
0745 - 0800	2	20	0	0	22	1	7	6	0	14	0	0	0	0	0	0	0	5	0	5	41
Hourly Total	5	81	0	0	86	8	15	6	2	31	0	0	0	0	0	0	0	13	0	13	130
0800 - 0815	0	25	0	0	25	4	5	2	0	11	0	0	0	0	0	0	0	2	0	2	38
0815 - 0830	0	19	0	0	19	3	17	2	0	22	2	0	0	0	2	0	0	3	0	3	46
0830 - 0845	0	13	0	0	13	1	10	5	0	16	0	0	0	0	0	0	0	7	0	7	36
0845 - 0900	1	13	0	0	14	1	11	7	0	19	3	0	1	0	4	0	0	1	0	1	38
Hourly Total	1	70	0	0	71	9	43	16	0	68	5	0	1	0	6	0	0	13	0	13	158
Grand Total	6	151	0	0	157	17	58	22	2	99	5	0	1	0	6	0	0	26	0	26	288
Approach %	3.82	96.18	0.00	0.00	-	17.17	58.59	22.22	2.02	-	83.33	0.00	16.67	0.00	-	0.00	0.00	100.00	0.00	-	-
Intersection %	2.08	52.43	0.00	0.00	54.51	5.90	20.14	7.64	0.69	34.38	1.74	0.00	0.35	0.00	2.08	0.00	0.00	9.03	0.00	9.03	-
PHF	0.25	0.77	0.00	0.00	0.79	0.56	0.57	0.63	0.00	0.72	0.25	0.00	0.00	0.00	0.25	0.00	0.00	0.61	0.00	0.61	0.88

1600 - 1800 (Weekday 2h Session) (25-02-2021)
All vehicles

TIME	Northbound Indian Lake Dr (South)					Southbound Indian Lake Dr (North)					Eastbound Driveway (West)					Westbound Driveway (East)					Int Total
	Left	Thru	Right	U-Turn	App Total	Left	Thru	Right	U-Turn	App Total	Left	Thru	Right	U-Turn	App Total	Left	Thru	Right	U-Turn	App Total	
	2.1	2.2	2.3	2.4		2.5	2.6	2.7	2.8		2.9	2.10	2.11	2.12		2.13	2.14	2.15	2.16		
1600 - 1615	1	26	0	0	27	4	19	13	1	37	20	0	4	0	24	1	1	1	0	3	91
1615 - 1630	1	31	0	0	32	2	33	12	0	47	16	0	2	0	18	0	0	3	0	3	100
1630 - 1645	1	34	0	0	35	2	36	7	1	46	21	0	4	0	25	0	0	4	0	4	110
1645 - 1700	2	24	0	0	26	2	31	13	3	49	12	0	3	0	15	0	0	6	0	6	96
Hourly Total	5	115	0	0	120	10	119	45	5	179	69	0	13	0	82	1	1	14	0	16	397
1700 - 1715	0	33	0	0	33	5	40	13	2	60	9	0	4	0	13	0	1	5	0	6	112
1715 - 1730	3	36	0	0	39	1	32	9	2	44	13	0	2	0	15	0	0	0	0	0	98
1730 - 1745	3	44	0	0	47	2	35	18	0	55	10	0	1	0	11	0	0	0	0	0	113
1745 - 1800	2	42	0	0	44	1	37	16	1	55	15	0	0	0	15	0	1	1	0	2	116
Hourly Total	8	155	0	0	163	9	144	56	5	214	47	0	7	0	54	0	2	6	0	8	439
Grand Total	13	270	0	0	283	19	263	101	10	393	116	0	20	0	136	1	3	20	0	24	836
Approach %	4.59	95.41	0.00	0.00	-	4.83	66.92	25.70	2.54	-	85.29	0.00	14.71	0.00	-	4.17	12.50	83.33	0.00	-	-
Intersection %	1.56	32.30	0.00	0.00	33.85	2.27	31.46	12.08	1.20	47.01	13.88	0.00	2.39	0.00	16.27	0.12	0.36	2.39	0.00	2.87	-
PHF	0.67	0.88	0.00	0.00	0.87	0.45	0.90	0.78	0.63	0.89	0.78	0.00	0.44	0.00	0.90	0.00	0.50	0.30	0.00	0.33	0.95

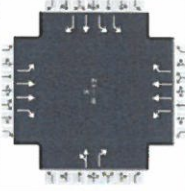

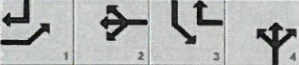
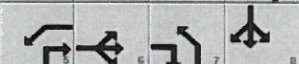
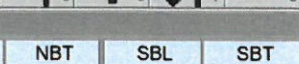
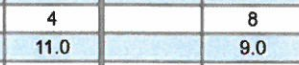
HCS Reports

HCS7 Signalized Intersection Results Summary															
General Information						Intersection Information									
Agency	Diane B. Zimmerman Traffic Engineering					Duration, h	0.250								
Analyst	DBZ		Analysis Date	6/15/2021		Area Type	Other								
Jurisdiction			Time Period	AM Peak		PHF	0.88								
Urban Street	Westport Road		Analysis Year	2021		Analysis Period	1> 7:45								
Intersection	Indian Lake Drive		File Name	AM 21.xus											
Project Description	Jagers														
Demand Information				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h				17	727	21	37	970	183	32	6	56	64	5	18
Signal Information															
Cycle, s	160.0	Reference Phase	2												
Offset, s	0	Reference Point	End	Green	3.5	104.1	5.4	8.1	5.9	0.0					
Uncoordinated	No	Simult. Gap E/W	On	Yellow	3.5	5.0	3.5	3.6	3.6	0.0					
Force Mode	Fixed	Simult. Gap N/S	Off	Red	3.0	1.8	3.0	3.0	3.0	0.0					
Timer Results				EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT				
Assigned Phase				1	6	5	2		4		8				
Case Number				1.2	3.0	1.3	3.0		11.0		9.0				
Phase Duration, s				10.0	120.9	11.9	122.8		14.7		12.5				
Change Period, (Y+Rc), s				6.5	6.8	6.8	6.8		6.6		6.6				
Max Allow Headway (MAH), s				3.0	0.0	3.0	0.0		3.3		3.2				
Queue Clearance Time (gs), s				2.6		2.0			8.0		5.6				
Green Extension Time (ge), s				0.0	0.0	0.0	0.0		0.2		0.2				
Phase Call Probability				0.58		0.85			0.99		0.99				
Max Out Probability				0.00		0.17			0.00		0.00				
Movement Group Results				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement				1	6	16	5	2	12	7	4	14	3	8	18
Adjusted Flow Rate (v), veh/h				19	826	24	42	1102	208		43	64	73	6	20
Adjusted Saturation Flow Rate (s), veh/h/ln				1725	1766	1610	1739	1781	1585		1781	1610	1593	1900	1610
Queue Service Time (gs), s				0.6	14.0	0.6	0.0	19.7	6.6		3.8	6.0	3.6	0.5	1.9
Cycle Queue Clearance Time (gc), s				0.6	14.0	0.6	0.0	19.7	6.6		3.8	6.0	3.6	0.5	1.9
Green Ratio (g/C)				0.68	0.71	0.76	0.67	0.72	0.72		0.05	0.08	0.04	0.04	0.06
Capacity (c), veh/h				343	2519	1230	497	2582	1149		90	133	118	70	94
Volume-to-Capacity Ratio (X)				0.056	0.328	0.019	0.085	0.427	0.181		0.477	0.479	0.616	0.081	0.217
Back of Queue (Q), ft/ln (95 th percentile)				9.7	225	8.2	25.9	291.5	99.9		81.3	98.9	74.4	10.3	36.6
Back of Queue (Q), veh/ln (95 th percentile)				0.4	8.8	0.3	1.0	11.5	3.9		3.2	4.0	2.7	0.4	1.5
Queue Storage Ratio (RQ) (95 th percentile)				0.04	0.00	0.06	0.09	0.00	0.30		0.29	0.35	0.62	0.02	0.61
Uniform Delay (d1), s/veh				9.6	8.6	19.3	10.8	8.8	7.0		73.9	20.6	75.9	74.4	71.8
Incremental Delay (d2), s/veh				0.0	0.3	0.0	0.0	0.5	0.3		1.4	1.0	1.9	0.2	0.4
Initial Queue Delay (d3), s/veh				0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh				9.6	9.0	19.3	10.8	9.3	7.3		75.3	21.6	77.9	74.6	72.2
Level of Service (LOS)				A	A	B	B	A	A		E	C	E	E	E
Approach Delay, s/veh / LOS				9.3	A	9.0	A	43.3	D	76.5	E				
Intersection Delay, s/veh / LOS				13.4					B						
Multimodal Results				EB			WB			NB			SB		
Pedestrian LOS Score / LOS				1.97	B	2.23	B	2.48	B	2.49	B				
Bicycle LOS Score / LOS				1.20	A	1.60	B	0.66	A	0.65	A				

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information																				
Agency	Diane B. Zimmerman Traffic Engineering			Duration, h	0.250																			
Analyst	DBZ	Analysis Date	6/15/2021	Area Type	Other																			
Jurisdiction		Time Period	AM Peak	PHF	0.88																			
Urban Street	Westport Road	Analysis Year	2022 No Build	Analysis Period	1> 7:45																			
Intersection	Indian Lake Drive	File Name	AM 22.xus																					
Project Description	Jaggers																							
Demand Information				EB			WB			NB			SB											
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R									
Demand (v), veh/h	20	840	24	43	1120	211	37	7	65	74	6	21												
Signal Information																								
Cycle, s	160.0	Reference Phase	2	Green	3.8	102.0	5.6	9.1	6.4	0.0														
Offset, s	0	Reference Point	End	Yellow	3.5	5.0	3.5	3.6	3.6	0.0														
Uncoordinated	No	Simult. Gap E/W	On	Red	3.0	1.8	3.0	3.0	3.0	0.0														
Force Mode	Fixed	Simult. Gap N/S	Off																					
Timer Results				EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT													
Assigned Phase				1	6	5	2		4		8													
Case Number				1.2	3.0	1.3	3.0		11.0		9.0													
Phase Duration, s				10.3	119.2	12.1	121.0		15.7		13.0													
Change Period, (Y+Rc), s				6.5	6.8	6.8	6.8		6.6		6.6													
Max Allow Headway (MAH), s				3.0	0.0	3.0	0.0		3.3		3.2													
Queue Clearance Time (gs), s				2.7		2.0			9.0		6.2													
Green Extension Time (ge), s				0.0	0.0	0.0	0.0		0.2		0.2													
Phase Call Probability				0.64		0.89			1.00		0.99													
Max Out Probability				0.00		0.18			0.00		0.00													
Movement Group Results				EB			WB			NB			SB											
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R									
Assigned Movement	1	6	16	5	2	12	7	4	14	3	8	18												
Adjusted Flow Rate (v), veh/h	23	955	27	49	1273	240		50	74	84	7	24												
Adjusted Saturation Flow Rate (s), veh/h/in	1725	1766	1610	1739	1781	1585		1781	1610	1593	1900	1610												
Queue Service Time (gs), s	0.7	17.6	0.7	0.0	25.5	8.2		4.4	7.0	4.2	0.6	2.3												
Cycle Queue Clearance Time (gc), s	0.7	17.6	0.7	0.0	25.5	8.2		4.4	7.0	4.2	0.6	2.3												
Green Ratio (g/C)	0.67	0.70	0.76	0.66	0.71	0.71		0.06	0.09	0.04	0.04	0.06												
Capacity (c), veh/h	288	2481	1223	435	2541	1131		102	146	127	76	103												
Volume-to-Capacity Ratio (X)	0.079	0.385	0.022	0.112	0.501	0.212		0.491	0.507	0.663	0.090	0.233												
Back of Queue (Q), ft/in (95th percentile)	12	272.8	3	34.3	365	124.3		93.7	114	86.2	12.4	42.5												
Back of Queue (Q), veh/in (95th percentile)	0.5	10.7	0.1	1.3	14.4	4.9		3.7	4.6	3.1	0.5	1.7												
Queue Storage Ratio (RQ) (95th percentile)	0.05	0.00	0.02	0.12	0.00	0.37		0.33	0.41	0.72	0.03	0.71												
Uniform Delay (d1), s/veh	11.1	9.7	20.6	13.1	10.2	7.7		73.2	20.8	75.8	74.0	71.2												
Incremental Delay (d2), s/veh	0.0	0.5	0.0	0.0	0.7	0.4		1.4	1.0	2.2	0.2	0.4												
Initial Queue Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0												
Control Delay (d), s/veh	11.2	10.2	20.6	13.2	10.9	8.2		74.5	21.8	78.0	74.2	71.6												
Level of Service (LOS)	B	B	C	B	B	A		E	C	E	E	E												
Approach Delay, s/veh / LOS	10.5			B			10.6			B			43.1			D			76.4			E		
Intersection Delay, s/veh / LOS	14.7												B											
Multimodal Results				EB			WB			NB			SB											
Pedestrian LOS Score / LOS	1.97			B			2.23			B			2.48			B								
Bicycle LOS Score / LOS	1.32			A			1.78			B			0.69			A								

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information																				
Agency	Diane B. Zimmerman Traffic Engineering			Duration, h	0.250																			
Analyst	DBZ	Analysis Date	6/15/2021	Area Type	Other																			
Jurisdiction		Time Period	AM Peak	PHF	0.88																			
Urban Street	Westport Road	Analysis Year	2022 Build	Analysis Period	1> 7:45																			
Intersection	Indian Lake Drive	File Name	AM 22 B.xus																					
Project Description	Jagers																							
Demand Information				EB			WB			NB			SB											
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R									
Demand (v), veh/h	20	828	48	71	1104	211	63	10	88	74	9	21												
Signal Information																								
Cycle, s	160.0	Reference Phase	2																					
Offset, s	0	Reference Point	End	Green	3.8	99.0	6.1	11.7	6.4	0.0														
Uncoordinated	No	Simult. Gap E/W	On	Yellow	3.5	5.0	3.5	3.6	3.6	0.0														
Force Mode	Fixed	Simult. Gap N/S	Off	Red	3.0	1.8	3.0	3.0	3.0	0.0														
Timer Results				EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT													
Assigned Phase				1	6	5	2		4															
Case Number				1.2	3.0	1.3	3.0		11.0															
Phase Duration, s				10.3	116.1	12.6	118.4		18.3															
Change Period, (Y+Rc), s				6.5	6.8	6.8	6.8		6.6															
Max Allow Headway (MAH), s				3.0	0.0	3.0	0.0		3.3															
Queue Clearance Time (ge), s				2.7		2.0			11.4															
Green Extension Time (ge), s				0.0	0.0	0.0	0.0		0.3															
Phase Call Probability				0.64		0.97			1.00															
Max Out Probability				0.00		0.23			0.00															
Movement Group Results				EB			WB			NB			SB											
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R									
Assigned Movement	1	6	16	5	2	12	7	4	14	3	8	18												
Adjusted Flow Rate (v), veh/h	23	941	55	81	1255	240		83	100	84	10	24												
Adjusted Saturation Flow Rate (s), veh/h/ln	1725	1766	1610	1739	1781	1585		1779	1610	1593	1900	1610												
Queue Service Time (gs), s	0.7	18.4	1.4	0.0	26.3	8.6		7.3	9.4	4.2	0.8	2.3												
Cycle Queue Clearance Time (gc), s	0.7	18.4	1.4	0.0	26.3	8.6		7.3	9.4	4.2	0.8	2.3												
Green Ratio (g/C)	0.65	0.68	0.76	0.64	0.70	0.70		0.07	0.11	0.04	0.04	0.06												
Capacity (c), veh/h	281	2413	1218	431	2484	1105		130	177	127	76	103												
Volume-to-Capacity Ratio (X)	0.081	0.390	0.045	0.187	0.505	0.217		0.637	0.566	0.662	0.135	0.233												
Back of Queue (Q), ft/ln (95 th percentile)	12.9	287	6.8	64.3	380.5	133.9		155.9	151.8	86.2	18.6	42.5												
Back of Queue (Q), veh/ln (95 th percentile)	0.5	11.2	0.3	2.5	15.0	5.3		6.1	6.1	3.1	0.7	1.7												
Queue Storage Ratio (RQ) (95 th percentile)	0.05	0.00	0.05	0.23	0.00	0.40		0.56	0.54	0.72	0.04	0.71												
Uniform Delay (d1), s/veh	12.3	11.0	21.0	15.5	11.3	8.6		72.1	21.1	75.7	74.1	71.2												
Incremental Delay (d2), s/veh	0.0	0.5	0.1	0.1	0.7	0.5		1.9	1.1	2.2	0.3	0.4												
Initial Queue Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0												
Control Delay (d), s/veh	12.4	11.4	21.0	15.6	12.0	9.1		74.0	22.2	77.9	74.4	71.6												
Level of Service (LOS)	B	B	C	B	B	A		E	C	E	E	E												
Approach Delay, s/veh / LOS	12.0			B			11.8			B			45.7			D			76.4			E		
Intersection Delay, s/veh / LOS	16.6												B											
Multimodal Results				EB			WB			NB			SB											
Pedestrian LOS Score / LOS	1.97			B			2.24			B			2.48			B								
Bicycle LOS Score / LOS	1.33			A			1.79			B			0.79			A								

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information				Diagram																			
Agency	Diane B. Zimmerman Traffic Engineering			Duration, h	0.250																						
Analyst	DBZ			Analysis Date	6/15/2021																						
Jurisdiction				Time Period	PM Peak																						
Urban Street	Westport Road			Analysis Year	2021																						
Intersection	Indian Lake Drive			File Name	PM 21.xus																						
Project Description	Jagers																										
Demand Information				EB			WB			NB			SB														
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R												
Demand (v), veh/h	53	1400	53	111	1145	455	47	36	117	417	49	76															
Signal Information																											
Cycle, s	180.0	Reference Phase	2	Green	5.6	88.9	6.0	14.4	30.0	0.0																	
Offset, s	0	Reference Point	End	Yellow	4.3	4.3	4.3	3.6	3.6	0.0																	
Uncoordinated	No	Simult. Gap E/W	On	Red	3.0	3.0	3.0	3.0	3.0	0.0																	
Force Mode	Fixed	Simult. Gap N/S	Off																								
Timer Results				EBL			EBT			WBL			WBT			NBL			NBT			SBL			SBT		
Assigned Phase				1			6			5			2						4						8		
Case Number				1.2			3.0			1.3			3.0						11.0						9.0		
Phase Duration, s				12.9			109.1			13.3			109.5						21.0						36.6		
Change Period, (Y+Rc), s				7.3			7.3			7.3			7.3						6.6						6.6		
Max Allow Headway (MAH), s				3.0			0.0			3.0			0.0						3.2						3.1		
Queue Clearance Time (g _s), s				4.6						2.0			0.0						14.9						23.1		
Green Extension Time (g _e), s				0.0			0.0			0.1			0.0						0.0						0.9		
Phase Call Probability				0.93						1.00									1.00						1.00		
Max Out Probability				0.00						0.27									1.00						0.08		
Movement Group Results				EB			WB			NB			SB														
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R												
Assigned Movement	1	6	16	5	2	12	7	4	14	3	8	18															
Adjusted Flow Rate (v), veh/h	55	1443	55	114	1180	469			86	121	430	51	78														
Adjusted Saturation Flow Rate (s), veh/h/in	1810	1795	1610	1753	1795	1610			1848	1610	1743	1900	1610														
Queue Service Time (g _s), s	2.6	52.6	2.2	0.0	38.1	32.0			8.0	12.9	21.1	4.1	7.4														
Cycle Queue Clearance Time (g _c), s	2.6	52.6	2.2	0.0	38.1	32.0			8.0	12.9	21.1	4.1	7.4														
Green Ratio (g/C)	0.54	0.57	0.65	0.52	0.57	0.57			0.08	0.11	0.17	0.17	0.20														
Capacity (c), veh/h	232	2030	1040	194	2038	914			148	182	581	317	319														
Volume-to-Capacity Ratio (X)	0.235	0.711	0.053	0.591	0.579	0.513			0.579	0.662	0.740	0.160	0.246														
Back of Queue (Q), ft/in (95 th percentile)	50.1	763.5	38.3	234.2	574.9	456.6			179.9	171.9	376.2	90.3	137.7														
Back of Queue (Q), veh/in (95 th percentile)	2.0	30.3	1.5	9.1	22.8	18.3			7.2	6.9	14.9	3.6	5.5														
Queue Storage Ratio (RQ) (95 th percentile)	0.20	0.00	0.28	0.85	0.00	1.36			0.64	0.61	3.14	0.20	2.29														
Uniform Delay (d ₁), s/veh	25.0	28.4	32.9	64.4	25.1	23.7			79.9	35.1	71.3	64.2	60.9														
Incremental Delay (d ₂), s/veh	0.2	2.1	0.1	3.2	1.2	2.1			3.7	7.0	4.3	0.1	0.1														
Initial Queue Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0														
Control Delay (d), s/veh	25.2	30.5	33.0	67.7	26.3	25.8			83.6	42.0	75.6	64.3	61.0														
Level of Service (LOS)	C	C	C	E	C	C			F	D	E	E	E														
Approach Delay, s/veh / LOS	30.4	C			28.8	C			59.3	E			72.5	E													
Intersection Delay, s/veh / LOS	37.0						D																				
Multimodal Results				EB			WB			NB			SB														
Pedestrian LOS Score / LOS	1.98	B			2.27	B			2.48	B			2.49	B													
Bicycle LOS Score / LOS	1.77	B			1.94	B			0.83	A			1.41	A													

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information				Diagram																			
Agency	Diane B. Zimmerman Traffic Engineering			Duration, h	0.250																						
Analyst	DBZ			Analysis Date	6/15/2021																						
Jurisdiction				Time Period	PM Peak																						
Urban Street	Westport Road			Analysis Year	2022 No Build																						
Intersection	Indian Lake Drive			File Name	PM 22 NB.xus																						
Project Description	Jagers																										
Demand Information				EB			WB			NB			SB														
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R												
Demand (v), veh/h	61	1617	61	128	1322	526	54	42	135	482	57	88															
Signal Information																											
Cycle, s	180.0	Reference Phase	2																								
Offset, s	0	Reference Point	End	Green	5.7	87.8	7.0	14.4	30.0	0.0																	
Uncoordinated	No	Simult. Gap E/W	On	Yellow	4.3	4.3	4.3	3.6	3.6	0.0																	
Force Mode	Fixed	Simult. Gap N/S	Off	Red	3.0	3.0	3.0	3.0	3.0	0.0																	
Timer Results				EBL			EBT			WBL			WBT			NBL			NBT			SBL			SBT		
Assigned Phase				1	6		5		2					4						8							
Case Number				1.2	3.0		1.3		3.0					11.0						9.0							
Phase Duration, s				13.0	108.1		14.3		109.4					21.0						36.6							
Change Period, (Y+R c), s				7.3	7.3		7.3		7.3					6.6						6.6							
Max Allow Headway (MAH), s				3.0	0.0		3.0		0.0					3.2						3.1							
Queue Clearance Time (g s), s				5.0			6.2							16.4						26.9							
Green Extension Time (g e), s				0.0	0.0		0.0		0.0					0.0						0.7							
Phase Call Probability				0.96			1.00							1.00						1.00							
Max Out Probability				0.00			1.00							1.00						0.84							
Movement Group Results				EB			WB			NB			SB														
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R	L	T	R												
Assigned Movement	1	6	16	5	2	12	7	4	14	3	8	18															
Adjusted Flow Rate (v), veh/h	63	1667	63	132	1363	542		99	139	497	59	91															
Adjusted Saturation Flow Rate (s), veh/h/ln	1810	1795	1610	1753	1795	1610		1848	1610	1743	1900	1610															
Queue Service Time (g s), s	3.0	68.7	2.6	4.2	47.7	39.6		9.4	14.4	24.9	4.8	8.6															
Cycle Queue Clearance Time (g c), s	3.0	68.7	2.6	4.2	47.7	39.6		9.4	14.4	24.9	4.8	8.6															
Green Ratio (g/C)	0.53	0.56	0.64	0.52	0.57	0.57		0.08	0.12	0.17	0.17	0.20															
Capacity (c), veh/h	188	2010	1031	157	2035	913		148	191	581	317	320															
Volume-to-Capacity Ratio (X)	0.335	0.829	0.061	0.840	0.670	0.594		0.669	0.727	0.855	0.186	0.284															
Back of Queue (Q), ft/ln (95 th percentile)	59.2	977	45.2	302.3	700.6	549		211.8	205	447.6	105.6	160.6															
Back of Queue (Q), veh/ln (95 th percentile)	2.4	38.8	1.8	11.7	27.8	22.0		8.5	8.2	17.8	4.2	6.4															
Queue Storage Ratio (RQ) (95 th percentile)	0.24	0.00	0.34	1.10	0.00	1.64		0.76	0.73	3.73	0.24	2.68															
Uniform Delay (d 1), s/veh	28.7	32.5	33.1	78.1	27.2	25.4		80.5	35.5	72.9	64.5	61.3															
Incremental Delay (d 2), s/veh	0.4	4.1	0.1	29.9	1.8	2.8		9.1	11.4	11.1	0.1	0.2															
Initial Queue Delay (d 3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0															
Control Delay (d), s/veh	29.1	36.7	33.2	108.0	29.0	28.3		89.6	46.9	84.0	64.6	61.4															
Level of Service (LOS)	C	D	C	F	C	C		F	D	F	E	E															
Approach Delay, s/veh / LOS	36.3		D	33.9		C		64.7		E		79.1			E												
Intersection Delay, s/veh / LOS	42.6						D																				
Multimodal Results				EB			WB			NB			SB														
Pedestrian LOS Score / LOS	1.97	B		2.27	B		2.48	B			2.49	B															
Bicycle LOS Score / LOS	1.97	B		2.17	B		0.88	A			1.55	B															

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information				Diagram											
Agency	Diane B. Zimmerman Traffic Engineering			Duration, h	0.250														
Analyst	DBZ	Analysis Date	6/15/2021	Area Type	Other														
Jurisdiction		Time Period	PM Peak	PHF	0.97														
Urban Street	Westport Road	Analysis Year	2022 Build	Analysis Period	1> 4:45														
Intersection	Indian Lake Drive	File Name	PM 22 B.xus																
Project Description	Jagers																		
Demand Information				EB			WB			NB			SB						
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R							
Demand (v), veh/h	61	1604	84	149	1311	526	73	44	156	482	59	88							
Signal Information																			
Cycle, s	180.0	Reference Phase	2																
Offset, s	0	Reference Point	End																
Uncoordinated	No	Simult. Gap E/W	On	Green	5.7	87.1	7.7	14.4	30.0	0.0									
Force Mode	Fixed	Simult. Gap N/S	Off	Yellow	4.3	4.3	4.3	3.6	3.6	0.0									
				Red	3.0	3.0	3.0	3.0	3.0	0.0									
Timer Results				EBL		EBT		WBL		WBT		NBL		NBT		SBL		SBT	
Assigned Phase	1		6		5		2				4				8				
Case Number	1.2		3.0		1.3		3.0				11.0				9.0				
Phase Duration, s	13.0		107.4		15.0		109.4				21.0				36.6				
Change Period, (Y+R c), s	7.3		7.3		7.3		7.3				6.6				6.6				
Max Allow Headway (MAH), s	3.0		0.0		3.0		0.0				3.2				3.1				
Queue Clearance Time (g s), s	5.1				8.4						16.4				26.9				
Green Extension Time (g e), s	0.0		0.0		0.0		0.0				0.0				0.7				
Phase Call Probability	0.96				1.00						1.00				1.00				
Max Out Probability	0.00				1.00						1.00				0.84				
Movement Group Results				EB			WB			NB			SB						
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R							
Assigned Movement	1	6	16	5	2	12	7	4	14	3	8	18							
Adjusted Flow Rate (v), veh/h	63	1654	87	154	1352	542		121	161	497	61	91							
Adjusted Saturation Flow Rate (s), veh/h/ln	1810	1795	1610	1753	1795	1610		1843	1610	1743	1900	1610							
Queue Service Time (g s), s	3.1	68.3	3.7	6.4	47.1	39.6		11.6	14.4	24.9	5.0	8.6							
Cycle Queue Clearance Time (g c), s	3.1	68.3	3.7	6.4	47.1	39.6		11.6	14.4	24.9	5.0	8.6							
Green Ratio (g/C)	0.53	0.56	0.64	0.52	0.57	0.57		0.08	0.12	0.17	0.17	0.20							
Capacity (c), veh/h	189	1996	1024	174	2035	913		147	198	581	317	320							
Volume-to-Capacity Ratio (X)	0.333	0.828	0.085	0.883	0.664	0.594		0.818	0.814	0.855	0.192	0.284							
Back of Queue (Q), ft/ln (95 th percentile)	59.8	974.8	64.9	344	691.4	549		272.2	247.1	447.6	109.4	160.6							
Back of Queue (Q), veh/ln (95 th percentile)	2.4	38.7	2.6	13.3	27.4	22.0		10.9	9.9	17.8	4.4	6.4							
Queue Storage Ratio (RQ) (95 th percentile)	0.24	0.00	0.48	1.25	0.00	1.64		0.97	0.88	3.73	0.25	2.68							
Uniform Delay (d 1), s/veh	28.8	32.9	33.6	77.9	27.1	25.4		81.5	36.0	72.9	64.6	61.3							
Incremental Delay (d 2), s/veh	0.4	4.1	0.2	36.3	1.7	2.8		27.4	20.9	11.1	0.1	0.2							
Initial Queue Delay (d 3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0							
Control Delay (d), s/veh	29.2	37.0	33.8	114.2	28.8	28.3		108.9	56.9	84.0	64.7	61.4							
Level of Service (LOS)	C	D	C	F	C	C		F	E	F	E	E							
Approach Delay, s/veh / LOS	36.6		D		35.1		D		79.2		E		79.0		E				
Intersection Delay, s/veh / LOS	44.2						D												
Multimodal Results				EB			WB			NB			SB						
Pedestrian LOS Score / LOS	1.97	B		2.27	B		2.48	B		2.49	B								
Bicycle LOS Score / LOS	1.98	B		2.18	B		0.95	A		1.56	B								

HCS7 Two-Way Stop-Control Report																			
General Information								Site Information											
Analyst	DBZ							Intersection	Indian Lake at Entrances										
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction											
Date Performed	6/16/2021							East/West Street	Entrances										
Analysis Year	2021							North/South Street	Indian Lake Drive										
Time Analyzed	AM Peak							Peak Hour Factor	0.88										
Intersection Orientation	North-South							Analysis Time Period (hrs)	0.25										
Project Description	Jagers																		
Lanes																			
<p style="text-align: center;">Major Street: North-South</p>																			
Vehicle Volumes and Adjustments																			
Approach	Eastbound				Westbound				Northbound				Southbound						
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R			
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6			
Number of Lanes		0	1	0		0	1	0		0	1	0		0	1	0			
Configuration			LTR				LTR				LTR				LTR				
Volume (veh/h)		2	0	0		0	0	17		2	77	0		9	39	15			
Percent Heavy Vehicles (%)		50	0	0		0	0	0		0				0					
Proportion Time Blocked																			
Percent Grade (%)		0				0													
Right Turn Channelized																			
Median Type Storage		Left Only									1								
Critical and Follow-up Headways																			
Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1					
Critical Headway (sec)		7.60	6.50	6.20		7.10	6.50	6.20		4.10				4.10					
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2					
Follow-Up Headway (sec)		3.95	4.00	3.30		3.50	4.00	3.30		2.20				2.20					
Delay, Queue Length, and Level of Service																			
Flow Rate, v (veh/h)			2				19			2					10				
Capacity, c (veh/h)			669				976			1555					1521				
v/c Ratio			0.00				0.02			0.00					0.01				
95% Queue Length, Q ₉₅ (veh)			0.0				0.1			0.0					0.0				
Control Delay (s/veh)			10.4				8.8			7.3					7.4				
Level of Service (LOS)			B				A			A					A				
Approach Delay (s/veh)		10.4				8.8					0.2					1.1			
Approach LOS		B				A													

HCS7 Two-Way Stop-Control Report																	
General Information								Site Information									
Analyst	DBZ							Intersection	Indian Lake at Entrances								
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction									
Date Performed	6/16/2021							East/West Street	Entrances								
Analysis Year	2022							North/South Street	Indian Lake Drive								
Time Analyzed	AM Peak No Build							Peak Hour Factor	0.88								
Intersection Orientation	North-South							Analysis Time Period (hrs)	0.25								
Project Description	Jagers																
Lanes																	
<p>Major Street: North-South</p>																	
Vehicle Volumes and Adjustments																	
Approach	Eastbound				Westbound				Northbound				Southbound				
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	1	0	
Configuration			LTR				LTR				LTR				LTR		
Volume (veh/h)		2	0	0		0	0	20		2	89	0		10	45	17	
Percent Heavy Vehicles (%)		50	0	0		0	0	0		0				0			
Proportion Time Blocked																	
Percent Grade (%)		0				0											
Right Turn Channelized																	
Median Type Storage					Left Only								1				
Critical and Follow-up Headways																	
Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1			
Critical Headway (sec)		7.60	6.50	6.20		7.10	6.50	6.20		4.10				4.10			
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2			
Follow-Up Headway (sec)		3.95	4.00	3.30		3.50	4.00	3.30		2.20				2.20			
Delay, Queue Length, and Level of Service																	
Flow Rate, v (veh/h)			2				23			2				11			
Capacity, c (veh/h)			648				960			1543				1504			
v/c Ratio			0.00				0.02			0.00				0.01			
95% Queue Length, Q ₉₅ (veh)			0.0				0.1			0.0				0.0			
Control Delay (s/veh)			10.6				8.8			7.3				7.4			
Level of Service (LOS)			B				A			A				A			
Approach Delay (s/veh)		10.6				8.8				0.2				1.1			
Approach LOS		B				A											

HCS7 Two-Way Stop-Control Report																		
General Information								Site Information										
Analyst	DBZ							Intersection	Indian Lake at Entrances									
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction										
Date Performed	6/16/2021							East/West Street	Entrances									
Analysis Year	2022							North/South Street	Indian Lake Drive									
Time Analyzed	AM Peak Build							Peak Hour Factor	0.88									
Intersection Orientation	North-South							Analysis Time Period (hrs)	0.25									
Project Description	Jagers																	
Lanes																		
Vehicle Volumes and Adjustments																		
Approach	Eastbound				Westbound				Northbound				Southbound					
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R		
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6		
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	1	0		
Configuration			LTR				LTR				LTR				LTR			
Volume (veh/h)		2	0	0		3	0	72		2	89	3		65	45	17		
Percent Heavy Vehicles (%)		50	0	0		0	0	0		0				0				
Proportion Time Blocked																		
Percent Grade (%)		0				0												
Right Turn Channelized																		
Median Type Storage		Left Only									1							
Critical and Follow-up Headways																		
Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1				
Critical Headway (sec)		7.60	6.50	6.20		7.10	6.50	6.20		4.10				4.10				
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2				
Follow-Up Headway (sec)		3.95	4.00	3.30		3.50	4.00	3.30		2.20				2.20				
Delay, Queue Length, and Level of Service																		
Flow Rate, v (veh/h)			2				85			2				74				
Capacity, c (veh/h)			497				940			1543				1500				
v/c Ratio			0.00				0.09			0.00				0.05				
95% Queue Length, Q ₉₅ (veh)			0.0				0.3			0.0				0.2				
Control Delay (s/veh)			12.3				9.2			7.3				7.5				
Level of Service (LOS)			B				A			A				A				
Approach Delay (s/veh)		12.3				9.2					0.2				4.0			
Approach LOS		B				A					A				A			

HCS7 Two-Way Stop-Control Report																		
General Information								Site Information										
Analyst	DBZ							Intersection	Indian Lake at Entrances									
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction										
Date Performed	6/16/2021							East/West Street	Entrances									
Analysis Year	2021							North/South Street	Indian Lake Drive									
Time Analyzed	PM Peak							Peak Hour Factor	0.95									
Intersection Orientation	North-South							Analysis Time Period (hrs)	0.25									
Project Description	Jagers																	
Lanes																		
<p>Major Street: North-South</p>																		
Vehicle Volumes and Adjustments																		
Approach	Eastbound				Westbound				Northbound				Southbound					
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R		
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6		
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	1	0		
Configuration		LTR				LTR				LTR				LTR				
Volume (veh/h)		47	0	7		0	0	6		8	155	0		14	144	56		
Percent Heavy Vehicles (%)		0	0	0		0	0	0		0				36				
Proportion Time Blocked																		
Percent Grade (%)		0				0												
Right Turn Channelized																		
Median Type Storage		Left Only									1							
Critical and Follow-up Headways																		
Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1				
Critical Headway (sec)		7.10	6.50	6.20		7.10	6.50	6.20		4.10				4.46				
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2				
Follow-Up Headway (sec)		3.50	4.00	3.30		3.50	4.00	3.30		2.20				2.52				
Delay, Queue Length, and Level of Service																		
Flow Rate, v (veh/h)			57				6			8				15				
Capacity, c (veh/h)			639				887			1372				1233				
v/c Ratio			0.09				0.01			0.01				0.01				
95% Queue Length, Q ₉₅ (veh)			0.3				0.0			0.0				0.0				
Control Delay (s/veh)			11.2				9.1			7.6				8.0				
Level of Service (LOS)			B				A			A				A				
Approach Delay (s/veh)		11.2				9.1				0.4				0.6				
Approach LOS		B				A												

HCS7 Two-Way Stop-Control Report																	
General Information								Site Information									
Analyst	DBZ							Intersection	Indian Lake at Entrances								
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction									
Date Performed	6/16/2021							East/West Street	Entrances								
Analysis Year	2022							North/South Street	Indian Lake Drive								
Time Analyzed	PM Peak No Build							Peak Hour Factor	0.95								
Intersection Orientation	North-South							Analysis Time Period (hrs)	0.25								
Project Description	Jaggers																
Lanes																	
<p>Major Street: North-South</p>																	
Vehicle Volumes and Adjustments																	
Approach	Eastbound				Westbound				Northbound				Southbound				
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	1	0	
Configuration			LTR				LTR				LTR				LTR		
Volume (veh/h)		54	0	8		0	0	7		8	179	0		16	166	65	
Percent Heavy Vehicles (%)		0	0	0		0	0	0		0				36			
Proportion Time Blocked																	
Percent Grade (%)		0				0											
Right Turn Channelized																	
Median Type Storage					Left Only								1				
Critical and Follow-up Headways																	
Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1			
Critical Headway (sec)		7.10	6.50	6.20		7.10	6.50	6.20		4.10				4.46			
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2			
Follow-Up Headway (sec)		3.50	4.00	3.30		3.50	4.00	3.30		2.20				2.52			
Delay, Queue Length, and Level of Service																	
Flow Rate, v (veh/h)			65				7			8				17			
Capacity, c (veh/h)			603				859			1335				1206			
v/c Ratio			0.11				0.01			0.01				0.01			
95% Queue Length, Q ₉₅ (veh)			0.4				0.0			0.0				0.0			
Control Delay (s/veh)			11.7				9.2			7.7				8.0			
Level of Service (LOS)			B				A			A				A			
Approach Delay (s/veh)		11.7				9.2				0.4				0.6			
Approach LOS		B				A											

HCS7 Two-Way Stop-Control Report																		
General Information								Site Information										
Analyst	DBZ							Intersection	Indian Lake at Entrances									
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction										
Date Performed	6/16/2021							East/West Street	Entrances									
Analysis Year	2022							North/South Street	Indian Lake Drive									
Time Analyzed	PM Peak Build							Peak Hour Factor	0.95									
Intersection Orientation	North-South							Analysis Time Period (hrs)	0.25									
Project Description	Jagers																	
Lanes																		
<p style="text-align: center;">Major Street: North-South</p>																		
Vehicle Volumes and Adjustments																		
Approach	Eastbound				Westbound				Northbound				Southbound					
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R		
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6		
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	1	0		
Configuration			LTR				LTR				LTR				LTR			
Volume (veh/h)		54	0	8		2	0	49		8	179	2		62	166	65		
Percent Heavy Vehicles (%)		0	0	0		0	0	0		0				8				
Proportion Time Blocked																		
Percent Grade (%)		0				0												
Right Turn Channelized																		
Median Type Storage		Left Only									1							
Critical and Follow-up Headways																		
Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1				
Critical Headway (sec)		7.10	6.50	6.20		7.10	6.50	6.20		4.10				4.18				
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2				
Follow-Up Headway (sec)		3.50	4.00	3.30		3.50	4.00	3.30		2.20				2.27				
Delay, Queue Length, and Level of Service																		
Flow Rate, v (veh/h)			65				54			8				65				
Capacity, c (veh/h)			502				835			1335				1348				
v/c Ratio			0.13				0.06			0.01				0.05				
95% Queue Length, Q ₉₅ (veh)			0.4				0.2			0.0				0.2				
Control Delay (s/veh)			13.2				9.6			7.7				7.8				
Level of Service (LOS)			B				A			A				A				
Approach Delay (s/veh)		13.2				9.6					0.4				2.0			
Approach LOS		B				A					A				A			