

final report

April 6, 2020
Revised October 22, 2020

Traffic Impact Study

Hurstbourne Commons
8127 Watterson Trail
Louisville, KY

Prepared for

Louisville Metro Planning Commission



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INTRODUCTION

The development plan for Hurstbourne Commons in Louisville, KY shows 103 single family homes, 126 townhome units, 312 apartments, a senior housing apartment community and an assisted living building. **Figure 1** displays a map of the site. Access to the development will be from an entrance Watterson Trail and connecting to existing stub streets Brownwood Drive, and Brody Lane, and connecting to the Meijer center. 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 intersections of Hurstbourne Parkway with Ridgehurst Place, Hurstbourne Crossings Drive, Hendrik Drive/Watterbourne Lane, and Watterson Trail; Brody Lane at Ridgehurst Place, Nachand Lane with Ridgehurst Place, Nachand Lane with Rowell Way, Watterson Trail at Nachand Lane, Laurel Springs Drive, and Watterson Trail at Hendrik Drive.



Figure 1. Site Map

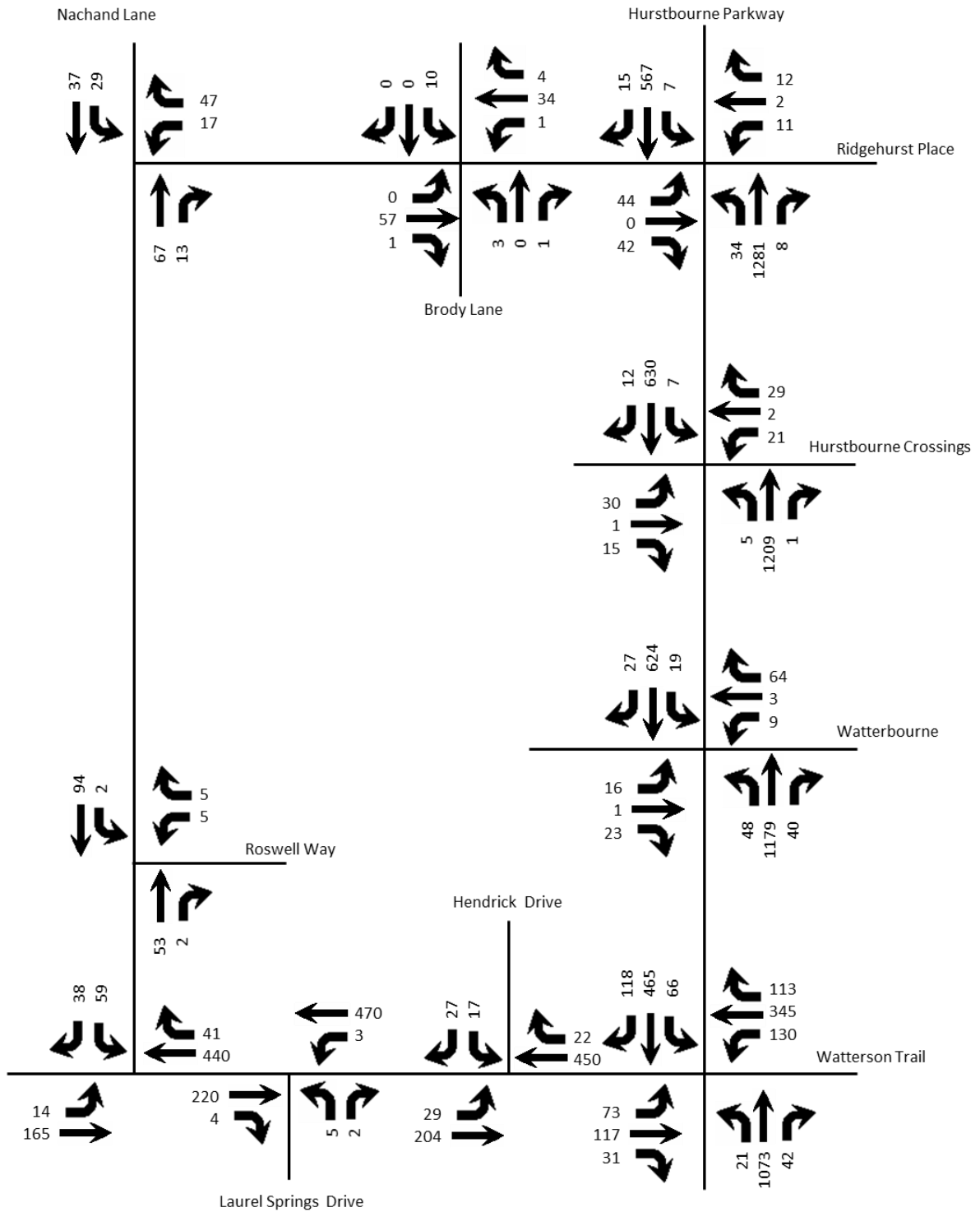
EXISTING CONDITIONS

Hurstbourne Parkway (KY 1747) is maintained by the Kentucky Transportation Cabinet an estimated 2020 Average Annual Daily Traffic (AADT) volume of 24,400 vehicles per day between Watterson Trail and Six Mile Lane, as estimated at the Kentucky Transportation Cabinet count station L72. The road has four lanes of twelve feet with a thirty-six-foot median and curbs through study area. The speed limit is 45 mph. There are sidewalks on both sides. The intersection with Hurstbourne Crossings Drive and Watterson Trail are controlled with a traffic signal. At both intersections there are left turn lanes on all approaches. At Watterson Trail there are right turn lane on each approach with east and westbound Watterson Trail having free-flow right turn lanes.

Watterson Trail is maintained by Louisville Metro with an estimated 2019 Average Annual Daily Traffic (AADT) volume of 9,500 vehicles per day between Hurstbourne Parkway and Nachand Lane, as estimated by the Kentucky Transportation Cabinet count station 455. The road has two lanes of eleven feet and four-foot shoulders through study area. The speed limit is 35 mph. There are sidewalks along the north side.

Peak hour traffic counts for the intersections were obtained on Thursday, December 4, 2019. The a.m. peak hour occurred between 7:15 and 8:15 and the p.m. peak hour was 4:45 to 5:45. **Figure 2** illustrates the existing a.m. and p.m. peak hour traffic volumes. The Appendix contains the full count data for the intersection.

AM



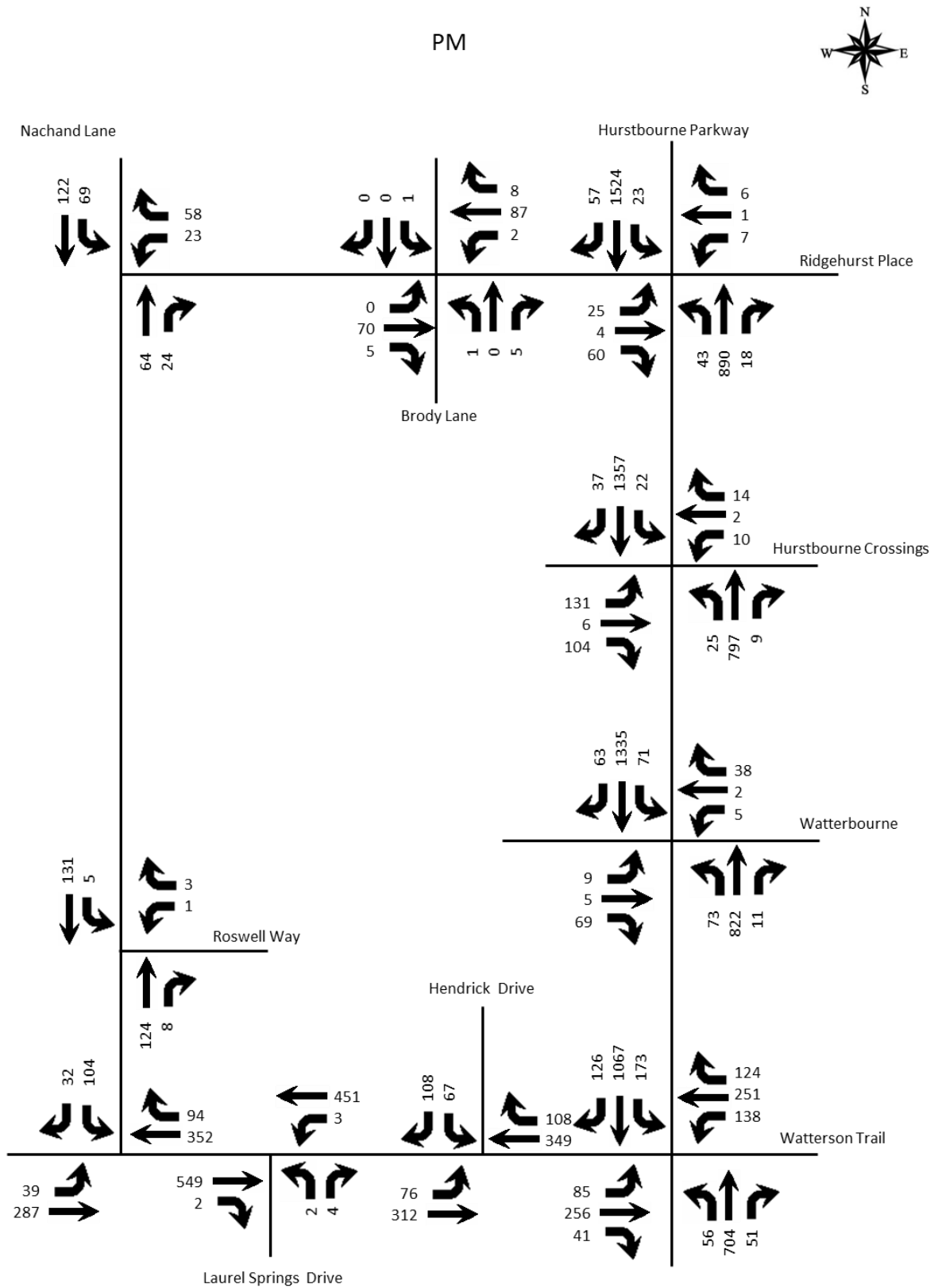
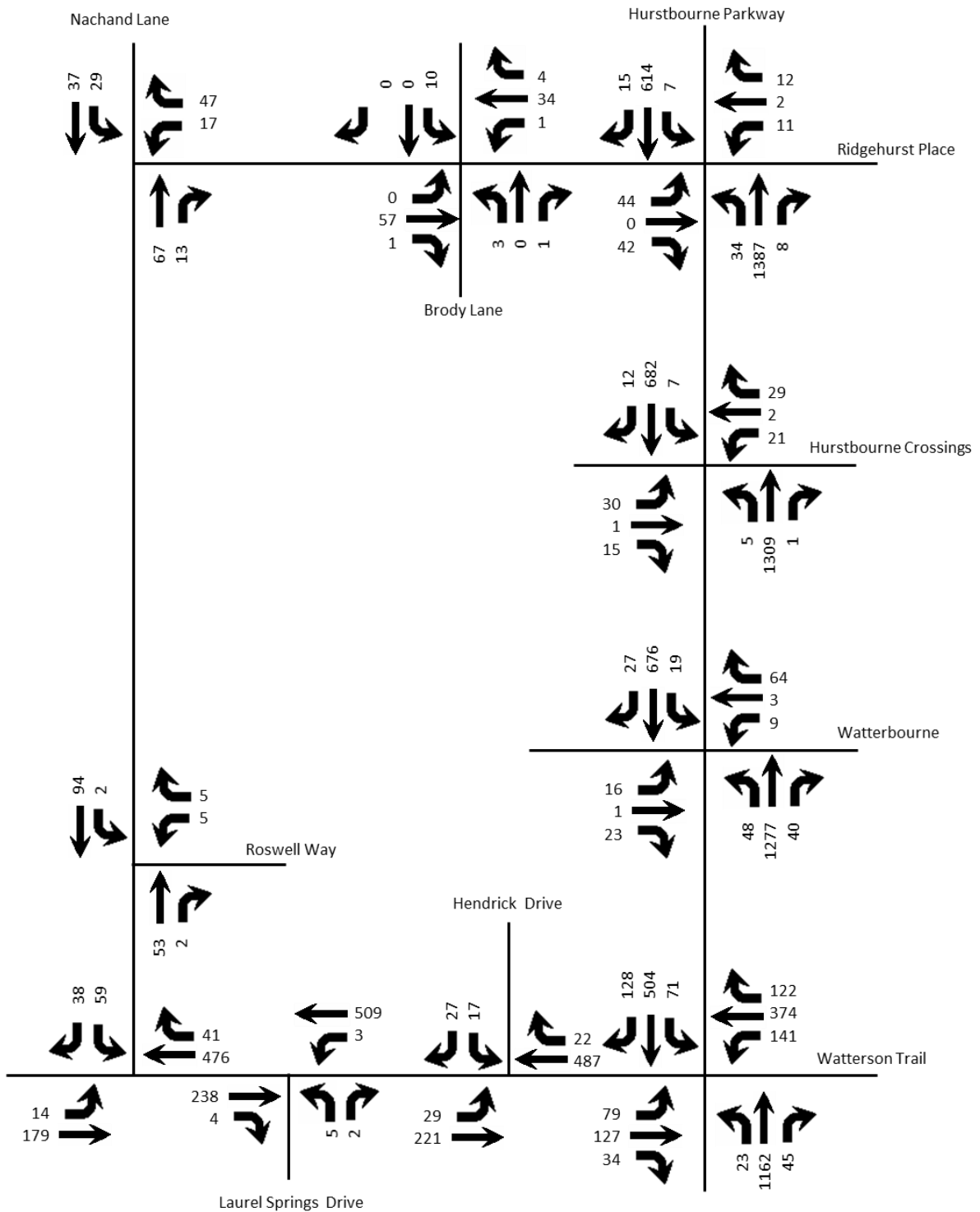


Figure 2. Existing Peak Hour Volumes

FUTURE CONDITIONS

The project completion date is 2027. An annual growth rate of 1.0 percent was applied to the through volumes on Hurstbourne Parkway and Watterson Trail. This growth rate was determined by reviewing the historical count data at KYTC count stations L72 and 455. **Figure 3** displays the 2027 No Build peak hour volumes.

AM



PM

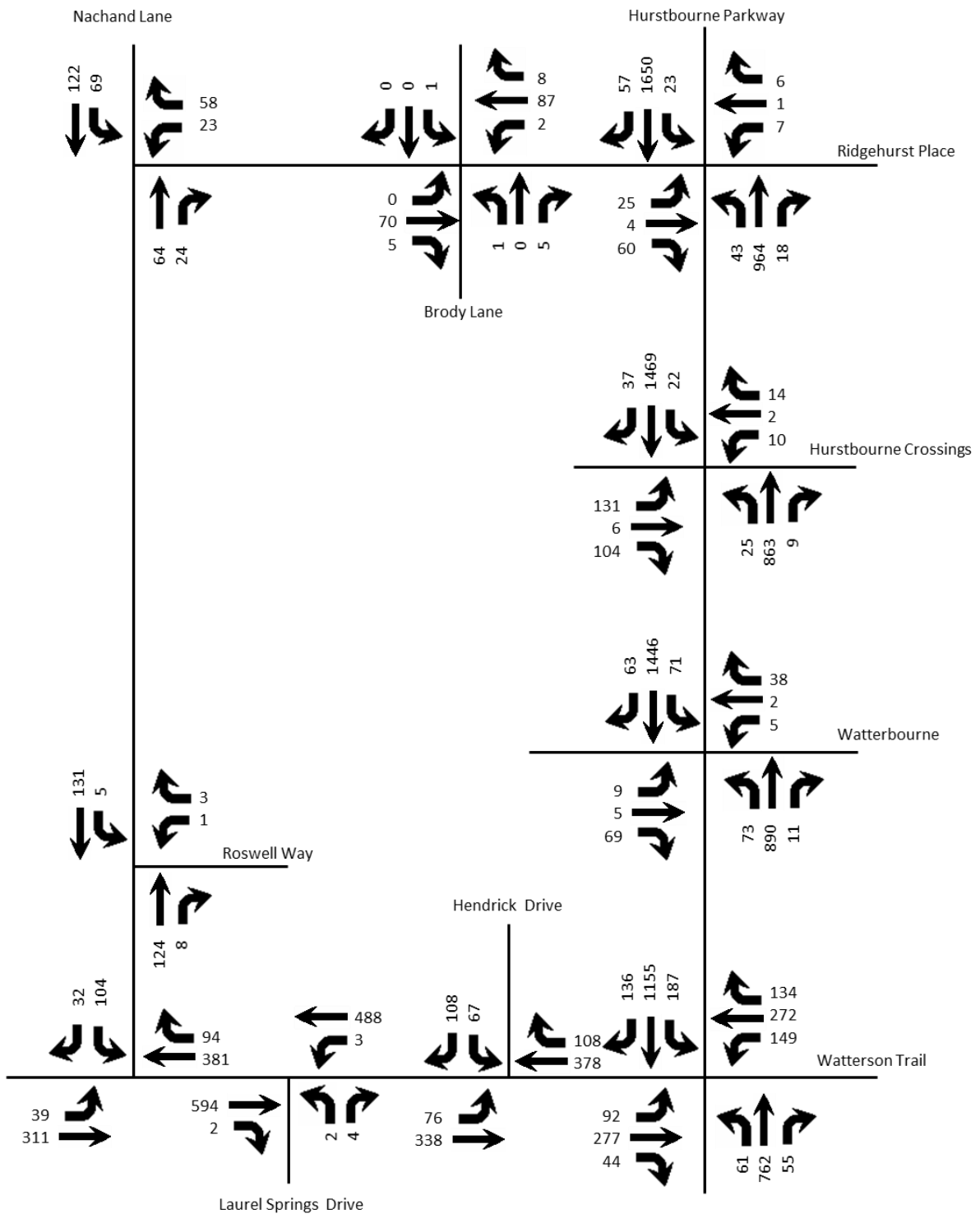


Figure 3. 2027 No Build Peak Hour Volumes

TRIP GENERATION

The Institute of Transportation Engineers Trip Generation Manual, 10th Edition contains trip generation rates for a wide range of developments. The land uses of were reviewed and determined to be the best match. The trip generation results are listed in **Table 1**. The 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. The Kentucky Transportation Cabinet will require a J-Hook installation on Hurstbourne Parkway at the time the development connects to Meijer. (A J-Hook allows left turns inbound and prohibits outbound left turns and through.) Northbound traffic was split between the traffic signal in front of Meijer and Watterson Trail.

Table 1. Peak Hour Trips Generated by Site

AM Peak Hour

Land use	ITE Code	Intensity	Rate/EQ	% IN	% Out	Total Trips		
						In	Out	Total
Assisted Living	254	100 units	$T = 0.19 (X)$	0.63	0.37	12	7	19
Single Family	210	103 units	$T = 0.71(X)+4.80$	0.25	0.75	20	58	78
Multi-Family (3-10)	221	312 units	$\ln(T) = 0.98\ln(X) - 0.98$	0.26	0.74	27	77	104
Multi-Family (1-2)	220	126 units	$\ln(T) = 0.95\ln(X) - 0.51$	0.23	0.77	13	46	59
Sr Living Attached	252	60 units	$T = .2(X) - 0.18$	0.35	0.65	4	8	12
Total						76	196	272

PM Peak Hour

Land use	ITE Code	Intensity				Total Trips		
						In	Out	Total
Assisted Living	254	100 units	$T = 0.26 (X)$	0.38	0.62	10	16	26
Single Family	210	103 units	$\ln(T) = 0.96\ln(X) + 0.20$	0.63	0.37	66	39	105
Multi-Family (3-10)	221	312 units	$\ln(T) = 0.96\ln(X) - 0.63$	0.61	0.39	81	51	132
Multi-Family (1-2)	220	126 units	$\ln(T) = 0.89\ln(X) - 0.02$	0.63	0.37	46	27	73
Sr Living Attached	252	60 units	$T = .24(X) + 2.26$	0.55	0.45	9	8	17
Total						212	140	352

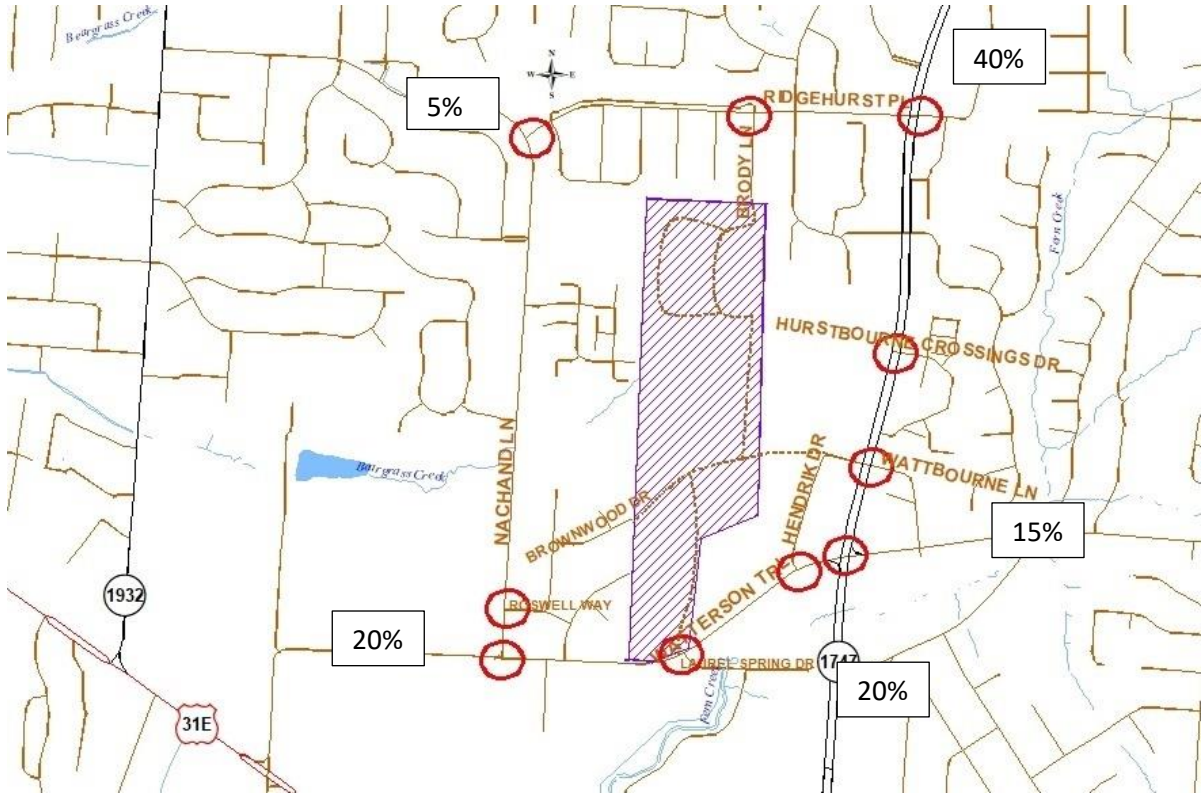
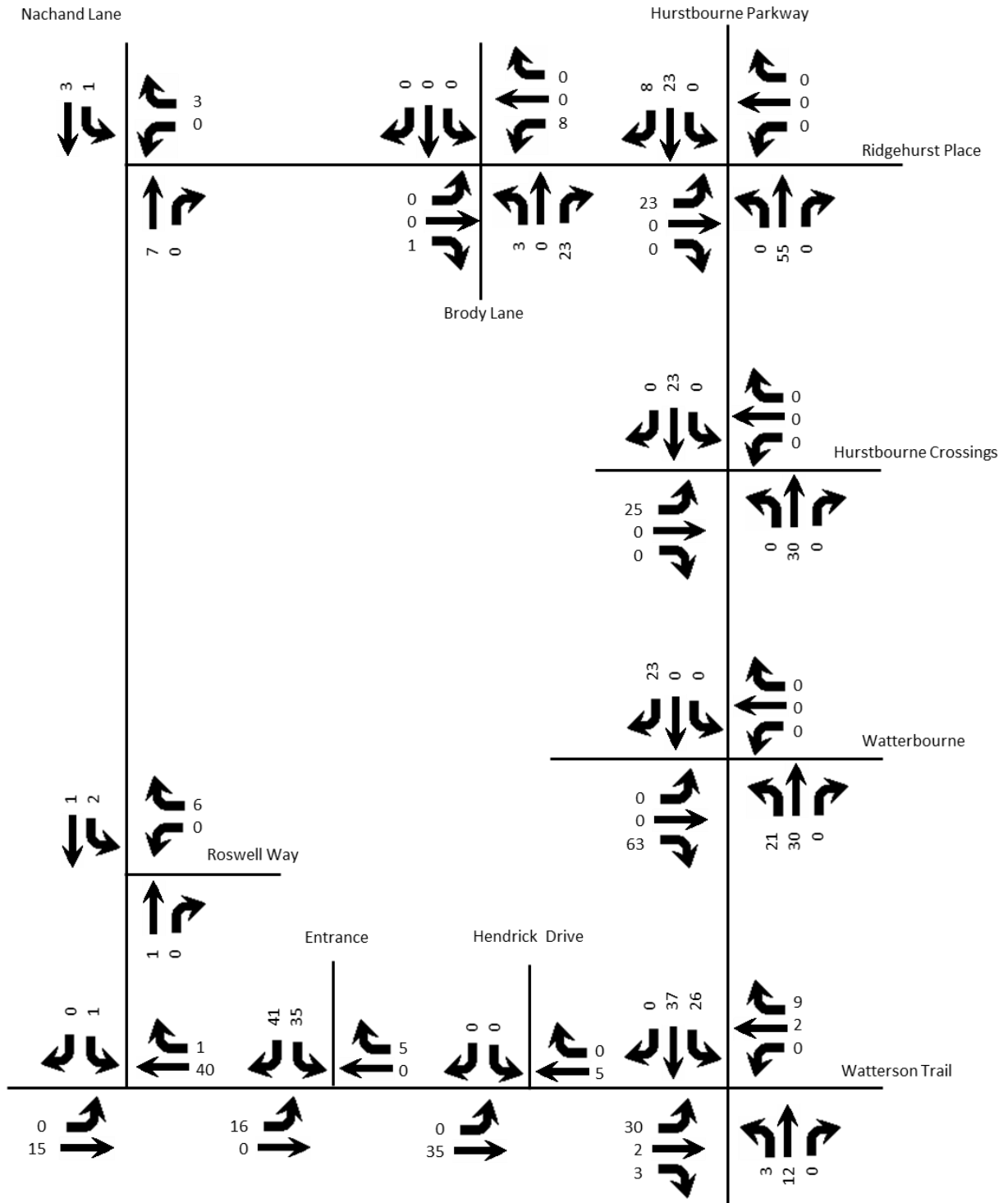
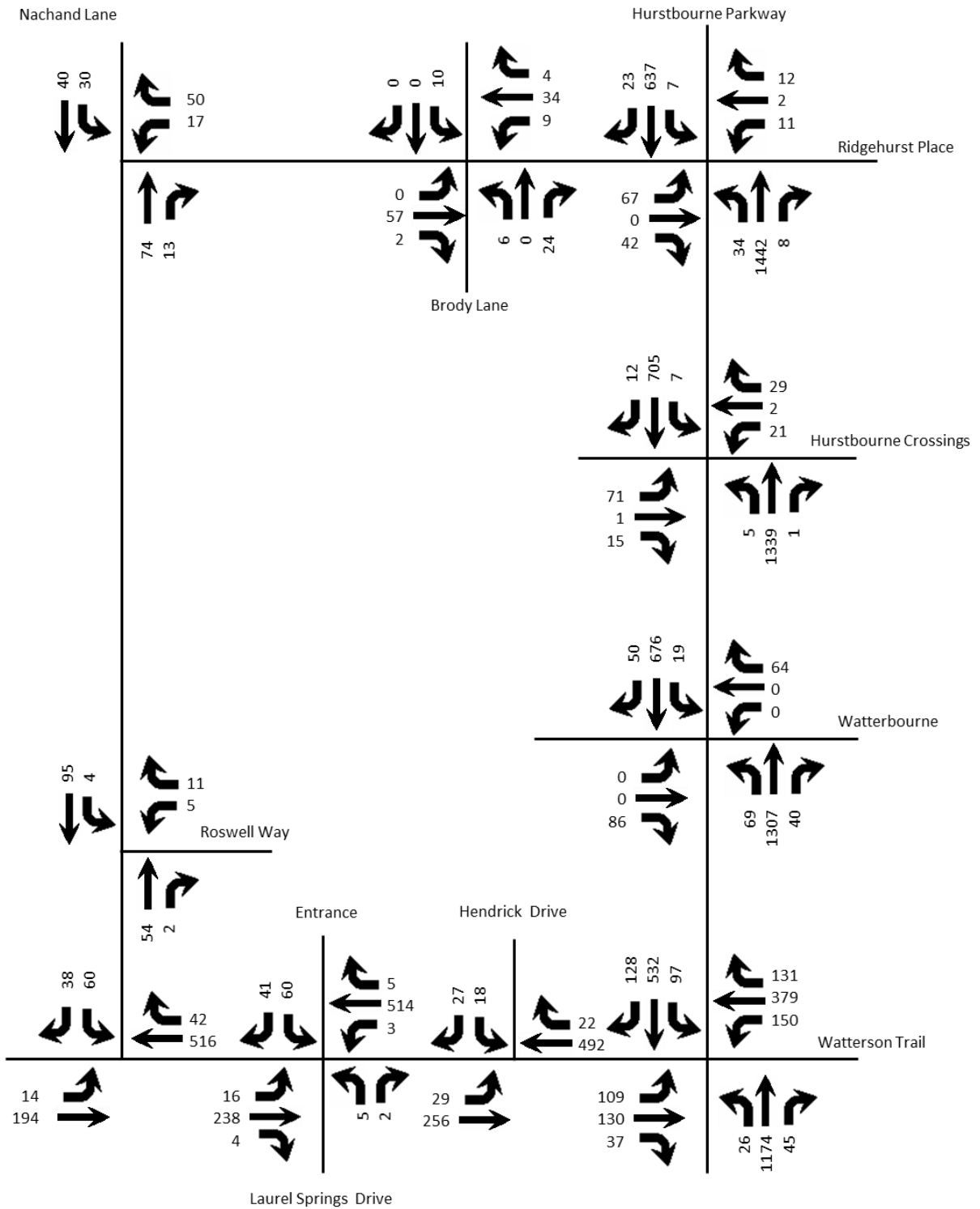


Figure 4. Trip Distribution Percentages

AM



AM



PM

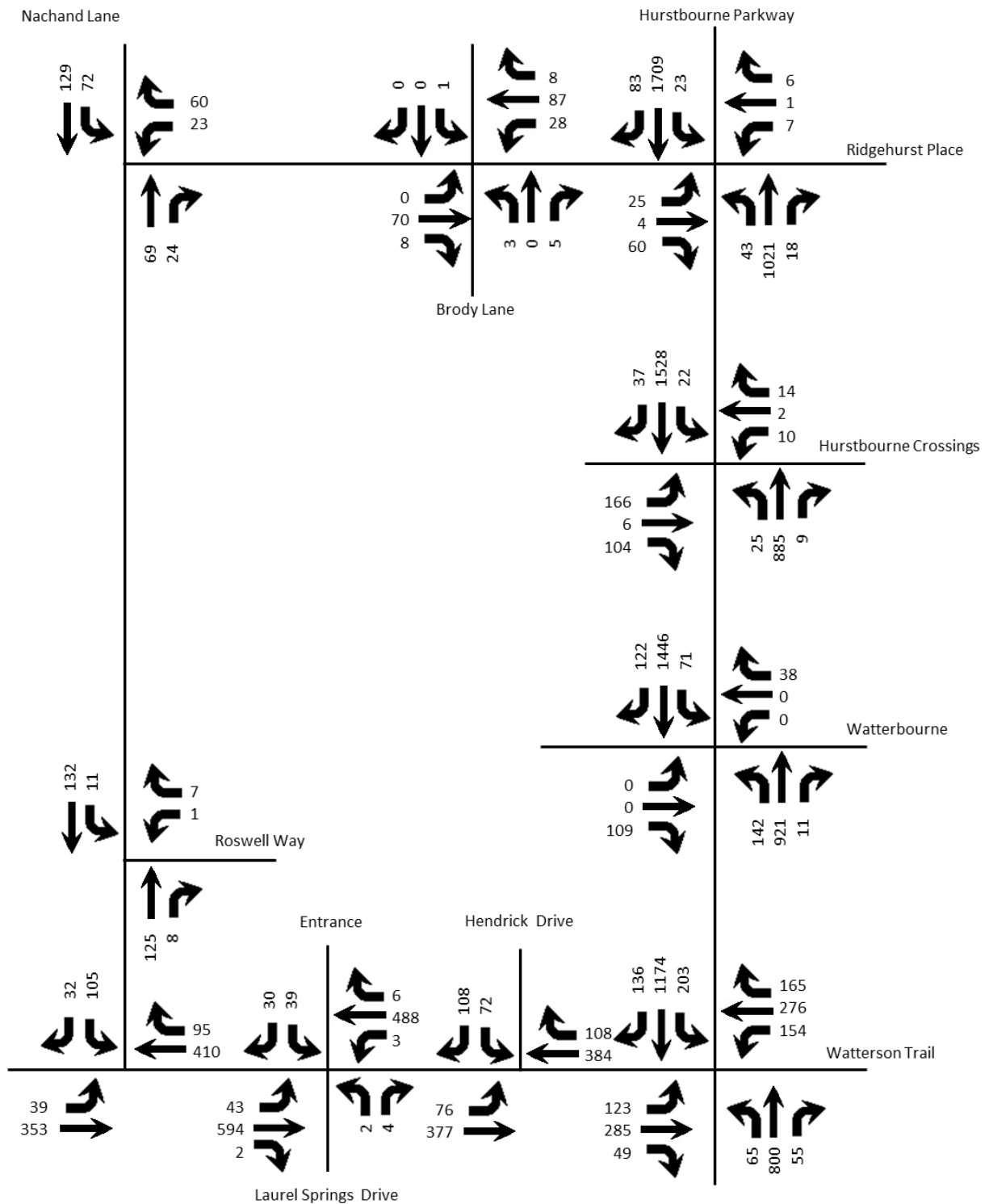


Figure 6. 2027 Build Peak Hour Volumes

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 for lanes at stop-controlled intersections.

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 7.8.5) software. The delays and Level of Service are summarized in **Table 2**.

Table 2. Peak Hour Level of Service

Approach	A.M.			P.M.		
	2019 Existing	2027 No Build	2027 Build	2019 Existing	2027 No Build	2027 Build
Hurstbourne Parkway at Watterson Trail	D 35.9	D 38.2	D 40.7	C 35.0	D 37.5	D 39.2
Watterson Trail Eastbound	E 56.8	E 56.8	E 57.2	E 69.5	E 71.8	E 70.7
Watterson Trail Westbound	E 66.7	E 68.6	E 70.6	E 60.3	E 61.2	E 63.9
Hurstbourne Parkway Northbound	C 25.5	C 28.7	C 31.7	C 23.2	C 26.2	C 28.3
Hurstbourne Parkway Southbound	B 19.3	C 21.2	C 22.8	C 23.5	C 26.4	C 27.5
Hurstbourne Parkway at Watterbourne						
Meijer Gas Eastbound	C 17.3	C 18.6	B 11.8	C 24.0	D 27.2	C 21.6
Watterbourne Westbound	C 18.3	C 20.0	C 16.1	C 16.9	C 18.5	B 12.3
Hurstbourne Parkway Northbound (left)	A 9.2	A 9.4	A 9.7	B 14.0	C 15.1	C 18.6
Hurstbourne Parkway Southbound (left)	B 11.7	B 12.3	B 12.5	B 10.1	B 10.4	B 10.6
Hurstbourne Parkway at Meijer	A 9.5	A 9.7	B 12.3	B 15.6	B 15.9	B 18.1
Meijer Eastbound	E 58.2	E 58.2	E 59.3	E 58.2	E 58.2	E 57.6
Hurstbourne Crossing Westbound	E 57.4	E 57.4	D 54.3	D 54.0	D 54.0	D 52.4
Hurstbourne Parkway Northbound	A 7.7	A 8.1	B 10.3	A 9.8	B 10.2	B 12.2
Hurstbourne Parkway Southbound	A 5.8	A 6.0	A 7.5	B 11.4	B 12.3	B 14.8

Hurstbourne Commons
Traffic Impact Study

Approach	A.M.			P.M.		
	2019 Existing	2027 No Build	2027 Build	2019 Existing	2027 No Build	2027 Build
Hurstbourne Parkway at Ridgehurst Place						
Ridgehurst Place Eastbound	C 17.9	C 19.4	C 24.8	E 38.0	E 47.1	F 54.1
Ambrosse Lane Westbound	D 26.9	D 30.7	D 32.9	D 27.8	D 31.7	D 34.6
Hurstbourne Parkway Northbound (left)	A 8.9	A 9.0	A 9.2	C 15.5	C 17.0	C 18.1
Hurstbourne Parkway Southbound (left)	B 11.9	B 12.6	B 13.0	B 10.1	B 10.4	B 10.7
Ridgehurst Place at Brody Lane						
Ridgehurst Place Eastbound	A 7.3	A 7.3	A 7.3	A 7.4	A 7.4	A 7.4
Ridgehurst Place Westbound	A 7.3	A 7.3	A 7.3	A 7.4	A 7.4	A 7.4
Brody Lane Northbound	A 9.0	A 9.0	A 8.9	A 8.9	A 8.9	A 9.3
Ridgehurst Place Southbound	A 9.2	A 9.2	A 9.5	A 9.8	A 9.8	B 10.3
Nachand Lane at Ridgehurst Place						
Ridgehurst Place Westbound	A 9.3	A 9.3	A 9.4	A 9.9	A 9.9	A 10.0
Nachand Lane Southbound (left)	A 7.5	A 7.5	A 7.5	A 7.5	A 7.5	A 7.5
Nachand Lane at Roswell Way						
Roswell Way Westbound	A 9.2	A 9.2	A 9.0	A 9.6	A 9.6	A 9.3
Nachand Lane Southbound (left)	A 7.8	A 7.8	A 7.6	A 7.7	A 7.7	A 7.6
Watterson Trail at Nachand Lane						
Watterson Trail Eastbound (left)	A 8.5	A 8.6	A 8.8	A 8.4	A 8.5	A 8.6
Nachand Lane Southbound	B 14.8	C 15.6	C 16.7	C 20.0	C 21.9	D 25.0
Watterson Trail at Laurel Springs Drive						
Watterson Trail Eastbound (left)			A 8.7			A 8.6
Watterson Trail Westbound (left)	A 7.7	A 7.8	A 7.8	A 8.7	A 8.8	A 8.8
Laurel Springs Drive Northbound	B 13.8	B 14.6	B 14.5	C 15.1	C 16.1	C 15.1
Entrance Southbound			B 15.4			C 17.4

Approach	A.M.			P.M.		
	2019 Existing	2027 No Build	2027 Build	2019 Existing	2027 No Build	2027 Build
Watterson Trail at Hendrick Drive						
Watterson Trail Eastbound (left)	A 8.4	A 8.5	A 8.6	A 8.6	A 8.7	A 8.7
Hendrick Drive Southbound	B 12.1	B 12.5	B 12.6	B 13.6	B 14.1	B 14.5

Key: Level of Service, Delay in seconds per vehicle

The proposed entrance on Watterson Trail was evaluated for turn lanes using the Kentucky Transportation Cabinet Highway Design Guidance Manual dated March, 2017. Using the volumes in Figure 6, a left-turn lane will be required for the entrance on Watterson Trail. The above build results at Watterbourne include the installation of a J-Hook on Hurstbourne Parkway at the intersection, which will prohibit exiting left and through movements.

The connection to Meijer is proposed after the occupation of the 200th apartment unit. Metro Transportation Planning requested analysis if improvements would be required to accommodate the traffic on Watterson Trail. To answer this question the development is assumed occupied except for 239 mid-rise apartments.

Table 3. Trip Generation thru 199 Apartments

AM Peak Hour

Land use	ITE Code	Intensity	Rate/EQ	% IN	% Out	Total Trips		
						In	Out	Total
Assisted Living	254	100 units	$T = 0.19 (X)$	0.63	0.37	12	7	19
Single Family	210	103 units	$T = 0.71(X)+4.80$	0.25	0.75	20	58	78
Multi-Family (3-10)	221	73 units	$\ln(T) = 0.98\ln(X) - 0.98$	0.26	0.74	6	19	25
Multi-Family (1-2)	220	126 units	$\ln(T) = 0.95\ln(X) - 0.51$	0.23	0.77	13	46	59
Sr Living Attached	252	60 units	$T = .2(X) - 0.18$	0.35	0.65	4	8	12
Total						55	138	193

PM Peak Hour

Land use	ITE Code	Intensity				Total Trips		
						In	Out	Total
Assisted Living	254	100 units	$T = 0.26 (X)$	0.38	0.62	10	16	26
Single Family	210	103 units	$\ln(T) = 0.96\ln(X) + 0.20$	0.63	0.37	66	39	105
Multi-Family (3-10)	221	73 units	$\ln(T) = 0.96\ln(X) - 0.63$	0.61	0.39	20	13	33
Multi-Family (1-2)	220	126 units	$\ln(T) = 0.89\ln(X) - 0.02$	0.63	0.37	46	27	73
Sr Living Attached	252	60 units	$T = .24(X) + 2.26$	0.55	0.45	9	8	17
Total						151	102	253

Figure 7 illustrates the pm peak hour trips at the entrance on Watterson Trail for the trips shown in Table 3. Using the Watterson Trail volumes from Figure 6, a right turn lane at the entrance is not warranted. Therefore, no

additional improvements are needed at the entrance on Watterson Trail to accommodate traffic generated by the development thru 199 apartments.

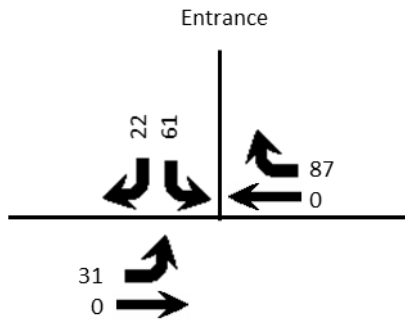


Figure 7. PM Peak Hour Site Trips for site up to 199 Apartments

CONCLUSIONS

Based upon the volume of traffic generated by the development and the amount of traffic forecasted for the year 2027, there will be a minor impact to the existing highway network. A left-turn lane will be required for the entrance on Watterson Trail. The Kentucky Transportation Cabinet will require the installation of a J-Hook on Hurstbourne Parkway at the Watterbourne intersection when the connection is made to Meijer.

APPENDIX

Hurstbourne Commons Traffic Impact Study

Traffic Counts

Hurstbourne, KY
Classified Turn Movement Count

Site 6 of 9
KY-1747 S Hurstbourne Pkwy (North)
Watterson Trail (East)
KY-1747 S Hurstbourne Pkwy (South)
Watterson Trail (West)

Lat/Long 38.183476°, -85.606692°
Weather Fair
44°F

Date
Wednesday, December 4, 2019



Marr Traffic
Transportation Data Collection

41 Peabody Street, Nashville, TN 37210
10 Glenlake Parkway, Suite 130, Atlanta, GA 30328
555 Fayetteville Street, Suite 201, Raleigh, NC 27601
1229 South Shelby Street, Louisville, KY 40203
6565 North MacArthur Boulevard, Suite 225, Dallas, TX 75039

hello@marrtraffic.com
www.marrtraffic.com

1 (800) 615-3765

	Southbound						Westbound						Northbound						Eastbound						
	KY-1747 S Hurstbourne Pkwy (North)						Watterson Trail (East)						KY-1747 S Hurstbourne Pkwy (South)						Watterson Trail (West)						
	U-Turn	Left	Thru	Right	Peds	App	U-Turn	Left	Thru	Right	Peds	App	U-Turn	Left	Thru	Right	Peds	App	U-Turn	Left	Thru	Right	Peds	App	
0700 - 0715	0	9	78	15	0	102	0	18	69	27	0	114	1	6	231	10	0	248	0	18	22	11	0	51	515
0715 - 0730	0	16	122	27	0	165	0	40	94	23	0	157	0	1	272	17	0	290	0	18	28	10	0	56	668
0730 - 0745	0	27	147	30	0	204	0	35	94	22	0	151	0	6	261	8	0	275	0	15	29	6	0	50	680
0745 - 0800	0	12	90	32	0	134	0	37	91	40	0	168	1	6	251	7	0	265	0	19	28	9	0	56	623
0800 - 0815	0	11	106	29	0	146	0	18	66	28	0	112	0	7	289	10	0	306	0	21	32	6	0	59	623
0815 - 0830	0	28	107	20	0	155	0	20	67	32	1	120	0	4	241	7	0	252	0	14	32	6	0	52	579
0830 - 0845	0	15	108	20	0	143	0	10	67	26	0	103	0	4	246	13	0	263	0	18	22	5	0	45	554
0845 - 0900	0	15	106	35	0	156	0	20	51	22	0	93	0	3	219	10	0	232	0	26	31	5	0	62	543
1600 - 1615	0	36	229	24	0	289	0	38	47	44	0	129	0	9	155	17	0	181	0	21	60	8	0	89	688
1615 - 1630	0	42	250	27	0	319	0	39	74	36	0	149	0	17	151	12	0	180	0	15	51	14	0	80	728
1630 - 1645	0	41	247	24	0	312	0	31	48	34	0	113	0	15	153	13	0	181	0	31	62	18	0	111	717
1645 - 1700	0	53	286	39	0	378	0	29	67	35	0	131	0	15	179	16	0	210	0	17	63	11	0	91	810
1700 - 1715	1	28	254	32	0	315	0	42	52	22	0	116	0	14	137	13	0	164	0	26	63	8	0	97	692
1715 - 1730	0	52	271	21	0	344	0	39	63	38	0	140	0	15	191	9	0	215	0	19	72	10	0	101	800
1730 - 1745	0	39	256	34	0	329	0	28	69	29	0	126	0	12	197	13	0	222	0	23	58	12	0	93	770
1745 - 1800	0	63	239	35	0	337	0	23	82	35	1	141	0	29	167	9	0	205	0	24	66	6	0	96	779

0715 - 0730	0	16	122	27	0	165	0	40	94	23	0	157	0	1	272	17	0	290	0	18	28	10	0	56	668
0730 - 0745	0	27	147	30	0	204	0	35	94	22	0	151	0	6	261	8	0	275	0	15	29	6	0	50	680
0745 - 0800	0	12	90	32	0	134	0	37	91	40	0	168	1	6	251	7	0	265	0	19	28	9	0	56	623
0800 - 0815	0	11	106	29	0	146	0	18	66	28	0	112	0	7	289	10	0	306	0	21	32	6	0	59	623
AM PEAK	0	66	465	118	0	649	0	130	345	113	0	588	1	20	1073	42	0	1136	0	73	117	31	0	221	2594
1645 - 1700	0	53	286	39	0	378	0	29	67	35	0	131	0	15	179	16	0	210	0	17	63	11	0	91	810
1700 - 1715	1	28	254	32	0	315	0	42	52	22	0	116	0	14	137	13	0	164	0	26	63	8	0	97	692
1715 - 1730	0	52	271	21	0	344	0	39	63	38	0	140	0	15	191	9	0	215	0	19	72	10	0	101	800
1730 - 1745	0	39	256	34	0	329	0	28	69	29	0	126	0	12	197	13	0	222	0	23	58	12	0	93	770
PM PEAK	1	172	1067	126	0	1366	0	138	251	124	0	513	0	56	704	51	0	811	0	85	256	41	0	382	3072

Hurstbourne Commons Traffic Impact Study

Hurstbourne, KY
Classified Turn Movement Count

Site 5 of 9
KY-1747 S Hurstbourne Pkwy (North)
Wattbourne Ln
KY-1747 S Hurstbourne Pkwy (South)
Hendrik Dr

Lat/Long
38.185462°, -85.606096°
Weather
Fair
44°F

Date
Wednesday, December 4, 2019



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1 (800) 615-3765

	Southbound						Westbound						Northbound						Eastbound						Int
	KY-1747 S Hurstbourne Pkwy (North)						Wattbourne Ln						KY-1747 S Hurstbourne Pkwy (South)						Hendrik Dr						
	U-Turn	Left	Thru	Right	Peds	App	U-Turn	Left	Thru	Right	Peds	App	U-Turn	Left	Thru	Right	Peds	App	U-Turn	Left	Thru	Right	Peds	App	
0700 - 0715	0	7	99	7	0	113	0	1	1	10	0	12	3	10	254	5	1	273	0	4	0	4	0	8	406
0715 - 0730	0	3	169	11	0	183	0	1	1	14	0	16	2	12	289	10	3	316	0	2	1	7	0	10	525
0730 - 0745	0	6	184	3	0	193	0	3	0	17	2	22	0	7	284	10	0	301	0	2	0	1	0	3	519
0745 - 0800	0	4	127	9	0	140	0	2	2	12	0	16	2	15	288	8	0	313	0	7	0	10	0	17	486
0800 - 0815	0	6	144	4	0	154	0	3	0	21	0	24	1	9	318	12	0	340	0	5	0	5	0	10	528
0815 - 0830	0	3	145	9	0	157	0	2	0	13	1	16	1	16	258	3	0	278	0	4	0	8	0	12	463
0830 - 0845	0	5	133	5	0	143	0	4	0	8	0	12	1	9	279	7	0	296	0	4	0	9	0	13	464
0845 - 0900	0	4	159	4	0	167	0	3	2	10	0	15	2	6	257	6	2	273	0	3	0	4	0	7	462
1600 - 1615	0	19	268	16	0	303	0	1	1	9	1	12	0	25	189	8	1	223	0	2	1	19	0	22	560
1615 - 1630	0	14	307	19	0	340	0	2	0	15	0	17	0	17	182	7	0	206	0	4	1	20	0	25	588
1630 - 1645	0	20	293	14	0	327	0	0	0	12	0	12	0	16	202	7	0	225	0	5	1	22	0	28	592
1645 - 1700	0	13	361	16	0	390	0	1	1	13	0	15	0	13	204	3	1	221	0	3	2	14	0	19	645
1700 - 1715	0	24	320	14	0	358	0	1	0	8	0	9	0	21	166	6	0	193	0	4	2	18	0	24	584
1715 - 1730	0	18	328	16	0	362	0	1	1	10	0	12	0	20	218	2	0	240	0	0	1	16	0	17	631
1730 - 1745	0	16	326	17	0	359	0	2	0	7	0	9	0	19	234	0	1	254	0	2	0	21	0	23	645
1745 - 1800	0	22	327	14	0	363	0	3	0	7	1	11	0	15	207	3	0	225	0	4	1	13	0	18	617

0715 - 0730	0	3	169	11	0	183	0	1	1	14	0	16	2	12	289	10	3	316	0	2	1	7	0	10	525
0730 - 0745	0	6	184	3	0	193	0	3	0	17	2	22	0	7	284	10	0	301	0	2	0	1	0	3	519
0745 - 0800	0	4	127	9	0	140	0	2	2	12	0	16	2	15	288	8	0	313	0	7	0	10	0	17	486
0800 - 0815	0	6	144	4	0	154	0	3	0	21	0	24	1	9	318	12	0	340	0	5	0	5	0	10	528
AM PEAK	0	19	624	27	0	670	0	9	3	64	2	78	5	43	1179	40	3	1270	0	16	1	23	0	40	2058
1645 - 1700	0	13	361	16	0	390	0	1	1	13	0	15	0	13	204	3	1	221	0	3	2	14	0	19	645
1700 - 1715	0	24	320	14	0	358	0	1	0	8	0	9	0	21	166	6	0	193	0	4	2	18	0	24	584
1715 - 1730	0	18	328	16	0	362	0	1	1	10	0	12	0	20	218	2	0	240	0	0	1	16	0	17	631
1730 - 1745	0	16	326	17	0	359	0	2	0	7	0	9	0	19	234	0	1	254	0	2	0	21	0	23	645
PM PEAK	0	71	1335	63	0	1469	0	5	2	38	0	45	0	73	822	11	2	908	0	9	5	69	0	83	2505

Hurstbourne Commons Traffic Impact Study

Hurstbourne, KY
Classified Turn Movement Count

Site 4 of 9
KY-1747 S Hurstbourne Pkwy (North)
Hurstbourne Crossing Dr
KY-1747 S Hurstbourne Pkwy (South)
Local Access

Lat/Long Weather
38.187935°, -85.605286° Fair
44°F

Date
Wednesday, December 4, 2019



Marr Traffic
Transportation Data Collection

41 Peabody Street, Nashville, TN 37210
10 Glenlake Parkway, Suite 130, Atlanta, GA 30328
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6565 North MacArthur Boulevard, Suite 225, Dallas, TX 75039

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	Southbound					Westbound					Northbound					Eastbound					Int				
	KY-1747 S Hurstbourne Pkwy (North)					Hurstbourne Crossing Dr					KY-1747 S Hurstbourne Pkwy (South)					Meijer									
	U-Turn	Left	Thru	Right	Peds	App	U-Turn	Left	Thru	Right	Peds	App	U-Turn	Left	Thru	Right	Peds	App	U-Turn	Left		Thru	Right	Peds	App
0700 - 0715	0	2	114	0	0	116	0	2	0	4	0	6	1	0	250	4	0	255	0	7	0	0	0	7	384
0715 - 0730	0	1	177	2	0	180	0	2	0	7	0	9	0	0	292	1	0	293	0	5	0	1	0	6	488
0730 - 0745	0	4	175	2	0	181	0	7	1	9	1	18	1	2	288	0	0	291	0	7	0	9	0	16	506
0745 - 0800	0	2	133	4	0	139	0	5	0	8	0	13	0	0	300	0	0	300	0	5	1	1	0	7	459
0800 - 0815	0	0	145	4	0	149	2	5	1	5	0	13	0	2	329	0	0	331	0	13	0	4	0	17	510
0815 - 0830	1	1	147	4	0	153	1	5	0	5	0	11	0	3	268	0	0	271	0	10	0	4	1	15	450
0830 - 0845	0	2	136	3	0	141	0	3	1	3	0	7	0	1	292	0	0	293	0	3	0	6	0	9	450
0845 - 0900	0	2	164	5	0	171	0	3	0	3	0	6	0	2	275	0	0	277	0	10	1	3	0	14	468
1600 - 1615	1	1	277	18	0	297	1	4	0	0	5	10	0	7	193	3	0	203	0	29	1	23	0	53	563
1615 - 1630	0	7	301	16	0	324	0	6	1	5	1	13	0	8	169	3	0	180	0	39	0	33	0	72	589
1630 - 1645	1	4	293	12	0	310	0	2	0	3	0	5	1	7	193	2	0	203	0	36	3	28	0	67	585
1645 - 1700	0	6	355	7	0	368	0	2	0	5	0	7	1	8	195	4	0	208	0	35	1	32	0	68	651
1700 - 1715	0	4	351	8	0	363	0	2	1	4	0	7	0	2	176	3	0	181	0	35	0	22	0	57	608
1715 - 1730	0	6	311	14	0	331	0	2	1	3	0	6	1	6	207	0	0	214	0	26	5	22	0	53	604
1730 - 1745	0	6	340	8	0	354	0	4	0	2	0	6	0	9	219	2	1	231	0	35	0	28	0	63	654
1745 - 1800	1	6	326	8	0	341	0	3	1	4	0	8	1	5	207	3	0	216	0	23	1	34	0	58	623

0715 - 0730	0	1	177	2	0	180	0	2	0	7	0	9	0	0	292	1	0	293	0	5	0	1	0	6	488
0730 - 0745	0	4	175	2	0	181	0	7	1	9	1	18	1	2	288	0	0	291	0	7	0	9	0	16	506
0745 - 0800	0	2	133	4	0	139	0	5	0	8	0	13	0	0	300	0	0	300	0	5	1	1	0	7	459
0800 - 0815	0	0	145	4	0	149	2	5	1	5	0	13	0	2	329	0	0	331	0	13	0	4	0	17	510
AM PEAK	0	7	630	12	0	649	2	19	2	29	1	53	1	4	1209	1	0	1215	0	30	1	15	0	46	1963
1645 - 1700	0	6	355	7	0	368	0	2	0	5	0	7	1	8	195	4	0	208	0	35	1	32	0	68	651
1700 - 1715	0	4	351	8	0	363	0	2	1	4	0	7	0	2	176	3	0	181	0	35	0	22	0	57	608
1715 - 1730	0	6	311	14	0	331	0	2	1	3	0	6	1	6	207	0	0	214	0	26	5	22	0	53	604
1730 - 1745	0	6	340	8	0	354	0	4	0	2	0	6	0	9	219	2	1	231	0	35	0	28	0	63	654
PM PEAK	0	22	1357	37	0	1416	0	10	2	14	0	26	2	25	797	9	1	834	0	131	6	104	0	241	2517

Hurstbourne Commons Traffic Impact Study

Hurstbourne, KY
Classified Turn Movement Count



Marr Traffic
Transportation Data Collection

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Site 1 of 9
KY-1747 S Hurstbourne Pkwy (North)
Ambrosse Ln
KY-1747 S Hurstbourne Pkwy (South)
Ridgehurst Pl

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Lat/Long
38.193013°, -85.604831°

Weather
Fair
44°F

1 (800) 615-3765

Date
Wednesday, December 4, 2019

	Southbound						Westbound						Northbound						Eastbound						
	KY-1747 S Hurstbourne Pkwy (North)						Ambrosse Ln						KY-1747 S Hurstbourne Pkwy (South)						Ridgehurst Pl						
	U-Turn	Left	Thru	Right	Peds	App	U-Turn	Left	Thru	Right	Peds	App	U-Turn	Left	Thru	Right	Peds	App	U-Turn	Left	Thru	Right	Peds	App	Int
0700 - 0715	1	3	110	5	0	119	0	0	0	3	0	3	0	5	307	3	2	295	0	15	0	9	0	24	441
0715 - 0730	0	2	162	4	0	168	0	4	0	3	2	9	0	7	287	1	0	317	0	10	0	13	0	23	517
0730 - 0745	0	2	169	3	0	174	0	3	0	3	0	6	0	8	318	3	1	330	0	7	0	14	0	21	531
0745 - 0800	0	2	126	3	0	131	0	1	2	4	0	7	1	9	318	0	0	328	0	8	0	9	0	17	483
0800 - 0815	0	1	140	5	0	146	0	3	0	2	0	5	0	11	338	2	0	351	0	19	0	6	1	26	528
0815 - 0830	1	1	147	5	0	154	0	3	0	1	0	4	0	4	303	3	0	310	0	9	3	14	0	26	494
0830 - 0845	2	0	139	3	0	144	0	0	0	2	0	2	1	6	297	1	0	305	0	12	0	9	2	23	474
0845 - 0900	1	0	159	5	0	165	0	3	0	1	0	4	0	8	279	2	0	289	0	8	0	7	0	15	473
1600 - 1615	1	3	336	19	0	359	0	5	0	0	0	5	2	12	216	1	0	231	0	5	1	10	1	17	612
1615 - 1630	0	4	313	6	0	323	0	2	0	2	0	4	0	13	202	2	0	217	0	8	1	16	0	25	569
1630 - 1645	0	3	359	13	0	375	0	3	1	2	0	6	1	15	217	5	1	239	0	3	3	12	0	18	638
1645 - 1700	0	5	407	13	0	425	0	3	0	1	1	5	1	5	225	9	0	240	0	8	2	12	1	23	693
1700 - 1715	1	3	367	8	0	379	0	0	0	1	0	1	0	19	208	5	0	232	0	7	2	19	1	29	641
1715 - 1730	0	7	356	20	0	383	0	2	1	2	0	5	1	9	225	3	0	238	0	7	0	10	0	17	643
1730 - 1745	0	7	394	16	1	418	0	2	0	2	0	4	0	8	232	1	0	241	0	3	0	19	1	23	686
1745 - 1800	0	5	337	21	0	363	0	4	0	4	1	9	1	9	174	3	0	187	0	7	2	14	0	23	582

0715 - 0730	0	2	162	4	0	168	0	4	0	3	2	9	0	5	307	3	2	317	0	10	0	13	0	23	517
0730 - 0745	0	2	169	3	0	174	0	3	0	3	0	6	0	8	318	3	1	330	0	7	0	14	0	21	531
0745 - 0800	0	2	126	3	0	131	0	1	2	4	0	7	1	9	318	0	0	328	0	8	0	9	0	17	483
0800 - 0815	0	1	140	5	0	146	0	3	0	2	0	5	0	11	338	2	0	351	0	19	0	6	1	26	528
AM PEAK	0	7	597	15	0	619	0	11	2	12	2	27	1	33	1281	8	3	1326	0	44	0	42	1	87	2059
1645 - 1700	0	5	407	13	0	425	0	3	0	1	1	5	1	5	225	9	0	240	0	8	2	12	1	23	693
1700 - 1715	1	3	367	8	0	379	0	0	0	1	0	1	0	19	208	5	0	232	0	7	2	19	1	29	641
1715 - 1730	0	7	356	20	0	383	0	2	1	2	0	5	1	9	225	3	0	238	0	7	0	10	0	17	643
1730 - 1745	0	7	394	16	1	418	0	2	0	2	0	4	0	8	232	1	0	241	0	3	0	19	1	23	686
PM PEAK	1	22	1524	57	1	1605	0	7	1	6	1	15	2	41	890	18	0	951	0	25	4	60	3	92	2663

Hurstbourne Commons Traffic Impact Study

Hurstbourne, KY
Classified Turn Movement Count

Site 2 of 9
Ridgehurst PI (North)
Ridgehurst PI (East)
Brody Ln
Ridgehurst PI (West)

Lat/Long
38.193091°, -85.609211°

Date
Wednesday, December 4, 2019



Marr Traffic
Transportation Data Collection

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Weather
Fair
44°F

	Southbound						Westbound						Northbound						Eastbound						Int
	Ridgehurst PI (North)						Ridgehurst PI (East)						Brody Ln						Ridgehurst PI (West)						
	U-Turn	Left	Thru	Right	Peds	App	U-Turn	Left	Thru	Right	Peds	App	U-Turn	Left	Thru	Right	Peds	App	U-Turn	Left	Thru	Right	Peds	App	
0700 - 0715	0	3	0	0	0	3	0	0	8	0	0	8	0	0	1	1	0	2	0	0	13	0	0	13	26
0715 - 0730	0	3	0	0	0	3	0	1	5	1	0	7	0	1	0	1	0	2	0	0	15	0	0	15	27
0730 - 0745	0	3	0	0	0	3	0	0	12	0	0	12	0	1	0	0	0	1	0	0	8	0	0	8	24
0745 - 0800	0	1	0	0	0	1	0	0	10	1	0	11	0	1	0	0	0	1	0	0	14	1	0	15	28
0800 - 0815	0	3	0	0	0	3	0	0	7	2	0	9	0	0	0	0	0	0	0	0	20	0	0	20	32
0815 - 0830	0	5	0	0	0	5	0	1	8	1	0	10	0	2	0	0	0	2	0	0	16	1	0	17	34
0830 - 0845	0	0	0	0	0	0	0	0	6	1	0	7	0	0	0	0	6	6	0	1	16	0	0	17	30
0845 - 0900	0	0	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	0	0	10	0	0	10	17
1600 - 1615	0	2	0	1	0	3	0	1	21	2	0	24	0	0	0	1	3	4	0	1	17	2	0	20	51
1615 - 1630	0	1	0	0	0	1	0	2	13	4	0	19	0	1	0	3	0	4	0	1	16	3	0	20	44
1630 - 1645	0	0	0	0	0	0	0	2	14	3	0	19	0	0	0	1	1	2	0	0	13	1	0	14	35
1645 - 1700	0	1	0	1	0	2	0	2	13	2	0	17	0	2	0	1	0	3	0	0	14	1	1	16	38
1700 - 1715	0	0	0	0	0	0	0	1	20	1	0	22	0	1	0	2	1	4	0	0	13	1	0	14	40
1715 - 1730	0	0	0	0	0	0	0	0	19	4	0	23	0	0	0	0	0	0	0	0	25	2	0	27	50
1730 - 1745	0	1	0	0	0	1	0	0	17	1	0	18	0	0	0	1	0	1	0	0	16	1	0	17	37
1745 - 1800	0	0	0	0	0	0	0	1	31	2	0	34	0	0	0	2	0	2	0	0	16	1	0	17	53
AM PEAK	0	10	0	0	0	10	0	1	34	4	0	39	0	3	0	1	0	4	0	0	57	1	0	58	111
1700 - 1715	0	0	0	0	0	0	0	1	20	1	0	22	0	1	0	2	1	4	0	0	13	1	0	14	40
1715 - 1730	0	0	0	0	0	0	0	0	19	4	0	23	0	0	0	0	0	0	0	0	25	2	0	27	50
1730 - 1745	0	1	0	0	0	1	0	0	17	1	0	18	0	0	0	1	0	1	0	0	16	1	0	17	37
1745 - 1800	0	0	0	0	0	0	0	1	31	2	0	34	0	0	0	2	0	2	0	0	16	1	0	17	53
PM PEAK	0	1	0	0	0	1	0	2	87	8	0	97	0	1	0	5	1	7	0	0	70	5	0	75	180

Hurstbourne Commons
Traffic Impact Study

Hurstbourne, KY
Classified Turn Movement Count



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Site 3 of 9
Nachand Ln (North)
Ridgehurst Pl
Nachand Ln (South)

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Lat/Long
38.192551°, -85.615474°

Weather
Fair
44°F

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Date
Wednesday, December 4, 2019

	Southbound					Westbound					Northbound					Int
	Nachand Ln (North)					Ridgehurst Pl					Nachand Ln (South)					
	U-Tum	Left	Thru	Peds	App	U-Tum	Left	Right	Peds	App	U-Tum	Thru	Right	Peds	App	
0700 - 0715	0	7	4	0	11	0	6	14	0	20	0	26	5	0	31	62
0715 - 0730	0	5	9	1	15	0	3	12	1	16	0	20	2	0	22	53
0730 - 0745	0	3	5	0	8	0	4	13	0	17	0	19	3	0	22	47
0745 - 0800	0	12	11	0	23	0	4	13	0	17	0	14	3	0	17	57
0800 - 0815	0	9	12	0	21	0	6	9	0	15	0	14	5	0	19	55
0815 - 0830	0	9	10	0	19	0	6	12	0	18	0	17	6	0	23	60
0830 - 0845	0	6	6	0	12	0	6	6	0	12	0	19	8	0	27	51
0845 - 0900	0	4	8	0	12	0	4	6	0	10	0	18	2	0	20	42
1600 - 1615	0	16	22	0	38	0	9	8	0	17	0	21	7	0	28	83
1615 - 1630	0	16	18	0	34	0	5	9	0	14	0	22	2	0	24	72
1630 - 1645	0	12	31	0	43	0	9	11	0	20	0	10	4	0	14	77
1645 - 1700	0	18	37	0	55	0	4	13	0	17	0	14	6	0	20	92
1700 - 1715	0	11	26	0	37	0	5	10	0	15	0	19	7	0	26	78
1715 - 1730	0	23	37	0	60	0	6	15	0	21	0	11	9	0	20	101
1730 - 1745	0	18	32	0	50	0	3	11	0	14	0	14	4	0	18	82
1745 - 1800	0	17	27	0	44	0	9	22	0	31	0	20	4	0	24	99

0715 - 0730	0	5	9	1	15	0	3	12	1	16	0	20	2	0	22	53
0730 - 0745	0	3	5	0	8	0	4	13	0	17	0	19	3	0	22	47
0745 - 0800	0	12	11	0	23	0	4	13	0	17	0	14	3	0	17	57
0800 - 0815	0	9	12	0	21	0	6	9	0	15	0	14	5	0	19	55
AM PEAK	0	29	37	1	67	0	17	47	1	65	0	67	13	0	80	212
1700 - 1715	0	11	26	0	37	0	5	10	0	15	0	19	7	0	26	78
1715 - 1730	0	23	37	0	60	0	6	15	0	21	0	11	9	0	20	101
1730 - 1745	0	18	32	0	50	0	3	11	0	14	0	14	4	0	18	82
1745 - 1800	0	17	27	0	44	0	9	22	0	31	0	20	4	0	24	99
PM PEAK	0	69	122	0	191	0	23	58	0	81	0	64	24	0	88	360

Hurstbourne Commons
Traffic Impact Study

Hurstbourne, KY
Classified Turn Movement Count

Site 9 of 9
Nachand Ln (North)
Roswell Way
Nachand Ln (South)



Marr Traffic
Transportation Data Collection

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Lat/Long
38.182370°, -85.616052°

Weather
Fair
44°F

1 (800) 615-3765

Date
Wednesday, December 4, 2019

	Southbound					Westbound					Northbound					Int
	Nachand Ln (North)					Roswell Way					Nachand Ln (South)					
	U-Turn	Left	Thru	Peds	App	U-Turn	Left	Right	Peds	App	U-Turn	Thru	Right	Peds	App	
0700 - 0715	0	0	19	0	19	0	2	1	0	3	0	22	0	0	22	44
0715 - 0730	0	0	20	0	20	0	1	1	0	2	0	14	0	0	14	36
0730 - 0745	0	0	27	0	27	0	3	0	0	3	0	15	0	0	15	45
0745 - 0800	0	1	18	0	19	0	1	1	0	2	0	9	1	0	10	31
0800 - 0815	0	1	29	0	30	0	0	3	0	3	0	15	1	0	16	49
0815 - 0830	0	1	21	0	22	0	1	1	0	2	0	12	0	0	12	36
0830 - 0845	0	0	21	0	21	0	0	1	0	1	0	18	1	0	19	41
0845 - 0900	0	1	11	0	12	0	2	2	0	4	0	13	0	0	13	29
1600 - 1615	0	1	32	0	33	0	0	2	0	2	0	35	0	0	35	70
1615 - 1630	0	0	20	0	20	0	3	2	0	5	0	27	0	0	27	52
1630 - 1645	0	0	32	0	32	0	1	0	0	1	0	25	0	0	25	58
1645 - 1700	0	4	32	0	36	0	0	0	0	0	0	27	0	0	27	63
1700 - 1715	0	0	32	0	32	0	1	0	0	1	0	35	0	0	35	68
1715 - 1730	0	1	36	0	37	0	0	1	2	3	0	21	2	0	23	63
1730 - 1745	0	2	35	0	37	1	0	0	0	1	0	36	4	0	40	78
1745 - 1800	0	2	28	0	30	0	0	2	0	2	0	32	2	0	34	66

0715 - 0730	0	0	20	0	20	0	1	1	0	2	0	14	0	0	14	36
0730 - 0745	0	0	27	0	27	0	3	0	0	3	0	15	0	0	15	45
0745 - 0800	0	1	18	0	19	0	1	1	0	2	0	9	1	0	10	31
0800 - 0815	0	1	29	0	30	0	0	3	0	3	0	15	1	0	16	49
AM PEAK	0	2	94	0	96	0	5	5	0	10	0	53	2	0	55	161
1700 - 1715	0	0	32	0	32	0	1	0	0	1	0	35	0	0	35	68
1715 - 1730	0	1	36	0	37	0	0	1	2	3	0	21	2	0	23	63
1730 - 1745	0	2	35	0	37	1	0	0	0	1	0	36	4	0	40	78
1745 - 1800	0	2	28	0	30	0	0	2	0	2	0	32	2	0	34	66
PM PEAK	0	5	131	0	136	1	1	3	2	7	0	124	8	0	132	275

Hurstbourne Commons Traffic Impact Study

Hurstbourne, KY
Classified Turn Movement Count

Site 8 of 9
Nachand Ln
Watterson Trail (East)

Watterson Trail (West)

Lat/Long
38.181341°, -85.616152°

Weather
Fair
44°F

Date
Wednesday, December 4, 2019



Marr Traffic
Transportation Data Collection

41 Peabody Street, Nashville, TN 37210
10 Glenlake Parkway, Suite 130, Atlanta, GA 30328
555 Fayetteville Street, Suite 201, Raleigh, NC 27601
1229 South Shelby Street, Louisville, KY 40203
6565 North MacArthur Boulevard, Suite 225, Dallas, TX 75039

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1 (800) 615-3765

	Southbound					Westbound					Eastbound					Int
	Nachand Ln					Watterson Trail (East)					Watterson Trail (West)					
	U-Turn	Left	Right	Peds	App	U-Turn	Thru	Right	Peds	App	U-Turn	Left	Thru	Peds	App	
0700 - 0715	0	12	9	0	21	0	80	18	0	98	0	3	25	0	28	147
0715 - 0730	0	14	6	0	20	0	108	12	0	120	0	3	43	0	46	186
0730 - 0745	0	17	13	0	30	0	120	11	0	131	0	3	28	0	31	192
0745 - 0800	0	10	10	0	20	0	115	7	0	122	0	3	50	0	53	195
0800 - 0815	0	18	9	0	27	0	97	11	0	108	0	5	44	0	49	184
0815 - 0830	0	17	7	0	24	0	87	8	0	95	0	4	40	0	44	163
0830 - 0845	0	12	8	0	20	0	78	18	0	96	0	2	42	0	44	160
0845 - 0900	0	9	5	0	14	0	76	12	0	88	0	1	38	0	39	141
1600 - 1615	0	28	5	0	33	0	79	31	0	110	0	4	84	0	88	231
1615 - 1630	0	17	6	1	24	0	87	22	0	109	0	5	59	0	64	197
1630 - 1645	0	26	7	0	33	0	65	17	0	82	0	7	67	0	74	189
1645 - 1700	0	24	3	0	27	0	92	24	0	116	0	4	80	0	84	227
1700 - 1715	0	26	11	0	37	0	69	26	0	95	0	7	81	0	88	220
1715 - 1730	0	28	7	0	35	0	94	12	0	106	0	12	66	0	78	219
1730 - 1745	0	29	6	0	35	0	93	29	0	122	0	13	69	0	82	239
1745 - 1800	0	21	8	0	29	0	96	27	0	123	0	7	71	0	78	230

0715 - 0730	0	14	6	0	20	0	108	12	0	120	0	3	43	0	46	186
0730 - 0745	0	17	13	0	30	0	120	11	0	131	0	3	28	0	31	192
0745 - 0800	0	10	10	0	20	0	115	7	0	122	0	3	50	0	53	195
0800 - 0815	0	18	9	0	27	0	97	11	0	108	0	5	44	0	49	184
AM PEAK	0	59	38	97	0	440	41	0	0	14	165	0	179	0	179	757
1700 - 1715	0	26	11	0	37	0	69	26	0	95	0	7	81	0	88	220
1715 - 1730	0	28	7	0	35	0	94	12	0	106	0	12	66	0	78	219
1730 - 1745	0	29	6	0	35	0	93	29	0	122	0	13	69	0	82	239
1745 - 1800	0	21	8	0	29	0	96	27	0	123	0	7	71	0	78	230
PM PEAK	0	104	32	136	0	352	94	0	0	39	287	0	326	0	326	908

Hurstbourne Commons
Traffic Impact Study

Classified Turn Movement Count



Marr Traffic
Transportation Data Collection

10 Glenlake Parkway, Suite 130, Atlanta, GA 30328
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1229 South Shelby Street, Louisville, KY 40203
6565 North MacArthur Boulevard, Suite 225, Dallas, TX 75039

Site 1 of 3

Watterson Trail (East)
Laurel Spring Dr
Watterson Trail (West)

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Lat/Long
38.181396°, -85.611107°

Weather
Fair
55°F

1 (800) 615-3765

Date
Tuesday, March 3, 2020

	Westbound					Northbound					Eastbound					Int
	Watterson Trail (East)					Laurel Spring Dr					Watterson Trail (West)					
	U-Turn	Left	Thru	Peds	App	U-Turn	Left	Right	Peds	App	U-Turn	Thru	Right	Peds	App	
0700 - 0715	0	1	115	0	116	0	2	2	0	4	0	32	1	0	33	153
0715 - 0730	0	1	128	0	129	0	1	1	0	2	0	43	0	0	43	174
0730 - 0745	0	0	115	0	115	0	1	0	0	1	0	54	2	0	56	172
0745 - 0800	0	0	139	0	139	0	1	0	0	1	0	63	1	0	64	204
0800 - 0815	0	1	88	1	90	0	2	1	0	3	0	60	1	1	62	155
0815 - 0830	0	0	76	0	76	0	2	0	0	2	0	51	0	0	51	129
0830 - 0845	0	0	102	0	102	0	0	2	0	2	0	61	0	1	62	166
0845 - 0900	0	1	97	0	98	0	0	3	0	3	0	57	0	0	57	158
1600 - 1615	0	1	98	0	99	0	0	1	0	1	0	77	1	0	78	178
1615 - 1630	0	3	93	0	96	0	1	0	0	1	0	96	1	0	97	194
1630 - 1645	0	5	102	0	107	0	0	0	0	0	0	106	1	0	107	214
1645 - 1700	0	1	117	0	118	0	1	0	0	1	0	103	1	0	104	223
1700 - 1715	1	0	115	0	116	0	0	1	0	1	0	134	0	0	134	251
1715 - 1730	0	0	122	0	122	0	1	1	0	2	0	152	1	0	153	277
1730 - 1745	0	1	97	0	98	0	0	2	0	2	0	160	0	0	160	260
1745 - 1800	0	0	105	0	105	0	0	0	0	0	0	111	0	1	112	217

0715 - 0730	0	1	128	0	129	0	1	1	0	2	0	43	0	0	43	174
0730 - 0745	0	0	115	0	115	0	1	0	0	1	0	54	2	0	56	172
0745 - 0800	0	0	139	0	139	0	1	0	0	1	0	63	1	0	64	204
0800 - 0815	0	1	88	1	90	0	2	1	0	3	0	60	1	1	62	155
AM PEAK	0	2	470	1	473	0	5	2	0	7	0	220	4	1	225	705
1645 - 1700	0	1	117	0	118	0	1	0	0	1	0	103	1	0	104	223
1700 - 1715	1	0	115	0	116	0	0	1	0	1	0	134	0	0	134	251
1715 - 1730	0	0	122	0	122	0	1	1	0	2	0	152	1	0	153	277
1730 - 1745	0	1	97	0	98	0	0	2	0	2	0	160	0	0	160	260
PM PEAK	1	2	451	0	454	0	2	4	0	6	0	549	2	0	551	1011

Hurstbourne Commons Traffic Impact Study

Hurstbourne, KY
Classified Turn Movement Count

Site 7 of 9
Hendrik Dr
Watterson Trail (East)
Local Access
Watterson Trail (West)

Lat/Long 38.183210°, -85.608027°
Weather Fair
44°F

Date
Wednesday, December 4, 2019



Marr Traffic
Transportation Data Collection

41 Peabody Street, Nashville, TN 37210
10 Glenlake Parkway, Suite 130, Atlanta, GA 30328
555 Fayetteville Street, Suite 201, Raleigh, NC 27601
1229 South Shelby Street, Louisville, KY 40203
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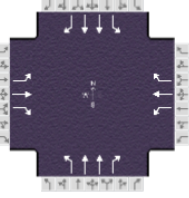
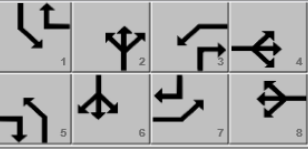
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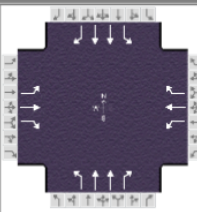
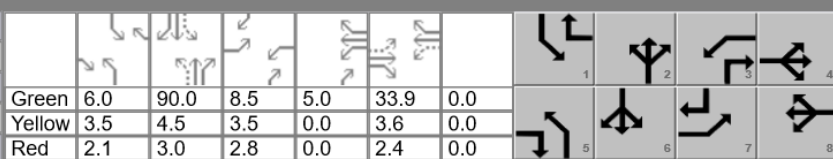
	Southbound						Westbound						Northbound						Eastbound						Int	
	Hendrik Dr						Watterson Trail (East)						Local Access						Watterson Trail (West)							
	U-Turn	Left	Thru	Right	Peds	App	U-Turn	Left	Thru	Right	Peds	App	U-Turn	Left	Thru	Right	Peds	App	U-Turn	Left	Thru	Right	Peds	App		
0700 - 0715	0	5	0	10	0	15	0	3	84	5	0	92	0	0	0	0	0	0	0	0	3	41	0	0	44	151
0715 - 0730	0	3	0	7	0	10	0	2	110	10	0	122	0	0	0	0	0	0	0	0	3	57	1	0	61	193
0730 - 0745	0	2	0	8	0	10	0	0	125	4	0	129	0	1	0	1	0	2	0	5	48	0	0	53	194	
0745 - 0800	0	5	0	4	0	9	0	1	122	6	0	129	0	0	0	0	0	0	0	9	49	0	0	58	196	
0800 - 0815	0	7	0	8	0	15	0	1	93	2	0	96	0	0	0	0	0	0	0	12	50	0	0	62	173	
0815 - 0830	0	3	0	10	0	13	0	2	87	6	0	95	0	1	0	0	0	1	0	7	52	3	0	62	171	
0830 - 0845	0	6	0	9	0	15	0	1	85	7	1	94	0	0	0	0	0	0	0	7	48	0	0	55	164	
0845 - 0900	0	5	0	9	0	14	0	1	81	5	0	87	0	0	0	2	0	2	0	8	45	0	0	53	156	
1600 - 1615	0	15	0	39	0	54	0	1	71	8	0	80	0	1	1	1	0	3	0	27	73	1	0	101	238	
1615 - 1630	0	18	0	24	0	42	0	0	86	30	0	116	0	0	0	2	0	2	0	20	60	2	0	82	242	
1630 - 1645	0	22	0	21	0	43	0	1	64	20	0	85	0	0	1	9	0	10	0	18	81	0	0	99	237	
1645 - 1700	0	16	0	33	0	49	0	3	93	27	0	123	0	0	0	1	0	1	0	21	75	3	0	99	272	
1700 - 1715	0	15	0	17	0	32	0	0	82	17	0	99	0	0	0	2	0	2	0	18	74	0	0	92	225	
1715 - 1730	0	18	0	26	0	44	0	1	81	21	0	103	0	1	0	2	0	3	0	28	88	1	0	117	267	
1730 - 1745	0	17	0	33	0	50	0	0	88	25	0	113	0	0	0	3	0	3	0	22	76	0	0	98	264	
1745 - 1800	0	17	0	32	0	49	0	1	98	45	0	144	0	1	0	0	0	1	0	8	74	0	0	82	276	

0715 - 0730	0	3	0	7	0	10	0	2	110	10	0	122	0	0	0	0	0	0	0	3	57	1	0	61	193
0730 - 0745	0	2	0	8	0	10	0	0	125	4	0	129	0	1	0	1	0	2	0	5	48	0	0	53	194
0745 - 0800	0	5	0	4	0	9	0	1	122	6	0	129	0	0	0	0	0	0	0	9	49	0	0	58	196
0800 - 0815	0	7	0	8	0	15	0	1	93	2	0	96	0	0	0	0	0	0	0	12	50	0	0	62	173
AM PEAK	0	17	0	27	0	44	0	4	450	22	0	476	0	1	0	1	0	2	0	29	204	1	0	234	756
1700 - 1715	0	15	0	17	0	32	0	0	82	17	0	99	0	0	0	2	0	2	0	18	74	0	0	92	225
1715 - 1730	0	18	0	26	0	44	0	1	81	21	0	103	0	1	0	2	0	3	0	28	88	1	0	117	267
1730 - 1745	0	17	0	33	0	50	0	0	88	25	0	113	0	0	0	3	0	3	0	22	76	0	0	98	264
1745 - 1800	0	17	0	32	0	49	0	1	98	45	0	144	0	1	0	0	0	1	0	8	74	0	0	82	276
PM PEAK	0	67	0	108	0	175	0	2	349	108	0	459	0	2	0	7	0	9	0	76	312	1	0	389	1032

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	2/5/2020			Area Type	Other						
Jurisdiction		Time Period	AM Peak			PHF	0.95						
Urban Street	Hurstbourne Pkwy	Analysis Year	2019			Analysis Period	1 > 7:15						
Intersection	Watterson Trail	File Name	Hurst AM 19.xus										
Project Description	Hurstbourne Commons												
Demand Information				EB			WB			NB		SB	
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R	
Demand (v), veh/h	73	117	31	130	345	113	21	1073	42	66	465	118	
Signal Information													
Cycle, s	165.1	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	Yes	Simult. Gap E/W	On	Green	6.0	90.0	7.9	4.6	31.2	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	3.5	4.5	3.5	0.0	3.6	0.0			
				Red	2.1	3.0	2.8	0.0	2.4	0.0			
Timer Results				EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT		
Assigned Phase				7	4	3	8	5	2	1	6		
Case Number				1.1	3.0	1.1	3.0	1.1	3.0	1.1	3.0		
Phase Duration, s				14.2	37.2	18.9	41.8	11.6	97.5	11.6	97.5		
Change Period, (Y+R _c), s				6.3	6.0	6.3	6.0	5.6	7.5	5.6	7.5		
Max Allow Headway (MAH), s				4.1	5.1	4.1	5.1	5.0	7.0	5.0	7.0		
Queue Clearance Time (g _s), s				7.8	11.4	12.3	32.9	2.9	36.5	4.9	14.3		
Green Extension Time (g _e), s				0.2	4.0	0.3	2.9	0.1	35.8	0.3	44.2		
Phase Call Probability				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Max Out Probability				0.00	0.00	0.00	0.22	0.00	0.51	0.00	0.37		
Movement Group Results				EB			WB			NB		SB	
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R	
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16	
Adjusted Flow Rate (v), veh/h	77	123	33	137	363	119	22	1129	44	71	497	126	
Adjusted Saturation Flow Rate (s), veh/h/ln	1753	1885	1610	1753	1885	1560	1810	1795	1585	1767	1766	1598	
Queue Service Time (g _s), s	5.8	9.4	2.6	10.3	30.9	10.2	0.9	34.5	1.8	2.9	12.3	5.8	
Cycle Queue Clearance Time (g _c), s	5.8	9.4	2.6	10.3	30.9	10.2	0.9	34.5	1.8	2.9	12.3	5.8	
Green Ratio (g/C)	0.24	0.19	0.23	0.27	0.22	0.25	0.58	0.55	0.62	0.58	0.55	0.59	
Capacity (c), veh/h	146	356	362	342	409	395	529	1956	984	274	1925	948	
Volume-to-Capacity Ratio (X)	0.527	0.346	0.090	0.400	0.889	0.301	0.042	0.577	0.045	0.258	0.258	0.133	
Back of Queue (Q), ft/ln (90 th percentile)	123.1	184.2	49.3	189.3	548.9	171.8	16	491.1	29.8	55.2	203.5	97	
Back of Queue (Q), veh/ln (90 th percentile)	4.8	7.3	2.0	7.3	21.8	6.7	0.6	19.5	1.2	2.2	7.9	3.8	
Queue Storage Ratio (RQ) (90 th percentile)	0.38	0.57	0.28	0.39	1.12	0.86	0.15	0.61	0.27	0.28	0.30	0.97	
Uniform Delay (d ₁), s/veh	52.9	58.1	50.6	48.5	62.7	49.9	15.3	24.9	12.2	19.3	19.9	14.8	
Incremental Delay (d ₂), s/veh	2.9	0.8	0.2	0.8	15.9	0.6	0.0	1.2	0.1	0.7	0.3	0.3	
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	0.0	
Control Delay (d), s/veh	55.8	59.0	50.8	49.2	78.6	50.5	15.3	26.2	12.3	20.0	20.2	15.1	
Level of Service (LOS)	E	E	D	D	E	D	B	C	B	B	C	B	
Approach Delay, s/veh / LOS	56.8	E		66.7	E		25.5	C		19.3	B		
Intersection Delay, s/veh / LOS	35.9						D						
Multimodal Results				EB			WB			NB		SB	
Pedestrian LOS Score / LOS	2.47	B		2.47	B		2.10	B		2.10	B		
Bicycle LOS Score / LOS	0.87	A		1.51	B		1.47	A		1.05	A		

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information											
Agency	Diane B. Zimmerman Traffic Engineering			Duration, h	0.250										
Analyst	DBZ	Analysis Date	Apr 6, 2020	Area Type	Other										
Jurisdiction		Time Period	AM Peak	PHF	0.95										
Urban Street	Hurstbourne Pkwy	Analysis Year	2027 No Build	Analysis Period	1> 7:15										
Intersection	Watterson Trail	File Name	Hurst AM 27 NB.xus												
Project Description	Hurstbourne Commons														
Demand Information				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h				79	127	34	141	374	122	23	1162	45	71	504	128
Signal Information															
Cycle, s	168.8	Reference Phase	2	Green	6.0	90.0	8.5	5.0	33.9	0.0					
Offset, s	0	Reference Point	End	Yellow	3.5	4.5	3.5	0.0	3.6	0.0					
Uncoordinated	Yes	Simult. Gap E/W	On	Red	2.1	3.0	2.8	0.0	2.4	0.0					
Force Mode	Fixed	Simult. Gap N/S	On												
Timer Results				EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT				
Assigned Phase				7	4	3	8	5	2	1	6				
Case Number				1.1	3.0	1.1	3.0	1.1	3.0	1.1	3.0				
Phase Duration, s				14.8	39.9	19.8	44.9	11.6	97.5	11.6	97.5				
Change Period, (Y+R c), s				6.3	6.0	6.3	6.0	5.6	7.5	5.6	7.5				
Max Allow Headway (MAH), s				4.1	5.1	4.1	5.1	5.0	7.0	5.0	7.0				
Queue Clearance Time (g s), s				8.3	12.3	13.2	36.3	3.0	42.7	5.3	16.1				
Green Extension Time (g e), s				0.2	4.4	0.3	2.6	0.1	35.5	0.3	48.6				
Phase Call Probability				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Max Out Probability				0.00	0.00	0.00	0.49	0.00	0.64	0.00	0.48				
Movement Group Results				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement				7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h				83	134	36	148	394	128	24	1223	47	76	536	136
Adjusted Saturation Flow Rate (s), veh/h/ln				1753	1885	1610	1753	1885	1560	1810	1795	1585	1767	1766	1598
Queue Service Time (g s), s				6.3	10.3	2.9	11.2	34.3	11.1	1.0	40.7	2.0	3.3	14.1	6.6
Cycle Queue Clearance Time (g c), s				6.3	10.3	2.9	11.2	34.3	11.1	1.0	40.7	2.0	3.3	14.1	6.6
Green Ratio (g/C)				0.25	0.20	0.24	0.29	0.23	0.27	0.57	0.53	0.61	0.57	0.53	0.58
Capacity (c), veh/h				146	379	381	356	435	415	493	1914	972	237	1883	932
Volume-to-Capacity Ratio (X)				0.569	0.353	0.094	0.417	0.905	0.309	0.049	0.639	0.049	0.318	0.285	0.146
Back of Queue (Q), ft/ln (90 th percentile)				132.1	199	54.5	203	611.2	184.4	18.7	574.3	33.7	63.6	229.3	111.5
Back of Queue (Q), veh/ln (90 th percentile)				5.1	7.9	2.2	7.9	24.3	7.1	0.7	22.8	1.3	2.5	9.0	4.4
Queue Storage Ratio (RQ) (90 th percentile)				0.41	0.61	0.31	0.41	1.25	0.92	0.18	0.72	0.31	0.33	0.34	1.12
Uniform Delay (d 1), s/veh				52.9	58.0	50.3	47.5	63.1	49.5	16.7	27.9	13.0	22.3	21.7	16.0
Incremental Delay (d 2), s/veh				3.5	0.8	0.2	0.8	19.1	0.6	0.1	1.6	0.1	1.1	0.4	0.3
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	0.0
Control Delay (d), s/veh				56.3	58.8	50.5	48.3	82.3	50.1	16.8	29.6	13.1	23.4	22.1	16.3
Level of Service (LOS)				E	E	D	D	F	D	B	C	B	C	C	B
Approach Delay, s/veh / LOS				56.8	E	68.6	E	28.7	C	21.2	C				
Intersection Delay, s/veh / LOS				38.2				D							
Multimodal Results				EB			WB			NB			SB		
Pedestrian LOS Score / LOS				2.47	B	2.47	B	2.11	B	2.11	B				
Bicycle LOS Score / LOS				0.90	A	1.59	B	1.56	B	1.10	A				

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information																							
Agency	Diane B. Zimmerman Traffic Engineering			Duration, h	0.250																						
Analyst	DBZ	Analysis Date	Oct 22, 2020	Area Type	Other																						
Jurisdiction		Time Period	AM Peak	PHF	0.95																						
Urban Street	Hurstbourne Pkwy	Analysis Year	2027 Build	Analysis Period	1> 7:15																						
Intersection	Watterson Trail	File Name	Hurst AM 27 B.xus																								
Project Description	Hurstbourne Commons																										
Demand Information				EB			WB			NB			SB														
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R												
Demand (v), veh/h				109	130	37	150	379	131	26	1174	45	97	532	128												
Signal Information																											
Cycle, s	173.7	Reference Phase	2																								
Offset, s	0	Reference Point	End	Green	6.0	1.0	90.0	11.1	3.4	36.8																	
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	3.5	0.0	4.5	3.5	0.0	3.6																	
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.1	0.0	3.0	2.8	0.0	2.4																	
Timer Results				EBL			EBT			WBL			WBT			NBL			NBT			SBL			SBT		
Assigned Phase				7			4			3			8			5			2			1			6		
Case Number				1.1			3.0			1.1			3.0			1.1			3.0			1.1			3.0		
Phase Duration, s				17.4			42.8			20.8			46.2			11.6			97.5			12.6			98.5		
Change Period, (Y+R c), s				6.3			6.0			6.3			6.0			5.6			7.5			5.6			7.5		
Max Allow Headway (MAH), s				4.1			5.1			4.1			5.1			5.0			7.0			5.0			7.0		
Queue Clearance Time (g s), s				10.8			12.7			14.1			37.8			3.2			45.9			6.5			17.0		
Green Extension Time (g e), s				0.3			4.5			0.3			2.4			0.1			33.9			0.4			48.7		
Phase Call Probability				1.00			1.00			1.00			1.00			1.00			1.00			1.00			1.00		
Max Out Probability				0.00			0.01			0.00			0.68			0.00			0.67			0.00			0.49		
Movement Group Results				EB			WB			NB			SB														
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R												
Assigned Movement				7	4	14	3	8	18	5	2	12	1	6	16												
Adjusted Flow Rate (v), veh/h				115	137	39	158	399	138	27	1236	47	99	542	131												
Adjusted Saturation Flow Rate (s), veh/h/ln				1753	1885	1610	1753	1885	1560	1810	1795	1585	1767	1766	1598												
Queue Service Time (g s), s				8.8	10.7	3.2	12.1	35.8	12.3	1.2	43.9	2.1	4.5	15.0	6.4												
Cycle Queue Clearance Time (g c), s				8.8	10.7	3.2	12.1	35.8	12.3	1.2	43.9	2.1	4.5	15.0	6.4												
Green Ratio (g/C)				0.28	0.21	0.25	0.30	0.23	0.27	0.55	0.52	0.60	0.56	0.52	0.59												
Capacity (c), veh/h				167	400	397	373	437	424	478	1860	953	231	1850	939												
Volume-to-Capacity Ratio (X)				0.688	0.342	0.098	0.423	0.913	0.325	0.057	0.664	0.050	0.429	0.293	0.139												
Back of Queue (Q), ft/ln (90 th percentile)				173.8	205.6	60.4	217	640.9	200	22.9	620.5	36.1	90.6	243	108.8												
Back of Queue (Q), veh/ln (90 th percentile)				6.7	8.2	2.4	8.4	25.4	7.8	0.9	24.6	1.4	3.5	9.5	4.3												
Queue Storage Ratio (RQ) (90 th percentile)				0.53	0.63	0.35	0.44	1.31	1.00	0.22	0.78	0.33	0.46	0.36	1.09												
Uniform Delay (d 1), s/veh				52.5	58.1	50.5	47.8	65.0	50.5	18.4	30.7	14.2	25.1	23.3	16.1												
Incremental Delay (d 2), s/veh				5.0	0.7	0.2	0.8	21.1	0.6	0.1	1.9	0.1	1.7	0.4	0.3												
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	0.0												
Control Delay (d), s/veh				57.5	58.8	50.6	48.5	86.1	51.1	18.5	32.6	14.3	26.8	23.7	16.4												
Level of Service (LOS)				E	E	D	D	F	D	B	C	B	C	C	B												
Approach Delay, s/veh / LOS				57.2	E	70.6	E	31.7	C	22.8	C																
Intersection Delay, s/veh / LOS				40.7				D																			
Multimodal Results				EB			WB			NB			SB														
Pedestrian LOS Score / LOS				2.47	B	2.47	B	2.11	B	2.11	B																
Bicycle LOS Score / LOS				0.97	A	1.63	B	1.57	B	1.14	A																

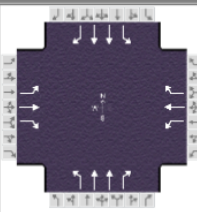
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information																										
Agency	Diane B. Zimmerman Traffic Engineering			Duration, h	0.250																									
Analyst	DBZ	Analysis Date	2/5/2020	Area Type	Other																									
Jurisdiction		Time Period	PM Peak	PHF	0.95																									
Urban Street	Hurstbourne Pkwy	Analysis Year	2019	Analysis Period	1> 4:45																									
Intersection	Watterson Trail	File Name	Hurst PM 19.xus																											
Project Description	Hurstbourne Commons																													
Demand Information				EB			WB			NB			SB																	
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R															
Demand (v), veh/h				85	256	41	138	251	124	56	704	51	173	1067	126															
Signal Information																														
Cycle, s	169.5	Reference Phase	2																											
Offset, s	0	Reference Point	End	Green	6.0	5.0	90.0	9.5	3.9	29.7																				
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	3.5	0.0	4.5	3.5	0.0	3.6																				
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.1	0.0	3.0	2.8	0.0	2.4																				
Timer Results				EBL			EBT			WBL			WBT			NBL			NBT			SBL			SBT					
Assigned Phase				7	4	3	8	5	2	1	6																			
Case Number				1.1	3.0	1.1	3.0	1.1	3.0	1.1	3.0	1.1	3.0	1.1	3.0	1.1	3.0	1.1	3.0	1.1	3.0	1.1	3.0	1.1	3.0	1.1	3.0	1.1	3.0	
Phase Duration, s				15.8	35.7	19.7	39.6	11.6	97.5	16.6	102.5																			
Change Period, (Y+R c), s				6.3	6.0	6.3	6.0	5.6	7.5	5.6	7.5																			
Max Allow Headway (MAH), s				4.1	5.1	4.1	5.1	5.0	7.0	5.0	7.0																			
Queue Clearance Time (g s), s				9.3	25.8	13.0	24.1	4.5	22.7	10.1	39.2																			
Green Extension Time (g e), s				0.2	3.9	0.3	4.0	0.2	50.3	0.9	40.4																			
Phase Call Probability				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00																			
Max Out Probability				0.00	0.07	0.00	0.05	0.00	0.62	0.00	0.71																			
Movement Group Results				EB			WB			NB			SB																	
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R															
Assigned Movement				7	4	14	3	8	18	5	2	12	1	6	16															
Adjusted Flow Rate (v), veh/h				89	269	43	145	264	131	59	741	54	194	1197	141															
Adjusted Saturation Flow Rate (s), veh/h/ln				1697	1856	1610	1810	1885	1585	1810	1795	1560	1795	1795	1598															
Queue Service Time (g s), s				7.3	23.8	3.7	11.0	22.1	11.2	2.5	20.7	2.4	8.1	37.2	6.3															
Cycle Queue Clearance Time (g c), s				7.3	23.8	3.7	11.0	22.1	11.2	2.5	20.7	2.4	8.1	37.2	6.3															
Green Ratio (g/C)				0.23	0.18	0.21	0.25	0.20	0.26	0.57	0.53	0.61	0.60	0.56	0.62															
Capacity (c), veh/h				196	325	339	225	374	417	263	1906	951	455	2013	985															
Volume-to-Capacity Ratio (X)				0.455	0.829	0.127	0.646	0.707	0.313	0.224	0.389	0.056	0.426	0.595	0.144															
Back of Queue (Q), ft/ln (90 th percentile)				146.5	422.8	68.9	204.4	385.6	185.3	48.1	317.5	39.6	137.6	509.2	102.3															
Back of Queue (Q), veh/ln (90 th percentile)				5.5	16.5	2.8	8.2	15.3	7.3	1.9	12.6	1.5	5.5	20.2	4.1															
Queue Storage Ratio (RQ) (90 th percentile)				0.45	1.30	0.39	0.42	0.79	0.93	0.46	0.40	0.36	0.71	0.75	1.02															
Uniform Delay (d 1), s/veh				54.2	67.4	54.3	53.2	63.4	50.1	20.4	23.5	13.4	16.8	24.5	13.7															
Incremental Delay (d 2), s/veh				1.6	9.0	0.2	3.1	3.9	0.6	0.6	0.6	0.1	0.7	1.0	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	0.0															
Control Delay (d), s/veh				55.9	76.4	54.5	56.3	67.3	50.7	21.0	24.1	13.5	17.6	25.6	13.9															
Level of Service (LOS)				E	E	D	E	E	D	C	C	B	B	C	B															
Approach Delay, s/veh / LOS				69.5	E	60.3	E	23.2	C	23.5	C																			
Intersection Delay, s/veh / LOS				35.0			C																							
Multimodal Results				EB			WB			NB			SB																	
Pedestrian LOS Score / LOS				2.47	B	2.47	B	2.11	B	2.10	B																			
Bicycle LOS Score / LOS				1.15	A	1.38	A	1.19	A	1.67	B																			

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information																				
Agency	Diane B. Zimmerman Traffic Engineering			Duration, h	0.250																			
Analyst	DBZ	Analysis Date	Apr 6, 2020	Area Type	Other																			
Jurisdiction		Time Period	PM Peak	PHF	0.95																			
Urban Street	Hurstbourne Pkwy	Analysis Year	2027 No Build	Analysis Period	1> 4:45																			
Intersection	Watterson Trail	File Name	Hurst PM 27 NB.xus																					
Project Description	Hurstbourne Commons																							
Demand Information				EB			WB			NB			SB											
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R									
Demand (v), veh/h				92	277	44	149	272	134	61	762	55	187	1155	136									
Signal Information																								
Cycle, s	174.6	Reference Phase	2	Green	6.0	0.6	90.0	10.2	4.3	32.6	Yellow	3.5	3.5	4.5	3.5	0.0	3.6	Red	2.1	2.1	3.0	2.8	0.0	2.4
Offset, s	0	Reference Point	End	Uncoordinated	Yes	Simult. Gap E/W	On	Force Mode	Fixed	Simult. Gap N/S	On													
Timer Results				EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT													
Assigned Phase				7	4	3	8	5	2	1	6													
Case Number				1.1	3.0	1.1	3.0	1.1	3.0	1.1	3.0													
Phase Duration, s				16.5	38.6	20.8	42.8	11.6	97.5	17.8	103.7													
Change Period, (Y+R c), s				6.3	6.0	6.3	6.0	5.6	7.5	5.6	7.5													
Max Allow Headway (MAH), s				4.1	5.1	4.1	5.1	5.0	7.0	5.0	7.0													
Queue Clearance Time (g s), s				10.0	28.5	14.1	26.7	4.9	26.4	11.3	45.9													
Green Extension Time (g e), s				0.2	4.1	0.3	4.2	0.2	51.7	1.0	37.9													
Phase Call Probability				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00													
Max Out Probability				0.00	0.14	0.00	0.10	0.00	0.72	0.00	0.81													
Movement Group Results				EB			WB			NB			SB											
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R									
Assigned Movement				7	4	14	3	8	18	5	2	12	1	6	16									
Adjusted Flow Rate (v), veh/h				97	292	46	157	286	141	64	802	58	209	1289	152									
Adjusted Saturation Flow Rate (s), veh/h/ln				1697	1856	1610	1810	1885	1585	1810	1795	1560	1795	1795	1598									
Queue Service Time (g s), s				8.0	26.5	4.0	12.1	24.7	12.3	2.9	24.4	2.7	9.3	43.9	7.2									
Cycle Queue Clearance Time (g c), s				8.0	26.5	4.0	12.1	24.7	12.3	2.9	24.4	2.7	9.3	43.9	7.2									
Green Ratio (g/C)				0.24	0.19	0.22	0.27	0.21	0.28	0.55	0.52	0.60	0.60	0.55	0.61									
Capacity (c), veh/h				201	346	356	230	397	445	229	1850	933	424	1978	974									
Volume-to-Capacity Ratio (X)				0.482	0.843	0.130	0.683	0.720	0.317	0.281	0.434	0.062	0.492	0.652	0.156									
Back of Queue (Q), ft/ln (90 th percentile)				158.2	470.3	75.5	221.2	426.4	199.4	57.4	368.7	46	153.2	591.8	112.4									
Back of Queue (Q), veh/ln (90 th percentile)				5.9	18.4	3.0	8.8	16.9	7.8	2.3	14.6	1.8	6.1	23.5	4.5									
Queue Storage Ratio (RQ) (90 th percentile)				0.49	1.45	0.43	0.45	0.87	1.00	0.55	0.46	0.42	0.79	0.88	1.12									
Uniform Delay (d 1), s/veh				54.4	68.6	54.6	53.4	64.1	49.6	23.7	26.4	14.7	18.9	27.5	14.7									
Incremental Delay (d 2), s/veh				1.8	11.1	0.2	3.6	4.9	0.6	0.9	0.7	0.1	1.0	1.3	0.3									
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	0.0									
Control Delay (d), s/veh				56.2	79.7	54.8	57.0	69.0	50.2	24.6	27.2	14.8	19.9	28.8	15.0									
Level of Service (LOS)				E	E	D	E	E	D	C	C	B	B	C	B									
Approach Delay, s/veh / LOS				71.8	E	61.2	E	26.2	C	26.4	C													
Intersection Delay, s/veh / LOS				37.5			D																	
Multimodal Results				EB			WB			NB			SB											
Pedestrian LOS Score / LOS				2.47	B	2.47	B	2.11	B	2.10	B													
Bicycle LOS Score / LOS				1.20	A	1.45	A	1.25	A	1.77	B													

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information																										
Agency	Diane B. Zimmerman Traffic Engineering			Duration, h	0.250																									
Analyst	DBZ	Analysis Date	Oct 22, 2020	Area Type	Other																									
Jurisdiction		Time Period	PM Peak	PHF	0.95																									
Urban Street	Hurstbourne Pkwy	Analysis Year	2027 Build	Analysis Period	1> 4:45																									
Intersection	Watterson Trail	File Name	Hurst PM 27 B.xus																											
Project Description	Hurstbourne Commons																													
Demand Information				EB			WB			NB			SB																	
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R															
Demand (v), veh/h				123	285	49	154	276	165	65	800	55	203	1174	136															
Signal Information																														
Cycle, s	177.9	Reference Phase	2																											
Offset, s	0	Reference Point	End	Green	6.0	2.1	90.0	13.1	1.9	33.8																				
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	3.5	3.5	4.5	3.5	0.0	3.6																				
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.1	2.1	3.0	2.8	0.0	2.4																				
Timer Results				EBL			EBT			WBL			WBT			NBL			NBT			SBL			SBT					
Assigned Phase				7	4	3	8	5	2	1	6																			
Case Number				1.1	3.0	1.1	3.0	1.1	3.0	1.1	3.0	1.1	3.0	1.1	3.0	1.1	3.0	1.1	3.0	1.1	3.0	1.1	3.0	1.1	3.0	1.1	3.0	1.1	3.0	
Phase Duration, s				19.4	39.8	21.3	41.8	11.6	97.5	19.3	105.2																			
Change Period, (Y+R c), s				6.3	6.0	6.3	6.0	5.6	7.5	5.6	7.5																			
Max Allow Headway (MAH), s				4.1	5.1	4.1	5.1	5.0	7.0	5.0	7.0																			
Queue Clearance Time (g s), s				12.8	29.6	14.7	27.9	5.2	29.0	12.6	49.1																			
Green Extension Time (g e), s				0.3	4.2	0.3	4.4	0.3	51.3	1.1	36.2																			
Phase Call Probability				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00																			
Max Out Probability				0.00	0.19	0.01	0.14	0.00	0.76	0.00	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				7	4	14	3	8	18	5	2	12	1	6	16															
Adjusted Flow Rate (v), veh/h				129	300	52	162	291	174	68	842	58	229	1327	154															
Adjusted Saturation Flow Rate (s), veh/h/ln				1697	1856	1610	1810	1885	1585	1810	1795	1560	1795	1795	1598															
Queue Service Time (g s), s				10.8	27.6	4.6	12.7	25.9	15.8	3.2	27.0	2.8	10.6	47.1	7.2															
Cycle Queue Clearance Time (g c), s				10.8	27.6	4.6	12.7	25.9	15.8	3.2	27.0	2.8	10.6	47.1	7.2															
Green Ratio (g/C)				0.26	0.20	0.23	0.27	0.20	0.28	0.54	0.51	0.59	0.59	0.55	0.62															
Capacity (c), veh/h				211	363	361	232	379	440	216	1815	921	411	1970	994															
Volume-to-Capacity Ratio (X)				0.612	0.826	0.143	0.699	0.766	0.394	0.317	0.464	0.063	0.558	0.674	0.155															
Back of Queue (Q), ft/ln (90 th percentile)				203.1	484.8	85.7	230.5	449.8	246.5	64.5	404.9	48.1	171	629.9	110.7															
Back of Queue (Q), veh/ln (90 th percentile)				7.6	18.9	3.4	9.2	17.9	9.7	2.6	16.1	1.9	6.8	25.0	4.4															
Queue Storage Ratio (RQ) (90 th percentile)				0.63	1.49	0.49	0.47	0.92	1.23	0.61	0.51	0.44	0.88	0.93	1.11															
Uniform Delay (d 1), s/veh				54.4	69.1	55.4	53.9	67.1	52.1	25.4	28.4	15.5	20.5	28.7	14.0															
Incremental Delay (d 2), s/veh				2.9	10.0	0.3	3.8	6.7	0.8	1.2	0.9	0.1	1.2	1.4	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	0.0															
Control Delay (d), s/veh				57.2	79.1	55.6	57.7	73.8	52.9	26.6	29.3	15.6	21.7	30.1	14.3															
Level of Service (LOS)				E	E	E	E	E	D	C	C	B	C	C	B															
Approach Delay, s/veh / LOS				70.7	E	63.9	E	28.3	C	27.5	C																			
Intersection Delay, s/veh / LOS				39.2						D																				
Multimodal Results				EB			WB			NB			SB																	
Pedestrian LOS Score / LOS				2.47	B	2.47	B	2.11	B	2.10	B																			
Bicycle LOS Score / LOS				1.28	A	1.52	B	1.29	A	1.80	B																			

HCS7 Two-Way Stop-Control Report																		
General Information								Site Information										
Analyst	DBZ							Intersection	Hurstbourne at Watterbour									
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction										
Date Performed	2/5/2020							East/West Street	Watterbourne/Hendrick									
Analysis Year	2019							North/South Street	Hurstbourne Parkway									
Time Analyzed	AM Peak							Peak Hour Factor	0.97									
Intersection Orientation	North-South							Analysis Time Period (hrs)	0.25									
Project Description	Hurstbourne Commons																	
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	1		0	1	1	0	1	2	0	0	1	2	0		
Configuration		LT		R		LT		R		L	T	TR		L	T	TR		
Volume (veh/h)		16	1	23		9	3	64	0	48	1179	40	0	19	624	27		
Percent Heavy Vehicles (%)		0	0	8		0	0	0	3	4			3	0				
Proportion Time Blocked																		
Percent Grade (%)		0				0												
Right Turn Channelized		No				No												
Median Type Storage		Left + Thru								1								
Critical and Follow-up Headways																		
Base Critical Headway (sec)		7.5	6.5	6.9		7.5	6.5	6.9		4.1				4.1				
Critical Headway (sec)		7.50	6.50	7.06		7.50	6.50	6.90		4.18				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)		3.50	4.00	3.38		3.50	4.00	3.30		2.24				2.20				
Delay, Queue Length, and Level of Service																		
Flow Rate, v (veh/h)		18		24		12		66		49				20				
Capacity, c (veh/h)		187		643		126		430		902				560				
v/c Ratio		0.09		0.04		0.10		0.15		0.05				0.03				
95% Queue Length, Q ₉₅ (veh)		0.3		0.1		0.3		0.5		0.2				0.1				
Control Delay (s/veh)		26.2		10.8		36.6		14.9		9.2				11.7				
Level of Service (LOS)		D		B		E		B		A				B				
Approach Delay (s/veh)		17.3				18.3					0.3				0.3			
Approach LOS		C				C												

HCS7 Two-Way Stop-Control Report																	
General Information								Site Information									
Analyst	DBZ							Intersection	Hurstbourne at Watterbour								
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction									
Date Performed	2/5/2020							East/West Street	Watterbourne/Hendrick								
Analysis Year	2027							North/South Street	Hurstbourne Parkway								
Time Analyzed	AM Peak No Build							Peak Hour Factor	0.97								
Intersection Orientation	North-South							Analysis Time Period (hrs)	0.25								
Project Description	Hurstbourne Commons																
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	1		0	1	1	0	1	2	0	0	1	2	0	
Configuration		LT		R		LT		R		L	T	TR		L	T	TR	
Volume (veh/h)		16	1	23		9	3	64	0	48	1277	40	0	19	676	27	
Percent Heavy Vehicles (%)		0	0	8		0	0	0	3	4			3	0			
Proportion Time Blocked																	
Percent Grade (%)		0				0											
Right Turn Channelized		No				No											
Median Type Storage		Left + Thru								1							
Critical and Follow-up Headways																	
Base Critical Headway (sec)		7.5	6.5	6.9		7.5	6.5	6.9		4.1				4.1			
Critical Headway (sec)		7.50	6.50	7.06		7.50	6.50	6.90		4.18				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)		3.50	4.00	3.38		3.50	4.00	3.30		2.24				2.20			
Delay, Queue Length, and Level of Service																	
Flow Rate, v (veh/h)		18		24		12		66		49				20			
Capacity, c (veh/h)		168		617		109		399		861				513			
v/c Ratio		0.10		0.04		0.11		0.17		0.06				0.04			
95% Queue Length, Q ₉₅ (veh)		0.3		0.1		0.4		0.6		0.2				0.1			
Control Delay (s/veh)		28.9		11.1		42.1		15.8		9.4				12.3			
Level of Service (LOS)		D		B		E		C		A				B			
Approach Delay (s/veh)		18.6				20.0				0.3				0.3			
Approach LOS		C				C											

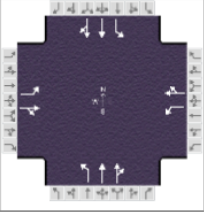
HCS7 Two-Way Stop-Control Report																	
General Information								Site Information									
Analyst	DBZ							Intersection	Hurstbourne at Watterbour								
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction									
Date Performed	10/22/20							East/West Street	Watterbourne/Hendrick								
Analysis Year	2027							North/South Street	Hurstbourne Parkway								
Time Analyzed	AM Peak Build							Peak Hour Factor	0.97								
Intersection Orientation	North-South							Analysis Time Period (hrs)	0.25								
Project Description	Hurstbourne Commons																
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	1		0	1	1		0	1	2	0	0	1	2	0
Configuration		LT		R		LT		R		L	T	TR		L	T	TR	
Volume (veh/h)		0	0	86		0	0	64		0	69	1307	40	0	19	676	49
Percent Heavy Vehicles (%)		0	0	3		0	0	0		3	4			3	0		
Proportion Time Blocked																	
Percent Grade (%)		0				0											
Right Turn Channelized		No				No											
Median Type Storage		Left + Thru								1							
Critical and Follow-up Headways																	
Base Critical Headway (sec)		7.5	6.5	6.9		7.5	6.5	6.9		4.1				4.1			
Critical Headway (sec)		7.50	6.50	6.96		7.50	6.50	6.90		4.18				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)		3.50	4.00	3.33		3.50	4.00	3.30		2.24				2.20			
Delay, Queue Length, and Level of Service																	
Flow Rate, v (veh/h)		0		89		0		66		71				20			
Capacity, c (veh/h)				621				390		844				499			
v/c Ratio				0.14				0.17		0.08				0.04			
95% Queue Length, Q ₉₅ (veh)				0.5				0.6		0.3				0.1			
Control Delay (s/veh)				11.8				16.1		9.7				12.5			
Level of Service (LOS)				B				C		A				B			
Approach Delay (s/veh)										0.5				0.3			
Approach LOS																	

HCS7 Two-Way Stop-Control Report																	
General Information								Site Information									
Analyst	DBZ							Intersection	Hurstbourne at Watterbour								
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction									
Date Performed	2/5/2020							East/West Street	Watterbourne/Hendrick								
Analysis Year	2019							North/South Street	Hurstbourne Parkway								
Time Analyzed	PM Peak							Peak Hour Factor	0.97								
Intersection Orientation	North-South							Analysis Time Period (hrs)	0.25								
Project Description	Hurstbourne Commons																
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	1		0	1	1	0	1	2	0	0	1	2	0	
Configuration		LT		R		LT		R		L	T	TR		L	T	TR	
Volume (veh/h)		9	5	69		5	2	38	0	73	822	11	0	71	1335	63	
Percent Heavy Vehicles (%)		0	20	0		0	0	3	3	0			3	1			
Proportion Time Blocked																	
Percent Grade (%)		0				0											
Right Turn Channelized		No				No											
Median Type Storage		Left + Thru								1							
Critical and Follow-up Headways																	
Base Critical Headway (sec)		7.5	6.5	6.9		7.5	6.5	6.9		4.1				4.1			
Critical Headway (sec)		7.50	6.90	6.90		7.50	6.50	6.96		4.10				4.12			
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	4.20	3.30		3.50	4.00	3.33		2.20				2.21			
Delay, Queue Length, and Level of Service																	
Flow Rate, v (veh/h)		14		71		7		39		75				73			
Capacity, c (veh/h)		80		375		98		571		477				784			
v/c Ratio		0.18		0.19		0.07		0.07		0.16				0.09			
95% Queue Length, Q ₉₅ (veh)		0.6		0.7		0.2		0.2		0.6				0.3			
Control Delay (s/veh)		59.4		16.9		44.8		11.8		14.0				10.1			
Level of Service (LOS)		F		C		E		B		B				B			
Approach Delay (s/veh)		24.0				16.9				1.1				0.5			
Approach LOS		C				C											

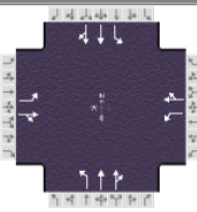
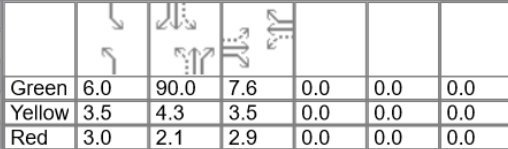
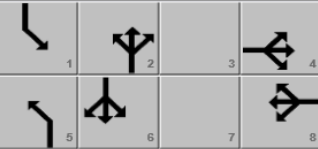
HCS7 Two-Way Stop-Control Report																	
General Information								Site Information									
Analyst	DBZ							Intersection	Hurstbourne at Watterbour								
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction									
Date Performed	2/5/2020							East/West Street	Watterbourne/Hendrick								
Analysis Year	2027							North/South Street	Hurstbourne Parkway								
Time Analyzed	PM Peak No Build							Peak Hour Factor	0.97								
Intersection Orientation	North-South							Analysis Time Period (hrs)	0.25								
Project Description	Hurstbourne Commons																
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	1		0	1	1	0	1	2	0	0	1	2	0	
Configuration		LT		R		LT		R		L	T	TR		L	T	TR	
Volume (veh/h)		9	5	69		5	2	38	0	73	890	11	0	71	1446	63	
Percent Heavy Vehicles (%)		0	20	0		0	0	3	3	0			3	1			
Proportion Time Blocked																	
Percent Grade (%)		0				0											
Right Turn Channelized		No				No											
Median Type Storage		Left + Thru								1							
Critical and Follow-up Headways																	
Base Critical Headway (sec)		7.5	6.5	6.9		7.5	6.5	6.9		4.1				4.1			
Critical Headway (sec)		7.50	6.90	6.90		7.50	6.50	6.96		4.10				4.12			
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	4.20	3.30		3.50	4.00	3.33		2.20				2.21			
Delay, Queue Length, and Level of Service																	
Flow Rate, v (veh/h)		14		71		7		39		75				73			
Capacity, c (veh/h)		68		344		83		542		431				738			
v/c Ratio		0.21		0.21		0.09		0.07		0.17				0.10			
95% Queue Length, Q ₉₅ (veh)		0.7		0.8		0.3		0.2		0.6				0.3			
Control Delay (s/veh)		71.7		18.2		52.7		12.2		15.1				10.4			
Level of Service (LOS)		F		C		F		B		C				B			
Approach Delay (s/veh)		27.2				18.5				1.1				0.5			
Approach LOS		D				C											

HCS7 Two-Way Stop-Control Report																	
General Information								Site Information									
Analyst	DBZ							Intersection	Hurstbourne at Watterbour								
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction									
Date Performed	10/22/2020							East/West Street	Watterbourne/Hendrick								
Analysis Year	2027							North/South Street	Hurstbourne Parkway								
Time Analyzed	PM Peak Build							Peak Hour Factor	0.97								
Intersection Orientation	North-South							Analysis Time Period (hrs)	0.25								
Project Description	Hurstbourne Commons																
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	1		0	1	1		0	1	2	0	0	1	2	0
Configuration		LT		R		LT		R		L	T	TR		L	T	TR	
Volume (veh/h)		0	0	109		0	0	38	0	142	921	11	0	71	1446	122	
Percent Heavy Vehicles (%)		0	20	0		0	0	3	3	0			3	1			
Proportion Time Blocked																	
Percent Grade (%)		0				0											
Right Turn Channelized		No				No											
Median Type Storage		Left + Thru								1							
Critical and Follow-up Headways																	
Base Critical Headway (sec)		7.5	6.5	6.9		7.5	6.5	6.9		4.1				4.1			
Critical Headway (sec)		7.50	6.90	6.90		7.50	6.50	6.96		4.10				4.12			
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	4.20	3.30		3.50	4.00	3.33		2.20				2.21			
Delay, Queue Length, and Level of Service																	
Flow Rate, v (veh/h)		0		112		0		39		146				73			
Capacity, c (veh/h)				328				529		409				718			
v/c Ratio				0.34				0.07		0.36				0.10			
95% Queue Length, Q ₉₅ (veh)				1.5				0.2		1.6				0.3			
Control Delay (s/veh)				21.6				12.3		18.6				10.6			
Level of Service (LOS)				C				B		C				B			
Approach Delay (s/veh)										2.5				0.5			
Approach LOS																	

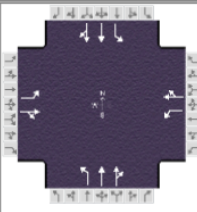

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information											
Agency	Diane B. Zimmerman Traffic Engineering			Duration, h	0.250										
Analyst	DBZ	Analysis Date	2/5/2020	Area Type	Other										
Jurisdiction		Time Period	AM Peak	PHF	0.96										
Urban Street	Hurstbourne Pkwy	Analysis Year	2019	Analysis Period	1> 7:15										
Intersection	Meijer	File Name	Hurst AM 19.xus												
Project Description	Hurstbourne Commons														
Demand Information				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h				30	1	15	21	2	29	5	1209	1	7	630	12
Signal Information															
Cycle, s	122.9	Reference Phase	2												
Offset, s	0	Reference Point	End												
Uncoordinated	Yes	Simult. Gap E/W	On	Green	6.0	90.0	7.6	0.0	0.0	0.0					
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	3.5	4.3	3.5	0.0	0.0	0.0					
				Red	3.0	2.1	2.9	0.0	0.0	0.0					
Timer Results				EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT				
Assigned Phase					4		8	5	2	1	6				
Case Number					6.0		6.0	1.1	4.0	1.1	4.0				
Phase Duration, s					14.0		14.0	12.5	96.4	12.5	96.4				
Change Period, (Y+R _c), s					6.4		6.4	6.5	6.4	6.5	6.4				
Max Allow Headway (MAH), s					5.4		5.4	5.0	2.9	5.0	2.9				
Queue Clearance Time (g _s), s					7.3		5.1	2.1	19.7	2.1	9.3				
Green Extension Time (g _e), s					0.5		0.5	0.0	4.1	0.0	4.1				
Phase Call Probability					0.97		0.97	1.00	1.00	1.00	1.00				
Max Out Probability					0.00		0.00	0.00	0.00	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				7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h				31	17		22	32		5	660	660	7	335	333
Adjusted Saturation Flow Rate (s), veh/h/ln				1290	1626		1418	1626		1527	1885	1885	1810	1856	1843
Queue Service Time (g _s), s				2.9	1.2		1.8	2.3		0.1	17.7	17.7	0.1	7.3	7.3
Cycle Queue Clearance Time (g _c), s				5.3	1.2		3.1	2.3		0.1	17.7	17.7	0.1	7.3	7.3
Green Ratio (g/C)				0.06	0.06		0.06	0.06		0.78	0.73	0.73	0.78	0.73	0.73
Capacity (c), veh/h				114	101		132	101		576	1380	1380	389	1359	1350
Volume-to-Capacity Ratio (X)				0.275	0.165		0.165	0.320		0.009	0.478	0.478	0.019	0.247	0.247
Back of Queue (Q), ft/ln (90 th percentile)				49.5	23.6		31.1	46.8		1.2	223.8	222	1.4	112.7	109.5
Back of Queue (Q), veh/ln (90 th percentile)				1.8	0.9		1.2	1.9		0.0	8.9	8.9	0.1	4.4	4.4
Queue Storage Ratio (RQ) (90 th percentile)				0.43	0.21		0.19	0.28		0.02	0.37	0.37	0.02	0.13	0.13
Uniform Delay (d ₁), s/veh				57.7	54.6		56.1	55.2		3.2	6.8	6.8	4.6	5.4	5.4
Incremental Delay (d ₂), s/veh				1.8	1.1		0.8	2.6		0.0	1.0	1.0	0.0	0.4	0.4
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
Control Delay (d), s/veh				59.6	55.7		56.9	57.7		3.2	7.8	7.8	4.6	5.8	5.8
Level of Service (LOS)				E	E		E	E		A	A	A	A	A	A
Approach Delay, s/veh / LOS				58.2	E		57.4	E		7.7	A		5.8	A	
Intersection Delay, s/veh / LOS				9.5						A					
Multimodal Results				EB			WB			NB			SB		
Pedestrian LOS Score / LOS				2.32	B		2.32	B		1.86	B		1.86	B	
Bicycle LOS Score / LOS				0.57	A		0.58	A		1.53	B		1.05	A	

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information											
Agency	Diane B. Zimmerman Traffic Engineering			Duration, h	0.250		Area Type	Other							
Analyst	DBZ	Analysis Date	Apr 6, 2020		PHF	0.96									
Jurisdiction		Time Period	AM Peak		Analysis Period	1> 7:15									
Urban Street	Hurstbourne Pkwy		Analysis Year	2027 No Build											
Intersection	Meijer	File Name	Hurst AM 27 NB.xus												
Project Description	Hurstbourne Commons														
Demand Information				EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R			
Demand (v), veh/h	30	1	15	21	2	29	5	1309	1	7	682	12			
Signal Information															
Cycle, s	122.9	Reference Phase	2	Green	6.0	90.0	7.6	0.0	0.0	0.0	0.0	0.0			
Offset, s	0	Reference Point	End	Yellow	3.5	4.3	3.5	0.0	0.0	0.0	0.0	0.0			
Uncoordinated	Yes	Simult. Gap E/W	On	Red	3.0	2.1	2.9	0.0	0.0	0.0	0.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On												
Timer Results				EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT				
Assigned Phase				4		8		5	2	1	6				
Case Number				6.0		6.0		1.1	4.0	1.1	4.0				
Phase Duration, s				14.0		14.0		12.5	96.4	12.5	96.4				
Change Period, (Y+R _c), s				6.4		6.4		6.5	6.4	6.5	6.4				
Max Allow Headway (MAH), s				5.4		5.4		5.0	2.9	5.0	2.9				
Queue Clearance Time (g _s), s				7.3		5.1		2.1	22.1	2.1	10.0				
Green Extension Time (g _e), s				0.5		0.5		0.0	4.7	0.0	4.7				
Phase Call Probability				0.97		0.97		1.00	1.00	1.00	1.00				
Max Out Probability				0.00		0.00		0.00	0.00	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	7	4	14	3	8	18	5	2	12	1	6	16			
Adjusted Flow Rate (v), veh/h	31	17		22	32		5	715	715	7	363	360			
Adjusted Saturation Flow Rate (s), veh/h/ln	1290	1626		1418	1626		1527	1885	1885	1810	1856	1844			
Queue Service Time (g _s), s	2.9	1.2		1.8	2.3		0.1	20.1	20.1	0.1	8.0	8.0			
Cycle Queue Clearance Time (g _c), s	5.3	1.2		3.1	2.3		0.1	20.1	20.1	0.1	8.0	8.0			
Green Ratio (g/C)	0.06	0.06		0.06	0.06		0.78	0.73	0.73	0.78	0.73	0.73			
Capacity (c), veh/h	114	101		132	101		551	1380	1380	357	1359	1350			
Volume-to-Capacity Ratio (X)	0.275	0.165		0.165	0.320		0.010	0.518	0.518	0.020	0.267	0.267			
Back of Queue (Q), ft/ln (90 th percentile)	49.5	23.6		31.1	46.8		1.2	246	244	1.4	122.9	119.5			
Back of Queue (Q), veh/ln (90 th percentile)	1.8	0.9		1.2	1.9		0.0	9.8	9.8	0.1	4.8	4.8			
Queue Storage Ratio (RQ) (90 th percentile)	0.43	0.21		0.19	0.28		0.02	0.41	0.41	0.02	0.14	0.14			
Uniform Delay (d ₁), s/veh	57.7	54.6		56.1	55.2		3.2	7.1	7.1	5.0	5.5	5.5			
Incremental Delay (d ₂), s/veh	1.8	1.1		0.8	2.6		0.0	1.1	1.1	0.0	0.5	0.5			
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			
Control Delay (d), s/veh	59.6	55.7		56.9	57.7		3.2	8.2	8.2	5.0	6.0	6.0			
Level of Service (LOS)	E	E		E	E		A	A	A	A	A	A			
Approach Delay, s/veh / LOS	58.2	E		57.4	E		8.1	A		6.0	A				
Intersection Delay, s/veh / LOS	9.7						A								
Multimodal Results				EB			WB			NB			SB		
Pedestrian LOS Score / LOS	2.32	B		2.32	B		1.86	B		1.86	B				
Bicycle LOS Score / LOS	0.57	A		0.58	A		1.62	B		1.09	A				

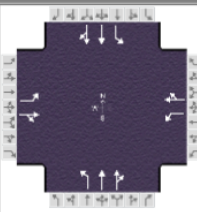
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information																							
Agency	Diane B. Zimmerman Traffic Engineering			Duration, h	0.250																						
Analyst	DBZ			Analysis Date	Oct 22, 2020																						
Jurisdiction				Area Type	Other																						
Urban Street	Hurstbourne Pkwy			Time Period	AM Peak																						
Intersection	Meijer			Analysis Year	2027 Build																						
Project Description	Hurstbourne Commons			Analysis Period	1> 7:15																						
Demand Information				EB			WB			NB			SB														
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R												
Demand (v), veh/h				71	1	15	21	2	29	5	1339	1	7	705	12												
Signal Information																											
Cycle, s	127.5	Reference Phase	2																								
Offset, s	0	Reference Point	End																								
Uncoordinated	Yes	Simult. Gap E/W	On	Green	6.0	90.0	12.2	0.0	0.0	0.0																	
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	3.5	4.3	3.5	0.0	0.0	0.0																	
				Red	3.0	2.1	2.9	0.0	0.0	0.0																	
Timer Results				EBL			EBT			WBL			WBT			NBL			NBT			SBL			SBT		
Assigned Phase							4						8			5			2			1			6		
Case Number							6.0						6.0			1.1			4.0			1.1			4.0		
Phase Duration, s							18.6						18.6			12.5			96.4			12.5			96.4		
Change Period, (Y+R c), s							6.4						6.4			6.5			6.4			6.5			6.4		
Max Allow Headway (MAH), s							5.4						5.4			5.0			2.9			5.0			2.9		
Queue Clearance Time (g s), s							11.5						5.0			2.1			26.3			2.1			11.5		
Green Extension Time (g e), s							0.7						0.8			0.0			5.0			0.0			5.0		
Phase Call Probability							0.99						0.99			1.00			1.00			1.00			1.00		
Max Out Probability							0.00						0.00			0.00			0.00			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				7	4	14	3	8	18	5	2	12	1	6	16												
Adjusted Flow Rate (v), veh/h				74	17		22	32		6	742	741	7	375	372												
Adjusted Saturation Flow Rate (s), veh/h/ln				1290	1626		1418	1626		1527	1885	1885	1810	1856	1844												
Queue Service Time (g s), s				7.2	1.2		1.8	2.3		0.1	24.3	24.3	0.1	9.5	9.5												
Cycle Queue Clearance Time (g c), s				9.5	1.2		3.0	2.3		0.1	24.3	24.3	0.1	9.5	9.5												
Green Ratio (g/C)				0.10	0.10		0.10	0.10		0.75	0.71	0.71	0.75	0.71	0.71												
Capacity (c), veh/h				156	156		179	156		515	1330	1330	322	1310	1302												
Volume-to-Capacity Ratio (X)				0.473	0.107		0.122	0.207		0.011	0.557	0.557	0.023	0.286	0.286												
Back of Queue (Q), ft/ln (90 th percentile)				121	23.1		30.7	45.4		1.6	304.8	302.3	1.9	148	143.9												
Back of Queue (Q), veh/ln (90 th percentile)				4.5	0.9		1.2	1.8		0.1	12.1	12.1	0.1	5.8	5.8												
Queue Storage Ratio (RQ) (90 th percentile)				1.05	0.20		0.19	0.27		0.02	0.51	0.51	0.02	0.17	0.17												
Uniform Delay (d 1), s/veh				57.6	52.7		54.0	53.2		4.3	9.1	9.1	6.7	6.9	6.9												
Incremental Delay (d 2), s/veh				3.1	0.4		0.4	0.9		0.0	1.2	1.2	0.0	0.5	0.6												
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													
Control Delay (d), s/veh				60.7	53.1		54.5	54.1		4.3	10.3	10.3	6.7	7.5	7.5												
Level of Service (LOS)				E	D		D	D		A	B	B	A	A	A												
Approach Delay, s/veh / LOS				59.3		E	54.3		D	10.3		B	7.5		A												
Intersection Delay, s/veh / LOS				12.3				B																			
Multimodal Results				EB			WB			NB			SB														
Pedestrian LOS Score / LOS				2.32		B	2.32		B	1.87		B	1.87		B												
Bicycle LOS Score / LOS				0.64		A	0.58		A	1.64		B	1.11		A												

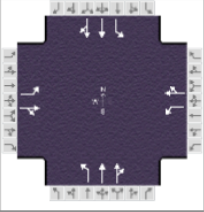






HCS7 Signalized Intersection Results Summary

General Information				Intersection Information																							
Agency	Diane B. Zimmerman Traffic Engineering			Duration, h	0.250			Area Type	Other																		
Analyst	DBZ	Analysis Date	2/5/2020	PHF	0.96			Analysis Period	1> 4:45																		
Jurisdiction		Time Period	PM Peak	File Name	Hurst PM 19.xus																						
Urban Street	Hurstbourne Pkwy																										
Intersection	Meijer																										
Project Description	Hurstbourne Commons																										
Demand Information				EB			WB			NB			SB														
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R												
Demand (v), veh/h				131	6	104	10	2	14	25	797	9	22	1357	37												
Signal Information																											
Cycle, s	132.4	Reference Phase	2																								
Offset, s	0	Reference Point	End	Green	6.0	90.0	17.1	0.0	0.0	0.0																	
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	3.5	4.3	3.5	0.0	0.0	0.0																	
Force Mode	Fixed	Simult. Gap N/S	On	Red	3.0	2.1	2.9	0.0	0.0	0.0																	
Timer Results				EBL			EBT			WBL			WBT			NBL			NBT			SBL			SBT		
Assigned Phase							4						8			5			2			1			6		
Case Number							6.0						6.0			1.1			4.0			1.1			4.0		
Phase Duration, s							23.5						23.5			12.5			96.4			12.5			96.4		
Change Period, (Y+R _c), s							6.4						6.4			6.5			6.4			6.5			6.4		
Max Allow Headway (MAH), s							5.4						5.4			5.0			2.9			5.0			2.9		
Queue Clearance Time (g _s), s							15.8						11.8			2.6			16.1			2.5			28.9		
Green Extension Time (g _e), s							1.3						1.5			0.1			5.5			0.1			5.5		
Phase Call Probability							1.00						1.00			1.00			1.00			1.00			1.00		
Max Out Probability							0.03						0.01			0.00			0.00			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				7	4	14	3	8	18	5	2	12	1	6	16												
Adjusted Flow Rate (v), veh/h				136	115		10	17		29	467	465	23	729	723												
Adjusted Saturation Flow Rate (s), veh/h/ln				1396	1624		1298	1552		1810	1870	1863	1810	1885	1867												
Queue Service Time (g _s), s				12.5	8.8		1.0	1.3		0.6	14.1	14.1	0.5	26.8	26.9												
Cycle Queue Clearance Time (g _c), s				13.8	8.8		9.8	1.3		0.6	14.1	14.1	0.5	26.8	26.9												
Green Ratio (g/C)				0.13	0.13		0.13	0.13		0.72	0.68	0.68	0.72	0.68	0.68												
Capacity (c), veh/h				232	211		137	201		308	1271	1266	476	1281	1269												
Volume-to-Capacity Ratio (X)				0.587	0.544		0.076	0.083		0.094	0.368	0.368	0.048	0.569	0.570												
Back of Queue (Q), ft/ln (90 th percentile)				188.7	157.5		15.6	24.2		9.3	209.7	205.8	7.2	351.8	347												
Back of Queue (Q), veh/ln (90 th percentile)				7.4	6.3		0.6	0.9		0.4	8.3	8.2	0.3	14.0	13.9												
Queue Storage Ratio (RQ) (90 th percentile)				1.64	1.37		0.09	0.15		0.12	0.35	0.35	0.09	0.40	0.40												
Uniform Delay (d ₁), s/veh				55.9	54.0		58.6	50.7		8.5	9.1	9.1	6.1	11.1	11.1												
Incremental Delay (d ₂), s/veh				3.3	3.1		0.3	0.2		0.2	0.8	0.8	0.1	0.4	0.4												
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												
Control Delay (d), s/veh				59.2	57.1		58.9	51.0		8.7	9.8	9.8	6.2	11.5	11.5												
Level of Service (LOS)				E	E		E	D		A	A	A	A	B	B												
Approach Delay, s/veh / LOS				58.2	E		54.0	D		9.8	A		11.4	B													
Intersection Delay, s/veh / LOS				15.6						B																	
Multimodal Results				EB			WB			NB			SB														
Pedestrian LOS Score / LOS				2.31	B		2.31	B		1.87	B		1.87	B													
Bicycle LOS Score / LOS				0.90	A		0.53	A		1.20	A		1.70	B													

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information																							
Agency	Diane B. Zimmerman Traffic Engineering			Duration, h	0.250																						
Analyst	DBZ	Analysis Date	Apr 6, 2020	Area Type	Other																						
Jurisdiction		Time Period	PM Peak	PHF	0.96																						
Urban Street	Hurstbourne Pkwy	Analysis Year	2027 No Build	Analysis Period	1> 4:45																						
Intersection	Meijer	File Name	Hurst PM 27 NB.xus																								
Project Description	Hurstbourne Commons																										
Demand Information				EB			WB			NB			SB														
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R												
Demand (v), veh/h				131	6	104	10	2	14	25	863	9	22	1469	37												
Signal Information																											
Cycle, s	132.4	Reference Phase	2																								
Offset, s	0	Reference Point	End																								
Uncoordinated	Yes	Simult. Gap E/W	On	Green	6.0	90.0	17.1	0.0	0.0	0.0																	
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	3.5	4.3	3.5	0.0	0.0	0.0																	
				Red	3.0	2.1	2.9	0.0	0.0	0.0																	
Timer Results				EBL			EBT			WBL			WBT			NBL			NBT			SBL			SBT		
Assigned Phase							4						8			5			2			1			6		
Case Number							6.0						6.0			1.1			4.0			1.1			4.0		
Phase Duration, s							23.5						23.5			12.5			96.4			12.5			96.4		
Change Period, (Y+R _c), s							6.4						6.4			6.5			6.4			6.5			6.4		
Max Allow Headway (MAH), s							5.4						5.4			5.0			2.9			5.0			2.9		
Queue Clearance Time (g _s), s							15.8						11.8			2.6			17.8			2.5			32.6		
Green Extension Time (g _e), s							1.3						1.5			0.1			6.3			0.1			6.3		
Phase Call Probability							1.00						1.00			1.00			1.00			1.00			1.00		
Max Out Probability							0.03						0.01			0.00			0.00			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				7	4	14	3	8	18	5	2	12	1	6	16												
Adjusted Flow Rate (v), veh/h				136	115		10	17		29	506	505	23	787	782												
Adjusted Saturation Flow Rate (s), veh/h/ln				1396	1624		1298	1552		1810	1870	1863	1810	1885	1869												
Queue Service Time (g _s), s				12.5	8.8		1.0	1.3		0.6	15.8	15.8	0.5	30.4	30.6												
Cycle Queue Clearance Time (g _c), s				13.8	8.8		9.8	1.3		0.6	15.8	15.8	0.5	30.4	30.6												
Green Ratio (g/C)				0.13	0.13		0.13	0.13		0.72	0.68	0.68	0.72	0.68	0.68												
Capacity (c), veh/h				232	211		137	201		281	1271	1266	445	1281	1269												
Volume-to-Capacity Ratio (X)				0.587	0.544		0.076	0.083		0.103	0.399	0.399	0.051	0.614	0.616												
Back of Queue (Q), ft/ln (90 th percentile)				188.7	157.5		15.6	24.2		9.3	229.1	224.8	7.2	394.6	390.4												
Back of Queue (Q), veh/ln (90 th percentile)				7.4	6.3		0.6	0.9		0.4	9.0	9.0	0.3	15.7	15.6												
Queue Storage Ratio (RQ) (90 th percentile)				1.64	1.37		0.09	0.15		0.12	0.38	0.38	0.09	0.45	0.45												
Uniform Delay (d ₁), s/veh				55.9	54.0		58.6	50.7		9.5	9.3	9.3	6.3	11.7	11.7												
Incremental Delay (d ₂), s/veh				3.3	3.1		0.3	0.2		0.2	0.9	0.9	0.1	0.6	0.7												
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												
Control Delay (d), s/veh				59.2	57.1		58.9	51.0		9.7	10.2	10.2	6.4	12.3	12.4												
Level of Service (LOS)				E	E		E	D		A	B	B	A	B	B												
Approach Delay, s/veh / LOS				58.2	E		54.0	D		10.2	B		12.3	B													
Intersection Delay, s/veh / LOS							15.9						B														
Multimodal Results				EB			WB			NB			SB														
Pedestrian LOS Score / LOS				2.31	B		2.31	B		1.87	B		1.87	B													
Bicycle LOS Score / LOS				0.90	A		0.53	A		1.26	A		1.80	B													

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information											
Agency	Diane B. Zimmerman Traffic Engineering			Duration, h	0.250										
Analyst	DBZ	Analysis Date	Oct 22, 2020	Area Type	Other										
Jurisdiction		Time Period	PM Peak	PHF	0.96										
Urban Street	Hurstbourne Pkwy	Analysis Year	2027 Build	Analysis Period	1> 4:45										
Intersection	Meijer	File Name	Hurst PM 27 B.xus												
Project Description	Hurstbourne Commons														
Demand Information				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h				166	6	104	10	2	14	25	885	9	22	1528	37
Signal Information															
Cycle, s	136.2	Reference Phase	2												
Offset, s	0	Reference Point	End	Green	6.0	90.0	20.9	0.0	0.0	0.0					
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	3.5	4.3	3.5	0.0	0.0	0.0					
Force Mode	Fixed	Simult. Gap N/S	On	Red	3.0	2.1	2.9	0.0	0.0	0.0					
Timer Results				EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT				
Assigned Phase					4		8	5	2	1	6				
Case Number					6.0		6.0	1.1	4.0	1.1	4.0				
Phase Duration, s					27.3		27.3	12.5	96.4	12.5	96.4				
Change Period, (Y+R c), s					6.4		6.4	6.5	6.4	6.5	6.4				
Max Allow Headway (MAH), s					5.3		5.3	5.0	2.9	5.0	2.9				
Queue Clearance Time (g s), s					19.6		11.8	2.7	21.7	2.5	37.6				
Green Extension Time (g e), s					1.3		1.7	0.1	7.1	0.1	7.1				
Phase Call Probability					1.00		1.00	1.00	1.00	1.00	1.00				
Max Out Probability					0.16		0.01	0.00	0.00	0.00	0.02				
Movement Group Results				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement				7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h				173	115		10	17		31	558	556	23	817	813
Adjusted Saturation Flow Rate (s), veh/h/ln				1396	1624		1298	1552		1810	1870	1864	1810	1885	1869
Queue Service Time (g s), s				16.3	8.8		1.0	1.3		0.7	19.7	19.7	0.5	35.4	35.6
Cycle Queue Clearance Time (g c), s				17.6	8.8		9.8	1.3		0.7	19.7	19.7	0.5	35.4	35.6
Green Ratio (g/C)				0.15	0.15		0.15	0.15		0.70	0.66	0.66	0.70	0.66	0.66
Capacity (c), veh/h				265	250		169	239		253	1235	1231	390	1245	1235
Volume-to-Capacity Ratio (X)				0.653	0.459		0.062	0.070		0.123	0.452	0.452	0.059	0.656	0.659
Back of Queue (Q), ft/ln (90 th percentile)				234.9	155.8		15.5	24.1		11.6	281.4	276.2	8.3	465.7	461.1
Back of Queue (Q), veh/ln (90 th percentile)				9.2	6.2		0.6	0.9		0.5	11.1	11.0	0.3	18.5	18.4
Queue Storage Ratio (RQ) (90 th percentile)				2.04	1.35		0.09	0.15		0.16	0.47	0.47	0.10	0.53	0.53
Uniform Delay (d 1), s/veh				55.9	52.5		57.0	49.3		11.8	11.2	11.2	7.8	13.9	13.9
Incremental Delay (d 2), s/veh				3.8	1.9		0.2	0.2		0.3	1.1	1.1	0.1	1.0	1.0
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
Control Delay (d), s/veh				59.8	54.4		57.2	49.5		12.1	12.2	12.2	7.9	14.9	14.9
Level of Service (LOS)				E	D		E	D		B	B	B	A	B	B
Approach Delay, s/veh / LOS				57.6		E	52.4		D	12.2		B	14.8		B
Intersection Delay, s/veh / LOS						18.1						B			
Multimodal Results				EB			WB			NB			SB		
Pedestrian LOS Score / LOS				2.31		B	2.31		B	1.88		B	1.88		B
Bicycle LOS Score / LOS				0.96		A	0.53		A	1.28		A	1.85		B

HCS7 Two-Way Stop-Control Report																	
General Information								Site Information									
Analyst	DBZ							Intersection	Hurstbourne at Ridgehurst								
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction									
Date Performed	4/5/2020							East/West Street	Ridgehurst Place								
Analysis Year	2019							North/South Street	Hurstbourne Parkway								
Time Analyzed	AM Peak							Peak Hour Factor	0.97								
Intersection Orientation	North-South							Analysis Time Period (hrs)	0.25								
Project Description	Hurstbourne Commons																
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	1		0	1	1	0	1	2	0	0	1	2	0	
Configuration		LT		R		LT		R		L	T	TR		L	T	TR	
Volume (veh/h)		44	0	42		11	2	12	0	34	1281	8	0	7	567	15	
Percent Heavy Vehicles (%)		0	0	5		0	0	8	0	3			0	0			
Proportion Time Blocked																	
Percent Grade (%)		0				0											
Right Turn Channelized		No				No											
Median Type Storage		Left + Thru								1							
Critical and Follow-up Headways																	
Base Critical Headway (sec)		7.5	6.5	6.9		7.5	6.5	6.9		4.1				4.1			
Critical Headway (sec)		7.50	6.50	7.00		7.50	6.50	7.06		4.16				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)		3.50	4.00	3.35		3.50	4.00	3.38		2.23				2.20			
Delay, Queue Length, and Level of Service																	
Flow Rate, v (veh/h)		45		43		13		12		35				7			
Capacity, c (veh/h)		225		687		121		389		966				526			
v/c Ratio		0.20		0.06		0.11		0.03		0.04				0.01			
95% Queue Length, Q ₉₅ (veh)		0.7		0.2		0.4		0.1		0.1				0.0			
Control Delay (s/veh)		25.0		10.6		38.4		14.6		8.9				11.9			
Level of Service (LOS)		C		B		E		B		A				B			
Approach Delay (s/veh)		17.9				26.9				0.2				0.1			
Approach LOS		C				D											

HCS7 Two-Way Stop-Control Report																	
General Information								Site Information									
Analyst	DBZ							Intersection	Hurstbourne at Ridgehurst								
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction									
Date Performed	4/5/2020							East/West Street	Ridgehurst Place								
Analysis Year	2027							North/South Street	Hurstbourne Parkway								
Time Analyzed	AM Peak No Build							Peak Hour Factor	0.97								
Intersection Orientation	North-South							Analysis Time Period (hrs)	0.25								
Project Description	Hurstbourne Commons																
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	1		0	1	1	0	1	2	0	0	1	2	0	
Configuration		LT		R		LT		R		L	T	TR		L	T	TR	
Volume (veh/h)		44	0	42		11	2	12	0	34	1387	8	0	7	614	15	
Percent Heavy Vehicles (%)		0	0	5		0	0	8	0	3			0	0			
Proportion Time Blocked																	
Percent Grade (%)		0				0											
Right Turn Channelized		No				No											
Median Type Storage		Left + Thru								1							
Critical and Follow-up Headways																	
Base Critical Headway (sec)		7.5	6.5	6.9		7.5	6.5	6.9		4.1				4.1			
Critical Headway (sec)		7.50	6.50	7.00		7.50	6.50	7.06		4.16				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)		3.50	4.00	3.35		3.50	4.00	3.38		2.23				2.20			
Delay, Queue Length, and Level of Service																	
Flow Rate, v (veh/h)		45		43		13		12		35				7			
Capacity, c (veh/h)		204		663		104		358		927				478			
v/c Ratio		0.22		0.07		0.13		0.03		0.04				0.02			
95% Queue Length, Q ₉₅ (veh)		0.8		0.2		0.4		0.1		0.1				0.0			
Control Delay (s/veh)		27.6		10.8		44.7		15.4		9.0				12.6			
Level of Service (LOS)		D		B		E		C		A				B			
Approach Delay (s/veh)		19.4				30.7				0.2				0.1			
Approach LOS		C				D											

HCS7 Two-Way Stop-Control Report																	
General Information								Site Information									
Analyst	DBZ							Intersection	Hurstbourne at Ridgehurst								
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction									
Date Performed	4/5/2020							East/West Street	Ridgehurst Place								
Analysis Year	2027							North/South Street	Hurstbourne Parkway								
Time Analyzed	AM Peak Build							Peak Hour Factor	0.97								
Intersection Orientation	North-South							Analysis Time Period (hrs)	0.25								
Project Description	Hurstbourne Commons																
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	1		0	1	1	0	1	2	0	0	1	2	0	
Configuration		LT		R		LT		R		L	T	TR		L	T	TR	
Volume (veh/h)		67	0	42		11	2	12	0	34	1442	8	0	7	637	23	
Percent Heavy Vehicles (%)		0	0	5		0	0	8	0	3			0	0			
Proportion Time Blocked																	
Percent Grade (%)		0				0											
Right Turn Channelized		No				No											
Median Type Storage		Left + Thru								1							
Critical and Follow-up Headways																	
Base Critical Headway (sec)		7.5	6.5	6.9		7.5	6.5	6.9		4.1				4.1			
Critical Headway (sec)		7.50	6.50	7.00		7.50	6.50	7.06		4.16				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)		3.50	4.00	3.35		3.50	4.00	3.38		2.23				2.20			
Delay, Queue Length, and Level of Service																	
Flow Rate, v (veh/h)		69		43		13		12		35				7			
Capacity, c (veh/h)		194		647		96		342		901				455			
v/c Ratio		0.36		0.07		0.14		0.04		0.04				0.02			
95% Queue Length, Q ₉₅ (veh)		1.5		0.2		0.5		0.1		0.1				0.0			
Control Delay (s/veh)		33.5		11.0		48.6		15.9		9.2				13.0			
Level of Service (LOS)		D		B		E		C		A				B			
Approach Delay (s/veh)		24.8				32.9				0.2				0.1			
Approach LOS		C				D											

HCS7 Two-Way Stop-Control Report																	
General Information								Site Information									
Analyst	DBZ							Intersection	Hurstbourne at Ridgehurst								
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction									
Date Performed	4/5/2020							East/West Street	Ridgehurst Place								
Analysis Year	2019							North/South Street	Hurstbourne Parkway								
Time Analyzed	PM Peak							Peak Hour Factor	0.96								
Intersection Orientation	North-South							Analysis Time Period (hrs)	0.25								
Project Description	Hurstbourne Commons																
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	1		0	1	1	0	1	2	0	0	1	2	0	
Configuration		LT		R		LT		R		L	T	TR		L	T	TR	
Volume (veh/h)		25	4	60		7	1	6	0	43	890	18	0	23	1524	57	
Percent Heavy Vehicles (%)		0	0	3		0	0	0	0	2			0	0			
Proportion Time Blocked																	
Percent Grade (%)		0				0											
Right Turn Channelized		No				No											
Median Type Storage		Left + Thru								1							
Critical and Follow-up Headways																	
Base Critical Headway (sec)		7.5	6.5	6.9		7.5	6.5	6.9		4.1				4.1			
Critical Headway (sec)		7.50	6.50	6.96		7.50	6.50	6.90		4.14				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)		3.50	4.00	3.33		3.50	4.00	3.30		2.22				2.20			
Delay, Queue Length, and Level of Service																	
Flow Rate, v (veh/h)		30		63		8		6		45				24			
Capacity, c (veh/h)		79		314		112		543		389				734			
v/c Ratio		0.38		0.20		0.07		0.01		0.12				0.03			
95% Queue Length, Q ₉₅ (veh)		1.5		0.7		0.2		0.0		0.4				0.1			
Control Delay (s/veh)		76.9		19.3		39.8		11.7		15.5				10.1			
Level of Service (LOS)		F		C		E		B		C				B			
Approach Delay (s/veh)		38.0				27.8				0.7				0.1			
Approach LOS		E				D											

HCS7 Two-Way Stop-Control Report																	
General Information								Site Information									
Analyst	DBZ							Intersection	Hurstbourne at Ridgehurst								
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction									
Date Performed	4/5/2020							East/West Street	Ridgehurst Place								
Analysis Year	2027							North/South Street	Hurstbourne Parkway								
Time Analyzed	PM Peak No Build							Peak Hour Factor	0.96								
Intersection Orientation	North-South							Analysis Time Period (hrs)	0.25								
Project Description	Hurstbourne Commons																
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	1		0	1	1	0	1	2	0	0	1	2	0	
Configuration		LT		R		LT		R		L	T	TR		L	T	TR	
Volume (veh/h)		25	4	60		7	1	6	0	43	964	18	0	23	1650	57	
Percent Heavy Vehicles (%)		0	0	3		0	0	0	0	2			0	0			
Proportion Time Blocked																	
Percent Grade (%)		0				0											
Right Turn Channelized		No				No											
Median Type Storage		Left + Thru								1							
Critical and Follow-up Headways																	
Base Critical Headway (sec)		7.5	6.5	6.9		7.5	6.5	6.9		4.1				4.1			
Critical Headway (sec)		7.50	6.50	6.96		7.50	6.50	6.90		4.14				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)		3.50	4.00	3.33		3.50	4.00	3.30		2.22				2.20			
Delay, Queue Length, and Level of Service																	
Flow Rate, v (veh/h)		30		63		8		6		45				24			
Capacity, c (veh/h)		65		284		95		513		345				686			
v/c Ratio		0.46		0.22		0.09		0.01		0.13				0.03			
95% Queue Length, Q ₉₅ (veh)		1.8		0.8		0.3		0.0		0.4				0.1			
Control Delay (s/veh)		100.7		21.2		46.4		12.1		17.0				10.4			
Level of Service (LOS)		F		C		E		B		C				B			
Approach Delay (s/veh)		47.1				31.7				0.7				0.1			
Approach LOS		E				D											

HCS7 Two-Way Stop-Control Report																	
General Information								Site Information									
Analyst	DBZ							Intersection	Hurstbourne at Ridgehurst								
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction									
Date Performed	4/5/2020							East/West Street	Ridgehurst Place								
Analysis Year	2027							North/South Street	Hurstbourne Parkway								
Time Analyzed	PM Peak Build							Peak Hour Factor	0.96								
Intersection Orientation	North-South							Analysis Time Period (hrs)	0.25								
Project Description	Hurstbourne Commons																
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	1		0	1	1	0	1	2	0	0	1	2	0	
Configuration		LT		R		LT		R		L	T	TR		L	T	TR	
Volume (veh/h)		25	4	60		7	1	6	0	43	1021	18	0	23	1709	83	
Percent Heavy Vehicles (%)		0	0	3		0	0	0	0	2			0	0			
Proportion Time Blocked																	
Percent Grade (%)		0				0											
Right Turn Channelized		No				No											
Median Type Storage		Left + Thru								1							
Critical and Follow-up Headways																	
Base Critical Headway (sec)		7.5	6.5	6.9		7.5	6.5	6.9		4.1				4.1			
Critical Headway (sec)		7.50	6.50	6.96		7.50	6.50	6.90		4.14				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)		3.50	4.00	3.33		3.50	4.00	3.30		2.22				2.20			
Delay, Queue Length, and Level of Service																	
Flow Rate, v (veh/h)		30		63		8		6		45				24			
Capacity, c (veh/h)		59		266		86		490		319				652			
v/c Ratio		0.52		0.24		0.10		0.01		0.14				0.04			
95% Queue Length, Q ₉₅ (veh)		2.0		0.9		0.3		0.0		0.5				0.1			
Control Delay (s/veh)		119.1		22.7		51.2		12.4		18.1				10.7			
Level of Service (LOS)		F		C		F		B		C				B			
Approach Delay (s/veh)		54.1				34.6				0.7				0.1			
Approach LOS		F				D											

HCS7 Two-Way Stop-Control Report																
General Information								Site Information								
Analyst	DBZ							Intersection	Ridgehurst at Brody							
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction								
Date Performed	4/6/2020							East/West Street	Ridgehurst Place							
Analysis Year	2019							North/South Street	Brody Lane							
Time Analyzed	AM Peak							Peak Hour Factor	0.87							
Intersection Orientation	East-West							Analysis Time Period (hrs)	0.25							
Project Description	Hurstbourne Commons															
Lanes																
<p style="text-align: center;">Major Street: East-West</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	1U	1	2	3	4U	4	5	6	7	8	9	10	11	12		
Number of Lanes	0	0	1	0	0	0	1	0	0	1	0	0	1	0		
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		0	57	1		1	34	4		3	0	1		10	0	0
Percent Heavy Vehicles (%)		0				0				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized																
Median Type Storage					Undivided											
Critical and Follow-up Headways																
Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.10				4.10				7.10	6.50	6.20		7.10	6.50	6.20
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)		0				1				5				11		
Capacity, c (veh/h)		1578				1548				902				871		
v/c Ratio		0.00				0.00				0.01				0.01		
95% Queue Length, Q ₉₅ (veh)		0.0				0.0				0.0				0.0		
Control Delay (s/veh)		7.3				7.3				9.0				9.2		
Level of Service (LOS)		A				A				A				A		
Approach Delay (s/veh)		0.0				0.2				9.0				9.2		
Approach LOS		A				A				A				A		

HCS7 Two-Way Stop-Control Report																	
General Information								Site Information									
Analyst	DBZ							Intersection	Ridgehurst at Brody								
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction									
Date Performed	4/6/2020							East/West Street	Ridgehurst Place								
Analysis Year	2027							North/South Street	Brody Lane								
Time Analyzed	AM Peak No Build							Peak Hour Factor	0.87								
Intersection Orientation	East-West							Analysis Time Period (hrs)	0.25								
Project Description	Hurstbourne Commons																
Lanes																	
<p style="text-align: center;">Major Street: East-West</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	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12	
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0	
Configuration			LTR				LTR				LTR				LTR		
Volume (veh/h)		0	57	1		1	34	4		3	0	1		10	0	0	
Percent Heavy Vehicles (%)		0				0				0	0	0		0	0	0	
Proportion Time Blocked																	
Percent Grade (%)										0				0			
Right Turn Channelized																	
Median Type Storage	Undivided																
Critical and Follow-up Headways																	
Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2	
Critical Headway (sec)		4.10				4.10				7.10	6.50	6.20		7.10	6.50	6.20	
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3	
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30	
Delay, Queue Length, and Level of Service																	
Flow Rate, v (veh/h)		0				1				5					11		
Capacity, c (veh/h)		1578				1548				902					871		
v/c Ratio		0.00				0.00				0.01					0.01		
95% Queue Length, Q ₉₅ (veh)		0.0				0.0				0.0					0.0		
Control Delay (s/veh)		7.3				7.3				9.0					9.2		
Level of Service (LOS)		A				A				A					A		
Approach Delay (s/veh)		0.0				0.2				9.0				9.2			
Approach LOS										A				A			

HCS7 Two-Way Stop-Control Report																	
General Information								Site Information									
Analyst	DBZ							Intersection	Ridgehurst at Brody								
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction									
Date Performed	4/6/2020							East/West Street	Ridgehurst Place								
Analysis Year	2027							North/South Street	Brody Lane								
Time Analyzed	AM Peak Build							Peak Hour Factor	0.87								
Intersection Orientation	East-West							Analysis Time Period (hrs)	0.25								
Project Description	Hurstbourne Commons																
Lanes																	
<p>Major Street: East-West</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	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12	
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0	
Configuration			LTR				LTR				LTR				LTR		
Volume (veh/h)		0	57	2		9	34	4		6	0	24		10	0	0	
Percent Heavy Vehicles (%)		0				0				0	0	0		0	0	0	
Proportion Time Blocked																	
Percent Grade (%)										0				0			
Right Turn Channelized																	
Median Type Storage	Undivided																
Critical and Follow-up Headways																	
Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2	
Critical Headway (sec)		4.10				4.10				7.10	6.50	6.20		7.10	6.50	6.20	
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3	
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30	
Delay, Queue Length, and Level of Service																	
Flow Rate, v (veh/h)		0				10					34				11		
Capacity, c (veh/h)		1578				1546					966				804		
v/c Ratio		0.00				0.01					0.04				0.01		
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.1				0.0		
Control Delay (s/veh)		7.3				7.3					8.9				9.5		
Level of Service (LOS)		A				A					A				A		
Approach Delay (s/veh)		0.0				1.4				8.9				9.5			
Approach LOS										A				A			

HCS7 Two-Way Stop-Control Report																	
General Information								Site Information									
Analyst	DBZ							Intersection	Ridgehurst at Brody								
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction									
Date Performed	4/6/2020							East/West Street	Ridgehurst Place								
Analysis Year	2019							North/South Street	Brody Lane								
Time Analyzed	PM Peak							Peak Hour Factor	0.85								
Intersection Orientation	East-West							Analysis Time Period (hrs)	0.25								
Project Description	Hurstbourne Commons																
Lanes																	
<p>Major Street: East-West</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	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12	
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0	
Configuration			LTR				LTR				LTR				LTR		
Volume (veh/h)		0	70	5		2	87	8		1	0	5		1	0	0	
Percent Heavy Vehicles (%)		0				0				0	0	0		0	0	0	
Proportion Time Blocked																	
Percent Grade (%)										0				0			
Right Turn Channelized																	
Median Type Storage	Undivided																
Critical and Follow-up Headways																	
Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2	
Critical Headway (sec)		4.10				4.10				7.10	6.50	6.20		7.10	6.50	6.20	
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3	
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30	
Delay, Queue Length, and Level of Service																	
Flow Rate, v (veh/h)		0				2					7				1		
Capacity, c (veh/h)		1491				1520					936				757		
v/c Ratio		0.00				0.00					0.01				0.00		
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.0				0.0		
Control Delay (s/veh)		7.4				7.4					8.9				9.8		
Level of Service (LOS)		A				A					A				A		
Approach Delay (s/veh)		0.0				0.2				8.9				9.8			
Approach LOS										A				A			

HCS7 Two-Way Stop-Control Report																		
General Information								Site Information										
Analyst	DBZ							Intersection	Ridgehurst at Brody									
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction										
Date Performed	4/6/2020							East/West Street	Ridgehurst Place									
Analysis Year	2027							North/South Street	Brody Lane									
Time Analyzed	PM Peak No Build							Peak Hour Factor	0.85									
Intersection Orientation	East-West							Analysis Time Period (hrs)	0.25									
Project Description	Hurstbourne Commons																	
Lanes																		
<p style="text-align: center;">Major Street: East-West</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	1U	1	2	3	4U	4	5	6			7	8	9			10	11	12
Number of Lanes	0	0	1	0	0	0	1	0			0	1	0			0	1	0
Configuration			LTR				LTR				LTR				LTR			
Volume (veh/h)		0	70	5		2	87	8		1	0	5		1	0	0		
Percent Heavy Vehicles (%)		0				0				0	0	0		0	0	0		
Proportion Time Blocked																		
Percent Grade (%)										0				0				
Right Turn Channelized																		
Median Type Storage	Undivided																	
Critical and Follow-up Headways																		
Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2		
Critical Headway (sec)		4.10				4.10				7.10	6.50	6.20		7.10	6.50	6.20		
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3		
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30		
Delay, Queue Length, and Level of Service																		
Flow Rate, v (veh/h)		0				2				7				1				
Capacity, c (veh/h)		1491				1520				936				757				
v/c Ratio		0.00				0.00				0.01				0.00				
95% Queue Length, Q ₉₅ (veh)		0.0				0.0				0.0				0.0				
Control Delay (s/veh)		7.4				7.4				8.9				9.8				
Level of Service (LOS)		A				A				A				A				
Approach Delay (s/veh)	0.0				0.2				8.9				9.8					
Approach LOS	A				A				A				A					

HCS7 Two-Way Stop-Control Report																	
General Information								Site Information									
Analyst	DBZ							Intersection	Ridgehurst at Brody								
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction									
Date Performed	4/6/2020							East/West Street	Ridgehurst Place								
Analysis Year	2027							North/South Street	Brody Lane								
Time Analyzed	PM Peak Build							Peak Hour Factor	0.85								
Intersection Orientation	East-West							Analysis Time Period (hrs)	0.25								
Project Description	Hurstbourne Commons																
Lanes																	
<p>Major Street: East-West</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	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12	
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0	
Configuration			LTR				LTR				LTR				LTR		
Volume (veh/h)		0	70	8		28	87	8		3	0	5		1	0	0	
Percent Heavy Vehicles (%)		0				0				0	0	0		0	0	0	
Proportion Time Blocked																	
Percent Grade (%)										0				0			
Right Turn Channelized																	
Median Type Storage	Undivided																
Critical and Follow-up Headways																	
Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2	
Critical Headway (sec)		4.10				4.10				7.10	6.50	6.20		7.10	6.50	6.20	
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3	
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30	
Delay, Queue Length, and Level of Service																	
Flow Rate, v (veh/h)		0				33					9					1	
Capacity, c (veh/h)		1491				1516					842					678	
v/c Ratio		0.00				0.02					0.01					0.00	
95% Queue Length, Q ₉₅ (veh)		0.0				0.1					0.0					0.0	
Control Delay (s/veh)		7.4				7.4					9.3					10.3	
Level of Service (LOS)		A				A					A					B	
Approach Delay (s/veh)		0.0				1.8				9.3				10.3			
Approach LOS										A				B			

HCS7 Two-Way Stop-Control Report																	
General Information								Site Information									
Analyst	DBZ							Intersection	Nachand at Ridgehurst								
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction									
Date Performed	4/6/2020							East/West Street	Ridgehurst Place								
Analysis Year	2019							North/South Street	Nachand Lane								
Time Analyzed	AM Peak							Peak Hour Factor	0.92								
Intersection Orientation	North-South							Analysis Time Period (hrs)	0.25								
Project Description	Hurstbourne Commons																
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	0	0		0	1	0	0	0	1	0	0	0	1	0	
Configuration							LR					TR		LT			
Volume (veh/h)							17					67	13			29	37
Percent Heavy Vehicles (%)							18									11	
Proportion Time Blocked																	
Percent Grade (%)							0										
Right Turn Channelized																	
Median Type Storage							Undivided										
Critical and Follow-up Headways																	
Base Critical Headway (sec)							7.1									4.1	
Critical Headway (sec)							6.58									4.21	
Base Follow-Up Headway (sec)							3.5									2.2	
Follow-Up Headway (sec)							3.66									2.30	
Delay, Queue Length, and Level of Service																	
Flow Rate, v (veh/h)							70									32	
Capacity, c (veh/h)							903									1454	
v/c Ratio							0.08									0.02	
95% Queue Length, Q ₉₅ (veh)							0.2									0.1	
Control Delay (s/veh)							9.3									7.5	
Level of Service (LOS)							A									A	
Approach Delay (s/veh)							9.3									3.4	
Approach LOS							A										

HCS7 Two-Way Stop-Control Report																
General Information								Site Information								
Analyst	DBZ							Intersection	Nachand at Ridgehurst							
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction								
Date Performed	4/6/2020							East/West Street	Ridgehurst Place							
Analysis Year	2027							North/South Street	Nachand Lane							
Time Analyzed	AM Peak No Build							Peak Hour Factor	0.92							
Intersection Orientation	North-South							Analysis Time Period (hrs)	0.25							
Project Description	Hurstbourne Commons															
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	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						17		47			67	13		29	37	
Percent Heavy Vehicles (%)						18		5						11		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type Storage					Undivided											
Critical and Follow-up Headways																
Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.58		6.25						4.21		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.66		3.35						2.30		
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)						70								32		
Capacity, c (veh/h)						903								1454		
v/c Ratio						0.08								0.02		
95% Queue Length, Q ₉₅ (veh)						0.2								0.1		
Control Delay (s/veh)						9.3								7.5		
Level of Service (LOS)						A								A		
Approach Delay (s/veh)						9.3								3.4		
Approach LOS						A										

HCS7 Two-Way Stop-Control Report																
General Information								Site Information								
Analyst	DBZ							Intersection	Nachand at Ridgehurst							
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction								
Date Performed	4/6/2020							East/West Street	Ridgehurst Place							
Analysis Year	2027							North/South Street	Nachand Lane							
Time Analyzed	AM Peak Build							Peak Hour Factor	0.92							
Intersection Orientation	North-South							Analysis Time Period (hrs)	0.25							
Project Description	Hurstbourne Commons															
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	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						17		50			74	13		30	40	
Percent Heavy Vehicles (%)						18		5						11		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type Storage					Undivided											
Critical and Follow-up Headways																
Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.58		6.25						4.21		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.66		3.35						2.30		
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)						73								33		
Capacity, c (veh/h)						894								1445		
v/c Ratio						0.08								0.02		
95% Queue Length, Q ₉₅ (veh)						0.3								0.1		
Control Delay (s/veh)						9.4								7.5		
Level of Service (LOS)						A								A		
Approach Delay (s/veh)						9.4								3.3		
Approach LOS						A										

HCS7 Two-Way Stop-Control Report																
General Information								Site Information								
Analyst	DBZ							Intersection	Nachand at Ridgehurst							
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction								
Date Performed	4/6/2020							East/West Street	Ridgehurst Place							
Analysis Year	2019							North/South Street	Nachand Lane							
Time Analyzed	PM Peak							Peak Hour Factor	0.89							
Intersection Orientation	North-South							Analysis Time Period (hrs)	0.25							
Project Description	Hurstbourne Commons															
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	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						23		58			64	24		69	122	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type Storage					Undivided											
Critical and Follow-up Headways																
Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)						91								78		
Capacity, c (veh/h)						826								1507		
v/c Ratio						0.11								0.05		
95% Queue Length, Q ₉₅ (veh)						0.4								0.2		
Control Delay (s/veh)						9.9								7.5		
Level of Service (LOS)						A								A		
Approach Delay (s/veh)						9.9								3.0		
Approach LOS						A										

HCS7 Two-Way Stop-Control Report																
General Information								Site Information								
Analyst	DBZ							Intersection	Nachand at Ridgehurst							
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction								
Date Performed	4/6/2020							East/West Street	Ridgehurst Place							
Analysis Year	2027							North/South Street	Nachand Lane							
Time Analyzed	PM Peak No Build							Peak Hour Factor	0.89							
Intersection Orientation	North-South							Analysis Time Period (hrs)	0.25							
Project Description	Hurstbourne Commons															
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	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						23		58			64	24		69	122	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type Storage					Undivided											
Critical and Follow-up Headways																
Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)								91						78		
Capacity, c (veh/h)								826						1507		
v/c Ratio								0.11						0.05		
95% Queue Length, Q ₉₅ (veh)								0.4						0.2		
Control Delay (s/veh)								9.9						7.5		
Level of Service (LOS)								A						A		
Approach Delay (s/veh)								9.9						3.0		
Approach LOS								A								

HCS7 Two-Way Stop-Control Report																
General Information								Site Information								
Analyst	DBZ							Intersection	Nachand at Ridgehurst							
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction								
Date Performed	4/6/2020							East/West Street	Ridgehurst Place							
Analysis Year	2027							North/South Street	Nachand Lane							
Time Analyzed	PM Peak Build							Peak Hour Factor	0.89							
Intersection Orientation	North-South							Analysis Time Period (hrs)	0.25							
Project Description	Hurstbourne Commons															
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	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						23		60			69	24		72	129	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type Storage					Undivided											
Critical and Follow-up Headways																
Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)						93								81		
Capacity, c (veh/h)						816								1500		
v/c Ratio						0.11								0.05		
95% Queue Length, Q ₉₅ (veh)						0.4								0.2		
Control Delay (s/veh)						10.0								7.5		
Level of Service (LOS)						A								A		
Approach Delay (s/veh)						10.0								3.0		
Approach LOS						A										

HCS7 Two-Way Stop-Control Report																
General Information								Site Information								
Analyst	DBZ							Intersection	Nachand at Roswell							
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction								
Date Performed	4/6/2020							East/West Street	Roswell Way							
Analysis Year	2019							North/South Street	Nachand Lane							
Time Analyzed	AM Peak							Peak Hour Factor	0.82							
Intersection Orientation	North-South							Analysis Time Period (hrs)	0.25							
Project Description	Hurstbourne Commons															
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	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						5		5			53	2		2	94	
Percent Heavy Vehicles (%)						0		20						50		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type Storage					Undivided											
Critical and Follow-up Headways																
Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.40						4.60		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.48						2.65		
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)						12								2		
Capacity, c (veh/h)						872								1278		
v/c Ratio						0.01								0.00		
95% Queue Length, Q ₉₅ (veh)						0.0								0.0		
Control Delay (s/veh)						9.2								7.8		
Level of Service (LOS)						A								A		
Approach Delay (s/veh)						9.2								0.2		
Approach LOS						A										

HCS7 Two-Way Stop-Control Report																
General Information								Site Information								
Analyst	DBZ							Intersection	Nachand at Roswell							
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction								
Date Performed	4/6/2020							East/West Street	Roswell Way							
Analysis Year	2027							North/South Street	Nachand Lane							
Time Analyzed	AM Peak No Build							Peak Hour Factor	0.82							
Intersection Orientation	North-South							Analysis Time Period (hrs)	0.25							
Project Description	Hurstbourne Commons															
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	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						5		5			53	2		2	94	
Percent Heavy Vehicles (%)						0		20						50		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type Storage					Undivided											
Critical and Follow-up Headways																
Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.40						4.60		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.48						2.65		
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)						12								2		
Capacity, c (veh/h)						872								1278		
v/c Ratio						0.01								0.00		
95% Queue Length, Q ₉₅ (veh)						0.0								0.0		
Control Delay (s/veh)						9.2								7.8		
Level of Service (LOS)						A								A		
Approach Delay (s/veh)						9.2								0.2		
Approach LOS						A										

HCS7 Two-Way Stop-Control Report																
General Information								Site Information								
Analyst	DBZ							Intersection	Nachand at Roswell							
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction								
Date Performed	4/6/2020							East/West Street	Roswell Way							
Analysis Year	2027							North/South Street	Nachand Lane							
Time Analyzed	AM Peak Build							Peak Hour Factor	0.82							
Intersection Orientation	North-South							Analysis Time Period (hrs)	0.25							
Project Description	Hurstbourne Commons															
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	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						5		11			54	2		4	95	
Percent Heavy Vehicles (%)						0		10						25		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type Storage					Undivided											
Critical and Follow-up Headways																
Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.30						4.35		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.39						2.43		
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)							20							5		
Capacity, c (veh/h)							911							1399		
v/c Ratio							0.02							0.00		
95% Queue Length, Q ₉₅ (veh)							0.1							0.0		
Control Delay (s/veh)							9.0							7.6		
Level of Service (LOS)							A							A		
Approach Delay (s/veh)							9.0							0.3		
Approach LOS							A									

HCS7 Two-Way Stop-Control Report																
General Information								Site Information								
Analyst	DBZ							Intersection	Nachand at Roswell							
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction								
Date Performed	4/6/2020							East/West Street	Roswell Way							
Analysis Year	2019							North/South Street	Nachand Lane							
Time Analyzed	PM Peak							Peak Hour Factor	0.88							
Intersection Orientation	North-South							Analysis Time Period (hrs)	0.25							
Project Description	Hurstbourne Commons															
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	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						1		3			124	8		5	131	
Percent Heavy Vehicles (%)						0		33						20		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type Storage					Undivided											
Critical and Follow-up Headways																
Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.53						4.30		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.60						2.38		
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)						5								6		
Capacity, c (veh/h)						786								1328		
v/c Ratio						0.01								0.00		
95% Queue Length, Q ₉₅ (veh)						0.0								0.0		
Control Delay (s/veh)						9.6								7.7		
Level of Service (LOS)						A								A		
Approach Delay (s/veh)						9.6								0.3		
Approach LOS						A										

HCS7 Two-Way Stop-Control Report																
General Information								Site Information								
Analyst	DBZ							Intersection	Nachand at Roswell							
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction								
Date Performed	4/6/2020							East/West Street	Roswell Way							
Analysis Year	2027							North/South Street	Nachand Lane							
Time Analyzed	PM Peak No Build							Peak Hour Factor	0.88							
Intersection Orientation	North-South							Analysis Time Period (hrs)	0.25							
Project Description	Hurstbourne Commons															
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	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						1		3			124	8		5	131	
Percent Heavy Vehicles (%)						0		33						20		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type Storage					Undivided											
Critical and Follow-up Headways																
Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.53						4.30		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.60						2.38		
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)						5								6		
Capacity, c (veh/h)						786								1328		
v/c Ratio						0.01								0.00		
95% Queue Length, Q ₉₅ (veh)						0.0								0.0		
Control Delay (s/veh)						9.6								7.7		
Level of Service (LOS)						A								A		
Approach Delay (s/veh)						9.6								0.3		
Approach LOS						A										

HCS7 Two-Way Stop-Control Report																
General Information								Site Information								
Analyst	DBZ							Intersection	Nachand at Roswell							
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction								
Date Performed	4/6/2020							East/West Street	Roswell Way							
Analysis Year	2027							North/South Street	Nachand Lane							
Time Analyzed	PM Peak Build							Peak Hour Factor	0.88							
Intersection Orientation	North-South							Analysis Time Period (hrs)	0.25							
Project Description	Hurstbourne Commons															
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	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						1		7			125	8		11	132	
Percent Heavy Vehicles (%)						0		14						9		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type Storage					Undivided											
Critical and Follow-up Headways																
Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.34						4.19		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.43						2.28		
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)						9								13		
Capacity, c (veh/h)						838								1388		
v/c Ratio						0.01								0.01		
95% Queue Length, Q ₉₅ (veh)						0.0								0.0		
Control Delay (s/veh)						9.3								7.6		
Level of Service (LOS)						A								A		
Approach Delay (s/veh)						9.3								0.7		
Approach LOS						A										

HCS7 Two-Way Stop-Control Report																	
General Information								Site Information									
Analyst	DBZ							Intersection	Watterson T at Nachand								
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction									
Date Performed	4/6/2020							East/West Street	Watterson Trail								
Analysis Year	2019							North/South Street	Nachand Lane								
Time Analyzed	AM Peak							Peak Hour Factor	0.97								
Intersection Orientation	East-West							Analysis Time Period (hrs)	0.25								
Project Description	Hurstbourne Commons																
Lanes																	
<p>Major Street: East-West</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	1U	1	2	3	4U	4	5	6			7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0			0	0	0		0	1	0
Configuration		LT						TR							LR		
Volume (veh/h)		14	165				440	41						59		38	
Percent Heavy Vehicles (%)		7												0		8	
Proportion Time Blocked																	
Percent Grade (%)													0				
Right Turn Channelized																	
Median Type Storage	Undivided																
Critical and Follow-up Headways																	
Base Critical Headway (sec)		4.1												7.1		6.2	
Critical Headway (sec)		4.17												6.40		6.28	
Base Follow-Up Headway (sec)		2.2												3.5		3.3	
Follow-Up Headway (sec)		2.26												3.50		3.37	
Delay, Queue Length, and Level of Service																	
Flow Rate, v (veh/h)		14														100	
Capacity, c (veh/h)		1043														468	
v/c Ratio		0.01														0.21	
95% Queue Length, Q ₉₅ (veh)		0.0														0.8	
Control Delay (s/veh)		8.5														14.8	
Level of Service (LOS)		A														B	
Approach Delay (s/veh)	0.8												14.8				
Approach LOS													B				

HCS7 Two-Way Stop-Control Report																
General Information								Site Information								
Analyst	DBZ							Intersection	Watterson T at Nachand							
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction								
Date Performed	4/6/2020							East/West Street	Watterson Trail							
Analysis Year	2027							North/South Street	Nachand Lane							
Time Analyzed	AM Peak No Build							Peak Hour Factor	0.97							
Intersection Orientation	East-West							Analysis Time Period (hrs)	0.25							
Project Description	Hurstbourne Commons															
Lanes																
<p>Major Street: East-West</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	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration	LT				TR								LR			
Volume (veh/h)		14	179				476	41						59		38
Percent Heavy Vehicles (%)		7												0		8
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage	Undivided															
Critical and Follow-up Headways																
Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.17												6.40		6.28
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.26												3.50		3.37
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)		14														100
Capacity, c (veh/h)		1010														439
v/c Ratio		0.01														0.23
95% Queue Length, Q ₉₅ (veh)		0.0														0.9
Control Delay (s/veh)		8.6														15.6
Level of Service (LOS)		A														C
Approach Delay (s/veh)	0.8												15.6			
Approach LOS	C												C			

HCS7 Two-Way Stop-Control Report																
General Information								Site Information								
Analyst	DBZ							Intersection	Watterson T at Nachand							
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction								
Date Performed	4/6/2020							East/West Street	Watterson Trail							
Analysis Year	2027							North/South Street	Nachand Lane							
Time Analyzed	AM Peak Build							Peak Hour Factor	0.97							
Intersection Orientation	East-West							Analysis Time Period (hrs)	0.25							
Project Description	Hurstbourne Commons															
Lanes																
<p>Major Street: East-West</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	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration	LT				TR								LR			
Volume (veh/h)		14	194				516	42						60		38
Percent Heavy Vehicles (%)		7												0		8
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage	Undivided															
Critical and Follow-up Headways																
Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.17												6.40		6.28
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.26												3.50		3.37
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)		14														101
Capacity, c (veh/h)		974														409
v/c Ratio		0.01														0.25
95% Queue Length, Q ₉₅ (veh)		0.0														1.0
Control Delay (s/veh)		8.8														16.7
Level of Service (LOS)		A														C
Approach Delay (s/veh)	0.7												16.7			
Approach LOS	A												C			

HCS7 Two-Way Stop-Control Report																	
General Information								Site Information									
Analyst	DBZ							Intersection	Watterson T at Nachand								
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction									
Date Performed	4/6/2020							East/West Street	Watterson Trail								
Analysis Year	2019							North/South Street	Nachand Lane								
Time Analyzed	PM Peak							Peak Hour Factor	0.95								
Intersection Orientation	East-West							Analysis Time Period (hrs)	0.25								
Project Description	Hurstbourne Commons																
Lanes																	
<p>Major Street: East-West</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	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12	
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0	
Configuration	LT								TR				LR				
Volume (veh/h)		39	287				352	94						104		32	
Percent Heavy Vehicles (%)		0												0		0	
Proportion Time Blocked																	
Percent Grade (%)	0																
Right Turn Channelized																	
Median Type Storage	Undivided																
Critical and Follow-up Headways																	
Base Critical Headway (sec)		4.1												7.1		6.2	
Critical Headway (sec)		4.10												6.40		6.20	
Base Follow-Up Headway (sec)		2.2												3.5		3.3	
Follow-Up Headway (sec)		2.20												3.50		3.30	
Delay, Queue Length, and Level of Service																	
Flow Rate, v (veh/h)		41														143	
Capacity, c (veh/h)		1103														381	
v/c Ratio		0.04														0.38	
95% Queue Length, Q ₉₅ (veh)		0.1														1.7	
Control Delay (s/veh)		8.4														20.0	
Level of Service (LOS)		A														C	
Approach Delay (s/veh)		1.3												20.0			
Approach LOS														C			

HCS7 Two-Way Stop-Control Report																
General Information								Site Information								
Analyst	DBZ							Intersection	Watterson T at Nachand							
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction								
Date Performed	4/6/2020							East/West Street	Watterson Trail							
Analysis Year	2027							North/South Street	Nachand Lane							
Time Analyzed	PM Peak No Build							Peak Hour Factor	0.95							
Intersection Orientation	East-West							Analysis Time Period (hrs)	0.25							
Project Description	Hurstbourne Commons															
Lanes																
<p style="text-align: center;">Major Street: East-West</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	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration	LT								TR				LR			
Volume (veh/h)		39	311				381	94						104		32
Percent Heavy Vehicles (%)		0												0		0
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage	Undivided															
Critical and Follow-up Headways																
Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.10												6.40		6.20
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.50		3.30
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)		41														143
Capacity, c (veh/h)		1075														354
v/c Ratio		0.04														0.40
95% Queue Length, Q ₉₅ (veh)		0.1														1.9
Control Delay (s/veh)		8.5														21.9
Level of Service (LOS)		A														C
Approach Delay (s/veh)	1.3												21.9			
Approach LOS	A												C			

HCS7 Two-Way Stop-Control Report																
General Information								Site Information								
Analyst	DBZ							Intersection	Watterson T at Nachand							
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction								
Date Performed	4/6/2020							East/West Street	Watterson Trail							
Analysis Year	2027							North/South Street	Nachand Lane							
Time Analyzed	PM Peak Build							Peak Hour Factor	0.95							
Intersection Orientation	East-West							Analysis Time Period (hrs)	0.25							
Project Description	Hurstbourne Commons															
Lanes																
<p>Major Street: East-West</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	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration	LT				TR								LR			
Volume (veh/h)		39	353				410	95						105		32
Percent Heavy Vehicles (%)		0												0		0
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage	Undivided															
Critical and Follow-up Headways																
Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.10												6.40		6.20
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.50		3.30
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)		41													144	
Capacity, c (veh/h)		1046													321	
v/c Ratio		0.04													0.45	
95% Queue Length, Q ₉₅ (veh)		0.1													2.2	
Control Delay (s/veh)		8.6													25.0	
Level of Service (LOS)		A													D	
Approach Delay (s/veh)	1.2												25.0			
Approach LOS	A												D			

HCS7 Two-Way Stop-Control Report																
General Information								Site Information								
Analyst	DBZ							Intersection	Watterson at Laurel Sprin							
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction								
Date Performed	4/5/2020							East/West Street	Watterson Trail							
Analysis Year	2019							North/South Street	Laurel Springs Drive							
Time Analyzed	AM Peak							Peak Hour Factor	0.86							
Intersection Orientation	East-West							Analysis Time Period (hrs)	0.25							
Project Description	Hurstbourne Common s															
Lanes																
<p>Major Street: East-West</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	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0	0	1	0		0	0	0	
Configuration				TR		LT					LR					
Volume (veh/h)			220	4		3	470			5		2				
Percent Heavy Vehicles (%)						0				0		0				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized																
Median Type Storage					Undivided											
Critical and Follow-up Headways																
Base Critical Headway (sec)						4.1				7.1		6.2				
Critical Headway (sec)						4.10				6.40		6.20				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.20				3.50		3.30				
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)						3					8					
Capacity, c (veh/h)						1316					416					
v/c Ratio						0.00					0.02					
95% Queue Length, Q ₉₅ (veh)						0.0					0.1					
Control Delay (s/veh)						7.7					13.8					
Level of Service (LOS)						A					B					
Approach Delay (s/veh)						0.1				13.8						
Approach LOS						A				B						

HCS7 Two-Way Stop-Control Report																
General Information								Site Information								
Analyst	DBZ							Intersection	Watterson at Laurel Sprin							
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction								
Date Performed	4/5/2020							East/West Street	Watterson Trail							
Analysis Year	2027							North/South Street	Laurel Springs Drive							
Time Analyzed	AM Peak No Build							Peak Hour Factor	0.86							
Intersection Orientation	East-West							Analysis Time Period (hrs)	0.25							
Project Description	Hurstbourne Common s															
Lanes																
<p>Major Street: East-West</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	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Number of Lanes	0	0	1	0	0	0	1	0	0	1	0		0	0	0	
Configuration				TR	LT					LR						
Volume (veh/h)			238	4	3	509			5		2					
Percent Heavy Vehicles (%)					0				0		0					
Proportion Time Blocked																
Percent Grade (%)									0							
Right Turn Channelized																
Median Type Storage	Undivided															
Critical and Follow-up Headways																
Base Critical Headway (sec)					4.1				7.1		6.2					
Critical Headway (sec)					4.10				6.40		6.20					
Base Follow-Up Headway (sec)					2.2				3.5		3.3					
Follow-Up Headway (sec)					2.20				3.50		3.30					
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)					3				8							
Capacity, c (veh/h)					1293				384							
v/c Ratio					0.00				0.02							
95% Queue Length, Q ₉₅ (veh)					0.0				0.1							
Control Delay (s/veh)					7.8				14.6							
Level of Service (LOS)					A				B							
Approach Delay (s/veh)					0.1				14.6							
Approach LOS									B							

HCS7 Two-Way Stop-Control Report																
General Information								Site Information								
Analyst	DBZ							Intersection	Watterson at Laurel Sprin							
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction								
Date Performed	10/22/2020							East/West Street	Watterson Trail							
Analysis Year	2027							North/South Street	Laurel Springs Drive							
Time Analyzed	AM Peak Build							Peak Hour Factor	0.86							
Intersection Orientation	East-West							Analysis Time Period (hrs)	0.25							
Project Description	Hurstbourne Common s															
Lanes																
<p>Major Street: East-West</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	1U	1	2	3	4U	4	5	6	7	8	9	10	11	12		
Number of Lanes	0	1	1	0	0	1	1	0	0	1	1	0	1	1		
Configuration		L		TR		L		TR	LT		R		LT		R	
Volume (veh/h)		16	238	4		3	514	5		5	0	2		60	0	41
Percent Heavy Vehicles (%)		0				0				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized										No				No		
Median Type Storage						Left Only								1		
Critical and Follow-up Headways																
Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.10				4.10				7.10	6.50	6.20		7.10	6.50	6.20
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)		19				3				6		2		70		48
Capacity, c (veh/h)		984				1293				322		765		366		504
v/c Ratio		0.02				0.00				0.02		0.00		0.19		0.09
95% Queue Length, Q ₉₅ (veh)		0.1				0.0				0.1		0.0		0.7		0.3
Control Delay (s/veh)		8.7				7.8				16.4		9.7		17.2		12.9
Level of Service (LOS)		A				A				C		A		C		B
Approach Delay (s/veh)		0.5				0.0				14.5				15.4		
Approach LOS		A				A				C				C		

HCS7 Two-Way Stop-Control Report																
General Information								Site Information								
Analyst	DBZ							Intersection	Watterson at Laurel Sprin							
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction								
Date Performed	4/5/2020							East/West Street	Watterson Trail							
Analysis Year	2019							North/South Street	Laurel Springs Drive							
Time Analyzed	PM Peak							Peak Hour Factor	0.91							
Intersection Orientation	East-West							Analysis Time Period (hrs)	0.25							
Project Description	Hurstbourne Common s															
Lanes																
<p>Major Street: East-West</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	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	0	0
Configuration				TR		LT					LR					
Volume (veh/h)			549	2		3	451			2		4				
Percent Heavy Vehicles (%)						0				0		0				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized																
Median Type Storage					Undivided											
Critical and Follow-up Headways																
Base Critical Headway (sec)						4.1				7.1		6.2				
Critical Headway (sec)						4.10				6.40		6.20				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.20				3.50		3.30				
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)						3					7					
Capacity, c (veh/h)						982					363					
v/c Ratio						0.00					0.02					
95% Queue Length, Q ₉₅ (veh)						0.0					0.1					
Control Delay (s/veh)						8.7					15.1					
Level of Service (LOS)						A					C					
Approach Delay (s/veh)						0.1					15.1					
Approach LOS						A					C					

HCS7 Two-Way Stop-Control Report																
General Information								Site Information								
Analyst	DBZ							Intersection	Watterson at Laurel Sprin							
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction								
Date Performed	4/5/2020							East/West Street	Watterson Trail							
Analysis Year	2027							North/South Street	Laurel Springs Drive							
Time Analyzed	PM Peak No Build							Peak Hour Factor	0.91							
Intersection Orientation	East-West							Analysis Time Period (hrs)	0.25							
Project Description	Hurstbourne Common s															
Lanes																
<p style="text-align: center;">Major Street: East-West</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	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	0	0
Configuration				TR		LT					LR					
Volume (veh/h)			594	2		3	488			2		4				
Percent Heavy Vehicles (%)						0				0		0				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized																
Median Type Storage	Undivided															
Critical and Follow-up Headways																
Base Critical Headway (sec)						4.1				7.1		6.2				
Critical Headway (sec)						4.10				6.40		6.20				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.20				3.50		3.30				
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)						3					7					
Capacity, c (veh/h)						942					330					
v/c Ratio						0.00					0.02					
95% Queue Length, Q ₉₅ (veh)						0.0					0.1					
Control Delay (s/veh)						8.8					16.1					
Level of Service (LOS)						A					C					
Approach Delay (s/veh)					0.1				16.1							
Approach LOS					A				C							

HCS7 Two-Way Stop-Control Report																
General Information								Site Information								
Analyst	DBZ							Intersection	Watterson at Laurel Sprin							
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction								
Date Performed	10/22/2020							East/West Street	Watterson Trail							
Analysis Year	2027							North/South Street	Laurel Springs Drive							
Time Analyzed	PM Peak Build							Peak Hour Factor	0.91							
Intersection Orientation	East-West							Analysis Time Period (hrs)	0.25							
Project Description	Hurstbourne Common s															
Lanes																
<p>Major Street: East-West</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	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Number of Lanes	0	1	1	0	0	1	1	0	0	1	1		0	1	1	
Configuration		L		TR		L		TR	LT			R		LT		R
Volume (veh/h)		43	594	2		3	488	6		2	0	4		39	0	30
Percent Heavy Vehicles (%)		0				0				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized										No				No		
Median Type Storage						Left Only								1		
Critical and Follow-up Headways																
Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.10				4.10				7.10	6.50	6.20		7.10	6.50	6.20
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)		47				3				2		4		43		33
Capacity, c (veh/h)		1036				942				244		470		260		546
v/c Ratio		0.05				0.00				0.01		0.01		0.16		0.06
95% Queue Length, Q ₉₅ (veh)		0.1				0.0				0.0		0.0		0.6		0.2
Control Delay (s/veh)		8.6				8.8				19.9		12.7		21.6		12.0
Level of Service (LOS)		A				A				C		B		C		B
Approach Delay (s/veh)		0.6				0.1				15.1				17.4		
Approach LOS		A				A				C				C		

HCS7 Two-Way Stop-Control Report																	
General Information								Site Information									
Analyst	DBZ							Intersection	Watterson Tr at Hendrick								
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction									
Date Performed	2/5/2020							East/West Street	Watterson Trail								
Analysis Year	2019							North/South Street	Hendrick								
Time Analyzed	AM Peak							Peak Hour Factor	0.96								
Intersection Orientation	East-West							Analysis Time Period (hrs)	0.25								
Project Description	Hurstbourne Commons																
Lanes																	
<p>Major Street: East-West</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	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12	
Number of Lanes	0	1	1	0	0	0	1	0		0	0	0		1	0	1	
Configuration		L	T					TR						L		R	
Volume (veh/h)		29	204				450	22						17		27	
Percent Heavy Vehicles (%)		0												12		0	
Proportion Time Blocked																	
Percent Grade (%)														0			
Right Turn Channelized																No	
Median Type Storage					Left Only											1	
Critical and Follow-up Headways																	
Base Critical Headway (sec)		4.1												7.1		6.2	
Critical Headway (sec)		4.10												6.52		6.20	
Base Follow-Up Headway (sec)		2.2												3.5		3.3	
Follow-Up Headway (sec)		2.20												3.61		3.30	
Delay, Queue Length, and Level of Service																	
Flow Rate, v (veh/h)		30												18		28	
Capacity, c (veh/h)		1082												459		590	
v/c Ratio		0.03												0.04		0.05	
95% Queue Length, Q ₉₅ (veh)		0.1												0.1		0.1	
Control Delay (s/veh)		8.4												13.2		11.4	
Level of Service (LOS)		A												B		B	
Approach Delay (s/veh)		1.0												12.1			
Approach LOS														B			

HCS7 Two-Way Stop-Control Report																	
General Information								Site Information									
Analyst	DBZ							Intersection	Watterson Tr at Hendrick								
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction									
Date Performed	2/5/2020							East/West Street	Watterson Trail								
Analysis Year	2027							North/South Street	Hendrick								
Time Analyzed	AM Peak No Build							Peak Hour Factor	0.96								
Intersection Orientation	East-West							Analysis Time Period (hrs)	0.25								
Project Description	Hurstbourne Commons																
Lanes																	
<p>Major Street: East-West</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	1U	1	2	3	4U	4	5	6			7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	0	1	0			0	0	0		1	0	1
Configuration		L	T					TR						L		R	
Volume (veh/h)		29	221				487	22						17		27	
Percent Heavy Vehicles (%)		0												12		0	
Proportion Time Blocked																	
Percent Grade (%)														0			
Right Turn Channelized															No		
Median Type Storage					Left Only											1	
Critical and Follow-up Headways																	
Base Critical Headway (sec)		4.1												7.1		6.2	
Critical Headway (sec)		4.10												6.52		6.20	
Base Follow-Up Headway (sec)		2.2												3.5		3.3	
Follow-Up Headway (sec)		2.20												3.61		3.30	
Delay, Queue Length, and Level of Service																	
Flow Rate, v (veh/h)		30												18		28	
Capacity, c (veh/h)		1047												437		561	
v/c Ratio		0.03												0.04		0.05	
95% Queue Length, Q ₉₅ (veh)		0.1												0.1		0.2	
Control Delay (s/veh)		8.5												13.6		11.8	
Level of Service (LOS)		A												B		B	
Approach Delay (s/veh)		1.0												12.5			
Approach LOS		A												B			

HCS7 Two-Way Stop-Control Report																				
General Information								Site Information												
Analyst	DBZ							Intersection	Watterson Tr at Hendrick											
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction												
Date Performed	10/22/20							East/West Street	Watterson Trail											
Analysis Year	2027							North/South Street	Hendrick											
Time Analyzed	AM Peak Build							Peak Hour Factor	0.96											
Intersection Orientation	East-West							Analysis Time Period (hrs)	0.25											
Project Description	Hurstbourne Commons																			
Lanes																				
<p style="text-align: center;">Major Street: East-West</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	1U	1	2	3	4U	4	5	6	7	8	9					10	11	12		
Number of Lanes	0	1	1	0	0	0	1	0	0	0	0					1	0	1		
Configuration		L	T					TR									L		R	
Volume (veh/h)		29	256				492	22									18		27	
Percent Heavy Vehicles (%)		0															12		0	
Proportion Time Blocked																				
Percent Grade (%)																	0			
Right Turn Channelized																	No			
Median Type Storage					Left Only								1							
Critical and Follow-up Headways																				
Base Critical Headway (sec)		4.1															7.1		6.2	
Critical Headway (sec)		4.10															6.52		6.20	
Base Follow-Up Headway (sec)		2.2															3.5		3.3	
Follow-Up Headway (sec)		2.20															3.61		3.30	
Delay, Queue Length, and Level of Service																				
Flow Rate, v (veh/h)		30															19		28	
Capacity, c (veh/h)		1043															424		557	
v/c Ratio		0.03															0.04		0.05	
95% Queue Length, Q ₉₅ (veh)		0.1															0.1		0.2	
Control Delay (s/veh)		8.6															13.9		11.8	
Level of Service (LOS)		A															B		B	
Approach Delay (s/veh)		0.9																12.6		
Approach LOS																		B		

HCS7 Two-Way Stop-Control Report																
General Information								Site Information								
Analyst	DBZ							Intersection	Watterson Tr at Hendrick							
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction								
Date Performed	4/5/2020							East/West Street	Watterson Trail							
Analysis Year	2019							North/South Street	Hendrick							
Time Analyzed	PM Peak							Peak Hour Factor	0.93							
Intersection Orientation	East-West							Analysis Time Period (hrs)	0.25							
Project Description	Hurstbourne Commons															
Lanes																
<p>Major Street: East-West</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	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	0	1	0		0	0	0		1	0	1
Configuration		L	T					TR						L		R
Volume (veh/h)		76	312				349	108						67		108
Percent Heavy Vehicles (%)		0												4		0
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized															No	
Median Type Storage					Left Only											1
Critical and Follow-up Headways																
Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.10												6.44		6.20
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.54		3.30
Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)		82												72		116
Capacity, c (veh/h)		1082												397		627
v/c Ratio		0.08												0.18		0.19
95% Queue Length, Q ₉₅ (veh)		0.2												0.7		0.7
Control Delay (s/veh)		8.6												16.1		12.0
Level of Service (LOS)		A												C		B
Approach Delay (s/veh)		1.7												13.6		
Approach LOS														B		

HCS7 Two-Way Stop-Control Report																	
General Information								Site Information									
Analyst	DBZ							Intersection	Watterson Tr at Hendrick								
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction									
Date Performed	4/5/2020							East/West Street	Watterson Trail								
Analysis Year	2027							North/South Street	Hendrick								
Time Analyzed	PM Peak No Build							Peak Hour Factor	0.93								
Intersection Orientation	East-West							Analysis Time Period (hrs)	0.25								
Project Description	Hurstbourne Commons																
Lanes																	
<p style="text-align: center;">Major Street: East-West</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	1U	1	2	3	4U	4	5	6			7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	0	1	0			0	0	0		1	0	1
Configuration		L	T					TR						L		R	
Volume (veh/h)		76	338				378	108						67		108	
Percent Heavy Vehicles (%)		0												4		0	
Proportion Time Blocked																	
Percent Grade (%)														0			
Right Turn Channelized															No		
Median Type Storage					Left Only											1	
Critical and Follow-up Headways																	
Base Critical Headway (sec)		4.1												7.1		6.2	
Critical Headway (sec)		4.10												6.44		6.20	
Base Follow-Up Headway (sec)		2.2												3.5		3.3	
Follow-Up Headway (sec)		2.20												3.54		3.30	
Delay, Queue Length, and Level of Service																	
Flow Rate, v (veh/h)		82												72		116	
Capacity, c (veh/h)		1054												379		602	
v/c Ratio		0.08												0.19		0.19	
95% Queue Length, Q ₉₅ (veh)		0.3												0.7		0.7	
Control Delay (s/veh)		8.7												16.7		12.4	
Level of Service (LOS)		A												C		B	
Approach Delay (s/veh)		1.6												14.1			
Approach LOS														B			

HCS7 Two-Way Stop-Control Report																	
General Information								Site Information									
Analyst	DBZ							Intersection	Watterson Tr at Hendrick								
Agency/Co.	Diane B Zimmerman Traffic Engineering							Jurisdiction									
Date Performed	10/22/2020							East/West Street	Watterson Trail								
Analysis Year	2027							North/South Street	Hendrick								
Time Analyzed	PM Peak Build							Peak Hour Factor	0.93								
Intersection Orientation	East-West							Analysis Time Period (hrs)	0.25								
Project Description	Hurstbourne Commons																
Lanes																	
<p>Major Street: East-West</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	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12	
Number of Lanes	0	1	1	0	0	0	1	0		0	0	0		1	0	1	
Configuration		L	T					TR						L		R	
Volume (veh/h)		76	377				384	108						72		108	
Percent Heavy Vehicles (%)		0												4		0	
Proportion Time Blocked																	
Percent Grade (%)														0			
Right Turn Channelized														No			
Median Type Storage					Left Only											1	
Critical and Follow-up Headways																	
Base Critical Headway (sec)		4.1												7.1		6.2	
Critical Headway (sec)		4.10												6.44		6.20	
Base Follow-Up Headway (sec)		2.2												3.5		3.3	
Follow-Up Headway (sec)		2.20												3.54		3.30	
Delay, Queue Length, and Level of Service																	
Flow Rate, v (veh/h)		82												77		116	
Capacity, c (veh/h)		1048												363		597	
v/c Ratio		0.08												0.21		0.19	
95% Queue Length, Q ₉₅ (veh)		0.3												0.8		0.7	
Control Delay (s/veh)		8.7												17.6		12.5	
Level of Service (LOS)		A												C		B	
Approach Delay (s/veh)		1.5												14.5			
Approach LOS														B			