final report

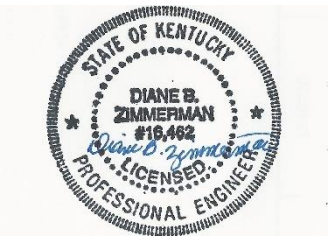
June 17, 2022
Revised August 8, 2022

Traffic Impact Study

4700 Hurstbourne Parkway Apartments
4700 Hurstbourne Parkway
Louisville, KY

Prepared for

Louisville Metro Planning Commission
Kentucky Transportation Cabinet



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Prospect, KY 40059
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dianebzim@att.net

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INTRODUCTION

The development plan for 4700 Hurstbourne Parkway shows 384 apartment units. The adjacent 4900 Hurstbourne Parkway shows 216 apartment units. The community will total 600 units. **Figure 1** displays a map of the site. Access to the development will be from the two existing access points on Hurstbourne Parkway and a connection to Bardstown Road. An emergency only, gated access is available at Laurel Spring Drive. 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 Hurstbourne Parkway intersections with Watterson Trail, Stony Brook Drive, Bardstown Road and the proposed entrances; Bardstown intersection with Watterson Trail.

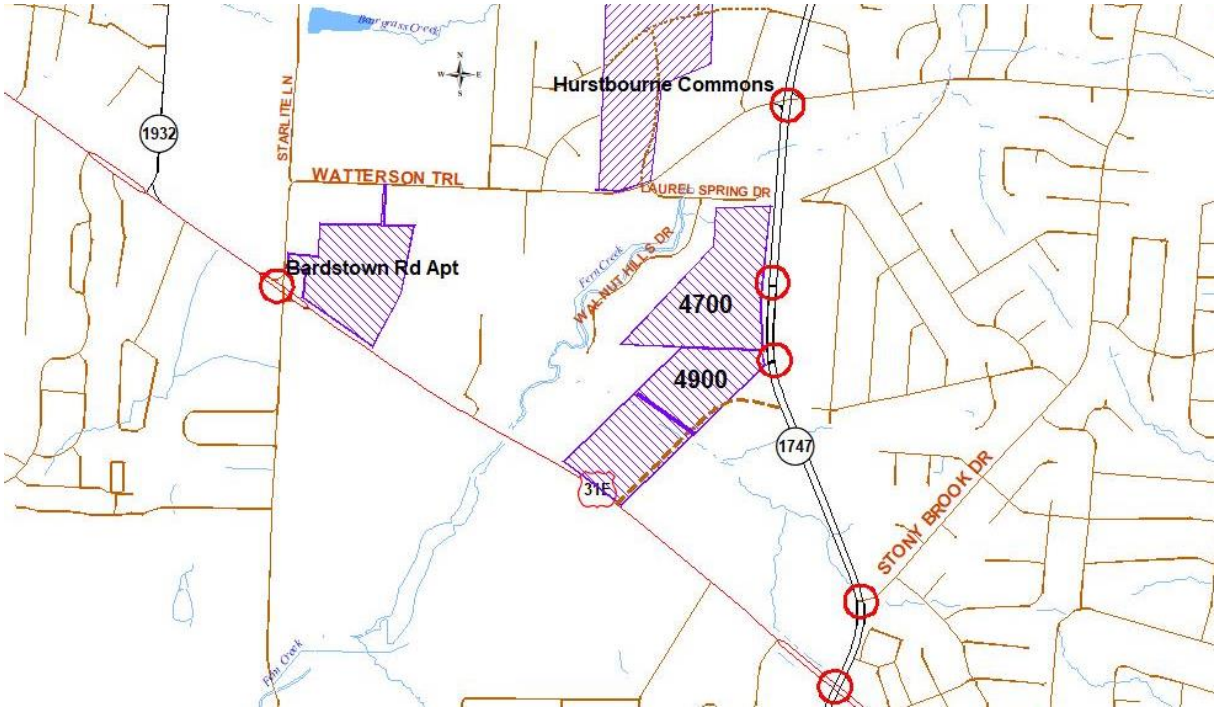


Figure 1. Site Map

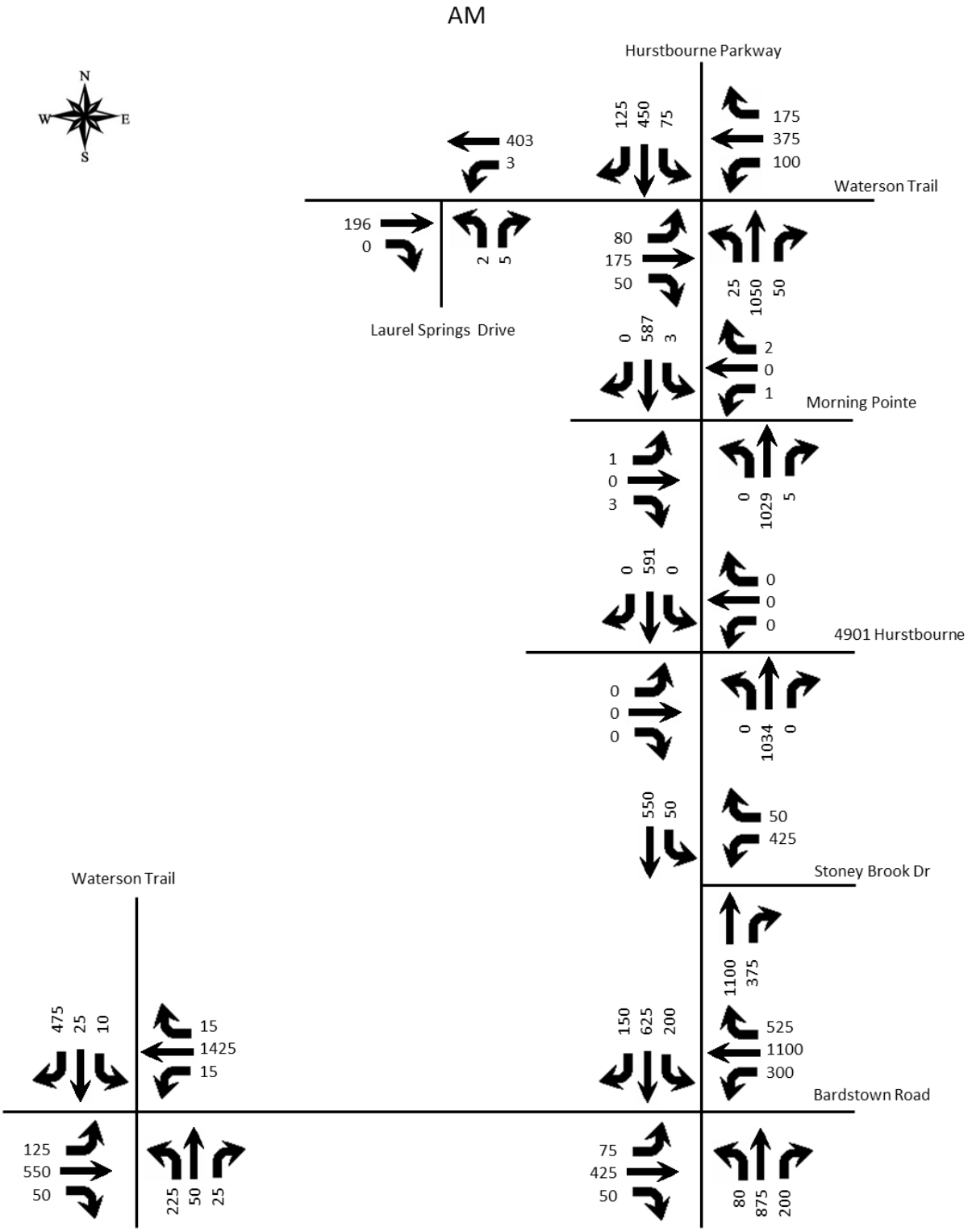
EXISTING CONDITIONS

Hurstbourne Parkway (KY 1747) is maintained by the Kentucky Transportation Cabinet an estimated 2020 Average Annual Daily Traffic (AADT) volume of 20,000 vehicles per day between Bardstown Road and Waterson Trail, as estimated at the Kentucky Transportation Cabinet count station M12. 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 where development has occurred. The intersections with Bardstown Road, Stony Brook Drive, and Watterson Trail are controlled with a traffic signal.

Bardstown Road is a state-maintained road (US 31E) with an estimated 2022 ADT of 25,500 vehicles per day between Watterson Trail and Hurstbourne Parkway, as estimated from the Kentucky Transportation Cabinet 2021 count at station P80. The road is a four-lane highway with twelve-foot lanes, four-foot paved shoulders, and a two-way left turn lane through the study area. The speed limit is 45 mph. There are no sidewalks. The intersection with

Watterson Trail is controlled with traffic signal and is part of a coordinated signal system. The intersection with Watterson Trail has left lanes and free-flow right-turn lanes to and from Watterson Trail. The Watterson Trail approach has a shared left and thru. TARC provides service along Bardstown Road.

Peak hour traffic count for the intersections were obtained from Metro Traffic Engineering Synchro models. The entrance to Morning Point (opposite 4700) was counted March 16, 2022. The peak hours occurred between 7:15 to 8:15 am and 4:15 to 5:15 pm. **Figure 2** illustrates the existing a.m. and p.m. peak hour traffic volumes. The Appendix contains the full count data.


AM
N
W
E
S
Hurstbourne Parkway
Waterson Trail
Laurel Springs Drive
Morning Pointe
4901 Hurstbourne
Stoney Brook Dr
Bardstown Road
Waterson Trail
403
3
196
0
2
5
125
450
75
175
375
100
80
175
50
25
1050
50
0
587
3
2
0
1
1
0
3
0
1029
5
0
591
0
0
0
0
0
0
0
1034
0
550
50
50
425
1100
375
150
625
200
525
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50
225
50
25
75
425
50
80
875
200

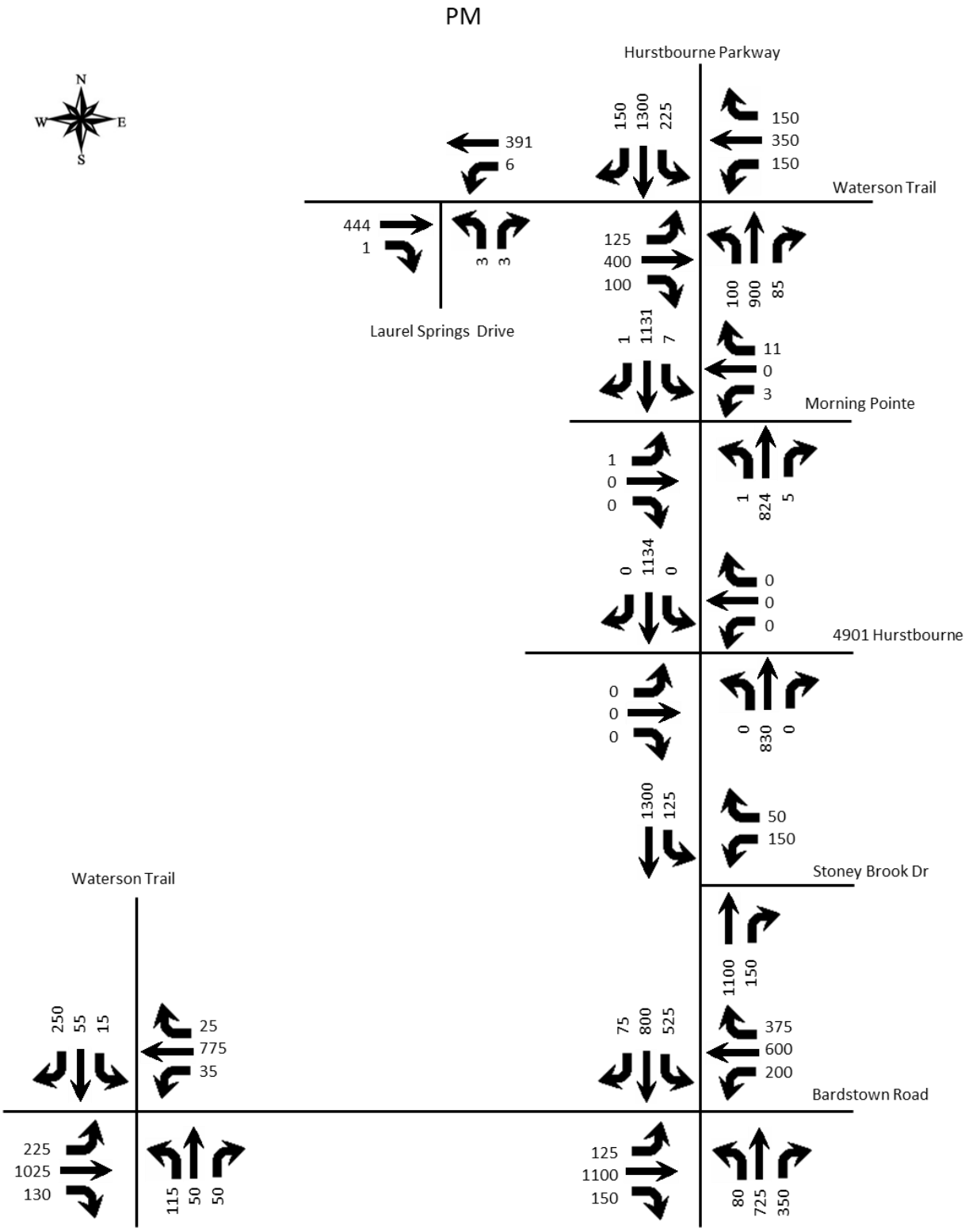
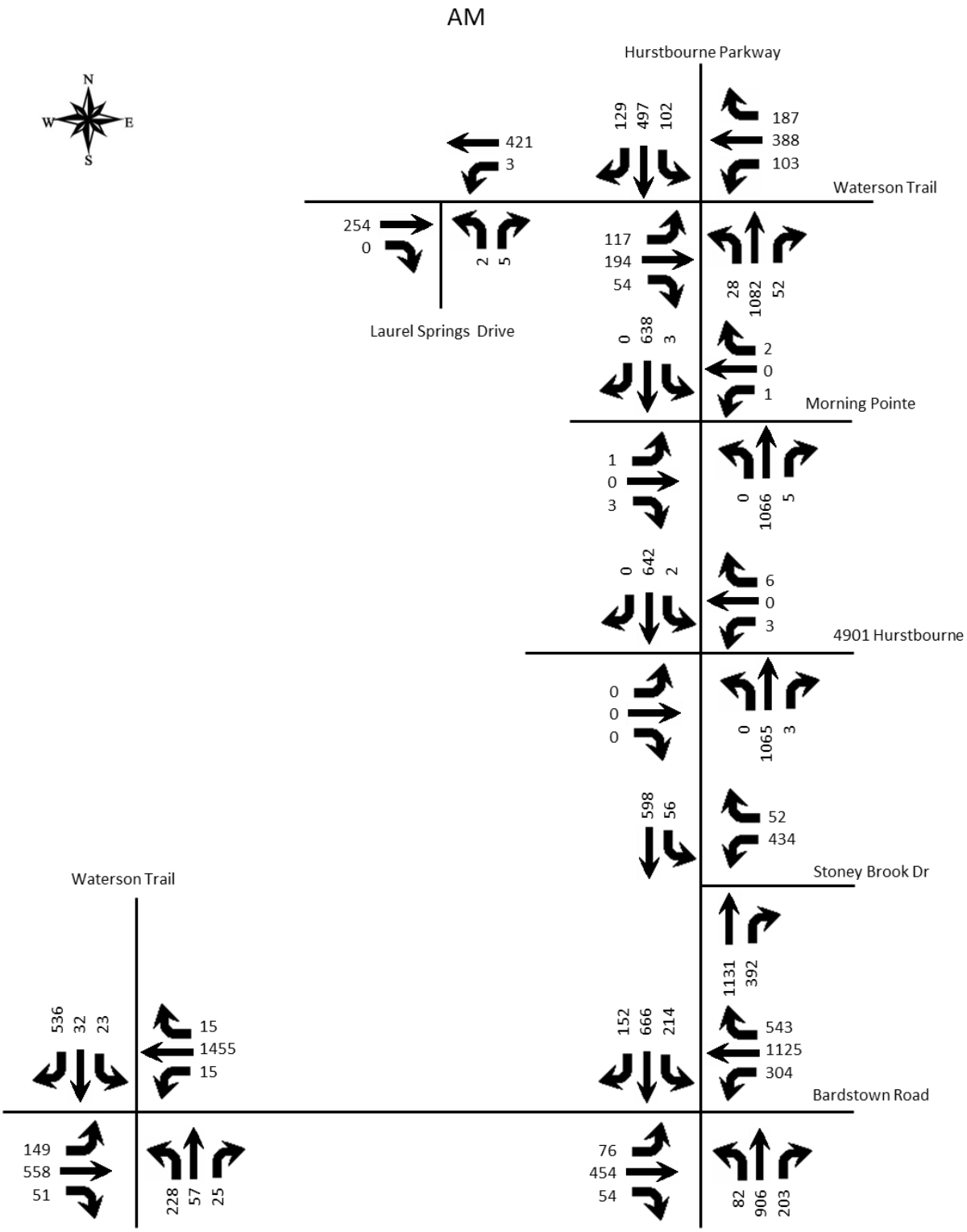


Figure 2. Existing Peak Hour Volumes

FUTURE CONDITIONS

The project completion date is 2025. An annual growth rate of 0.5 percent was applied to the volumes. This was determined by the historical growth at KYTC station P80. Additionally, trip generation for the Bardstown Road Apartments, Hurstbourne Commons, 4901 Hurstbourne Senior Apartments, and an office building at 5206 Stony Brook Drive were also included. **Figure 3** displays the 2025 No Build peak hour volumes.


AM
N
W
E
S
Hurstbourne Parkway
129
497
102
187
388
103
421
3
Waterson Trail
254
0
2
5
117
194
54
28
1082
52
Laurel Springs Drive
0
638
3
2
0
1
Morning Pointe
1
0
3
0
1066
5
0
642
2
6
0
3
4901 Hurstbourne
0
0
0
0
1065
3
598
56
52
434
Stoney Brook Dr
1131
392
Waterson Trail
536
32
23
15
1455
15
152
666
214
543
1125
304
Bardstown Road
149
558
51
228
57
25
76
454
54
82
906
203

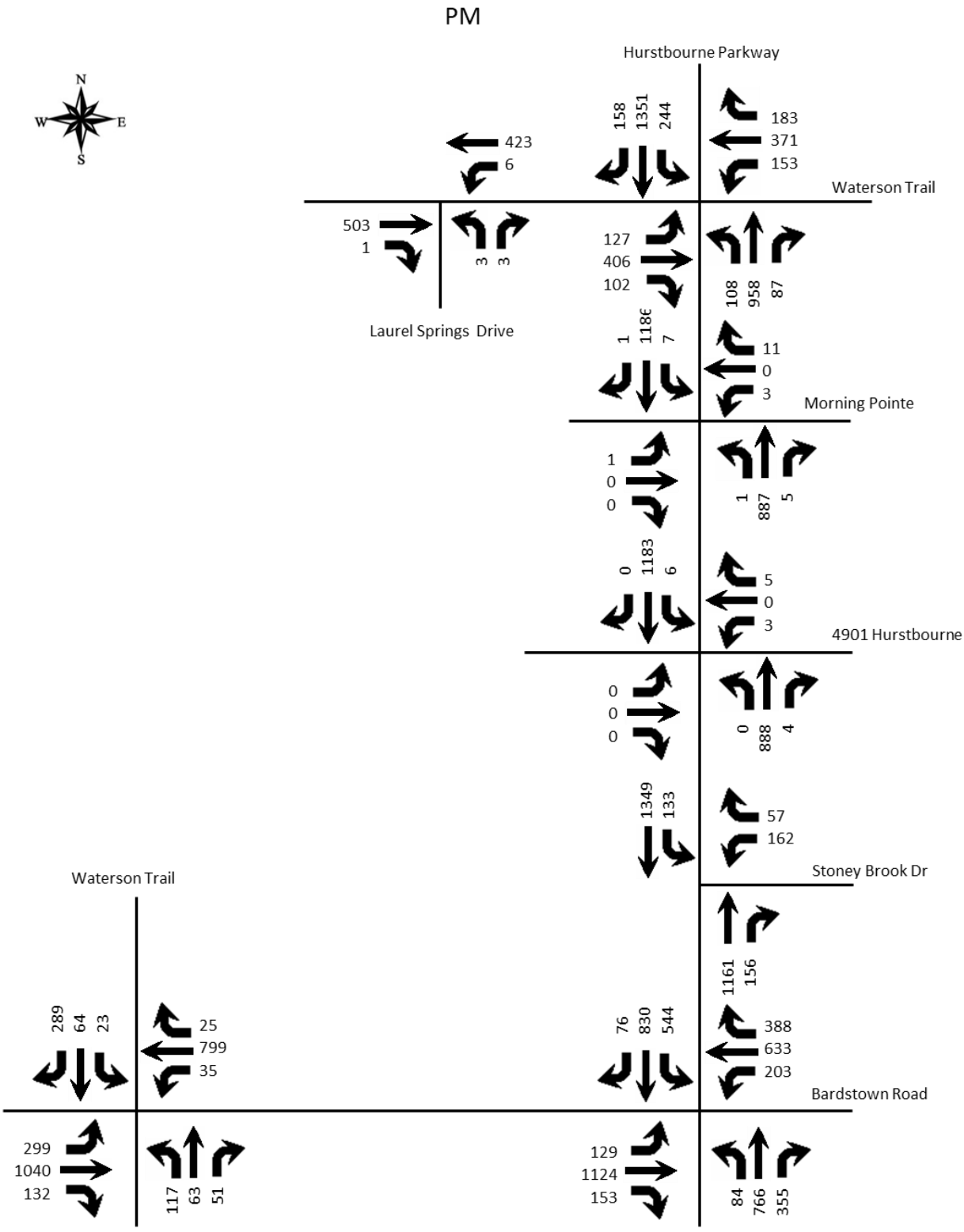


Figure 3. 2025 No Build Peak Hour Volumes

TRIP GENERATION

The Institute of Transportation Engineers Trip Generation Manual, 11th Edition contains trip generation rates for a wide range of developments. The land use of "Multi-family (Low-Rise) (220)" was 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.

Table 1. Peak Hour Trips Generated by Site

	A.M. Peak Hour			P.M. Peak Hour		
Land Use	**Trips**	**In**	**Out**	**Trips**	**In**	**Out**
Multi-family (Low-Rise) 600 units	209	50	159	279	176	103

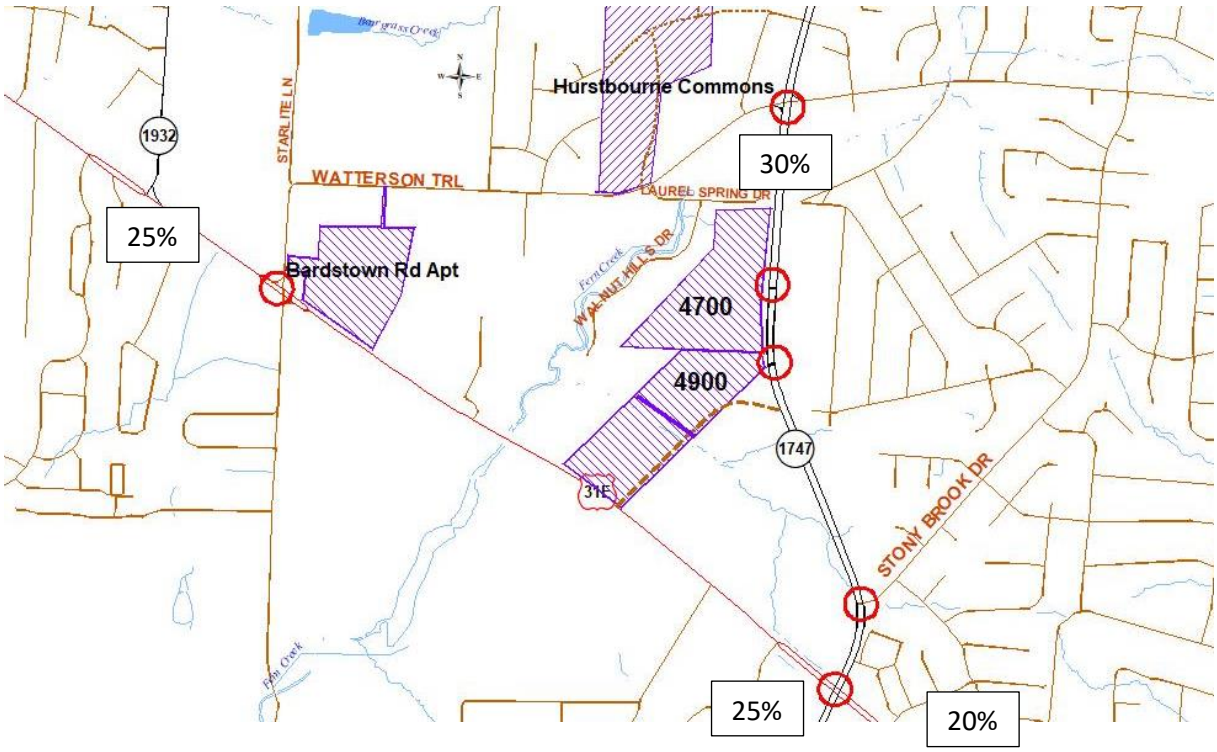
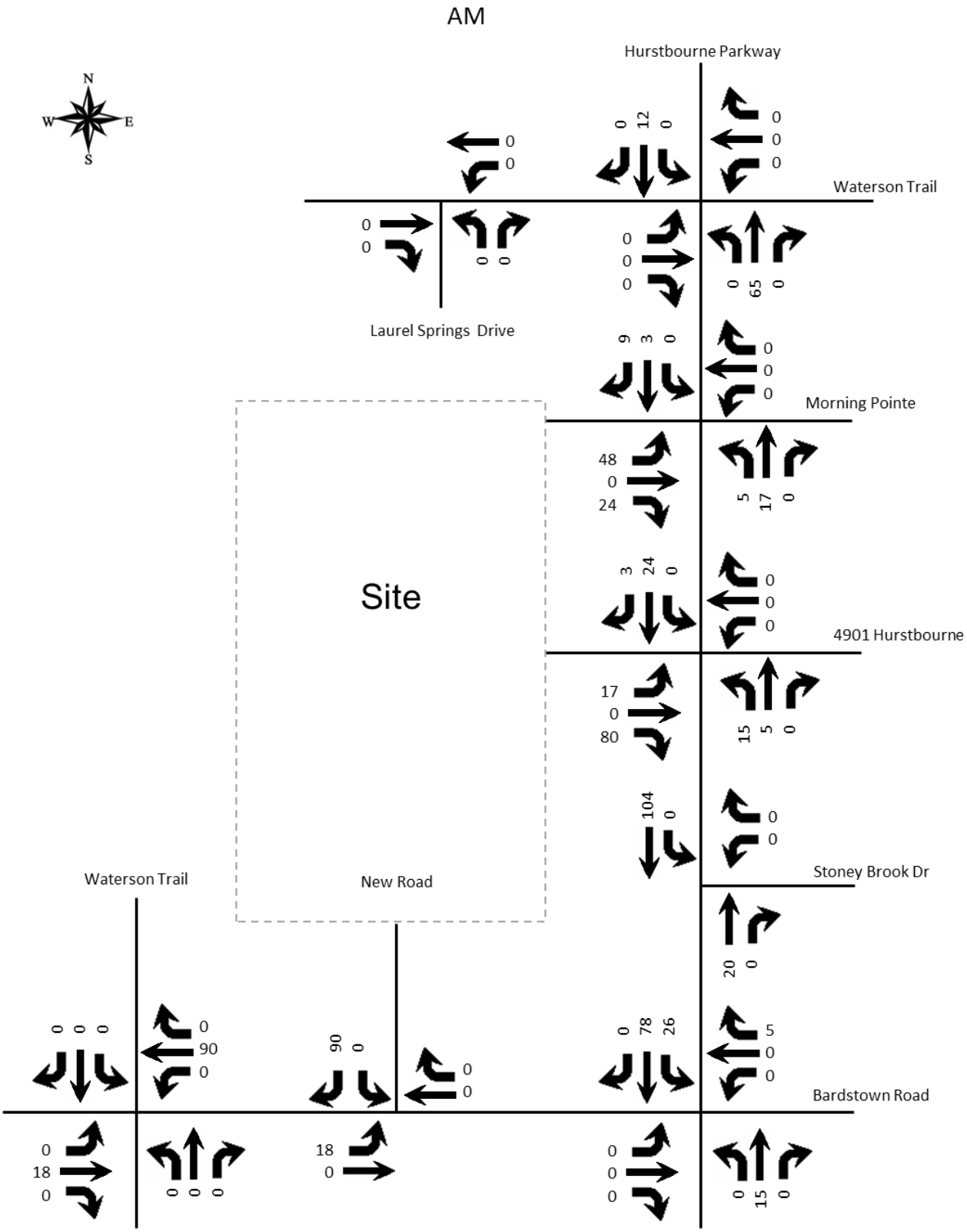


Figure 4. Trip Distribution Percentages


AM
Hurstbourne Parkway
Waterson Trail
Laurel Springs Drive
Morning Pointe
Site
4901 Hurstbourne
Stoney Brook Dr
Waterson Trail
New Road
Bardstown Road

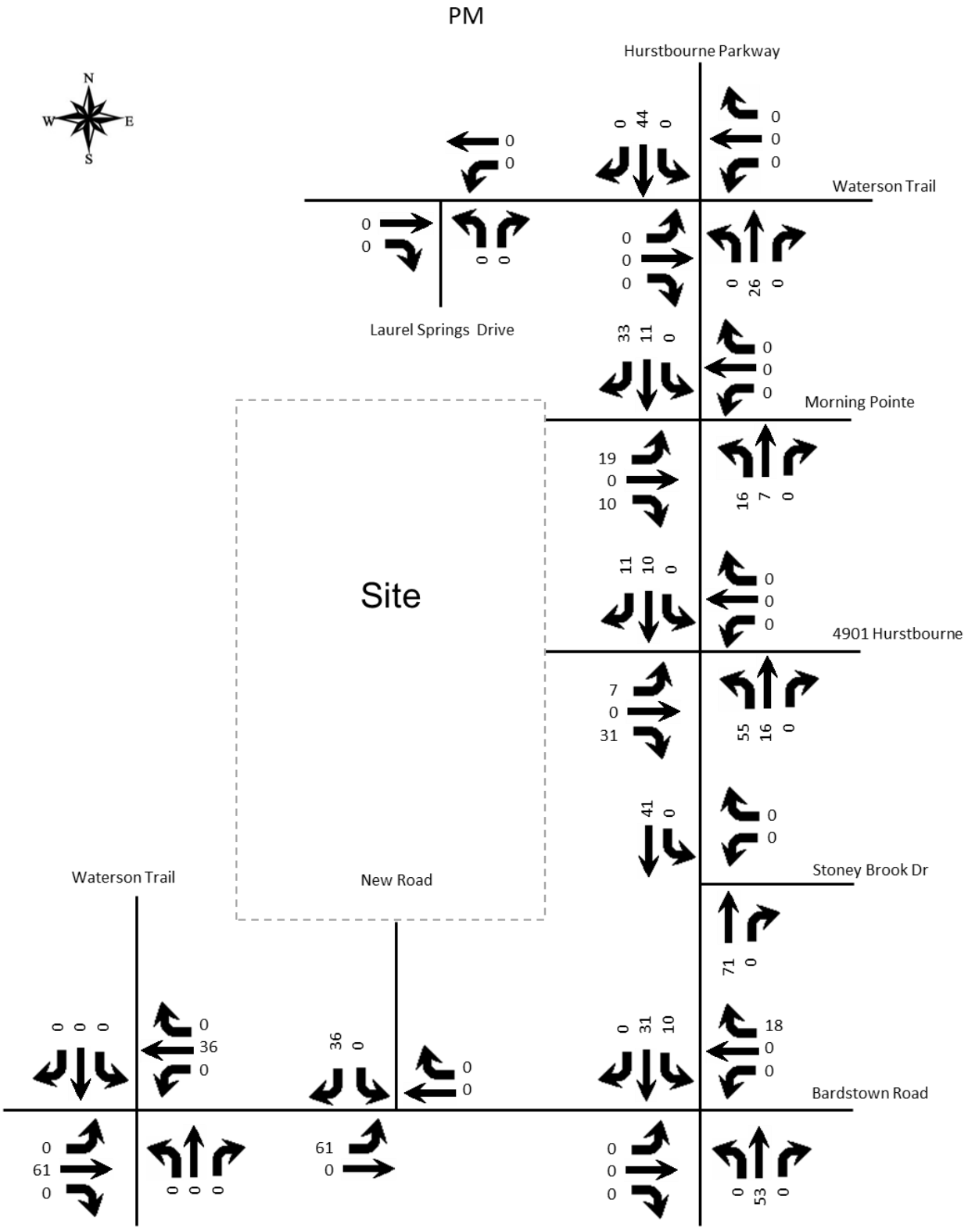
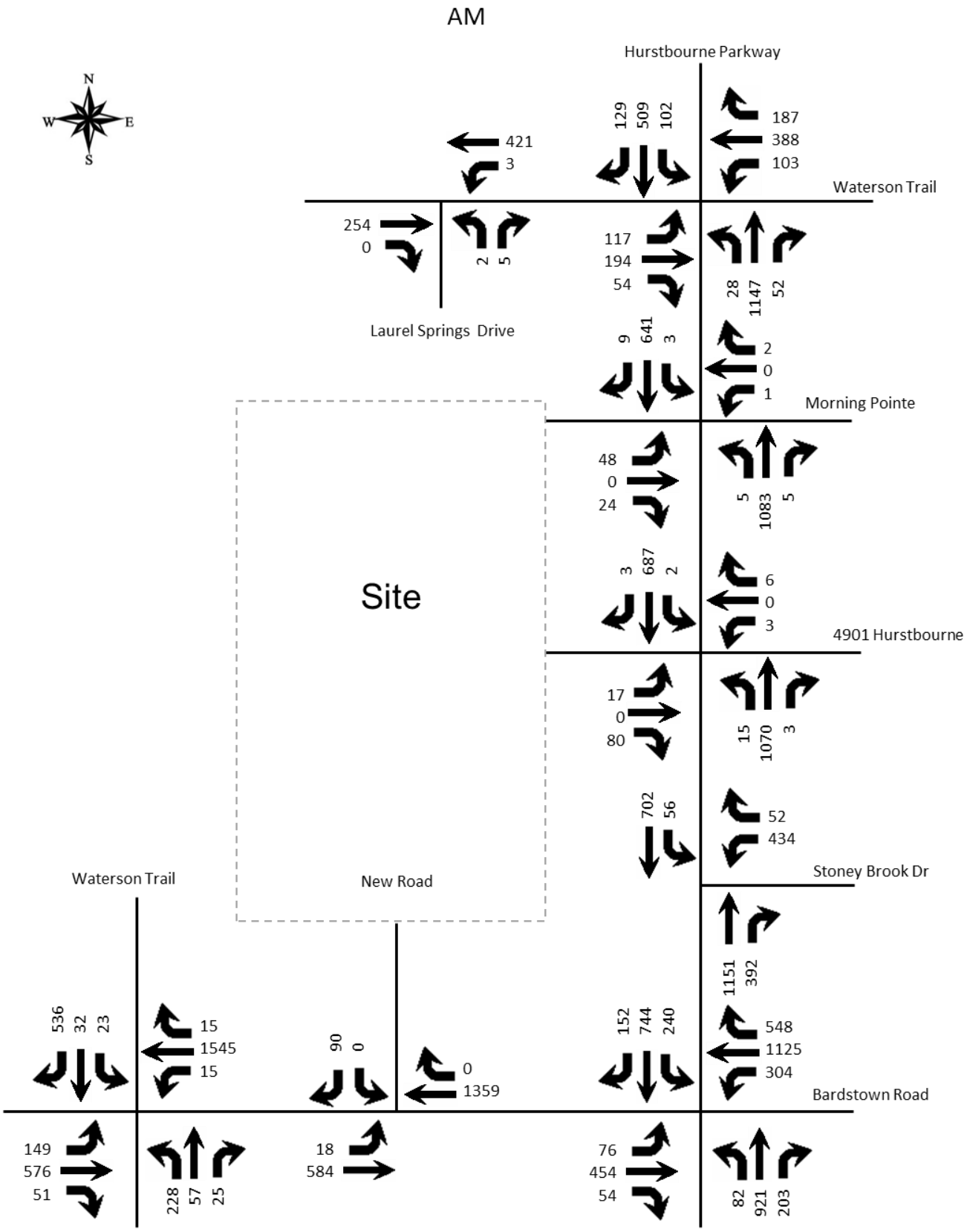


Figure 5. Peak Hour Trips Generated by Site


AM
Hurstbourne Parkway
Waterson Trail
Laurel Springs Drive
Morning Pointe
4901 Hurstbourne
Stoney Brook Dr
Bardstown Road
New Road
Site
N
W
E
S
421
3
129
509
102
187
388
103
254
0
2
5
117
194
54
28
1147
52
9
641
3
2
0
1
48
0
24
5
1083
5
3
687
2
6
0
3
17
0
80
15
1070
3
702
56
52
434
1151
392
536
32
23
15
1545
15
90
0
0
1359
152
744
240
548
1125
304
149
576
51
228
57
25
18
584
76
454
54
82
921
203
Waterson Trail

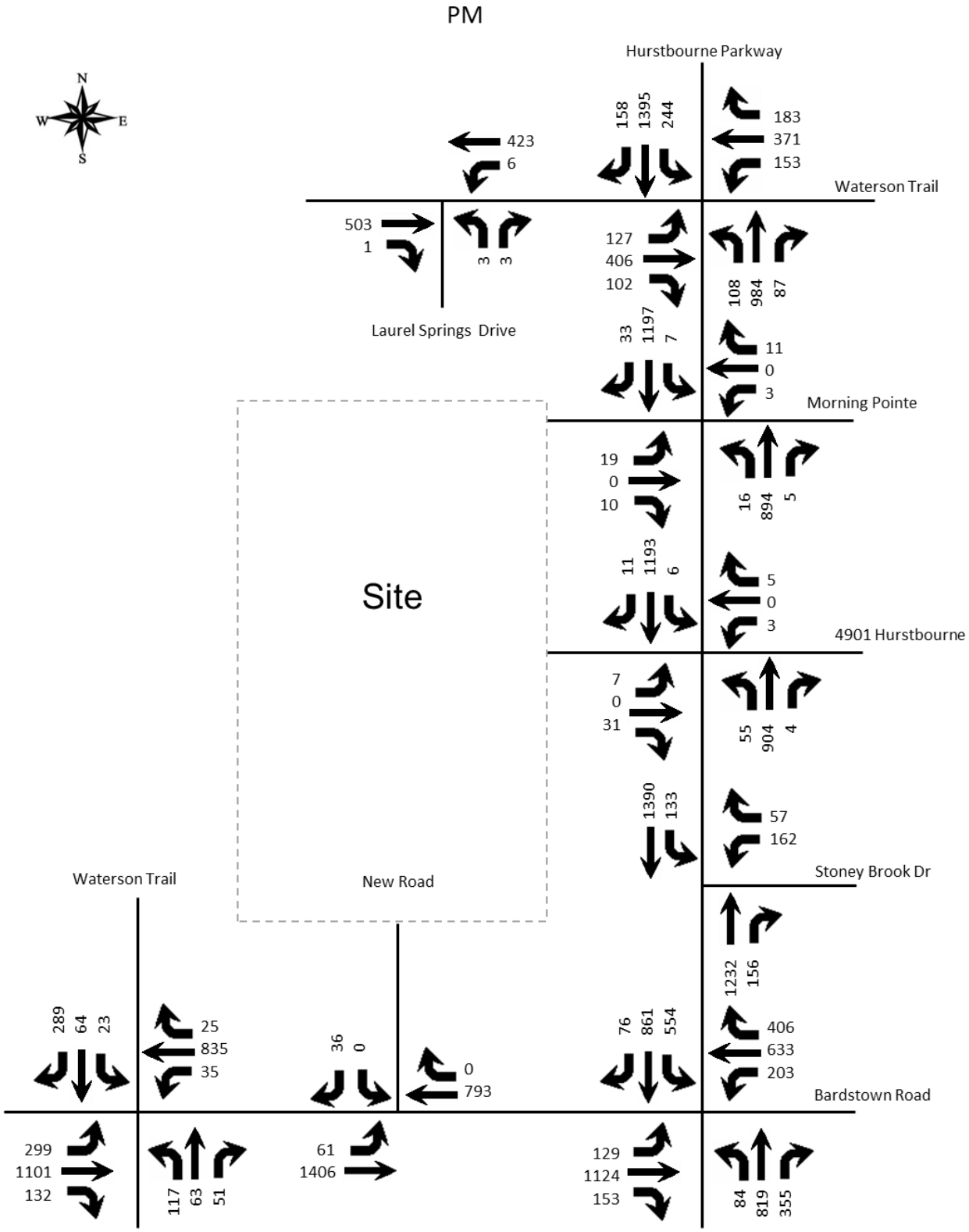


Figure 6. 2025 Build Peak Hour Volumes

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 Synchro (version 11) software. The initial Synchro models were provided by Louisville Metro Traffic Engineering. The delays and Level of Service are summarized in **Table 2**.

Table 2. Peak Hour Level of Service

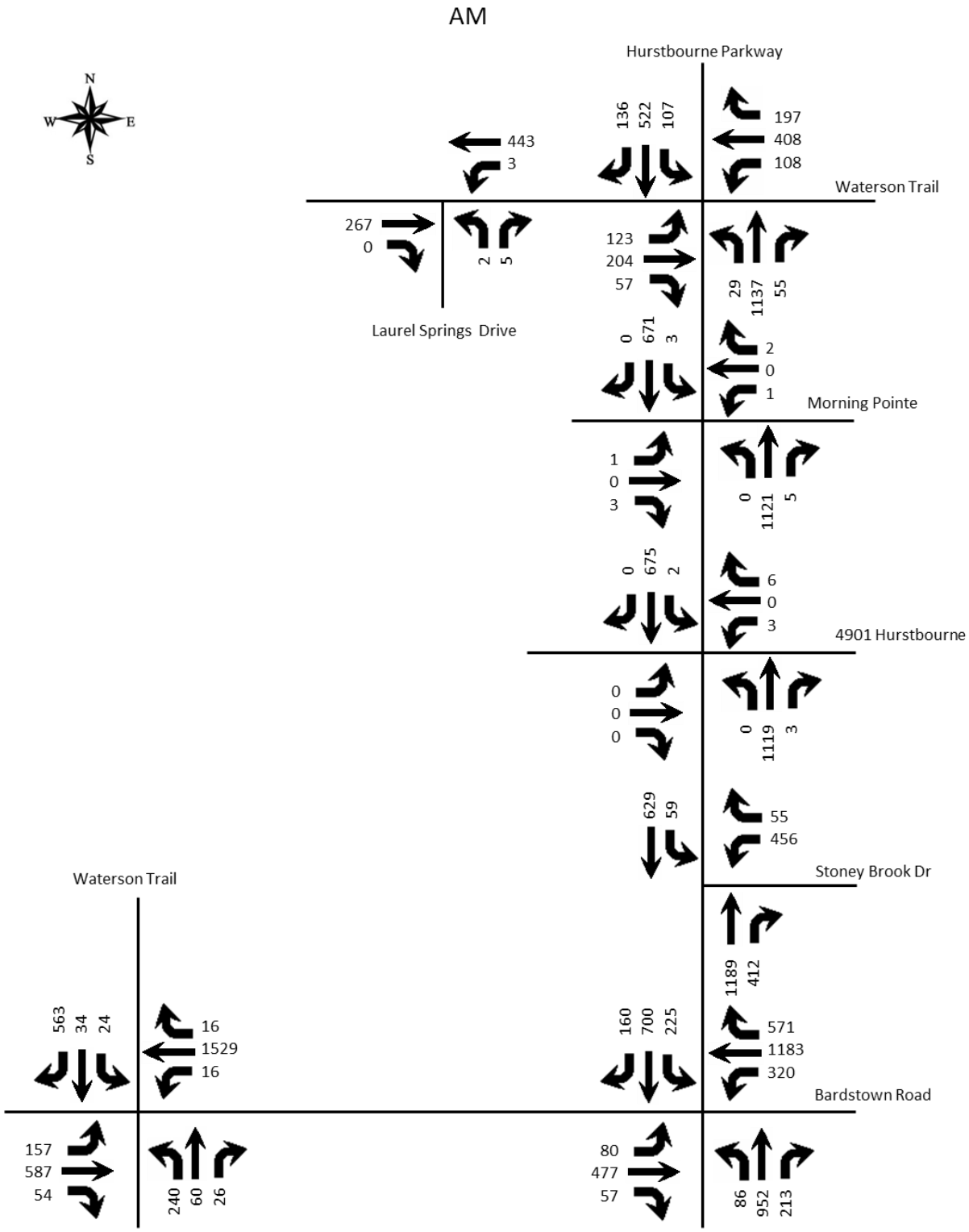
	A.M.			P.M.		
Approach	2022 Existing	2025 No Build	2025 Build	2022 Existing	2025 No Build	2025 Build
Hurstbourne Pkwy at Watterson Tr	**D 44.8**	**D 45.7**	**D 45.7**	**D 44.9**	**D 46.0**	**D 48.2**
Watterson Tr Eastbound	D 52.4	D 50.9	D 50.9	F 80.4	F 80.9	F 80.9
Watterson Tr Westbound	E 59.0	E 59.2	E 59.2	E 59.3	E 60.3	E 60.3
Hurstbourne Pkwy Northbound	E 57.8	E 60.9	E 60.9	E 62.8	E 62.8	E 68.2
Hurstbourne Pkwy Southbound	A 4.6	A 6.5	A 6.5	B 14.4	B 17.1	B 18.8
Hurstbourne Pkwy at Stoney Brook Dr	**C 33.6**	**C 34.7**	**C 33.9**	**B 17.0**	**B 18.0**	**B 18.1**
Stoney Brook Dr Westbound	F 102.8	F 108.3	F 108.3	E 76.9	E 75.9	E 75.9
Hurstbourne Pkwy Northbound	B 17.9	B 18.1	B 18.3	B 12.5	B 13.8	B 14.3
Hurstbourne Pkwy Southbound	B 17.7	B 18.4	B 18.0	B 12.5	B 13.3	B 13.2
Hurstbourne Pkwy at Bardstown Rd	**E 64.2**	**E 69.0**	**F 73.1**	**E 73.2**	**E 79.3**	**F 88.2**
Hurstbourne Pkwy Northbound	F 95.3	F 106.3	F 111.9	F 93.2	F 107.9	F 129.4
Hurstbourne Pkwy Southbound	D 53.6	E 58.8	E 71.0	E 70.0	E 72.4	F 86.3
Bardstown Rd Eastbound	D 46.5	D 47.0	D 47.4	E 79.6	F 87.0	F 87.0

	A.M.			P.M.		
Approach	2022 Existing	2025 No Build	2025 Build	2022 Existing	2025 No Build	2025 Build
Bardstown Rd Westbound	E 56.0	E 58.4	E 58.3	D 49.8	D 50.3	D 49.9
Bardstown Road at Watterson Trail	**D 45.3**	**D 48.6**	**D 48.6**	**D 38.7**	**D 40.8**	**D 42.4**
Watterson Trail Northbound	F 96.3	F 97.5	F 97.5	F 86.8	F 87.9	F 87.9
Watterson Trail Southbound	E 75.0	E 76.1	E 76.1	E 78.1	F 82.8	F 82.8
Bardstown Rd Eastbound	D 36.3	D 38.4	D 38.4	D 41.4	D 41.8	D 44.6
Bardstown Rd Westbound	D 39.4	D 43.4	D 43.4	C 21.3	C 25.1	C 25.6
Hurstbourne Pkwy at 4700 Entrance						
4700 Hurstbourne Eastbound			C 18.8			D 27.3
Morning Point Westbound			C 17.5			B 14.7
Hurstbourne Pkwy Northbound			A 9.0			B 11.6
Hurstbourne Pkwy Southbound			B 10.9			A 9.8
Hurstbourne Pkwy at 4900 Entrance						
4900 Hurstbourne Eastbound			B 13.1			C 18.2
Morning Point Westbound			C 18.1			C 19.4
Hurstbourne Pkwy Northbound			A 9.1			B 12.4
Hurstbourne Pkwy Southbound			B 10.8			B 10.1
Bardstown Road at Entrance						
Bardstown Road Eastbound (left)			B 13.1			A 10.0
Entrance Southbound			C 18.5			B 11.7

Key: Level of Service, Delay in seconds per vehicle

The entrances were evaluated for turn lanes using the Kentucky Transportation Cabinet Highway Design Guidance Manual dated July, 2020. The traffic impact policy requires using volumes for ten years beyond opening date, or 2035. The 2035 volumes were determined applying a 0.5 percent annual growth rate from 2025. Figure 7 illustrates

the 2035 No Build volumes. Figure 8 illustrates the 2035 Build Volumes. Using the volumes in Figure 8, no turn lanes will be required at the entrances. **Table 3** summarizes the delay and Level of Service for 2035.



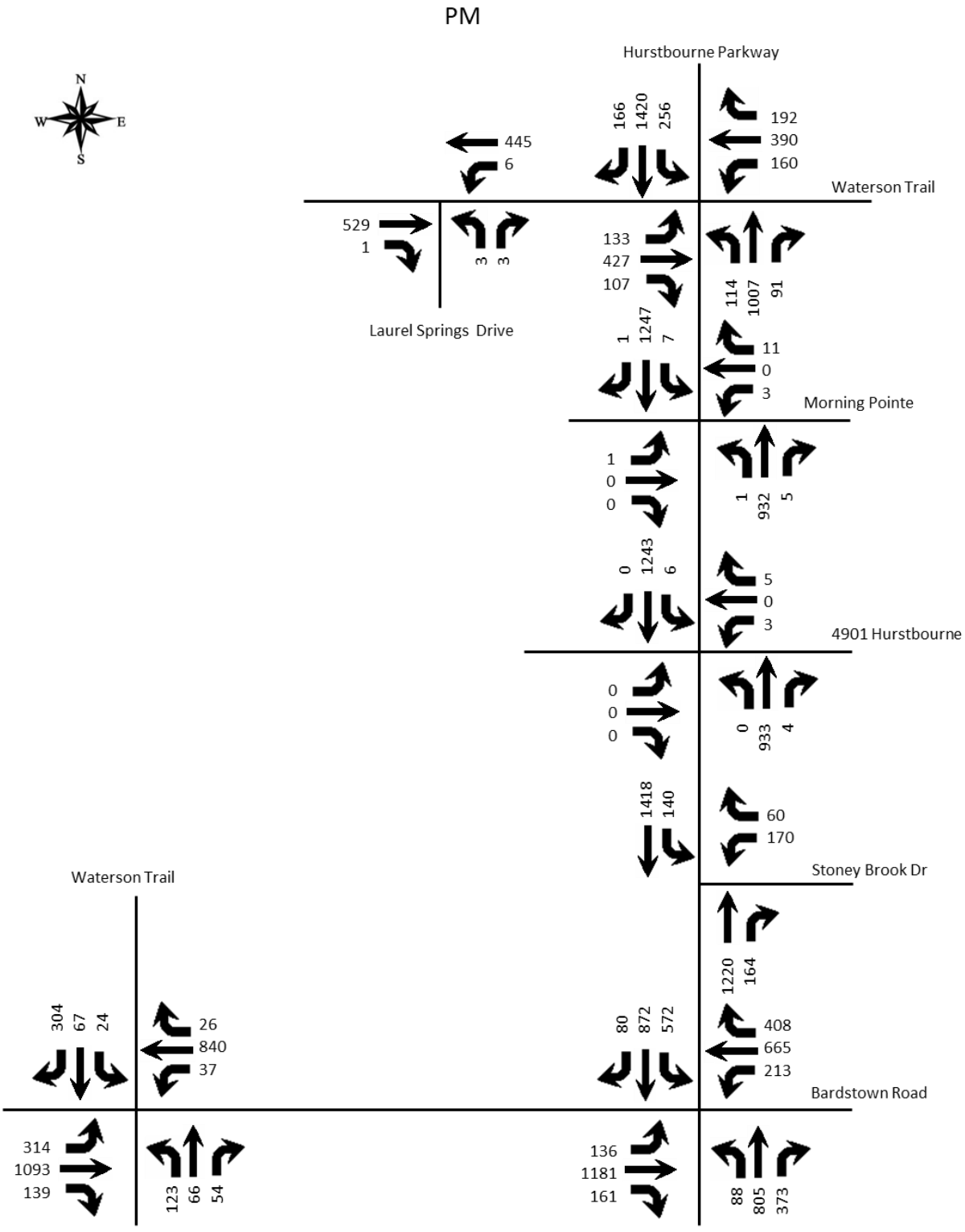
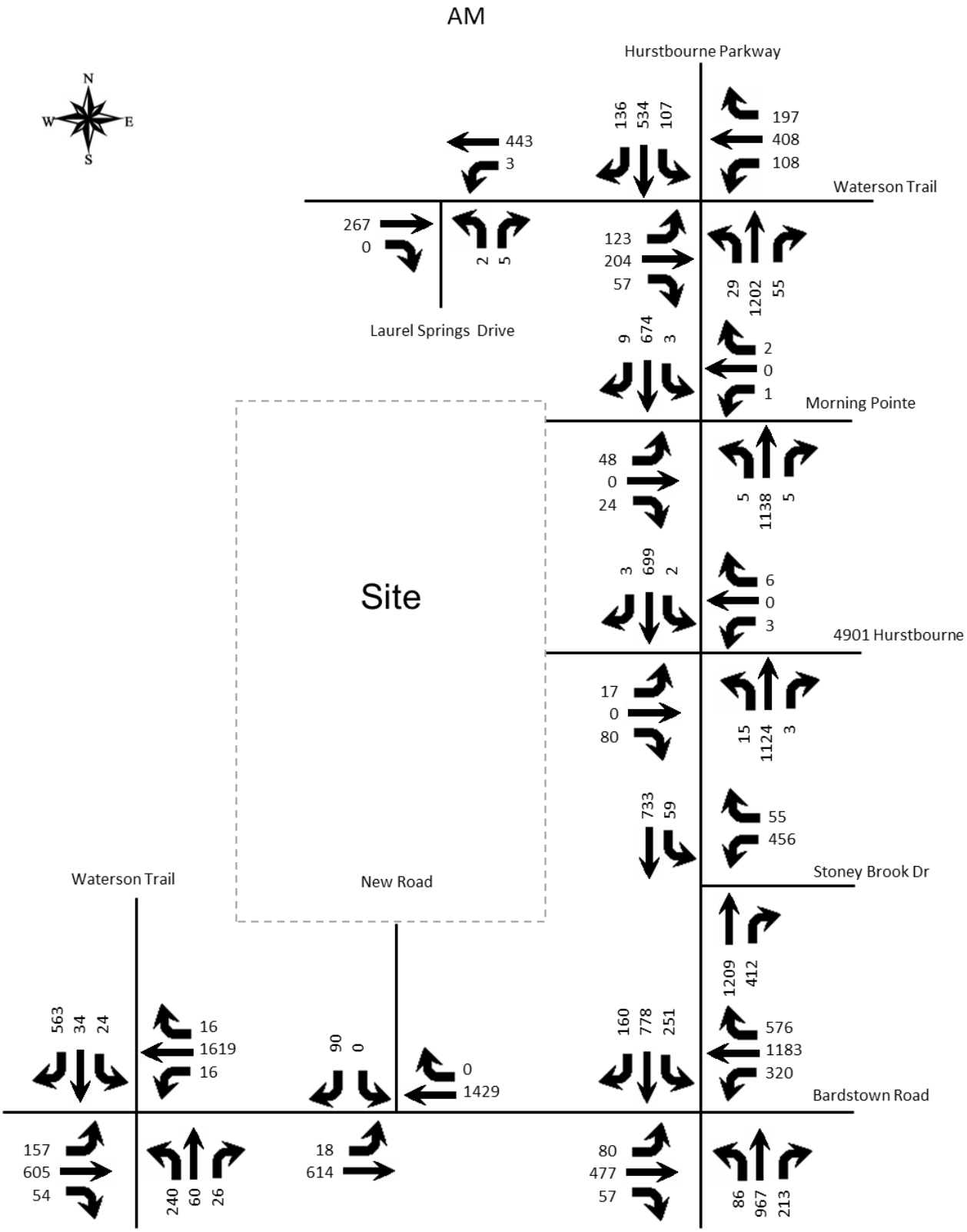


Figure 7. 2035 No Build Peak Hour Volumes


AM
Hurstbourne Parkway
Waterson Trail
Laurel Springs Drive
Morning Pointe
4901 Hurstbourne
Stoney Brook Dr
Bardstown Road
Site
New Road
Waterson Trail
N
W
E
S
443
3
136
534
107
197
408
108
267
0
2
5
123
204
57
29
1202
55
9
674
3
2
0
1
48
0
24
5
1138
5
3
699
2
6
0
3
17
0
80
15
1124
3
733
59
55
456
1209
412
563
34
24
16
1619
16
90
0
0
1429
160
778
251
576
1183
320
157
605
54
240
60
26
18
614
80
477
57
86
967
213

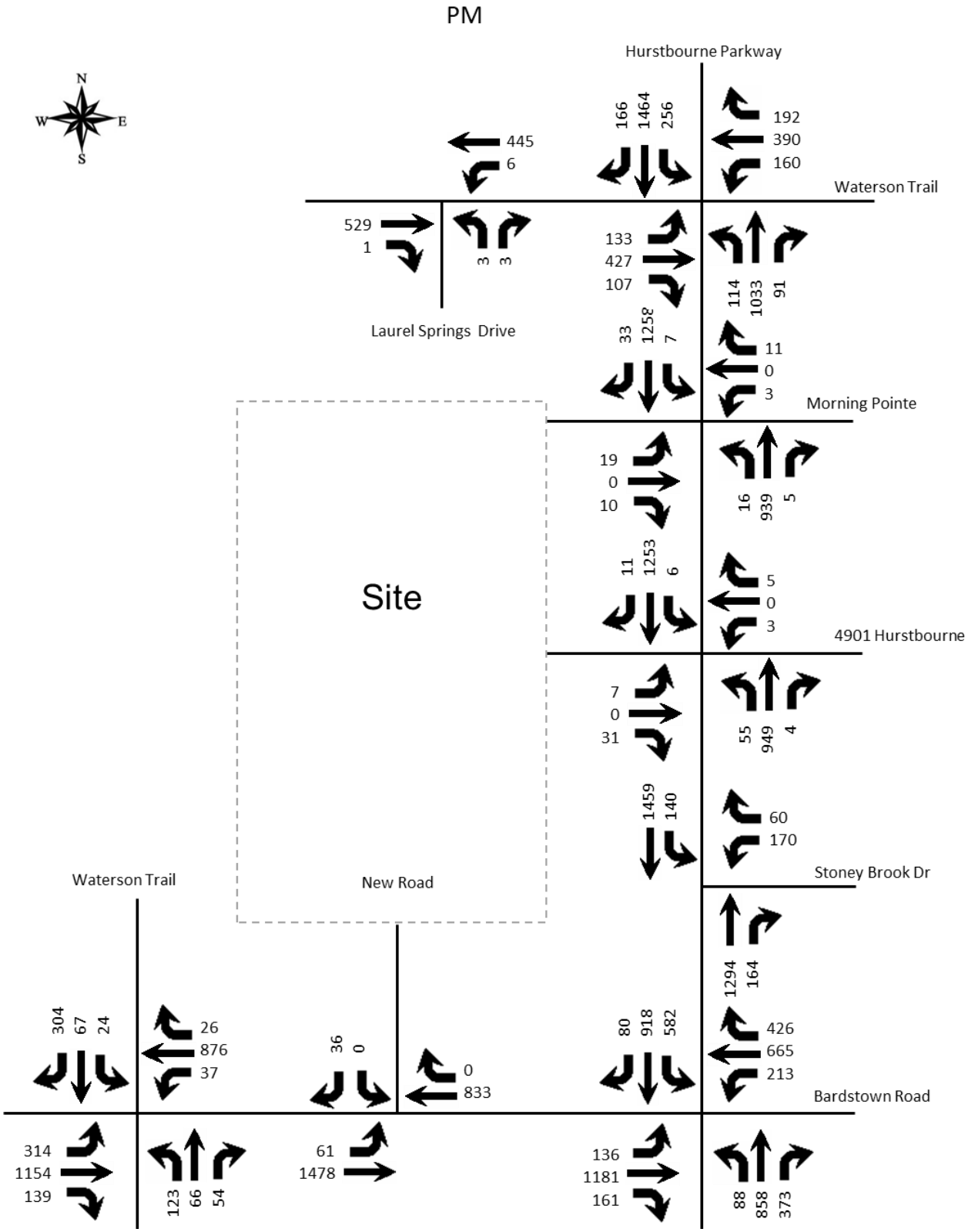


Figure 8. 2035 Build Peak Hour Volumes

Table 3. Peak Hour Level of Service (2035)

Approach	A.M.			P.M.		
	2022 Existing	2035 No Build	2035 Build	2022 Existing	2035 No Build	2035 Build
Hurstbourne Pkwy at Watterson Tr	**D 44.8**	**D 49.2**	**D 54.8**	**D 44.9**	**D 54.5**	**E 57.7**
Watterson Tr Eastbound	D 52.4	D 50.6	D 50.6	F 80.4	F 83.2	F 83.2
Watterson Tr Westbound	E 59.0	E 59.9	E 59.9	E 59.3	E 61.9	E 61.9
Hurstbourne Pkwy Northbound	E 57.8	E 68.4	F 81.7	E 62.8	E 70.9	E 73.8
Hurstbourne Pkwy Southbound	A 4.6	A 7.8	A 7.8	B 14.4	C 30.3	D 36.5
Hurstbourne Pkwy at Stoney Brook Dr	**C 33.6**	**D 37.8**	**D 37.0**	**B 17.0**	**B 18.8**	**B 18.9**
Stoney Brook Dr Westbound	F 102.8	F 123.8	F 123.8	E 76.9	E 75.7	E 75.7
Hurstbourne Pkwy Northbound	B 17.9	B 18.6	B 18.8	B 12.5	B 14.7	B 15.4
Hurstbourne Pkwy Southbound	B 17.7	B 18.7	B 18.3	B 12.5	B 13.9	B 13.9
Hurstbourne Pkwy at Bardstown Rd	**E 64.2**	**E 78.9**	**F 83.4**	**E 73.2**	**F 98.6**	**F 100.6**
Hurstbourne Pkwy Northbound	F 95.3	F 123.4	F 129.4	F 93.2	F 145.6	F 145.6
Hurstbourne Pkwy Southbound	D 53.6	E 65.5	E 79.5	E 70.0	F 91.7	F 100.3
Bardstown Rd Eastbound	D 46.5	D 47.7	D 48.3	E 79.6	F 109.4	F 109.4
Bardstown Rd Westbound	E 56.0	E 68.2	E 68.0	D 49.8	D 46.0	D 45.7
Bardstown Road at Watterson Trail	**D 45.3**	**E 56.2**	**E 66.4**	**D 38.7**	**D 43.1**	**D 45.2**
Watterson Trail Northbound	F 96.3	F 101.1	F 101.1	F 86.8	F 88.7	F 88.7
Watterson Trail Southbound	E 75.0	E 76.4	E 76.4	E 78.1	F 84.2	F 84.2
Bardstown Rd Eastbound	D 36.3	D 42.2	D 43.2	D 41.4	D 44.5	D 48.2
Bardstown Rd Westbound	D 39.4	D 53.9	E 71.2	C 21.3	C 27.0	C 27.6
Hurstbourne Pkwy at 4700 Entrance						
4700 Hurstbourne Eastbound			C 19.8			D 29.6

	A.M.			P.M.		
Approach	2022 Existing	2035 No Build	2035 Build	2022 Existing	2035 No Build	2035 Build
Morning Point Westbound			C 18.3			C 15.2
Hurstbourne Pkwy Northbound			A 9.1			B 12.0
Hurstbourne Pkwy Southbound			B 11.2			B 10.0
Hurstbourne Pkwy at 4900 Entrance						
4900 Hurstbourne Eastbound			B 10.7			C 18.2
Morning Point Westbound			C 18.2			C 19.4
Hurstbourne Pkwy Northbound			A 7.8			B 12.4
Hurstbourne Pkwy Southbound			B 11.1			B 10.1
Bardstown Road at Entrance						
Bardstown Road Eastbound (left)			B 13.7			B 10.2
Entrance Southbound			C 19.6			B 11.9

Key: Level of Service, Delay in seconds per vehicle

The intersection of Hurstbourne Parkway at Bardstown Road will experience Level of Service F in both peak hours. The connection to Bardstown Road will provide an improvement to the intersection. Due to right-of-way constraints and locations of utilities at the intersection, there are not cost-effective mitigation options for the intersection.

CONCLUSIONS

Based upon the volume of traffic generated by the development and the amount of traffic forecasted for the year 2025 and 2035, there will be an impact to the existing highway network. No additional improvements are recommended.

APPENDIX

Traffic Counts

Classified Turn Movement Count || All vehicles

Marr Traffic DATA COLLECTION
www.marrtraffic.com

19524 Jefferson County, KY

Site 1 of 2
KY-1747 S Hurstbourne Pkwy (South)
KY-1747 S Hurstbourne Pkwy (North)
Driveway (West)
Driveway (East)

Date
Wednesday, March 16, 2022

Lat/Long
38.178940°, -85.607194°

Weather
Mostly Cloudy
58°F

0700 - 0900 (Weekday 2h Session) (03-16-2022)
All vehicles

	Northbound					Southbound					Eastbound					Westbound					
	KY-1747 S Hurstbourne Pkwy (South)					KY-1747 S Hurstbourne Pkwy (North)					Driveway (West)					Driveway (East)					
	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Int
TIME	1.1	1.2	1.3	1.4	Total	1.5	1.6	1.7	1.8	Total	1.9	1.10	1.11	1.12	Total	1.13	1.14	1.15	1.16	Total	Total
0700 - 0715	0	186	1	0	187	0	114	0	0	114	0	0	0	0	0	3	0	0	0	3	304
0715 - 0730	0	228	2	0	230	0	165	0	0	165	0	0	2	0	2	0	0	2	0	2	399
0730 - 0745	0	267	1	0	268	1	160	0	1	162	1	0	1	0	2	1	0	0	0	1	433
0745 - 0800	0	267	1	0	268	1	139	0	0	140	0	0	0	0	0	0	0	0	0	0	408
Hourly Total	0	948	5	0	**953**	2	578	0	1	**581**	1	0	3	0	**4**	4	0	2	0	**6**	**1544**
0800 - 0815	0	267	1	0	268	0	123	0	0	123	0	0	0	0	0	0	0	0	0	0	391
0815 - 0830	0	200	1	0	201	2	123	0	0	125	0	0	0	0	0	0	0	1	0	1	327
0830 - 0845	0	264	3	0	267	4	131	0	0	135	0	0	0	0	0	1	0	0	0	1	403
0845 - 0900	0	236	1	0	237	3	150	0	0	153	0	0	0	0	0	0	0	0	0	0	390
Hourly Total	0	967	6	0	**973**	9	527	0	0	**536**	0	0	0	0	**0**	1	0	1	0	**2**	**1511**
Grand Total	0	1915	11	0	**1926**	11	1105	0	1	**1117**	1	0	3	0	**4**	5	0	3	0	**8**	**3055**
Approach %	0.00	99.43	0.57	0.00	-	0.98	98.93	0.00	0.09	-	25.00	0.00	75.00	0.00	-	62.50	0.00	37.50	0.00	-	
Intersection %	0.00	62.68	0.36	0.00	63.04	0.36	36.17	0.00	0.03	36.56	0.03	0.00	0.10	0.00	0.13	0.16	0.00	0.10	0.00	0.26	
PHF	0.00	0.96	0.63	0.00	**0.96**	0.50	0.89	0.00	0.25	**0.89**	0.25	0.00	0.38	0.00	**0.50**	0.25	0.00	0.25	0.00	**0.38**	**0.94**

1600 - 1800 (Weekday 2h Session) (03-16-2022)
All vehicles

	Northbound					Southbound					Eastbound					Westbound					
	KY-1747 S Hurstbourne Pkwy (South)					KY-1747 S Hurstbourne Pkwy (North)					Driveway (West)					Driveway (East)					
	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Left	Thru	Right	U-Turn	App	Int
TIME	1.1	1.2	1.3	1.4	Total	1.5	1.6	1.7	1.8	Total	1.9	1.10	1.11	1.12	Total	1.13	1.14	1.15	1.16	Total	Total
1600 - 1615	1	205	0	0	206	0	232	0	0	232	1	0	0	0	1	0	0	0	0	0	439
1615 - 1630	0	202	2	1	205	0	294	1	0	295	1	0	0	0	1	0	0	2	0	2	503
1630 - 1645	0	206	1	0	207	1	289	0	1	291	0	0	0	0	0	1	0	2	0	3	501
1645 - 1700	0	204	1	0	205	2	262	0	0	264	0	0	0	0	0	0	0	3	0	3	472
Hourly Total	1	817	4	1	**823**	3	1077	1	1	**1082**	2	0	0	0	**2**	1	0	7	0	**8**	**1915**
1700 - 1715	0	212	1	0	213	1	286	0	2	289	0	0	0	0	0	2	0	4	0	6	508
1715 - 1730	0	230	0	0	230	1	253	3	0	257	0	0	1	0	1	2	0	2	0	4	492
1730 - 1745	0	228	0	0	228	1	277	0	0	278	0	0	0	0	0	0	0	3	0	3	509
1745 - 1800	0	166	0	0	166	0	240	0	0	240	1	0	0	0	1	0	0	0	0	0	407
Hourly Total	0	836	1	0	**837**	3	1056	3	2	**1064**	1	0	1	0	**2**	4	0	9	0	**13**	**1916**
Grand Total	1	1653	5	1	**1660**	6	2133	4	3	**2146**	3	0	1	0	**4**	5	0	16	0	**21**	**3831**
Approach %	0.06	99.58	0.30	0.06	-	0.28	99.39	0.19	0.14	-	75.00	0.00	25.00	0.00	-	23.81	0.00	76.19	0.00	-	
Intersection %	0.03	43.15	0.13	0.03	43.33	0.16	55.68	0.10	0.08	56.02	0.08	0.00	0.03	0.00	0.10	0.13	0.00	0.42	0.00	0.55	
PHF	0.00	0.97	0.63	0.25	**0.97**	0.50	0.96	0.25	0.38	**0.97**	0.25	0.00	0.00	0.00	**0.25**	0.38	0.00	0.69	0.00	**0.58**	**0.98**

Classified Turn Movement Count || All vehicles

Marr Traffic DATA COLLECTION
www.marrtraffic.com

19524 Jefferson County, KY

Site 2 of 2
Laurel Spring Dr

Watterson Trail (West)
Watterson Trail (East)

Date
Wednesday, March 16, 2022

Lat/Long
38.181397°, -85.611134°

Weather
Mostly Cloudy
58°F

0700 - 0900 (Weekday 2h Session) (03-16-2022)
All vehicles

	Northbound				Eastbound				Westbound				
	Laurel Spring Dr				Watterson Trail (West)				Watterson Trail (East)				
TIME	Left 2.1	Right 2.2	U-Turn 2.3	App Total	Thru 2.4	Right 2.5	U-Turn 2.6	App Total	Left 2.7	Thru 2.8	U-Turn 2.9	App Total	Int Total
0700 - 0715	1	2	0	3	35	0	0	35	1	95	0	96	134
0715 - 0730	2	4	0	6	44	0	0	44	0	98	0	98	148
0730 - 0745	0	0	0	0	59	0	0	59	1	112	0	113	172
0745 - 0800	0	1	0	1	48	0	0	48	2	99	0	101	150
Hourly Total	3	7	0	**10**	186	0	0	**186**	4	404	0	**408**	**604**
0800 - 0815	0	0	0	0	45	0	0	45	0	94	0	94	139
0815 - 0830	0	0	0	0	45	0	0	45	2	61	0	63	108
0830 - 0845	0	0	0	0	62	0	0	62	0	87	0	87	149
0845 - 0900	0	0	0	0	58	1	0	59	0	94	0	94	153
Hourly Total	0	0	0	**0**	210	1	0	**211**	2	336	0	**338**	**549**
Grand Total	3	7	0	**10**	396	1	0	**397**	6	740	0	**746**	**1153**
Approach %	30.00	70.00	0.00	-	99.75	0.25	0.00	-	0.80	99.20	0.00	-	
Intersection %	0.26	0.61	0.00	0.87	34.35	0.09	0.00	34.43	0.52	64.18	0.00	64.70	
PHF	0.25	0.31	0.00	**0.29**	0.83	0.00	0.00	**0.83**	0.38	0.90	0.00	**0.90**	**0.89**

1600 - 1800 (Weekday 2h Session) (03-16-2022)
All vehicles

	Northbound				Eastbound				Westbound				
	Laurel Spring Dr				Watterson Trail (West)				Watterson Trail (East)				
TIME	Left 2.1	Right 2.2	U-Turn 2.3	App Total	Thru 2.4	Right 2.5	U-Turn 2.6	App Total	Left 2.7	Thru 2.8	U-Turn 2.9	App Total	Int Total
1600 - 1615	0	1	0	1	85	0	0	85	1	102	0	103	189
1615 - 1630	0	1	0	1	82	2	0	84	2	109	0	111	196
1630 - 1645	1	1	0	2	110	0	0	110	1	111	0	112	224
1645 - 1700	0	2	0	2	104	0	0	104	1	91	0	92	198
Hourly Total	1	5	0	**6**	381	2	0	**383**	5	413	0	**418**	**807**
1700 - 1715	0	0	0	0	106	0	0	106	1	90	0	91	197
1715 - 1730	2	0	0	2	124	1	0	125	3	99	0	102	229
1730 - 1745	0	1	0	1	87	0	0	87	1	106	0	107	195
1745 - 1800	0	0	0	0	87	0	0	87	0	97	0	97	184
Hourly Total	2	1	0	**3**	404	1	0	**405**	5	392	0	**397**	**805**
Grand Total	3	6	0	**9**	785	3	0	**788**	10	805	0	**815**	**1612**
Approach %	33.33	66.67	0.00	-	99.62	0.38	0.00	-	1.23	98.77	0.00	-	
Intersection %	0.19	0.37	0.00	0.56	48.70	0.19	0.00	48.88	0.62	49.94	0.00	50.56	
PHF	0.38	0.38	0.00	**0.75**	0.90	0.25	0.00	**0.89**	0.50	0.88	0.00	**0.89**	**0.93**

HCS Reports

HCM 6th Signalized Intersection Summary
2216: KY-1747 & US-31E

06/17/2022

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	80	875	200	200	625	150	75	425	50	300	1100	525
Future Volume (veh/h)	80	875	200	200	625	150	75	425	50	300	1100	525
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	87	951	217	217	679	163	82	462	54	326	1196	571
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	107	882	658	295	776	186	220	1127	503	297	1282	707
Arrive On Green	0.06	0.25	0.25	0.17	0.55	0.55	0.12	0.32	0.32	0.22	0.48	0.48
Sat Flow, veh/h	1781	3554	1585	3456	2843	682	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	87	951	217	217	424	418	82	462	54	326	1196	571
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1748	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	7.7	39.7	9.2	9.5	33.2	33.3	6.8	16.3	3.9	26.7	50.7	31.4
Cycle Q Clear(g_c), s	7.7	39.7	9.2	9.5	33.2	33.3	6.8	16.3	3.9	26.7	50.7	31.4
Prop In Lane	1.00		1.00	1.00		0.39	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	107	882	658	295	485	477	220	1127	503	297	1282	707
V/C Ratio(X)	0.81	1.08	0.33	0.74	0.87	0.88	0.37	0.41	0.11	1.10	0.93	0.81
Avail Cap(c_a), veh/h	175	882	658	425	485	477	220	1127	503	297	1282	707
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	0.77	0.77	0.77	1.00	1.00	1.00	0.46	0.46	0.46
Uniform Delay (d), s/veh	74.3	60.2	13.8	64.7	33.9	33.9	64.4	42.9	38.6	62.2	39.8	29.5
Incr Delay (d2), s/veh	18.2	53.8	1.3	4.1	15.6	15.9	1.3	1.1	0.4	64.7	7.3	4.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	24.1	3.4	4.0	12.7	12.5	3.1	7.3	1.6	16.7	21.2	9.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	92.5	113.9	15.1	68.7	49.5	49.8	65.7	44.0	39.0	127.0	47.1	34.1
LnGrp LOS	F	F	B	E	D	D	E	D	D	F	D	C
Approach Vol, veh/h		1255			1059			598			2093	
Approach Delay, s/veh		95.3			53.6			46.5			56.0	
Approach LOS		F			D			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.9	47.0	27.1	65.0	16.9	51.0	34.0	58.1
Change Period (Y+Rc), s	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3
Max Green Setting (Gmax), s	19.7	39.7	13.7	57.7	15.7	43.7	26.7	44.7
Max Q Clear Time (g_c+I1), s	11.5	0.0	8.8	52.7	9.7	0.0	28.7	18.3
Green Ext Time (p_c), s	0.7	0.0	0.1	4.3	0.1	0.0	0.0	4.4

Intersection Summary	
HCM 6th Ctrl Delay	64.2
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary
2217: S Watterson Trail & US-31E

06/17/2022

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	225	50	25	15	25	475	125	550	50	15	1425	15
Future Volume (veh/h)	225	50	25	15	25	475	125	550	50	15	1425	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	245	54	0	16	27	0	136	598	54	16	1549	16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	263	58		44	74		221	1393	621	596	1808	806
Arrive On Green	0.18	0.18	0.00	0.06	0.06	0.00	0.07	0.39	0.39	0.19	0.51	0.51
Sat Flow, veh/h	1472	324	1585	683	1153	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	299	0	0	43	0	0	136	598	54	16	1549	16
Grp Sat Flow(s),veh/h/ln	1797	0	1585	1836	0	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	26.2	0.0	0.0	3.6	0.0	0.0	5.5	19.7	3.4	0.0	60.7	0.8
Cycle Q Clear(g_c), s	26.2	0.0	0.0	3.6	0.0	0.0	5.5	19.7	3.4	0.0	60.7	0.8
Prop In Lane	0.82		1.00	0.37		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	321	0		117	0		221	1393	621	596	1808	806
V/C Ratio(X)	0.93	0.00		0.37	0.00		0.62	0.43	0.09	0.03	0.86	0.02
Avail Cap(c_a), veh/h	341	0		303	0		374	1393	621	596	1808	806
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	64.7	0.0	0.0	71.8	0.0	0.0	32.5	35.6	30.6	23.8	34.2	19.5
Incr Delay (d2), s/veh	31.6	0.0	0.0	3.3	0.0	0.0	4.7	1.0	0.3	0.0	5.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.8	0.0	0.0	1.8	0.0	0.0	2.9	8.6	1.4	0.3	26.5	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	96.3	0.0	0.0	75.0	0.0	0.0	37.2	36.5	30.9	23.8	39.7	19.6
LnGrp LOS	F	A		E	A		D	D	C	C	D	B
Approach Vol, veh/h		299			43			788			1581	
Approach Delay, s/veh		96.3			75.0			36.3			39.4	
Approach LOS		F			E			D			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	19.3	88.7		35.2	38.0	70.0		16.8				
Change Period (Y+Rc), s	7.3	7.3		6.6	7.3	7.3		6.6				
Max Green Setting (Gmax), s	25.7	49.7		30.4	12.7	62.7		26.4				
Max Q Clear Time (g_c+I1), s	7.5	0.0		28.2	2.0	0.0		5.6				
Green Ext Time (p_c), s	0.6	0.0		0.4	0.0	0.0		0.1				

Intersection Summary	
HCM 6th Ctrl Delay	45.3
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.
Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
3003: KY-1747 & S Stony Brook Dr

06/17/2022

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	425	50	1100	375	50	550
Future Volume (veh/h)	425	50	1100	375	50	550
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	462	54	1196	408	54	598
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	450	400	2024	1303	81	2348
Arrive On Green	0.25	0.25	0.57	0.57	0.05	0.66
Sat Flow, veh/h	1781	1585	3647	1585	1781	3647
Grp Volume(v), veh/h	462	54	1196	408	54	598
Grp Sat Flow(s),veh/h/ln	1781	1585	1777	1585	1781	1777
Q Serve(g_s), s	40.4	4.2	34.9	9.9	4.8	11.0
Cycle Q Clear(g_c), s	40.4	4.2	34.9	9.9	4.8	11.0
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	450	400	2024	1303	81	2348
V/C Ratio(X)	1.03	0.13	0.59	0.31	0.67	0.25
Avail Cap(c_a), veh/h	450	400	2024	1303	164	2348
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.32	0.32	1.00	1.00
Uniform Delay (d), s/veh	59.8	46.3	22.3	3.4	75.2	11.1
Incr Delay (d2), s/veh	49.6	0.3	0.4	0.2	12.6	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	24.3	4.2	14.1	8.6	2.4	4.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	109.4	46.6	22.8	3.6	87.8	11.3
LnGrp LOS	F	D	C	A	F	B
Approach Vol, veh/h	516		1604			652
Approach Delay, s/veh	102.8		17.9			17.7
Approach LOS	F		B			B
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	14.6	98.4		47.0		113.0
Change Period (Y+Rc), s	7.3	7.3		6.6		7.3
Max Green Setting (Gmax), s	14.7	83.7		40.4		105.7
Max Q Clear Time (g_c+I1), s	6.8	0.0		42.4		0.0
Green Ext Time (p_c), s	0.1	0.0		0.0		0.0
Intersection Summary						
HCM 6th Ctrl Delay			33.6			
HCM 6th LOS			C			

Pattern 10 (Weekday AM Peak) KY-1747 (Hurstbourne Pkwy) 7:56 am 03/19/2021 Weekday AM Peak
M. Brandon Shelley, PE

Synchro 11 Report
Page 3

HCM 6th Signalized Intersection Summary
3004: KY-1747 & Watterson Trail

06/17/2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	175	50	100	375	175	25	1050	50	75	450	125
Future Volume (veh/h)	80	175	50	100	375	175	25	1050	50	75	450	125
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	87	190	54	109	408	190	27	1141	54	82	489	136
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	153	426	361	310	445	377	54	1270	567	430	1862	830
Arrive On Green	0.05	0.23	0.23	0.06	0.24	0.24	0.03	0.36	0.36	0.40	1.00	1.00
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	87	190	54	109	408	190	27	1141	54	82	489	136
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	5.9	14.0	4.4	7.4	34.0	10.5	2.4	48.6	2.9	0.0	0.0	0.0
Cycle Q Clear(g_c), s	5.9	14.0	4.4	7.4	34.0	10.5	2.4	48.6	2.9	0.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	153	426	361	310	445	377	54	1270	567	430	1862	830
V/C Ratio(X)	0.57	0.45	0.15	0.35	0.92	0.50	0.50	0.90	0.10	0.19	0.26	0.16
Avail Cap(c_a), veh/h	230	514	436	368	514	436	127	1270	567	430	1862	830
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.98	0.98
Uniform Delay (d), s/veh	46.8	53.1	49.4	44.0	59.4	21.1	76.3	48.6	21.3	36.7	0.0	0.0
Incr Delay (d2), s/veh	3.3	1.0	0.3	0.7	20.4	1.5	9.6	10.2	0.3	0.3	0.3	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	6.7	1.8	3.4	18.6	4.1	1.2	22.8	1.5	2.0	0.1	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.1	54.2	49.7	44.7	79.8	22.6	85.9	58.9	21.7	37.0	0.3	0.4
LnGrp LOS	D	D	D	D	E	C	F	E	C	D	A	A
Approach Vol, veh/h		331			707			1222			707	
Approach Delay, s/veh		52.4			59.0			57.8			4.6	
Approach LOS		D			E			E			A	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	38.8	63.0	15.8	42.4	11.5	90.3	14.1	44.1
Change Period (Y+Rc), s	* 6.5	5.8	* 6.3	6.0	6.6	* 6.5	* 6.3	6.0
Max Green Setting (Gmax), s	* 20	57.2	* 15	44.0	11.4	* 65	* 15	44.0
Max Q Clear Time (g_c+I1), s	2.0	0.0	9.4	16.0	4.4	0.0	7.9	36.0
Green Ext Time (p_c), s	0.3	0.0	0.1	1.2	0.0	0.0	0.1	2.1

Intersection Summary	
HCM 6th Ctrl Delay	44.8
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
2216: KY-1747 & US-31E

06/17/2022

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	82	906	203	214	666	152	76	454	54	304	1125	543
Future Volume (veh/h)	82	906	203	214	666	152	76	454	54	304	1125	543
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	89	985	221	233	724	165	83	493	59	330	1223	590
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	109	882	658	299	785	179	218	1123	501	297	1282	709
Arrive On Green	0.06	0.25	0.25	0.17	0.55	0.55	0.12	0.32	0.32	0.22	0.48	0.48
Sat Flow, veh/h	1781	3554	1585	3456	2874	655	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	89	985	221	233	447	442	83	493	59	330	1223	590
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1752	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	7.9	39.7	9.4	10.3	36.8	36.9	6.9	17.6	4.2	26.7	52.8	34.0
Cycle Q Clear(g_c), s	7.9	39.7	9.4	10.3	36.8	36.9	6.9	17.6	4.2	26.7	52.8	34.0
Prop In Lane	1.00		1.00	1.00		0.37	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	109	882	658	299	485	479	218	1123	501	297	1282	709
V/C Ratio(X)	0.81	1.12	0.34	0.78	0.92	0.92	0.38	0.44	0.12	1.11	0.95	0.83
Avail Cap(c_a), veh/h	175	882	658	425	485	479	218	1123	501	297	1282	709
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	0.76	0.76	0.76	1.00	1.00	1.00	0.46	0.46	0.46
Uniform Delay (d), s/veh	74.2	60.2	13.8	64.7	34.7	34.8	64.6	43.5	38.9	62.2	40.4	29.9
Incr Delay (d2), s/veh	18.7	67.8	1.4	5.7	20.9	21.2	1.3	1.2	0.5	69.6	9.3	5.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	25.8	3.5	4.4	14.6	14.4	3.2	7.9	1.7	17.1	22.4	10.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	92.9	128.0	15.2	70.4	55.6	55.9	66.0	44.7	39.4	131.8	49.7	35.3
LnGrp LOS	F	F	B	E	E	E	E	D	D	F	D	D
Approach Vol, veh/h		1295			1122			635			2143	
Approach Delay, s/veh		106.3			58.8			47.0			58.4	
Approach LOS		F			E			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.1	47.0	26.9	65.0	17.1	51.0	34.0	57.9
Change Period (Y+Rc), s	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3
Max Green Setting (Gmax), s	19.7	39.7	13.7	57.7	15.7	43.7	26.7	44.7
Max Q Clear Time (g_c+I1), s	12.3	0.0	8.9	54.8	9.9	0.0	28.7	19.6
Green Ext Time (p_c), s	0.7	0.0	0.1	2.6	0.1	0.0	0.0	4.6

Intersection Summary	
HCM 6th Ctrl Delay	69.0
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary
2217: S Watterson Trail & US-31E

06/17/2022

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	228	57	25	23	32	536	149	558	51	15	1455	15
Future Volume (veh/h)	228	57	25	23	32	536	149	558	51	15	1455	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	248	62	0	25	35	0	162	607	55	16	1582	16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	265	66		53	75		209	1393	621	573	1768	789
Arrive On Green	0.18	0.18	0.00	0.07	0.07	0.00	0.07	0.39	0.39	0.18	0.50	0.50
Sat Flow, veh/h	1439	360	1585	763	1069	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	310	0	0	60	0	0	162	607	55	16	1582	16
Grp Sat Flow(s),veh/h/ln	1798	0	1585	1832	0	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	27.2	0.0	0.0	5.0	0.0	0.0	7.4	20.0	3.5	0.0	64.5	0.8
Cycle Q Clear(g_c), s	27.2	0.0	0.0	5.0	0.0	0.0	7.4	20.0	3.5	0.0	64.5	0.8
Prop In Lane	0.80		1.00	0.42		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	331	0		128	0		209	1393	621	573	1768	789
V/C Ratio(X)	0.94	0.00		0.47	0.00		0.78	0.44	0.09	0.03	0.89	0.02
Avail Cap(c_a), veh/h	342	0		302	0		361	1393	621	573	1768	789
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	64.4	0.0	0.0	71.6	0.0	0.0	37.1	35.7	30.6	25.0	36.4	20.4
Incr Delay (d2), s/veh	33.1	0.0	0.0	4.5	0.0	0.0	10.1	1.0	0.3	0.0	7.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.5	0.0	0.0	2.5	0.0	0.0	3.6	8.8	1.4	0.3	28.6	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	97.5	0.0	0.0	76.1	0.0	0.0	47.2	36.7	30.9	25.0	43.9	20.4
LnGrp LOS	F	A		E	A		D	D	C	C	D	C
Approach Vol, veh/h		310			60			824			1614	
Approach Delay, s/veh		97.5			76.1			38.4			43.4	
Approach LOS		F			E			D			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	19.3	86.9		36.0	36.2	70.0		17.8				
Change Period (Y+Rc), s	7.3	7.3		6.6	7.3	7.3		6.6				
Max Green Setting (Gmax), s	25.7	49.7		30.4	12.7	62.7		26.4				
Max Q Clear Time (g_c+I1), s	9.4	0.0		29.2	2.0	0.0		7.0				
Green Ext Time (p_c), s	0.7	0.0		0.2	0.0	0.0		0.2				

Intersection Summary	
HCM 6th Ctrl Delay	48.6
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.
Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
3003: KY-1747 & S Stony Brook Dr

06/17/2022

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	434	52	1131	392	56	598
Future Volume (veh/h)	434	52	1131	392	56	598
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	472	57	1229	426	61	650
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	450	400	2020	1301	83	2348
Arrive On Green	0.25	0.25	0.57	0.57	0.05	0.66
Sat Flow, veh/h	1781	1585	3647	1585	1781	3647
Grp Volume(v), veh/h	472	57	1229	426	61	650
Grp Sat Flow(s),veh/h/ln	1781	1585	1777	1585	1781	1777
Q Serve(g_s), s	40.4	4.5	36.5	10.5	5.4	12.2
Cycle Q Clear(g_c), s	40.4	4.5	36.5	10.5	5.4	12.2
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	450	400	2020	1301	83	2348
V/C Ratio(X)	1.05	0.14	0.61	0.33	0.73	0.28
Avail Cap(c_a), veh/h	450	400	2020	1301	164	2348
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.26	0.26	1.00	1.00
Uniform Delay (d), s/veh	59.8	46.4	22.8	3.5	75.3	11.3
Incr Delay (d2), s/veh	56.0	0.3	0.4	0.2	16.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	25.1	4.5	14.8	9.2	2.8	4.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	115.8	46.7	23.1	3.7	91.5	11.6
LnGrp LOS	F	D	C	A	F	B
Approach Vol, veh/h	529		1655			711
Approach Delay, s/veh	108.3		18.1			18.4
Approach LOS	F		B			B
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	14.8	98.2		47.0		113.0
Change Period (Y+Rc), s	7.3	7.3		6.6		7.3
Max Green Setting (Gmax), s	14.7	83.7		40.4		105.7
Max Q Clear Time (g_c+I1), s	7.4	0.0		42.4		0.0
Green Ext Time (p_c), s	0.1	0.0		0.0		0.0
Intersection Summary						
HCM 6th Ctrl Delay			34.7			
HCM 6th LOS			C			

Pattern 10 (Weekday AM Peak) 1 2025 No Build 4:47 pm 06/17/2022 4700 Hurstbourne Pkwy
DBZ

Synchro 11 Report
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HCM 6th Signalized Intersection Summary
3004: KY-1747 & Watterson Trail

06/17/2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	117	194	54	103	388	187	28	1082	52	102	497	129
Future Volume (veh/h)	117	194	54	103	388	187	28	1082	52	102	497	129
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	127	211	59	112	422	203	30	1176	57	111	540	140
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	182	471	399	324	458	388	57	1270	567	380	1771	790
Arrive On Green	0.07	0.25	0.25	0.06	0.24	0.24	0.03	0.36	0.36	0.36	1.00	1.00
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	127	211	59	112	422	203	30	1176	57	111	540	140
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	8.5	15.2	4.6	7.4	35.2	11.7	2.7	50.8	3.0	0.9	0.1	0.1
Cycle Q Clear(g_c), s	8.5	15.2	4.6	7.4	35.2	11.7	2.7	50.8	3.0	0.9	0.1	0.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	182	471	399	324	458	388	57	1270	567	380	1771	790
V/C Ratio(X)	0.70	0.45	0.15	0.35	0.92	0.52	0.52	0.93	0.10	0.29	0.30	0.18
Avail Cap(c_a), veh/h	229	514	436	382	514	436	127	1270	567	380	1771	790
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.98	0.98
Uniform Delay (d), s/veh	45.4	50.5	46.5	41.4	58.9	22.8	76.2	49.4	21.4	41.9	0.1	0.1
Incr Delay (d2), s/veh	6.6	1.0	0.2	0.6	21.5	1.6	10.1	12.8	0.4	0.6	0.4	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	7.3	1.9	3.3	19.3	4.6	1.4	24.2	1.5	2.9	0.1	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.0	51.4	46.8	42.0	80.5	24.4	86.3	62.1	21.8	42.5	0.6	0.6
LnGrp LOS	D	D	D	D	F	C	F	E	C	D	A	A
Approach Vol, veh/h		397			737			1263			791	
Approach Delay, s/veh		50.9			59.2			60.9			6.5	
Approach LOS		D			E			E			A	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	35.0	63.0	15.7	46.3	11.8	86.2	16.8	45.2
Change Period (Y+Rc), s	* 6.5	5.8	* 6.3	6.0	6.6	* 6.5	* 6.3	6.0
Max Green Setting (Gmax), s	* 20	57.2	* 15	44.0	11.4	* 65	* 15	44.0
Max Q Clear Time (g_c+I1), s	2.9	0.0	9.4	17.2	4.7	0.0	10.5	37.2
Green Ext Time (p_c), s	0.4	0.0	0.1	1.4	0.0	0.0	0.1	2.0

Intersection Summary	
HCM 6th Ctrl Delay	45.7
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Pattern 10 (Weekday AM Peak) 25 Build
2216: KY-1747 & US-31E

08/08/2022

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	82	921	203	240	744	152	76	454	54	304	1125	548
Future Volume (veh/h)	82	921	203	240	744	152	76	454	54	304	1125	548
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	89	1001	221	261	809	165	83	493	59	330	1223	596
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	109	882	658	310	812	166	212	1112	496	297	1282	714
Arrive On Green	0.06	0.25	0.25	0.18	0.55	0.55	0.12	0.31	0.31	0.22	0.48	0.48
Sat Flow, veh/h	1781	3554	1585	3456	2940	600	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	89	1001	221	261	489	485	83	493	59	330	1223	596
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1762	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	7.9	39.7	9.3	11.7	43.8	43.8	6.9	17.7	4.3	26.7	52.8	33.9
Cycle Q Clear(g_c), s	7.9	39.7	9.3	11.7	43.8	43.8	6.9	17.7	4.3	26.7	52.8	33.9
Prop In Lane	1.00		1.00	1.00		0.34	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	109	882	658	310	491	487	212	1112	496	297	1282	714
V/C Ratio(X)	0.81	1.14	0.34	0.84	1.00	1.00	0.39	0.44	0.12	1.11	0.95	0.83
Avail Cap(c_a), veh/h	175	882	658	425	491	487	212	1112	496	297	1282	714
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	0.76	0.76	0.76	1.00	1.00	1.00	0.46	0.46	0.46
Uniform Delay (d), s/veh	74.2	60.2	13.6	64.5	35.7	35.7	65.1	43.9	39.2	62.2	40.4	29.7
Incr Delay (d2), s/veh	18.7	74.8	1.4	9.6	34.4	34.5	1.4	1.3	0.5	69.6	9.3	5.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	26.7	3.4	5.1	18.6	18.4	3.2	7.9	1.7	17.1	22.4	10.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	92.9	134.9	15.0	74.2	70.1	70.2	66.5	45.2	39.7	131.8	49.7	35.1
LnGrp LOS	F	F	B	E	E	E	E	D	D	F	D	D
Approach Vol, veh/h		1311			1235			635			2149	
Approach Delay, s/veh		111.9			71.0			47.4			58.3	
Approach LOS		F			E			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.7	47.0	26.3	65.0	17.1	51.5	34.0	57.3
Change Period (Y+Rc), s	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3
Max Green Setting (Gmax), s	19.7	39.7	13.7	57.7	15.7	43.7	26.7	44.7
Max Q Clear Time (g_c+I1), s	13.7	0.0	8.9	54.8	9.9	0.0	28.7	19.7
Green Ext Time (p_c), s	0.7	0.0	0.1	2.6	0.1	0.0	0.0	4.6

Intersection Summary	
HCM 6th Ctrl Delay	73.1
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary
2217: S Watterson Trail & US-31E

06/17/2022

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	228	57	25	23	32	536	149	576	51	15	1545	15
Future Volume (veh/h)	228	57	25	23	32	536	149	576	51	15	1545	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	248	62	0	25	35	0	162	626	55	16	1679	16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	265	66		53	75		192	1393	621	566	1768	789
Arrive On Green	0.18	0.18	0.00	0.07	0.07	0.00	0.07	0.39	0.39	0.18	0.50	0.50
Sat Flow, veh/h	1439	360	1585	763	1069	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	310	0	0	60	0	0	162	626	55	16	1679	16
Grp Sat Flow(s),veh/h/ln	1798	0	1585	1832	0	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	27.2	0.0	0.0	5.0	0.0	0.0	9.0	20.8	3.5	0.0	72.0	0.8
Cycle Q Clear(g_c), s	27.2	0.0	0.0	5.0	0.0	0.0	9.0	20.8	3.5	0.0	72.0	0.8
Prop In Lane	0.80		1.00	0.42		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	331	0		128	0		192	1393	621	566	1768	789
V/C Ratio(X)	0.94	0.00		0.47	0.00		0.84	0.45	0.09	0.03	0.95	0.02
Avail Cap(c_a), veh/h	342	0		302	0		345	1393	621	566	1768	789
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	64.4	0.0	0.0	71.6	0.0	0.0	45.8	35.9	30.6	25.4	38.3	20.4
Incr Delay (d2), s/veh	33.1	0.0	0.0	4.5	0.0	0.0	15.3	1.1	0.3	0.0	12.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.5	0.0	0.0	2.5	0.0	0.0	7.2	9.1	1.4	0.4	32.9	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	97.5	0.0	0.0	76.1	0.0	0.0	61.1	37.0	30.9	25.4	50.7	20.4
LnGrp LOS	F	A		E	A		E	D	C	C	D	C
Approach Vol, veh/h		310			60			843			1711	
Approach Delay, s/veh		97.5			76.1			41.2			50.1	
Approach LOS		F			E			D			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	19.3	86.9		36.0	36.2	70.0		17.8				
Change Period (Y+Rc), s	7.3	7.3		6.6	7.3	7.3		6.6				
Max Green Setting (Gmax), s	25.7	49.7		30.4	12.7	62.7		26.4				
Max Q Clear Time (g_c+I1), s	11.0	0.0		29.2	2.0	0.0		7.0				
Green Ext Time (p_c), s	0.7	0.0		0.2	0.0	0.0		0.2				

Intersection Summary	
HCM 6th Ctrl Delay	53.1
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.
Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Pattern 10 (Weekday AM Peak) 25 Build
3003: KY-1747 & S Stony Brook Dr 08/08/2022

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	434	52	1151	392	56	702
Future Volume (veh/h)	434	52	1151	392	56	702
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	472	57	1251	426	61	763
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	450	400	2020	1301	83	2348
Arrive On Green	0.25	0.25	0.57	0.57	0.05	0.66
Sat Flow, veh/h	1781	1585	3647	1585	1781	3647
Grp Volume(v), veh/h	472	57	1251	426	61	763
Grp Sat Flow(s),veh/h/ln	1781	1585	1777	1585	1781	1777
Q Serve(g_s), s	40.4	4.5	37.5	10.5	5.4	14.8
Cycle Q Clear(g_c), s	40.4	4.5	37.5	10.5	5.4	14.8
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	450	400	2020	1301	83	2348
V/C Ratio(X)	1.05	0.14	0.62	0.33	0.73	0.33
Avail Cap(c_a), veh/h	450	400	2020	1301	164	2348
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.22	0.22	1.00	1.00
Uniform Delay (d), s/veh	59.8	46.4	23.0	3.5	75.3	11.7
Incr Delay (d2), s/veh	56.0	0.3	0.3	0.1	16.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	25.1	4.5	15.2	9.1	2.8	5.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	115.8	46.7	23.3	3.7	91.5	12.1
LnGrp LOS	F	D	C	A	F	B
Approach Vol, veh/h	529		1677			824
Approach Delay, s/veh	108.3		18.3			18.0
Approach LOS	F		B			B
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	14.8	98.2		47.0		113.0
Change Period (Y+Rc), s	7.3	7.3		6.6		7.3
Max Green Setting (Gmax), s	14.7	83.7		40.4		105.7
Max Q Clear Time (g_c+I1), s	7.4	0.0		42.4		0.0
Green Ext Time (p_c), s	0.1	0.0		0.0		0.0
Intersection Summary						
HCM 6th Ctrl Delay			33.9			
HCM 6th LOS			C			

Pattern 10 (Weekday AM Peak) 25 Build 2025 Build 12:58 pm 08/08/2022 4700 Hurstbourne Pkwy
DBZ

Synchro 11 Report
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HCM 6th Signalized Intersection Summary
3004: KY-1747 & Watterson Trail

06/17/2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	117	194	54	103	388	187	28	1147	52	102	509	129
Future Volume (veh/h)	117	194	54	103	388	187	28	1147	52	102	509	129
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	127	211	59	112	422	203	30	1247	57	111	553	140
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	182	471	399	324	458	388	57	1270	567	366	1771	790
Arrive On Green	0.07	0.25	0.25	0.06	0.24	0.24	0.03	0.36	0.36	0.36	1.00	1.00
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	127	211	59	112	422	203	30	1247	57	111	553	140
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	8.5	15.2	4.6	7.4	35.2	11.7	2.7	55.6	3.0	2.3	0.1	0.1
Cycle Q Clear(g_c), s	8.5	15.2	4.6	7.4	35.2	11.7	2.7	55.6	3.0	2.3	0.1	0.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	182	471	399	324	458	388	57	1270	567	366	1771	790
V/C Ratio(X)	0.70	0.45	0.15	0.35	0.92	0.52	0.52	0.98	0.10	0.30	0.31	0.18
Avail Cap(c_a), veh/h	229	514	436	382	514	436	127	1270	567	366	1771	790
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.98	0.98
Uniform Delay (d), s/veh	45.4	50.5	46.5	41.4	58.9	22.8	76.2	50.9	21.4	42.5	0.1	0.1
Incr Delay (d2), s/veh	6.6	1.0	0.2	0.6	21.5	1.6	10.1	21.2	0.4	0.6	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	7.3	1.9	3.3	19.3	4.6	1.4	27.7	1.5	3.0	0.1	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.0	51.4	46.8	42.0	80.5	24.4	86.3	72.1	21.8	43.2	0.6	0.6
LnGrp LOS	D	D	D	D	F	C	F	E	C	D	A	A
Approach Vol, veh/h		397			737			1334			804	
Approach Delay, s/veh		50.9			59.2			70.3			6.5	
Approach LOS		D			E			E			A	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	35.0	63.0	15.7	46.3	11.8	86.2	16.8	45.2
Change Period (Y+Rc), s	* 6.5	5.8	* 6.3	6.0	6.6	* 6.5	* 6.3	6.0
Max Green Setting (Gmax), s	* 20	57.2	* 15	44.0	11.4	* 65	* 15	44.0
Max Q Clear Time (g_c+I1), s	4.3	0.0	9.4	17.2	4.7	0.0	10.5	37.2
Green Ext Time (p_c), s	0.4	0.0	0.1	1.4	0.0	0.0	0.1	2.0

Intersection Summary	
HCM 6th Ctrl Delay	49.7
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
2216: KY-1747 & US-31E

06/17/2022

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	86	952	213	225	700	160	80	477	57	320	1183	571
Future Volume (veh/h)	86	952	213	225	700	160	80	477	57	320	1183	571
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	93	1035	232	245	761	174	87	518	62	348	1286	621
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	114	882	658	307	784	179	214	1115	497	297	1282	712
Arrive On Green	0.06	0.25	0.25	0.18	0.55	0.55	0.12	0.31	0.31	0.22	0.48	0.48
Sat Flow, veh/h	1781	3554	1585	3456	2872	657	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	93	1035	232	245	471	464	87	518	62	348	1286	621
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1752	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	8.3	39.7	9.9	10.9	40.9	40.9	7.2	18.7	4.5	26.7	57.7	38.4
Cycle Q Clear(g_c), s	8.3	39.7	9.9	10.9	40.9	40.9	7.2	18.7	4.5	26.7	57.7	38.4
Prop In Lane	1.00		1.00	1.00		0.37	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	114	882	658	307	485	479	214	1115	497	297	1282	712
V/C Ratio(X)	0.82	1.17	0.35	0.80	0.97	0.97	0.41	0.46	0.12	1.17	1.00	0.87
Avail Cap(c_a), veh/h	175	882	658	425	485	479	214	1115	497	297	1282	712
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	0.73	0.73	0.73	1.00	1.00	1.00	0.46	0.46	0.46
Uniform Delay (d), s/veh	74.0	60.2	13.8	64.4	35.7	35.7	65.1	44.1	39.2	62.2	41.6	30.6
Incr Delay (d2), s/veh	20.1	90.2	1.5	6.5	28.3	28.5	1.5	1.4	0.5	92.7	17.9	7.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	28.5	3.6	4.6	16.9	16.7	3.3	8.4	1.8	19.1	25.8	12.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	94.1	150.3	15.3	70.9	64.0	64.2	66.6	45.5	39.7	154.9	59.5	37.7
LnGrp LOS	F	F	B	E	E	E	E	D	D	F	F	D
Approach Vol, veh/h		1360			1180			667			2255	
Approach Delay, s/veh		123.4			65.5			47.7			68.2	
Approach LOS		F			E			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.5	47.0	26.5	65.0	17.5	51.0	34.0	57.5
Change Period (Y+Rc), s	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3
Max Green Setting (Gmax), s	19.7	39.7	13.7	57.7	15.7	43.7	26.7	44.7
Max Q Clear Time (g_c+I1), s	12.9	0.0	9.2	59.7	10.3	0.0	28.7	20.7
Green Ext Time (p_c), s	0.7	0.0	0.1	0.0	0.1	0.0	0.0	4.8

Intersection Summary	
HCM 6th Ctrl Delay	78.9
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary
2217: S Watterson Trail & US-31E

06/17/2022

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	240	60	26	24	34	563	157	587	54	16	1529	16
Future Volume (veh/h)	240	60	26	24	34	563	157	587	54	16	1529	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	261	65	0	26	37	0	171	638	59	17	1662	17
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	274	68		53	76		198	1393	621	548	1724	769
Arrive On Green	0.19	0.19	0.00	0.07	0.07	0.00	0.08	0.39	0.39	0.17	0.49	0.49
Sat Flow, veh/h	1440	359	1585	756	1076	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	326	0	0	63	0	0	171	638	59	17	1662	17
Grp Sat Flow(s),veh/h/ln	1798	0	1585	1833	0	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	28.7	0.0	0.0	5.3	0.0	0.0	10.2	21.3	3.8	0.0	72.4	0.9
Cycle Q Clear(g_c), s	28.7	0.0	0.0	5.3	0.0	0.0	10.2	21.3	3.8	0.0	72.4	0.9
Prop In Lane	0.80		1.00	0.41		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	342	0		129	0		198	1393	621	548	1724	769
V/C Ratio(X)	0.95	0.00		0.49	0.00		0.86	0.46	0.09	0.03	0.96	0.02
Avail Cap(c_a), veh/h	342	0		302	0		341	1393	621	548	1724	769
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	64.1	0.0	0.0	71.6	0.0	0.0	48.3	36.1	30.7	26.3	39.8	21.4
Incr Delay (d2), s/veh	37.0	0.0	0.0	4.8	0.0	0.0	16.7	1.1	0.3	0.0	14.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.6	0.0	0.0	2.7	0.0	0.0	7.7	9.3	1.5	0.4	33.7	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	101.1	0.0	0.0	76.4	0.0	0.0	65.0	37.1	31.0	26.4	54.5	21.5
LnGrp LOS	F	A		E	A		E	D	C	C	D	C
Approach Vol, veh/h		326			63			868			1696	
Approach Delay, s/veh		101.1			76.4			42.2			53.9	
Approach LOS		F			E			D			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	20.2	84.9		37.0	35.1	70.0		17.9				
Change Period (Y+Rc), s	7.3	7.3		6.6	7.3	7.3		6.6				
Max Green Setting (Gmax), s	25.7	49.7		30.4	12.7	62.7		26.4				
Max Q Clear Time (g_c+I1), s	12.2	0.0		30.7	2.0	0.0		7.3				
Green Ext Time (p_c), s	0.7	0.0		0.0	0.0	0.0		0.2				

Intersection Summary	
HCM 6th Ctrl Delay	56.2
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.
Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
3003: KY-1747 & S Stony Brook Dr

06/17/2022

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	456	55	1189	412	59	629
Future Volume (veh/h)	456	55	1189	412	59	629
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	496	60	1292	448	64	684
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	450	400	2018	1300	84	2348
Arrive On Green	0.25	0.25	0.57	0.57	0.05	0.66
Sat Flow, veh/h	1781	1585	3647	1585	1781	3647
Grp Volume(v), veh/h	496	60	1292	448	64	684
Grp Sat Flow(s),veh/h/ln	1781	1585	1777	1585	1781	1777
Q Serve(g_s), s	40.4	4.7	39.5	11.3	5.7	12.9
Cycle Q Clear(g_c), s	40.4	4.7	39.5	11.3	5.7	12.9
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	450	400	2018	1300	84	2348
V/C Ratio(X)	1.10	0.15	0.64	0.34	0.76	0.29
Avail Cap(c_a), veh/h	450	400	2018	1300	164	2348
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.15	0.15	1.00	1.00
Uniform Delay (d), s/veh	59.8	46.5	23.5	3.6	75.3	11.4
Incr Delay (d2), s/veh	73.3	0.4	0.2	0.1	18.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	27.3	4.7	15.9	9.8	3.0	5.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	133.1	46.8	23.7	3.7	93.5	11.7
LnGrp LOS	F	D	C	A	F	B
Approach Vol, veh/h	556		1740			748
Approach Delay, s/veh	123.8		18.6			18.7
Approach LOS	F		B			B
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	14.8	98.2		47.0		113.0
Change Period (Y+Rc), s	7.3	7.3		6.6		7.3
Max Green Setting (Gmax), s	14.7	83.7		40.4		105.7
Max Q Clear Time (g_c+I1), s	7.7	0.0		42.4		0.0
Green Ext Time (p_c), s	0.1	0.0		0.0		0.0
Intersection Summary						
HCM 6th Ctrl Delay			37.8			
HCM 6th LOS			D			

Pattern 10 (Weekday AM Peak) 35 No Build 2035 No Build 5:27 pm 06/17/2022 4700 Hurstbourne Pkwy
DBZ

Synchro 11 Report
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HCM 6th Signalized Intersection Summary
3004: KY-1747 & Watterson Trail

06/17/2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	123	204	57	108	408	197	29	1137	55	107	522	136
Future Volume (veh/h)	123	204	57	108	408	197	29	1137	55	107	522	136
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	134	222	62	117	443	214	32	1236	60	116	567	148
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	184	490	415	331	476	403	59	1270	567	348	1726	770
Arrive On Green	0.07	0.26	0.26	0.06	0.25	0.25	0.03	0.36	0.36	0.33	0.97	0.97
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	134	222	62	117	443	214	32	1236	60	116	567	148
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	8.8	15.9	4.8	7.6	37.0	12.5	2.8	54.8	3.2	2.7	1.1	0.5
Cycle Q Clear(g_c), s	8.8	15.9	4.8	7.6	37.0	12.5	2.8	54.8	3.2	2.7	1.1	0.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	184	490	415	331	476	403	59	1270	567	348	1726	770
V/C Ratio(X)	0.73	0.45	0.15	0.35	0.93	0.53	0.54	0.97	0.11	0.33	0.33	0.19
Avail Cap(c_a), veh/h	226	514	436	387	514	436	127	1270	567	348	1726	770
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.98	0.98
Uniform Delay (d), s/veh	44.6	49.4	45.4	40.2	58.3	23.2	76.1	50.6	21.3	44.8	1.2	1.2
Incr Delay (d2), s/veh	8.8	0.9	0.2	0.6	23.5	1.5	10.5	19.5	0.4	0.8	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	7.6	1.9	3.4	20.5	4.9	1.5	27.1	1.6	3.2	0.4	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.4	50.4	45.6	40.8	81.8	24.8	86.7	70.2	21.7	45.5	1.7	1.7
LnGrp LOS	D	D	D	D	F	C	F	E	C	D	A	A
Approach Vol, veh/h		418			774			1328			831	
Approach Delay, s/veh		50.6			59.9			68.4			7.8	
Approach LOS		D			E			E			A	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	33.1	63.0	16.0	47.9	11.9	84.2	17.2	46.7
Change Period (Y+Rc), s	* 6.5	5.8	* 6.3	6.0	6.6	* 6.5	* 6.3	6.0
Max Green Setting (Gmax), s	* 20	57.2	* 15	44.0	11.4	* 65	* 15	44.0
Max Q Clear Time (g_c+I1), s	4.7	0.0	9.6	17.9	4.8	0.0	10.8	39.0
Green Ext Time (p_c), s	0.4	0.0	0.1	1.4	0.0	0.0	0.1	1.7

Intersection Summary	
HCM 6th Ctrl Delay	49.2
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Pattern 10 (Weekday AM Peak) 35 Build 1
2216: KY-1747 & US-31E

08/08/2022

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	86	967	213	251	778	160	80	477	57	320	1183	576
Future Volume (veh/h)	86	967	213	251	778	160	80	477	57	320	1183	576
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	93	1051	232	273	846	174	87	518	62	348	1286	626
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	114	882	658	321	814	167	206	1100	491	297	1282	719
Arrive On Green	0.06	0.25	0.25	0.19	0.55	0.55	0.12	0.31	0.31	0.22	0.48	0.48
Sat Flow, veh/h	1781	3554	1585	3456	2935	604	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	93	1051	232	273	512	508	87	518	62	348	1286	626
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1762	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	8.3	39.7	9.7	12.2	44.4	44.4	7.3	18.9	4.5	26.7	57.7	37.9
Cycle Q Clear(g_c), s	8.3	39.7	9.7	12.2	44.4	44.4	7.3	18.9	4.5	26.7	57.7	37.9
Prop In Lane	1.00		1.00	1.00		0.34	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	114	882	658	321	493	489	206	1100	491	297	1282	719
V/C Ratio(X)	0.82	1.19	0.35	0.85	1.04	1.04	0.42	0.47	0.13	1.17	1.00	0.87
Avail Cap(c_a), veh/h	175	882	658	425	493	489	206	1100	491	297	1282	719
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	0.73	0.73	0.73	1.00	1.00	1.00	0.46	0.46	0.46
Uniform Delay (d), s/veh	74.0	60.2	13.6	64.0	35.6	35.6	65.8	44.7	39.7	62.2	41.6	30.3
Incr Delay (d2), s/veh	20.1	97.6	1.5	10.1	45.3	45.5	1.7	1.4	0.5	92.7	17.9	6.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	29.5	3.6	5.3	20.2	20.1	3.4	8.4	1.8	19.1	25.8	11.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	94.1	157.7	15.1	74.1	80.9	81.1	67.4	46.1	40.2	154.9	59.5	37.2
LnGrp LOS	F	F	B	E	F	F	E	D	D	F	F	D
Approach Vol, veh/h		1376			1293			667			2260	
Approach Delay, s/veh		129.4			79.5			48.3			68.0	
Approach LOS		F			E			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.2	47.0	25.8	65.0	17.5	51.7	34.0	56.8
Change Period (Y+Rc), s	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3
Max Green Setting (Gmax), s	19.7	39.7	13.7	57.7	15.7	43.7	26.7	44.7
Max Q Clear Time (g_c+I1), s	14.2	0.0	9.3	59.7	10.3	0.0	28.7	20.9
Green Ext Time (p_c), s	0.7	0.0	0.1	0.0	0.1	0.0	0.0	4.8

Intersection Summary	
HCM 6th Ctrl Delay	83.4
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary
2217: S Watterson Trail & US-31E

06/17/2022

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	240	60	26	24	34	563	157	605	54	16	1619	16
Future Volume (veh/h)	240	60	26	24	34	563	157	605	54	16	1619	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	261	65	0	26	37	0	171	658	59	17	1760	17
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	274	68		53	76		198	1393	621	541	1705	761
Arrive On Green	0.19	0.19	0.00	0.07	0.07	0.00	0.09	0.39	0.39	0.17	0.48	0.48
Sat Flow, veh/h	1440	359	1585	756	1076	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	326	0	0	63	0	0	171	658	59	17	1760	17
Grp Sat Flow(s),veh/h/ln	1798	0	1585	1833	0	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	28.7	0.0	0.0	5.3	0.0	0.0	11.1	22.1	3.8	0.0	76.8	0.9
Cycle Q Clear(g_c), s	28.7	0.0	0.0	5.3	0.0	0.0	11.1	22.1	3.8	0.0	76.8	0.9
Prop In Lane	0.80		1.00	0.41		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	342	0		129	0		198	1393	621	541	1705	761
V/C Ratio(X)	0.95	0.00		0.49	0.00		0.86	0.47	0.09	0.03	1.03	0.02
Avail Cap(c_a), veh/h	342	0		302	0		331	1393	621	541	1705	761
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	64.1	0.0	0.0	71.6	0.0	0.0	52.2	36.3	30.7	26.8	41.6	21.9
Incr Delay (d2), s/veh	37.0	0.0	0.0	4.8	0.0	0.0	17.5	1.2	0.3	0.0	30.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.6	0.0	0.0	2.7	0.0	0.0	7.8	9.7	1.5	0.4	39.3	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	101.1	0.0	0.0	76.4	0.0	0.0	69.7	37.5	31.0	26.9	72.1	21.9
LnGrp LOS	F	A		E	A		E	D	C	C	F	C
Approach Vol, veh/h		326			63			888			1794	
Approach Delay, s/veh		101.1			76.4			43.2			71.2	
Approach LOS		F			E			D			E	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	21.0	84.1		37.0	35.1	70.0		17.9				
Change Period (Y+Rc), s	7.3	7.3		6.6	7.3	7.3		6.6				
Max Green Setting (Gmax), s	25.7	49.7		30.4	12.7	62.7		26.4				
Max Q Clear Time (g_c+I1), s	13.1	0.0		30.7	2.0	0.0		7.3				
Green Ext Time (p_c), s	0.7	0.0		0.0	0.0	0.0		0.2				

Intersection Summary	
HCM 6th Ctrl Delay	66.4
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.
Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Pattern 10 (Weekday AM Peak) 35 Build 1
3003: KY-1747 & S Stony Brook Dr 08/08/2022

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	456	55	1209	412	59	733
Future Volume (veh/h)	456	55	1209	412	59	733
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	496	60	1314	448	64	797
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	450	400	2018	1300	84	2348
Arrive On Green	0.25	0.25	0.57	0.57	0.05	0.66
Sat Flow, veh/h	1781	1585	3647	1585	1781	3647
Grp Volume(v), veh/h	496	60	1314	448	64	797
Grp Sat Flow(s),veh/h/ln	1781	1585	1777	1585	1781	1777
Q Serve(g_s), s	40.4	4.7	40.6	11.3	5.7	15.7
Cycle Q Clear(g_c), s	40.4	4.7	40.6	11.3	5.7	15.7
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	450	400	2018	1300	84	2348
V/C Ratio(X)	1.10	0.15	0.65	0.34	0.76	0.34
Avail Cap(c_a), veh/h	450	400	2018	1300	164	2348
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.12	0.12	1.00	1.00
Uniform Delay (d), s/veh	59.8	46.5	23.7	3.6	75.3	11.9
Incr Delay (d2), s/veh	73.3	0.4	0.2	0.1	18.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	27.3	4.7	16.4	9.8	3.0	6.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	133.1	46.8	23.9	3.7	93.5	12.3
LnGrp LOS	F	D	C	A	F	B
Approach Vol, veh/h	556		1762			861
Approach Delay, s/veh	123.8		18.8			18.3
Approach LOS	F		B			B
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	14.8	98.2		47.0		113.0
Change Period (Y+Rc), s	7.3	7.3		6.6		7.3
Max Green Setting (Gmax), s	14.7	83.7		40.4		105.7
Max Q Clear Time (g_c+I1), s	7.7	0.0		42.4		0.0
Green Ext Time (p_c), s	0.1	0.0		0.0		0.0
Intersection Summary						
HCM 6th Ctrl Delay			37.0			
HCM 6th LOS			D			

Pattern 10 (Weekday AM Peak) 35 Build 1 2035 Build 1:02 pm 08/08/2022 4700 Hurstbourne Pkwy
DBZ

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HCM 6th Signalized Intersection Summary
3004: KY-1747 & Watterson Trail

06/17/2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	123	204	57	108	408	197	29	1202	55	107	534	136
Future Volume (veh/h)	123	204	57	108	408	197	29	1202	55	107	534	136
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	134	222	62	117	443	214	32	1307	60	116	580	148
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	184	490	415	331	476	403	59	1270	567	341	1726	770
Arrive On Green	0.07	0.26	0.26	0.06	0.25	0.25	0.03	0.36	0.36	0.33	0.97	0.97
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	134	222	62	117	443	214	32	1307	60	116	580	148
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	8.8	15.9	4.8	7.6	37.0	12.5	2.8	57.2	3.2	3.3	1.1	0.5
Cycle Q Clear(g_c), s	8.8	15.9	4.8	7.6	37.0	12.5	2.8	57.2	3.2	3.3	1.1	0.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	184	490	415	331	476	403	59	1270	567	341	1726	770
V/C Ratio(X)	0.73	0.45	0.15	0.35	0.93	0.53	0.54	1.03	0.11	0.34	0.34	0.19
Avail Cap(c_a), veh/h	226	514	436	387	514	436	127	1270	567	341	1726	770
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.98	0.98
Uniform Delay (d), s/veh	44.6	49.4	45.4	40.2	58.3	23.2	76.1	51.4	21.3	45.0	1.2	1.2
Incr Delay (d2), s/veh	8.8	0.9	0.2	0.6	23.5	1.5	10.5	32.9	0.4	0.8	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	7.6	1.9	3.4	20.5	4.9	1.5	30.5	1.6	3.2	0.4	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.4	50.4	45.6	40.8	81.8	24.8	86.7	84.3	21.7	45.8	1.7	1.7
LnGrp LOS	D	D	D	D	F	C	F	F	C	D	A	A
Approach Vol, veh/h		418			774			1399			844	
Approach Delay, s/veh		50.6			59.9			81.7			7.8	
Approach LOS		D			E			F			A	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	33.1	63.0	16.0	47.9	11.9	84.2	17.2	46.7
Change Period (Y+Rc), s	* 6.5	5.8	* 6.3	6.0	6.6	* 6.5	* 6.3	6.0
Max Green Setting (Gmax), s	* 20	57.2	* 15	44.0	11.4	* 65	* 15	44.0
Max Q Clear Time (g_c+I1), s	5.3	0.0	9.6	17.9	4.8	0.0	10.8	39.0
Green Ext Time (p_c), s	0.4	0.0	0.1	1.4	0.0	0.0	0.1	1.7

Intersection Summary	
HCM 6th Ctrl Delay	54.8
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
2216: KY-1747 & US-31E

06/19/2022

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	80	725	350	525	800	75	125	1100	150	200	600	375
Future Volume (veh/h)	80	725	350	525	800	75	125	1100	150	200	600	375
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	83	755	365	547	833	78	130	1146	156	208	625	391
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	139	704	522	569	935	88	210	1106	493	234	1154	776
Arrive On Green	0.08	0.20	0.20	0.22	0.38	0.38	0.12	0.31	0.31	0.04	0.11	0.11
Sat Flow, veh/h	1781	3554	1585	3456	3284	308	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	83	755	365	547	451	460	130	1146	156	208	625	391
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1815	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	6.8	29.7	29.7	23.5	35.7	35.7	10.4	46.7	8.4	17.4	25.0	13.1
Cycle Q Clear(g_c), s	6.8	29.7	29.7	23.5	35.7	35.7	10.4	46.7	8.4	17.4	25.0	13.1
Prop In Lane	1.00		1.00	1.00		0.17	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	139	704	522	569	506	517	210	1106	493	234	1154	776
V/C Ratio(X)	0.60	1.07	0.70	0.96	0.89	0.89	0.62	1.04	0.32	0.89	0.54	0.50
Avail Cap(c_a), veh/h	139	704	522	569	506	517	210	1106	493	270	1154	776
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	0.83	0.83	0.83	1.00	1.00	1.00	0.76	0.76	0.76
Uniform Delay (d), s/veh	66.9	60.1	43.8	58.1	44.4	44.4	62.9	51.7	21.9	70.7	56.4	12.3
Incr Delay (d2), s/veh	8.1	55.2	7.6	25.2	17.7	17.4	5.9	36.8	1.7	22.2	1.4	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	18.5	12.7	11.6	16.9	17.2	5.0	25.8	3.3	9.8	12.2	5.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	75.0	115.4	51.4	83.3	62.1	61.9	68.8	88.4	23.6	92.8	57.8	14.0
LnGrp LOS	E	F	D	F	E	E	E	F	C	F	E	B
Approach Vol, veh/h		1203			1458			1432			1224	
Approach Delay, s/veh		93.2			70.0			79.6			49.8	
Approach LOS		F			E			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	32.0	37.0	25.0	56.0	19.0	50.0	27.0	54.0
Change Period (Y+Rc), s	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3
Max Green Setting (Gmax), s	24.7	29.7	17.7	48.7	11.7	42.7	22.7	43.7
Max Q Clear Time (g_c+I1), s	25.5	0.0	12.4	27.0	8.8	0.0	19.4	48.7
Green Ext Time (p_c), s	0.0	0.0	0.2	8.7	0.1	0.0	0.3	0.0

Intersection Summary	
HCM 6th Ctrl Delay	73.2
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.

Pattern 50 (Weekday PM Peak) KY-1747 (Hurstbourne Pkwy) 4:51 pm 03/15/2021 Weekday PM Peak
M. Brandon Shelley, PE

Synchro 11 Report
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HCM 6th Signalized Intersection Summary
2217: S Watterson Trail & US-31E

06/17/2022

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	115	50	50	15	55	250	225	1025	130	35	775	25
Future Volume (veh/h)	115	50	50	15	55	250	225	1025	130	35	775	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	125	54	0	16	60	0	245	1114	141	38	842	27
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	145	62		28	106		454	1393	621	536	1996	890
Arrive On Green	0.11	0.11	0.00	0.07	0.07	0.00	0.08	0.39	0.39	0.25	0.56	0.56
Sat Flow, veh/h	1262	545	1585	390	1461	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	179	0	0	76	0	0	245	1114	141	38	842	27
Grp Sat Flow(s),veh/h/ln	1807	0	1585	1851	0	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	15.6	0.0	0.0	6.4	0.0	0.0	9.2	44.4	9.5	0.0	21.8	1.2
Cycle Q Clear(g_c), s	15.6	0.0	0.0	6.4	0.0	0.0	9.2	44.4	9.5	0.0	21.8	1.2
Prop In Lane	0.70		1.00	0.21		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	207	0		134	0		454	1393	621	536	1996	890
V/C Ratio(X)	0.86	0.00		0.57	0.00		0.54	0.80	0.23	0.07	0.42	0.03
Avail Cap(c_a), veh/h	343	0		305	0		602	1393	621	536	1996	890
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	69.6	0.0	0.0	71.8	0.0	0.0	14.5	43.1	32.5	35.7	20.1	15.6
Incr Delay (d2), s/veh	17.2	0.0	0.0	6.3	0.0	0.0	1.7	4.9	0.8	0.1	0.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.2	0.0	0.0	3.3	0.0	0.0	3.8	20.0	3.8	1.0	9.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	86.8	0.0	0.0	78.1	0.0	0.0	16.2	48.0	33.3	35.8	20.8	15.7
LnGrp LOS	F	A		E	A		B	D	C	D	C	B
Approach Vol, veh/h		179			76			1500			907	
Approach Delay, s/veh		86.8			78.1			41.4			21.3	
Approach LOS		F			E			D			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	19.7	97.2		24.9	46.9	70.0		18.2				
Change Period (Y+Rc), s	7.3	7.3		6.6	7.3	7.3		6.6				
Max Green Setting (Gmax), s	25.7	49.7		30.4	12.7	62.7		26.4				
Max Q Clear Time (g_c+I1), s	11.2	0.0		17.6	2.0	0.0		8.4				
Green Ext Time (p_c), s	1.2	0.0		0.8	0.1	0.0		0.3				

Intersection Summary		
HCM 6th Ctrl Delay	38.7	
HCM 6th LOS	D	

Notes

User approved pedestrian interval to be less than phase max green.
Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
3003: KY-1747 & S Stony Brook Dr

06/17/2022

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	150	50	1100	150	125	1300
Future Volume (veh/h)	150	50	1100	150	125	1300
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	163	54	1196	163	136	1413
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	198	176	2334	1217	162	2829
Arrive On Green	0.11	0.11	0.66	0.66	0.09	0.80
Sat Flow, veh/h	1781	1585	3647	1585	1781	3647
Grp Volume(v), veh/h	163	54	1196	163	136	1413
Grp Sat Flow(s),veh/h/ln	1781	1585	1777	1585	1781	1777
Q Serve(g_s), s	13.4	4.7	26.1	4.0	11.3	20.2
Cycle Q Clear(g_c), s	13.4	4.7	26.1	4.0	11.3	20.2
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	198	176	2334	1217	162	2829
V/C Ratio(X)	0.82	0.31	0.51	0.13	0.84	0.50
Avail Cap(c_a), veh/h	361	321	2334	1217	281	2829
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.35	0.35	1.00	1.00
Uniform Delay (d), s/veh	65.2	61.3	13.3	4.5	67.1	5.2
Incr Delay (d2), s/veh	16.2	2.1	0.3	0.1	15.1	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.0	4.3	9.8	2.0	5.7	6.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	81.4	63.4	13.6	4.6	82.2	5.8
LnGrp LOS	F	E	B	A	F	A
Approach Vol, veh/h	217		1359			1549
Approach Delay, s/veh	76.9		12.5			12.5
Approach LOS	E		B			B
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	20.9	105.8		23.3		126.7
Change Period (Y+Rc), s	7.3	7.3		6.6		7.3
Max Green Setting (Gmax), s	23.7	74.7		30.4		105.7
Max Q Clear Time (g_c+I1), s	13.3	0.0		15.4		0.0
Green Ext Time (p_c), s	0.4	0.0		1.3		0.0
Intersection Summary						
HCM 6th Ctrl Delay			17.0			
HCM 6th LOS			B			

Pattern 50 (Weekday PM Peak) KY-1747 (Hurstbourne Pkwy) 4:51 pm 03/15/2021 Weekday PM Peak
M. Brandon Shelley, PE

Synchro 11 Report
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HCM 6th Signalized Intersection Summary
3004: KY-1747 & Watterson Trail

06/17/2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	125	400	100	150	350	150	100	900	85	225	1300	150
Future Volume (veh/h)	125	400	100	150	350	150	100	900	85	225	1300	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	136	435	109	163	380	163	109	978	92	245	1413	163
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	219	458	388	196	481	407	129	1189	530	363	1641	732
Arrive On Green	0.07	0.24	0.24	0.08	0.26	0.26	0.07	0.33	0.33	0.41	0.92	0.92
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	136	435	109	163	380	163	109	978	92	245	1413	163
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	10.0	41.2	10.0	12.2	34.1	9.7	10.9	45.5	5.7	20.2	26.8	1.8
Cycle Q Clear(g_c), s	10.0	41.2	10.0	12.2	34.1	9.7	10.9	45.5	5.7	20.2	26.8	1.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	219	458	388	196	481	407	129	1189	530	363	1641	732
V/C Ratio(X)	0.62	0.95	0.28	0.83	0.79	0.40	0.85	0.82	0.17	0.67	0.86	0.22
Avail Cap(c_a), veh/h	293	478	405	249	481	407	192	1189	530	363	1641	732
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67
Uniform Delay (d), s/veh	48.2	66.9	55.1	50.4	62.4	22.1	82.5	55.0	25.6	48.4	4.7	3.8
Incr Delay (d2), s/veh	2.8	28.8	0.6	16.8	9.2	0.9	23.1	6.5	0.7	3.7	4.3	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	23.3	4.1	6.4	17.5	3.8	5.8	21.1	3.0	8.0	3.5	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.1	95.7	55.7	67.2	71.5	23.0	105.6	61.5	26.4	52.1	9.0	4.3
LnGrp LOS	D	F	E	E	E	C	F	E	C	D	A	A
Approach Vol, veh/h		680			706			1179			1821	
Approach Delay, s/veh		80.4			59.3			62.8			14.4	
Approach LOS		F			E			E			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	43.2	66.0	20.7	50.0	19.6	89.6	18.5	52.3
Change Period (Y+Rc), s	* 6.5	5.8	* 6.3	6.0	6.6	* 6.5	* 6.3	6.0
Max Green Setting (Gmax), s	* 30	60.2	* 20	46.0	19.4	* 70	* 20	46.0
Max Q Clear Time (g_c+I1), s	22.2	0.0	14.2	43.2	12.9	0.0	12.0	36.1
Green Ext Time (p_c), s	0.7	0.0	0.2	0.8	0.2	0.0	0.2	2.1

Intersection Summary	
HCM 6th Ctrl Delay	44.9
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
2216: KY-1747 & US-31E

06/19/2022

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	84	766	355	525	830	76	129	1124	153	203	633	388
Future Volume (veh/h)	84	766	355	525	830	76	129	1124	153	203	633	388
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	88	798	370	547	865	79	134	1171	159	211	659	404
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	139	704	525	569	937	86	210	1101	491	237	1154	776
Arrive On Green	0.08	0.20	0.20	0.22	0.38	0.38	0.12	0.31	0.31	0.04	0.11	0.11
Sat Flow, veh/h	1781	3554	1585	3456	3292	301	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	88	798	370	547	467	477	134	1171	159	211	659	404
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1816	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	7.2	29.7	29.7	23.5	37.6	37.6	10.8	46.5	8.6	17.7	26.5	13.6
Cycle Q Clear(g_c), s	7.2	29.7	29.7	23.5	37.6	37.6	10.8	46.5	8.6	17.7	26.5	13.6
Prop In Lane	1.00		1.00	1.00		0.17	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	139	704	525	569	506	517	210	1101	491	237	1154	776
V/C Ratio(X)	0.63	1.13	0.71	0.96	0.92	0.92	0.64	1.06	0.32	0.89	0.57	0.52
Avail Cap(c_a), veh/h	139	704	525	569	506	517	210	1101	491	270	1154	776
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	0.81	0.81	0.81	1.00	1.00	1.00	0.76	0.76	0.76
Uniform Delay (d), s/veh	67.1	60.1	43.8	58.1	45.0	45.0	63.1	51.8	22.1	70.6	57.0	12.4
Incr Delay (d2), s/veh	10.4	77.3	7.8	24.8	21.4	21.0	6.7	45.8	1.7	22.6	1.6	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	20.6	12.9	11.6	18.2	18.5	5.2	27.1	3.4	10.0	12.9	5.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	77.4	137.4	51.6	82.9	66.4	66.1	69.8	97.6	23.8	93.2	58.6	14.3
LnGrp LOS	E	F	D	F	E	E	E	F	C	F	E	B
Approach Vol, veh/h		1256			1491			1464			1274	
Approach Delay, s/veh		107.9			72.4			87.0			50.3	
Approach LOS		F			E			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	32.0	37.0	25.0	56.0	19.0	50.0	27.2	53.8
Change Period (Y+Rc), s	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3
Max Green Setting (Gmax), s	24.7	29.7	17.7	48.7	11.7	42.7	22.7	43.7
Max Q Clear Time (g_c+I1), s	25.5	0.0	12.8	28.5	9.2	0.0	19.7	48.5
Green Ext Time (p_c), s	0.0	0.0	0.2	8.9	0.1	0.0	0.3	0.0

Intersection Summary	
HCM 6th Ctrl Delay	79.3
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary
2217: S Watterson Trail & US-31E

06/17/2022

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	117	63	51	23	64	289	299	1040	132	35	799	25
Future Volume (veh/h)	117	63	51	23	64	289	299	1040	132	35	799	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	127	68	0	25	70	0	325	1130	143	38	868	27
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	145	78		36	101		462	1393	621	515	1866	832
Arrive On Green	0.12	0.12	0.00	0.07	0.07	0.00	0.10	0.39	0.39	0.24	0.52	0.52
Sat Flow, veh/h	1180	632	1585	486	1360	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	195	0	0	95	0	0	325	1130	143	38	868	27
Grp Sat Flow(s),veh/h/ln	1811	0	1585	1846	0	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	16.9	0.0	0.0	8.0	0.0	0.0	13.2	45.4	9.6	0.0	24.6	1.3
Cycle Q Clear(g_c), s	16.9	0.0	0.0	8.0	0.0	0.0	13.2	45.4	9.6	0.0	24.6	1.3
Prop In Lane	0.65		1.00	0.26		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	223	0		136	0		462	1393	621	515	1866	832
V/C Ratio(X)	0.87	0.00		0.70	0.00		0.70	0.81	0.23	0.07	0.47	0.03
Avail Cap(c_a), veh/h	344	0		305	0		562	1393	621	515	1866	832
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	68.9	0.0	0.0	72.3	0.0	0.0	17.4	43.4	32.5	37.5	23.9	18.4
Incr Delay (d2), s/veh	19.0	0.0	0.0	10.4	0.0	0.0	4.2	5.2	0.9	0.1	0.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.0	0.0	0.0	4.2	0.0	0.0	5.7	20.4	3.8	1.1	10.3	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	87.9	0.0	0.0	82.8	0.0	0.0	21.6	48.6	33.4	37.6	24.7	18.4
LnGrp LOS	F	A		F	A		C	D	C	D	C	B
Approach Vol, veh/h		195			95			1598			933	
Approach Delay, s/veh		87.9			82.8			41.8			25.1	
Approach LOS		F			F			D			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	24.0	91.3		26.3	45.3	70.0		18.4				
Change Period (Y+Rc), s	7.3	7.3		6.6	7.3	7.3		6.6				
Max Green Setting (Gmax), s	25.7	49.7		30.4	12.7	62.7		26.4				
Max Q Clear Time (g_c+I1), s	15.2	0.0		18.9	2.0	0.0		10.0				
Green Ext Time (p_c), s	1.4	0.0		0.8	0.1	0.0		0.4				

Intersection Summary	
HCM 6th Ctrl Delay	40.8
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.
Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
3003: KY-1747 & S Stony Brook Dr

06/17/2022

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	162	57	1161	156	133	1349
Future Volume (veh/h)	162	57	1161	156	133	1349
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	176	62	1262	170	145	1466
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	212	189	2288	1209	171	2802
Arrive On Green	0.12	0.12	0.64	0.64	0.10	0.79
Sat Flow, veh/h	1781	1585	3647	1585	1781	3647
Grp Volume(v), veh/h	176	62	1262	170	145	1466
Grp Sat Flow(s),veh/h/ln	1781	1585	1777	1585	1781	1777
Q Serve(g_s), s	14.5	5.4	29.4	4.3	12.0	22.3
Cycle Q Clear(g_c), s	14.5	5.4	29.4	4.3	12.0	22.3
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	212	189	2288	1209	171	2802
V/C Ratio(X)	0.83	0.33	0.55	0.14	0.85	0.52
Avail Cap(c_a), veh/h	361	321	2288	1209	281	2802
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.25	0.25	1.00	1.00
Uniform Delay (d), s/veh	64.6	60.6	14.8	4.7	66.7	5.7
Incr Delay (d2), s/veh	15.9	2.1	0.2	0.1	15.9	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.5	5.0	11.1	2.2	6.1	6.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	80.5	62.7	15.0	4.8	82.6	6.4
LnGrp LOS	F	E	B	A	F	A
Approach Vol, veh/h	238		1432			1611
Approach Delay, s/veh	75.9		13.8			13.3
Approach LOS	E		B			B
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	21.7	103.9		24.4		125.6
Change Period (Y+Rc), s	7.3	7.3		6.6		7.3
Max Green Setting (Gmax), s	23.7	74.7		30.4		105.7
Max Q Clear Time (g_c+I1), s	14.0	0.0		16.5		0.0
Green Ext Time (p_c), s	0.4	0.0		1.4		0.0
Intersection Summary						
HCM 6th Ctrl Delay			18.0			
HCM 6th LOS			B			

Pattern 50 (Weekday PM Peak) 1 2025 No Build 5:19 pm 06/17/2022 4700 Hurstbourne Pkwy
DBZ

Synchro 11 Report
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HCM 6th Signalized Intersection Summary
3004: KY-1747 & Watterson Trail

06/17/2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	127	406	102	153	371	183	100	900	85	244	1351	158
Future Volume (veh/h)	127	406	102	153	371	183	100	900	85	244	1351	158
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	138	441	111	166	403	199	109	978	92	265	1468	172
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	208	462	392	197	486	412	129	1189	530	357	1628	726
Arrive On Green	0.07	0.25	0.25	0.08	0.26	0.26	0.07	0.33	0.33	0.40	0.92	0.92
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	138	441	111	166	403	199	109	978	92	265	1468	172
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	10.2	41.8	10.2	12.4	36.6	12.2	10.9	45.5	5.7	22.8	35.8	2.1
Cycle Q Clear(g_c), s	10.2	41.8	10.2	12.4	36.6	12.2	10.9	45.5	5.7	22.8	35.8	2.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	208	462	392	197	486	412	129	1189	530	357	1628	726
V/C Ratio(X)	0.66	0.95	0.28	0.84	0.83	0.48	0.85	0.82	0.17	0.74	0.90	0.24
Avail Cap(c_a), veh/h	281	478	405	248	486	412	192	1189	530	357	1628	726
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67
Uniform Delay (d), s/veh	48.5	66.7	54.8	50.2	62.8	22.8	82.5	55.0	25.5	50.0	5.6	4.2
Incr Delay (d2), s/veh	3.6	29.6	0.6	18.4	11.9	1.3	23.1	6.5	0.7	5.9	6.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	23.7	4.2	6.6	19.0	4.8	5.8	21.1	3.0	9.2	4.2	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.0	96.3	55.4	68.6	74.7	24.0	105.6	61.5	26.3	55.9	11.6	4.7
LnGrp LOS	D	F	E	E	E	C	F	E	C	E	B	A
Approach Vol, veh/h		690			768			1179			1905	
Approach Delay, s/veh		80.9			60.3			62.8			17.1	
Approach LOS		F			E			E			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	42.6	66.0	20.9	50.5	19.6	89.0	18.6	52.8
Change Period (Y+Rc), s	* 6.5	5.8	* 6.3	6.0	6.6	* 6.5	* 6.3	6.0
Max Green Setting (Gmax), s	* 30	60.2	* 20	46.0	19.4	* 70	* 20	46.0
Max Q Clear Time (g_c+I1), s	24.8	0.0	14.4	43.8	12.9	0.0	12.2	38.6
Green Ext Time (p_c), s	0.5	0.0	0.2	0.7	0.2	0.0	0.2	2.0

Intersection Summary	
HCM 6th Ctrl Delay	46.0
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Pattern 50 (Weekday PM Peak) 25 B
2216: KY-1747 & US-31E

08/08/2022

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	84	819	355	554	861	76	129	1124	153	203	633	406
Future Volume (veh/h)	84	819	355	554	861	76	129	1124	153	203	633	406
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	88	853	370	577	897	79	134	1171	159	211	659	423
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	139	704	525	569	940	83	210	1101	491	237	1154	776
Arrive On Green	0.08	0.20	0.20	0.16	0.28	0.28	0.12	0.31	0.31	0.04	0.11	0.11
Sat Flow, veh/h	1781	3554	1585	3456	3304	291	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	88	853	370	577	482	494	134	1171	159	211	659	423
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1818	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	7.2	29.7	29.7	24.7	40.0	40.0	10.8	46.5	8.6	17.7	26.5	14.3
Cycle Q Clear(g_c), s	7.2	29.7	29.7	24.7	40.0	40.0	10.8	46.5	8.6	17.7	26.5	14.3
Prop In Lane	1.00		1.00	1.00		0.16	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	139	704	525	569	506	518	210	1101	491	237	1154	776
V/C Ratio(X)	0.63	1.21	0.71	1.01	0.95	0.95	0.64	1.06	0.32	0.89	0.57	0.55
Avail Cap(c_a), veh/h	139	704	525	569	506	518	210	1101	491	270	1154	776
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	0.79	0.79	0.79	1.00	1.00	1.00	0.76	0.76	0.76
Uniform Delay (d), s/veh	67.1	60.1	43.8	62.7	52.7	52.7	63.1	51.8	22.1	70.6	57.0	12.6
Incr Delay (d2), s/veh	10.4	108.4	7.8	37.1	25.9	25.5	6.7	45.8	1.7	22.6	1.6	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	23.7	12.9	13.6	21.0	21.4	5.2	27.1	3.4	10.0	12.9	6.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	77.4	168.6	51.6	99.7	78.5	78.2	69.8	97.6	23.8	93.2	58.6	14.7
LnGrp LOS	E	F	D	F	E	E	E	F	C	F	E	B
Approach Vol, veh/h		1311			1553			1464			1293	
Approach Delay, s/veh		129.4			86.3			87.0			49.9	
Approach LOS		F			F			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	32.0	37.0	25.0	56.0	19.0	50.0	27.2	53.8
Change Period (Y+Rc), s	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3
Max Green Setting (Gmax), s	24.7	29.7	17.7	48.7	11.7	42.7	22.7	43.7
Max Q Clear Time (g_c+I1), s	26.7	0.0	12.8	28.5	9.2	0.0	19.7	48.5
Green Ext Time (p_c), s	0.0	0.0	0.2	9.0	0.1	0.0	0.3	0.0

Intersection Summary	
HCM 6th Ctrl Delay	88.2
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary
2217: S Watterson Trail & US-31E

06/17/2022

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	117	63	51	23	64	289	299	1101	132	35	835	25
Future Volume (veh/h)	117	63	51	23	64	289	299	1101	132	35	835	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	127	68	0	25	70	0	325	1197	143	38	908	27
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	145	78		36	101		447	1393	621	501	1866	832
Arrive On Green	0.12	0.12	0.00	0.07	0.07	0.00	0.10	0.39	0.39	0.24	0.52	0.52
Sat Flow, veh/h	1180	632	1585	486	1360	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	195	0	0	95	0	0	325	1197	143	38	908	27
Grp Sat Flow(s),veh/h/ln	1811	0	1585	1846	0	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	16.9	0.0	0.0	8.0	0.0	0.0	13.2	49.4	9.6	0.0	26.1	1.3
Cycle Q Clear(g_c), s	16.9	0.0	0.0	8.0	0.0	0.0	13.2	49.4	9.6	0.0	26.1	1.3
Prop In Lane	0.65		1.00	0.26		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	223	0		136	0		447	1393	621	501	1866	832
V/C Ratio(X)	0.87	0.00		0.70	0.00		0.73	0.86	0.23	0.08	0.49	0.03
Avail Cap(c_a), veh/h	344	0		305	0		548	1393	621	501	1866	832
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	68.9	0.0	0.0	72.3	0.0	0.0	18.1	44.6	32.5	40.8	24.2	18.4
Incr Delay (d2), s/veh	19.0	0.0	0.0	10.4	0.0	0.0	5.0	7.1	0.9	0.1	0.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.0	0.0	0.0	4.2	0.0	0.0	5.8	22.5	3.8	1.1	11.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	87.9	0.0	0.0	82.8	0.0	0.0	23.1	51.7	33.4	40.9	25.2	18.4
LnGrp LOS	F	A		F	A		C	D	C	D	C	B
Approach Vol, veh/h		195			95			1665			973	
Approach Delay, s/veh		87.9			82.8			44.6			25.6	
Approach LOS		F			F			D			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	24.0	91.3		26.3	45.3	70.0		18.4				
Change Period (Y+Rc), s	7.3	7.3		6.6	7.3	7.3		6.6				
Max Green Setting (Gmax), s	25.7	49.7		30.4	12.7	62.7		26.4				
Max Q Clear Time (g_c+I1), s	15.2	0.0		18.9	2.0	0.0		10.0				
Green Ext Time (p_c), s	1.4	0.0		0.8	0.1	0.0		0.4				

Intersection Summary	
HCM 6th Ctrl Delay	42.4
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.
Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Pattern 50 (Weekday PM Peak) 25 B
3003: KY-1747 & S Stony Brook Dr 08/08/2022

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	162	57	1232	156	133	1390
Future Volume (veh/h)	162	57	1232	156	133	1390
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	176	62	1339	170	145	1511
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	212	189	2288	1209	171	2802
Arrive On Green	0.12	0.12	0.64	0.64	0.10	0.79
Sat Flow, veh/h	1781	1585	3647	1585	1781	3647
Grp Volume(v), veh/h	176	62	1339	170	145	1511
Grp Sat Flow(s),veh/h/ln	1781	1585	1777	1585	1781	1777
Q Serve(g_s), s	14.5	5.4	32.3	4.3	12.0	23.5
Cycle Q Clear(g_c), s	14.5	5.4	32.3	4.3	12.0	23.5
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	212	189	2288	1209	171	2802
V/C Ratio(X)	0.83	0.33	0.59	0.14	0.85	0.54
Avail Cap(c_a), veh/h	361	321	2288	1209	281	2802
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.21	0.21	1.00	1.00
Uniform Delay (d), s/veh	64.6	60.6	15.3	4.7	66.7	5.8
Incr Delay (d2), s/veh	15.9	2.1	0.2	0.1	15.9	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.5	5.0	12.2	2.2	6.1	7.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	80.5	62.7	15.5	4.8	82.6	6.6
LnGrp LOS	F	E	B	A	F	A
Approach Vol, veh/h	238		1509			1656
Approach Delay, s/veh	75.9		14.3			13.2
Approach LOS	E		B			B
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	21.7	103.9		24.4		125.6
Change Period (Y+Rc), s	7.3	7.3		6.6		7.3
Max Green Setting (Gmax), s	23.7	74.7		30.4		105.7
Max Q Clear Time (g_c+I1), s	14.0	0.0		16.5		0.0
Green Ext Time (p_c), s	0.4	0.0		1.4		0.0
Intersection Summary						
HCM 6th Ctrl Delay			18.1			
HCM 6th LOS			B			

Pattern 50 (Weekday PM Peak) 25 B 2025 Build 1:05 pm 08/08/2022 4700 Hurstbourne Pkwy
DBZ

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HCM 6th Signalized Intersection Summary
3004: KY-1747 & Watterson Trail

06/17/2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	127	406	102	153	371	183	100	984	85	244	1395	158
Future Volume (veh/h)	127	406	102	153	371	183	100	984	85	244	1395	158
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	138	441	111	166	403	199	109	1070	92	265	1516	172
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	208	462	392	197	486	412	129	1189	530	357	1628	726
Arrive On Green	0.07	0.25	0.25	0.08	0.26	0.26	0.07	0.33	0.33	0.40	0.92	0.92
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	138	441	111	166	403	199	109	1070	92	265	1516	172
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	10.2	41.8	10.2	12.4	36.6	12.2	10.9	51.6	5.7	22.8	43.8	2.1
Cycle Q Clear(g_c), s	10.2	41.8	10.2	12.4	36.6	12.2	10.9	51.6	5.7	22.8	43.8	2.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	208	462	392	197	486	412	129	1189	530	357	1628	726
V/C Ratio(X)	0.66	0.95	0.28	0.84	0.83	0.48	0.85	0.90	0.17	0.74	0.93	0.24
Avail Cap(c_a), veh/h	281	478	405	248	486	412	192	1189	530	357	1628	726
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67
Uniform Delay (d), s/veh	48.5	66.7	54.8	50.2	62.8	22.8	82.5	57.0	25.5	50.0	5.9	4.2
Incr Delay (d2), s/veh	3.6	29.6	0.6	18.4	11.9	1.3	23.1	11.0	0.7	5.9	8.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	23.7	4.2	6.6	19.0	4.8	5.8	24.6	3.0	9.2	4.8	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.0	96.3	55.4	68.6	74.7	24.0	105.6	68.0	26.3	55.9	13.9	4.7
LnGrp LOS	D	F	E	E	E	C	F	E	C	E	B	A
Approach Vol, veh/h		690			768			1271			1953	
Approach Delay, s/veh		80.9			60.3			68.2			18.8	
Approach LOS		F			E			E			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	42.6	66.0	20.9	50.5	19.6	89.0	18.6	52.8
Change Period (Y+Rc), s	* 6.5	5.8	* 6.3	6.0	6.6	* 6.5	* 6.3	6.0
Max Green Setting (Gmax), s	* 30	60.2	* 20	46.0	19.4	* 70	* 20	46.0
Max Q Clear Time (g_c+I1), s	24.8	0.0	14.4	43.8	12.9	0.0	12.2	38.6
Green Ext Time (p_c), s	0.5	0.0	0.2	0.7	0.2	0.0	0.2	2.0

Intersection Summary	
HCM 6th Ctrl Delay	48.2
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Pattern 50 (Weekday PM Peak) 25 B 2025 Build 6:12 pm 06/17/2022 4700 Hurstbourne Pkwy
DBZ

Synchro 11 Report
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HCM 6th Signalized Intersection Summary
2216: KY-1747 & US-31E

06/19/2022

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	88	858	373	572	872	80	136	1181	161	213	665	408
Future Volume (veh/h)	88	858	373	572	872	80	136	1181	161	213	665	408
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	92	894	389	596	908	83	142	1230	168	222	693	425
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	139	704	533	569	937	86	210	1082	483	246	1154	776
Arrive On Green	0.08	0.20	0.20	0.16	0.28	0.28	0.12	0.30	0.30	0.09	0.22	0.22
Sat Flow, veh/h	1781	3554	1585	3456	3292	301	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	92	894	389	596	490	501	142	1230	168	222	693	425
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1816	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	7.5	29.7	29.7	24.7	40.9	40.9	11.5	45.7	9.2	18.5	26.3	14.0
Cycle Q Clear(g_c), s	7.5	29.7	29.7	24.7	40.9	40.9	11.5	45.7	9.2	18.5	26.3	14.0
Prop In Lane	1.00		1.00	1.00		0.17	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	139	704	533	569	506	517	210	1082	483	246	1154	776
V/C Ratio(X)	0.66	1.27	0.73	1.05	0.97	0.97	0.68	1.14	0.35	0.90	0.60	0.55
Avail Cap(c_a), veh/h	139	704	533	569	506	517	210	1082	483	270	1154	776
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	0.78	0.78	0.78	1.00	1.00	1.00	0.76	0.76	0.76
Uniform Delay (d), s/veh	67.2	60.1	43.8	62.7	53.0	53.0	63.4	52.2	22.7	67.1	49.9	10.8
Incr Delay (d2), s/veh	12.5	132.8	8.5	46.4	28.5	28.1	8.8	73.1	2.0	24.8	1.8	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	26.1	13.7	14.3	21.7	22.2	5.6	30.8	3.7	10.3	12.3	5.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	79.7	192.9	52.3	109.0	81.5	81.1	72.2	125.2	24.7	91.9	51.7	12.9
LnGrp LOS	E	F	D	F	F	F	E	F	C	F	D	B
Approach Vol, veh/h		1375			1587			1540			1340	
Approach Delay, s/veh		145.6			91.7			109.4			46.0	
Approach LOS		F			F			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	32.0	37.0	25.0	56.0	19.0	50.0	28.0	53.0
Change Period (Y+Rc), s	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3
Max Green Setting (Gmax), s	24.7	29.7	17.7	48.7	11.7	42.7	22.7	43.7
Max Q Clear Time (g_c+I1), s	26.7	0.0	13.5	28.3	9.5	0.0	20.5	47.7
Green Ext Time (p_c), s	0.0	0.0	0.2	9.4	0.1	0.0	0.2	0.0

Intersection Summary	
HCM 6th Ctrl Delay	98.6
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary
2217: S Watterson Trail & US-31E

06/17/2022

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	123	66	54	24	67	304	314	1093	139	37	840	26
Future Volume (veh/h)	123	66	54	24	67	304	314	1093	139	37	840	26
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	134	72	0	26	73	0	341	1188	151	40	913	28
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	152	82		36	101		447	1393	621	492	1820	812
Arrive On Green	0.13	0.13	0.00	0.07	0.07	0.00	0.11	0.39	0.39	0.23	0.51	0.51
Sat Flow, veh/h	1178	633	1585	485	1361	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	206	0	0	99	0	0	341	1188	151	40	913	28
Grp Sat Flow(s),veh/h/ln	1811	0	1585	1846	0	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	17.9	0.0	0.0	8.4	0.0	0.0	14.3	48.9	10.2	0.0	27.0	1.4
Cycle Q Clear(g_c), s	17.9	0.0	0.0	8.4	0.0	0.0	14.3	48.9	10.2	0.0	27.0	1.4
Prop In Lane	0.65		1.00	0.26		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	234	0		137	0		447	1393	621	492	1820	812
V/C Ratio(X)	0.88	0.00		0.72	0.00		0.76	0.85	0.24	0.08	0.50	0.03
Avail Cap(c_a), veh/h	344	0		305	0		536	1393	621	492	1820	812
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	68.4	0.0	0.0	72.5	0.0	0.0	19.4	44.4	32.7	41.3	25.6	19.4
Incr Delay (d2), s/veh	20.2	0.0	0.0	11.7	0.0	0.0	6.6	6.8	0.9	0.1	1.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.6	0.0	0.0	4.4	0.0	0.0	6.4	22.3	4.1	1.2	11.4	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	88.7	0.0	0.0	84.2	0.0	0.0	26.0	51.2	33.6	41.4	26.6	19.5
LnGrp LOS	F	A		F	A		C	D	C	D	C	B
Approach Vol, veh/h		206			99			1680			981	
Approach Delay, s/veh		88.7			84.2			44.5			27.0	
Approach LOS		F			F			D			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	25.0	89.3		27.3	44.3	70.0		18.5				
Change Period (Y+Rc), s	7.3	7.3		6.6	7.3	7.3		6.6				
Max Green Setting (Gmax), s	25.7	49.7		30.4	12.7	62.7		26.4				
Max Q Clear Time (g_c+I1), s	16.3	0.0		19.9	2.0	0.0		10.4				
Green Ext Time (p_c), s	1.4	0.0		0.8	0.1	0.0		0.4				

Intersection Summary	
HCM 6th Ctrl Delay	43.1
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.
Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
3003: KY-1747 & S Stony Brook Dr

06/17/2022

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	170	60	1220	164	140	1418
Future Volume (veh/h)	170	60	1220	164	140	1418
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	185	65	1326	178	152	1541
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	221	197	2256	1203	178	2783
Arrive On Green	0.12	0.12	0.63	0.63	0.10	0.78
Sat Flow, veh/h	1781	1585	3647	1585	1781	3647
Grp Volume(v), veh/h	185	65	1326	178	152	1541
Grp Sat Flow(s),veh/h/ln	1781	1585	1777	1585	1781	1777
Q Serve(g_s), s	15.2	5.6	32.6	4.6	12.6	24.9
Cycle Q Clear(g_c), s	15.2	5.6	32.6	4.6	12.6	24.9
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	221	197	2256	1203	178	2783
V/C Ratio(X)	0.84	0.33	0.59	0.15	0.86	0.55
Avail Cap(c_a), veh/h	361	321	2256	1203	281	2783
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.09	0.09	1.00	1.00
Uniform Delay (d), s/veh	64.2	60.0	16.0	4.9	66.4	6.2
Incr Delay (d2), s/veh	16.2	2.1	0.1	0.0	17.2	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.9	5.2	12.4	2.3	6.5	7.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	80.4	62.1	16.1	4.9	83.6	7.0
LnGrp LOS	F	E	B	A	F	A
Approach Vol, veh/h	250		1504			1693
Approach Delay, s/veh	75.7		14.7			13.9
Approach LOS	E		B			B
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	22.3	102.5		25.2		124.8
Change Period (Y+Rc), s	7.3	7.3		6.6		7.3
Max Green Setting (Gmax), s	23.7	74.7		30.4		105.7
Max Q Clear Time (g_c+I1), s	14.6	0.0		17.2		0.0
Green Ext Time (p_c), s	0.4	0.0		1.4		0.0
Intersection Summary						
HCM 6th Ctrl Delay			18.8			
HCM 6th LOS			B			

Pattern 50 (Weekday PM Peak) 35 NB 2035 No Build 6:20 pm 06/17/2022 4700 Hurstbourne Pkwy
DBZ

Synchro 11 Report
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HCM 6th Signalized Intersection Summary
3004: KY-1747 & Watterson Trail

06/17/2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	133	427	107	160	390	192	114	1007	91	256	1420	166
Future Volume (veh/h)	133	427	107	160	390	192	114	1007	91	256	1420	166
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	145	464	116	174	424	209	124	1095	99	278	1543	180
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	209	478	405	197	502	426	144	1189	530	338	1559	696
Arrive On Green	0.07	0.26	0.26	0.08	0.27	0.27	0.08	0.33	0.33	0.38	0.88	0.88
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	145	464	116	174	424	209	124	1095	99	278	1543	180
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	10.5	44.2	10.6	12.9	38.6	12.9	12.4	53.4	6.2	25.4	72.7	3.2
Cycle Q Clear(g_c), s	10.5	44.2	10.6	12.9	38.6	12.9	12.4	53.4	6.2	25.4	72.7	3.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	209	478	405	197	502	426	144	1189	530	338	1559	696
V/C Ratio(X)	0.69	0.97	0.29	0.88	0.84	0.49	0.86	0.92	0.19	0.82	0.99	0.26
Avail Cap(c_a), veh/h	278	478	405	243	502	426	192	1189	530	338	1559	696
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67
Uniform Delay (d), s/veh	47.8	66.3	53.8	49.4	62.3	23.1	81.7	57.6	25.4	53.2	10.6	6.4
Incr Delay (d2), s/veh	4.7	33.7	0.5	25.4	12.9	1.2	27.6	13.0	0.8	11.0	16.3	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.0	25.5	4.3	7.2	20.1	5.1	6.8	25.7	3.2	10.7	8.1	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.5	100.0	54.4	74.8	75.1	24.4	109.3	70.6	26.2	64.2	27.0	7.0
LnGrp LOS	D	F	D	E	E	C	F	E	C	E	C	A
Approach Vol, veh/h		725			807			1318			2001	
Approach Delay, s/veh		83.2			61.9			70.9			30.3	
Approach LOS		F			E			E			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	40.6	66.0	21.4	52.0	21.1	85.5	19.0	54.3
Change Period (Y+Rc), s	* 6.5	5.8	* 6.3	6.0	6.6	* 6.5	* 6.3	6.0
Max Green Setting (Gmax), s	* 30	60.2	* 20	46.0	19.4	* 70	* 20	46.0
Max Q Clear Time (g_c+I1), s	27.4	0.0	14.9	46.2	14.4	0.0	12.5	40.6
Green Ext Time (p_c), s	0.3	0.0	0.2	0.0	0.2	0.0	0.2	1.7

Intersection Summary	
HCM 6th Ctrl Delay	54.5
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Pattern 50 (Weekday PM Peak) 35 B
2216: KY-1747 & US-31E

08/08/2022

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	88	858	373	582	918	80	136	1181	161	213	665	426
Future Volume (veh/h)	88	858	373	582	918	80	136	1181	161	213	665	426
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	92	894	389	606	956	83	142	1230	168	222	693	444
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	139	704	533	569	942	82	210	1082	483	246	1154	776
Arrive On Green	0.08	0.20	0.20	0.16	0.28	0.28	0.12	0.30	0.30	0.09	0.22	0.22
Sat Flow, veh/h	1781	3554	1585	3456	3308	287	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	92	894	389	606	513	526	142	1230	168	222	693	444
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1819	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	7.5	29.7	29.7	24.7	42.7	42.7	11.5	45.7	9.2	18.5	26.3	14.8
Cycle Q Clear(g_c), s	7.5	29.7	29.7	24.7	42.7	42.7	11.5	45.7	9.2	18.5	26.3	14.8
Prop In Lane	1.00		1.00	1.00		0.16	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	139	704	533	569	506	518	210	1082	483	246	1154	776
V/C Ratio(X)	0.66	1.27	0.73	1.06	1.02	1.02	0.68	1.14	0.35	0.90	0.60	0.57
Avail Cap(c_a), veh/h	139	704	533	569	506	518	210	1082	483	270	1154	776
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	0.76	0.76	0.76	1.00	1.00	1.00	0.76	0.76	0.76
Uniform Delay (d), s/veh	67.2	60.1	43.8	62.7	53.7	53.7	63.4	52.2	22.7	67.1	49.9	11.0
Incr Delay (d2), s/veh	12.5	132.8	8.5	51.6	38.7	38.3	8.8	73.1	2.0	24.8	1.8	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	26.1	13.7	14.7	24.0	24.5	5.6	30.8	3.7	10.3	12.3	5.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	79.7	192.9	52.3	114.2	92.3	92.0	72.2	125.2	24.7	91.9	51.7	13.3
LnGrp LOS	E	F	D	F	F	F	E	F	C	F	D	B
Approach Vol, veh/h		1375			1645			1540			1359	
Approach Delay, s/veh		145.6			100.3			109.4			45.7	
Approach LOS		F			F			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	32.0	37.0	25.0	56.0	19.0	50.0	28.0	53.0
Change Period (Y+Rc), s	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3
Max Green Setting (Gmax), s	24.7	29.7	17.7	48.7	11.7	42.7	22.7	43.7
Max Q Clear Time (g_c+I1), s	26.7	0.0	13.5	28.3	9.5	0.0	20.5	47.7
Green Ext Time (p_c), s	0.0	0.0	0.2	9.6	0.1	0.0	0.2	0.0

Intersection Summary	
HCM 6th Ctrl Delay	100.6
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary
2217: S Watterson Trail & US-31E

06/17/2022

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	123	66	54	24	67	304	314	1154	139	37	876	26
Future Volume (veh/h)	123	66	54	24	67	304	314	1154	139	37	876	26
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	134	72	0	26	73	0	341	1254	151	40	952	28
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	152	82		36	101		434	1393	621	480	1820	812
Arrive On Green	0.13	0.13	0.00	0.07	0.07	0.00	0.11	0.39	0.39	0.23	0.51	0.51
Sat Flow, veh/h	1178	633	1585	485	1361	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	206	0	0	99	0	0	341	1254	151	40	952	28
Grp Sat Flow(s),veh/h/ln	1811	0	1585	1846	0	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	17.9	0.0	0.0	8.4	0.0	0.0	14.3	53.1	10.2	0.0	28.6	1.4
Cycle Q Clear(g_c), s	17.9	0.0	0.0	8.4	0.0	0.0	14.3	53.1	10.2	0.0	28.6	1.4
Prop In Lane	0.65		1.00	0.26		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	234	0		137	0		434	1393	621	480	1820	812
V/C Ratio(X)	0.88	0.00		0.72	0.00		0.79	0.90	0.24	0.08	0.52	0.03
Avail Cap(c_a), veh/h	344	0		305	0		523	1393	621	480	1820	812
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	68.4	0.0	0.0	72.5	0.0	0.0	20.3	45.7	32.7	44.5	26.0	19.4
Incr Delay (d2), s/veh	20.2	0.0	0.0	11.7	0.0	0.0	7.9	9.6	0.9	0.1	1.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.6	0.0	0.0	4.4	0.0	0.0	6.5	24.6	4.1	1.2	12.1	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	88.7	0.0	0.0	84.2	0.0	0.0	28.3	55.3	33.6	44.6	27.1	19.5
LnGrp LOS	F	A		F	A		C	E	C	D	C	B
Approach Vol, veh/h		206			99			1746			1020	
Approach Delay, s/veh		88.7			84.2			48.2			27.6	
Approach LOS		F			F			D			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	25.0	89.3		27.3	44.3	70.0		18.5				
Change Period (Y+Rc), s	7.3	7.3		6.6	7.3	7.3		6.6				
Max Green Setting (Gmax), s	25.7	49.7		30.4	12.7	62.7		26.4				
Max Q Clear Time (g_c+I1), s	16.3	0.0		19.9	2.0	0.0		10.4				
Green Ext Time (p_c), s	1.4	0.0		0.8	0.1	0.0		0.4				

Intersection Summary	
HCM 6th Ctrl Delay	45.2
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.
Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Pattern 50 (Weekday PM Peak) 35 B
3003: KY-1747 & S Stony Brook Dr 08/08/2022

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	170	60	1294	164	140	1459
Future Volume (veh/h)	170	60	1294	164	140	1459
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	185	65	1407	178	152	1586
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	221	197	2256	1203	178	2783
Arrive On Green	0.12	0.12	0.63	0.63	0.10	0.78
Sat Flow, veh/h	1781	1585	3647	1585	1781	3647
Grp Volume(v), veh/h	185	65	1407	178	152	1586
Grp Sat Flow(s),veh/h/ln	1781	1585	1777	1585	1781	1777
Q Serve(g_s), s	15.2	5.6	35.9	4.6	12.6	26.2
Cycle Q Clear(g_c), s	15.2	5.6	35.9	4.6	12.6	26.2
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	221	197	2256	1203	178	2783
V/C Ratio(X)	0.84	0.33	0.62	0.15	0.86	0.57
Avail Cap(c_a), veh/h	361	321	2256	1203	281	2783
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.10	0.10	1.00	1.00
Uniform Delay (d), s/veh	64.2	60.0	16.6	4.9	66.4	6.4
Incr Delay (d2), s/veh	16.2	2.1	0.1	0.0	17.2	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.9	5.2	13.6	2.3	6.5	8.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	80.4	62.1	16.7	4.9	83.6	7.2
LnGrp LOS	F	E	B	A	F	A
Approach Vol, veh/h	250		1585			1738
Approach Delay, s/veh	75.7		15.4			13.9
Approach LOS	E		B			B
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	22.3	102.5		25.2		124.8
Change Period (Y+Rc), s	7.3	7.3		6.6		7.3
Max Green Setting (Gmax), s	23.7	74.7		30.4		105.7
Max Q Clear Time (g_c+I1), s	14.6	0.0		17.2		0.0
Green Ext Time (p_c), s	0.4	0.0		1.4		0.0
Intersection Summary						
HCM 6th Ctrl Delay			18.9			
HCM 6th LOS			B			

Pattern 50 (Weekday PM Peak) 35 B 2035 Build 1:07 pm 08/08/2022 4700 Hurstbourne Pkwy
DBZ
Synchro 11 Report
Page 1

HCM 6th Signalized Intersection Summary
3004: KY-1747 & Watterson Trail

06/17/2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	133	427	107	160	390	192	114	1033	91	256	1464	166
Future Volume (veh/h)	133	427	107	160	390	192	114	1033	91	256	1464	166
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	145	464	116	174	424	209	124	1123	99	278	1591	180
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	209	478	405	197	502	426	144	1189	530	338	1559	696
Arrive On Green	0.07	0.26	0.26	0.08	0.27	0.27	0.08	0.33	0.33	0.38	0.88	0.88
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	145	464	116	174	424	209	124	1123	99	278	1591	180
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	10.5	44.2	10.6	12.9	38.6	12.9	12.4	55.3	6.2	25.4	79.0	3.2
Cycle Q Clear(g_c), s	10.5	44.2	10.6	12.9	38.6	12.9	12.4	55.3	6.2	25.4	79.0	3.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	209	478	405	197	502	426	144	1189	530	338	1559	696
V/C Ratio(X)	0.69	0.97	0.29	0.88	0.84	0.49	0.86	0.94	0.19	0.82	1.02	0.26
Avail Cap(c_a), veh/h	278	478	405	243	502	426	192	1189	530	338	1559	696
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67
Uniform Delay (d), s/veh	47.8	66.3	53.8	49.4	62.3	23.1	81.7	58.3	25.4	53.2	11.0	6.4
Incr Delay (d2), s/veh	4.7	33.7	0.5	25.4	12.9	1.2	27.6	15.8	0.8	11.0	23.9	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.0	25.5	4.3	7.2	20.1	5.1	6.8	27.0	3.2	10.7	9.8	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.5	100.0	54.4	74.8	75.1	24.4	109.3	74.1	26.2	64.2	35.0	7.0
LnGrp LOS	D	F	D	E	E	C	F	E	C	E	F	A
Approach Vol, veh/h		725			807			1346			2049	
Approach Delay, s/veh		83.2			61.9			73.8			36.5	
Approach LOS		F			E			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	40.6	66.0	21.4	52.0	21.1	85.5	19.0	54.3
Change Period (Y+Rc), s	* 6.5	5.8	* 6.3	6.0	6.6	* 6.5	* 6.3	6.0
Max Green Setting (Gmax), s	* 30	60.2	* 20	46.0	19.4	* 70	* 20	46.0
Max Q Clear Time (g_c+I1), s	27.4	0.0	14.9	46.2	14.4	0.0	12.5	40.6
Green Ext Time (p_c), s	0.3	0.0	0.2	0.0	0.2	0.0	0.2	1.7

Intersection Summary	
HCM 6th Ctrl Delay	57.7
HCM 6th LOS	E

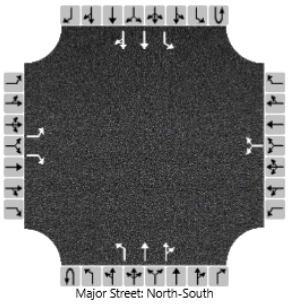
Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	Diane Zimmerman	Intersection	Hurstbourne at North Ent
Agency/Co.	Diane B. Zimmerman Traffic Engineering	Jurisdiction	
Date Performed	8/8/2022	East/West Street	North Ent/Morning Pt
Analysis Year	2025	North/South Street	Hurstbourne Parkway
Time Analyzed	AM Peak	Peak Hour Factor	0.94
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	4700 Hurstbourne		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	0	1		0	1	0	0	1	2	0	0	1	2	0
Configuration		L		R			LR			L	T	TR		L	T	TR
Volume (veh/h)		48		24		1		2	0	5	1083	5	0	3	641	9
Percent Heavy Vehicles (%)		0		0		0		0	3	0			0	0		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized	No															
Median Type | Storage	Left Only								1							

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5		6.9		7.5		6.9		4.1				4.1		
Critical Headway (sec)		7.50		6.90		7.50		6.90		4.10				4.10		
Base Follow-Up Headway (sec)		3.5		3.3		3.5		3.3		2.2				2.2		
Follow-Up Headway (sec)		3.50		3.30		3.50		3.30		2.20				2.20		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		51		26			3			5				3		
Capacity, c (veh/h)		252		656			292			913				611		
v/c Ratio		0.20		0.04			0.01			0.01				0.01		
95% Queue Length, Q_{95} (veh)		0.7		0.1			0.0			0.0				0.0		
Control Delay (s/veh)		22.9		10.7			17.5			9.0				10.9		
Level of Service (LOS)		C		B			C			A				B		
Approach Delay (s/veh)	18.8				17.5				0.0				0.1			
Approach LOS	C				C				A				A			

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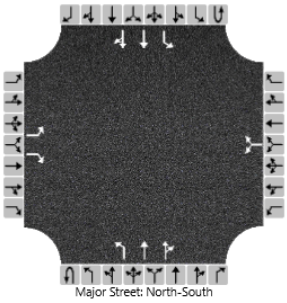
HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	Diane Zimmerman	Intersection	Hurstbourne at North Ent
Agency/Co.	Diane B. Zimmerman Traffic Engineering	Jurisdiction	
Date Performed	8/8/2022	East/West Street	North Ent/Morning Pt
Analysis Year	2035	North/South Street	Hurstbourne Parkway
Time Analyzed	AM Peak	Peak Hour Factor	0.94
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	4700 Hurstbourne		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	0	1		0	1	0	0	1	2	0	0	1	2	0
Configuration		L		R			LR			L	T	TR		L	T	TR
Volume (veh/h)		48		24		1		2	0	5	1138	5	0	3	674	9
Percent Heavy Vehicles (%)		0		0		0		0	3	0			0	0		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized	No															
Median Type | Storage	Left Only								1							

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5		6.9		7.5		6.9		4.1				4.1		
Critical Headway (sec)		7.50		6.90		7.50		6.90		4.10				4.10		
Base Follow-Up Headway (sec)		3.5		3.3		3.5		3.3		2.2				2.2		
Follow-Up Headway (sec)		3.50		3.30		3.50		3.30		2.20				2.20		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		51		26			3			5				3		
Capacity, c (veh/h)		237		639			273			886				581		
v/c Ratio		0.22		0.04			0.01			0.01				0.01		
95% Queue Length, Q_{95} (veh)		0.8		0.1			0.0			0.0				0.0		
Control Delay (s/veh)		24.3		10.9			18.3			9.1				11.2		
Level of Service (LOS)		C		B			C			A				B		
Approach Delay (s/veh)	19.8				18.3				0.0				0.0			
Approach LOS	C				C				A				A			

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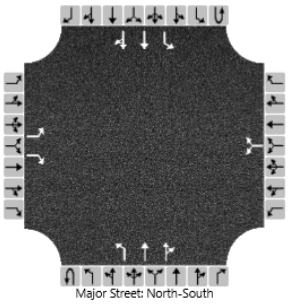
HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	Diane Zimmerman	Intersection	Hurstbourne at North Ent
Agency/Co.	Diane B. Zimmerman Traffic Engineering	Jurisdiction	
Date Performed	8/8/2022	East/West Street	North Ent/Morning Pt
Analysis Year	2025	North/South Street	Hurstbourne Parkway
Time Analyzed	PM Peak	Peak Hour Factor	0.98
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	4700 Hurstbourne		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	0	1		0	1	0	0	1	2	0	0	1	2	0
Configuration		L		R			LR			L	T	TR		L	T	TR
Volume (veh/h)		19		10		3		11	0	16	894	5	0	7	1197	33
Percent Heavy Vehicles (%)		0		0		0		0	3	0			0	0		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized	No															
Median Type | Storage	Left Only								1							

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5		6.9		7.5		6.9		4.1				4.1		
Critical Headway (sec)		7.50		6.90		7.50		6.90		4.10				4.10		
Base Follow-Up Headway (sec)		3.5		3.3		3.5		3.3		2.2				2.2		
Follow-Up Headway (sec)		3.50		3.30		3.50		3.30		2.20				2.20		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		19		10			14			16				7		
Capacity, c (veh/h)		141		431			386			561				752		
v/c Ratio		0.14		0.02			0.04			0.03				0.01		
95% Queue Length, Q_{95} (veh)		0.5		0.1			0.1			0.1				0.0		
Control Delay (s/veh)		34.6		13.6			14.7			11.6				9.8		
Level of Service (LOS)		D		B			B			B				A		
Approach Delay (s/veh)	27.3				14.7				0.2				0.1			
Approach LOS	D				B				A				A			

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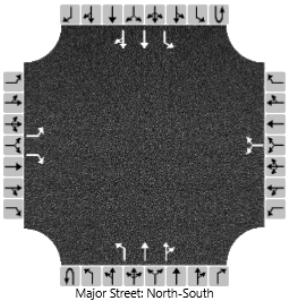
HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	Diane Zimmerman	Intersection	Hurstbourne at North Ent
Agency/Co.	Diane B. Zimmerman Traffic Engineering	Jurisdiction	
Date Performed	8/8/2022	East/West Street	North Ent/Morning Pt
Analysis Year	2035	North/South Street	Hurstbourne Parkway
Time Analyzed	PM Peak	Peak Hour Factor	0.98
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	4700 Hurstbourne		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	0	1		0	1	0	0	1	2	0	0	1	2	0
Configuration		L		R			LR			L	T	TR		L	T	TR
Volume (veh/h)		19		10		3		11	0	16	939	5	0	7	1258	33
Percent Heavy Vehicles (%)		0		0		0		0	3	0			0	0		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized	No															
Median Type | Storage	Left Only								1							

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5		6.9		7.5		6.9		4.1				4.1		
Critical Headway (sec)		7.50		6.90		7.50		6.90		4.10				4.10		
Base Follow-Up Headway (sec)		3.5		3.3		3.5		3.3		2.2				2.2		
Follow-Up Headway (sec)		3.50		3.30		3.50		3.30		2.20				2.20		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		19		10			14			16				7		
Capacity, c (veh/h)		129		411			366			531				723		
v/c Ratio		0.15		0.02			0.04			0.03				0.01		
95% Queue Length, Q_{95} (veh)		0.5		0.1			0.1			0.1				0.0		
Control Delay (s/veh)		37.7		14.0			15.2			12.0				10.0		
Level of Service (LOS)		E		B			C			B				B		
Approach Delay (s/veh)	29.6				15.2				0.2				0.1			
Approach LOS	D				C				A				A			

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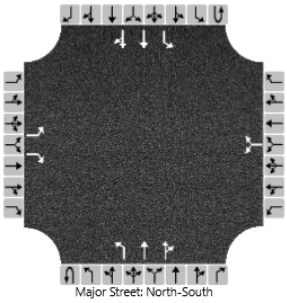
HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	Diane Zimmerman	Intersection	Hurstbourne at South Ent
Agency/Co.	Diane B. Zimmerman Traffic Engineering	Jurisdiction	
Date Performed	8/8/2022	East/West Street	South Ent/4901 Hurst
Analysis Year	2025	North/South Street	Hurstbourne Parkway
Time Analyzed	AM Peak	Peak Hour Factor	0.94
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	4700 Hurstbourne		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	0	1		0	1	0	0	1	2	0	0	1	2	0
Configuration		L		R			LR			L	T	TR		L	T	TR
Volume (veh/h)		17		80		3		6	0	15	1070	3	0	2	666	3
Percent Heavy Vehicles (%)		0		0		0		0	3	0			0	0		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized	No															
Median Type | Storage	Left Only								1							

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5		6.9		7.5		6.9		4.1				4.1		
Critical Headway (sec)		7.50		6.90		7.50		6.90		4.10				4.10		
Base Follow-Up Headway (sec)		3.5		3.3		3.5		3.3		2.2				2.2		
Follow-Up Headway (sec)		3.50		3.30		3.50		3.30		2.20				2.20		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		18		85			10			16				2		
Capacity, c (veh/h)		241		646			284			897				619		
v/c Ratio		0.07		0.13			0.03			0.02				0.00		
95% Queue Length, Q_{95} (veh)		0.2		0.5			0.1			0.1				0.0		
Control Delay (s/veh)		21.1		11.4			18.1			9.1				10.8		
Level of Service (LOS)		C		B			C			A				B		
Approach Delay (s/veh)	13.1				18.1				0.1				0.0			
Approach LOS	B				C				A				A			

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HCS Two-Way Stop-Control Report

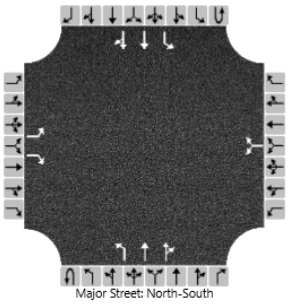
General Information

Analyst	Diane Zimmerman
Agency/Co.	Diane B. Zimmerman Traffic Engineering
Date Performed	8/8/2022
Analysis Year	2035
Time Analyzed	AM Peak
Intersection Orientation	North-South
Project Description	4700 Hurstbourne

Site Information

Intersection	Hurstbourne at South Ent
Jurisdiction	
East/West Street	South Ent/4901 Hurst
North/South Street	Hurstbourne Parkway
Peak Hour Factor	0.94
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	0	1		0	1	0	0	1	2	0	0	1	2	0
Configuration		L		R			LR			L	T	TR		L	T	TR
Volume (veh/h)		17		80		3		6	0	15	1124	3	0	2	266	3
Percent Heavy Vehicles (%)		0		0		0		0	3	0			0	0		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized	No															
Median Type | Storage	Left Only								1							

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5		6.9		7.5		6.9		4.1				4.1		
Critical Headway (sec)		7.50		6.90		7.50		6.90		4.10				4.10		
Base Follow-Up Headway (sec)		3.5		3.3		3.5		3.3		2.2				2.2		
Follow-Up Headway (sec)		3.50		3.30		3.50		3.30		2.20				2.20		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		18		85			10			16				2		
Capacity, c (veh/h)		334		885			282			1288				589		
v/c Ratio		0.05		0.10			0.03			0.01				0.00		
95% Queue Length, Q_{95} (veh)		0.2		0.3			0.1			0.0				0.0		
Control Delay (s/veh)		16.4		9.5			18.2			7.8				11.1		
Level of Service (LOS)		C		A			C			A				B		
Approach Delay (s/veh)	10.7				18.2				0.1				0.1			
Approach LOS	B				C				A				A			

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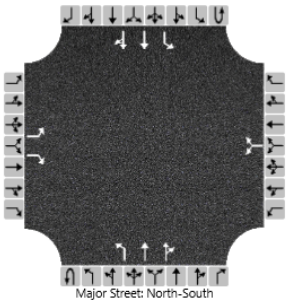
HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	Diane Zimmerman	Intersection	Hurstbourne at South Ent
Agency/Co.	Diane B. Zimmerman Traffic Engineering	Jurisdiction	
Date Performed	8/8/2022	East/West Street	South Ent/4901 Hurstbourne
Analysis Year	2025	North/South Street	Hurstbourne Parkway
Time Analyzed	PM Peak	Peak Hour Factor	0.98
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	4700 Hurstbourne		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	0	1		0	1	0	0	1	2	0	0	1	2	0
Configuration		L		R			LR			L	T	TR		L	T	TR
Volume (veh/h)		7		31		3		5	0	55	904	4	0	6	1193	11
Percent Heavy Vehicles (%)		0		0		0		0	3	0			0	0		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized	No															
Median Type | Storage	Left Only								1							

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5		6.9		7.5		6.9		4.1				4.1		
Critical Headway (sec)		7.50		6.90		7.50		6.90		4.10				4.10		
Base Follow-Up Headway (sec)		3.5		3.3		3.5		3.3		2.2				2.2		
Follow-Up Headway (sec)		3.50		3.30		3.50		3.30		2.20				2.20		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		7		32			8			56				6		
Capacity, c (veh/h)		136		440			275			574				746		
v/c Ratio		0.05		0.07			0.03			0.10				0.01		
95% Queue Length, Q_{95} (veh)		0.2		0.2			0.1			0.3				0.0		
Control Delay (s/veh)		33.0		13.8			18.5			11.9				9.9		
Level of Service (LOS)		D		B			C			B				A		
Approach Delay (s/veh)	17.4				18.5				0.7				0.0			
Approach LOS	C				C				A				A			

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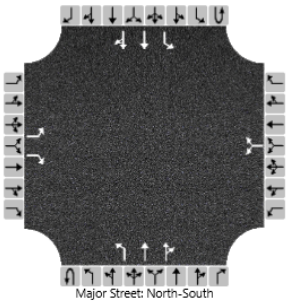
HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	Diane Zimmerman	Intersection	Hurstbourne at South Ent
Agency/Co.	Diane B. Zimmerman Traffic Engineering	Jurisdiction	
Date Performed	8/8/2022	East/West Street	South Ent/4901 Hurstbourne
Analysis Year	2035	North/South Street	Hurstbourne Parkway
Time Analyzed	PM Peak	Peak Hour Factor	0.98
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	4700 Hurstbourne		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	0	1		0	1	0	0	1	2	0	0	1	2	0
Configuration		L		R			LR			L	T	TR		L	T	TR
Volume (veh/h)		7		31		3		5	0	55	949	4	0	6	1253	11
Percent Heavy Vehicles (%)		0		0		0		0	3	0			0	0		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized	No															
Median Type | Storage	Left Only								1							

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5		6.9		7.5		6.9		4.1				4.1		
Critical Headway (sec)		7.50		6.90		7.50		6.90		4.10				4.10		
Base Follow-Up Headway (sec)		3.5		3.3		3.5		3.3		2.2				2.2		
Follow-Up Headway (sec)		3.50		3.30		3.50		3.30		2.20				2.20		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		7		32			8			56				6		
Capacity, c (veh/h)		125		420			258			544				717		
v/c Ratio		0.06		0.08			0.03			0.10				0.01		
95% Queue Length, Q_{95} (veh)		0.2		0.2			0.1			0.3				0.0		
Control Delay (s/veh)		35.6		14.3			19.4			12.4				10.1		
Level of Service (LOS)		E		B			C			B				B		
Approach Delay (s/veh)	18.2				19.4				0.7				0.0			
Approach LOS	C				C				A				A			

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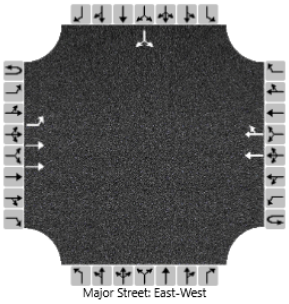
HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	Diane Zimmerman	Intersection	Bardstown at New Road
Agency/Co.	Diane B. Zimmerman Traffic Engineering	Jurisdiction	
Date Performed	8/8/2022	East/West Street	Bardstown Rd
Analysis Year	2025	North/South Street	New Road
Time Analyzed	AM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	4700 Hurstbourne		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	0	2	0		0	0	0		0	1	0
Configuration		L	T				T	TR							LR	
Volume (veh/h)	0	18	584				1359	0						0		90
Percent Heavy Vehicles (%)	3	0												0		0
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized																
Median Type | Storage	Left Only								1							

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.5		6.9
Critical Headway (sec)		4.10												6.80		6.90
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)		20													98	
Capacity, c (veh/h)		462													365	
v/c Ratio		0.04													0.27	
95% Queue Length, Q_{95} (veh)		0.1													1.1	
Control Delay (s/veh)		13.1													18.5	
Level of Service (LOS)		B													C	
Approach Delay (s/veh)	0.4												18.5			
Approach LOS	A												C			

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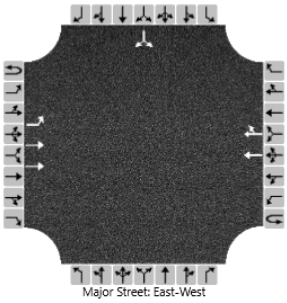
HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	Diane Zimmerman	Intersection	Bardstown at New Road
Agency/Co.	Diane B. Zimmerman Traffic Engineering	Jurisdiction	
Date Performed	8/8/2022	East/West Street	Bardstown Rd
Analysis Year	2035	North/South Street	New Road
Time Analyzed	AM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	4700 Hurstbourne		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	0	2	0		0	0	0		0	1	0
Configuration		L	T				T	TR							LR	
Volume (veh/h)	0	18	614				1429	0						0		90
Percent Heavy Vehicles (%)	3	0												0		0
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized																
Median Type | Storage	Left Only								1							

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.5		6.9
Critical Headway (sec)		4.10												6.80		6.90
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)		20													98	
Capacity, c (veh/h)		432													344	
v/c Ratio		0.05													0.28	
95% Queue Length, Q_{95} (veh)		0.1													1.1	
Control Delay (s/veh)		13.7													19.6	
Level of Service (LOS)		B													C	
Approach Delay (s/veh)	0.4												19.6			
Approach LOS	A												C			

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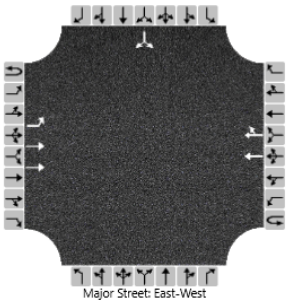
HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	Diane Zimmerman	Intersection	Bardstown at New Road
Agency/Co.	Diane B. Zimmerman Traffic Engineering	Jurisdiction	
Date Performed	8/8/2022	East/West Street	Bardstown Rd
Analysis Year	2025	North/South Street	New Road
Time Analyzed	PM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	4700 Hurstbourne		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	0	2	0		0	0	0		0	1	0
Configuration		L	T				T	TR							LR	
Volume (veh/h)	0	61	1406				793	0						0		36
Percent Heavy Vehicles (%)	3	0												0		0
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized																
Median Type | Storage	Left Only								1							

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.5		6.9
Critical Headway (sec)		4.10												6.80		6.90
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.50		3.30

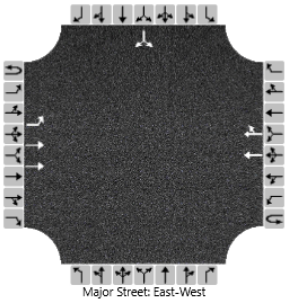
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		66													39	
Capacity, c (veh/h)		789													578	
v/c Ratio		0.08													0.07	
95% Queue Length, Q_{95} (veh)		0.3													0.2	
Control Delay (s/veh)		10.0													11.7	
Level of Service (LOS)		A													B	
Approach Delay (s/veh)	0.4												11.7			
Approach LOS	A												B			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	Diane Zimmerman	Intersection	Bardstown at New Road
Agency/Co.	Diane B. Zimmerman Traffic Engineering	Jurisdiction	
Date Performed	8/8/2022	East/West Street	Bardstown Rd
Analysis Year	2035	North/South Street	New Road
Time Analyzed	PM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	4700 Hurstbourne		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	0	2	0		0	0	0		0	1	0
Configuration		L	T				T	TR							LR	
Volume (veh/h)	0	61	1478				833	0						0		36
Percent Heavy Vehicles (%)	3	0												0		0
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized																
Median Type | Storage	Left Only								1							

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.5		6.9
Critical Headway (sec)		4.10												6.80		6.90
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)		66													39	
Capacity, c (veh/h)		760													560	
v/c Ratio		0.09													0.07	
95% Queue Length, Q_{95} (veh)		0.3													0.2	
Control Delay (s/veh)		10.2													11.9	
Level of Service (LOS)		B													B	
Approach Delay (s/veh)	0.4												11.9			
Approach LOS	A												B			

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