final report

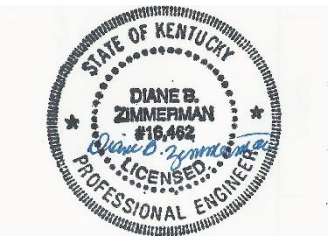
April 11, 2022

Traffic Impact Study

Broad Run Subdivision
8000 Broad Run Road
Louisville, KY

Prepared for

Louisville Metro Planning Commission



DIANE B. ZIMMERMAN
Traffic Engineering, LLC

12803 High Meadows Pike
Prospect, KY 40059
502.648.1858
dianebzim@att.net

Table of Contents

INTRODUCTION

The development plan for the Broad Run subdivision on Broad Run Road in Louisville, KY shows 243 single family lots with 190 multi-family townhouse units. **Figure 1** displays a map of the site. Access to the subdivision will be from two entrances on Broad Run Road. The purpose of this study is to examine the traffic impacts of the development upon the adjacent highway system. For this study, the impact area was defined to be the intersections of Broad Road with Seatonville Road, Seatonville Road with Brentlinger Lane and Billtown Road, and the proposed entrances.

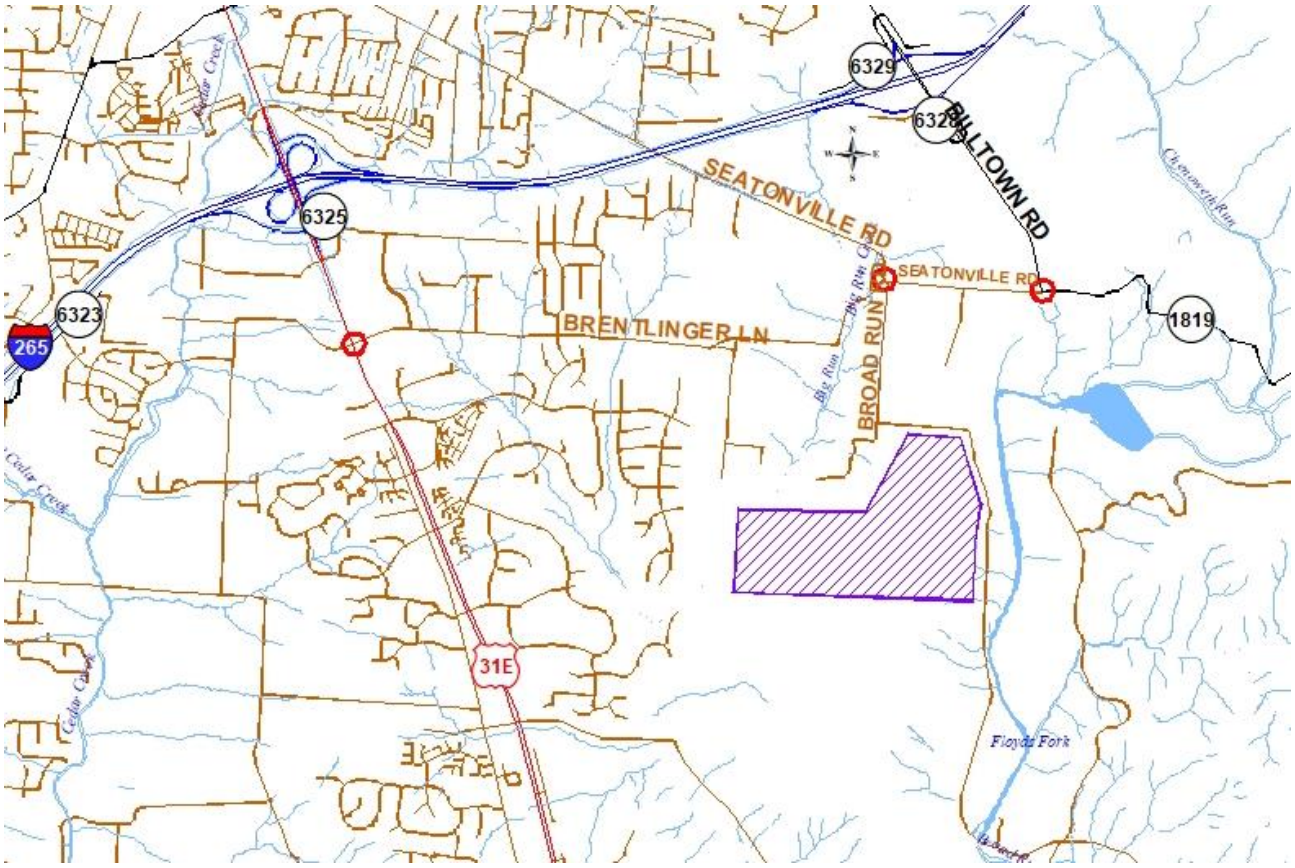


Figure 1. Site Map

EXISTING CONDITIONS

Broad Run Road is a Metro Louisville maintained road with an estimated 2021 ADT volume of 1,300 vehicles per day south of Seatonville Road, as estimated from the turning movement count. The road is two lanes with nine-foot lanes and a one-foot shoulder. The speed limit is 35 mph. There are no sidewalks. The intersection with Seatonville Road is controlled with a stop sign on Seatonville Road. The intersection of Seatonville Road at Brentlinger Lane is controlled with a stop sign on Brentlinger Lane.

Peak hour traffic counts for the intersections were obtained on April 13, 2021. The a.m. and p.m. peak hour varied between the intersections. **Figure 2** illustrates the existing a.m. and p.m. peak hour traffic volumes. The figure is illustrative and is not reflective of traffic control.

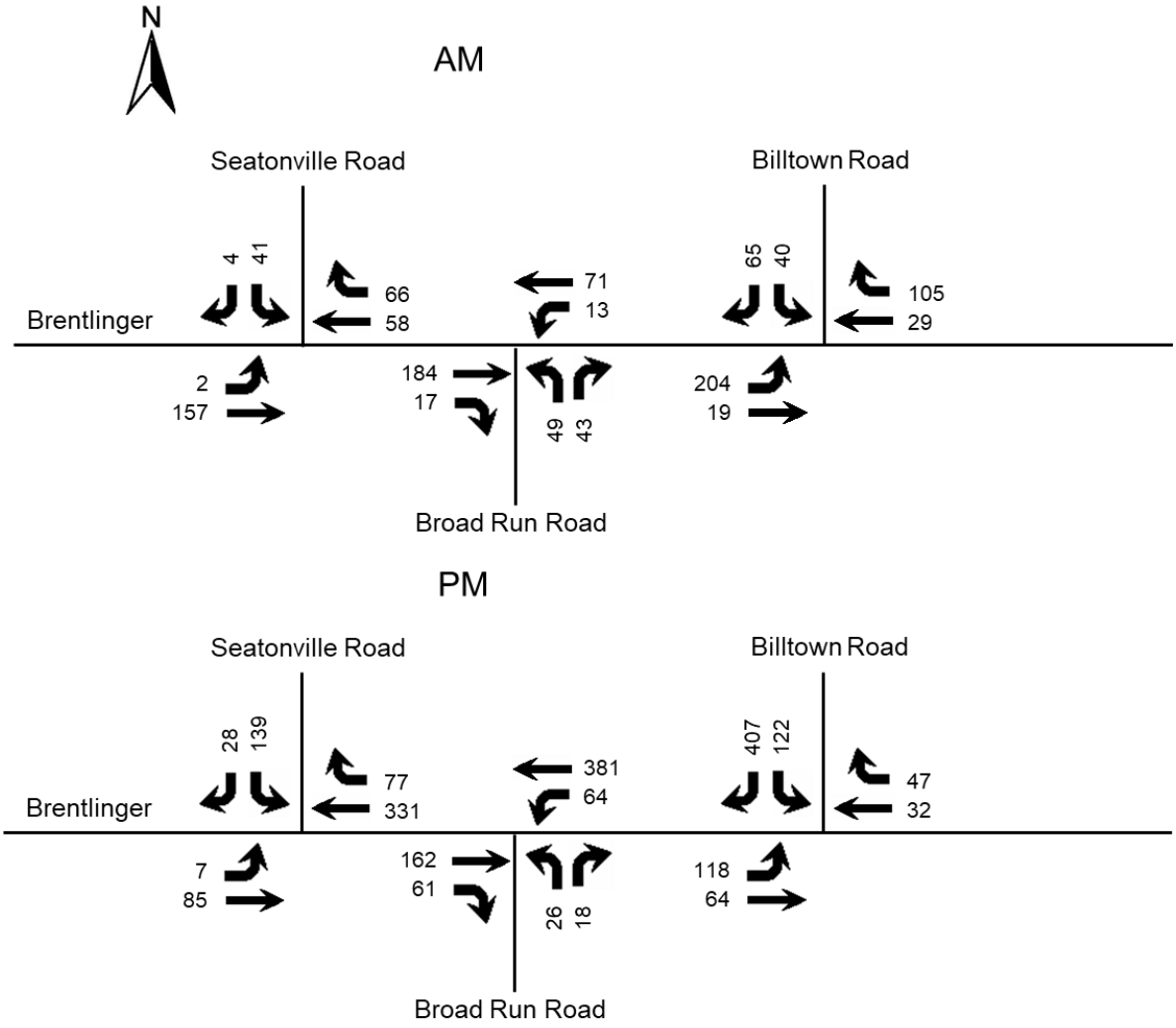


Figure 2. Existing Peak Hour Volumes

FUTURE CONDITIONS

The project completion date is 2028. An annual growth rate of 1.0 percent was applied to all volumes east of the intersection of Brentlinger Lane and Seatonville Road. **Figure 3** displays the 2028 No Build peak hour volumes.

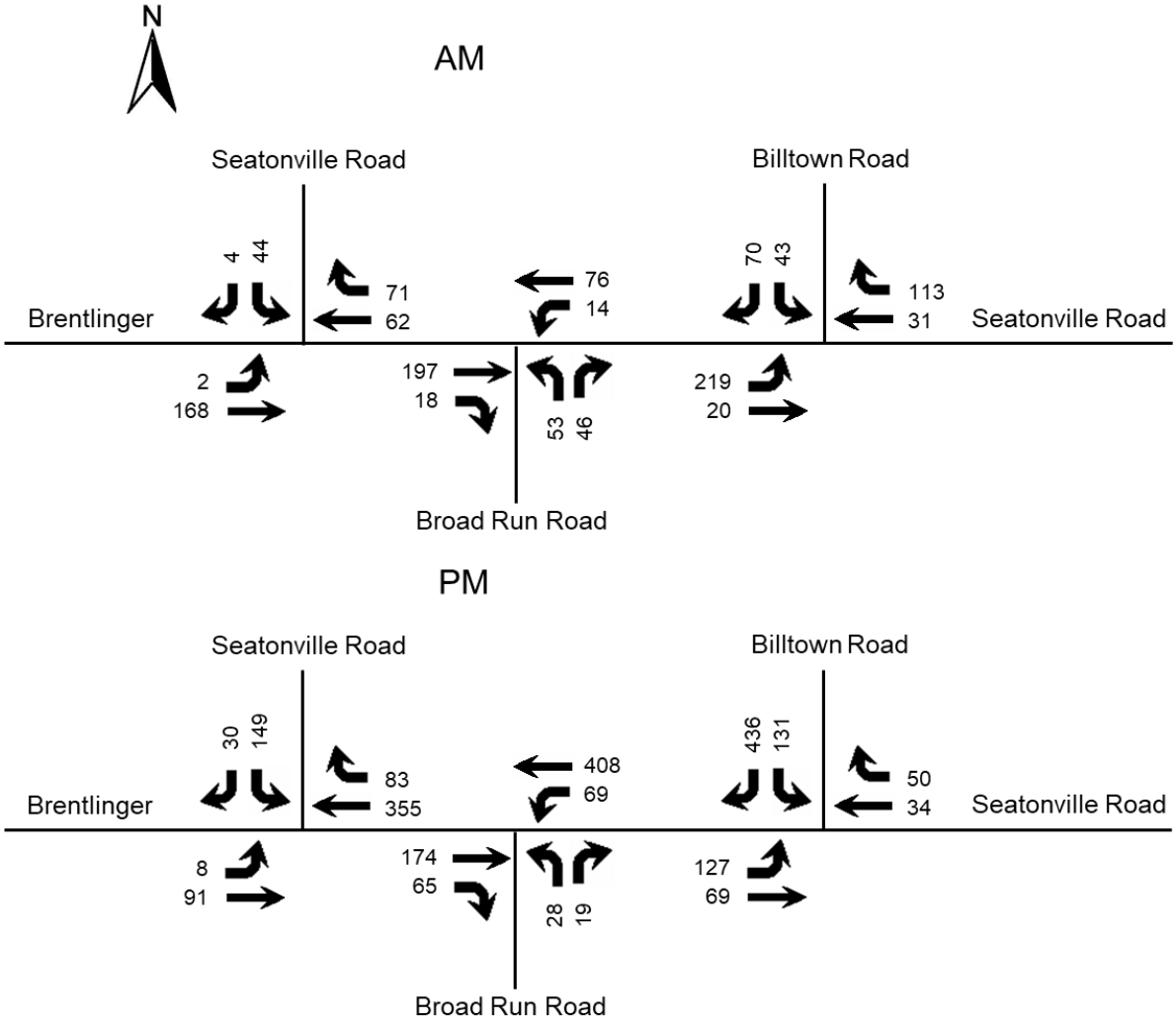


Figure 3. No Build Peak Hour Volumes

TRIP GENERATION

The Institute of Transportation Engineers Trip Generation Manual, 11th Edition contains trip generation rates for a wide range of developments. The land uses of "Single Family Detached (210)" and "Multi-family Low-Rise (220)" were reviewed and determined to be the best match. The trip generation results are listed in **Table 1**. The trips were assigned to the highway network with the percentages shown in **Figure 4**. **Figure 5** shows the trips generated by this development and distributed throughout the road network during the peak hours. **Figure 6** displays the individual turning movements for the peak hours when the development is completed.

Table 1. Peak Hour Trips Generated by Site

	A.M. Peak Hour			P.M. Peak Hour		
Land Use	Trips	In	Out	Trips	In	Out
Single Family Detached (243 lots)	167	43	124	229	144	85
Multi-family Low-Rise (190 units)	82	20	62	102	64	38
TOTAL	249	186	63	331	208	123

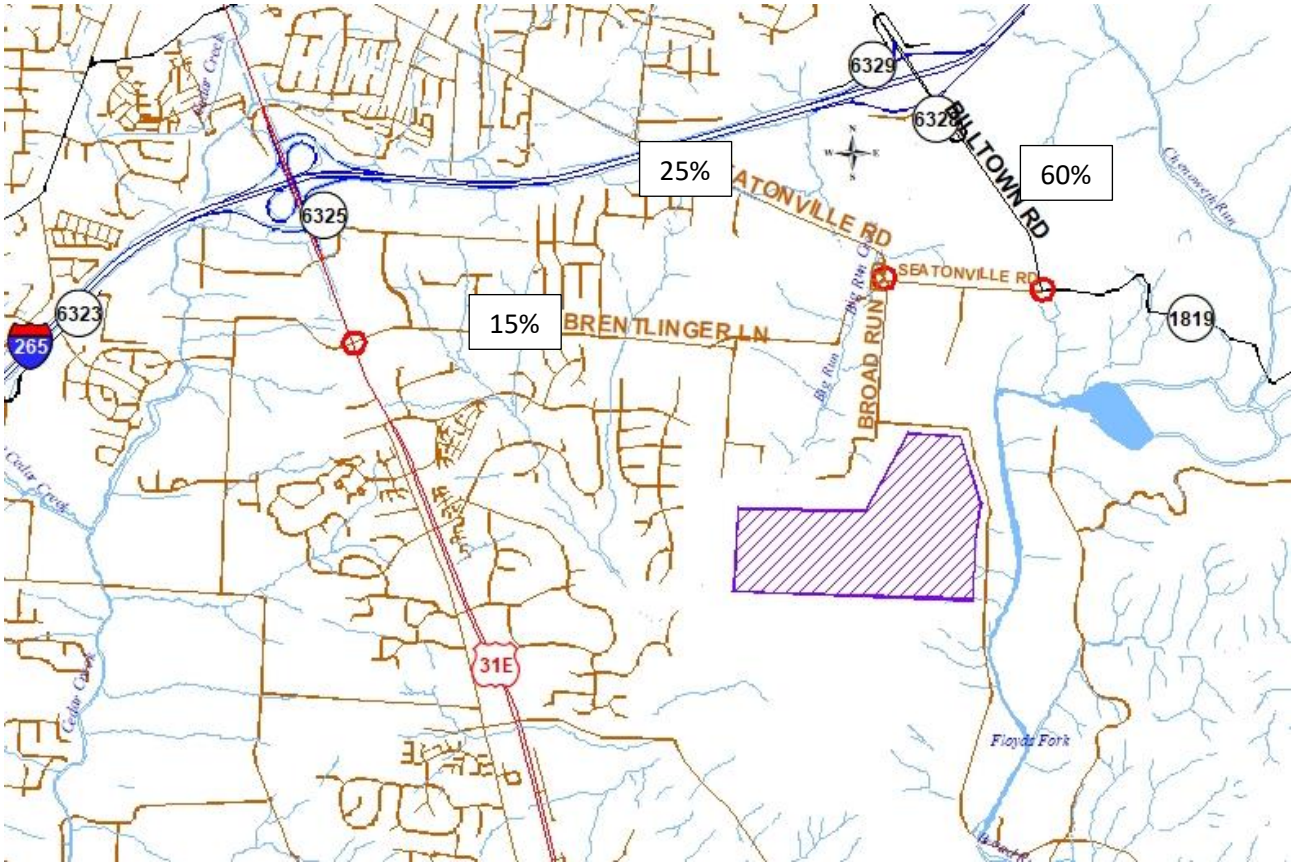


Figure 4. Trip Distribution Percentages

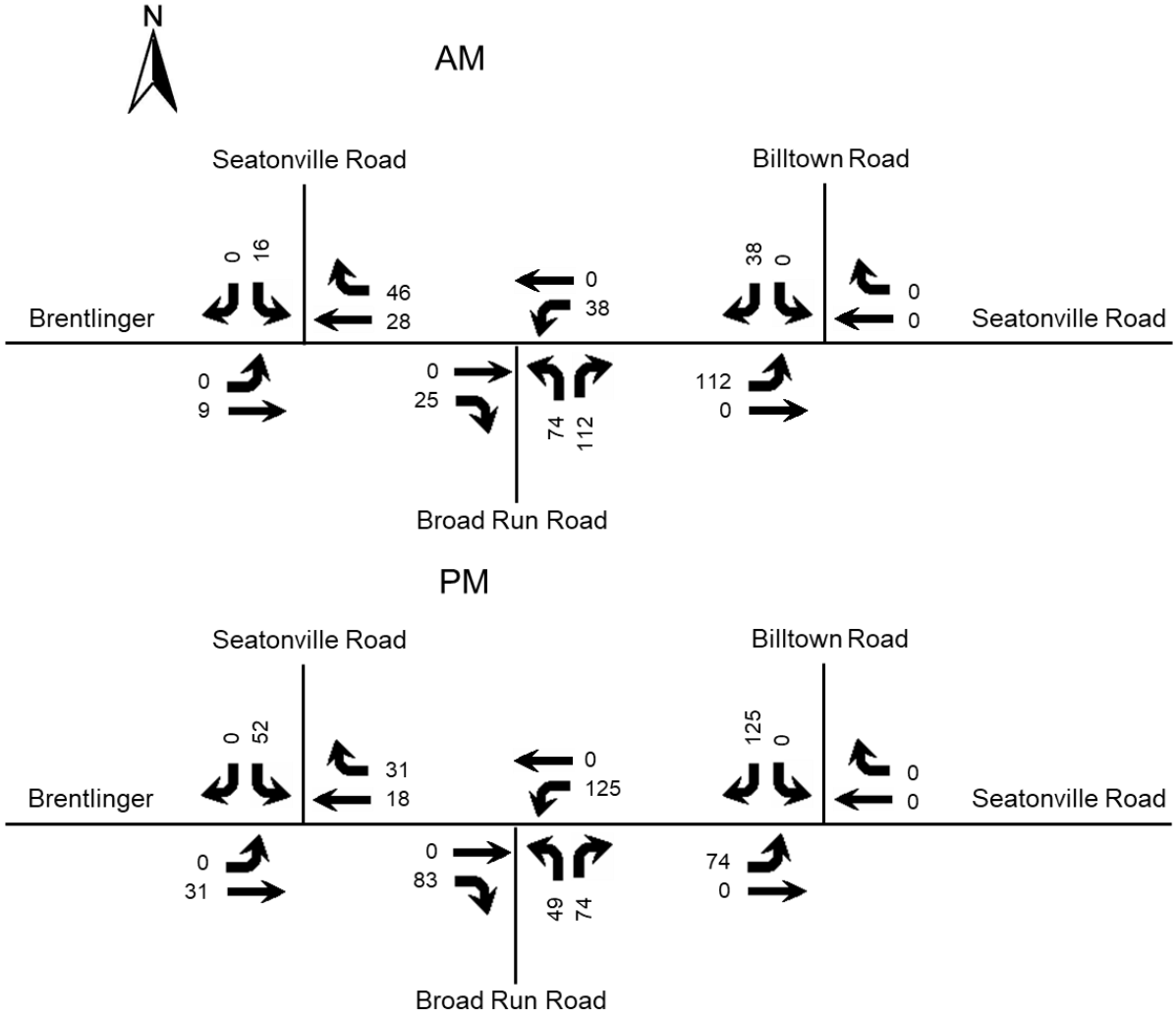


Figure 5. Peak Hour Trips Generated by Site

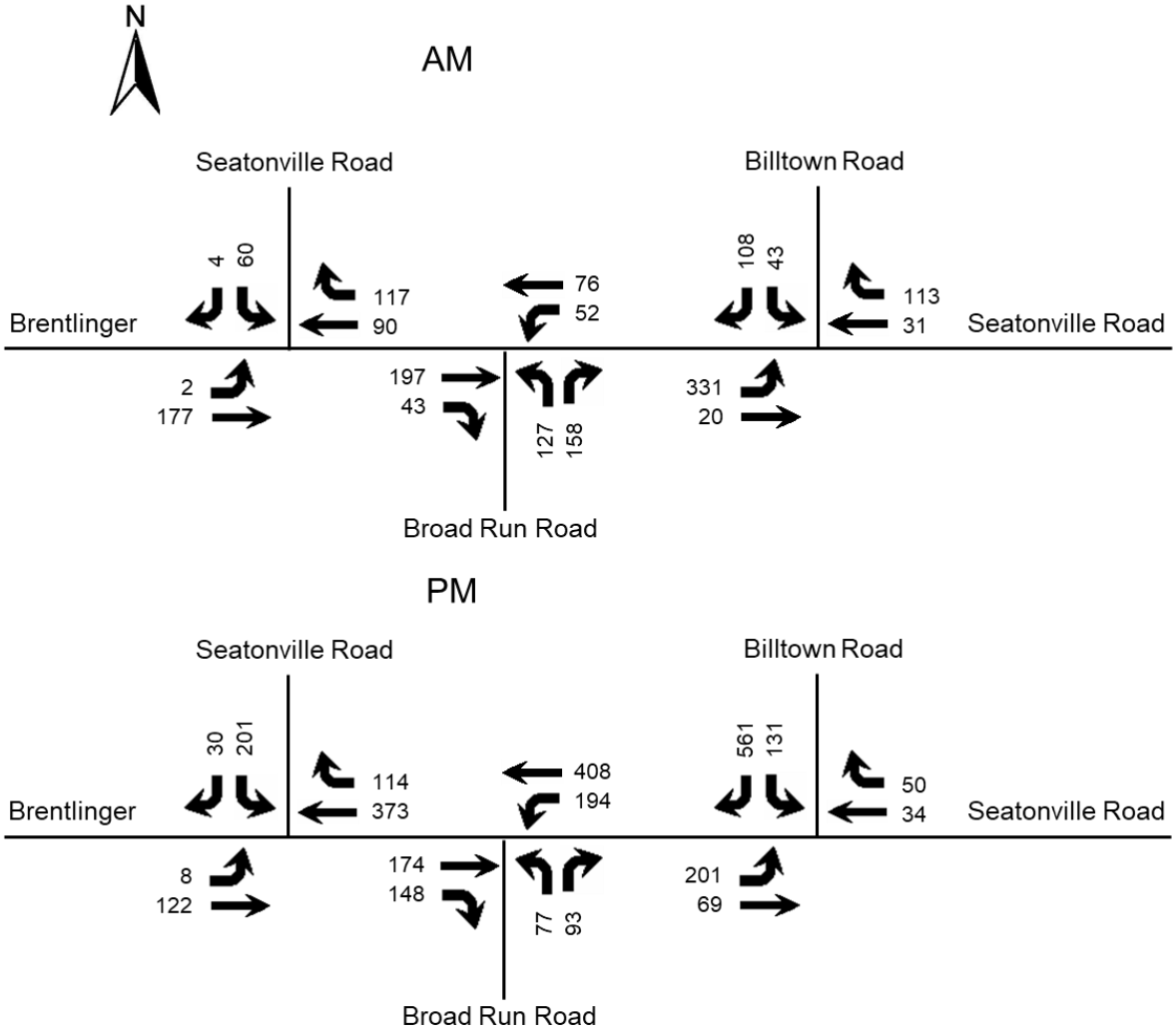


Figure 6. Build Peak Hour Volumes

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 average delay experienced at an intersection.

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

Table 2. Peak Hour Level of Service

	A.M.			P.M.		
Approach	2021 Existing	2028 No Build	2028 Build	2021 Existing	2028 No Build	2028 Build
Billtown Road at Seatonville Road						
Seatonville Road Eastbound	A 8.0	A 8.1	A 8.5	A 7.6	A 7.7	A 7.8
Billtown Road Southbound	B 12.3	B 12.9	C 16.0	C 16.9	C 19.4	E 40.4
Seatonville Road at Broad Run Road						
Seatonville Road Westbound (left)	A 8.2	A 8.3	A 8.0	A 7.9	A 7.9	A 8.7
Broad Run Road Northbound	B 11.1	B 11.4	C 15.6	B 14.4	C 15.4	C 21.7
Seatonville Road at Brentlinger Lane						
Seatonville Road Westbound (left)	A 7.4	A 7.4	A 7.5	A 8.5	A 8.7	A 9.1
Brentlinger Lane Eastbound	A 9.4	A 9.5	A 9.7	B 11.2	B 11.8	B 12.9

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. Using the volumes in Figure 6, no turn lanes will be required at the entrances. The intersection of Broad Run Road at Seatonville Road does meet the volume warrant for a left turn lane and is included in the Build analysis above. Until the proposed improvements to combine the Brentlinger Lane/Seatonville Road/Broad Run Road can be constructed, the traffic control for the Brentlinger Lane intersection should be modified to add a stop sign on Seatonville Road southbound approach. This will eliminate the queue for left turns to Brentlinger Lane provide adequate sight distance for Broad Run Road.

CONCLUSIONS

Based upon the volume of traffic generated by the development and the amount of traffic forecasted for the year 2028, there will be a manageable impact to the existing highway network, with Levels of Service remaining within acceptable limits. The intersection of Broad Run Road at Seatonville Road does meet the volume warrant for a left turn lane. Until the proposed improvements to combine the Brentlinger Lane/Seatonville Road/Broad Run Road can be constructed, the traffic control for the Brentlinger Lane intersection should be modified to add a stop sign on Seatonville Road southbound approach. This will eliminate the queue for left turns to Brentlinger Lane provide adequate sight distance for Broad Run Road.

APPENDIX

Traffic Counts

Classified Turn Movement Count || All vehicles

Marr Traffic DATA COLLECTION
www.marrtraffic.com

Broad Run, KY

Site 4 of 4

Billtown Rd
Seatonville Rd
KY-1819 Seatonville Rd

Date
Tuesday, April 13, 2021

Lat/Long
38.136631°, -85.538376°

Weather
Cloudy
61°F

0700 - 0900 (Weekday 2h Session) (13-04-2021)
All vehicles

	Southbound				Eastbound				Westbound				
	Billtown Rd				Seatonville Rd				KY-1819 Seatonville Rd				
TIME	Left 4.1	Right 4.2	U-Turn 4.3	App Total	Left 4.4	Thru 4.5	U-Turn 4.6	App Total	Thru 4.7	Right 4.8	U-Turn 4.9	App Total	Int Total
0700 - 0715	4	4	0	8	39	2	0	41	5	22	0	27	76
0715 - 0730	8	8	0	16	48	2	0	50	7	22	0	29	95
0730 - 0745	4	14	0	18	39	4	0	43	8	36	0	44	105
0745 - 0800	8	15	0	23	66	6	0	72	10	26	0	36	131
Hourly Total	24	41	0	**65**	192	14	0	**206**	30	106	0	**136**	**407**
0800 - 0815	16	16	0	32	57	7	0	64	5	20	0	25	121
0815 - 0830	12	20	0	32	42	2	0	44	6	23	0	29	105
0830 - 0845	5	17	0	22	35	2	0	37	5	21	0	26	85
0845 - 0900	13	14	0	27	17	5	1	23	8	20	0	28	78
Hourly Total	46	67	0	**113**	151	16	1	**168**	24	84	0	**108**	**389**
Grand Total	70	108	0	**178**	343	30	1	**374**	54	190	0	**244**	**796**
Approach %	39.33	60.67	0.00	-	91.71	8.02	0.27	-	22.13	77.87	0.00	-	
Intersection %	8.79	13.57	0.00	22.36	43.09	3.77	0.13	46.98	6.78	23.87	0.00	30.65	
PHF	0.63	0.81	0.00	**0.82**	0.77	0.68	0.00	**0.77**	0.73	0.73	0.00	**0.76**	**0.88**

1600 - 1800 (Weekday 2h Session) (13-04-2021)
All vehicles

	Southbound				Eastbound				Westbound				
	Billtown Rd				Seatonville Rd				KY-1819 Seatonville Rd				
TIME	Left 4.1	Right 4.2	U-Turn 4.3	App Total	Left 4.4	Thru 4.5	U-Turn 4.6	App Total	Thru 4.7	Right 4.8	U-Turn 4.9	App Total	Int Total
1600 - 1615	29	77	0	106	27	9	0	36	8	14	0	22	164
1615 - 1630	29	75	0	104	24	12	0	36	6	15	0	21	161
1630 - 1645	38	87	0	125	31	20	0	51	10	13	0	23	199
1645 - 1700	26	103	0	129	30	17	0	47	9	12	0	21	197
Hourly Total	122	342	0	**464**	112	58	0	**170**	33	54	0	**87**	**721**
1700 - 1715	28	98	0	126	28	10	0	38	8	11	0	19	183
1715 - 1730	30	119	0	149	29	17	0	46	5	11	0	16	211
1730 - 1745	36	72	0	108	23	12	0	35	6	20	0	26	169
1745 - 1800	28	78	0	106	31	13	0	44	14	17	0	31	181
Hourly Total	122	367	0	**489**	111	52	0	**163**	33	59	0	**92**	**744**
Grand Total	244	709	0	**953**	223	110	0	**333**	66	113	0	**179**	**1465**
Approach %	25.60	74.40	0.00	-	66.97	33.03	0.00	-	36.87	63.13	0.00	-	
Intersection %	16.66	48.40	0.00	65.05	15.22	7.51	0.00	22.73	4.51	7.71	0.00	12.22	
PHF	0.80	0.86	0.00	**0.89**	0.95	0.80	0.00	**0.89**	0.80	0.90	0.00	**0.86**	**0.94**

Classified Turn Movement Count || All vehicles

Marr Traffic DATA COLLECTION
www.marrtraffic.com

Broad Run, KY

Site 3 of 4
Broad Run Rd

Seatonville Rd (West)
Seatonville Rd (East)

Date
Tuesday, April 13, 2021

Lat/Long
38.137031°, -85.547568°

Weather
Cloudy
61°F

0700 - 0900 (Weekday 2h Session) (13-04-2021)
All vehicles

	Northbound				Eastbound				Westbound				
	Broad Run Rd				Seatonville Rd (West)				Seatonville Rd (East)				
TIME	Left 3.1	Right 3.2	U-Turn 3.3	App Total	Thru 3.4	Right 3.5	U-Turn 3.6	App Total	Left 3.7	Thru 3.8	U-Turn 3.9	App Total	Int Total
0700 - 0715	7	11	0	18	32	5	0	37	1	8	0	9	64
0715 - 0730	12	12	0	24	38	3	0	41	2	14	0	16	81
0730 - 0745	9	11	0	20	33	8	0	41	3	19	0	22	83
0745 - 0800	16	9	0	25	60	4	0	64	5	20	0	25	114
Hourly Total	44	43	0	**87**	163	20	0	**183**	11	61	0	**72**	**342**
0800 - 0815	12	11	0	23	53	2	0	55	3	18	0	21	99
0815 - 0830	7	9	0	16	38	3	0	41	1	23	0	24	81
0830 - 0845	7	3	0	10	31	2	0	33	4	20	0	24	67
0845 - 0900	7	1	0	8	25	3	0	28	3	19	0	22	58
Hourly Total	33	24	0	**57**	147	10	0	**157**	11	80	0	**91**	**305**
Grand Total	77	67	0	**144**	310	30	0	**340**	22	141	0	**163**	**647**
Approach %	53.47	46.53	0.00	-	91.18	8.82	0.00	-	13.50	86.50	0.00	-	
Intersection %	11.90	10.36	0.00	22.26	47.91	4.64	0.00	52.55	3.40	21.79	0.00	25.19	
PHF	0.77	0.90	0.00	**0.92**	0.77	0.53	0.00	**0.79**	0.65	0.89	0.00	**0.84**	**0.83**

1600 - 1800 (Weekday 2h Session) (13-04-2021)
All vehicles

	Northbound				Eastbound				Westbound				
	Broad Run Rd				Seatonville Rd (West)				Seatonville Rd (East)				
TIME	Left 3.1	Right 3.2	U-Turn 3.3	App Total	Thru 3.4	Right 3.5	U-Turn 3.6	App Total	Left 3.7	Thru 3.8	U-Turn 3.9	App Total	Int Total
1600 - 1615	6	6	0	12	33	12	0	45	11	71	0	82	139
1615 - 1630	7	7	0	14	34	16	0	50	13	66	0	79	143
1630 - 1645	5	5	0	10	42	8	0	50	15	79	0	94	154
1645 - 1700	5	3	0	8	41	20	1	62	16	95	0	111	181
Hourly Total	23	21	0	**44**	150	56	1	**207**	55	311	0	**366**	**617**
1700 - 1715	6	5	0	11	37	14	0	51	12	99	0	111	173
1715 - 1730	10	5	0	15	41	19	0	60	21	108	0	129	204
1730 - 1745	5	5	0	10	29	17	0	46	9	71	0	80	136
1745 - 1800	10	8	0	18	34	12	0	46	16	76	0	92	156
Hourly Total	31	23	0	**54**	141	62	0	**203**	58	354	0	**412**	**669**
Grand Total	54	44	0	**98**	291	118	1	**410**	113	665	0	**778**	**1286**
Approach %	55.10	44.90	0.00	-	70.98	28.78	0.24	-	14.52	85.48	0.00	-	
Intersection %	4.20	3.42	0.00	7.62	22.63	9.18	0.08	31.88	8.79	51.71	0.00	60.50	
PHF	0.65	0.90	0.00	**0.73**	0.96	0.76	0.25	**0.90**	0.76	0.88	0.00	**0.86**	**0.87**

Classified Turn Movement Count || All vehicles

Marr Traffic DATA COLLECTION
www.marrtraffic.com

Broad Run, KY

Site 2 of 4
Brentlinger Ln
Seatonville Rd (North)

Seatonville Rd (East)

Date
Tuesday, April 13, 2021

Lat/Long
38.137123°, -85.547928°

Weather
Cloudy
61°F

0700 - 0900 (Weekday 2h Session) (13-04-2021)
All vehicles

	Northbound (Brentlinger Ln)				Southbound (Seatonville Rd (North))				Westbound (Seatonville Rd (East))				
TIME	Thru 2.1	Right 2.2	U-Turn 2.3	App Total	Left 2.4	Thru 2.5	U-Turn 2.6	App Total	Left 2.7	Right 2.8	U-Turn 2.9	App Total	Int Total
0700 - 0715	0	23	0	23	15	0	0	15	5	9	0	14	52
0715 - 0730	1	34	0	35	10	0	0	10	8	19	0	27	72
0730 - 0745	0	27	0	27	13	0	0	13	13	14	0	27	67
0745 - 0800	1	54	0	55	8	0	0	8	13	24	0	37	100
Hourly Total	2	138	0	**140**	46	0	0	**46**	39	66	0	**105**	**291**
0800 - 0815	1	45	0	46	10	2	0	12	15	15	0	30	88
0815 - 0830	0	31	0	31	10	2	0	12	17	13	0	30	73
0830 - 0845	1	22	0	23	10	0	0	10	17	10	0	27	60
0845 - 0900	1	13	0	14	15	0	0	15	15	11	0	26	55
Hourly Total	3	111	0	**114**	45	4	0	**49**	64	49	0	**113**	**276**
Grand Total	5	249	0	**254**	91	4	0	**95**	103	115	0	**218**	**567**
Approach %	1.97	98.03	0.00	-	95.79	4.21	0.00	-	47.25	52.75	0.00	-	
Intersection %	0.88	43.92	0.00	44.80	16.05	0.71	0.00	16.75	18.17	20.28	0.00	38.45	
PHF	0.50	0.73	0.00	**0.72**	0.79	0.50	0.00	**0.87**	0.85	0.69	0.00	**0.84**	**0.82**

1600 - 1800 (Weekday 2h Session) (13-04-2021)
All vehicles

	Northbound (Brentlinger Ln)				Southbound (Seatonville Rd (North))				Westbound (Seatonville Rd (East))				
TIME	Thru 2.1	Right 2.2	U-Turn 2.3	App Total	Left 2.4	Thru 2.5	U-Turn 2.6	App Total	Left 2.7	Right 2.8	U-Turn 2.9	App Total	Int Total
1600 - 1615	1	21	0	22	24	2	0	26	55	22	0	77	125
1615 - 1630	1	15	0	16	35	3	0	38	57	16	0	73	127
1630 - 1645	2	15	0	17	35	1	0	36	67	17	0	84	137
1645 - 1700	1	21	0	22	42	14	0	56	82	19	0	101	179
Hourly Total	5	72	0	**77**	136	20	0	**156**	261	74	0	**335**	**568**
1700 - 1715	3	26	0	29	25	4	0	29	83	21	0	104	162
1715 - 1730	1	23	0	24	37	9	0	46	99	20	0	119	189
1730 - 1745	1	20	0	21	25	2	0	27	61	15	0	76	124
1745 - 1800	0	21	0	21	25	6	0	31	59	27	0	86	138
Hourly Total	5	90	0	**95**	112	21	0	**133**	302	83	0	**385**	**613**
Grand Total	10	162	0	**172**	248	41	0	**289**	563	157	0	**720**	**1181**
Approach %	5.81	94.19	0.00	-	85.81	14.19	0.00	-	78.19	21.81	0.00	-	
Intersection %	0.85	13.72	0.00	14.56	21.00	3.47	0.00	24.47	47.67	13.29	0.00	60.97	
PHF	0.58	0.82	0.00	**0.79**	0.83	0.50	0.00	**0.75**	0.84	0.92	0.00	**0.86**	**0.88**

Classified Turn Movement Count || All vehicles

Marr Traffic DATA COLLECTION
www.marrtraffic.com

Broad Run, KY

Site 1 of 4
US-150 Bardstown Rd (South)
US-150 Bardstown Rd (North)
Cedar Creek Rd
Brentlinger Ln

Date
Tuesday, April 13, 2021

Lat/Long
38.134100°, -85.579618°

Weather
Cloudy
61°F

0700 - 0900 (Weekday 2h Session) (13-04-2021)
All vehicles

	Northbound					Southbound					Eastbound					Westbound					
	US-150 Bardstown Rd (South)					US-150 Bardstown Rd (North)					Cedar Creek Rd					Brentlinger Ln					
TIME	Left 1.1	Thru 1.2	Right 1.3	U-Turn 1.4	App Total	Left 1.5	Thru 1.6	Right 1.7	U-Turn 1.8	App Total	Left 1.9	Thru 1.10	Right 1.11	U-Turn 1.12	App Total	Left 1.13	Thru 1.14	Right 1.15	U-Turn 1.16	App Total	Int Total
0700 - 0715	0	538	13	0	551	12	177	11	0	200	26	3	7	0	36	3	0	33	0	36	823
0715 - 0730	4	582	15	0	601	13	239	22	0	274	28	2	3	0	33	4	3	44	0	51	959
0730 - 0745	1	527	14	0	542	21	250	16	0	287	43	6	3	0	52	10	4	38	0	52	933
0745 - 0800	1	528	15	0	544	29	299	14	0	342	24	2	9	0	35	7	0	44	0	51	972
Hourly Total	6	2175	57	0	**2238**	75	965	63	0	**1103**	121	13	22	0	**156**	24	7	159	0	**190**	**3687**
0800 - 0815	2	539	20	0	561	24	253	9	0	286	16	1	4	0	21	18	1	33	0	52	920
0815 - 0830	4	511	16	0	531	15	249	24	0	288	13	4	2	0	19	8	0	33	0	41	879
0830 - 0845	2	460	18	0	480	30	244	5	0	279	20	7	2	0	29	15	5	52	0	72	860
0845 - 0900	1	409	23	0	433	43	225	7	0	275	21	4	6	0	31	21	8	48	0	77	816
Hourly Total	9	1919	77	0	**2005**	112	971	45	0	**1128**	70	16	14	0	**100**	62	14	166	0	**242**	**3475**
Grand Total	15	4094	134	0	**4243**	187	1936	108	0	**2231**	191	29	36	0	**256**	86	21	325	0	**432**	**7162**
Approach %	0.35	96.49	3.16	0.00	-	8.38	86.78	4.84	0.00	-	74.61	11.33	14.06	0.00	-	19.91	4.86	75.23	0.00	-	
Intersection %	0.21	57.16	1.87	0.00	59.24	2.61	27.03	1.51	0.00	31.15	2.67	0.40	0.50	0.00	3.57	1.20	0.29	4.54	0.00	6.03	
PHF	0.50	0.93	0.80	0.00	**0.94**	0.75	0.87	0.69	0.00	**0.87**	0.65	0.46	0.53	0.00	**0.68**	0.54	0.50	0.90	0.00	**0.99**	**0.97**

1600 - 1800 (Weekday 2h Session) (13-04-2021)
All vehicles

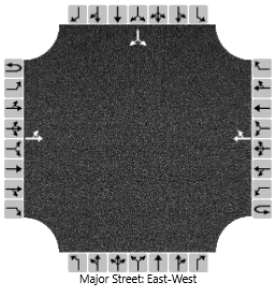
	Northbound					Southbound					Eastbound					Westbound					
	US-150 Bardstown Rd (South)					US-150 Bardstown Rd (North)					Cedar Creek Rd					Brentlinger Ln					
TIME	Left 1.1	Thru 1.2	Right 1.3	U-Turn 1.4	App Total	Left 1.5	Thru 1.6	Right 1.7	U-Turn 1.8	App Total	Left 1.9	Thru 1.10	Right 1.11	U-Turn 1.12	App Total	Left 1.13	Thru 1.14	Right 1.15	U-Turn 1.16	App Total	Int Total
1600 - 1615	4	344	15	0	363	40	547	18	0	605	12	4	9	0	25	55	15	44	0	114	1107
1615 - 1630	7	392	10	0	409	49	570	14	0	633	13	4	8	0	25	52	5	37	0	94	1161
1630 - 1645	9	420	13	0	442	29	554	17	0	600	14	1	5	0	20	48	7	36	0	91	1153
1645 - 1700	2	422	12	0	436	28	530	16	0	574	19	4	10	0	33	55	6	35	0	96	1139
Hourly Total	22	1578	50	0	**1650**	146	2201	65	0	**2412**	58	13	32	0	**103**	210	33	152	0	**395**	**4560**
1700 - 1715	5	415	20	0	440	40	549	20	0	609	18	5	11	0	34	73	9	28	0	110	1193
1715 - 1730	4	393	23	0	420	38	545	30	0	613	18	7	8	0	33	58	8	44	0	110	1176
1730 - 1745	10	421	8	0	439	44	550	17	0	611	19	4	8	0	31	46	11	31	0	88	1169
1745 - 1800	6	352	12	0	370	48	535	13	0	596	15	1	5	0	21	42	10	39	0	91	1078
Hourly Total	25	1581	63	0	**1669**	170	2179	80	0	**2429**	70	17	32	0	**119**	219	38	142	0	**399**	**4616**
Grand Total	47	3159	113	0	**3319**	316	4380	145	0	**4841**	128	30	64	0	**222**	429	71	294	0	**794**	**9176**
Approach %	1.42	95.18	3.40	0.00	-	6.53	90.48	3.00	0.00	-	57.66	13.51	28.83	0.00	-	54.03	8.94	37.03	0.00	-	
Intersection %	0.51	34.43	1.23	0.00	36.17	3.44	47.73	1.58	0.00	52.76	1.39	0.33	0.70	0.00	2.42	4.68	0.77	3.20	0.00	8.65	
PHF	0.53	0.98	0.68	0.00	**0.99**	0.85	0.99	0.69	0.00	**0.98**	0.97	0.71	0.84	0.00	**0.96**	0.79	0.77	0.78	0.00	**0.92**	**0.98**

HCS Reports

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DBZ	Intersection	Seatonville at Billtown
Agency/Co.	Diane B Zimmerman Traffic Engineering	Jurisdiction	
Date Performed	8/5/2021	East/West Street	Seatonville Road
Analysis Year	2021	North/South Street	Billtown Road
Time Analyzed	AM Peak	Peak Hour Factor	0.88
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Broad Run		

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	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		204	19				29	105						40		65
Percent Heavy Vehicles (%)		2												8		8
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.12												6.48		6.28
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.22												3.57		3.37

Delay, Queue Length, and Level of Service

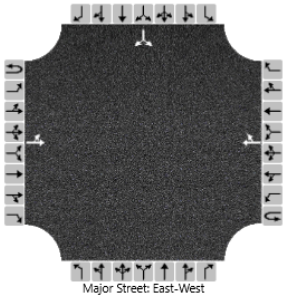
Flow Rate, v (veh/h)		232													119	
Capacity, c (veh/h)		1428													615	
v/c Ratio		0.16													0.19	
95% Queue Length, Q_{95} (veh)		0.6													0.7	
Control Delay (s/veh)		8.0													12.3	
Level of Service (LOS)		A													B	
Approach Delay (s/veh)		7.4												12.3		
Approach LOS														B		

HCS™ TWSC Version 7.9.5
Billtown AM 21.xtw
Generated: 8/5/2021 5:48:59 PM

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DBZ	Intersection	Seatonville at Billtown
Agency/Co.	Diane B Zimmerman Traffic Engineering	Jurisdiction	
Date Performed	8/5/2021	East/West Street	Seatonville Road
Analysis Year	2028	North/South Street	Billtown Road
Time Analyzed	AM Peak No Build	Peak Hour Factor	0.88
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Broad Run		

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	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		219	20				31	113						43		70
Percent Heavy Vehicles (%)		2												8		8
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.12												6.48		6.28
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.22												3.57		3.37

Delay, Queue Length, and Level of Service

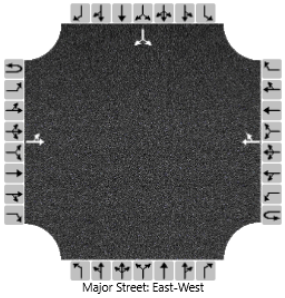
Flow Rate, v (veh/h)		249													128	
Capacity, c (veh/h)		1415													586	
v/c Ratio		0.18													0.22	
95% Queue Length, Q_{95} (veh)		0.6													0.8	
Control Delay (s/veh)		8.1													12.9	
Level of Service (LOS)		A													B	
Approach Delay (s/veh)		7.5												12.9		
Approach LOS														B		

HCS™ TWSC Version 7.9.5
Billtown AM 28 NB.xtw
Generated: 8/8/2021 4:12:18 PM

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DBZ	Intersection	Seatonville at Billtown
Agency/Co.	Diane B Zimmerman Traffic Engineering	Jurisdiction	
Date Performed	3/10/22	East/West Street	Seatonville Road
Analysis Year	2028	North/South Street	Billtown Road
Time Analyzed	AM Peak Build	Peak Hour Factor	0.88
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Broad Run		

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	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		331	20				31	113						43		108
Percent Heavy Vehicles (%)		2												8		8
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.12												6.48		6.28
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.22												3.57		3.37

Delay, Queue Length, and Level of Service

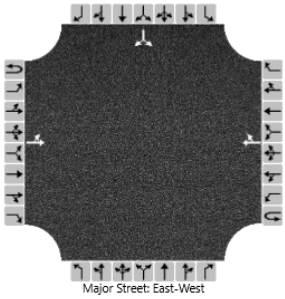
Flow Rate, v (veh/h)		376													172	
Capacity, c (veh/h)		1415													498	
v/c Ratio		0.27													0.34	
95% Queue Length, Q_{95} (veh)		1.1													1.5	
Control Delay (s/veh)		8.5													16.0	
Level of Service (LOS)		A													C	
Approach Delay (s/veh)	8.1												16.0			
Approach LOS													C			

HCS™ TWSC Version 7.9.5
Billtown AM 28 B.xtw
Generated: 3/10/2022 3:50:14 PM

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DBZ	Intersection	Seatonville at Billtown
Agency/Co.	Diane B Zimmerman Traffic Engineering	Jurisdiction	
Date Performed	8/5/2021	East/West Street	Seatonville Road
Analysis Year	2021	North/South Street	Billtown Road
Time Analyzed	PM Peak	Peak Hour Factor	0.94
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Broad Run		

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	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		118	64				32	47						122		407
Percent Heavy Vehicles (%)		6												2		1
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.16												6.42		6.21
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.25												3.52		3.31

Delay, Queue Length, and Level of Service

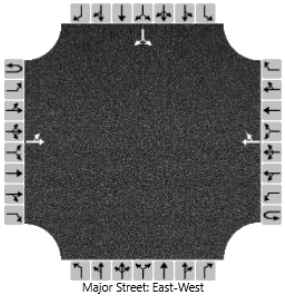
Flow Rate, v (veh/h)		126													563	
Capacity, c (veh/h)		1488													857	
v/c Ratio		0.08													0.66	
95% Queue Length, Q_{95} (veh)		0.3													5.1	
Control Delay (s/veh)		7.6													16.9	
Level of Service (LOS)		A													C	
Approach Delay (s/veh)		5.2												16.9		
Approach LOS														C		

HCS™ TWSC Version 7.9.5
Billtown PM 21.xtw
Generated: 8/8/2021 4:16:48 PM

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DBZ	Intersection	Seatonville at Billtown
Agency/Co.	Diane B Zimmerman Traffic Engineering	Jurisdiction	
Date Performed	8/5/2021	East/West Street	Seatonville Road
Analysis Year	2028	North/South Street	Billtown Road
Time Analyzed	PM Peak No Build	Peak Hour Factor	0.94
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Broad Run		

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	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		127	69				34	50						131		436
Percent Heavy Vehicles (%)		6												2		1
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.16												6.42		6.21
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.25												3.52		3.31

Delay, Queue Length, and Level of Service

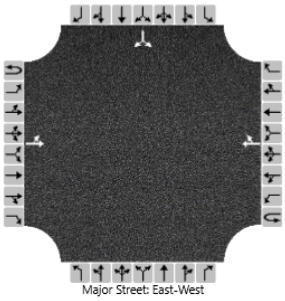
Flow Rate, v (veh/h)		135													603	
Capacity, c (veh/h)		1481													840	
v/c Ratio		0.09													0.72	
95% Queue Length, Q_{95} (veh)		0.3													6.3	
Control Delay (s/veh)		7.7													19.4	
Level of Service (LOS)		A													C	
Approach Delay (s/veh)	5.2												19.4			
Approach LOS													C			

HCS™ TWSC Version 7.9.5
Billtown PM 28 NB.xtw
Generated: 8/8/2021 4:18:23 PM

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DBZ	Intersection	Seatonville at Billtown
Agency/Co.	Diane B Zimmerman Traffic Engineering	Jurisdiction	
Date Performed	3/10/2022	East/West Street	Seatonville Road
Analysis Year	2028	North/South Street	Billtown Road
Time Analyzed	PM PeakBuild	Peak Hour Factor	0.94
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Broad Run		

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	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		201	69				34	50						131		561
Percent Heavy Vehicles (%)		6												2		1
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.16												6.42		6.21
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.25												3.52		3.31

Delay, Queue Length, and Level of Service

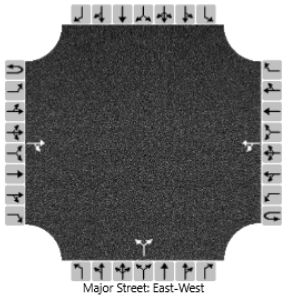
Flow Rate, v (veh/h)		214													736	
Capacity, c (veh/h)		1481													791	
v/c Ratio		0.14													0.93	
95% Queue Length, Q_{95} (veh)		0.5													13.5	
Control Delay (s/veh)		7.8													40.4	
Level of Service (LOS)		A													E	
Approach Delay (s/veh)		6.1												40.4		
Approach LOS														E		

HCS™ TWSC Version 7.9.5
Billtown PM 28 B.xtw
Generated: 3/10/2022 3:59:05 PM

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DBZ	Intersection	Seatonville at Broad Run
Agency/Co.	Diane B Zimmerman Traffic Engineering	Jurisdiction	
Date Performed	6/23/2021	East/West Street	Seatonville Road
Analysis Year	2021	North/South Street	Broad Run
Time Analyzed	AM Peak	Peak Hour Factor	0.83
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Broad Run		

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	0	1	0	0	0	1	0		0	1	0		0	0	0
Configuration				TR		LT					LR					
Volume (veh/h)			184	17		13	71			49		43				
Percent Heavy Vehicles (%)						38				4		2				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.1		6.2				
Critical Headway (sec)						4.48				6.44		6.22				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.54				3.54		3.32				

Delay, Queue Length, and Level of Service

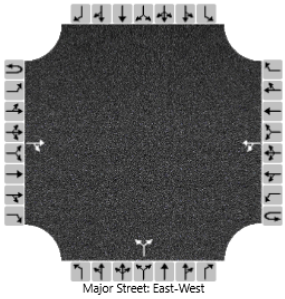
Flow Rate, v (veh/h)						16					111					
Capacity, c (veh/h)						1140					705					
v/c Ratio						0.01					0.16					
95% Queue Length, Q_{95} (veh)						0.0					0.6					
Control Delay (s/veh)						8.2					11.1					
Level of Service (LOS)						A					B					
Approach Delay (s/veh)					1.4				11.1							
Approach LOS									B							

HCS™ TWSC Version 7.9.5
Broad Run AM 21.xtw
Generated: 8/5/2021 4:52:07 PM

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DBZ	Intersection	Seatonville at Broad Run
Agency/Co.	Diane B Zimmerman Traffic Engineering	Jurisdiction	
Date Performed	6/23/2021	East/West Street	Seatonville Road
Analysis Year	2028	North/South Street	Broad Run
Time Analyzed	AM Peak	Peak Hour Factor	0.83
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Broad Run		

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	0	1	0	0	0	1	0		0	1	0		0	0	0
Configuration				TR		LT					LR					
Volume (veh/h)			197	18		14	76			53		46				
Percent Heavy Vehicles (%)						38				4		2				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.1		6.2				
Critical Headway (sec)						4.48				6.44		6.22				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.54				3.54		3.32				

Delay, Queue Length, and Level of Service

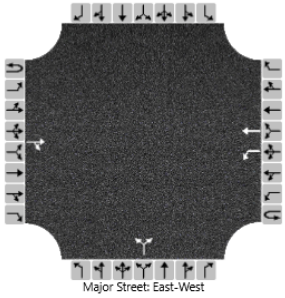
Flow Rate, v (veh/h)						17					119					
Capacity, c (veh/h)						1123					685					
v/c Ratio						0.02					0.17					
95% Queue Length, Q_{95} (veh)						0.0					0.6					
Control Delay (s/veh)						8.3					11.4					
Level of Service (LOS)						A					B					
Approach Delay (s/veh)					1.4				11.4							
Approach LOS									B							

HCS™ TWSC Version 7.9.5
Broad Run AM 28 NB.xtw
Generated: 8/5/2021 4:53:52 PM

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DBZ	Intersection	Seatonville at Broad Run
Agency/Co.	Diane B Zimmerman Traffic Engineering	Jurisdiction	
Date Performed	3/10/2022	East/West Street	Seatonville Road
Analysis Year	2028	North/South Street	Broad Run
Time Analyzed	AM Peak Build	Peak Hour Factor	0.83
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Broad Run		

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	0	1	0	0	1	1	0		0	1	0		0	0	0
Configuration				TR		L	T				LR					
Volume (veh/h)			197	43		52	76			127		158				
Percent Heavy Vehicles (%)						7				4		2				
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				7.1		6.2				
Critical Headway (sec)						4.17				6.44		6.22				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.26				3.54		3.32				

Delay, Queue Length, and Level of Service

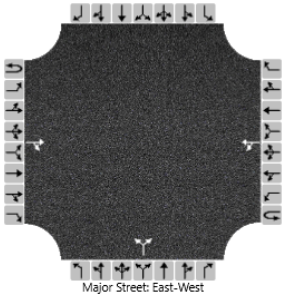
Flow Rate, v (veh/h)						63					343					
Capacity, c (veh/h)						1245					679					
v/c Ratio						0.05					0.51					
95% Queue Length, Q_{95} (veh)						0.2					2.9					
Control Delay (s/veh)						8.0					15.6					
Level of Service (LOS)						A					C					
Approach Delay (s/veh)						3.3				15.6						
Approach LOS										C						

HCS™ TWSC Version 7.9.5
Broad Run AM 28 B.xtw
Generated: 4/11/2022 11:11:33 AM

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DBZ	Intersection	Seatonville at Broad Run
Agency/Co.	Diane B Zimmerman Traffic Engineering	Jurisdiction	
Date Performed	6/23/2021	East/West Street	Seatonville Road
Analysis Year	2021	North/South Street	Broad Run
Time Analyzed	PM Peak	Peak Hour Factor	0.87
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Broad Run		

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	0	1	0	0	0	1	0		0	1	0		0	0	0
Configuration				TR		LT					LR					
Volume (veh/h)			162	61		64	381			26		18				
Percent Heavy Vehicles (%)						0				0		6				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.1		6.2				
Critical Headway (sec)						4.10				6.40		6.26				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.20				3.50		3.35				

Delay, Queue Length, and Level of Service

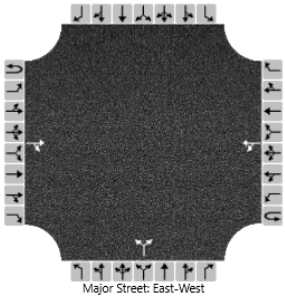
Flow Rate, v (veh/h)						74					51					
Capacity, c (veh/h)						1320					433					
v/c Ratio						0.06					0.12					
95% Queue Length, Q_{95} (veh)						0.2					0.4					
Control Delay (s/veh)						7.9					14.4					
Level of Service (LOS)						A					B					
Approach Delay (s/veh)					1.6				14.4							
Approach LOS									B							

HCS™ TWSC Version 7.9.5
Broad Run PM 21.xtw
Generated: 8/5/2021 4:56:55 PM

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DBZ	Intersection	Seatonville at Broad Run
Agency/Co.	Diane B Zimmerman Traffic Engineering	Jurisdiction	
Date Performed	7/9/21	East/West Street	Seatonville Road
Analysis Year	2028	North/South Street	Broad Run
Time Analyzed	PM Peak No Build	Peak Hour Factor	0.87
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Broad Run		

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	0	1	0	0	0	1	0		0	1	0		0	0	0
Configuration				TR		LT					LR					
Volume (veh/h)			174	65		69	408			28		19				
Percent Heavy Vehicles (%)						0				0		6				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.1		6.2				
Critical Headway (sec)						4.10				6.40		6.26				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.20				3.50		3.35				

Delay, Queue Length, and Level of Service

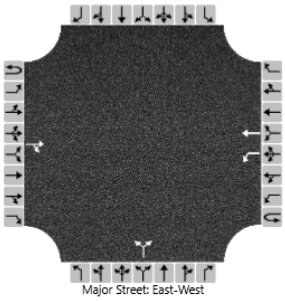
Flow Rate, v (veh/h)						79					54					
Capacity, c (veh/h)						1300					400					
v/c Ratio						0.06					0.13					
95% Queue Length, Q_{95} (veh)						0.2					0.5					
Control Delay (s/veh)						7.9					15.4					
Level of Service (LOS)						A					C					
Approach Delay (s/veh)					1.7				15.4							
Approach LOS									C							

HCS™ TWSC Version 7.9.5
Broad Run PM 28 NB.xtw
Generated: 8/5/2021 4:58:04 PM

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DBZ	Intersection	Seatonville at Broad Run
Agency/Co.	Diane B Zimmerman Traffic Engineering	Jurisdiction	
Date Performed	4/11/22	East/West Street	Seatonville Road
Analysis Year	2028	North/South Street	Broad Run
Time Analyzed	PM Peak Build	Peak Hour Factor	0.87
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Broad Run		

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	0	1	0	0	1	1	0		0	1	0		0	0	0
Configuration				TR		L	T				LR					
Volume (veh/h)			174	148		194	408			77		93				
Percent Heavy Vehicles (%)						1				1		6				
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				7.1		6.2				
Critical Headway (sec)						4.11				6.41		6.26				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.21				3.51		3.35				

Delay, Queue Length, and Level of Service

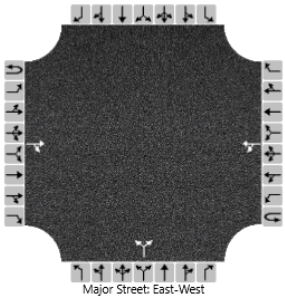
Flow Rate, v (veh/h)						223					195					
Capacity, c (veh/h)						1194					407					
v/c Ratio						0.19					0.48					
95% Queue Length, Q_{95} (veh)						0.7					2.5					
Control Delay (s/veh)						8.7					21.7					
Level of Service (LOS)						A					C					
Approach Delay (s/veh)					2.8				21.7							
Approach LOS									C							

HCS™ TWSC Version 7.9.5
Broad Run PM 28 B.xtw
Generated: 4/11/2022 11:12:17 AM

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DBZ	Intersection	Seatonville at Brentlinge
Agency/Co.	Diane B Zimmerman Traffic Engineering	Jurisdiction	
Date Performed	6/23/2021	East/West Street	Seatonville Road
Analysis Year	2021	North/South Street	Brentlinger
Time Analyzed	AM Peak	Peak Hour Factor	0.82
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Broad Run		

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	0	1	0	0	0	1	0		0	1	0		0	0	0
Configuration				TR		LT					LR					
Volume (veh/h)			41	4		58	66			2		157				
Percent Heavy Vehicles (%)						0				0		0				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.1		6.2				
Critical Headway (sec)						4.10				6.40		6.20				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.20				3.50		3.30				

Delay, Queue Length, and Level of Service

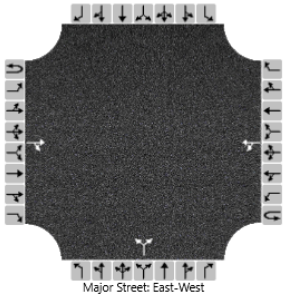
Flow Rate, v (veh/h)						71					194					
Capacity, c (veh/h)						1563					1015					
v/c Ratio						0.05					0.19					
95% Queue Length, Q_{95} (veh)						0.1					0.7					
Control Delay (s/veh)						7.4					9.4					
Level of Service (LOS)						A					A					
Approach Delay (s/veh)					3.7				9.4							
Approach LOS					A											

HCS™ TWSC Version 7.9.5
Brentlinger AM 21.xtw
Generated: 8/5/2021 5:04:50 PM

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DBZ	Intersection	Seatonville at Brentlinge
Agency/Co.	Diane B Zimmerman Traffic Engineering	Jurisdiction	
Date Performed	6/23/2021	East/West Street	Seatonville Road
Analysis Year	2028	North/South Street	Brentlinger
Time Analyzed	AM Peak No Build	Peak Hour Factor	0.82
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Broad Run		

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	0	1	0	0	0	1	0		0	1	0		0	0	0
Configuration				TR		LT					LR					
Volume (veh/h)			44	4		62	71			2		168				
Percent Heavy Vehicles (%)						0				0		0				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.1		6.2				
Critical Headway (sec)						4.10				6.40		6.20				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.20				3.50		3.30				

Delay, Queue Length, and Level of Service

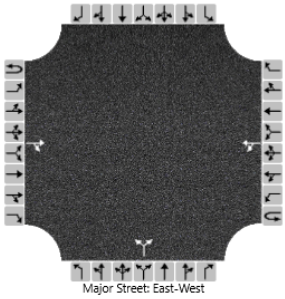
Flow Rate, v (veh/h)						76					207					
Capacity, c (veh/h)						1558					1010					
v/c Ratio						0.05					0.21					
95% Queue Length, Q_{95} (veh)						0.2					0.8					
Control Delay (s/veh)						7.4					9.5					
Level of Service (LOS)						A					A					
Approach Delay (s/veh)					3.7				9.5							
Approach LOS					A											

HCS™ TWSC Version 7.9.5
Brentlinger AM 28 NB.xtw
Generated: 8/5/2021 5:06:37 PM

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DBZ	Intersection	Seatonville at Brentlinge
Agency/Co.	Diane B Zimmerman Traffic Engineering	Jurisdiction	
Date Performed	3/10/2022	East/West Street	Seatonville Road
Analysis Year	2028	North/South Street	Brentlinger
Time Analyzed	AM Peak Build	Peak Hour Factor	0.82
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Broad Run		

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	0	1	0	0	0	1	0		0	1	0		0	0	0
Configuration				TR		LT					LR					
Volume (veh/h)			60	4		90	117			2		177				
Percent Heavy Vehicles (%)						0				0		0				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.1		6.2				
Critical Headway (sec)						4.10				6.40		6.20				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.20				3.50		3.30				

Delay, Queue Length, and Level of Service

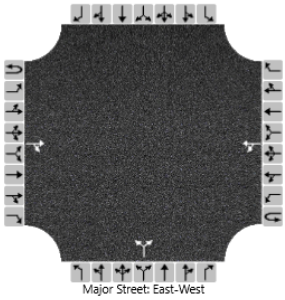
Flow Rate, v (veh/h)						110					218					
Capacity, c (veh/h)						1533					982					
v/c Ratio						0.07					0.22					
95% Queue Length, Q_{95} (veh)						0.2					0.9					
Control Delay (s/veh)						7.5					9.7					
Level of Service (LOS)						A					A					
Approach Delay (s/veh)					3.6				9.7							
Approach LOS									A							

HCS™ TWSC Version 7.9.5
Brentlinger AM 28 B.xtw
Generated: 3/10/2022 4:03:38 PM

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DBZ	Intersection	Seatonville at Brentlinge
Agency/Co.	Diane B Zimmerman Traffic Engineering	Jurisdiction	
Date Performed	6/23/2021	East/West Street	Seatonville Road
Analysis Year	2021	North/South Street	Brentlinger
Time Analyzed	PM Peak	Peak Hour Factor	0.88
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Broad Run		

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	0	1	0	0	0	1	0		0	1	0		0	0	0
Configuration				TR		LT					LR					
Volume (veh/h)			139	28		331	71			7		85				
Percent Heavy Vehicles (%)						1				0		2				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.1		6.2				
Critical Headway (sec)						4.11				6.40		6.22				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.21				3.50		3.32				

Delay, Queue Length, and Level of Service

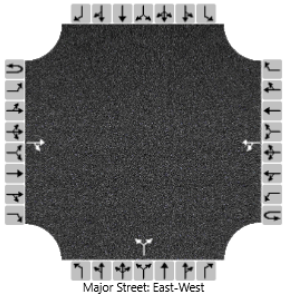
Flow Rate, v (veh/h)						376					105					
Capacity, c (veh/h)						1390					686					
v/c Ratio						0.27					0.15					
95% Queue Length, Q_{95} (veh)						1.1					0.5					
Control Delay (s/veh)						8.5					11.2					
Level of Service (LOS)						A					B					
Approach Delay (s/veh)					7.5				11.2							
Approach LOS									B							

HCS™ TWSC Version 7.9.5
Brentlinger PM 21.xtw
Generated: 8/5/2021 5:10:14 PM

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DBZ	Intersection	Seatonville at Brentlinge
Agency/Co.	Diane B Zimmerman Traffic Engineering	Jurisdiction	
Date Performed	7/9/2021	East/West Street	Seatonville Road
Analysis Year	2028	North/South Street	Brentlinger
Time Analyzed	PM Peak No Build	Peak Hour Factor	0.88
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Broad Run		

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	0	1	0	0	0	1	0		0	1	0		0	0	0
Configuration				TR		LT					LR					
Volume (veh/h)			149	30		355	83			8		91				
Percent Heavy Vehicles (%)						1				0		2				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.1		6.2				
Critical Headway (sec)						4.11				6.40		6.22				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.21				3.50		3.32				

Delay, Queue Length, and Level of Service

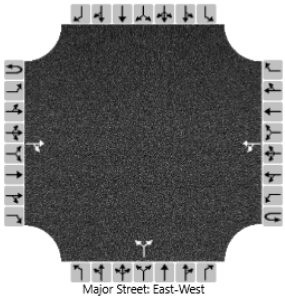
Flow Rate, v (veh/h)						403					113					
Capacity, c (veh/h)						1374					641					
v/c Ratio						0.29					0.18					
95% Queue Length, Q_{95} (veh)						1.2					0.6					
Control Delay (s/veh)						8.7					11.8					
Level of Service (LOS)						A					B					
Approach Delay (s/veh)					7.6				11.8							
Approach LOS									B							

HCS™ TWSC Version 7.9.5
Brentlinger PM 28 NB.xtw
Generated: 8/5/2021 5:22:41 PM

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DBZ	Intersection	Seatonville at Brentlinge
Agency/Co.	Diane B Zimmerman Traffic Engineering	Jurisdiction	
Date Performed	3/10/2022	East/West Street	Seatonville Road
Analysis Year	2028	North/South Street	Brentlinger
Time Analyzed	PM Peak Build	Peak Hour Factor	0.88
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Broad Run		

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	0	1	0	0	0	1	0		0	1	0		0	0	0
Configuration				TR		LT					LR					
Volume (veh/h)			201	30		373	114			8		122				
Percent Heavy Vehicles (%)						1				0		2				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.1		6.2				
Critical Headway (sec)						4.11				6.40		6.22				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.21				3.50		3.32				

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						424					148					
Capacity, c (veh/h)						1308					604					
v/c Ratio						0.32					0.24					
95% Queue Length, Q_{95} (veh)						1.4					1.0					
Control Delay (s/veh)						9.1					12.9					
Level of Service (LOS)						A					B					
Approach Delay (s/veh)					7.7				12.9							
Approach LOS									B							

HCS™ TWSC Version 7.9.5
Brentlinger PM 28 B.xtw
Generated: 3/10/2022 4:05:05 PM

Right Turn Warrant at Entrance

Right Turn Lane Warrants

Input Fields

Right Turn Volume (vph)	208	Speed Limit (mph)	35
Advancing Volume (vph)	342		

Note: This spreadsheet is intended to supplement the guidance provided in the Auxiliary Turn Lane policy outlined in the KYTC Highway Design Manual. This policy should be fully reviewed and understood prior to using this application.