final report

December 7, 2017

Traffic Impact Study

Advanced ENT and Allergy
2944 Breckenridge Lane
Louisville, KY

Prepared for

Louisville Metro Planning Commission
Kentucky Transportation Cabinet

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INTRODUCTION

The development plan for the Advanced ENT & Allergy at 2944 Breckenridge Lane in Louisville, KY shows a medical office building with 25,459 square feet and a convenience store with 16 fueling locations. **Figure 1** displays a map of the site. Access to the site will be from Breckenridge Lane. 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 Breckenridge Lane with Hillbrook Drive, Berkshire Avenue, Taylorsville Road, Hikes Lane, and the entrance to McMahan Plaza.

Figure 1. Site Map

EXISTING CONDITIONS

Breckenridge Lane (KY 1932) is a state maintained road with an estimated 2017 ADT of 30,000 vehicles per day between Taylorsville Road (KY 155) and I 264, as provided by a Kentucky Transportation Cabinet 2015 count at station 152. The road has four twelve-foot lanes, curb and gutter, and center turn lane. The speed limit is 35 mph. There are sidewalks. The intersections with Hillbrook Drive, Taylorsville Road, Hikes Lane and McMahan Plaza are controlled with a traffic signal. The intersection with Berkshire Avenue is controlled with a stop sign. Breckenridge Lane is served by TARC.

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A twelve-hour turning movement count was made at the intersection of Breckenridge Lane and Berkshire Avenue on December 13, 2016. The data for the other intersections were provided by Metro Traffic Engineering from 2009. **Figure 2** illustrates the a.m. and p.m. peak hour traffic volumes.

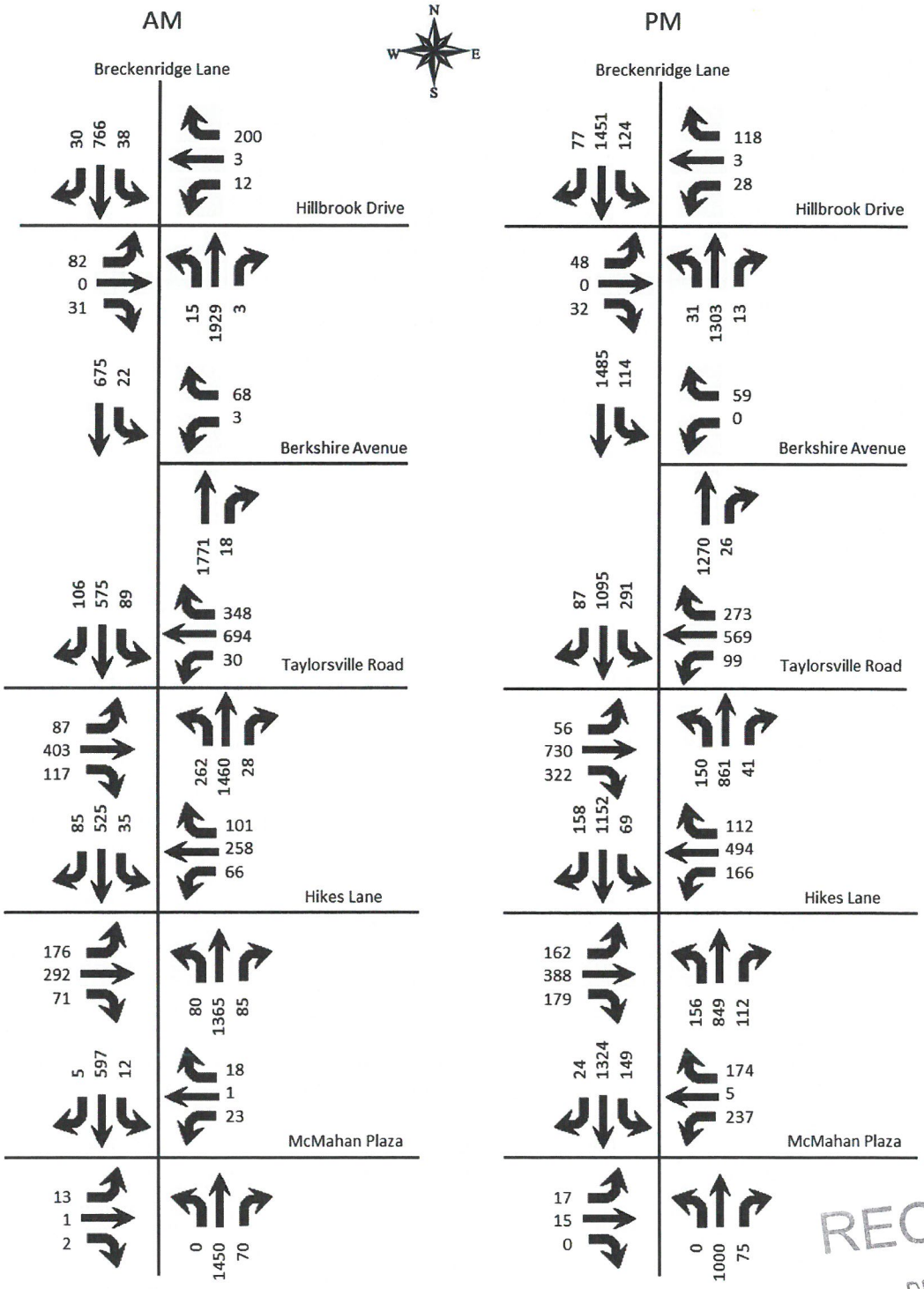

Figure 2. Existing Peak Hour Volumes

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TRIP GENERATION

The Institute of Transportation Engineers Trip Generation Manual, 10th Edition contains trip generation rates for a wide range of developments. The land use of "Medical-Dental Office (720)" and "Super Convenience Market/Gas Station (960)" were reviewed and determined to be the best match. The trip generation results are listed in **Table 1**. Using the trip generation equation yields 520 a.m. peak hour trips and 455 p.m. peak hour trips. The trips were assigned to the highway network using the percentages shown in **Figure 3**.

Figure 4 shows the trips generated by this development and distributed throughout the road network during the peak hours. Pass-by trips are trips already on the road that choose to visit the site. They are assigned using the peak hour directional traffic. These trips are shown in parenthesis in Figure 4. **Figure 5** 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**
Medical-Dental Office (25,459 sq. ft.)	71	55	16	88	25	63
Super Convenience Market/Gas (16 pumps)	449	225	224	367	184	183
TOTAL	**520**	**280**	**240**	**455**	**209**	**246**
Pass-by Trips for Super Convenience Market/Gas	278	139	139	206	103	103
New Trips	242	141	101	249	106	143

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Figure 3. Trip Distribution Percentages

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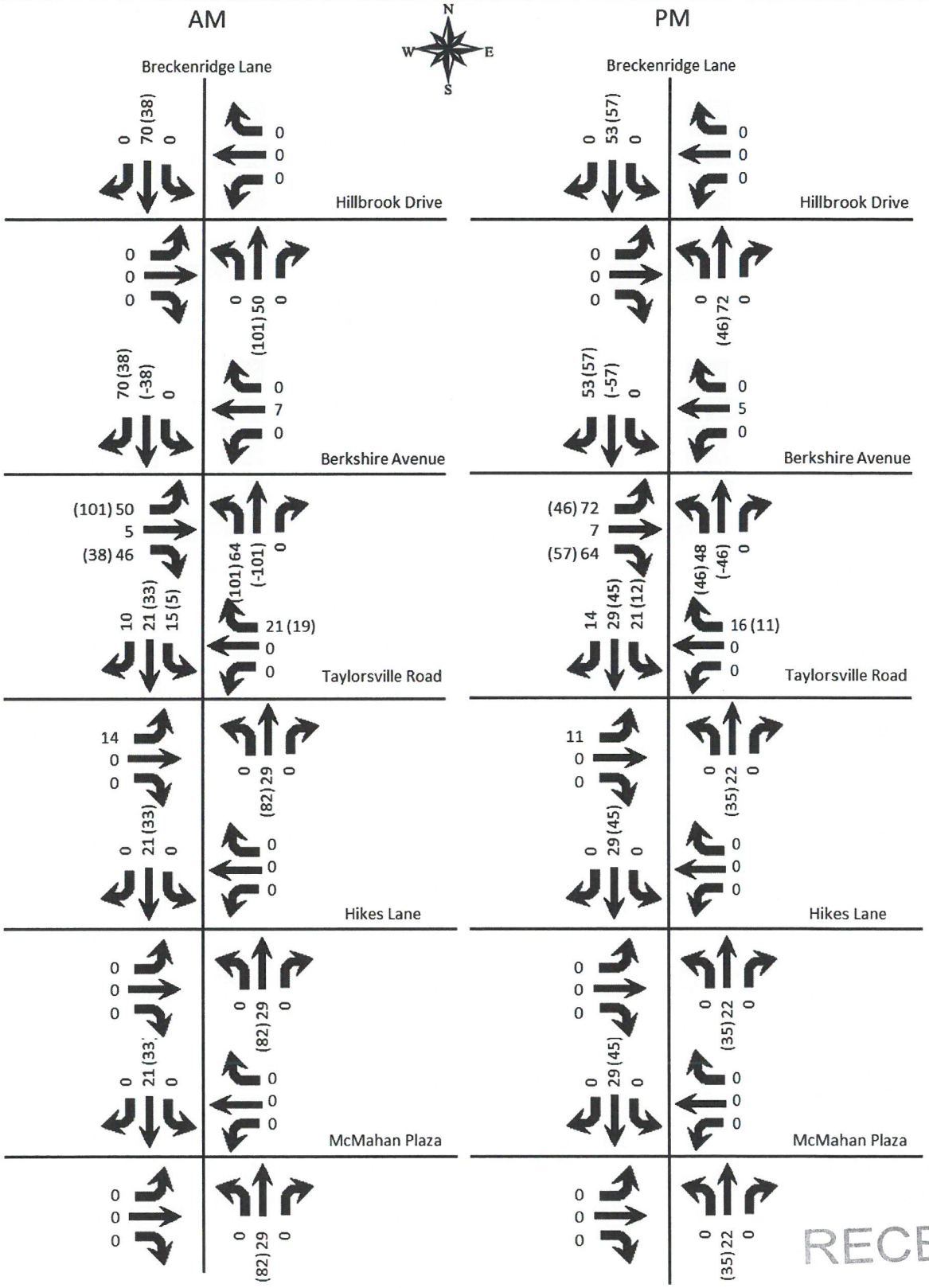

Figure 4. Peak Hour Trips Generated by Site

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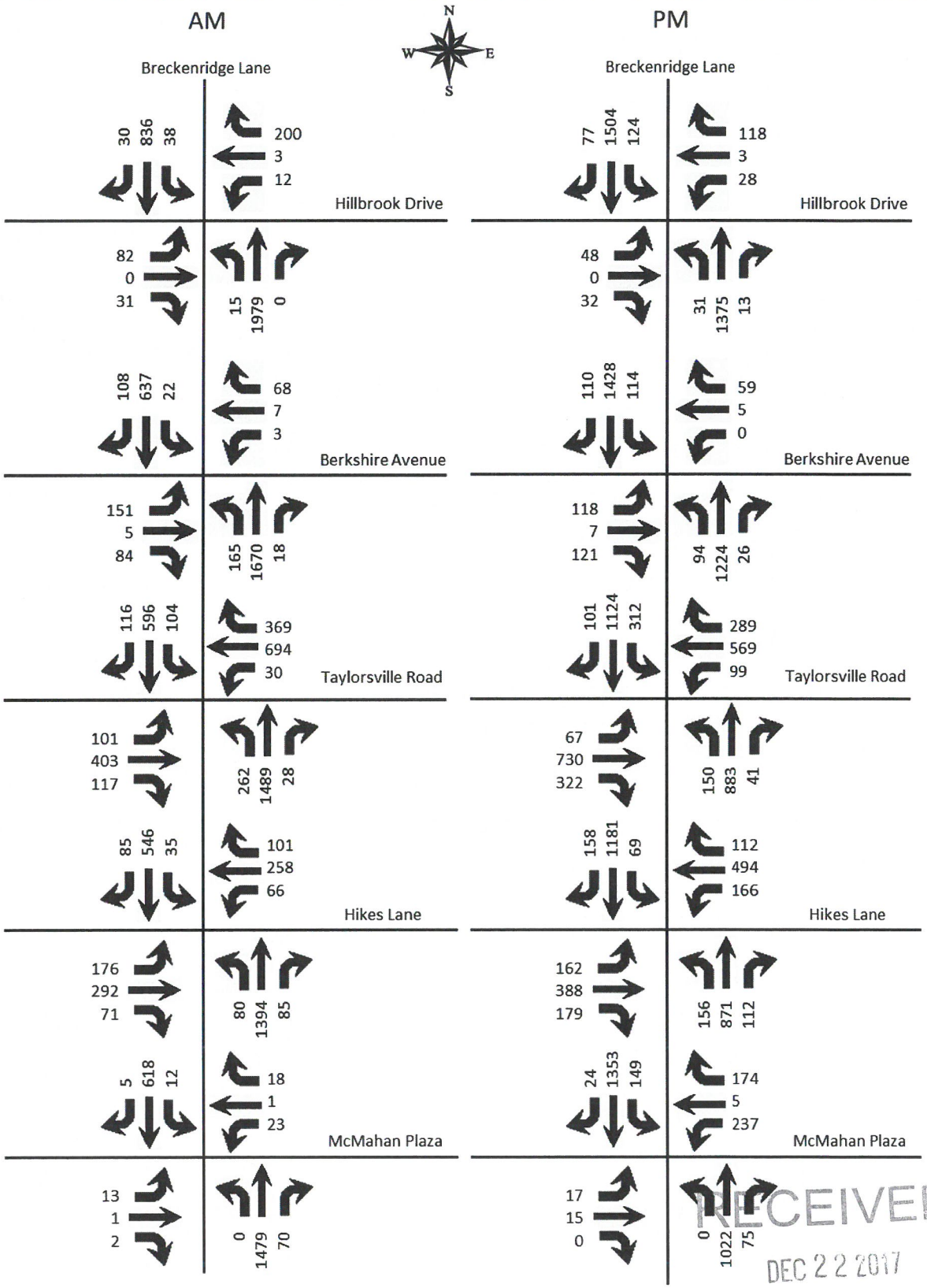

Figure 5. Build Peak Hour Trips

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ANALYSIS

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

To evaluate the impact of the proposed development, the vehicle delays at the intersections were determined using procedures detailed in the Highway Capacity Manual, 6th edition. Future delays and Level of Service were determined for the intersections using Synchro (version 10.1) software. The delays and Level of Service are summarized in **Table 2**.

Table 2. Level of Service Results

	A.M.		P.M.	
Approach	2019 No Build	2019 Build	2019 No Build	2019 Build
Breckenridge Lane at Hillbrook Drive	**D 42.9**	**C 23.8**	**C 34.0**	**C 20.7**
Deebet Drive Eastbound	F 125.1	F 125.1	E 68.2	E 68.2
Hillbrook Drive Westbound	F 136.2	F 136.2	E 79.4	E 79.4
Breckenridge Lane Northbound	D 38.7	A 9.1	D 47.8	B 15.9
Breckenridge Lane Southbound	B 17.7	B 17.1	B 17.5	B 17.3
Breckenridge Lane at Berkshire Drive		**B 13.3**		**B 17.6**
Advanced ENT Eastbound	NA	E 77.0	NA	E 78.8
Berkshire Drive Westbound	C 23.2	E 69.3	C 15.8	E 69.6
Breckenridge Lane Northbound	NA	A 8.0	NA	B 14.0
Breckenridge Lane Southbound	C 17.1	A 0.6	B 14.3	A 9.5
Breckenridge Lane at Taylorsville Road	**F 103.7**	**F 106.3**	**E 71.1**	**E 72.1**
Taylorsville Road Eastbound	F 195.3	F 194.1	F 95.9	F 95.8
Taylorsville Road Westbound	F 87.8	F 93.8	D 49.8	D 53.1
Breckenridge Lane Northbound	E 59.0	E 65.0	E 71.4	E 73.2
Breckenridge Lane Southbound	E 63.1	E 60.4	E 65.4	E 65.4

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	A.M.		P.M.	
Approach	2019 No Build	2019 Build	2019 No Build	2019 Build
Breckenridge Lane at Hikes Lane	**D 41.6**	**D 41.3**	**E 71.9**	**E 71.6**
Hikes Lane Eastbound	F 114.1	F 114.1	F 111.6	F 111.6
Hikes Lane Westbound	F 89.8	F 89.8	F 115.1	F 115.1
Breckenridge Lane Northbound	A 5.0	A 5.0	B 12.9	B 12.6
Breckenridge Lane Southbound	D 36.3	D 36.4	E 74.4	E 75.3
Breckenridge Lane at McMahon Plaza	**A 6.5**	**A 6.5**	**C 23.5**	**C 23.3**
Casa Granada Eastbound	F 88.0	F 88.0	E 73.7	E 73.7
McMahon Plaza Westbound	F 86.9	F 86.9	E 74.8	E 74.8
Breckenridge Lane Northbound	A 4.6	A 4.7	C 22.9	C 23.2
Breckenridge Lane Southbound	A 3.7	A 3.6	A 8.5	A 8.3

Key: Level of Service, Delay in seconds per vehicle

The Kentucky Transportation Cabinet evaluates the need and length of auxiliary turn lanes using the Highway Design Guidance Manual dated March, 2017. For intersections with a traffic signal, the capacity analysis determines the requirement for a right turn lane. The analysis indicates a southbound right turn lane will not improve the operation of the approach.

The volume forecasted to exit the site is significant enough to evaluate the installation of a traffic signal at entrance opposite Berkshire Drive. The Manual on Uniform Traffic Control Device Warrants for installing a traffic signal were reviewed. The Institute of Transportation Engineers Trip Generation Manual, 10th Edition contains time of day trip distribution rates in Appendix A. Using the distribution percentages for "Super Convenience Market/Gas Station" and the hourly distribution of trips from Advanced ENT patient counts, there is sufficient minor street volume to meet Warrant 1A. The warrant spreadsheet is included in the Appendix.

CONCLUSIONS

Based upon the volume of traffic generated by the development there will be a minimal impact to the existing highway network. The current delays experienced at the intersections evaluated will increase within the acceptable limits. The development will generate sufficient volume of traffic to meet the warrant for the installation of a traffic signal at the proposed entrance opposite Berkshire Avenue.

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APPENDIX

Traffic Counts

Study Name Breckenridge Ln & Berkshire Ave
Start Date 12/13/2016
Start Time 7:00 AM

Groundbreaking by Design.

	Southbound Approach Southbound				Northbound Approach Northbound				Westbound Approach Westbound				Eastbound Approach Eastbound				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Total
7:00 AM	0	97	7	0	0	365	0	0	24	0	0	0	0	0	0	0	469
7:15 AM	0	124	4	1	6	467	0	0	23	0	1	0	0	0	0	0	602
7:30 AM	0	183	8	0	2	463	0	0	17	0	0	0	0	0	0	0	656
7:45 AM	0	199	6	0	7	440	0	0	19	0	1	0	0	0	0	0	652
8:00 AM	0	134	3	0	5	408	0	0	23	0	2	0	0	0	0	0	550
8:15 AM	0	159	5	0	4	460	0	0	9	0	0	0	0	0	0	0	628
8:30 AM	0	156	11	0	3	457	1	0	22	0	0	0	2	0	0	0	628
8:45 AM	0	197	8	0	4	451	0	0	22	0	2	0	0	0	0	0	660
9:00 AM	0	173	9	1	2	331	0	0	16	0	1	0	0	0	0	0	516
9:15 AM	0	167	5	0	1	303	0	0	8	0	3	0	0	0	0	0	476
9:30 AM	0	173	10	0	1	294	0	0	10	0	1	0	0	0	0	0	478
9:45 AM	0	211	13	0	1	336	0	0	11	0	1	0	0	0	0	0	561
10:00 AM	0	232	5	0	1	318	0	0	13	0	0	0	0	0	0	0	556
10:15 AM	0	213	5	0	4	273	0	0	15	0	1	0	0	0	0	0	495
10:30 AM	0	229	4	0	5	291	0	0	12	0	0	0	0	0	0	0	529
10:45 AM	0	241	6	0	5	291	0	0	9	0	3	0	0	0	0	0	543
11:00 AM	0	264	5	0	1	266	0	0	16	0	1	0	0	0	0	0	536
11:15 AM	0	302	15	0	4	306	0	0	5	0	1	0	0	0	0	0	627
11:30 AM	0	290	19	0	4	301	0	0	12	0	1	0	0	0	0	0	614
11:45 AM	1	274	11	0	6	271	0	0	9	0	0	0	0	0	0	0	563
12:00 PM	0	285	13	0	4	270	0	0	14	0	0	0	0	0	0	0	572
12:15 PM	0	299	9	0	6	275	0	0	15	0	1	0	0	0	0	0	589
12:30 PM	0	294	4	1	3	315	0	0	4	0	1	0	0	0	0	0	617
12:45 PM	0	278	15	1	3	325	0	0	12	0	2	0	0	0	0	0	622
1:00 PM	0	248	18	0	1	338	0	0	13	0	1	0	0	0	0	0	605
1:15 PM	1	321	7	0	5	270	0	0	15	0	2	0	0	0	0	0	604
1:30 PM	0	250	12	0	10	343	0	0	15	0	3	0	0	0	0	0	615
1:45 PM	0	314	14	0	1	329	0	0	10	0	2	0	0	0	0	0	658
2:00 PM	0	286	14	0	2	334	0	0	12	0	1	0	0	0	0	0	636
2:15 PM	0	310	13	0	5	296	0	0	15	0	2	0	0	0	0	0	624
2:30 PM	0	351	17	1	3	305	0	0	10	0	0	0	0	0	0	0	677
2:45 PM	0	348	17	0	5	292	0	0	14	0	0	0	0	0	0	0	662
3:00 PM	0	352	23	0	7	310	1	0	8	0	0	0	0	0	0	0	693
3:15 PM	0	391	23	0	5	293	0	0	14	0	0	0	0	0	0	0	712
3:30 PM	0	370	22	0	8	276	0	0	7	0	2	0	0	0	0	0	676
3:45 PM	0	362	23	0	12	266	0	0	12	0	3	0	0	0	0	0	663
4:00 PM	0	414	24	0	7	320	0	0	14	0	1	0	0	0	0	0	765
4:15 PM	0	412	29	0	4	257	0	0	16	0	1	0	0	0	0	0	702
4:30 PM	0	401	21	0	5	294	0	0	15	0	1	0	0	0	0	0	721
4:45 PM	0	346	28	0	10	311	0	0	7	0	0	0	0	0	0	0	695
5:00 PM	0	357	27	0	9	322	0	0	10	0	0	0	0	0	0	0	715
5:15 PM	0	410	37	0	4	283	0	0	21	0	0	0	0	0	0	0	734
5:30 PM	0	372	22	0	3	354	0	0	21	0	0	0	0	0	0	0	751
5:45 PM	0	300	21	0	9	347	0	0	19	0	1	0	1	0	0	0	677
6:00 PM	0	359	23	0	3	250	0	0	13	0	0	0	0	0	0	0	635
6:15 PM	0	323	23	0	6	304	0	0	18	0	1	0	0	0	0	0	656
6:30 PM	0	293	22	0	6	238	0	0	10	0	0	0	0	0	0	0	559
6:45 PM	0	264	6	1	4	248	0	0	12	0	0	0	0	0	0	0	523

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Study Name Breckenridge Ln & Berkshire Ave
Start Date 12/13/2016
Start Time 7:00 AM

Groundbreaking by Design.

	Southbound Approach Southbound				Northbound Approach Northbound				Westbound Approach Westbound				Eastbound Approach Eastbound				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Total
7:30 AM	0	183	8	0	2	463	0	0	17	0	0	0	0	0	0	0	656
7:45 AM	0	199	6	0	7	440	0	0	19	0	1	0	0	0	0	0	652
8:00 AM	0	134	3	0	5	408	0	0	23	0	2	0	0	0	0	0	550
8:15 AM	0	159	5	0	4	460	0	0	9	0	0	0	0	0	0	0	628
AM Peak	**0**	**675**	**22**	**0**	**18**	**1771**	**0**	**0**	**68**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**2486**
4:45 PM	0	346	28	0	10	311	0	0	7	0	0	0	0	0	0	0	695
5:00 PM	0	357	27	0	9	322	0	0	10	0	0	0	0	0	0	0	715
5:15 PM	0	410	37	0	4	283	0	0	21	0	0	0	0	0	0	0	734
5:30 PM	0	372	22	0	3	354	0	0	21	0	0	0	0	0	0	0	751
PM Peak	**0**	**1485**	**114**	**0**	**26**	**1270**	**0**	**0**	**59**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2895**

Traffic Signal Warrant Analysis

TRAFFIC SIGNAL WARRANT ANALYSIS

COUNTY	Jefferson		DATE	December 13, 2016	DAY OF WEEK: Tues
CITY	Louisville	MILEPOST: 3.066		NO. OF CORRECTIBLE CRASHES IN 12 MONTH PERIOD	
MAJOR STREET NAME	Breckenridge Lane			NO. OF MAJOR STREET APPROACH LANES	2
MINOR STREET NAME	Berkshire Ave			NO. OF MINOR STREET APPROACH LANES	1
POSTED SPEED LIMIT MAJOR SREET	35 MPH	POPULATION < 10,000		REDUCED WARRANTS BASED UPON	
POSTED SPEED LIMIT MINOR SREET	35 MPH	☐ YES ☒ NO		☐ SPEED ☐ POPULATION	

TIME	MAJOR STREET TWO WAY VOLUME	MINOR STREET HIGHEST VOLUME APPROACH Are Side Street Rights Included? Yes ☑ No ☐	Warrant 1 Condition A Minimum Vehicular Volume		Warrant 1 Condition B Interruption of Continuous Traffic		Warrant 7 - CRASH EXPERIENCE (Warrant 1 Condition A or B 80% Satisfied) AND (5 or More Correctible Crashes in 12 Month Period) Warrant 1 Condition A - 80%		Warrant 1 Condition B - 80%	
			MAJOR	MINOR	MAJOR	MINOR	MAJOR	MINOR	MAJOR	MINOR
			500 (1)	150 (1)	750 (1)	75 (1)	400 (1)	120 (1)	600 (1)	60 (1)
			600 (2)	200 (2)	900 (2)	100 (2)	480 (2)	160 (2)	720 (2)	80 (2)
			REDUCED WARRANTS				REDUCED WARRANTS (56% Reduction)			
			350 (1)	105 (1)	525 (1)	53 (1)	280 (1)	84 (1)	420 (1)	42 (1)
			420 (2)	140 (2)	630 (2)	70 (2)	336 (2)	112 (2)	504 (2)	56 (2)
			(1) = ONE LANE APPROACH				(2) = TWO LANE APPROACH			
7-8 am	2,379	169	X	X	X	X	X	X	X	X
8-9 am	2,466	240	X	X	X	X	X	X	X	X
9-10 am	2,031	200	X	X	X	X	X	X	X	X
10-11 am	2,123	189	X	X	X	X	X	X	X	X
11-12 am	2,340	194	X	X	X	X	X	X	X	X
12-1 pm	2,400	211	X	X	X	X	X	X	X	X
1-2 pm	2,482	198	X	X	X	X	X	X	X	X
2-3 pm	2,599	208	X	X	X	X	X	X	X	X
3-4 pm	2,744	216	X	X	X	X	X	X	X	X
4-5 pm	2,883	229	X	X	X	X	X	X	X	X
5-6 pm	2,877	246	X	X	X	X	X	X	X	X
6-7 pm	2,372	182	X	X	X	X	X	X	X	X
NUMBER OF HOURS			12		12		12		12	
COMPLIANCE			YES		YES		NO			

The AM and PM peak hour trips generated on page 3 were used for 8-9 am and 5-6 pm.

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SYNCHRO Reports

HCM 6th Signalized Intersection Summary
8: Breckenridge Ln/KY 1932 & Deebet Dr/Hillbrook Dr

12/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	82	0	31	12	3	200	15	1929	3	38	766	30
Future Volume (veh/h)	82	0	31	12	3	200	15	1929	3	38	766	30
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	85	0	32	12	3	208	16	2009	3	40	798	31
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	90	0	391	21	13	181	413	2267	3	116	2202	86
Arrive On Green	0.25	0.00	0.25	0.25	0.25	0.25	0.02	0.62	0.62	0.02	0.63	0.63
Sat Flow, veh/h	204	0	1585	0	53	733	1781	3641	5	1781	3487	135
Grp Volume(v), veh/h	85	0	32	223	0	0	16	980	1032	40	407	422
Grp Sat Flow(s),veh/h/ln	204	0	1585	786	0	0	1781	1777	1869	1781	1777	1846
Q Serve(g_s), s	0.0	0.0	2.8	0.0	0.0	0.0	0.6	83.6	83.7	1.5	19.7	19.7
Cycle Q Clear(g_c), s	44.4	0.0	2.8	44.4	0.0	0.0	0.6	83.6	83.7	1.5	19.7	19.7
Prop In Lane	1.00		1.00	0.05		0.93	1.00		0.00	1.00		0.07
Lane Grp Cap(c), veh/h	90	0	391	215	0	0	413	1106	1164	116	1122	1165
V/C Ratio(X)	0.94	0.00	0.08	1.04	0.00	0.00	0.04	0.89	0.89	0.34	0.36	0.36
Avail Cap(c_a), veh/h	90	0	391	215	0	0	578	1106	1164	267	1122	1165
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	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	76.9	0.0	52.1	64.7	0.0	0.0	12.8	28.6	28.6	35.4	15.9	15.9
Incr Delay (d2), s/veh	75.7	0.0	0.1	71.4	0.0	0.0	0.0	10.5	10.1	1.7	0.9	0.9
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	5.9	0.0	1.1	13.2	0.0	0.0	0.2	37.7	39.6	1.0	8.4	8.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	152.6	0.0	52.2	136.2	0.0	0.0	12.9	39.1	38.7	37.2	16.8	16.7
LnGrp LOS	F	A	D	F	A	A	B	D	D	D	B	B
Approach Vol, veh/h		117			223			2028			869	
Approach Delay, s/veh		125.1			136.2			38.7			17.7	
Approach LOS		F			F			D			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.8	118.2		51.0	9.3	119.7		51.0				
Change Period (Y+Rc), s	6.5	* 6.1		6.6	6.5	* 6.1		6.6				
Max Green Setting (Gmax), s	19.5	* 97		44.4	19.5	* 97		44.4				
Max Q Clear Time (g_c+I1), s	3.5	85.7		46.4	2.6	0.0		46.4				
Green Ext Time (p_c), s	0.1	9.2		0.0	0.0	0.0		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	42.9
HCM 6th LOS	D

Notes

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

HCM 6th TWSC
30: Breckenridge Ln & Berkshire Avenue

12/06/2017

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
Lane Configurations										
Traffic Vol, veh/h	0	68	0	1771	18	22	675	0	0	0
Future Vol, veh/h	0	68	0	1771	18	22	675	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	-	None	-	-
Storage Length	0	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	1	-	-	0	-	-	0	-	16983	-
Grade, %	0	-	-	0	-	-	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	71	0	1845	19	23	703	0	0	0

Major/Minor	Minor1		Major1			Major2		
Conflicting Flow All	2253	932	-	0	0	1864	0	0
Stage 1	1855	-	-	-	-	-	-	-
Stage 2	398	-	-	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	-	4.14	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	-	2.22	-	-
Pot Cap-1 Maneuver	35	268	0	-	-	320	-	0
Stage 1	109	-	0	-	-	-	-	0
Stage 2	647	-	0	-	-	-	-	0
Platoon blocked, %				-	-		-	
Mov Cap-1 Maneuver	31	268	-	-	-	320	-	-
Mov Cap-2 Maneuver	82	-	-	-	-	-	-	-
Stage 1	96	-	-	-	-	-	-	-
Stage 2	647	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	23.2	0	0.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	268	320	-
HCM Lane V/C Ratio	-	-	0.264	0.072	-
HCM Control Delay (s)	-	-	23.2	17.1	-
HCM Lane LOS	-	-	C	C	-
HCM 95th %tile Q(veh)	-	-	1	0.2	-

17 Zone 1054

HCM 6th Signalized Intersection Summary
504: Breckenridge Ln & Taylorsville Rd

12/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR	NWR2
Lane Configurations												
Traffic Volume (veh/h)	87	403	117	30	694	348	89	575	106	262	1460	28
Future Volume (veh/h)	87	403	117	30	694	348	89	575	106	262	1460	28
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	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	91	420	122	31	723	362	93	93	0	273	0	0
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	110	311	139	366	823	367	111	111		466		
Arrive On Green	0.06	0.09	0.09	0.21	0.23	0.23	0.06	0.06	0.00	0.26	0.00	0.00
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1781	1781	1585	1781	0	0
Grp Volume(v), veh/h	91	420	122	31	723	362	93	93	0	273	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	1781	1585	1781	0	0
Q Serve(g_s), s	9.1	15.8	13.7	2.5	35.3	40.9	9.3	9.3	0.0	24.1	0.0	0.0
Cycle Q Clear(g_c), s	9.1	15.8	13.7	2.5	35.3	40.9	9.3	9.3	0.0	24.1	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.00	0.00
Lane Grp Cap(c), veh/h	110	311	139	366	823	367	111	111		466		
V/C Ratio(X)	0.83	1.35	0.88	0.08	0.88	0.99	0.83	0.83		0.59		
Avail Cap(c_a), veh/h	175	843	376	366	823	367	153	153		466		
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	1.00	1.00	0.98	0.98	0.98	1.00	1.00	0.00	0.57	0.00	0.00
Uniform Delay (d), s/veh	83.5	82.1	81.2	57.8	66.7	68.9	83.5	83.5	0.0	57.9	0.0	0.0
Incr Delay (d2), s/veh	16.3	162.4	15.8	0.1	10.5	42.6	23.7	23.7	0.0	1.1	0.0	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	4.7	14.3	6.2	1.2	17.2	20.9	5.0	5.0	0.0	11.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	99.9	244.5	97.0	57.9	77.2	111.4	107.2	107.2	0.0	59.0	0.0	0.0
LnGrp LOS	F	F	F	E	E	F	F	F		E		
Approach Vol, veh/h		633			1116		692	692	A	273	A	A
Approach Delay, s/veh		195.3			87.8		63.1	63.1		59.0		
Approach LOS		F			F		E	E		E		

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.8	95.9	43.3	22.1	54.6	60.0	17.4	48.0
Change Period (Y+Rc), s	7.5	7.5	* 6.3	* 6.3	7.5	7.5	* 6.3	* 6.3
Max Green Setting (Gmax), s	15.5	77.5	* 17	* 43	40.5	52.5	* 18	* 42
Max Q Clear Time (g_c+I1), s	11.3	0.0	4.5	15.7	26.1	0.0	11.1	42.9
Green Ext Time (p_c), s	0.1	0.0	0.0	0.1	0.7	0.0	0.1	0.0

Intersection Summary	
HCM 6th Ctrl Delay	103.7
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [NWR2, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
533: Hikes Ln & Breckenridge Ln

12/06/2017

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	80	1365	85	35	525	85	176	292	71	66	258	101
Future Volume (veh/h)	80	1365	85	35	525	85	176	292	71	66	258	101
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	1422	89	36	547	89	183	304	74	69	269	105
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	336	2139	133	47	1430	232	159	468	112	86	311	118
Arrive On Green	0.38	1.00	1.00	0.03	0.47	0.47	0.09	0.16	0.16	0.05	0.12	0.12
Sat Flow, veh/h	1781	3397	212	1781	3061	496	1781	2843	681	1781	2517	958
Grp Volume(v), veh/h	83	742	769	36	317	319	183	188	190	69	188	186
Grp Sat Flow(s),veh/h/ln	1781	1777	1832	1781	1777	1781	1781	1777	1748	1781	1777	1698
Q Serve(g_s), s	5.8	0.0	0.0	3.6	20.8	20.9	16.1	17.8	18.3	6.9	18.7	19.4
Cycle Q Clear(g_c), s	5.8	0.0	0.0	3.6	20.8	20.9	16.1	17.8	18.3	6.9	18.7	19.4
Prop In Lane	1.00		0.12	1.00		0.28	1.00		0.39	1.00		0.56
Lane Grp Cap(c), veh/h	336	1119	1154	47	830	832	159	293	288	86	219	210
V/C Ratio(X)	0.25	0.66	0.67	0.77	0.38	0.38	1.15	0.64	0.66	0.80	0.86	0.89
Avail Cap(c_a), veh/h	336	1119	1154	189	830	832	159	366	360	159	366	350
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.85	0.85	0.85	0.86	0.86	0.86	1.00	1.00	1.00	0.87	0.87	0.87
Uniform Delay (d), s/veh	47.3	0.0	0.0	87.1	31.1	31.1	81.9	70.2	70.4	84.8	77.3	77.6
Incr Delay (d2), s/veh	0.3	2.6	2.6	20.1	1.1	1.2	116.8	2.6	3.1	13.8	8.8	12.5
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	2.5	0.8	0.8	1.9	9.3	9.4	12.6	8.3	8.5	3.5	9.1	9.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.6	2.6	2.6	107.2	32.2	32.3	198.8	72.8	73.5	98.6	86.2	90.2
LnGrp LOS	D	A	A	F	C	C	F	E	E	F	F	F
Approach Vol, veh/h		1594			672			561			443	
Approach Delay, s/veh		5.0			36.3			114.1			89.8	
Approach LOS		A			D			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	39.9	90.0	14.6	35.5	10.6	119.2	22.0	28.1
Change Period (Y+Rc), s	* 5.9	* 5.9	* 5.9	* 5.9	* 5.9	* 5.9	* 5.9	* 5.9
Max Green Setting (Gmax), s	* 19	* 84	* 16	* 37	* 19	* 84	* 16	* 37
Max Q Clear Time (g_c+I1), s	7.8	22.9	8.9	20.3	5.6	2.0	18.1	21.4
Green Ext Time (p_c), s	0.1	1.6	0.1	0.8	0.0	5.1	0.0	0.8

Intersection Summary	
HCM 6th Ctrl Delay	41.6
HCM 6th LOS	D

Notes

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

17 Zone 1054

HCM 6th Signalized Intersection Summary
552: Breckenridge Ln & McMahon Ctr

12/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	1	2	23	1	18	0	1450	70	12	597	5
Future Volume (veh/h)	13	1	2	23	1	18	0	1450	70	12	597	5
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	14	1	2	24	1	19	0	1510	73	12	622	5
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	67	21	42	88	3	60	1	2951	142	18	3238	26
Arrive On Green	0.04	0.04	0.04	0.04	0.04	0.04	0.00	0.86	0.86	0.01	0.90	0.90
Sat Flow, veh/h	1392	557	1113	1308	78	1585	1781	3451	166	1781	3613	29
Grp Volume(v), veh/h	14	0	3	25	0	19	0	775	808	12	306	321
Grp Sat Flow(s),veh/h/ln	1392	0	1670	1386	0	1585	1781	1777	1840	1781	1777	1865
Q Serve(g_s), s	1.8	0.0	0.3	3.0	0.0	2.1	0.0	20.2	20.4	1.2	3.9	3.9
Cycle Q Clear(g_c), s	5.1	0.0	0.3	3.3	0.0	2.1	0.0	20.2	20.4	1.2	3.9	3.9
Prop In Lane	1.00		0.67	0.96		1.00	1.00		0.09	1.00		0.02
Lane Grp Cap(c), veh/h	67	0	63	91	0	60	1	1519	1574	18	1592	1672
V/C Ratio(X)	0.21	0.00	0.05	0.27	0.00	0.32	0.00	0.51	0.51	0.67	0.19	0.19
Avail Cap(c_a), veh/h	275	0	313	305	0	297	143	1519	1574	143	1592	1672
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	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.94	0.94	0.94
Uniform Delay (d), s/veh	87.4	0.0	83.5	85.0	0.0	84.4	0.0	3.4	3.4	88.8	1.2	1.2
Incr Delay (d2), s/veh	1.5	0.0	0.3	1.6	0.0	3.0	0.0	1.2	1.2	34.1	0.3	0.2
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	0.7	0.0	0.1	1.2	0.0	0.9	0.0	6.2	6.5	0.7	0.9	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	88.9	0.0	83.8	86.6	0.0	87.4	0.0	4.6	4.6	122.9	1.4	1.4
LnGrp LOS	F	A	F	F	A	F	A	A	A	F	A	A
Approach Vol, veh/h		17			44			1583			639	
Approach Delay, s/veh		88.0			86.9			4.6			3.7	
Approach LOS		F			F			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.4	159.5		13.1	0.0	166.9		13.1				
Change Period (Y+Rc), s	5.6	5.6		* 6.3	5.6	5.6		* 6.3				
Max Green Setting (Gmax), s	14.4	114.4		* 34	14.4	114.4		* 34				
Max Q Clear Time (g_c+I1), s	3.2	0.0		5.3	0.0	0.0		7.1				
Green Ext Time (p_c), s	0.0	0.0		0.1	0.0	0.0		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	6.5
HCM 6th LOS	A

Notes

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

17 Zone 1054

HCM 6th Signalized Intersection Summary
8: Breckenridge Ln/KY 1932 & Deebet Dr/Hillbrook Dr

12/08/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	82	0	31	12	3	200	15	1979	3	38	836	30
Future Volume (veh/h)	82	0	31	12	3	200	15	1979	3	38	836	30
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	85	0	32	12	3	208	16	2061	3	40	871	31
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	90	0	391	21	13	181	382	2267	3	209	2210	79
Arrive On Green	0.25	0.00	0.25	0.25	0.25	0.25	0.03	1.00	1.00	0.02	0.63	0.63
Sat Flow, veh/h	204	0	1585	0	53	733	1781	3641	5	1781	3500	125
Grp Volume(v), veh/h	85	0	32	223	0	0	16	1006	1058	40	442	460
Grp Sat Flow(s),veh/h/ln	204	0	1585	786	0	0	1781	1777	1869	1781	1777	1848
Q Serve(g_s), s	0.0	0.0	2.8	0.0	0.0	0.0	0.6	0.0	0.0	1.5	22.0	22.0
Cycle Q Clear(g_c), s	44.4	0.0	2.8	44.4	0.0	0.0	0.6	0.0	0.0	1.5	22.0	22.0
Prop In Lane	1.00		1.00	0.05		0.93	1.00		0.00	1.00		0.07
Lane Grp Cap(c), veh/h	90	0	391	215	0	0	382	1106	1164	209	1122	1167
V/C Ratio(X)	0.94	0.00	0.08	1.04	0.00	0.00	0.04	0.91	0.91	0.19	0.39	0.39
Avail Cap(c_a), veh/h	90	0	391	215	0	0	548	1106	1164	359	1122	1167
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	0.70	0.70	0.70	1.00	1.00	1.00
Uniform Delay (d), s/veh	76.9	0.0	52.1	64.7	0.0	0.0	12.9	0.0	0.0	11.5	16.3	16.3
Incr Delay (d2), s/veh	75.7	0.0	0.1	71.4	0.0	0.0	0.0	9.3	8.9	0.4	1.0	1.0
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	5.9	0.0	1.1	13.2	0.0	0.0	0.2	2.8	2.9	0.6	9.3	9.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	152.6	0.0	52.2	136.2	0.0	0.0	12.9	9.3	8.9	11.9	17.3	17.3
LnGrp LOS	F	A	D	F	A	A	B	A	A	B	B	B
Approach Vol, veh/h		117			223			2080			942	
Approach Delay, s/veh		125.1			136.2			9.1			17.1	
Approach LOS		F			F			A			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.8	118.2		51.0	9.3	119.7		51.0				
Change Period (Y+Rc), s	6.5	* 6.1		6.6	6.5	* 6.1		6.6				
Max Green Setting (Gmax), s	19.5	* 97		44.4	19.5	* 97		44.4				
Max Q Clear Time (g_c+I1), s	3.5	2.0		46.4	2.6	0.0		46.4				
Green Ext Time (p_c), s	0.1	36.5		0.0	0.0	0.0		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	23.8
HCM 6th LOS	C

Notes

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

HCM 6th Signalized Intersection Summary
30: Breckenridge Ln & Berkshire Avenue

12/08/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	151	5	84	3	7	68	172	1670	18	22	637	108
Future Volume (veh/h)	151	5	84	3	7	68	172	1670	18	22	637	108
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	157	5	88	3	7	71	179	1740	19	23	664	112
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	216	13	225	23	27	210	586	2828	31	199	2390	403
Arrive On Green	0.15	0.15	0.15	0.15	0.15	0.15	0.79	0.79	0.79	1.00	1.00	1.00
Sat Flow, veh/h	1321	86	1512	18	181	1410	695	3601	39	272	3042	513
Grp Volume(v), veh/h	157	0	93	81	0	0	179	858	901	23	387	389
Grp Sat Flow(s),veh/h/ln	1321	0	1598	1609	0	0	695	1777	1863	272	1777	1778
Q Serve(g_s), s	15.8	0.0	9.5	0.0	0.0	0.0	13.4	36.0	36.2	4.4	0.0	0.0
Cycle Q Clear(g_c), s	23.9	0.0	9.5	8.1	0.0	0.0	13.4	36.0	36.2	40.5	0.0	0.0
Prop In Lane	1.00		0.95	0.04		0.88	1.00		0.02	1.00		0.29
Lane Grp Cap(c), veh/h	216	0	238	260	0	0	586	1396	1464	199	1396	1397
V/C Ratio(X)	0.73	0.00	0.39	0.31	0.00	0.00	0.31	0.61	0.62	0.12	0.28	0.28
Avail Cap(c_a), veh/h	328	0	374	396	0	0	586	1396	1464	199	1396	1397
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	0.00	1.00	1.00	0.00	0.00	0.09	0.09	0.09	0.95	0.95	0.95
Uniform Delay (d), s/veh	76.4	0.0	69.2	68.6	0.0	0.0	5.6	8.0	8.0	5.2	0.0	0.0
Incr Delay (d2), s/veh	4.6	0.0	1.0	0.7	0.0	0.0	0.1	0.2	0.2	1.1	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	7.5	0.0	4.0	3.4	0.0	0.0	1.9	12.7	13.4	0.3	0.2	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	81.1	0.0	70.3	69.3	0.0	0.0	5.7	8.2	8.2	6.3	0.5	0.5
LnGrp LOS	F	A	E	E	A	A	A	A	A	A	A	A
Approach Vol, veh/h		250			81			1938			799	
Approach Delay, s/veh		77.0			69.3			8.0			0.6	
Approach LOS		E			E			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		147.3		32.7		147.3		32.7				
Change Period (Y+Rc), s		* 5.9		* 5.9		* 5.9		* 5.9				
Max Green Setting (Gmax), s		* 1.3E2		* 42		* 1.3E2		* 42				
Max Q Clear Time (g_c+I1), s		38.2		25.9		42.5		10.1				
Green Ext Time (p_c), s		30.0		0.9		6.5		0.5				

Intersection Summary	
HCM 6th Ctrl Delay	13.3
HCM 6th LOS	B

Notes

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

HCM 6th Signalized Intersection Summary
504: Breckenridge Ln & Taylorsville Rd

12/08/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR	NWR2
Lane Configurations												
Traffic Volume (veh/h)	101	403	117	30	694	369	104	596	116	262	1489	28
Future Volume (veh/h)	101	403	117	30	694	369	104	596	116	262	1489	28
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	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	105	420	122	31	723	384	108	108	0	273	0	0
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	124	311	139	381	823	367	127	127		452		
Arrive On Green	0.07	0.09	0.09	0.21	0.23	0.23	0.07	0.07	0.00	0.25	0.00	0.00
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1781	1781	1585	1781	0	0
Grp Volume(v), veh/h	105	420	122	31	723	384	108	108	0	273	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	1781	1585	1781	0	0
Q Serve(g_s), s	10.5	15.8	13.7	2.5	35.3	41.7	10.8	10.8	0.0	24.3	0.0	0.0
Cycle Q Clear(g_c), s	10.5	15.8	13.7	2.5	35.3	41.7	10.8	10.8	0.0	24.3	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.00	0.00
Lane Grp Cap(c), veh/h	124	311	139	381	823	367	127	127		452		
V/C Ratio(X)	0.85	1.35	0.88	0.08	0.88	1.05	0.85	0.85		0.60		
Avail Cap(c_a), veh/h	175	843	376	381	823	367	153	153		452		
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	1.00	1.00	0.98	0.98	0.98	0.97	0.97	0.00	0.55	0.00	0.00
Uniform Delay (d), s/veh	82.8	82.1	81.2	56.6	66.7	69.1	82.7	82.7	0.0	59.2	0.0	0.0
Incr Delay (d2), s/veh	22.5	162.4	15.8	0.1	10.5	58.9	29.6	29.6	0.0	1.3	0.0	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	5.6	14.3	6.2	1.2	17.2	22.9	6.0	6.0	0.0	11.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	105.3	244.5	97.0	56.7	77.2	128.1	112.3	112.3	0.0	60.4	0.0	0.0
LnGrp LOS	F	F	F	E	E	F	F	F		E		
Approach Vol, veh/h		647			1138		729	729	A	273	A	A
Approach Delay, s/veh		194.1			93.8		65.0	65.0		60.4		
Approach LOS		F			F		E	E		E		

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.3	92.9	44.8	22.1	53.2	60.0	18.8	48.0
Change Period (Y+Rc), s	7.5	7.5	* 6.3	* 6.3	7.5	7.5	* 6.3	* 6.3
Max Green Setting (Gmax), s	15.5	77.5	* 17	* 43	40.5	52.5	* 18	* 42
Max Q Clear Time (g_c+I1), s	12.8	0.0	4.5	15.7	26.3	0.0	12.5	43.7
Green Ext Time (p_c), s	0.1	0.0	0.0	0.1	0.7	0.0	0.1	0.0

Intersection Summary	
HCM 6th Ctrl Delay	106.3
HCM 6th LOS	F

Notes

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

Unsignalized Delay for [NWR2, SBR] is excluded from calculations of the approach delay and intersection delay.

17 Zone 1054

HCM 6th Signalized Intersection Summary
533: Hikes Ln & Breckenridge Ln

12/08/2017

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	80	1394	85	35	546	85	176	292	71	66	258	101
Future Volume (veh/h)	80	1394	85	35	546	85	176	292	71	66	258	101
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	1452	89	36	569	89	183	304	74	69	269	105
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	336	2142	131	47	1439	224	159	468	112	86	311	118
Arrive On Green	0.38	1.00	1.00	0.03	0.47	0.47	0.09	0.16	0.16	0.05	0.12	0.12
Sat Flow, veh/h	1781	3402	208	1781	3080	480	1781	2843	681	1781	2517	958
Grp Volume(v), veh/h	83	756	785	36	328	330	183	188	190	69	188	186
Grp Sat Flow(s),veh/h/ln	1781	1777	1833	1781	1777	1784	1781	1777	1748	1781	1777	1698
Q Serve(g_s), s	5.8	0.0	0.0	3.6	21.7	21.8	16.1	17.8	18.3	6.9	18.7	19.4
Cycle Q Clear(g_c), s	5.8	0.0	0.0	3.6	21.7	21.8	16.1	17.8	18.3	6.9	18.7	19.4
Prop In Lane	1.00		0.11	1.00		0.27	1.00		0.39	1.00		0.56
Lane Grp Cap(c), veh/h	336	1119	1154	47	830	833	159	293	288	86	219	210
V/C Ratio(X)	0.25	0.68	0.68	0.77	0.39	0.40	1.15	0.64	0.66	0.80	0.86	0.89
Avail Cap(c_a), veh/h	336	1119	1154	189	830	833	159	366	360	159	366	350
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.84	0.84	0.84	0.85	0.85	0.85	1.00	1.00	1.00	0.87	0.87	0.87
Uniform Delay (d), s/veh	47.3	0.0	0.0	87.1	31.3	31.4	81.9	70.2	70.4	84.8	77.3	77.6
Incr Delay (d2), s/veh	0.3	2.8	2.7	19.9	1.2	1.2	116.8	2.6	3.1	13.8	8.8	12.5
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	2.5	0.9	0.9	1.9	9.7	9.8	12.6	8.3	8.5	3.5	9.1	9.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.6	2.8	2.7	107.0	32.5	32.6	198.8	72.8	73.5	98.6	86.2	90.2
LnGrp LOS	D	A	A	F	C	C	F	E	E	F	F	F
Approach Vol, veh/h		1624			694			561			443	
Approach Delay, s/veh		5.0			36.4			114.1			89.8	
Approach LOS		A			D			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	39.9	90.0	14.6	35.5	10.6	119.2	22.0	28.1
Change Period (Y+Rc), s	* 5.9	* 5.9	* 5.9	* 5.9	* 5.9	* 5.9	* 5.9	* 5.9
Max Green Setting (Gmax), s	* 19	* 84	* 16	* 37	* 19	* 84	* 16	* 37
Max Q Clear Time (g_c+I1), s	7.8	23.8	8.9	20.3	5.6	2.0	18.1	21.4
Green Ext Time (p_c), s	0.1	1.7	0.1	0.8	0.0	5.2	0.0	0.8

Intersection Summary	
HCM 6th Ctrl Delay	41.3
HCM 6th LOS	D

Notes

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

17 Zone 1054

HCM 6th Signalized Intersection Summary
552: Breckenridge Ln & McMahon Ctr

12/08/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	1	2	23	1	18	0	1479	70	12	618	5
Future Volume (veh/h)	13	1	2	23	1	18	0	1479	70	12	618	5
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	14	1	2	24	1	19	0	1541	73	12	644	5
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	67	21	42	88	3	60	1	2954	139	18	3239	25
Arrive On Green	0.04	0.04	0.04	0.04	0.04	0.04	0.00	0.86	0.86	0.01	0.90	0.90
Sat Flow, veh/h	1392	557	1113	1308	78	1585	1781	3455	163	1781	3614	28
Grp Volume(v), veh/h	14	0	3	25	0	19	0	790	824	12	317	332
Grp Sat Flow(s),veh/h/ln	1392	0	1670	1386	0	1585	1781	1777	1841	1781	1777	1865
Q Serve(g_s), s	1.8	0.0	0.3	3.0	0.0	2.1	0.0	20.9	21.1	1.2	4.0	4.1
Cycle Q Clear(g_c), s	5.1	0.0	0.3	3.3	0.0	2.1	0.0	20.9	21.1	1.2	4.0	4.1
Prop In Lane	1.00		0.67	0.96		1.00	1.00		0.09	1.00		0.02
Lane Grp Cap(c), veh/h	67	0	63	91	0	60	1	1519	1574	18	1592	1672
V/C Ratio(X)	0.21	0.00	0.05	0.27	0.00	0.32	0.00	0.52	0.52	0.67	0.20	0.20
Avail Cap(c_a), veh/h	275	0	313	305	0	297	143	1519	1574	143	1592	1672
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	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.94	0.94	0.94
Uniform Delay (d), s/veh	87.4	0.0	83.5	85.0	0.0	84.4	0.0	3.4	3.4	88.8	1.2	1.2
Incr Delay (d2), s/veh	1.5	0.0	0.3	1.6	0.0	3.0	0.0	1.3	1.2	34.1	0.3	0.3
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	0.7	0.0	0.1	1.2	0.0	0.9	0.0	6.4	6.7	0.7	0.9	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	88.9	0.0	83.8	86.6	0.0	87.4	0.0	4.7	4.7	122.9	1.4	1.4
LnGrp LOS	F	A	F	F	A	F	A	A	A	F	A	A
Approach Vol, veh/h		17			44			1614			661	
Approach Delay, s/veh		88.0			86.9			4.7			3.6	
Approach LOS		F			F			A			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.4	159.5		13.1	0.0	166.9		13.1				
Change Period (Y+Rc), s	5.6	5.6		* 6.3	5.6	5.6		* 6.3				
Max Green Setting (Gmax), s	14.4	114.4		* 34	14.4	114.4		* 34				
Max Q Clear Time (g_c+I1), s	3.2	0.0		5.3	0.0	0.0		7.1				
Green Ext Time (p_c), s	0.0	0.0		0.1	0.0	0.0		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	6.5
HCM 6th LOS	A

Notes

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

HCM 6th Signalized Intersection Summary
8: Breckenridge Ln & Deebet Dr/Hillbrook Dr & KY 1932

12/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR	NWR2
Lane Configurations												
Traffic Volume (veh/h)	48	0	32	28	3	118	124	1451	77	31	1303	13
Future Volume (veh/h)	48	0	32	28	3	118	124	1451	77	31	1303	13
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	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	50	0	33	29	3	123	129	129	80	32	14	14
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	128	0	273	43	18	140	236	236	128	228	25	25
Arrive On Green	0.17	0.00	0.17	0.17	0.17	0.17	0.03	0.03	0.70	0.01	0.23	0.23
Sat Flow, veh/h	511	0	1585	109	102	813	1781	1781	183	1781	36	36
Grp Volume(v), veh/h	50	0	33	155	0	0	129	129	803	32	728	728
Grp Sat Flow(s),veh/h/ln	511	0	1585	1024	0	0	1781	1781	1837	1781	1864	1864
Q Serve(g_s), s	0.0	0.0	3.2	8.9	0.0	0.0	3.9	3.9	42.1	1.0	62.5	62.5
Cycle Q Clear(g_c), s	19.3	0.0	3.2	28.2	0.0	0.0	3.9	3.9	42.1	1.0	62.5	62.5
Prop In Lane	1.00		1.00	0.19		0.79	1.00	1.00	0.10	1.00	0.02	0.02
Lane Grp Cap(c), veh/h	128	0	273	200	0	0	236	236	1284	228	1279	1279
V/C Ratio(X)	0.39	0.00	0.12	0.77	0.00	0.00	0.55	0.55	0.63	0.14	0.57	0.57
Avail Cap(c_a), veh/h	257	0	435	358	0	0	417	417	1284	431	1279	1279
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	0.00	1.00	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	62.9	73.2	0.0	0.0	23.6	23.6	14.5	12.9	46.0	46.0
Incr Delay (d2), s/veh	1.9	0.0	0.2	6.2	0.0	0.0	2.0	2.0	2.3	0.3	1.8	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	2.2	0.0	1.3	7.5	0.0	0.0	2.9	2.9	17.9	0.4	32.1	32.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.5	0.0	63.1	79.4	0.0	0.0	25.6	25.6	16.8	13.2	47.8	47.8
LnGrp LOS	E	A	E	E	A	A	C	C	B	B	D	D
Approach Vol, veh/h		83			155		1720	1720		1403		
Approach Delay, s/veh		68.2			79.4		17.5	17.5		47.1		
Approach LOS		E			E		B	B		D		

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.7	129.6		37.7	10.5	131.9		37.7				
Change Period (Y+Rc), s	6.5	* 6.1		6.6	6.5	* 6.1		6.6				
Max Green Setting (Gmax), s	24.5	* 87		49.4	24.5	* 87		49.4				
Max Q Clear Time (g_c+I1), s	5.9	64.5		21.3	3.0	0.0		30.2				
Green Ext Time (p_c), s	0.3	9.7		0.3	0.0	0.0		0.8				

Intersection Summary	
HCM 6th Ctrl Delay	34.0
HCM 6th LOS	C

Notes

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

HCM 6th TWSC
30: Breckenridge Ln & Berkshire

12/06/2017

Intersection	
Int Delay, s/veh	0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	59	1270	26	114	1485
Future Vol, veh/h	0	59	1270	26	114	1485
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	61	1323	27	119	1547

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2349	675	0	0	1350	0
Stage 1	1337	-	-	-	-	-
Stage 2	1012	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	30	396	-	-	506	-
Stage 1	210	-	-	-	-	-
Stage 2	312	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	23	396	-	-	506	-
Mov Cap-2 Maneuver	91	-	-	-	-	-
Stage 1	161	-	-	-	-	-
Stage 2	312	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.8	0	1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	396	506	-
HCM Lane V/C Ratio	-	-	0.155	0.235	-
HCM Control Delay (s)	-	-	15.8	14.3	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	0.5	0.9	-

HCM 6th Signalized Intersection Summary
504: Breckenridge Ln & Taylorsville Rd

12/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	56	730	322	99	569	273	150	861	41	291	1095	87
Future Volume (veh/h)	56	730	322	99	569	273	150	861	41	291	1095	87
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	58	760	335	103	593	284	156	897	0	303	1141	0
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	74	785	350	121	879	392	296	1342		321	1392	
Arrive On Green	0.04	0.22	0.22	0.14	0.49	0.49	0.05	0.12	0.00	0.18	0.39	0.00
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1781	3647	0	1781	3554	1585
Grp Volume(v), veh/h	58	760	335	103	593	284	156	897	0	303	1141	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	1777	0	1781	1777	1585
Q Serve(g_s), s	5.8	38.1	37.6	10.2	22.8	25.4	15.3	43.4	0.0	30.2	51.8	0.0
Cycle Q Clear(g_c), s	5.8	38.1	37.6	10.2	22.8	25.4	15.3	43.4	0.0	30.2	51.8	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	74	785	350	121	879	392	296	1342		321	1392	
V/C Ratio(X)	0.79	0.97	0.96	0.85	0.67	0.72	0.53	0.67		0.94	0.82	
Avail Cap(c_a), veh/h	165	843	376	165	879	392	296	1342		341	1392	
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.99	0.99	0.99	0.74	0.74	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	85.5	69.5	69.2	76.9	40.0	40.6	78.2	68.0	0.0	72.8	49.1	0.0
Incr Delay (d2), s/veh	16.7	22.7	34.1	25.4	2.0	6.4	1.3	2.0	0.0	33.2	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	3.0	19.8	18.5	5.2	8.7	9.1	7.5	21.3	0.0	16.8	24.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	102.2	92.1	103.3	102.4	42.0	47.1	79.5	70.0	0.0	106.1	54.6	0.0
LnGrp LOS	F	F	F	F	D	D	E	E		F	D	
Approach Vol, veh/h		1153			980			1053	A		1444	A
Approach Delay, s/veh		95.9			49.8			71.4			65.4	
Approach LOS		F			D			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	40.0	75.5	18.5	46.1	37.4	78.0	13.7	50.8
Change Period (Y+Rc), s	7.5	7.5	* 6.3	* 6.3	7.5	7.5	* 6.3	* 6.3
Max Green Setting (Gmax), s	34.5	58.5	* 17	* 43	22.5	70.5	* 17	* 43
Max Q Clear Time (g_c+I1), s	32.2	45.4	12.2	39.6	17.3	0.0	7.8	27.4
Green Ext Time (p_c), s	0.2	2.5	0.1	0.2	0.2	0.0	0.1	0.3

Intersection Summary	
HCM 6th Ctrl Delay	71.1
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

17 Zone 1054

HCM 6th Signalized Intersection Summary
533: Breckenridge Ln & Hikes Ln

12/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	162	388	179	166	494	112	156	849	112	69	1152	158
Future Volume (veh/h)	162	388	179	166	494	112	156	849	112	69	1152	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	169	404	186	173	515	117	162	884	117	72	1200	165
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	159	453	206	159	550	124	206	1697	225	90	1484	203
Arrive On Green	0.09	0.19	0.19	0.09	0.19	0.19	0.23	1.00	1.00	0.02	0.16	0.16
Sat Flow, veh/h	1781	2373	1080	1781	2879	651	1781	3155	418	1781	3140	430
Grp Volume(v), veh/h	169	301	289	173	317	315	162	498	503	72	677	688
Grp Sat Flow(s),veh/h/ln	1781	1777	1676	1781	1777	1753	1781	1777	1795	1781	1777	1793
Q Serve(g_s), s	16.1	29.7	30.3	16.1	31.6	31.9	15.4	0.0	0.0	7.3	66.2	66.7
Cycle Q Clear(g_c), s	16.1	29.7	30.3	16.1	31.6	31.9	15.4	0.0	0.0	7.3	66.2	66.7
Prop In Lane	1.00		0.64	1.00		0.37	1.00		0.23	1.00		0.24
Lane Grp Cap(c), veh/h	159	339	320	159	339	335	206	956	966	90	840	848
V/C Ratio(X)	1.06	0.89	0.90	1.09	0.93	0.94	0.79	0.52	0.52	0.80	0.81	0.81
Avail Cap(c_a), veh/h	159	356	336	159	356	352	206	956	966	159	840	848
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	0.83	0.83	0.83	0.83	0.83	0.83	0.60	0.60	0.60
Uniform Delay (d), s/veh	81.9	70.9	71.2	81.9	71.7	71.8	67.1	0.0	0.0	87.6	68.0	68.2
Incr Delay (d2), s/veh	88.4	22.1	25.6	89.7	27.0	28.7	15.3	1.7	1.7	9.5	5.1	5.2
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	11.3	15.6	15.3	11.4	16.9	17.0	7.2	0.4	0.4	3.7	33.1	33.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	170.3	93.0	96.7	171.6	98.6	100.5	82.4	1.7	1.7	97.1	73.0	73.4
LnGrp LOS	F	F	F	F	F	F	F	A	A	F	E	E
Approach Vol, veh/h		759			805			1163			1437	
Approach Delay, s/veh		111.6			115.1			12.9			74.4	
Approach LOS		F			F			B			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	26.7	91.0	22.0	40.3	15.0	102.8	22.0	40.3
Change Period (Y+Rc), s	* 5.9	* 5.9	* 5.9	* 5.9	* 5.9	* 5.9	* 5.9	* 5.9
Max Green Setting (Gmax), s	* 19	* 85	* 16	* 36	* 16	* 88	* 16	* 36
Max Q Clear Time (g_c+I1), s	17.4	68.7	18.1	32.3	9.3	2.0	18.1	33.9
Green Ext Time (p_c), s	0.1	3.9	0.0	0.7	0.1	2.8	0.0	0.5

Intersection Summary	
HCM 6th Ctrl Delay	71.9
HCM 6th LOS	E

Notes

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

HCM 6th Signalized Intersection Summary
552: Breckenridge Ln & McMahon Ctr

12/06/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	15	0	237	5	174	0	1000	75	149	1324	24
Future Volume (veh/h)	17	15	0	237	5	174	0	1000	75	149	1324	24
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	18	16	0	247	5	181	0	1042	78	155	1379	25
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	71	388	0	316	6	329	1	2003	150	174	2594	47
Arrive On Green	0.21	0.21	0.00	0.21	0.21	0.21	0.00	0.60	0.60	0.20	1.00	1.00
Sat Flow, veh/h	1198	1870	0	1331	27	1585	1781	3351	251	1781	3571	65
Grp Volume(v), veh/h	18	16	0	252	0	181	0	552	568	155	686	718
Grp Sat Flow(s),veh/h/ln	1198	1870	0	1358	0	1585	1781	1777	1825	1781	1777	1859
Q Serve(g_s), s	2.7	1.2	0.0	31.5	0.0	18.4	0.0	32.7	32.7	15.3	0.0	0.0
Cycle Q Clear(g_c), s	35.4	1.2	0.0	32.7	0.0	18.4	0.0	32.7	32.7	15.3	0.0	0.0
Prop In Lane	1.00		0.00	0.98		1.00	1.00		0.14	1.00		0.03
Lane Grp Cap(c), veh/h	71	388	0	321	0	329	1	1062	1091	174	1291	1350
V/C Ratio(X)	0.25	0.04	0.00	0.78	0.00	0.55	0.00	0.52	0.52	0.89	0.53	0.53
Avail Cap(c_a), veh/h	80	402	0	332	0	341	93	1062	1091	291	1291	1350
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	0.00	1.00	0.00	1.00	0.00	1.00	1.00	0.41	0.41	0.41
Uniform Delay (d), s/veh	86.7	57.0	0.0	70.1	0.0	63.8	0.0	21.1	21.1	71.5	0.0	0.0
Incr Delay (d2), s/veh	1.9	0.0	0.0	11.4	0.0	1.8	0.0	1.8	1.8	8.0	0.6	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	0.9	0.6	0.0	12.4	0.0	7.7	0.0	14.2	14.6	6.8	0.2	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	88.6	57.1	0.0	81.4	0.0	65.6	0.0	23.0	22.9	79.5	0.6	0.6
LnGrp LOS	F	E	A	F	A	E	A	C	C	E	A	A
Approach Vol, veh/h		34			433			1120			1559	
Approach Delay, s/veh		73.7			74.8			22.9			8.5	
Approach LOS		E			E			C			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	23.2	113.2		43.7	0.0	136.3		43.7				
Change Period (Y+Rc), s	5.6	5.6		* 6.3	5.6	5.6		* 6.3				
Max Green Setting (Gmax), s	29.4	94.4		* 39	9.4	114.4		* 39				
Max Q Clear Time (g_c+I1), s	17.3	0.0		34.7	0.0	0.0		37.4				
Green Ext Time (p_c), s	0.3	0.0		0.6	0.0	0.0		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	23.5
HCM 6th LOS	C

Notes

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

HCM 6th Signalized Intersection Summary
8: Breckenridge Ln & Deebet Dr/Hillbrook Dr & KY 1932

12/08/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR	NWR2
Lane Configurations												
Traffic Volume (veh/h)	48	0	32	28	3	118	124	1504	77	31	1375	13
Future Volume (veh/h)	48	0	32	28	3	118	124	1504	77	31	1375	13
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	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	50	0	33	29	3	123	129	129	80	32	14	14
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	128	0	273	43	18	140	273	273	123	216	23	23
Arrive On Green	0.17	0.00	0.17	0.17	0.17	0.17	0.03	0.03	0.70	0.02	0.69	0.69
Sat Flow, veh/h	511	0	1585	109	102	813	1781	1781	177	1781	34	34
Grp Volume(v), veh/h	50	0	33	155	0	0	129	129	832	32	768	768
Grp Sat Flow(s),veh/h/ln	511	0	1585	1024	0	0	1781	1781	1839	1781	1864	1864
Q Serve(g_s), s	0.0	0.0	3.2	8.9	0.0	0.0	3.9	3.9	44.9	1.0	39.6	39.6
Cycle Q Clear(g_c), s	19.3	0.0	3.2	28.2	0.0	0.0	3.9	3.9	44.9	1.0	39.6	39.6
Prop In Lane	1.00		1.00	0.19		0.79	1.00	1.00	0.10	1.00	0.02	0.02
Lane Grp Cap(c), veh/h	128	0	273	200	0	0	273	273	1284	216	1279	1279
V/C Ratio(X)	0.39	0.00	0.12	0.77	0.00	0.00	0.47	0.47	0.65	0.15	0.60	0.60
Avail Cap(c_a), veh/h	257	0	435	358	0	0	454	454	1284	419	1279	1279
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	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.41	0.41	0.41
Uniform Delay (d), s/veh	69.6	0.0	62.9	73.2	0.0	0.0	14.3	14.3	14.9	13.4	15.1	15.1
Incr Delay (d2), s/veh	1.9	0.0	0.2	6.2	0.0	0.0	1.3	1.3	2.5	0.1	0.9	0.9
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	2.2	0.0	1.3	7.5	0.0	0.0	1.7	1.7	19.1	0.4	16.7	16.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.5	0.0	63.1	79.4	0.0	0.0	15.5	15.5	17.5	13.6	15.9	15.9
LnGrp LOS	E	A	E	E	A	A	B	B	B	B	B	B
Approach Vol, veh/h		83			155		1776	1776		1478		
Approach Delay, s/veh		68.2			79.4		17.3	17.3		15.9		
Approach LOS		E			E		B	B		B		

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.7	129.6		37.7	10.5	131.9		37.7
Change Period (Y+Rc), s	6.5	* 6.1		6.6	6.5	* 6.1		6.6
Max Green Setting (Gmax), s	24.5	* 87		49.4	24.5	* 87		49.4
Max Q Clear Time (g_c+I1), s	5.9	41.6		21.3	3.0	0.0		30.2
Green Ext Time (p_c), s	0.3	13.5		0.3	0.0	0.0		0.8

Intersection Summary	
HCM 6th Ctrl Delay	20.7
HCM 6th LOS	C

Notes

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

HCM 6th Signalized Intersection Summary
30: Breckenridge Ln & Berkshire

12/08/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	118	7	121	0	5	59	95	1224	26	114	1428	110
Future Volume (veh/h)	118	7	121	0	5	59	95	1224	26	114	1428	110
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	123	7	126	0	5	61	99	1275	27	119	1488	115
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	182	12	217	0	17	212	135	1876	43	286	2646	203
Arrive On Green	0.14	0.14	0.14	0.00	0.14	0.14	0.79	0.79	0.79	0.79	0.79	0.79
Sat Flow, veh/h	1335	84	1514	0	121	1482	140	2371	54	423	3344	257
Grp Volume(v), veh/h	123	0	133	0	0	66	552	0	849	119	787	816
Grp Sat Flow(s),veh/h/ln	1335	0	1598	0	0	1604	873	0	1692	423	1777	1824
Q Serve(g_s), s	16.3	0.0	14.0	0.0	0.0	6.6	55.8	0.0	37.8	29.5	29.9	30.4
Cycle Q Clear(g_c), s	22.9	0.0	14.0	0.0	0.0	6.6	86.2	0.0	37.8	67.3	29.9	30.4
Prop In Lane	1.00		0.95	0.00		0.92	0.18		0.03	1.00		0.14
Lane Grp Cap(c), veh/h	182	0	229	0	0	230	714	0	1339	286	1406	1443
V/C Ratio(X)	0.68	0.00	0.58	0.00	0.00	0.29	0.77	0.00	0.63	0.42	0.56	0.57
Avail Cap(c_a), veh/h	258	0	320	0	0	321	714	0	1339	286	1406	1443
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	1.00	0.00	0.00	1.00	0.61	0.00	0.61	0.76	0.76	0.76
Uniform Delay (d), s/veh	79.1	0.0	72.1	0.0	0.0	68.9	16.3	0.0	7.9	22.0	7.0	7.1
Incr Delay (d2), s/veh	4.3	0.0	2.3	0.0	0.0	0.7	5.0	0.0	1.4	3.4	1.2	1.2
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	5.9	0.0	5.9	0.0	0.0	2.8	16.1	0.0	13.0	3.2	10.8	11.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	83.5	0.0	74.4	0.0	0.0	69.6	21.3	0.0	9.3	25.3	8.3	8.3
LnGrp LOS	F	A	E	A	A	E	C	A	A	C	A	A
Approach Vol, veh/h		256			66			1401			1722	
Approach Delay, s/veh		78.8			69.6			14.0			9.5	
Approach LOS		E			E			B			A	

Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	148.3		31.7		148.3		31.7					
Change Period (Y+Rc), s	* 5.9		* 5.9		* 5.9		* 5.9					
Max Green Setting (Gmax), s	* 1.3E2		* 36		* 1.3E2		* 36					
Max Q Clear Time (g_c+I1), s	88.2		24.9		69.3		8.6					
Green Ext Time (p_c), s	17.6		0.8		23.7		0.3					

Intersection Summary	
HCM 6th Ctrl Delay	17.6
HCM 6th LOS	B

Notes

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

HCM 6th Signalized Intersection Summary
504: Breckenridge Ln & Taylorsville Rd

12/08/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	730	322	99	569	289	150	883	41	312	1124	101
Future Volume (veh/h)	67	730	322	99	569	289	150	883	41	312	1124	101
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	70	760	335	103	593	301	156	920	0	325	1171	0
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	87	785	350	121	852	380	296	1302		341	1392	
Arrive On Green	0.05	0.22	0.22	0.14	0.48	0.48	0.05	0.12	0.00	0.19	0.39	0.00
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1781	3647	0	1781	3554	1585
Grp Volume(v), veh/h	70	760	335	103	593	301	156	920	0	325	1171	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	1777	0	1781	1777	1585
Q Serve(g_s), s	7.0	38.1	37.6	10.2	23.5	28.7	15.3	44.8	0.0	32.5	53.8	0.0
Cycle Q Clear(g_c), s	7.0	38.1	37.6	10.2	23.5	28.7	15.3	44.8	0.0	32.5	53.8	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	87	785	350	121	852	380	296	1302		341	1392	
V/C Ratio(X)	0.80	0.97	0.96	0.85	0.70	0.79	0.53	0.71		0.95	0.84	
Avail Cap(c_a), veh/h	165	843	376	165	852	380	296	1302		341	1392	
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.99	0.99	0.99	0.72	0.72	0.00	0.80	0.80	0.00
Uniform Delay (d), s/veh	84.7	69.5	69.2	76.9	41.7	43.1	78.2	69.8	0.0	72.0	49.7	0.0
Incr Delay (d2), s/veh	15.5	22.7	34.1	25.4	2.5	10.8	1.2	2.4	0.0	31.6	5.1	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	3.6	19.8	18.5	5.2	9.1	10.7	7.5	22.0	0.0	17.8	24.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	100.3	92.1	103.3	102.4	44.2	53.8	79.4	72.2	0.0	103.5	54.8	0.0
LnGrp LOS	F	F	F	F	D	D	E	E		F	D	
Approach Vol, veh/h		1165			997			1076	A		1496	A
Approach Delay, s/veh		95.8			53.1			73.2			65.4	
Approach LOS		F			D			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	42.0	73.4	18.5	46.1	37.4	78.0	15.1	49.5
Change Period (Y+Rc), s	7.5	7.5	* 6.3	* 6.3	7.5	7.5	* 6.3	* 6.3
Max Green Setting (Gmax), s	34.5	58.5	* 17	* 43	22.5	70.5	* 17	* 43
Max Q Clear Time (g_c+I1), s	34.5	46.8	12.2	39.6	17.3	0.0	9.0	30.7
Green Ext Time (p_c), s	0.0	2.5	0.1	0.2	0.2	0.0	0.1	0.3

Intersection Summary	
HCM 6th Ctrl Delay	72.1
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
533: Breckenridge Ln & Hikes Ln

12/08/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	162	388	179	166	494	112	156	883	112	69	1181	158
Future Volume (veh/h)	162	388	179	166	494	112	156	883	112	69	1181	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	169	404	186	173	515	117	162	920	117	72	1230	165
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	159	453	206	159	550	124	206	1706	217	90	1490	199
Arrive On Green	0.09	0.19	0.19	0.09	0.19	0.19	0.23	1.00	1.00	0.02	0.16	0.16
Sat Flow, veh/h	1781	2373	1080	1781	2879	651	1781	3171	403	1781	3151	421
Grp Volume(v), veh/h	169	301	289	173	317	315	162	515	522	72	691	704
Grp Sat Flow(s),veh/h/ln	1781	1777	1676	1781	1777	1753	1781	1777	1798	1781	1777	1795
Q Serve(g_s), s	16.1	29.7	30.3	16.1	31.6	31.9	15.4	0.0	0.0	7.3	67.8	68.4
Cycle Q Clear(g_c), s	16.1	29.7	30.3	16.1	31.6	31.9	15.4	0.0	0.0	7.3	67.8	68.4
Prop In Lane	1.00		0.64	1.00		0.37	1.00		0.22	1.00		0.23
Lane Grp Cap(c), veh/h	159	339	320	159	339	335	206	956	967	90	840	848
V/C Ratio(X)	1.06	0.89	0.90	1.09	0.93	0.94	0.79	0.54	0.54	0.80	0.82	0.83
Avail Cap(c_a), veh/h	159	356	336	159	356	352	206	956	967	159	840	848
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	0.83	0.83	0.83	0.82	0.82	0.82	0.57	0.57	0.57
Uniform Delay (d), s/veh	81.9	70.9	71.2	81.9	71.7	71.8	67.1	0.0	0.0	87.6	68.7	68.9
Incr Delay (d2), s/veh	88.4	22.1	25.6	89.7	27.0	28.7	15.1	1.8	1.8	9.1	5.3	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	11.3	15.6	15.3	11.4	16.9	17.0	7.2	0.5	0.5	3.7	33.9	34.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	170.3	93.0	96.7	171.6	98.6	100.5	82.2	1.8	1.8	96.7	74.0	74.4
LnGrp LOS	F	F	F	F	F	F	F	A	A	F	E	E
Approach Vol, veh/h		759			805			1199			1467	
Approach Delay, s/veh		111.6			115.1			12.6			75.3	
Approach LOS		F			F			B			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	26.7	91.0	22.0	40.3	15.0	102.8	22.0	40.3
Change Period (Y+Rc), s	* 5.9	* 5.9	* 5.9	* 5.9	* 5.9	* 5.9	* 5.9	* 5.9
Max Green Setting (Gmax), s	* 19	* 85	* 16	* 36	* 16	* 88	* 16	* 36
Max Q Clear Time (g_c+I1), s	17.4	70.4	18.1	32.3	9.3	2.0	18.1	33.9
Green Ext Time (p_c), s	0.1	3.9	0.0	0.7	0.1	2.9	0.0	0.5

Intersection Summary	
HCM 6th Ctrl Delay	71.6
HCM 6th LOS	E

Notes

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

HCM 6th Signalized Intersection Summary
552: Breckenridge Ln & McMahon Ctr

12/08/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	15	0	237	5	174	0	1022	75	149	1353	24
Future Volume (veh/h)	17	15	0	237	5	174	0	1022	75	149	1353	24
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	18	16	0	247	5	181	0	1065	78	155	1409	25
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	71	388	0	316	6	329	1	2006	147	174	2595	46
Arrive On Green	0.21	0.21	0.00	0.21	0.21	0.21	0.00	0.60	0.60	0.20	1.00	1.00
Sat Flow, veh/h	1198	1870	0	1331	27	1585	1781	3357	246	1781	3572	63
Grp Volume(v), veh/h	18	16	0	252	0	181	0	563	580	155	700	734
Grp Sat Flow(s),veh/h/ln	1198	1870	0	1358	0	1585	1781	1777	1826	1781	1777	1859
Q Serve(g_s), s	2.7	1.2	0.0	31.5	0.0	18.4	0.0	33.6	33.7	15.3	0.0	0.0
Cycle Q Clear(g_c), s	35.4	1.2	0.0	32.7	0.0	18.4	0.0	33.6	33.7	15.3	0.0	0.0
Prop In Lane	1.00		0.00	0.98		1.00	1.00		0.13	1.00		0.03
Lane Grp Cap(c), veh/h	71	388	0	321	0	329	1	1062	1091	174	1291	1350
V/C Ratio(X)	0.25	0.04	0.00	0.78	0.00	0.55	0.00	0.53	0.53	0.89	0.54	0.54
Avail Cap(c_a), veh/h	80	402	0	332	0	341	93	1062	1091	291	1291	1350
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	0.00	1.00	0.00	1.00	0.00	1.00	1.00	0.39	0.39	0.39
Uniform Delay (d), s/veh	86.7	57.0	0.0	70.1	0.0	63.8	0.0	21.3	21.3	71.5	0.0	0.0
Incr Delay (d2), s/veh	1.9	0.0	0.0	11.4	0.0	1.8	0.0	1.9	1.9	7.6	0.6	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	0.9	0.6	0.0	12.4	0.0	7.7	0.0	14.6	15.0	6.8	0.2	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	88.6	57.1	0.0	81.4	0.0	65.6	0.0	23.2	23.2	79.1	0.6	0.6
LnGrp LOS	F	E	A	F	A	E	A	C	C	E	A	A
Approach Vol, veh/h		34			433			1143			1589	
Approach Delay, s/veh		73.7			74.8			23.2			8.3	
Approach LOS		E			E			C			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	23.2	113.2		43.7	0.0	136.3		43.7				
Change Period (Y+Rc), s	5.6	5.6		* 6.3	5.6	5.6		* 6.3				
Max Green Setting (Gmax), s	29.4	94.4		* 39	9.4	114.4		* 39				
Max Q Clear Time (g_c+I1), s	17.3	0.0		34.7	0.0	0.0		37.4				
Green Ext Time (p_c), s	0.3	0.0		0.6	0.0	0.0		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	23.3
HCM 6th LOS	C

Notes

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