

TRAFFIC STUDY FOR

BELLS FERRY ROAD AT KELLOGG CREEK ROAD / VICTORY DRIVE

Cherokee County, Georgia

OCTOBER 26, 2016

PREPARED FOR:
Cherokee County

PREPARED BY:
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11-14-2016

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1. Introduction

The purpose of this study is to address safety and congestion at the intersections of Bells Ferry Road at Kellogg Creek Road and Kellogg Creek Road at Victory Drive. New traffic counts were collected at key intersections and road segments during several time periods. Independent observations were made during the AM, afternoon, and PM peak hours. The study includes several design alternatives along with estimates of probable costs.

Figure 1 shows the proposed intersection location in south Cherokee County, Georgia. The intersection location is shown on an aerial image in Figure 2.

Figure 1: Vicinity Map

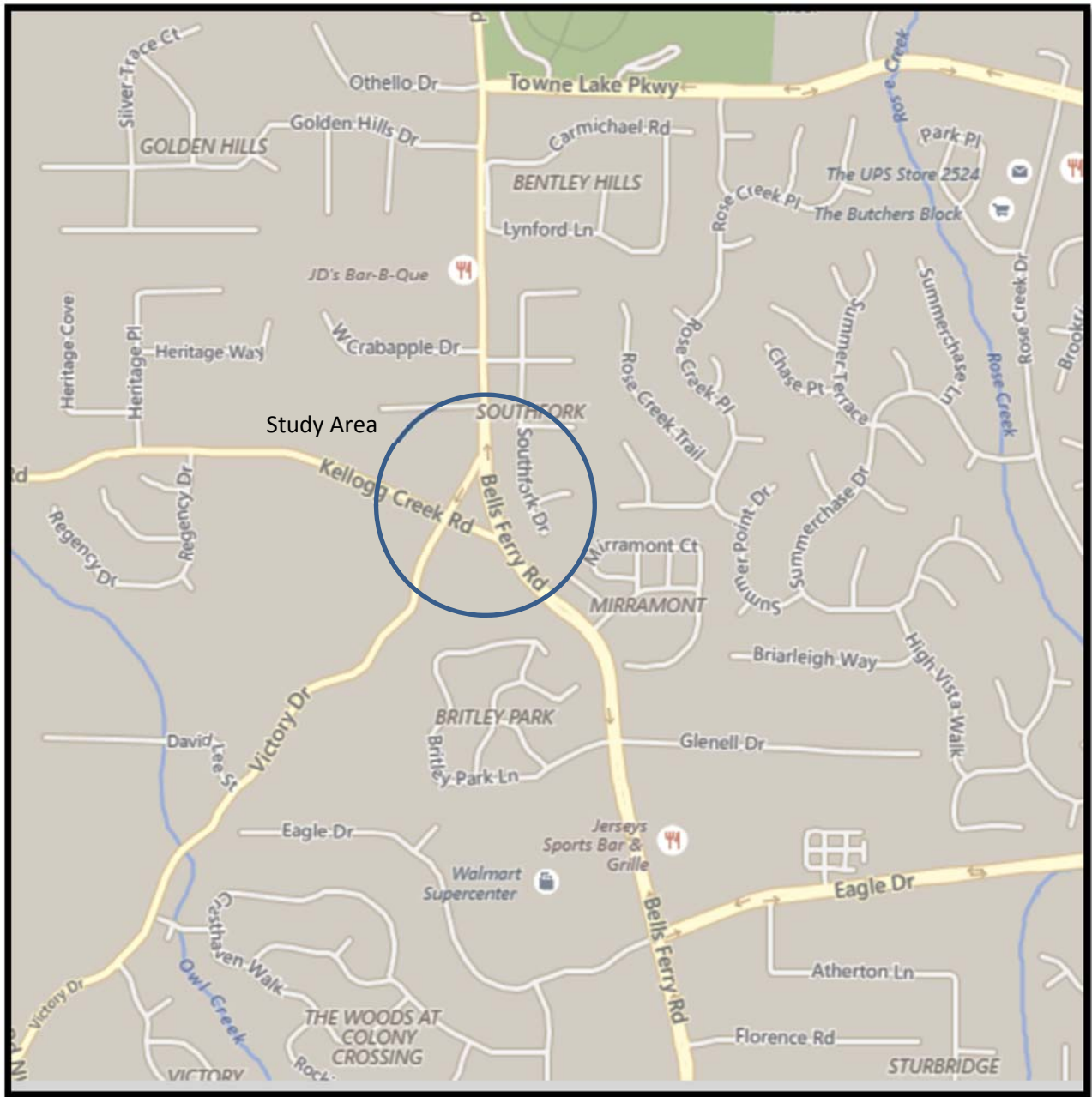


Figure 2: Site Location Aerial



2. Problem Identification

2.1. Traffic Counts

New traffic counts were collected on Tuesday, August 9, 2016. Traffic turning movement counts were collected between 7:00a and 9:00a, 4:00p and 6:00p and the peak hours were determined to be 7:00-8:00a and 5:00-6:00p. Daily volume counts were also collected at four locations. Figure 3 below shows the location of the traffic counts. Figures 4 and 5 show the AM and PM peak hour counts, respectively.

Figure 3: Traffic Count Locations



Figure 4: AM Peak Hour Traffic Volume

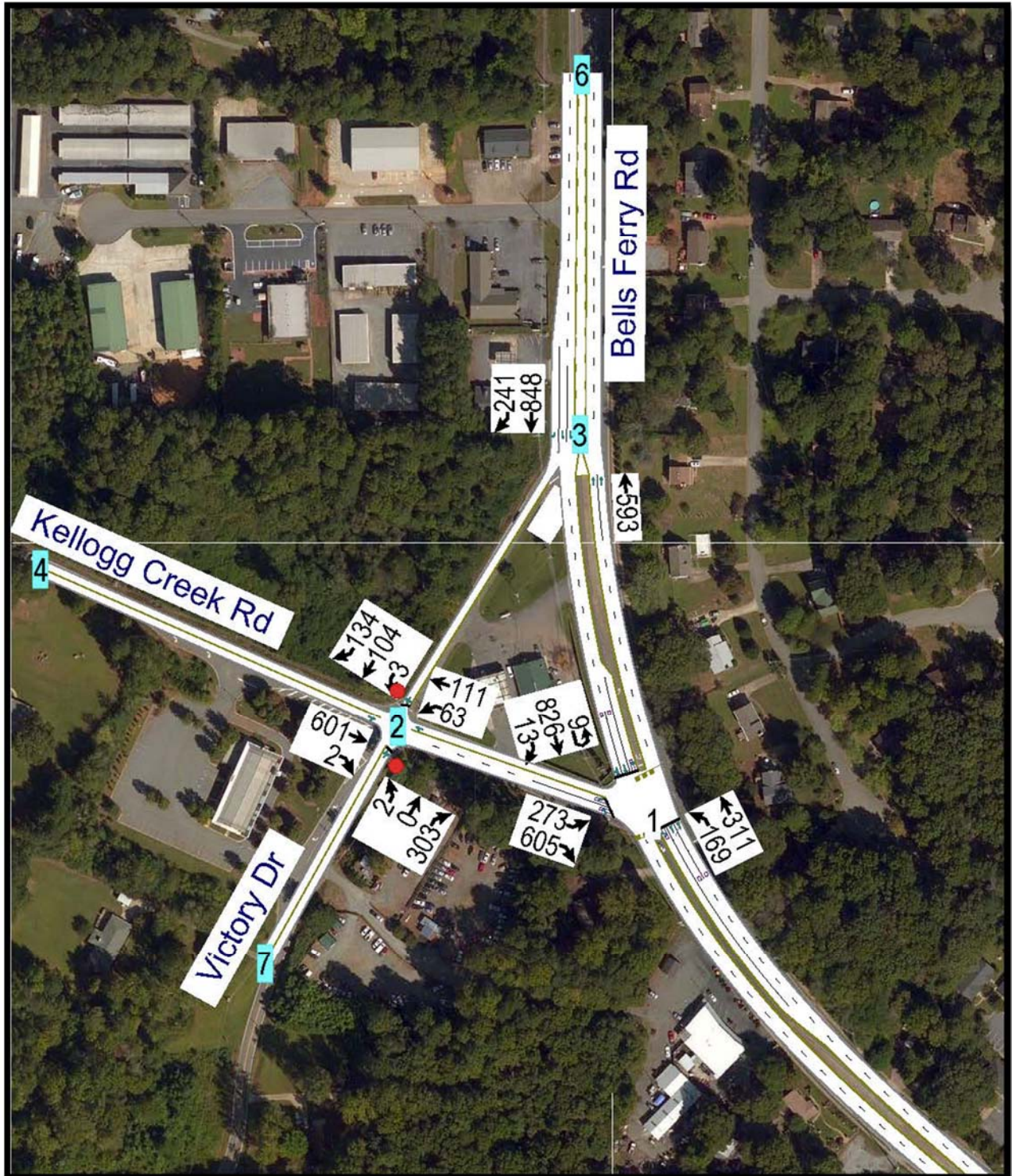


Figure 5: PM Peak Hour Traffic Volume



2.2. Crash Analysis

There have been very few, if any, serious injuries from 2013 to date in 2016. There were only five left-turn or right angle crashes at Victory Drive and Kellogg Creek Road, all in different directions, so this does not appear to be a major problem. However, three crashes from eastbound Kellogg Creek Road to northbound Victory Drive (a one-way southbound roadway) occurred during that period. There were 13 crashes involving left turns into or out of Kellogg Creek Road at the Bells Ferry Road signal. It is unlikely that improvements to the Kellogg Creek Road approach to Bells Ferry Road would result in a reduction in crashes since the majority of the crashes are rear-end types resulting from driver distraction and inattention (and failure to yield right-of-way and running red lights).

2.3. Capacity Analysis

The results of the capacity analysis are shown by approach in Table 1 for existing conditions with existing and future volumes. Current signal timing plans were used in the analysis. Average vehicular delays are reported in seconds, and LOS is level-of service, as defined by the Highway Capacity Manual (HCM). Full Synchro output reports are included in the appendix. The future 2026 volumes include a 1.0% per year growth rate to account for nominal growth in the area even though the trend has been stagnant for the past several years.

Table 1: No-Build Capacity Analysis Results

Intersection	Control	Approach	2016 Volume		2026 Volume	
			AM Peak LOS (sec)	PM Peak LOS (sec)	AM Peak LOS (sec)	PM Peak LOS (sec)
Bells Ferry Rd at Kellogg Creek Rd	Signal	NB	B (11.5)	B (13.5)	B (12.1)	B (15.8)
		SB	B (19.7)	C (24.7)	B (20.9)	C (27.1)
		EB	F (245.7)	F (85.6)	F (295.3)	F (108.7)
		Overall	F (108.2)	D (36.5)	F (128.6)	D (36.5)
Kellogg Creek Rd at Victory Dr	Victory Dr Stop	NB	D (31.0)	C (20.8)	F (51.0)	D (32.9)
		SB	D (30.5)	F (54.5)	F (62.4)	F (119.8)
		WB Left	A (9.2)	A (8.6)	A (9.5)	A (8.8)
		Overall	n/a (13.1)	n/a (15.3)	n/a (23.6)	n/a (29.5)

The levels of service from the Synchro model seem to match the observed conditions. In the AM peak hour, motorists on Kellogg Creek Drive queue from the signal at Bells Ferry Road past Victory Drive and also ¼ mile south on Victory Drive. The problem stems from a lack of capacity for the eastbound right turn movement at Bells Ferry Road.

In the PM peak hour, motorists desiring to turn left from Kellogg Creek Road to southbound Victory Drive wait for a gap in the eastbound traffic and, because of a lack of a left turn lane,

impede through traffic. This condition backs up traffic onto Bells Ferry Road and impacts the northbound left turn lane on Bells Ferry Road and spills back into the northbound through lanes.

In addition, the lack of a right turn lane on Victory Drive in the southbound direction results in two problems. First, traffic frequently queues on Victory Drive. Second, when more than three vehicles are in line to go straight or turn right, some motorists cut through the gas station to the east of the intersection to bypass those waiting in line. The re-routing of traffic through the gas station is an annoyance and potential safety hazard for the gas station, but also adds to the left turn problem (spillback on Bells Ferry Road) described above.

2.4. Pedestrian Accommodation

There are sidewalks on Bells Ferry Road in the project area but there are no sidewalk on the other roads. There is evidence of foot traffic on the south side of Kellogg Creek Road between Bells Ferry Road and Victory Drive.

3. Alternatives

Based on the crash analysis, capacity model, and observations, several options were investigated to address the problems. All of the alternatives include adding a right turn lane on Victory Road in the southbound direction to reduce southbound queue lengths. In addition, adding sidewalk on the south side of Kellogg Creek Road between Victory Drive and Bells Ferry Road is recommended to accommodate the apparent presence of pedestrians.

3.1. Alternative 1 – One-way Split

Kellogg Creek Road would be converted to one-way eastbound between Victory Drive and Bells Ferry Road with two right turn lanes and one left turn lane. The existing median and U-turn lane on Bells Ferry Road at Victory Drive would be removed to create a left turn lane from northbound Bells Ferry Road to southbound Victory Drive. This movement would be signalized. The turn radius on Bells Ferry Road would have to be modified for this left turn movement. See Figure 6.

Table 2: Alternative 1 Capacity Analysis Results

Intersection	Control	Approach	2016 Volume		2026 Volume	
			AM Peak LOS (sec)	PM Peak LOS (sec)	AM Peak LOS (sec)	PM Peak LOS (sec)
Bells Ferry Rd at Kellogg Creek Rd	Signal	NB	B (11.0)	B (12.4)	B (12.8)	B (15.1)
		SB	B (12.8)	C (22.5)	B (34.3)	C (24.5)
		EB	D (47.9)	D (51.6)	D (46.9)	D (51.0)
		Overall	C (26.4)	D (36.5)	C (34.7)	D (37.3)
Kellogg Creek Rd at Victory Dr	Victory Dr Stop	NB	A (0.0)	A (0.0)	A (0.0)	A (0.0)
		SB	C (22.6)	C (17.5)	D (28.0)	C (20.2)
		WB Left	- -	- -	- -	- -
		Overall	n/a (0.0)	n/a (0.0)	n/a (0.0)	n/a (0.0)
Bells Ferry Rd at Victory Dr	½ Signal	NB Left	A (0.0)	A (0.1)	A (0.1)	A (0.1)
		SB	A (0.0)	A (0.0)	A (0.1)	A (0.0)
		Overall	A (0.0)	A (0.1)	A (0.1)	A (0.1)

3.2. Alternative 2 – Continuous Flow Right-turn

The eastbound right turn lane from Kellogg Creek Road at Bells Ferry Road would be continuous; this requires an additional receiving lane on Bells Ferry Road for approximately ¼ mile. A left turn lane would be added on westbound Kellogg Creek Road to separate the left turns from the through movement. See Figure 7.

Table 3: Alternative 2 Capacity Analysis Results

Intersection	Control	Approach	2016 Volume		2026 Volume	
			AM Peak LOS (sec)	PM Peak LOS (sec)	AM Peak LOS (sec)	PM Peak LOS (sec)
Bells Ferry Rd at Kellogg Creek Rd	Signal	NB	A (7.1)	B (10.9)	A (8.5)	B (14.0)
		SB	B (12.9)	C (21.4)	B (15.1)	C (26.5)
		EB	E (63.1)	E (68.1)	E (65.3)	E (73.1)
		Overall	B (19.8)	C (22.6)	C (21.7)	C (26.5)
Kellogg Creek Rd at Victory Dr	Victory Dr Stop	NB	D (30.9)	C (19.9)	F (50.2)	D (28.6)
		SB	C (21.2)	D (25.1)	D (33.4)	E (36.4)
		WB Left	A (3.3)	A (2.6)	A (3.4)	A (2.6)
		Overall	n/a (11.4)	n/a (9.9)	n/a (18.1)	n/a (13.9)

3.3. Alternative 3 – Dual Right Turns

A second eastbound right turn lane would be added along the south side of Kellogg Creek Road between Victory Drive and Bells Ferry Road. The intersection of Kellogg Creek Road and Victory Drive would be reconstructed with a channelized northbound right turn lane from Victory Drive to Kellogg Creek Road for traffic that eventually turns right onto Bells Ferry Road. Similarly, west of Victory Drive, the eastbound through lane on Kellogg Creek Road would align with the middle eastbound lane approaching Bells Ferry Road. See Figure 8.

Table 4: Alternative 3 Capacity Analysis Results

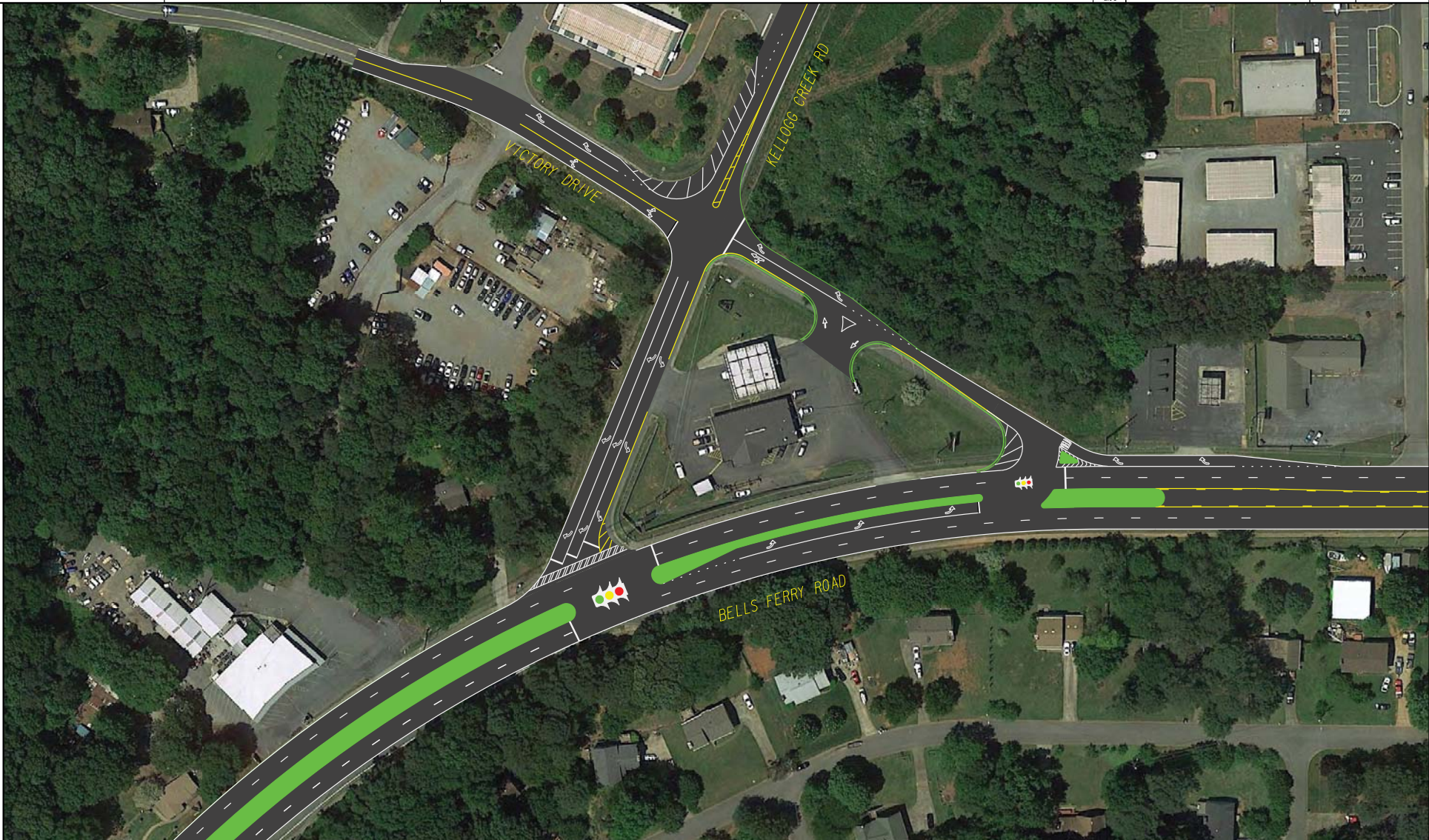
Intersection	Control	Approach	2016 Volume		2026 Volume	
			AM Peak LOS (sec)	PM Peak LOS (sec)	AM Peak LOS (sec)	PM Peak LOS (sec)
Bells Ferry Rd at Kellogg Creek Rd	Signal	NB	B (10.1)	B (11.5)	B (11.8)	B (14.8)
		SB	B (17.9)	C (22.5)	B (20.9)	C (27.8)
		EB	D (37.0)	D (46.8)	D (37.3)	D (47.2)
		Overall	C (23.9)	C (23.9)	C (25.4)	C (26.8)
Kellogg Creek Rd at Victory Dr	Victory Dr Stop	NB	E (37.2)	F (67.4)	F (51.4)	F (119.8)
		SB	C (18.9)	C (24.6)	C (23.7)	E (35.2)
		WB Left	A (3.3)	A (2.6)	A (3.4)	A (2.6)
		Overall	n/a (5.1)	n/a (7.0)	n/a (6.3)	n/a (9.6)

3.4. Alternative 4 – Hybrid One-Way Pairs and Channelized Right Turns

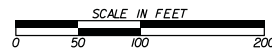
Similar to Alternative 1, Kellogg Creek Road would be one-way eastbound, between Victory Drive and Bells Ferry Road. In addition, the Kellogg Creek Road and Victory Drive intersection would be reconstructed with a channelized lane as in Alternative 3.

The capacity analysis is essentially the same as for Alternative 1. The primary difference is in the assignment of movements at the Victory Drive and Kellogg Creek intersection such that northbound right turns would have their own assigned lane. See Figure 9.

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA			

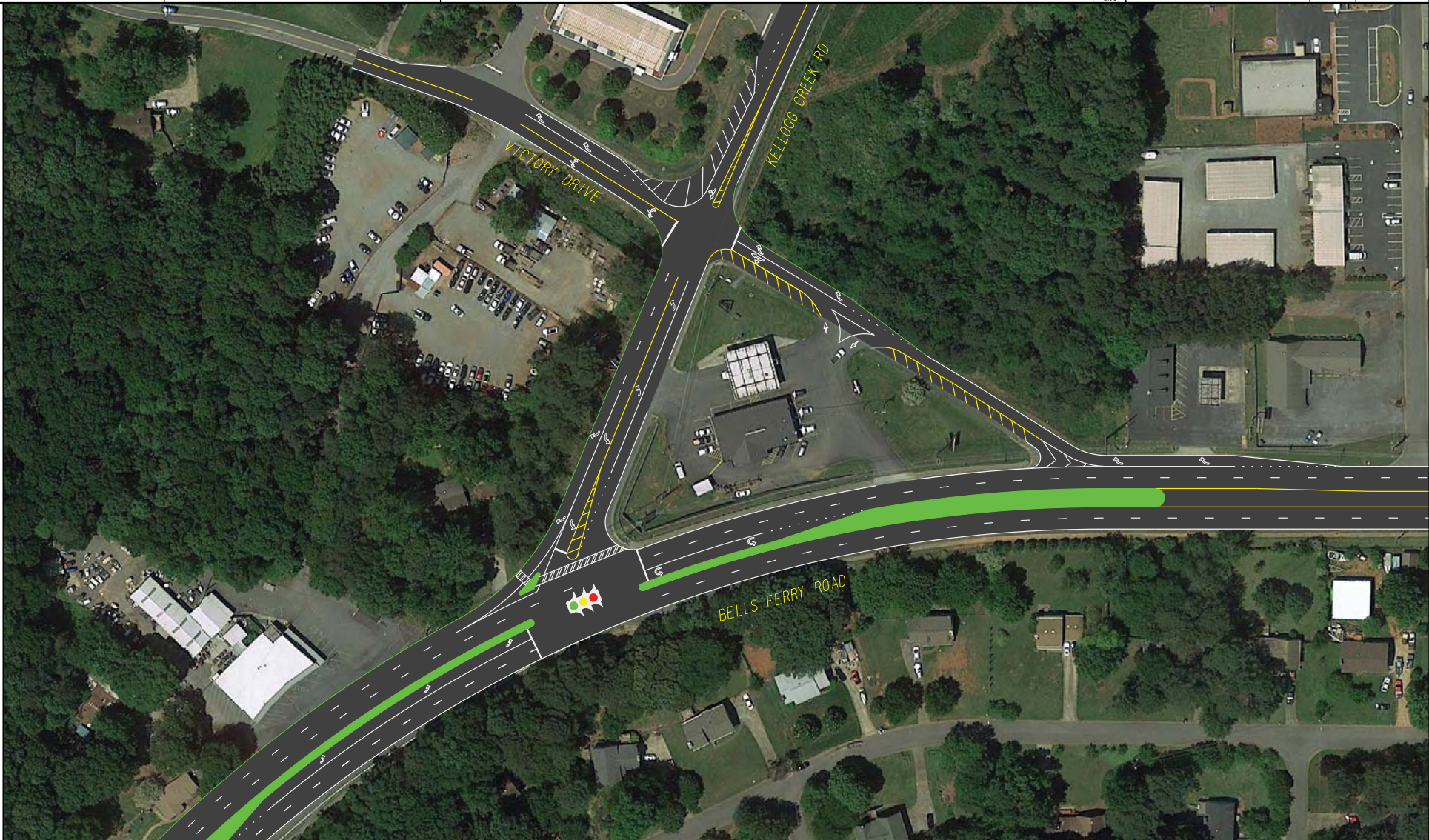


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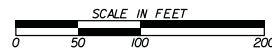


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ALTERNATE 1
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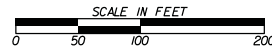
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ALTERNATE 2
DRAWING No.

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA			



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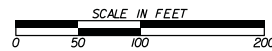
CHEROKEE COUNTY

OFFICE:
BELLS FERRY RD @ KELLOGG CREEK RD
ALTERNATE 3

DRAWING No.



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REVISION DATES

NO.	DATE	DESCRIPTION

CHEROKEE COUNTY

OFFICE:
BELLS FERRY RD @ KELLOGG CREEK RD

ALTERNATE 4

DRAWING No.

3.5. Environmental, Utility and Right-of-Way Analysis

For the most part, the alternatives have very low impacts to environmental resources, utilities, and right-of-way. All of the alternatives include adding a right-turn lane on the one-way segment of Victory Drive as well as sidewalk on the south side of Kellogg Creek Road. No additional right-of-way is needed just for the sidewalk and no utilities should be impacted. To add the right turn lane, a small amount of right-of-way will be needed. No utilities should need to be relocated. Each alternative's unique impacts to the environmental resources, utilities, and right-of-way are discussed in detail below.

3.5.1. Alternatives 1 and 4

Since most of the improvements are along existing right-of-way, there are few, if any, environmental impacts. It appears the turn lane from Bells Ferry Road to Victory Drive can be accomplished within the existing right-of-way although a landscape easement may be needed near the corner of the gas station property. There is a storm drain within the concrete median that will have to be re-constructed from a catch basin to a drop inlet.

3.5.2. Alternative 2

The free-flow right-turn lane from Kellogg Creek Road to Bells Ferry Road requires a significant length of additional pavement on Bells Ferry Road. The additional 12 feet, including adding back the sidewalk, will have significant impacts on adjacent driveways, right-of-way, and utilities. At least one driveway will have to be rebuilt to improve the grade since the current grade is already very steep. There are also high tension power lines with two poles that would have to be relocated.

The additional lane on Kellogg Creek Road between Victory Drive and Bells Ferry Road will require a narrow strip of right-of-way – approximately 6 feet. No utilities are impacted by the additional lane.

3.5.3. Alternative 3

As with Alternative 2, the additional lane on Kellogg Creek Road between Victory Drive and Bells Ferry Road will require a narrow strip of right-of-way. There is a small utility pole on the southeast corner of the Victory Drive/Kellogg Creek Road intersection that will need to be relocated but there is only one utility attached to it. There are no apparent environmental impacts.

3.6. Alternative Analysis

Each alternative has merit and a measurable benefit. Some address one or more specific problems and some address all of the issues. To recap, the following are the conditions the alternatives seek to address:

- A. Congestion from limited eastbound right turn capacity at Bells Ferry Road
- B. Queuing westbound between Victory Drive and Bells Ferry Road
- C. Northbound left turn overflow on Bells Ferry Road
- D. Cut-thru gas station
- E. Pedestrian accommodation

Each alternative was compared to the criteria above and assigned a value: “3” if the alternative fully addressed the issue; “2” if the alternative mostly addressed the issue; “1” if only partially resolves the issue. A subjective tally is shown in Table 5.

Table 5: Decision Matrix

Alternative	Addresses Capacity or Safety Issue					Average Score
	A	B	C	D	E	
1 – One-way Split	2	3	3	3	3	2.8
2 – Continuous Right	3	3	3	2	2	2.6
3 – Dual Rights	3	1	1	2	3	2.0
4 - Hybrid	3	3	3	3	3	3.0

4. Cost Analysis

Using the Atlanta Regional Commission’s Planning Level Cost Estimating tool, the costs of the alternatives were approximated. The tool is very conservative and may overestimate the construction cost since it is typically used for very large, federally funded projects. Cherokee County would probably get bids much lower than the Georgia DOT. Even so, the estimates are good for comparison purposes. The breakdown of costs are shown in the Appendix.

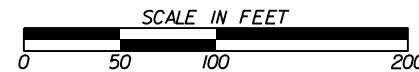
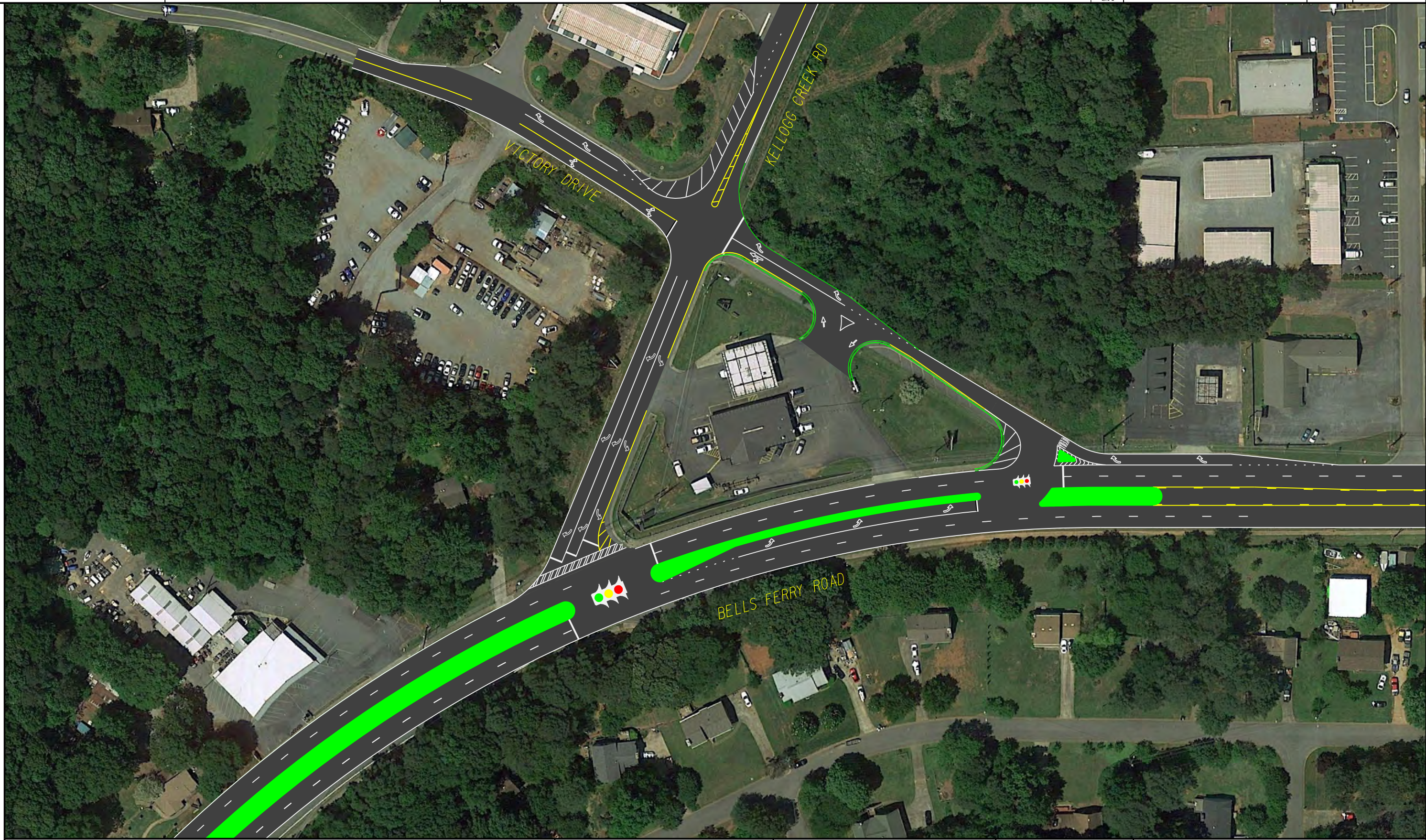
Table 6: Cost Estimates

Alternative	Design	Utilities	ROW	CST	Total
1	\$70,000	\$0	\$23,000	\$699,000	\$792,000
2	274,500	500,000	153,843	2,744,500	3,672,843
3	69,000	5,000	35,876	689,500	799,376
4	77,400	5,000	23,000	774,000	879,400

5. Recommendations

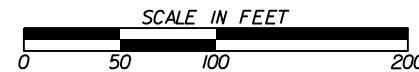
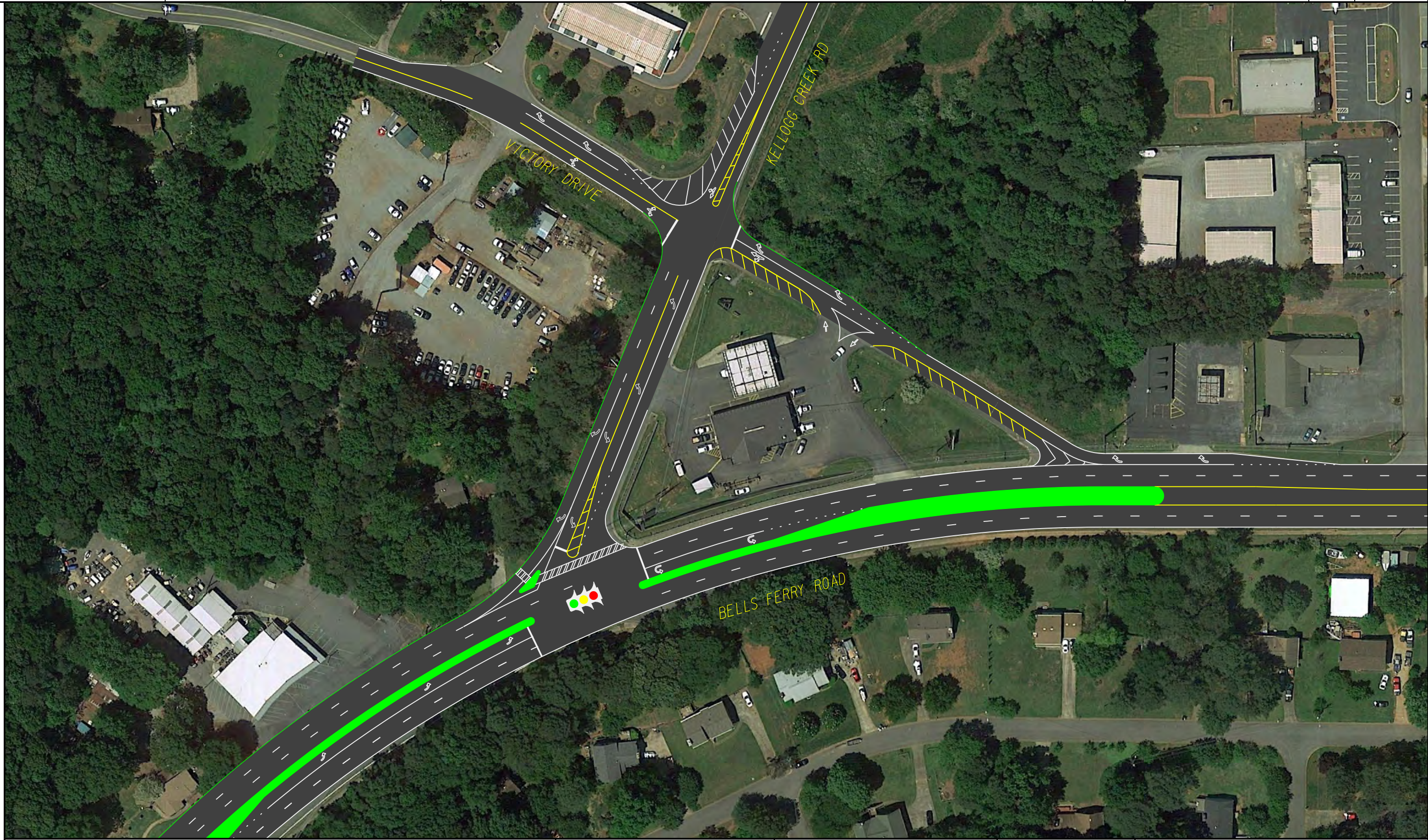
It appears the hybrid solution, Alternative 4, is the best overall solution to resolve capacity, safety and circulation problems. It will be important to communicate to the public the changes involved since the recommended alternative would change how traffic moves. Naturally, it will be very important to design the intersection at Bells Ferry Road and Kellogg Creek Road to lessen the likelihood that someone will drive in the wrong direction on Kellogg Creek Road.

Appendix



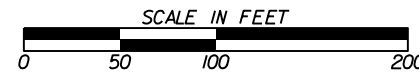
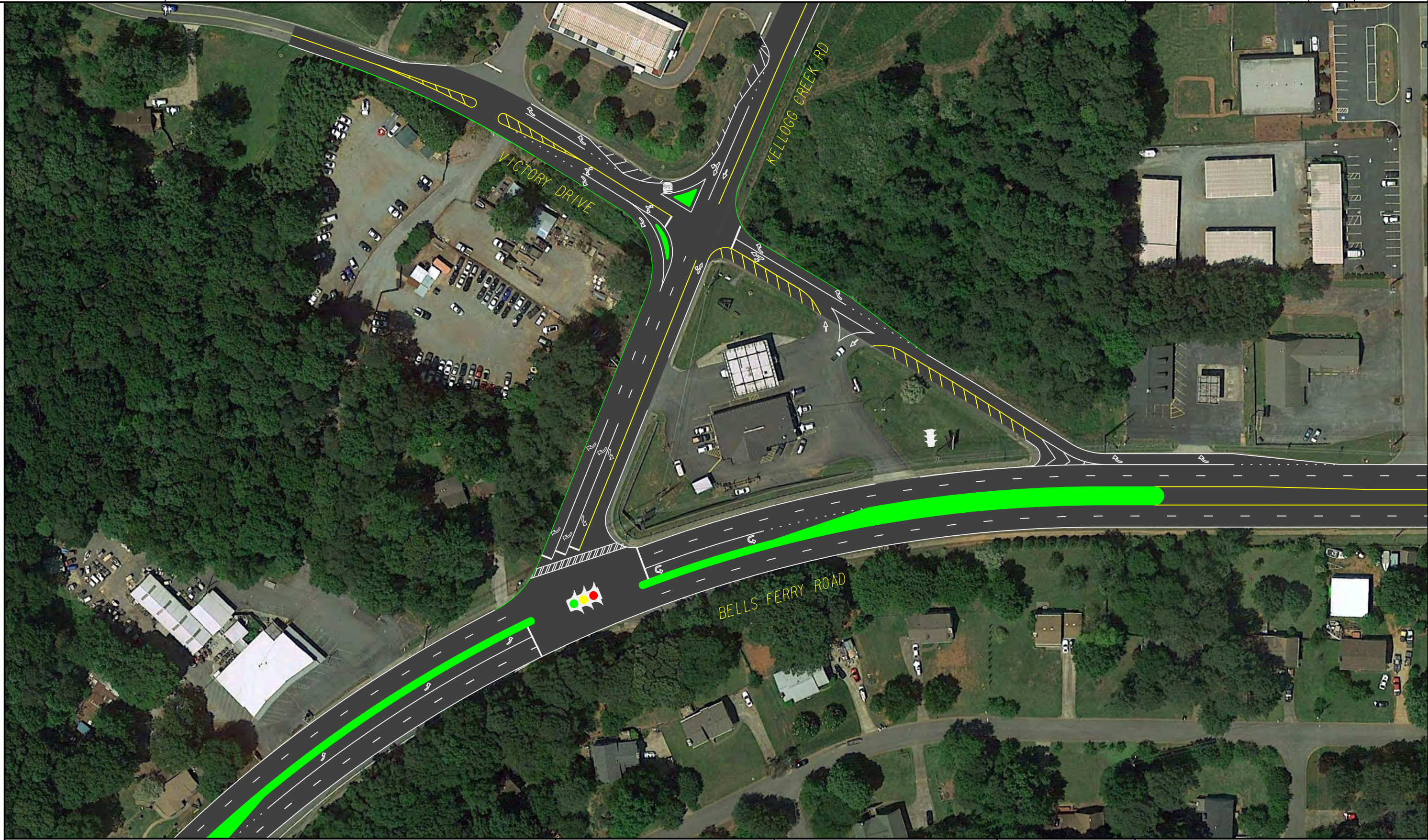
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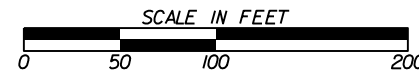
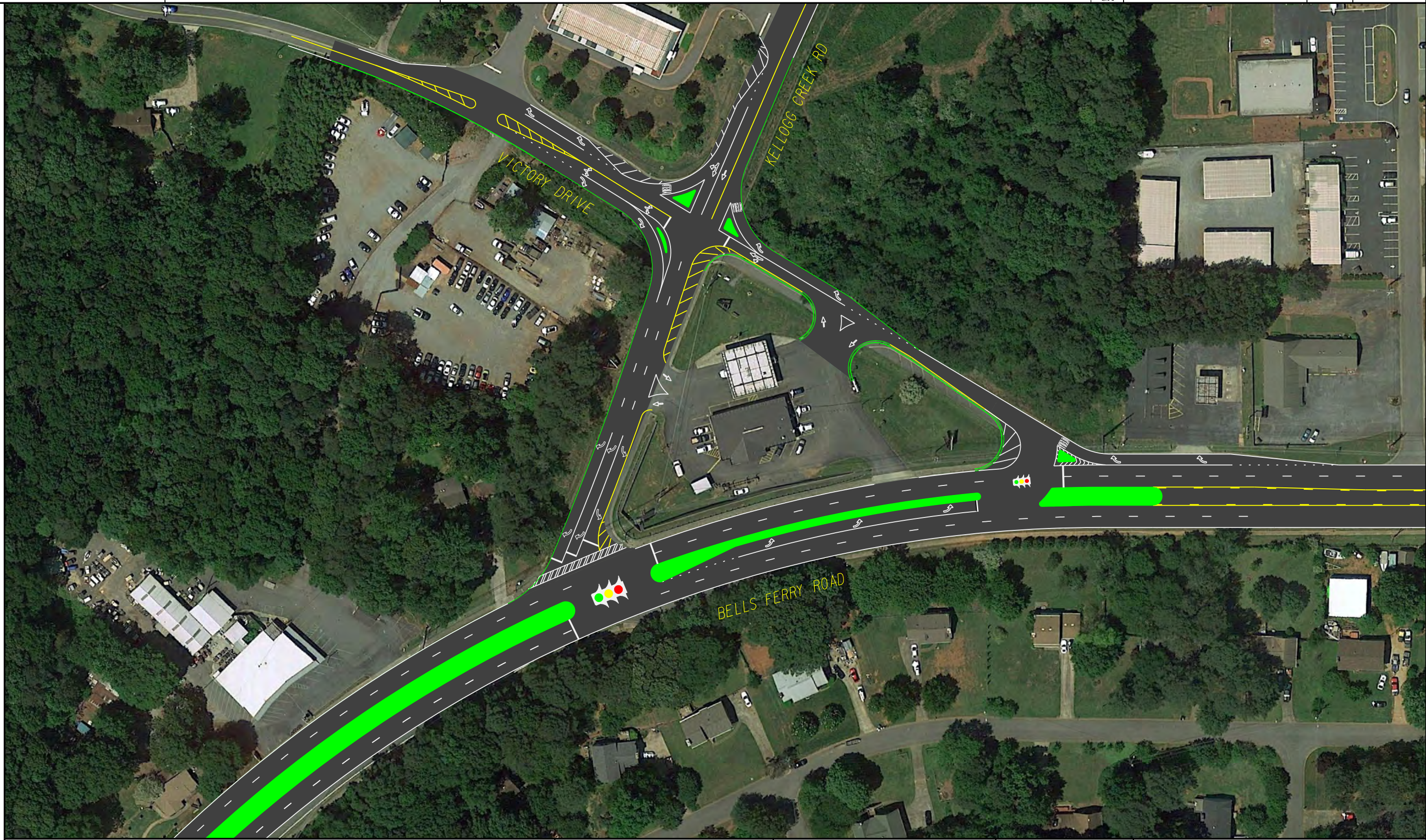
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ALTERNATE 2	
DRAWING No.	



REVISION DATES	

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ALTERNATE 3
DRAWING No.



REVISION DATES	

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ALTERNATE 4
DRAWING No.

Alternative	Design	Utilities	ROW	CST	Total	ROW (per acre)	Sidewalk (per ft)	1" Overlay (sq. yd.)
1	\$70,000	\$0	\$23,000	\$699,000	\$792,000	\$300,000	\$100	\$10
2	\$274,500	\$500,000	\$153,843	\$2,744,500	\$3,672,843	Roadway - 12' lane (per ft)	High Tension Power	
3	\$69,000	\$5,000	\$35,876	\$689,500	\$799,376	\$900		\$250,000
4	\$77,400	\$5,000	\$23,000	\$774,000	\$879,400			

Assumptions

All	ROW at NW corner of Kellogg Crk and Victory	0.05 ac	\$15,000
	360' of sidewalk on Kellogg Crk Rd	360	\$36,000
	200' turn lane and taper on one-way section of Victory	250	\$225,000
	Design is 10% of construction cost		
	Overlay asphalt on Kellogg Crk between Victory and Bells Ferry - ~145C	1450 sy	\$14,500
1	One-way pair		
	Minimal ROW, Slope easement for north edge of Mapco property		\$8,000
	475' of sidewalk on one-way section of Victory	475	\$47,500
	One catch basin to be rebuilt into roadway drain		\$10,000
	Rip up 480' of median and u-turn lane and replace with asphalt and m	480 1/2 cost	\$216,000
	Rebuild existing signal; add new half signal, coordinate		\$150,000
2	Free-flow right turn		
	12' of new ROW for 1500' along Bells Ferry Rd	0.413223 ac	\$123,966.94
	6' of new ROW for 360' along Kellogg Crk Rd	0.049587 ac	\$14,876.03
	Two high tension power poles to relocate	2	\$500,000
	Relocate two driveways	2	\$100,000
	Rebuild 10 driveways	10	\$200,000
	1600' of new 12' roadway plus taper	1600	\$1,440,000
	1400' of rebuilt sidewalk on Bells Ferry	1400	\$140,000
	360' of new 12' lane along Kellogg Crk	360	\$324,000
	Grading/demo		\$250,000
	Add Rt-turn overlap signal		\$15,000
3	Dual right turns		
	6' of new ROW for 360' along Kellogg Crk Rd	0.049587 ac	\$14,876.03
	Add Rt-turn overlap signal		\$15,000
	Additional ROW need in SE corner of Kellogg Crk and Victory	0.02 ac	\$6,000.00
	Additional pavement and island in SE corner of Kellogg Crk and Victory		\$75,000
	360' of new 12' lane along Kellogg Crk	360	\$324,000
	One small power pole relo or removal		\$5,000
4	Hybrid one-way		
	Minimal ROW, Slope easement for north edge of Mapco property		\$8,000
	475' of sidewalk on one-way section of Victory	475	\$47,500
	One catch basin to be rebuilt into roadway drain		\$10,000
	Rip up 480' of median and u-turn lane and replace with asphalt and m	480 1/2 cost	\$216,000
	Rebuild existing signal; add new half signal, coordinate		\$150,000
	Additional pavement and island in SE corner of Kellogg Crk and Victory		\$75,000
	One small power pole relo or removal		\$5,000

All Traffic Data Services, Inc

1336 Farmer Road
Conyers, GA 30012
alltrafficdata.net

Site Code: 3
Station ID: 3

VICTORY DRIVE NORTH OF KELLOG CREEK ROAD

Latitude: 0' 0.0000 Undefined

Start Time	09-Aug-16 Tue	SB		Hour Totals	
		Morning	Afternoon	Morning	Afternoon
12:00		4	34		
12:15		5	32		
12:30		4	32		
12:45		2	36	15	134
01:00		4	20		
01:15		1	32		
01:30		1	36		
01:45		4	27	10	115
02:00		2	31		
02:15		4	54		
02:30		5	38		
02:45		1	37	12	160
03:00		2	48		
03:15		1	45		
03:30		2	40		
03:45		1	59	6	192
04:00		1	52		
04:15		2	42		
04:30		3	60		
04:45		8	64	14	218
05:00		5	64		
05:15		7	74		
05:30		16	56		
05:45		16	54	44	248
06:00		26	66		
06:15		30	44		
06:30		52	50		
06:45		68	58	176	218
07:00		46	55		
07:15		65	48		
07:30		54	36		
07:45		74	50	239	189
08:00		58	38		
08:15		49	55		
08:30		34	44		
08:45		28	38	169	175
09:00		38	23		
09:15		35	36		
09:30		42	38		
09:45		25	27	140	124
10:00		36	17		
10:15		46	15		
10:30		25	12		
10:45		32	16	139	60
11:00		32	13		
11:15		27	2		
11:30		36	4		
11:45		28	6	123	25
Total		1087	1858		
Percent		36.9%	63.1%		
Grand Total		1087	1858		
Percent		36.9%	63.1%		

ADT

ADT 2,945

AADT 2,945

All Traffic Data Services, Inc

1336 Farmer Road
Conyers, GA 30012
alltrafficdata.net

Site Code: 4
Station ID: 4
VICTORY DRIVE SOUTH OF KELLOG CREEK

Latitude: 0' 0.0000 Undefined

Start Time	09-Aug-16 Tue	NB		Hour Totals		SB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		6	44			6	29				
12:15		8	38			1	45				
12:30		4	43			3	30				
12:45		1	33	19	158	6	34	16	138	35	296
01:00		2	44			6	29				
01:15		1	49			1	46				
01:30		3	42			4	34				
01:45		1	40	7	175	0	54	11	163	18	338
02:00		3	44			4	34				
02:15		1	38			5	40				
02:30		0	76			2	39				
02:45		4	62	8	220	0	45	11	158	19	378
03:00		2	54			3	50				
03:15		4	60			4	46				
03:30		4	65			0	62				
03:45		2	76	12	255	3	62	10	220	22	475
04:00		2	55			2	54				
04:15		6	69			3	66				
04:30		4	66			2	70				
04:45		4	70	16	260	1	65	8	255	24	515
05:00		2	81			2	66				
05:15		8	82			8	76				
05:30		13	95			15	58				
05:45		13	80	36	338	12	64	37	264	73	602
06:00		18	118			22	68				
06:15		28	87			23	70				
06:30		46	72			50	72				
06:45		60	68	152	345	66	58	161	268	313	613
07:00		74	46			44	56				
07:15		79	36			36	60				
07:30		78	46			39	50				
07:45		76	30	307	158	66	55	185	221	492	379
08:00		46	41			60	59				
08:15		42	36			32	58				
08:30		66	44			40	54				
08:45		47	38	201	159	28	54	160	225	361	384
09:00		40	31			29	33				
09:15		34	17			34	59				
09:30		38	18			34	35				
09:45		50	23	162	89	31	27	128	154	290	243
10:00		28	15			28	19				
10:15		35	11			36	24				
10:30		37	16			28	10				
10:45		40	12	140	54	36	11	128	64	268	118
11:00		28	5			37	18				
11:15		35	2			29	13				
11:30		30	12			20	6				
11:45		34	8	127	27	32	7	118	44	245	71
Total		1187	2238			973	2174			2160	4412
Percent		34.7%	65.3%			30.9%	69.1%			32.9%	67.1%
Grand Total		1187	2238			973	2174			2160	4412
Percent		34.7%	65.3%			30.9%	69.1%			32.9%	67.1%

ADT ADT 6,572 AADT 6,572

All Traffic Data Services, Inc

1336 Farmer Road
Conyers, GA 30012
alltrafficdata.net

Site Code: 5
Station ID: 5

KELLOGG CREEK ROAD WEST OF VICTORY DRIVE

Latitude: 0' 0.0000 Undefined

Start Time	09-Aug-16 Tue	EB		Hour Totals		WB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		8	52			5	54				
12:15		4	62			8	58				
12:30		2	64			2	71				
12:45		6	46	20	224	5	63	20	246	40	470
01:00		2	50			3	56				
01:15		2	48			1	64				
01:30		0	76			4	61				
01:45		3	76	7	250	4	58	12	239	19	489
02:00		3	58			6	100				
02:15		0	60			1	84				
02:30		2	78			2	79				
02:45		0	72	5	268	2	80	11	343	16	611
03:00		5	70			1	100				
03:15		4	63			0	89				
03:30		4	89			3	92				
03:45		6	90	19	312	3	102	7	383	26	695
04:00		6	54			2	126				
04:15		6	68			2	100				
04:30		12	88			6	128				
04:45		22	68	46	278	6	126	16	480	62	758
05:00		17	104			3	141				
05:15		33	105			8	136				
05:30		34	86			9	106				
05:45		36	82	120	377	12	130	32	513	152	890
06:00		64	100			21	124				
06:15		76	89			32	108				
06:30		99	87			36	111				
06:45		91	77	330	353	36	130	125	473	455	826
07:00		129	69			62	100				
07:15		175	62			80	86				
07:30		172	60			76	95				
07:45		124	59	600	250	62	85	280	366	880	616
08:00		92	44			65	73				
08:15		108	56			48	79				
08:30		84	34			60	60				
08:45		84	46	368	180	44	50	217	262	585	442
09:00		77	34			52	64				
09:15		68	34			42	78				
09:30		61	22			56	49				
09:45		66	19	272	109	48	41	198	232	470	341
10:00		64	17			42	38				
10:15		57	20			52	32				
10:30		54	16			46	32				
10:45		60	8	235	61	32	27	172	129	407	190
11:00		40	4			46	16				
11:15		51	12			51	8				
11:30		64	12			56	12				
11:45		66	7	221	35	60	13	213	49	434	84
Total		2243	2697			1303	3715			3546	6412
Percent		45.4%	54.6%			26.0%	74.0%			35.6%	64.4%
Grand Total		2243	2697			1303	3715			3546	6412
Percent		45.4%	54.6%			26.0%	74.0%			35.6%	64.4%

ADT ADT 9,958 AADT 9,958

All Traffic Data Services, Inc

1336 Farmer Road
Conyers, GA 30012
alltrafficdata.net

Site Code: 6
Station ID: 6
KELLOG CREEK ROAD EAST OF VICTORY DRIVE

Latitude: 0' 0.0000 Undefined

Start Time	09-Aug-16 Tue	EB		Hour Totals		WB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		13	108			5	60				
12:15		14	98			4	60				
12:30		6	109			5	62				
12:45		6	99	39	414	5	66	19	248	58	662
01:00		7	93			8	70				
01:15		2	106			3	61				
01:30		4	103			3	68				
01:45		2	110	15	412	5	78	19	277	34	689
02:00		11	119			8	84				
02:15		1	96			2	78				
02:30		0	135			2	82				
02:45		4	146	16	496	1	76	13	320	29	816
03:00		6	125			2	96				
03:15		8	114			2	92				
03:30		6	152			1	112				
03:45		12	172	32	563	2	104	7	404	39	967
04:00		6	125			4	115				
04:15		11	120			2	132				
04:30		13	157			4	132				
04:45		23	164	53	566	0	117	10	496	63	1062
05:00		22	159			4	149				
05:15		34	202			6	130				
05:30		54	192			9	101				
05:45		46	160	156	713	6	152	25	532	181	1245
06:00		72	202			17	121				
06:15		106	198			24	137				
06:30		136	160			21	130				
06:45		154	158	468	718	49	118	111	506	579	1224
07:00		181	104			48	91				
07:15		242	104			44	116				
07:30		252	102			50	96				
07:45		213	88	888	398	60	90	202	393	1090	791
08:00		152	87			60	80				
08:15		154	93			41	75				
08:30		150	84			54	73				
08:45		127	82	583	346	52	64	207	292	790	638
09:00		135	76			44	70				
09:15		90	56			47	92				
09:30		109	45			48	56				
09:45		121	42	455	219	46	40	185	258	640	477
10:00		94	28			36	48				
10:15		101	32			52	40				
10:30		79	27			48	28				
10:45		106	26	380	113	41	26	177	142	557	255
11:00		82	12			56	24				
11:15		78	12			57	18				
11:30		91	22			36	14				
11:45		94	20	345	66	51	14	200	70	545	136
Total		3430	5024			1175	3938			4605	8962
Percent		40.6%	59.4%			23.0%	77.0%			33.9%	66.1%
Grand Total		3430	5024			1175	3938			4605	8962
Percent		40.6%	59.4%			23.0%	77.0%			33.9%	66.1%

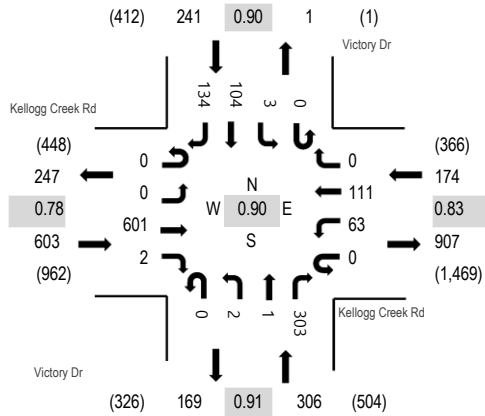
ADT ADT 13,567 AADT 13,567



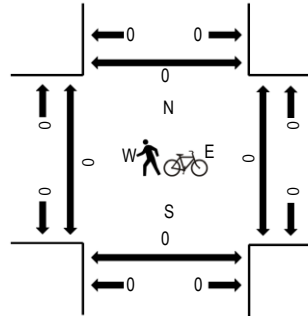
(303) 216-2439
www.alltrafficdata.net

Location: 1 Victory Dr & Kellogg Creek Rd AM
Date and Start Time: Tuesday, August 9, 2016
Peak Hour: 07:00 AM - 08:00 AM
Peak 15-Minutes: 07:15 AM - 07:30 AM

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	Kellogg Creek Rd Eastbound				Kellogg Creek Rd Westbound				Victory Dr Northbound				Victory Dr Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	0	105	0	0	21	26	0	0	0	0	73	0	2	25	22	274	1,324	0	0	0	0
7:15 AM	0	0	193	1	0	12	25	0	0	1	0	69	0	0	25	43	369	1,308	0	0	0	0
7:30 AM	0	0	183	1	0	8	33	0	0	0	1	78	0	1	18	33	356	1,167	0	0	0	0
7:45 AM	0	0	120	0	0	22	27	0	0	1	0	83	0	0	36	36	325	1,058	0	0	0	0
8:00 AM	0	0	87	0	0	26	33	0	0	0	0	46	0	4	34	28	258	920	0	0	0	0
8:15 AM	0	0	109	2	0	14	24	0	0	0	0	42	0	2	17	18	228		0	0	0	0
8:30 AM	0	0	87	1	0	17	34	0	0	0	0	66	0	1	20	21	247		0	0	0	0
8:45 AM	0	0	73	0	0	13	31	0	0	0	0	44	0	1	13	12	187		0	0	0	0

Peak Rolling Hour Flow Rates

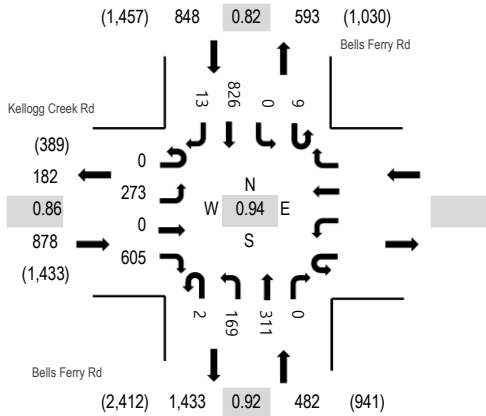
Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	1	0	0	0	0	0	0	0	0	2	0	0	0	0	3
Lights	0	0	587	1	0	59	105	0	0	2	1	287	0	1	101	132	1,276
Mediums	0	0	13	1	0	4	6	0	0	0	14	0	2	3	2	45	
Total	0	0	601	2	0	63	111	0	0	2	1	303	0	3	104	134	1,324



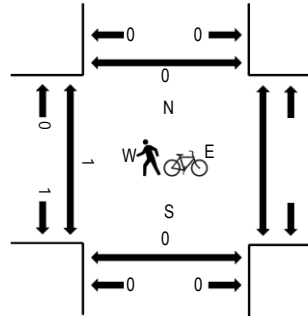
(303) 216-2439
www.alltrafficdata.net

Location: 2 Bells Ferry Rd & Kellogg Creek Rd AM
Date and Start Time: Tuesday, August 9, 2016
Peak Hour: 07:00 AM - 08:00 AM
Peak 15-Minutes: 07:30 AM - 07:45 AM

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	Kellogg Creek Rd				Westbound			Bells Ferry Rd Northbound				Bells Ferry Rd Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru Right	U-Turn	Left	Thru Right	U-Turn	Left	Thru	Right	West			East	South	North	
7:00 AM	0	62	0	125				0	46	66	0	1	0	173	2	475	2,208	0	0	0	
7:15 AM	0	90	0	165				0	41	92	0	2	0	180	1	571	2,154	0	0	0	
7:30 AM	0	61	0	179				1	39	77	0	1	0	224	4	586	2,003	1	0	0	
7:45 AM	0	60	0	136				1	43	76	0	5	0	249	6	576	1,831	0	0	0	
8:00 AM	0	44	0	87				1	59	62	0	2	0	164	2	421	1,623	0	0	0	
8:15 AM	0	52	0	105				2	42	54	0	0	0	162	3	420		0	0	0	
8:30 AM	0	38	0	104				0	54	65	0	4	0	145	4	414		0	0	0	
8:45 AM	0	38	0	87				1	41	78	0	0	0	121	2	368		1	0	0	

Peak Rolling Hour Flow Rates

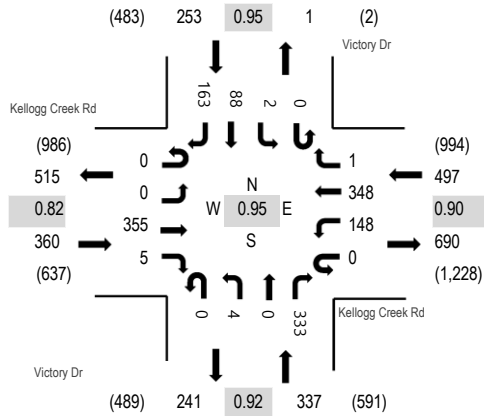
Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	2	0	0					0	0	0	0	0	0	2	0	4
Lights	0	262	0	587					2	160	302	0	9	0	807	13	2,142
Mediums	0	9	0	18					0	9	9	0	0	0	17	0	62
Total	0	273	0	605					2	169	311	0	9	0	826	13	2,208



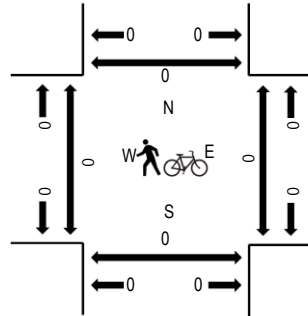
(303) 216-2439
www.alltrafficdata.net

Location: 1 Victory Dr & Kellogg Creek Rd PM
Date and Start Time: Tuesday, August 9, 2016
Peak Hour: 05:00 PM - 06:00 PM
Peak 15-Minutes: 05:15 PM - 05:30 PM

Peak Hour - All Vehicles



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	Kellogg Creek Rd Eastbound				Kellogg Creek Rd Westbound				Victory Dr Northbound				Victory Dr Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	1	61	0	0	39	85	0	0	0	0	56	0	5	15	35	297	1,258	0	0	0	0
4:15 PM	0	0	57	0	0	46	87	0	0	0	0	61	0	1	21	28	301	1,328	0	0	0	0
4:30 PM	0	0	79	1	0	32	82	0	0	0	0	69	0	4	32	32	331	1,409	0	0	0	0
4:45 PM	0	0	78	0	0	35	91	0	0	3	0	65	0	2	27	28	329	1,420	0	0	0	0
5:00 PM	0	0	77	0	0	39	104	0	0	0	0	80	0	0	21	46	367	1,447	0	0	0	0
5:15 PM	0	0	109	1	0	43	78	0	0	0	0	82	0	1	22	46	382		0	0	0	0
5:30 PM	0	0	95	2	0	27	66	1	0	1	0	91	0	1	25	33	342		0	0	0	0
5:45 PM	0	0	74	2	0	39	100	0	0	3	0	80	0	0	20	38	356		0	0	0	0

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
Lights	0	0	348	4	0	147	344	1	0	4	0	332	0	2	85	160	1,427
Mediums	0	0	7	1	0	1	4	0	0	0	0	1	0	0	2	2	18
Total	0	0	355	5	0	148	348	1	0	4	0	333	0	2	88	163	1,447

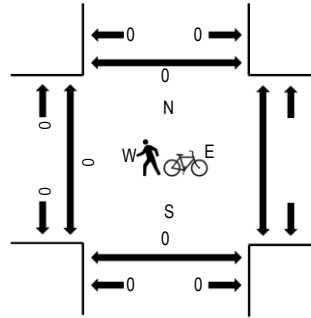
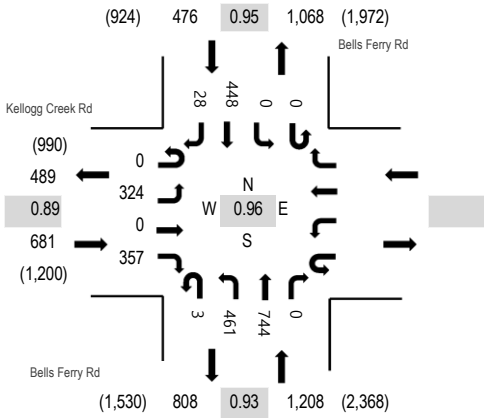


(303) 216-2439
www.alltrafficdata.net

Location: 2 Bells Ferry Rd & Kellogg Creek Rd PM
Date and Start Time: Tuesday, August 9, 2016
Peak Hour: 05:00 PM - 06:00 PM
Peak 15-Minutes: 05:00 PM - 05:15 PM

Peak Hour - All Vehicles

Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts














Interval Start Time	Kellogg Creek Rd Eastbound				Westbound			Bells Ferry Rd Northbound				Bells Ferry Rd Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru Right	U-Turn	Left	Thru Right	U-Turn	Left	Thru	Right	West			East	South	North	
4:00 PM	0	43	0	73				3	115	143	0	0	0	99	7	483	2,127	0	0	0	
4:15 PM	0	57	0	65				0	131	141	0	0	0	111	2	507	2,257	0	0	0	
4:30 PM	0	64	0	79				1	122	202	0	2	0	110	4	584	2,346	0	0	0	
4:45 PM	0	65	0	73				0	115	187	0	0	0	108	5	553	2,339	0	0	0	
5:00 PM	0	64	0	88				0	136	200	0	0	0	115	10	613	2,365	0	0	0	
5:15 PM	0	92	0	100				0	108	184	0	0	0	100	12	596		0	0	0	
5:30 PM	0	84	0	93				2	103	177	0	0	0	116	2	577		0	0	0	
5:45 PM	0	84	0	76				1	114	183	0	0	0	117	4	579		0	0	0	

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0					0	0	1	0	0	0	2	0	3
Lights	0	322	0	351					3	458	732	0	0	0	443	28	2,337
Mediums	0	2	0	6					0	3	11	0	0	0	3	0	25
Total	0	324	0	357					3	461	744	0	0	0	448	28	2,365

HCM 2010 Signalized Intersection Summary
 1: Bells Ferry Rd & Kellogg Creek Rd

10/24/2016

								
Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR	
Lane Configurations								
Traffic Volume (veh/h)	273	605	169	311	9	826	13	
Future Volume (veh/h)	273	605	169	311	9	826	13	
Number	7	14	5	2		6	16	
Initial Q (Qb), veh	0	0	0	0		0	0	
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00				1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00		1.00	1.00	
Adj Sat Flow, veh/h/ln	1816	1816	1891	1891		1891	1928	
Adj Flow Rate, veh/h	297	658	184	338		898	14	
Adj No. of Lanes	1	1	1	2		2	0	
Peak Hour Factor	0.92	0.92	0.92	0.92		0.92	0.92	
Percent Heavy Veh, %	2	2	2	2		2	2	
Cap, veh/h	456	407	397	2288		1909	30	
Arrive On Green	0.26	0.26	0.06	0.64		0.53	0.53	
Sat Flow, veh/h	1730	1544	1801	3687		3715	56	
Grp Volume(v), veh/h	297	658	184	338		446	466	
Grp Sat Flow(s),veh/h/ln	1730	1544	1801	1796		1796	1881	
Q Serve(g_s), s	19.8	34.3	5.9	4.9		20.3	20.3	
Cycle Q Clear(g_c), s	19.8	34.3	5.9	4.9		20.3	20.3	
Prop In Lane	1.00	1.00	1.00				0.03	
Lane Grp Cap(c), veh/h	456	407	397	2288		947	991	
V/C Ratio(X)	0.65	1.62	0.46	0.15		0.47	0.47	
Avail Cap(c_a), veh/h	456	407	476	2288		947	991	
HCM Platoon Ratio	1.00	1.00	1.00	1.00		1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	1.00		1.00	1.00	
Uniform Delay (d), s/veh	42.5	47.8	14.0	9.5		19.3	19.3	
Incr Delay (d2), s/veh	3.3	288.1	0.8	0.1		0.4	0.3	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0		0.0	0.0	
%ile BackOfQ(50%),veh/ln	9.9	58.0	3.0	2.4		10.1	10.6	
LnGrp Delay(d),s/veh	45.8	336.0	14.9	9.6		19.7	19.7	
LnGrp LOS	D	F	B	A		B	B	
Approach Vol, veh/h	955			522		912		
Approach Delay, s/veh	245.7			11.5		19.7		
Approach LOS	F			B		B		
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		90.0		40.0	14.3	75.7		
Change Period (Y+Rc), s		7.2		* 5.7	* 6.2	7.2		
Max Green Setting (Gmax), s		82.8		* 34	* 14	62.8		
Max Q Clear Time (g_c+I1), s		6.9		36.3	7.9	22.3		
Green Ext Time (p_c), s		9.4		0.0	0.2	9.0		
Intersection Summary								
HCM 2010 Ctrl Delay			108.2					
HCM 2010 LOS			F					
Notes								
User approved ignoring U-Turning movement.								

HCM 2010 TWSC
2: Victory Dr & Kellogg Creek Rd

10/24/2016

Intersection

Int Delay, s/veh 13.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	0	601	2	63	111	0	2	0	303	3	104	134
Future Vol, veh/h	0	601	2	63	111	0	2	0	303	3	104	134
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	3	-	-	-5	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	653	2	68	121	0	2	0	329	3	113	146














Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	655	0	0	1041	912	654	1077	913	121
Stage 1	-	-	-	-	-	-	654	654	-	258	258	-
Stage 2	-	-	-	-	-	-	387	258	-	819	655	-
Critical Hdwy	-	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	932	-	0	208	274	467	197	273	930
Stage 1	0	-	-	-	-	0	456	463	-	747	694	-
Stage 2	0	-	-	-	-	0	637	694	-	369	463	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	932	-	-	108	253	467	55	252	930
Mov Cap-2 Maneuver	-	-	-	-	-	-	108	253	-	55	252	-
Stage 1	-	-	-	-	-	-	456	463	-	747	640	-
Stage 2	-	-	-	-	-	-	408	640	-	109	463	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	3.3	31	30.5
HCM LOS			D	D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	457	-	-	932	-	394
HCM Lane V/C Ratio	0.725	-	-	0.073	-	0.665
HCM Control Delay (s)	31	-	-	9.2	0	30.5
HCM Lane LOS	D	-	-	A	A	D
HCM 95th %tile Q(veh)	5.8	-	-	0.2	-	4.6

HCM 2010 Signalized Intersection Summary
 1: Bells Ferry Rd & Kellogg Creek Rd

10/24/2016

								
Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR	
Lane Configurations								
Traffic Volume (veh/h)	324	357	464	744	0	448	28	
Future Volume (veh/h)	324	357	464	744	0	448	28	
Number	7	14	5	2		6	16	
Initial Q (Qb), veh	0	0	0	0		0	0	
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00				1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00		1.00	1.00	
Adj Sat Flow, veh/h/ln	1816	1816	1891	1891		1891	1928	
Adj Flow Rate, veh/h	352	388	504	809		487	30	
Adj No. of Lanes	1	1	1	2		2	0	
Peak Hour Factor	0.92	0.92	0.92	0.92		0.92	0.92	
Percent Heavy Veh, %	2	2	2	2		2	2	
Cap, veh/h	424	378	674	2381		1555	96	
Arrive On Green	0.25	0.25	0.17	0.66		0.45	0.45	
Sat Flow, veh/h	1730	1544	1801	3687		3533	211	
Grp Volume(v), veh/h	352	388	504	809		254	263	
Grp Sat Flow(s),veh/h/ln	1730	1544	1801	1796		1796	1853	
Q Serve(g_s), s	27.0	34.3	20.0	13.7		12.6	12.7	
Cycle Q Clear(g_c), s	27.0	34.3	20.0	13.7		12.6	12.7	
Prop In Lane	1.00	1.00	1.00				0.11	
Lane Grp Cap(c), veh/h	424	378	674	2381		813	838	
V/C Ratio(X)	0.83	1.03	0.75	0.34		0.31	0.31	
Avail Cap(c_a), veh/h	424	378	809	2381		813	838	
HCM Platoon Ratio	1.00	1.00	1.00	1.00		1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	1.00		1.00	1.00	
Uniform Delay (d), s/veh	50.1	52.8	14.9	10.3		24.4	24.5	
Incr Delay (d2), s/veh	13.1	53.1	3.1	0.4		0.2	0.2	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0		0.0	0.0	
%ile BackOfQ(50%),veh/ln	14.4	31.3	10.4	6.9		6.3	6.6	
LnGrp Delay(d),s/veh	63.2	105.9	18.0	10.7		24.7	24.7	
LnGrp LOS	E	F	B	B		C	C	
Approach Vol, veh/h	740			1313		517		
Approach Delay, s/veh	85.6			13.5		24.7		
Approach LOS	F			B		C		
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		100.0		40.0	29.5	70.5		
Change Period (Y+Rc), s		7.2		* 5.7	* 6.2	7.2		
Max Green Setting (Gmax), s		92.8		* 34	* 34	52.8		
Max Q Clear Time (g_c+I1), s		15.7		36.3	22.0	14.7		
Green Ext Time (p_c), s		10.7		0.0	1.3	10.0		
Intersection Summary								
HCM 2010 Ctrl Delay			36.5					
HCM 2010 LOS			D					
Notes								
User approved ignoring U-Turning movement.								

HCM 2010 TWSC
2: Victory Dr & Kellogg Creek Rd

10/24/2016

Intersection

Int Delay, s/veh 15.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	0	355	5	148	348	0	4	0	333	2	88	163
Future Vol, veh/h	0	355	5	148	348	0	4	0	333	2	88	163
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	3	-	-	-5	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	386	5	161	378	0	4	0	362	2	96	177

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	391	0	0	1225	1089	389	1270	1091	378
Stage 1	-	-	-	-	-	-	389	389	-	700	700	-
Stage 2	-	-	-	-	-	-	836	700	-	570	391	-
Critical Hdwy	-	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1168	-	0	156	215	659	145	215	669
Stage 1	0	-	-	-	-	0	635	608	-	430	441	-
Stage 2	0	-	-	-	-	0	362	441	-	506	607	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	1168	-	-	58	177	659	57	177	669
Mov Cap-2 Maneuver	-	-	-	-	-	-	58	177	-	57	177	-
Stage 1	-	-	-	-	-	-	635	608	-	430	364	-
Stage 2	-	-	-	-	-	-	162	364	-	228	607	-














Approach	EB	WB	NB	SB
HCM Control Delay, s	0	2.6	20.8	54.5
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	587	-	-	1168	-	326
HCM Lane V/C Ratio	0.624	-	-	0.138	-	0.844
HCM Control Delay (s)	20.8	-	-	8.6	0	54.5
HCM Lane LOS	C	-	-	A	A	F
HCM 95th %tile Q(veh)	4.3	-	-	0.5	-	7.5

HCM 2010 Signalized Intersection Summary

1: Bells Ferry Rd & Kellogg Creek Rd

10/24/2016

								
Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR	
Lane Configurations								
Traffic Volume (veh/h)	273	605	169	311	9	826	13	
Future Volume (veh/h)	273	605	169	311	9	826	13	
Number	7	14	5	2		6	16	
Initial Q (Qb), veh	0	0	0	0		0	0	
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00				1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00		1.00	1.00	
Adj Sat Flow, veh/h/ln	1816	1816	1891	1891		1891	1928	
Adj Flow Rate, veh/h	326	723	202	372		988	16	
Adj No. of Lanes	1	1	1	2		2	0	
Peak Hour Factor	0.92	0.92	0.92	0.92		0.92	0.92	
Percent Heavy Veh, %	2	2	2	2		2	2	
Cap, veh/h	456	407	371	2288		1889	31	
Arrive On Green	0.26	0.26	0.07	0.64		0.52	0.52	
Sat Flow, veh/h	1730	1544	1801	3687		3712	59	
Grp Volume(v), veh/h	326	723	202	372		491	513	
Grp Sat Flow(s),veh/h/ln	1730	1544	1801	1796		1796	1880	
Q Serve(g_s), s	22.2	34.3	6.5	5.5		23.3	23.3	
Cycle Q Clear(g_c), s	22.2	34.3	6.5	5.5		23.3	23.3	
Prop In Lane	1.00	1.00	1.00				0.03	
Lane Grp Cap(c), veh/h	456	407	371	2288		938	982	
V/C Ratio(X)	0.71	1.78	0.55	0.16		0.52	0.52	
Avail Cap(c_a), veh/h	456	407	441	2288		938	982	
HCM Platoon Ratio	1.00	1.00	1.00	1.00		1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	1.00		1.00	1.00	
Uniform Delay (d), s/veh	43.4	47.8	15.3	9.6		20.4	20.4	
Incr Delay (d2), s/veh	5.2	358.6	1.2	0.2		0.5	0.5	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0		0.0	0.0	
%ile BackOfQ(50%),veh/ln	11.3	66.0	3.3	2.7		11.7	12.3	
LnGrp Delay(d),s/veh	48.6	406.5	16.5	9.7		21.0	20.9	
LnGrp LOS	D	F	B	A		C	C	
Approach Vol, veh/h	1049			574		1004		
Approach Delay, s/veh	295.3			12.1		20.9		
Approach LOS	F			B		C		
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		90.0		40.0	14.9	75.1		
Change Period (Y+Rc), s		7.2		* 5.7	* 6.2	7.2		
Max Green Setting (Gmax), s		82.8		* 34	* 14	62.8		
Max Q Clear Time (g_c+I1), s		7.5		36.3	8.5	25.3		
Green Ext Time (p_c), s		11.0		0.0	0.2	10.3		
Intersection Summary								
HCM 2010 Ctrl Delay			128.6					
HCM 2010 LOS			F					
Notes								
User approved ignoring U-Turning movement.								

HCM 2010 TWSC
2: Victory Dr & Kellogg Creek Rd

10/24/2016

Intersection

Int Delay, s/veh 23.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	0	601	2	63	111	0	2	0	303	3	104	134
Future Vol, veh/h	0	601	2	63	111	0	2	0	303	3	104	134
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	3	-	-	-5	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	719	2	75	133	0	2	0	362	4	124	160














Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	721	0	0	1146	1003	720	1184	1004	133
Stage 1	-	-	-	-	-	-	720	720	-	283	283	-
Stage 2	-	-	-	-	-	-	426	283	-	901	721	-
Critical Hdwy	-	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	881	-	0	176	242	428	166	242	916
Stage 1	0	-	-	-	-	0	419	432	-	724	677	-
Stage 2	0	-	-	-	-	0	606	677	-	333	432	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	881	-	-	75	220	428	24	220	916
Mov Cap-2 Maneuver	-	-	-	-	-	-	75	220	-	24	220	-
Stage 1	-	-	-	-	-	-	419	432	-	724	615	-
Stage 2	-	-	-	-	-	-	362	615	-	51	432	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	3.4	51	62.4
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	415	-	-	881	-	324
HCM Lane V/C Ratio	0.879	-	-	0.086	-	0.889
HCM Control Delay (s)	51	-	-	9.5	0	62.4
HCM Lane LOS	F	-	-	A	A	F
HCM 95th %tile Q(veh)	9	-	-	0.3	-	8.4

HCM 2010 Signalized Intersection Summary
 1: Bells Ferry Rd & Kellogg Creek Rd

10/24/2016

								
Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR	
Lane Configurations								
Traffic Volume (veh/h)	324	357	464	744	0	448	28	
Future Volume (veh/h)	324	357	464	744	0	448	28	
Number	7	14	5	2		6	16	
Initial Q (Qb), veh	0	0	0	0		0	0	
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00				1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00		1.00	1.00	
Adj Sat Flow, veh/h/ln	1816	1816	1891	1891		1891	1928	
Adj Flow Rate, veh/h	387	427	555	890		536	33	
Adj No. of Lanes	1	1	1	2		2	0	
Peak Hour Factor	0.92	0.92	0.92	0.92		0.92	0.92	
Percent Heavy Veh, %	2	2	2	2		2	2	
Cap, veh/h	424	378	666	2381		1484	91	
Arrive On Green	0.25	0.25	0.19	0.66		0.43	0.43	
Sat Flow, veh/h	1730	1544	1801	3687		3533	211	
Grp Volume(v), veh/h	387	427	555	890		280	289	
Grp Sat Flow(s),veh/h/ln	1730	1544	1801	1796		1796	1853	
Q Serve(g_s), s	30.5	34.3	22.9	15.5		14.7	14.7	
Cycle Q Clear(g_c), s	30.5	34.3	22.9	15.5		14.7	14.7	
Prop In Lane	1.00	1.00	1.00				0.11	
Lane Grp Cap(c), veh/h	424	378	666	2381		775	800	
V/C Ratio(X)	0.91	1.13	0.83	0.37		0.36	0.36	
Avail Cap(c_a), veh/h	424	378	764	2381		775	800	
HCM Platoon Ratio	1.00	1.00	1.00	1.00		1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	1.00		1.00	1.00	
Uniform Delay (d), s/veh	51.4	52.8	16.5	10.6		26.8	26.8	
Incr Delay (d2), s/veh	23.9	86.1	7.0	0.5		0.3	0.3	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0		0.0	0.0	
%ile BackOfQ(50%),veh/ln	17.3	34.8	12.6	7.8		7.4	7.6	
LnGrp Delay(d),s/veh	75.3	139.0	23.5	11.0		27.1	27.1	
LnGrp LOS	E	F	C	B		C	C	
Approach Vol, veh/h	814			1445		569		
Approach Delay, s/veh	108.7			15.8		27.1		
Approach LOS	F			B		C		
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		100.0		40.0	32.4	67.6		
Change Period (Y+Rc), s		7.2		* 5.7	* 6.2	7.2		
Max Green Setting (Gmax), s		92.8		* 34	* 34	52.8		
Max Q Clear Time (g_c+I1), s		17.5		36.3	24.9	16.7		
Green Ext Time (p_c), s		12.5		0.0	1.3	11.3		
Intersection Summary								
HCM 2010 Ctrl Delay			44.8					
HCM 2010 LOS			D					
Notes								
User approved ignoring U-Turning movement.								

HCM 2010 TWSC
2: Victory Dr & Kellogg Creek Rd

10/24/2016

Intersection

Int Delay, s/veh 29.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	0	355	5	148	348	0	4	0	333	2	88	163
Future Vol, veh/h	0	355	5	148	348	0	4	0	333	2	88	163
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	3	-	-	-5	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	424	6	177	416	0	5	0	398	2	105	195

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	430	0	0	1347	1197	427	1397	1200	416
Stage 1	-	-	-	-	-	-	427	427	-	770	770	-
Stage 2	-	-	-	-	-	-	920	770	-	627	430	-
Critical Hdwy	-	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1129	-	0	128	186	628	118	185	637
Stage 1	0	-	-	-	-	0	606	585	-	393	410	-
Stage 2	0	-	-	-	-	0	325	410	-	471	583	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	1129	-	-	32	148	628	36	147	637
Mov Cap-2 Maneuver	-	-	-	-	-	-	32	148	-	36	147	-
Stage 1	-	-	-	-	-	-	606	585	-	393	326	-
Stage 2	-	-	-	-	-	-	122	326	-	172	583	-











Approach	EB	WB	NB	SB
HCM Control Delay, s	0	2.6	32.9	119.8
HCM LOS			D	F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	514	-	-	1129	-	278
HCM Lane V/C Ratio	0.784	-	-	0.157	-	1.088
HCM Control Delay (s)	32.9	-	-	8.8	0	119.8
HCM Lane LOS	D	-	-	A	A	F
HCM 95th %tile Q(veh)	7.2	-	-	0.6	-	12.3

HCM 2010 Signalized Intersection Summary

1: Bells Ferry Rd & Kellogg Creek Rd

10/24/2016

								
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Traffic Volume (veh/h)	273	605	0	480	837	0		
Future Volume (veh/h)	273	605	0	480	837	0		
Number	7	14	5	2	6	16		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1816	1816	0	1835	1891	0		
Adj Flow Rate, veh/h	297	658	0	522	910	0		
Adj No. of Lanes	1	2	0	2	2	0		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	0	2	2	0		
Cap, veh/h	477	749	0	2179	2245	0		
Arrive On Green	0.28	0.28	0.00	0.62	0.62	0.00		
Sat Flow, veh/h	1730	2717	0	3670	3781	0		
Grp Volume(v), veh/h	297	658	0	522	910	0		
Grp Sat Flow(s),veh/h/ln	1730	1359	0	1743	1796	0		
Q Serve(g_s), s	19.5	30.1	0.0	8.6	16.5	0.0		
Cycle Q Clear(g_c), s	19.5	30.1	0.0	8.6	16.5	0.0		
Prop In Lane	1.00	1.00	0.00			0.00		
Lane Grp Cap(c), veh/h	477	749	0	2179	2245	0		
V/C Ratio(X)	0.62	0.88	0.00	0.24	0.41	0.00		
Avail Cap(c_a), veh/h	722	1135	0	2179	2245	0		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.96	0.00		
Uniform Delay (d), s/veh	41.2	45.0	0.0	10.8	12.2	0.0		
Incr Delay (d2), s/veh	1.3	5.4	0.0	0.3	0.5	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	9.5	11.8	0.0	4.2	8.4	0.0		
LnGrp Delay(d),s/veh	42.5	50.4	0.0	11.0	12.8	0.0		
LnGrp LOS	D	D		B	B			
Approach Vol, veh/h	955			522	910			
Approach Delay, s/veh	47.9			11.0	12.8			
Approach LOS	D			B	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		88.4		41.6		88.4		
Change Period (Y+Rc), s		7.2		* 5.7		7.2		
Max Green Setting (Gmax), s		62.8		* 54		62.8		
Max Q Clear Time (g_c+I1), s		10.6		32.1		18.5		
Green Ext Time (p_c), s		12.6		3.8		12.3		
Intersection Summary								
HCM 2010 Ctrl Delay			26.4					
HCM 2010 LOS			C					
Notes								
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.								











HCM 2010 TWSC
2: Victory Dr & Kellogg Creek Rd

10/24/2016

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑					↖		↗		↖	↗
Traffic Vol, veh/h	0	601	2	0	0	0	2	0	303	3	167	256
Future Vol, veh/h	0	601	2	0	0	0	2	0	303	3	167	256
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	150	-	-	-	25	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	3	-	-	-5	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	653	2	0	0	0	2	0	329	3	182	278
Major/Minor	Major1			Minor1			Minor2					
Conflicting Flow All	-	0	0				745	-	-	327	655	0
Stage 1	-	-	-				654	-	-	0	0	-
Stage 2	-	-	-				91	-	-	327	655	-
Critical Hdwy	-	-	-				7.54	-	-	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-				6.54	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-				-	-	-	6.54	5.54	-
Follow-up Hdwy	-	-	-				3.52	-	-	3.52	4.02	3.32
Pot Cap-1 Maneuver	0	-	-				302	0	0	602	384	-
Stage 1	0	-	-				422	0	0	-	-	-
Stage 2	0	-	-				-	0	0	660	461	-
Platoon blocked, %		-	-									
Mov Cap-1 Maneuver	-	-	-				-	-	-	602	384	-
Mov Cap-2 Maneuver	-	-	-				-	-	-	602	384	-
Stage 1	-	-	-				422	-	-	-	-	-
Stage 2	-	-	-				-	-	-	660	461	-
Approach	EB			NB			SB					
HCM Control Delay, s	0											
HCM LOS	-											
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	SBLn1	SBLn2						
Capacity (veh/h)	-	-	-	-	386	-						
HCM Lane V/C Ratio	-	-	-	-	0.479	-						
HCM Control Delay (s)	-	0	-	-	22.6	-						
HCM Lane LOS	-	A	-	-	C	-						
HCM 95th %tile Q(veh)	-	-	-	-	2.5	-						

HCM 2010 Signalized Intersection Summary
 3: Bells Ferry Rd & Victory Dr











10/24/2016

								
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Traffic Volume (veh/h)	0	0	169	584	837	254		
Future Volume (veh/h)	0	0	169	584	837	254		
Number			5	2	6	16		
Initial Q (Qb), veh			0	0	0	0		
Ped-Bike Adj(A_pbT)			1.00			1.00		
Parking Bus, Adj			1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln			1863	1863	1863	1863		
Adj Flow Rate, veh/h			184	635	910	0		
Adj No. of Lanes			1	2	2	1		
Peak Hour Factor			0.92	0.92	0.92	0.92		
Percent Heavy Veh, %			2	2	2	2		
Cap, veh/h			1192	6602	6289	2814		
Arrive On Green			0.04	1.00	1.00	0.00		
Sat Flow, veh/h			1774	3632	3632	1583		
Grp Volume(v), veh/h			184	635	910	0		
Grp Sat Flow(s),veh/h/ln			1774	1770	1770	1583		
Q Serve(g_s), s			0.0	0.0	0.0	0.0		
Cycle Q Clear(g_c), s			0.0	0.0	0.0	0.0		
Prop In Lane			1.00			1.00		
Lane Grp Cap(c), veh/h			1192	6602	6289	2814		
V/C Ratio(X)			0.15	0.10	0.14	0.00		
Avail Cap(c_a), veh/h			1540	6602	6289	2814		
HCM Platoon Ratio			1.00	1.00	1.00	1.00		
Upstream Filter(I)			0.92	0.92	1.00	0.00		
Uniform Delay (d), s/veh			0.1	0.0	0.0	0.0		
Incr Delay (d2), s/veh			0.1	0.0	0.0	0.0		
Initial Q Delay(d3),s/veh			0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln			0.2	0.0	0.0	0.0		
LnGrp Delay(d),s/veh			0.1	0.0	0.0	0.0		
LnGrp LOS			A	A	A			
Approach Vol, veh/h				819	910			
Approach Delay, s/veh				0.0	0.0			
Approach LOS				A	A			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		
Phs Duration (G+Y+Rc), s		252.5			11.5	241.0		
Change Period (Y+Rc), s		* 6.5			6.5	6.5		
Max Green Setting (Gmax), s		* 1.3E2			30.5	86.5		
Max Q Clear Time (g_c+I1), s		2.0			2.0	2.0		
Green Ext Time (p_c), s		15.0			0.5	14.9		
Intersection Summary								
HCM 2010 Ctrl Delay			0.0					
HCM 2010 LOS			A					
Notes								
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.								

HCM 2010 Signalized Intersection Summary

1: Bells Ferry Rd & Kellogg Creek Rd

10/24/2016

								
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Traffic Volume (veh/h)	324	357	0	1208	448	0		
Future Volume (veh/h)	324	357	0	1208	448	0		
Number	7	14	5	2	6	16		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1816	1816	0	1835	1891	0		
Adj Flow Rate, veh/h	352	388	0	1313	487	0		
Adj No. of Lanes	1	2	0	2	2	0		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	0	2	2	0		
Cap, veh/h	400	628	0	2334	2405	0		
Arrive On Green	0.23	0.23	0.00	0.67	1.00	0.00		
Sat Flow, veh/h	1730	2717	0	3670	3781	0		
Grp Volume(v), veh/h	352	388	0	1313	487	0		
Grp Sat Flow(s),veh/h/ln	1730	1359	0	1743	1796	0		
Q Serve(g_s), s	25.5	16.6	0.0	26.0	0.0	0.0		
Cycle Q Clear(g_c), s	25.5	16.6	0.0	26.0	0.0	0.0		
Prop In Lane	1.00	1.00	0.00			0.00		
Lane Grp Cap(c), veh/h	400	628	0	2334	2405	0		
V/C Ratio(X)	0.88	0.62	0.00	0.56	0.20	0.00		
Avail Cap(c_a), veh/h	603	947	0	2334	2405	0		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.99	0.00		
Uniform Delay (d), s/veh	48.2	44.8	0.0	11.4	0.0	0.0		
Incr Delay (d2), s/veh	9.7	1.0	0.0	1.0	0.2	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	13.3	6.3	0.0	12.7	0.1	0.0		
LnGrp Delay(d),s/veh	57.9	45.8	0.0	12.4	0.2	0.0		
LnGrp LOS	E	D		B	A			
Approach Vol, veh/h	740			1313	487			
Approach Delay, s/veh	51.6			12.4	0.2			
Approach LOS	D			B	A			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		94.2		35.8		94.2		
Change Period (Y+Rc), s		7.2		* 5.7		7.2		
Max Green Setting (Gmax), s		71.8		* 45		71.8		
Max Q Clear Time (g_c+I1), s		28.0		27.5		2.0		
Green Ext Time (p_c), s		17.9		2.5		20.2		
Intersection Summary								
HCM 2010 Ctrl Delay			21.5					
HCM 2010 LOS			C					
Notes								
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.								

Intersection

Int Delay, s/veh 0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑					↘		↗		↘	↗
Traffic Vol, veh/h	0	355	5	0	0	0	4	0	333	2	236	511
Future Vol, veh/h	0	355	5	0	0	0	4	0	333	2	236	511
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	150	-	-	-	25	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	3	-	-	-5	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	386	5	0	0	0	4	0	362	2	257	555











Major/Minor	Major1			Minor1			Minor2		
Conflicting Flow All	-	0	0	517	-	-	193	391	0
Stage 1	-	-	-	389	-	-	0	0	-
Stage 2	-	-	-	128	-	-	193	391	-
Critical Hdwy	-	-	-	7.54	-	-	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	6.54	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-
Follow-up Hdwy	-	-	-	3.52	-	-	3.52	4.02	3.32
Pot Cap-1 Maneuver	0	-	-	441	0	0	749	543	-
Stage 1	0	-	-	606	0	0	-	-	-
Stage 2	0	-	-	-	0	0	790	606	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	-	749	543	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	749	543	-
Stage 1	-	-	-	606	-	-	-	-	-
Stage 2	-	-	-	-	-	-	790	606	-

Approach	EB	NB	SB
HCM Control Delay, s	0		
HCM LOS		-	-

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	SBLn1	SBLn2
Capacity (veh/h)	-	-	-	-	544	-
HCM Lane V/C Ratio	-	-	-	-	0.476	-
HCM Control Delay (s)	-	0	-	-	17.5	-
HCM Lane LOS	-	A	-	-	C	-
HCM 95th %tile Q(veh)	-	-	-	-	2.5	-











HCM 2010 Signalized Intersection Summary
 3: Bells Ferry Rd & Victory Dr

10/24/2016

								
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Traffic Volume (veh/h)	0	0	464	744	476	283		
Future Volume (veh/h)	0	0	464	744	476	283		
Number			5	2	6	16		
Initial Q (Qb), veh			0	0	0	0		
Ped-Bike Adj(A_pbT)			1.00			1.00		
Parking Bus, Adj			1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln			1863	1863	1863	1863		
Adj Flow Rate, veh/h			504	809	517	0		
Adj No. of Lanes			1	2	2	1		
Peak Hour Factor			0.92	0.92	0.92	0.92		
Percent Heavy Veh, %			2	2	2	2		
Cap, veh/h			1664	6602	6289	2813		
Arrive On Green			0.04	1.00	1.00	0.00		
Sat Flow, veh/h			1774	3632	3632	1583		
Grp Volume(v), veh/h			504	809	517	0		
Grp Sat Flow(s),veh/h/ln			1774	1770	1770	1583		
Q Serve(g_s), s			0.0	0.0	0.0	0.0		
Cycle Q Clear(g_c), s			0.0	0.0	0.0	0.0		
Prop In Lane			1.00			1.00		
Lane Grp Cap(c), veh/h			1664	6602	6289	2813		
V/C Ratio(X)			0.30	0.12	0.08	0.00		
Avail Cap(c_a), veh/h			2463	6602	6289	2813		
HCM Platoon Ratio			1.00	1.00	1.00	1.00		
Upstream Filter(I)			0.74	0.74	1.00	0.00		
Uniform Delay (d), s/veh			0.1	0.0	0.0	0.0		
Incr Delay (d2), s/veh			0.1	0.0	0.0	0.0		
Initial Q Delay(d3),s/veh			0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln			0.6	0.0	0.0	0.0		
LnGrp Delay(d),s/veh			0.2	0.0	0.0	0.0		
LnGrp LOS			A	A	A			
Approach Vol, veh/h				1313	517			
Approach Delay, s/veh				0.1	0.0			
Approach LOS				A	A			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		
Phs Duration (G+Y+Rc), s		252.5			11.5	241.0		
Change Period (Y+Rc), s		* 6.5			6.5	6.5		
Max Green Setting (Gmax), s		* 1.3E2			63.5	53.5		
Max Q Clear Time (g_c+I1), s		2.0			2.0	2.0		
Green Ext Time (p_c), s		11.5			1.6	11.1		
Intersection Summary								
HCM 2010 Ctrl Delay			0.1					
HCM 2010 LOS			A					
Notes								
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.								

HCM 2010 Signalized Intersection Summary
 1: Bells Ferry Rd & Kellogg Creek Rd

10/24/2016

								
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Traffic Volume (veh/h)	273	605	0	480	837	0		
Future Volume (veh/h)	273	605	0	480	837	0		
Number	7	14	5	2	6	16		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1816	1816	0	1835	1891	0		
Adj Flow Rate, veh/h	326	723	0	574	1001	0		
Adj No. of Lanes	1	2	0	2	2	0		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	0	2	2	0		
Cap, veh/h	520	816	0	2093	2156	0		
Arrive On Green	0.30	0.30	0.00	0.60	0.20	0.00		
Sat Flow, veh/h	1730	2717	0	3670	3781	0		
Grp Volume(v), veh/h	326	723	0	574	1001	0		
Grp Sat Flow(s),veh/h/ln	1730	1359	0	1743	1796	0		
Q Serve(g_s), s	21.1	33.0	0.0	10.2	32.0	0.0		
Cycle Q Clear(g_c), s	21.1	33.0	0.0	10.2	32.0	0.0		
Prop In Lane	1.00	1.00	0.00			0.00		
Lane Grp Cap(c), veh/h	520	816	0	2093	2156	0		
V/C Ratio(X)	0.63	0.89	0.00	0.27	0.46	0.00		
Avail Cap(c_a), veh/h	722	1135	0	2093	2156	0		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	0.33	1.00		
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.95	0.00		
Uniform Delay (d), s/veh	39.2	43.3	0.0	12.4	33.7	0.0		
Incr Delay (d2), s/veh	1.2	6.5	0.0	0.3	0.7	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	10.2	13.1	0.0	5.0	16.1	0.0		
LnGrp Delay(d),s/veh	40.4	49.9	0.0	12.8	34.3	0.0		
LnGrp LOS	D	D		B	C			
Approach Vol, veh/h	1049			574	1001			
Approach Delay, s/veh	46.9			12.8	34.3			
Approach LOS	D			B	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs	2		4			6		
Phs Duration (G+Y+Rc), s	85.2		44.8			85.2		
Change Period (Y+Rc), s	7.2		* 5.7			7.2		
Max Green Setting (Gmax), s	62.8		* 54			62.8		
Max Q Clear Time (g_c+I1), s	12.2		35.0			34.0		
Green Ext Time (p_c), s	14.6		4.1			12.3		
Intersection Summary								
HCM 2010 Ctrl Delay	34.7							
HCM 2010 LOS	C							
Notes								
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.								

HCM 2010 TWSC
2: Victory Dr & Kellogg Creek Rd

10/24/2016

Intersection

Int Delay, s/veh 0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑					↑		↑		↑	↑
Traffic Vol, veh/h	0	601	2	0	0	0	2	0	303	3	167	256
Future Vol, veh/h	0	601	2	0	0	0	2	0	303	3	167	256
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	150	-	-	-	25	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	3	-	-	-5	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	719	2	0	0	0	2	0	362	4	200	306

Major/Minor	Major1			Minor1			Minor2		
Conflicting Flow All	-	0	0	820	-	-	359	721	0
Stage 1	-	-	-	720	-	-	0	0	-
Stage 2	-	-	-	100	-	-	359	721	-
Critical Hdwy	-	-	-	7.54	-	-	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	6.54	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-
Follow-up Hdwy	-	-	-	3.52	-	-	3.52	4.02	3.32
Pot Cap-1 Maneuver	0	-	-	267	0	0	572	352	-
Stage 1	0	-	-	385	0	0	-	-	-
Stage 2	0	-	-	-	0	0	632	430	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	-	572	352	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	572	352	-
Stage 1	-	-	-	385	-	-	-	-	-
Stage 2	-	-	-	-	-	-	632	430	-











Approach	EB	NB	SB
HCM Control Delay, s	0		
HCM LOS		-	-

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	SBLn1	SBLn2
Capacity (veh/h)	-	-	-	-	354	-
HCM Lane V/C Ratio	-	-	-	-	0.574	-
HCM Control Delay (s)	-	0	-	-	28	-
HCM Lane LOS	-	A	-	-	D	-
HCM 95th %tile Q(veh)	-	-	-	-	3.4	-

HCM 2010 Signalized Intersection Summary











3: Bells Ferry Rd & Victory Dr

10/24/2016

								
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Traffic Volume (veh/h)	0	0	169	584	837	254		
Future Volume (veh/h)	0	0	169	584	837	254		
Number			5	2	6	16		
Initial Q (Qb), veh			0	0	0	0		
Ped-Bike Adj(A_pbT)			1.00			1.00		
Parking Bus, Adj			1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln			1863	1863	1863	1863		
Adj Flow Rate, veh/h			202	698	1001	0		
Adj No. of Lanes			1	2	2	1		
Peak Hour Factor			0.92	0.92	0.92	0.92		
Percent Heavy Veh, %			2	2	2	2		
Cap, veh/h			1104	6602	6289	2814		
Arrive On Green			0.04	1.00	1.00	0.00		
Sat Flow, veh/h			1774	3632	3632	1583		
Grp Volume(v), veh/h			202	698	1001	0		
Grp Sat Flow(s),veh/h/ln			1774	1770	1770	1583		
Q Serve(g_s), s			0.0	0.0	0.0	0.0		
Cycle Q Clear(g_c), s			0.0	0.0	0.0	0.0		
Prop In Lane			1.00			1.00		
Lane Grp Cap(c), veh/h			1104	6602	6289	2814		
V/C Ratio(X)			0.18	0.11	0.16	0.00		
Avail Cap(c_a), veh/h			1453	6602	6289	2814		
HCM Platoon Ratio			1.00	1.00	1.00	1.00		
Upstream Filter(I)			0.92	0.92	1.00	0.00		
Uniform Delay (d), s/veh			0.1	0.0	0.0	0.0		
Incr Delay (d2), s/veh			0.1	0.0	0.1	0.0		
Initial Q Delay(d3),s/veh			0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln			0.2	0.0	0.0	0.0		
LnGrp Delay(d),s/veh			0.1	0.0	0.1	0.0		
LnGrp LOS			A	A	A			
Approach Vol, veh/h				900	1001			
Approach Delay, s/veh				0.1	0.1			
Approach LOS				A	A			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		
Phs Duration (G+Y+Rc), s		252.5			11.5	241.0		
Change Period (Y+Rc), s		* 6.5			6.5	6.5		
Max Green Setting (Gmax), s		* 1.3E2			30.5	86.5		
Max Q Clear Time (g_c+I1), s		2.0			2.0	2.0		
Green Ext Time (p_c), s		18.0			0.5	17.7		
Intersection Summary								
HCM 2010 Ctrl Delay			0.1					
HCM 2010 LOS			A					
Notes								
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.								

HCM 2010 Signalized Intersection Summary
 1: Bells Ferry Rd & Kellogg Creek Rd

10/24/2016

								
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Traffic Volume (veh/h)	324	357	0	1208	448	0		
Future Volume (veh/h)	324	357	0	1208	448	0		
Number	7	14	5	2	6	16		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1816	1816	0	1835	1891	0		
Adj Flow Rate, veh/h	387	427	0	1444	536	0		
Adj No. of Lanes	1	2	0	2	2	0		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	0	2	2	0		
Cap, veh/h	436	684	0	2262	2331	0		
Arrive On Green	0.25	0.25	0.00	0.65	0.21	0.00		
Sat Flow, veh/h	1730	2717	0	3670	3781	0		
Grp Volume(v), veh/h	387	427	0	1444	536	0		
Grp Sat Flow(s),veh/h/ln	1730	1359	0	1743	1796	0		
Q Serve(g_s), s	28.0	18.1	0.0	32.3	16.0	0.0		
Cycle Q Clear(g_c), s	28.0	18.1	0.0	32.3	16.0	0.0		
Prop In Lane	1.00	1.00	0.00			0.00		
Lane Grp Cap(c), veh/h	436	684	0	2262	2331	0		
V/C Ratio(X)	0.89	0.62	0.00	0.64	0.23	0.00		
Avail Cap(c_a), veh/h	603	947	0	2262	2331	0		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	0.33	1.00		
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.99	0.00		
Uniform Delay (d), s/veh	46.9	43.2	0.0	13.7	24.2	0.0		
Incr Delay (d2), s/veh	11.7	0.9	0.0	1.4	0.2	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	14.9	6.9	0.0	15.9	8.1	0.0		
LnGrp Delay(d),s/veh	58.5	44.1	0.0	15.1	24.5	0.0		
LnGrp LOS	E	D		B	C			
Approach Vol, veh/h	814			1444	536			
Approach Delay, s/veh	51.0			15.1	24.5			
Approach LOS	D			B	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		91.6		38.4		91.6		
Change Period (Y+Rc), s		7.2		* 5.7		7.2		
Max Green Setting (Gmax), s		71.8		* 45		71.8		
Max Q Clear Time (g_c+I1), s		34.3		30.0		18.0		
Green Ext Time (p_c), s		19.4		2.7		22.6		
Intersection Summary								
HCM 2010 Ctrl Delay			27.3					
HCM 2010 LOS			C					
Notes								
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.								

HCM 2010 TWSC
2: Victory Dr & Kellogg Creek Rd

10/24/2016

Intersection

Int Delay, s/veh 0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑					↑		↑		↑	↑
Traffic Vol, veh/h	0	355	5	0	0	0	4	0	333	2	236	511
Future Vol, veh/h	0	355	5	0	0	0	4	0	333	2	236	511
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	150	-	-	-	25	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	3	-	-	-5	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	424	6	0	0	0	5	0	398	2	282	611

Major/Minor	Major1			Minor1			Minor2		
Conflicting Flow All	-	0	0	568	-	-	212	430	0
Stage 1	-	-	-	427	-	-	0	0	-
Stage 2	-	-	-	141	-	-	212	430	-
Critical Hdwy	-	-	-	7.54	-	-	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	6.54	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-
Follow-up Hdwy	-	-	-	3.52	-	-	3.52	4.02	3.32
Pot Cap-1 Maneuver	0	-	-	406	0	0	726	516	-
Stage 1	0	-	-	576	0	0	-	-	-
Stage 2	0	-	-	-	0	0	770	582	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	-	726	516	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	726	516	-
Stage 1	-	-	-	576	-	-	-	-	-
Stage 2	-	-	-	-	-	-	770	582	-











Approach	EB	NB	SB
HCM Control Delay, s	0		
HCM LOS		-	-

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	SBLn1	SBLn2
Capacity (veh/h)	-	-	-	-	517	-
HCM Lane V/C Ratio	-	-	-	-	0.55	-
HCM Control Delay (s)	-	0	-	-	20.2	-
HCM Lane LOS	-	A	-	-	C	-
HCM 95th %tile Q(veh)	-	-	-	-	3.3	-

HCM 2010 Signalized Intersection Summary

3: Bells Ferry Rd & Victory Dr














10/24/2016

								
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Traffic Volume (veh/h)	0	0	464	744	476	283		
Future Volume (veh/h)	0	0	464	744	476	283		
Number			5	2	6	16		
Initial Q (Qb), veh			0	0	0	0		
Ped-Bike Adj(A_pbT)			1.00			1.00		
Parking Bus, Adj			1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln			1863	1863	1863	1863		
Adj Flow Rate, veh/h			555	890	569	0		
Adj No. of Lanes			1	2	2	1		
Peak Hour Factor			0.92	0.92	0.92	0.92		
Percent Heavy Veh, %			2	2	2	2		
Cap, veh/h			1592	6602	6289	2813		
Arrive On Green			0.04	1.00	1.00	0.00		
Sat Flow, veh/h			1774	3632	3632	1583		
Grp Volume(v), veh/h			555	890	569	0		
Grp Sat Flow(s),veh/h/ln			1774	1770	1770	1583		
Q Serve(g_s), s			0.0	0.0	0.0	0.0		
Cycle Q Clear(g_c), s			0.0	0.0	0.0	0.0		
Prop In Lane			1.00			1.00		
Lane Grp Cap(c), veh/h			1592	6602	6289	2813		
V/C Ratio(X)			0.35	0.13	0.09	0.00		
Avail Cap(c_a), veh/h			2390	6602	6289	2813		
HCM Platoon Ratio			1.00	1.00	1.00	1.00		
Upstream Filter(I)			0.66	0.66	1.00	0.00		
Uniform Delay (d), s/veh			0.1	0.0	0.0	0.0		
Incr Delay (d2), s/veh			0.1	0.0	0.0	0.0		
Initial Q Delay(d3),s/veh			0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln			0.6	0.0	0.0	0.0		
LnGrp Delay(d),s/veh			0.2	0.0	0.0	0.0		
LnGrp LOS			A	A	A			
Approach Vol, veh/h				1445	569			
Approach Delay, s/veh				0.1	0.0			
Approach LOS				A	A			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		
Phs Duration (G+Y+Rc), s		252.5			11.5	241.0		
Change Period (Y+Rc), s		* 6.5			6.5	6.5		
Max Green Setting (Gmax), s		* 1.3E2			63.5	53.5		
Max Q Clear Time (g_c+I1), s		2.0			2.0	2.0		
Green Ext Time (p_c), s		13.5			1.8	12.9		
Intersection Summary								
HCM 2010 Ctrl Delay			0.1					
HCM 2010 LOS			A					
Notes								
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.								

HCM 2010 Signalized Intersection Summary

1: Bells Ferry Rd & Kellogg Creek Rd

10/25/2016

								
Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR	
Lane Configurations								
Traffic Volume (veh/h)	273	605	169	311	9	826	13	
Future Volume (veh/h)	273	605	169	311	9	826	13	
Number	7	14	5	2		6	16	
Initial Q (Qb), veh	0	0	0	0		0	0	
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00				1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00		1.00	1.00	
Adj Sat Flow, veh/h/ln	1816	1816	1835	1835		1891	1928	
Adj Flow Rate, veh/h	297	0	184	338		898	14	
Adj No. of Lanes	1	1	1	2		2	0	
Peak Hour Factor	0.92	0.92	0.92	0.92		0.92	0.92	
Percent Heavy Veh, %	2	2	2	2		2	2	
Cap, veh/h	327	292	448	2524		2260	35	
Arrive On Green	0.19	0.00	0.05	0.72		0.62	0.62	
Sat Flow, veh/h	1730	1544	1747	3578		3715	56	
Grp Volume(v), veh/h	297	0	184	338		446	466	
Grp Sat Flow(s),veh/h/ln	1730	1544	1747	1743		1796	1881	
Q Serve(g_s), s	22.7	0.0	4.9	4.0		16.7	16.7	
Cycle Q Clear(g_c), s	22.7	0.0	4.9	4.0		16.7	16.7	
Prop In Lane	1.00	1.00	1.00				0.03	
Lane Grp Cap(c), veh/h	327	292	448	2524		1121	1174	
V/C Ratio(X)	0.91	0.00	0.41	0.13		0.40	0.40	
Avail Cap(c_a), veh/h	647	577	674	2524		1121	1174	
HCM Platoon Ratio	1.00	1.00	1.00	1.00		1.00	1.00	
Upstream Filter(l)	1.00	0.00	1.00	1.00		1.00	1.00	
Uniform Delay (d), s/veh	53.6	0.0	9.0	5.7		12.7	12.7	
Incr Delay (d2), s/veh	9.5	0.0	0.6	0.1		0.2	0.2	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0		0.0	0.0	
%ile BackOfQ(50%),veh/ln	11.7	0.0	2.4	2.0		8.4	8.8	
LnGrp Delay(d),s/veh	63.1	0.0	9.6	5.8		12.9	12.9	
LnGrp LOS	E		A	A		B	B	
Approach Vol, veh/h	297			522		912		
Approach Delay, s/veh	63.1			7.1		12.9		
Approach LOS	E			A		B		
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		105.0		30.1	13.5	91.5		
Change Period (Y+Rc), s		7.2		4.5	* 6.2	7.2		
Max Green Setting (Gmax), s		97.8		50.5	* 25	66.8		
Max Q Clear Time (g_c+I1), s		6.0		24.7	6.9	18.7		
Green Ext Time (p_c), s		9.4		0.9	0.4	9.2		
Intersection Summary								
HCM 2010 Ctrl Delay			19.8					
HCM 2010 LOS			B					
Notes								
User approved ignoring U-Turning movement.								

HCM 2010 TWSC
2: Victory Dr & Kellogg Creek Rd

10/25/2016

Intersection

Int Delay, s/veh 11.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔			↕			↕	↕
Traffic Vol, veh/h	0	601	2	63	111	0	2	0	303	3	104	134
Future Vol, veh/h	0	601	2	63	111	0	2	0	303	3	104	134
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	250	-	-	-	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	3	-	-	-5	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	653	2	68	121	0	2	0	329	3	113	146














Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	655	0	0	968	912	654	1077	913	121
Stage 1	-	-	-	-	-	-	654	654	-	258	258	-
Stage 2	-	-	-	-	-	-	314	258	-	819	655	-
Critical Hdwy	-	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	932	-	0	233	274	467	197	273	930
Stage 1	0	-	-	-	-	0	456	463	-	747	694	-
Stage 2	0	-	-	-	-	0	697	694	-	369	463	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	932	-	-	121	254	467	55	253	930
Mov Cap-2 Maneuver	-	-	-	-	-	-	121	254	-	55	253	-
Stage 1	-	-	-	-	-	-	456	463	-	747	643	-
Stage 2	-	-	-	-	-	-	449	643	-	109	463	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	3.3	30.9	21.2
HCM LOS			D	C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	458	-	-	932	-	230	930
HCM Lane V/C Ratio	0.724	-	-	0.073	-	0.506	0.157
HCM Control Delay (s)	30.9	-	-	9.2	-	35.7	9.6
HCM Lane LOS	D	-	-	A	-	E	A
HCM 95th %tile Q(veh)	5.8	-	-	0.2	-	2.6	0.6

HCM 2010 Signalized Intersection Summary
 1: Bells Ferry Rd & Kellogg Creek Rd

10/25/2016

								
Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR	
Lane Configurations								
Traffic Volume (veh/h)	324	357	464	744	0	448	28	
Future Volume (veh/h)	324	357	464	744	0	448	28	
Number	7	14	5	2		6	16	
Initial Q (Qb), veh	0	0	0	0		0	0	
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00				1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00		1.00	1.00	
Adj Sat Flow, veh/h/ln	1816	1816	1835	1835		1891	1928	
Adj Flow Rate, veh/h	352	0	504	809		487	30	
Adj No. of Lanes	1	1	1	2		2	0	
Peak Hour Factor	0.92	0.92	0.92	0.92		0.92	0.92	
Percent Heavy Veh, %	2	2	2	2		2	2	
Cap, veh/h	381	340	686	2430		1696	104	
Arrive On Green	0.22	0.00	0.16	0.70		0.49	0.49	
Sat Flow, veh/h	1730	1544	1747	3578		3533	211	
Grp Volume(v), veh/h	352	0	504	809		254	263	
Grp Sat Flow(s),veh/h/ln	1730	1544	1747	1743		1796	1853	
Q Serve(g_s), s	28.2	0.0	19.1	13.0		11.8	11.9	
Cycle Q Clear(g_c), s	28.2	0.0	19.1	13.0		11.8	11.9	
Prop In Lane	1.00	1.00	1.00				0.11	
Lane Grp Cap(c), veh/h	381	340	686	2430		886	914	
V/C Ratio(X)	0.92	0.00	0.74	0.33		0.29	0.29	
Avail Cap(c_a), veh/h	604	539	1106	2430		886	914	
HCM Platoon Ratio	1.00	1.00	1.00	1.00		1.00	1.00	
Upstream Filter(I)	1.00	0.00	1.00	1.00		1.00	1.00	
Uniform Delay (d), s/veh	54.1	0.0	12.6	8.5		21.2	21.2	
Incr Delay (d2), s/veh	14.0	0.0	1.6	0.4		0.2	0.2	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0		0.0	0.0	
%ile BackOfQ(50%),veh/ln	15.0	0.0	9.3	6.3		5.9	6.1	
LnGrp Delay(d),s/veh	68.1	0.0	14.2	8.8		21.4	21.4	
LnGrp LOS	E		B	A		C	C	
Approach Vol, veh/h	352			1313		517		
Approach Delay, s/veh	68.1			10.9		21.4		
Approach LOS	E			B		C		
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		106.0		35.7	28.9	77.1		
Change Period (Y+Rc), s		7.2		4.5	* 6.2	7.2		
Max Green Setting (Gmax), s		98.8		49.5	* 57	35.8		
Max Q Clear Time (g_c+I1), s		15.0		30.2	21.1	13.9		
Green Ext Time (p_c), s		10.7		1.0	1.6	8.4		
Intersection Summary								
HCM 2010 Ctrl Delay			22.6					
HCM 2010 LOS			C					
Notes								
User approved ignoring U-Turning movement.								

HCM 2010 TWSC
 2: Victory Dr & Kellogg Creek Rd

10/25/2016

Intersection

Int Delay, s/veh 9.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔			↕			↔	↔
Traffic Vol, veh/h	0	355	5	148	348	0	4	0	333	2	88	163
Future Vol, veh/h	0	355	5	148	348	0	4	0	333	2	88	163
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	250	-	-	-	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	3	-	-	-5	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	386	5	161	378	0	4	0	362	2	96	177

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	391	0	0	1137	1089	389	1270	1091	378
Stage 1	-	-	-	-	-	-	389	389	-	700	700	-
Stage 2	-	-	-	-	-	-	748	700	-	570	391	-
Critical Hdwy	-	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1168	-	0	179	215	659	145	215	669
Stage 1	0	-	-	-	-	0	635	608	-	430	441	-
Stage 2	0	-	-	-	-	0	404	441	-	506	607	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	1168	-	-	71	185	659	58	185	669
Mov Cap-2 Maneuver	-	-	-	-	-	-	71	185	-	58	185	-
Stage 1	-	-	-	-	-	-	635	608	-	430	380	-
Stage 2	-	-	-	-	-	-	192	380	-	228	607	-














Approach	EB	WB	NB	SB
HCM Control Delay, s	0	2.6	19.9	25.1
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	600	-	-	1168	-	176	669
HCM Lane V/C Ratio	0.611	-	-	0.138	-	0.556	0.265
HCM Control Delay (s)	19.9	-	-	8.6	-	48.4	12.3
HCM Lane LOS	C	-	-	A	-	E	B
HCM 95th %tile Q(veh)	4.1	-	-	0.5	-	2.9	1.1

HCM 2010 Signalized Intersection Summary

1: Bells Ferry Rd & Kellogg Creek Rd

10/25/2016

								
Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR	
Lane Configurations								
Traffic Volume (veh/h)	273	605	169	311	9	826	13	
Future Volume (veh/h)	273	605	169	311	9	826	13	
Number	7	14	5	2		6	16	
Initial Q (Qb), veh	0	0	0	0		0	0	
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00				1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00		1.00	1.00	
Adj Sat Flow, veh/h/ln	1816	1816	1835	1835		1891	1928	
Adj Flow Rate, veh/h	326	0	202	372		988	16	
Adj No. of Lanes	1	1	1	2		2	0	
Peak Hour Factor	0.92	0.92	0.92	0.92		0.92	0.92	
Percent Heavy Veh, %	2	2	2	2		2	2	
Cap, veh/h	356	317	408	2476		2193	36	
Arrive On Green	0.21	0.00	0.06	0.71		0.61	0.61	
Sat Flow, veh/h	1730	1544	1747	3578		3712	59	
Grp Volume(v), veh/h	326	0	202	372		491	513	
Grp Sat Flow(s),veh/h/ln	1730	1544	1747	1743		1796	1880	
Q Serve(g_s), s	25.7	0.0	5.8	4.8		20.6	20.6	
Cycle Q Clear(g_c), s	25.7	0.0	5.8	4.8		20.6	20.6	
Prop In Lane	1.00	1.00	1.00				0.03	
Lane Grp Cap(c), veh/h	356	317	408	2476		1089	1140	
V/C Ratio(X)	0.92	0.00	0.49	0.15		0.45	0.45	
Avail Cap(c_a), veh/h	616	549	641	2476		1089	1140	
HCM Platoon Ratio	1.00	1.00	1.00	1.00		1.00	1.00	
Upstream Filter(I)	1.00	0.00	1.00	1.00		1.00	1.00	
Uniform Delay (d), s/veh	54.1	0.0	10.9	6.5		14.8	14.8	
Incr Delay (d2), s/veh	11.2	0.0	0.9	0.1		0.3	0.3	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0		0.0	0.0	
%ile BackOfQ(50%),veh/ln	13.3	0.0	2.9	2.3		10.3	10.8	
LnGrp Delay(d),s/veh	65.3	0.0	11.9	6.7		15.1	15.1	
LnGrp LOS	E		B	A		B	B	
Approach Vol, veh/h	326			574		1004		
Approach Delay, s/veh	65.3			8.5		15.1		
Approach LOS	E			A		B		
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		106.0		33.1	14.5	91.5		
Change Period (Y+Rc), s		7.2		4.5	* 6.2	7.2		
Max Green Setting (Gmax), s		98.8		49.5	* 27	65.8		
Max Q Clear Time (g_c+I1), s		6.8		27.7	7.8	22.6		
Green Ext Time (p_c), s		11.1		0.9	0.5	10.5		
Intersection Summary								
HCM 2010 Ctrl Delay			21.7					
HCM 2010 LOS			C					
Notes								
User approved ignoring U-Turning movement.								

HCM 2010 TWSC
2: Victory Dr & Kellogg Creek Rd

10/25/2016

Intersection

Int Delay, s/veh 18.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↑			↕			↕	↕
Traffic Vol, veh/h	0	601	2	63	111	0	2	0	303	3	104	134
Future Vol, veh/h	0	601	2	63	111	0	2	0	303	3	104	134
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	250	-	-	-	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	3	-	-	-5	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	719	2	75	133	0	2	0	362	4	124	160

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	721	0	0	1066	1003	720	1184	1004	133
Stage 1	-	-	-	-	-	-	720	720	-	283	283	-
Stage 2	-	-	-	-	-	-	346	283	-	901	721	-
Critical Hdwy	-	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	881	-	0	200	242	428	166	242	916
Stage 1	0	-	-	-	-	0	419	432	-	724	677	-
Stage 2	0	-	-	-	-	0	670	677	-	333	432	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	881	-	-	86	221	428	24	221	916
Mov Cap-2 Maneuver	-	-	-	-	-	-	86	221	-	24	221	-
Stage 1	-	-	-	-	-	-	419	432	-	724	619	-
Stage 2	-	-	-	-	-	-	404	619	-	51	432	-














Approach	EB	WB	NB	SB
HCM Control Delay, s	0	3.4	50.2	33.4
HCM LOS			F	D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	417	-	-	881	-	180	916
HCM Lane V/C Ratio	0.875	-	-	0.086	-	0.711	0.175
HCM Control Delay (s)	50.2	-	-	9.5	-	63	9.8
HCM Lane LOS	F	-	-	A	-	F	A
HCM 95th %tile Q(veh)	8.9	-	-	0.3	-	4.4	0.6

HCM 2010 Signalized Intersection Summary

1: Bells Ferry Rd & Kellogg Creek Rd

10/25/2016

								
Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR	
Lane Configurations								
Traffic Volume (veh/h)	324	357	464	744	0	448	28	
Future Volume (veh/h)	324	357	464	744	0	448	28	
Number	7	14	5	2		6	16	
Initial Q (Qb), veh	0	0	0	0		0	0	
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00				1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00		1.00	1.00	
Adj Sat Flow, veh/h/ln	1816	1816	1835	1835		1891	1928	
Adj Flow Rate, veh/h	387	0	555	890		536	33	
Adj No. of Lanes	1	1	1	2		2	0	
Peak Hour Factor	0.92	0.92	0.92	0.92		0.92	0.92	
Percent Heavy Veh, %	2	2	2	2		2	2	
Cap, veh/h	415	370	666	2372		1548	95	
Arrive On Green	0.24	0.00	0.19	0.68		0.45	0.45	
Sat Flow, veh/h	1730	1544	1747	3578		3533	211	
Grp Volume(v), veh/h	387	0	555	890		280	289	
Grp Sat Flow(s),veh/h/ln	1730	1544	1747	1743		1796	1853	
Q Serve(g_s), s	32.1	0.0	23.8	16.1		14.9	14.9	
Cycle Q Clear(g_c), s	32.1	0.0	23.8	16.1		14.9	14.9	
Prop In Lane	1.00	1.00	1.00				0.11	
Lane Grp Cap(c), veh/h	415	370	666	2372		809	835	
V/C Ratio(X)	0.93	0.00	0.83	0.38		0.35	0.35	
Avail Cap(c_a), veh/h	572	510	1026	2372		809	835	
HCM Platoon Ratio	1.00	1.00	1.00	1.00		1.00	1.00	
Upstream Filter(I)	1.00	0.00	1.00	1.00		1.00	1.00	
Uniform Delay (d), s/veh	54.6	0.0	16.0	10.1		26.2	26.3	
Incr Delay (d2), s/veh	18.5	0.0	3.6	0.5		0.3	0.2	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0		0.0	0.0	
%ile BackOfQ(50%),veh/ln	17.5	0.0	11.9	7.8		7.4	7.7	
LnGrp Delay(d),s/veh	73.1	0.0	19.6	10.5		26.5	26.5	
LnGrp LOS	E		B	B		C	C	
Approach Vol, veh/h	387			1445		569		
Approach Delay, s/veh	73.1			14.0		26.5		
Approach LOS	E			B		C		
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		107.0		39.7	33.8	73.2		
Change Period (Y+Rc), s		7.2		4.5	* 6.2	7.2		
Max Green Setting (Gmax), s		99.8		48.5	* 58	35.8		
Max Q Clear Time (g_c+I1), s		18.1		34.1	25.8	16.9		
Green Ext Time (p_c), s		12.6		1.0	1.8	8.8		
Intersection Summary								
HCM 2010 Ctrl Delay				26.5				
HCM 2010 LOS				C				
Notes								
User approved ignoring U-Turning movement.								

HCM 2010 TWSC
2: Victory Dr & Kellogg Creek Rd

10/25/2016

Intersection

Int Delay, s/veh 13.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↑			↕			↕	↕
Traffic Vol, veh/h	0	355	5	148	348	0	4	0	333	2	88	163
Future Vol, veh/h	0	355	5	148	348	0	4	0	333	2	88	163
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	250	-	-	-	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	3	-	-	-5	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	424	6	177	416	0	5	0	398	2	105	195

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	430	0	0	1250	1197	427	1397	1200	416
Stage 1	-	-	-	-	-	-	427	427	-	770	770	-
Stage 2	-	-	-	-	-	-	823	770	-	627	430	-
Critical Hdwy	-	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1129	-	0	150	186	628	118	185	637
Stage 1	0	-	-	-	-	0	606	585	-	393	410	-
Stage 2	0	-	-	-	-	0	368	410	-	471	583	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	1129	-	-	43	157	628	38	156	637
Mov Cap-2 Maneuver	-	-	-	-	-	-	43	157	-	38	156	-
Stage 1	-	-	-	-	-	-	606	585	-	393	346	-
Stage 2	-	-	-	-	-	-	150	346	-	172	583	-

















Approach	EB	WB	NB	SB
HCM Control Delay, s	0	2.6	28.6	36.4
HCM LOS			D	E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	541	-	-	1129	-	146	637
HCM Lane V/C Ratio	0.745	-	-	0.157	-	0.737	0.306
HCM Control Delay (s)	28.6	-	-	8.8	-	78.6	13.1
HCM Lane LOS	D	-	-	A	-	F	B
HCM 95th %tile Q(veh)	6.4	-	-	0.6	-	4.4	1.3

HCM 2010 Signalized Intersection Summary

1: Bells Ferry Rd & Kellogg Creek Rd

10/25/2016

								
Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR	
Lane Configurations								
Traffic Volume (veh/h)	273	605	169	311	9	826	13	
Future Volume (veh/h)	273	605	169	311	9	826	13	
Number	7	14	5	2		6	16	
Initial Q (Qb), veh	0	0	0	0		0	0	
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00				1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00		1.00	1.00	
Adj Sat Flow, veh/h/ln	1816	1816	1835	1835		1891	1928	
Adj Flow Rate, veh/h	297	658	184	338		898	14	
Adj No. of Lanes	1	2	1	2		2	0	
Peak Hour Factor	0.92	0.92	0.92	0.92		0.92	0.92	
Percent Heavy Veh, %	2	2	2	2		2	2	
Cap, veh/h	446	886	396	2222		1861	29	
Arrive On Green	0.26	0.26	0.07	0.64		0.51	0.51	
Sat Flow, veh/h	1730	2717	1747	3578		3715	56	
Grp Volume(v), veh/h	297	658	184	338		446	466	
Grp Sat Flow(s),veh/h/ln	1730	1359	1747	1743		1796	1881	
Q Serve(g_s), s	17.2	24.1	5.3	4.4		17.9	17.9	
Cycle Q Clear(g_c), s	17.2	24.1	5.3	4.4		17.9	17.9	
Prop In Lane	1.00	1.00	1.00				0.03	
Lane Grp Cap(c), veh/h	446	886	396	2222		923	967	
V/C Ratio(X)	0.67	0.74	0.47	0.15		0.48	0.48	
Avail Cap(c_a), veh/h	549	1047	586	2222		923	967	
HCM Platoon Ratio	1.00	1.00	1.00	1.00		1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	1.00		1.00	1.00	
Uniform Delay (d), s/veh	37.2	33.5	12.6	8.1		17.6	17.6	
Incr Delay (d2), s/veh	2.2	2.4	0.9	0.1		0.4	0.4	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0		0.0	0.0	
%ile BackOfQ(50%),veh/ln	8.4	17.3	2.6	2.1		9.0	9.4	
LnGrp Delay(d),s/veh	39.4	35.9	13.4	8.3		18.0	17.9	
LnGrp LOS	D	D	B	A		B	B	
Approach Vol, veh/h	955			522		912		
Approach Delay, s/veh	37.0			10.1		17.9		
Approach LOS	D			B		B		
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		78.5		33.4	13.8	64.7		
Change Period (Y+Rc), s		7.2		4.5	* 6.2	7.2		
Max Green Setting (Gmax), s		71.3		35.5	* 20	45.3		
Max Q Clear Time (g_c+I1), s		6.4		26.1	7.3	19.9		
Green Ext Time (p_c), s		9.4		2.8	0.4	8.1		
Intersection Summary								
HCM 2010 Ctrl Delay			23.9					
HCM 2010 LOS			C					
Notes								
User approved ignoring U-Turning movement.								















HCM 2010 TWSC
2: Victory Dr & Kellogg Creek Rd

10/25/2016

Intersection												
Int Delay, s/veh	5.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↔		↔		↔		↔	↔
Traffic Vol, veh/h	0	601	2	63	111	0	2	0	303	3	104	134
Future Vol, veh/h	0	601	2	63	111	0	2	0	303	3	104	134
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	150	-	-	-	25	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	3	-	-	-5	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	653	2	68	121	0	2	0	329	3	113	146
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	653	0	0	967	-	-	585	911	121
Stage 1	-	-	-	-	-	-	653	-	-	258	258	-
Stage 2	-	-	-	-	-	-	314	-	-	327	653	-
Critical Hdwy	-	-	-	4.13	-	-	7.33	-	-	7.33	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.53	-	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	-	-	6.53	5.53	-
Follow-up Hdwy	-	-	-	2.219	-	-	3.519	-	-	3.519	4.019	3.319
Pot Cap-1 Maneuver	0	-	-	932	-	0	221	0	0	408	273	930
Stage 1	0	-	-	-	-	0	423	0	0	746	694	-
Stage 2	0	-	-	-	-	0	696	0	0	660	463	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	932	-	-	114	-	-	384	252	930
Mov Cap-2 Maneuver	-	-	-	-	-	-	114	-	-	384	252	-
Stage 1	-	-	-	-	-	-	423	-	-	746	640	-
Stage 2	-	-	-	-	-	-	446	-	-	660	463	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			3.3			37.2			18.9		
HCM LOS							E			C		
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT	SBLn1	SBLn2				
Capacity (veh/h)	114	-	-	-	932	-	254	930				
HCM Lane V/C Ratio	0.019	-	-	-	0.073	-	0.458	0.157				
HCM Control Delay (s)	37.2	0	-	-	9.2	0	30.6	9.6				
HCM Lane LOS	E	A	-	-	A	A	D	A				
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2	-	2.2	0.6				

HCM 2010 Signalized Intersection Summary
 1: Bells Ferry Rd & Kellogg Creek Rd

10/25/2016

								
Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR	
Lane Configurations								
Traffic Volume (veh/h)	324	357	464	744	0	448	28	
Future Volume (veh/h)	324	357	464	744	0	448	28	
Number	7	14	5	2		6	16	
Initial Q (Qb), veh	0	0	0	0		0	0	
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00				1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00		1.00	1.00	
Adj Sat Flow, veh/h/ln	1816	1816	1835	1835		1891	1928	
Adj Flow Rate, veh/h	352	388	504	809		487	30	
Adj No. of Lanes	1	2	1	2		2	0	
Peak Hour Factor	0.92	0.92	0.92	0.92		0.92	0.92	
Percent Heavy Veh, %	2	2	2	2		2	2	
Cap, veh/h	396	1065	680	2403		1662	102	
Arrive On Green	0.23	0.23	0.16	0.69		0.48	0.48	
Sat Flow, veh/h	1730	2717	1747	3578		3533	211	
Grp Volume(v), veh/h	352	388	504	809		254	263	
Grp Sat Flow(s),veh/h/ln	1730	1359	1747	1743		1796	1853	
Q Serve(g_s), s	28.2	14.5	19.7	13.5		12.2	12.3	
Cycle Q Clear(g_c), s	28.2	14.5	19.7	13.5		12.2	12.3	
Prop In Lane	1.00	1.00	1.00				0.11	
Lane Grp Cap(c), veh/h	396	1065	680	2403		868	896	
V/C Ratio(X)	0.89	0.36	0.74	0.34		0.29	0.29	
Avail Cap(c_a), veh/h	597	1381	1088	2403		868	896	
HCM Platoon Ratio	1.00	1.00	1.00	1.00		1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	1.00		1.00	1.00	
Uniform Delay (d), s/veh	53.5	30.9	13.3	9.0		22.3	22.3	
Incr Delay (d2), s/veh	10.6	0.2	1.6	0.4		0.2	0.2	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0		0.0	0.0	
%ile BackOfQ(50%),veh/ln	14.7	12.4	9.7	6.5		6.1	6.3	
LnGrp Delay(d),s/veh	64.1	31.1	14.9	9.4		22.5	22.5	
LnGrp LOS	E	C	B	A		C	C	
Approach Vol, veh/h	740			1313		517		
Approach Delay, s/veh	46.8			11.5		22.5		
Approach LOS	D			B		C		
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		106.0		37.3	29.5	76.5		
Change Period (Y+Rc), s		7.2		4.5	* 6.2	7.2		
Max Green Setting (Gmax), s		98.8		49.5	* 57	35.8		
Max Q Clear Time (g_c+I1), s		15.5		30.2	21.7	14.3		
Green Ext Time (p_c), s		10.7		2.6	1.6	8.4		
Intersection Summary								
HCM 2010 Ctrl Delay			23.9					
HCM 2010 LOS			C					
Notes								
User approved ignoring U-Turning movement.								

HCM 2010 TWSC
 2: Victory Dr & Kellogg Creek Rd

10/25/2016

Intersection

Int Delay, s/veh 7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↔		↔		↔		↔	↔
Traffic Vol, veh/h	0	355	5	148	348	0	4	0	333	2	88	163
Future Vol, veh/h	0	355	5	148	348	0	4	0	333	2	88	163
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	150	-	-	-	25	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	3	-	-	-5	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	386	5	161	378	0	4	0	362	2	96	177

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	386	0	0	1134	-	-	893	1086	378
Stage 1	-	-	-	-	-	-	386	-	-	700	700	-
Stage 2	-	-	-	-	-	-	748	-	-	193	386	-
Critical Hdwy	-	-	-	4.13	-	-	7.33	-	-	7.33	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.53	-	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	-	-	6.53	5.53	-
Follow-up Hdwy	-	-	-	2.219	-	-	3.519	-	-	3.519	4.019	3.319
Pot Cap-1 Maneuver	0	-	-	1171	-	0	168	0	0	249	216	668
Stage 1	0	-	-	-	-	0	610	0	0	429	440	-
Stage 2	0	-	-	-	-	0	404	0	0	791	609	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	1171	-	-	62	-	-	216	178	668
Mov Cap-2 Maneuver	-	-	-	-	-	-	62	-	-	216	178	-
Stage 1	-	-	-	-	-	-	610	-	-	429	363	-
Stage 2	-	-	-	-	-	-	181	-	-	791	609	-














Approach	EB	WB	NB	SB
HCM Control Delay, s	0	2.6	67.4	24.6
HCM LOS			F	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	62	-	-	-	1171	-	179	668
HCM Lane V/C Ratio	0.07	-	-	-	0.137	-	0.547	0.265
HCM Control Delay (s)	67.4	0	-	-	8.6	0	47	12.3
HCM Lane LOS	F	A	-	-	A	A	E	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.5	-	2.8	1.1

HCM 2010 Signalized Intersection Summary

1: Bells Ferry Rd & Kellogg Creek Rd

10/25/2016

								
Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR	
Lane Configurations								
Traffic Volume (veh/h)	273	605	169	311	9	826	13	
Future Volume (veh/h)	273	605	169	311	9	826	13	
Number	7	14	5	2		6	16	
Initial Q (Qb), veh	0	0	0	0		0	0	
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00				1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00		1.00	1.00	
Adj Sat Flow, veh/h/ln	1816	1816	1835	1835		1891	1928	
Adj Flow Rate, veh/h	326	723	202	372		988	16	
Adj No. of Lanes	1	2	1	2		2	0	
Peak Hour Factor	0.92	0.92	0.92	0.92		0.92	0.92	
Percent Heavy Veh, %	2	2	2	2		2	2	
Cap, veh/h	475	950	361	2172		1787	29	
Arrive On Green	0.27	0.27	0.07	0.62		0.49	0.49	
Sat Flow, veh/h	1730	2717	1747	3578		3712	59	
Grp Volume(v), veh/h	326	723	202	372		491	513	
Grp Sat Flow(s),veh/h/ln	1730	1359	1747	1743		1796	1880	
Q Serve(g_s), s	19.3	27.0	6.2	5.2		21.8	21.8	
Cycle Q Clear(g_c), s	19.3	27.0	6.2	5.2		21.8	21.8	
Prop In Lane	1.00	1.00	1.00				0.03	
Lane Grp Cap(c), veh/h	475	950	361	2172		887	929	
V/C Ratio(X)	0.69	0.76	0.56	0.17		0.55	0.55	
Avail Cap(c_a), veh/h	537	1046	536	2172		887	929	
HCM Platoon Ratio	1.00	1.00	1.00	1.00		1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	1.00		1.00	1.00	
Uniform Delay (d), s/veh	37.1	33.0	15.0	9.1		20.2	20.2	
Incr Delay (d2), s/veh	3.1	3.0	1.4	0.2		0.7	0.7	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0		0.0	0.0	
%ile BackOfQ(50%),veh/ln	9.6	19.3	3.1	2.5		10.9	11.5	
LnGrp Delay(d),s/veh	40.2	36.0	16.3	9.3		20.9	20.9	
LnGrp LOS	D	D	B	A		C	C	
Approach Vol, veh/h	1049			574		1004		
Approach Delay, s/veh	37.3			11.8		20.9		
Approach LOS	D			B		C		
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		78.5		35.9	14.8	63.7		
Change Period (Y+Rc), s		7.2		4.5	* 6.2	7.2		
Max Green Setting (Gmax), s		71.3		35.5	* 20	45.1		
Max Q Clear Time (g_c+I1), s		7.2		29.0	8.2	23.8		
Green Ext Time (p_c), s		11.0		2.4	0.4	8.5		
Intersection Summary								
HCM 2010 Ctrl Delay			25.4					
HCM 2010 LOS			C					
Notes								
User approved ignoring U-Turning movement.								

HCM 2010 TWSC
2: Victory Dr & Kellogg Creek Rd

10/25/2016

Intersection

Int Delay, s/veh 6.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↔		↔		↔		↔	↔
Traffic Vol, veh/h	0	601	2	63	111	0	2	0	303	3	104	134
Future Vol, veh/h	0	601	2	63	111	0	2	0	303	3	104	134
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	150	-	-	-	25	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	3	-	-	-5	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	719	2	75	133	0	2	0	362	4	124	160

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	719	0	0	1065	-	-	642	1002	133
Stage 1	-	-	-	-	-	-	719	-	-	283	283	-
Stage 2	-	-	-	-	-	-	346	-	-	359	719	-
Critical Hdwy	-	-	-	4.13	-	-	7.33	-	-	7.33	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.53	-	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	-	-	6.53	5.53	-
Follow-up Hdwy	-	-	-	2.219	-	-	3.519	-	-	3.519	4.019	3.319
Pot Cap-1 Maneuver	0	-	-	880	-	0	188	0	0	373	242	916
Stage 1	0	-	-	-	-	0	387	0	0	723	676	-
Stage 2	0	-	-	-	-	0	669	0	0	632	432	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	880	-	-	80	-	-	347	220	916
Mov Cap-2 Maneuver	-	-	-	-	-	-	80	-	-	347	220	-
Stage 1	-	-	-	-	-	-	387	-	-	723	614	-
Stage 2	-	-	-	-	-	-	400	-	-	632	432	-















Approach	EB	WB	NB	SB
HCM Control Delay, s	0	3.4	51.4	23.7
HCM LOS			F	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	80	-	-	-	880	-	222	916
HCM Lane V/C Ratio	0.03	-	-	-	0.086	-	0.576	0.175
HCM Control Delay (s)	51.4	0	-	-	9.5	0	41.2	9.8
HCM Lane LOS	F	A	-	-	A	A	E	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3	-	3.2	0.6

HCM 2010 Signalized Intersection Summary

1: Bells Ferry Rd & Kellogg Creek Rd

10/25/2016

								
Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR	
Lane Configurations								
Traffic Volume (veh/h)	324	357	464	744	0	448	28	
Future Volume (veh/h)	324	357	464	744	0	448	28	
Number	7	14	5	2		6	16	
Initial Q (Qb), veh	0	0	0	0		0	0	
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00				1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00		1.00	1.00	
Adj Sat Flow, veh/h/ln	1816	1816	1835	1835		1891	1928	
Adj Flow Rate, veh/h	387	427	555	890		536	33	
Adj No. of Lanes	1	2	1	2		2	0	
Peak Hour Factor	0.92	0.92	0.92	0.92		0.92	0.92	
Percent Heavy Veh, %	2	2	2	2		2	2	
Cap, veh/h	429	1193	660	2346		1513	93	
Arrive On Green	0.25	0.25	0.19	0.67		0.44	0.44	
Sat Flow, veh/h	1730	2717	1747	3578		3533	211	
Grp Volume(v), veh/h	387	427	555	890		280	289	
Grp Sat Flow(s),veh/h/ln	1730	1359	1747	1743		1796	1853	
Q Serve(g_s), s	32.1	15.5	24.5	16.6		15.3	15.4	
Cycle Q Clear(g_c), s	32.1	15.5	24.5	16.6		15.3	15.4	
Prop In Lane	1.00	1.00	1.00				0.11	
Lane Grp Cap(c), veh/h	429	1193	660	2346		791	816	
V/C Ratio(X)	0.90	0.36	0.84	0.38		0.35	0.35	
Avail Cap(c_a), veh/h	566	1407	1008	2346		791	816	
HCM Platoon Ratio	1.00	1.00	1.00	1.00		1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	1.00		1.00	1.00	
Uniform Delay (d), s/veh	54.0	27.7	16.8	10.7		27.5	27.5	
Incr Delay (d2), s/veh	14.6	0.2	4.0	0.5		0.3	0.3	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0		0.0	0.0	
%ile BackOfQ(50%),veh/ln	17.1	13.7	12.5	8.1		7.7	7.9	
LnGrp Delay(d),s/veh	68.6	27.9	20.8	11.1		27.8	27.8	
LnGrp LOS	E	C	C	B		C	C	
Approach Vol, veh/h	814			1445		569		
Approach Delay, s/veh	47.2			14.8		27.8		
Approach LOS	D			B		C		
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		107.0		41.3	34.5	72.5		
Change Period (Y+Rc), s		7.2		4.5	* 6.2	7.2		
Max Green Setting (Gmax), s		99.8		48.5	* 58	35.8		
Max Q Clear Time (g_c+I1), s		18.6		34.1	26.5	17.4		
Green Ext Time (p_c), s		12.6		2.7	1.8	8.7		
Intersection Summary								
HCM 2010 Ctrl Delay			26.8					
HCM 2010 LOS			C					
Notes								
User approved ignoring U-Turning movement.								

Intersection

Int Delay, s/veh 9.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↔		↔		↔		↔	↔
Traffic Vol, veh/h	0	355	5	148	348	0	4	0	333	2	88	163
Future Vol, veh/h	0	355	5	148	348	0	4	0	333	2	88	163
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	150	-	-	-	25	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	3	-	-	-5	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	424	6	177	416	0	5	0	398	2	105	195

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	424	0	0	1247	-	-	982	1194	416
Stage 1	-	-	-	-	-	-	424	-	-	770	770	-
Stage 2	-	-	-	-	-	-	823	-	-	212	424	-
Critical Hdwy	-	-	-	4.13	-	-	7.33	-	-	7.33	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.53	-	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	-	-	6.53	5.53	-
Follow-up Hdwy	-	-	-	2.219	-	-	3.519	-	-	3.519	4.019	3.319
Pot Cap-1 Maneuver	0	-	-	1133	-	0	140	0	0	215	186	636
Stage 1	0	-	-	-	-	0	579	0	0	392	409	-
Stage 2	0	-	-	-	-	0	367	0	0	771	586	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	1133	-	-	36	-	-	181	148	636
Mov Cap-2 Maneuver	-	-	-	-	-	-	36	-	-	181	148	-
Stage 1	-	-	-	-	-	-	579	-	-	392	326	-
Stage 2	-	-	-	-	-	-	137	-	-	771	586	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	2.6	119.8	35.2
HCM LOS			F	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	36	-	-	-	1133	-	149	636
HCM Lane V/C Ratio	0.133	-	-	-	0.156	-	0.722	0.306
HCM Control Delay (s)	119.8	0	-	-	8.8	0	75.1	13.1
HCM Lane LOS	F	A	-	-	A	A	F	B
HCM 95th %tile Q(veh)	0.4	-	-	-	0.6	-	4.3	1.3

2016 Summary of Reported Crashes:

- 23(21 without 2 rear-ends beyond the intersections) total crashes with 18(16) rear-end, 4 angle (2 at each intersection), 1 run-off-the-road single vehicle,(11 at signal, 12 at TWSC) with 13(11) people injured in 6(5) crashes, none transported.
- 11(9) on Bells Ferry Rd (8 at intersections), 4(3) northbound and 4(3) southbound rear-end with 2 injury crashes for 3 injured NB; 1 SB run-of-the-road single vehicle; and 2 angle (one red light runner) involving LTs (1 NB LT and 1 EB LT) resulting in 7 injured in both crashes.
- 6 on Kellogg Creek Rd, 2 rear-end eastbound turning right onto Bells Ferry Rd with 1 injury crash/2 injured, and 2 eastbound and 2 westbound rear-end approaching Victory Dr.
- 6 on Victory Dr approaching Kellogg Creek Rd, 4 rear-end southbound and 2 angle with 1 injury/injured.

2015 Summary of Reported Crashes:

- 39(33 without 6 beyond the intersections) total crashes with 19(16) rear-end, 19(17) angle (all but 2 at Victory Dr and Kellogg Creek Rd), and 1(0) head-on crashes with 8(6) injury crashes (18 at signal, 19 at TWSC) with 14(8) injured, 2 transported.
- 16 on Victory Dr: 15 southbound angle crashes with 4 injury/7 injured, 2 transported & 1 northbound rear-end. Several drivers stated they thought intersection was all-way stop controlled.
- 12(10) Kellogg Creek Rd: 9 eastbound rear-end approaching Bells Ferry Rd, 2(1) angle with 1(0) injury & 1(0) rear-end westbound (in addition to the 15 angle crashes listed on Victory Dr above.)
- 11(7) on Bells Ferry Rd: 6(5) rear-end & 1 angle crashes northbound with 2(1) rear-end, 1(0) angle & 1(0) head-on with 5 injured, crashes southbound.

2014 Summary of Reported Crashes:

- 31(23 without 7 related weather caused on same day/time and 1 hitting deer) total crashes with 15(8) rear-end crashes, 14 angle crashes (8 at Victory Dr and Kellogg Creek Rd), 1 sideswipe and 1(0) hitting deer crashes with 9 injury crashes with 16 injured.
- 15(8) Kellogg Creek Rd: 11(4 eastbound) rear-end, 4 angle with 2 injury/3 injured (1 at Bells Ferry, 2 at Victory Dr) (angle crashes in addition to the 6 listed on Victory Dr below.)
- 8 on Victory Dr: 6 southbound angle crashes with 4 injury/9 injured & 2 northbound rear-end.
- 8(7) on Bells Ferry Rd: 2 southbound and 2 northbound with 1 injury/injured angle crashes, 1 southbound and 1 northbound with 1 injury/injured rear-end crashes, 1 northbound sideswipe, 1(0) northbound hitting deer.

2013 Summary of Reported Crashes:

- 19 total crashes with 8 rear-end, 9 angle (6 at Bells Ferry and Kellogg Creek Rd), 2 single vehicle run off road or into median crashes with 7 injury crashes (4 at signal, 3 at TWSC) with 10 injured.
- 8 on Bells Ferry Rd: 3 rear-end northbound (1 300 ft north of Kellogg Creek) with 1 injury/2 injured, 3 northbound left turn angle crashes with 2 injury/3 injured, 1 run off road and 1 into median northbound crashes.
- 6 Kellogg Creek Rd: 2 angle crashes at Bells Ferry Rd with 1 injury/injured, 2 eastbound rear-end, & 2 westbound rear-end (1 west of Victory Dr) with 1 injury/injured.
- 5 on Victory Dr: 3 southbound angle crashes, with 2 injury/3 injured, & 2 northbound rear-end.

There appear to be have been very few, if any, serious injuries 2013 to date in 2016. There were only 5 left turn angle crashes at Victory Dr and Kellogg Creek Rd, all in different directions, so this does not appear to be a major problem; however 3 appear to have been from eastbound Kellogg Creek Rd to northbound Victory Dr (one-way southbound now). There appeared to be 13 crashes involving left turns into or out of Kellogg Creek Rd at the Bells Ferry Rd signal. I doubt that any improvements except perhaps trimming landscaping to provide better sight distance and larger stop signs at the southbound Victory Dr approach to Kellogg Creek Rd, and perhaps improvements to the Kellogg Creek Rd approach to Bells Ferry Rd would result in much reduction in crashes since the majority of the crashes are rear-end types resulting from driver distraction and inattention (and failure to yield right-of-way and running red lights).

Initial Recommendations::

- Install "crossing traffic does not stop" signs on southbound Victory Dr approach stop signs at Kellogg Creek Rd (also possibly on northbound approach) and consider replacing with larger stop signs on both sides of Victory Dr.
- Cut back trees/bushes to provide better sight distance to the right on the southbound Victory Dr approach at Kellogg Creek Rd.
- Increase education and enforcement to minimize distracted driving, particularly cell phone use.
- Consider restriping pavement markings, especially stop bars, unless completed since March 2016.
- Consider installing crosswalk and pedestrian signals/control across Bells Ferry Rd at Kellogg Creek Rd.
- Consider enhancing visibility or relocating of the supplemental signal head on northbound Bells Ferry Rd approach to Kellogg Creek Rd intersection.
- Consider extending the eastbound Kellogg Creek Rd approach to Bells Ferry Rd left turn lane through Victory Drive intersection.
- Consider prohibiting Right Turn on Red on eastbound Kellogg Creek Rd approach to Bells Ferry Rd (would probably queue AM peak hour vehicles into Victory Dr intersection encouraging other routes or risky maneuvers).
- Install raised right-turn channelizing island on eastbound Kellogg Creek Rd approach to Bells Ferry Rd (may require increasing corner radius).
- Install southbound Bells Ferry Rd receiving lane for free right turns from eastbound Kellogg Creek Rd with channelizing island described above.
- Consider installation of modern design single-lane roundabout, possibly of small diameter and with fully mountable center island, at Victory Dr and Kellogg Creek Rd intersection.
- Decrease approach grade on Kellogg Creek Rd at Bells Ferry Rd to increase visibility of on-coming southbound Bells Ferry Rd vehicles.
- Consider installation of modern design single-lane, possibly hybrid with northbound/southbound bypass through lanes, roundabout at Bells Ferry Rd and Kellogg Creek Rd intersection. Capacity analyses would be necessary to determine if a roundabout would be feasible for horizon year growth. Construction might be costly involving extensive grading, drainage modification and right-of-way acquisition; therefore probably not cost effective at an intersection with no fatal crashes history.
- Restrict gas station access points to right in/out only (would require left turns from northbound Bells Ferry Rd and eastbound Kellogg Creek Rd to access gas station and may not allow convenient exits to northbound Bells Ferry Rd) and would probably would have prevented few crashes.