

Appendix D

Traffic Analysis Supporting Data for Alternatives Analysis

Traffic Diversion:

Under each closure alternative, vehicles on US 14 were assumed to divert to the nearest interchange either west or east of the closure.

The diverted volume was determined using travel times from Google Maps with the route diversion curve, and engineering judgement based on the surrounding land usage.

Daily volumes were developed using the peak hour volumes approaching and exiting the intersection on each leg. The existing a.m. and p.m. peak hour percentages were 11 percent and 12 percent (23 percent total). The assumed 2040 a.m. and p.m. peak hour percentages were 10 percent and 11 percent (21 percent total) – assumed peak spreading.

North-South Local Roadways

Road	Daily Traffic				
	No Build	A3	A4	B1	B2
CSAH 15	925	7,675	0	3,875	3,875
280th Ave	4,700	0	9,525	0	0
CSAH 5	11,500	1,575	0	17,900	20,000
10th Ave	10,125	20,100	19,200	0	0
CSAH 3	3,500	0	525	9,200	1,325
CR 104	5,800	7,425	7,425	5,800	11,575

Table 1: Daily Traffic on the North Side of US 14

Road	Daily Traffic				
	No Build	A3	A4	B1	B2
CSAH 15	1,025	2,150	0	1,550	1,550
280th Ave	425	0	2,625	0	0
CSAH 5	3,025	1,575	0	5,550	5,825
10th Ave	3,025	5,275	5,625	0	0
CSAH 3	1,950	0	525	2,650	1,325
CR 104	1,875	2,625	2,625	1,875	2,900

Table 2: Daily Traffic on the South Side of US 14

East-West Local Roadways

Roadways and segments highlighted in Table 3 indicate parallel routes along US 14 in which traffic may divert under each alternative. The highlighted rows assume a “worst case scenario” where 100 percent of the daily traffic volume would utilize the same diversion route. For the segment of US 14 between 280th Ave and CSAH 5 there are two identified parallel routes that traffic may divert onto and three parallel routes for the segment of US 14 between CSAH 5 and 10th Ave. Under each alternative, Table 3 summarizes the anticipated added daily traffic as well as the anticipated total daily traffic along the parallel local route.

Road	Segment	Daily Traffic								
		No Build	A3		A4		B1		B2	
			Added	Total	Added	Total	Added	Total	Added	Total
CSAH 34	CSAH 15 - 280th	2,600	3,950	6,550	1,100	3,700	2,800	5,400	2,800	5,400
Frontage Rd W	280th - CSAH 5	3,000	3,400	6,400	3,800	6,800	2,000	5,000	2,000	5,000
4th St W	280th - CSAH 5	3,600	3,400	7,000	3,800	7,400	2,000	5,600	2,000	5,600
Frontage Rd E	CSAH 5 - 10th	4,500	8,200	12,700	7,800	12,300	4,500	9,000	6,600	11,100
4th St E	CSAH 5 - 10th	2,400	8,200	10,600	7,800	10,200	4,500	6,900	6,600	9,000
7th St W	CSAH 5 - 10th	2,200	8,200	10,400	7,800	10,000	4,500	6,700	6,600	8,800
7th St E	10th - CSAH 3	2,200	1,900	4,100	1,400	3,600	5,800	8,000	5,500	7,700
14th St	CSAH 3 - CR 104	200	1,700	1,900	1,700	1,900	0	200	5,800	6,000

Table 3: Daily Traffic on the Local Routes Parallel to US 14

Cross-Section	Maximum Daily Capacity	Approaching Capacity (85% of Daily)
Two-Lane Undivided Urban	10,000	8,500
Two-Lane Undivided Rural	15,000	12,750
Two-Lane Divided Urban (Three-Lane)	17,000	14,450
Four-Lane Undivided Urban	22,000	18,700
Four-Lane Undivided Rural	28,000	23,000
Four-Lane Divided Urban (Five-Lane)	32,000	27,200

Table 4: Planning-Level Daily Traffic Capacity Thresholds

Alternative A3

Significant Volume Diverted to the following Locations:

10th Avenue

- SBL volume at 10th Ave and US 14 increases:
 - From **615 to 1,020** during the a.m. peak hour
 - From **320 to 610** during the p.m. peak hour
- WBR volume at 10th Ave and US 14 increases:
 - From **185 to 490** during the a.m. peak hour
 - From **345 to 780** during the p.m. peak hour
- AADT on 10th Ave north of US 14 increases from **10,125 to 20,100**
 - Currently a 2-lane divided urban (3-lane) roadway – demand exceeds capacity
 - Need to upgrade to a 4-lane divided urban (5-lane) roadway
- 10th Ave is the only easy option for Byron to access US 14 (CSAH 15 is 2.5 miles west of CSAH 5)

Frontage Road/4th Street/7th Street: CSAH 5 to 10th Ave

- Volume destined or originating east US 14 from 280th Ave and CSAH 5 will likely use one of these routes to divert to 10th Ave
- Frontage Rd worst case scenario: AADT on this section increases from **4,500 to 12,700**
 - Currently a 2-lane divided urban (3-lane) roadway – demand is under capacity
- 4th Street worst case scenario: AADT on this section increases from **2,400 to 10,600**
 - Currently a 2-lane undivided urban roadway – demand exceeds capacity
 - Need to upgrade to a 2-lane divided urban (3-lane) roadway
- 7th Street worst case scenario: AADT on this section increases from **2,200 to 10,400**
 - Currently a 2-lane undivided urban roadway – demand exceeds capacity
 - Need to upgrade to a 2-lane divided urban (3-lane) roadway

14th Street: CSAH 3 to CR 104

- Volume from CSAH 3 will likely be diverted on 14th Street to access CR 104
- **140 and 200** additional trips during the a.m. and p.m. peak hours on 14th Street
- AADT on 14th Street will be **1,900**
 - Currently a gravel road – demand exceeds capacity
 - Need to upgrade to a 2-lane undivided rural roadway

Alternative A4

Significant Volume Diverted to the following Locations

280th Avenue

- SBR at 280th Ave and US 14 increases:
 - From **55 to 265** during the a.m. peak hour
 - From **85 to 305** during the p.m. peak hour
- EBL at 280th Ave and US 14 increases:
 - From **110 to 310** during the a.m. peak hour
 - From **155 to 295** during the p.m. peak hour
- AADT on 280th Ave north of US 14 increases from **4,700 to 9,525**
 - Currently a 2-lane undivided rural roadway – demand is under capacity

10th Avenue

- SBL volume at 10th Ave and US 14 increases:
 - From **615 to 985** during the a.m. peak hour
 - From **320 to 600** during the p.m. peak hour
- WBR volume at 10th Ave and US 14 increases:
 - From **185 to 475** during the a.m. peak hour
 - From **345 to 725** during the p.m. peak hour
- AADT on 10th Ave north of US 14 increases from **10,125 to 19,200**
 - Currently a 2-lane divided urban (3-lane) roadway – demand exceeds capacity
 - Need to upgrade to a 4-lane divided urban (5-lane) roadway

Frontage Rd/4th Street/7th Street: CSAH 5 to 10th Ave

- Volume destined or originating east US 14 from CSAH 5 will likely use one of these routes to divert to 10th Ave
- Frontage Rd worst case scenario: AADT on this section increases from **4,500 to 12,300**
 - Currently a 2-lane divided urban (3-lane) roadway – demand is under capacity
- 4th Street worst case scenario: AADT on this section increases from **2,400 to 10,200**
 - Currently a 2-lane undivided urban roadway – demand exceeds capacity
 - Need to upgrade to a 2-lane divided urban (3-lane) roadway
- 7th Street worst case scenario: AADT on this section increases from **2,200 to 10,000**
 - Currently a 2-lane undivided urban roadway – demand is approaching capacity
 - Need to upgrade to a 2-lane divided urban (3-lane) roadway

14th Street: CSAH 3 to CR 104

- Volume from CSAH 3 will likely be diverted on 14th Street to access CR 104
- **140 and 200** additional trips during the a.m. and p.m. peak hours on 14th Street
- AADT on 14th Street will be **1,900**
 - Currently a gravel road – demand exceeds capacity
 - Need to upgrade to a 2-lane undivided rural roadway

Alternative B1

Significant Volume Diverted to the following Locations:

CSAH 5

- SBL volume at CSAH 5 and US 14 increases:
 - From **340 to 655** during the a.m. peak hour
 - From **265 to 395** during the p.m. peak hour
- WBR volume at CSAH 5 and US 14 increases:
 - From **260 to 355** during the a.m. peak hour
 - From **315 to 560** during the p.m. peak hour
- AADT on CSAH 5 north of US 14 increases from **11,500 to 17,900**
 - Currently a 2-lane undivided urban roadway – demand exceeds capacity
 - Need to upgrade to a 4-lane undivided urban roadway

CSAH 3

- SBL volume at CSAH 3 and US 14 increases:
 - From **85 to 550** during the a.m. peak hour
 - From **45 to 285** during the p.m. peak hour
- WBR volume at CSAH 3 and US 14 increases:
 - From **90 to 230** during the a.m. peak hour
 - From **205 to 465** during the p.m. peak hour
- AADT on CSAH 3 north of US 14 increases from **3,500 to 9,200**
 - Currently a 2-lane undivided rural roadway – demand is under capacity

Frontage Rd/4th Street/7th Street: CSAH 5 to 10th Ave

- Volume diverting from 10th Ave to the interchange at CSAH 5 to access US 14 will likely use one of these routes
- Frontage Rd worst case scenario: AADT on this section increases from **4,500 to 9,000**
 - Currently a 2-lane divided urban (3-lane) roadway – demand is under capacity
- 4th Street worst case scenario: AADT on this section increases from **2,400 to 6,900**
 - Currently a 2-lane undivided urban roadway – demand is under capacity
- 7th Street worst case scenario: AADT on this section increases from **2,200 to 6,700**
 - Currently a 2-lane undivided urban roadway – demand is under capacity

7th Street: 10th Ave to CSAH 3

- Volume destined or originating east US 14 from 10th Ave will likely use this route to divert to CSAH 3
- AADT on this section of 7th Street increases from **2,200 to 8,000**
 - Currently a 2-lane undivided rural roadway – demand is under capacity

Alternative B2

Significant Volume Diverted to the following locations:

CSAH 5

- SBL volume at CSAH 5 and US 14 increases:
 - From **340 to 810** during the a.m. peak hour
 - From **265 to 475** during the p.m. peak hour
- WBR volume at CSAH 5 and US 14 increases:
 - From **260 to 385** during the a.m. peak hour
 - From **315 to 610** during the p.m. peak hour
- EBL volume at CSAH 5 and US 14 increases:
 - From **280 to 390** during the a.m. peak hour
 - From **180 to 330** during the p.m. peak hour
- AADT on CSAH 5 north of US 14 increases from **11,500 to 20,000**
 - Currently a 2-lane undivided urban roadway – demand exceeds capacity
 - Need to upgrade to 4-lane divided urban (5-lane) roadway

CR 104

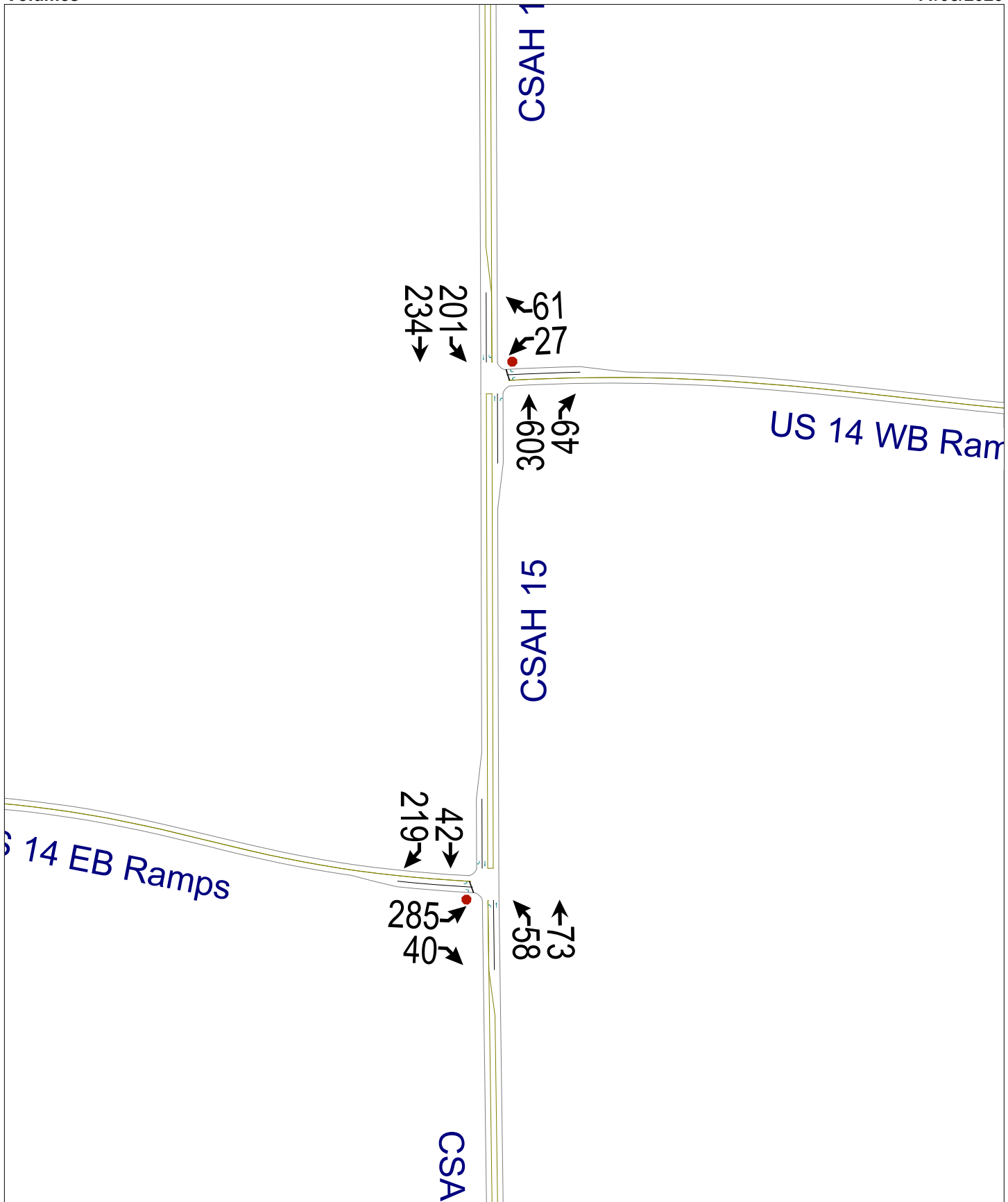
- SBL volume at CSAH 5 and US 14 increases:
 - From **60 to 455** during the a.m. peak hour
 - From **30 to 235** during the p.m. peak hour
- WBR volume at CSAH 5 and US 14 increases:
 - From **115 to 315** during the a.m. peak hour
 - From **180 to 595** during the p.m. peak hour
- AADT on CR 104 north of US 14 increases from **5,800 to 11,575**
 - Currently a 2-lane undivided rural roadway – demand is under capacity

Frontage Rd/4th Street/7th Street: CSAH 5 to 10th Ave

- Volume diverting from 10th Ave or from CSAH 3 to the interchange at CSAH 5 to access US 14 will likely use one of these routes
- Frontage Rd worst case scenario: AADT on this section increases from **4,500 to 11,100**
 - Currently a 2-lane divided urban (3-lane) roadway – demand is under capacity
- 4th Street worst case scenario: AADT on this section increases from **2,400 to 9,000**
 - Currently a 2-lane undivided urban roadway – demand is under capacity
- 7th Street worst case scenario: AADT on this section increases from **2,200 to 8,800**
 - Currently a 2-lane undivided urban roadway – demand is under capacity

14th Street: CSAH 3 to CR 104

- Volume from 10th Ave and CSAH 3 will be diverted on this road to access CR 104
- **595 and 620** additional trips during the a.m. and p.m. peak hours on 14th Street
- AADT on 14th Street will be **5,900**
 - Currently a gravel road – demand exceeds capacity
 - Need to upgrade to a 2-lane roadway



Intersection						
Int Delay, s/veh	3.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗	↑	↗	↘	↑
Traffic Vol, veh/h	27	61	309	49	201	234
Future Vol, veh/h	27	61	309	49	201	234
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	150	-	150	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	29	66	336	53	218	254

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1026	336	0	0	389
Stage 1	336	-	-	-	-
Stage 2	690	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	260	706	-	-	1170
Stage 1	724	-	-	-	-
Stage 2	498	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	212	706	-	-	1170
Mov Cap-2 Maneuver	212	-	-	-	-
Stage 1	724	-	-	-	-
Stage 2	405	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.9	0	4.1
HCM LOS	B		

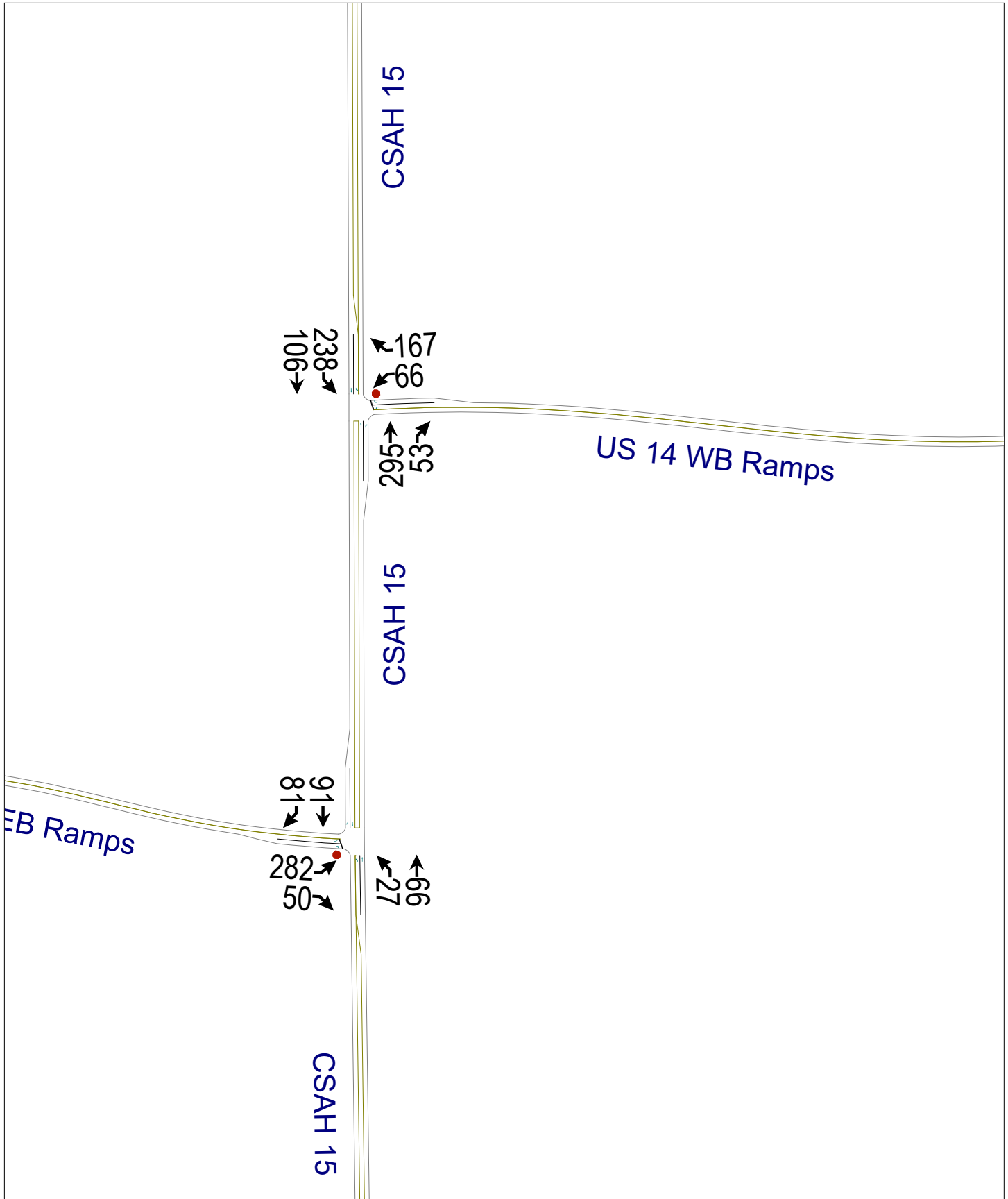
Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	212	706	1170
HCM Lane V/C Ratio	-	-	0.138	0.094	0.187
HCM Control Delay (s)	-	-	24.7	10.6	8.8
HCM Lane LOS	-	-	C	B	A
HCM 95th %tile Q(veh)	-	-	0.5	0.3	0.7

Intersection						
Int Delay, s/veh	6.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	285	40	58	73	42	219
Future Vol, veh/h	285	40	58	73	42	219
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	150	150	-	-	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	310	43	63	79	46	238

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	251	46	284	0	-	0
Stage 1	46	-	-	-	-	-
Stage 2	205	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	738	1023	1278	-	-	-
Stage 1	976	-	-	-	-	-
Stage 2	829	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	702	1023	1278	-	-	-
Mov Cap-2 Maneuver	702	-	-	-	-	-
Stage 1	928	-	-	-	-	-
Stage 2	829	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.4	3.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1278	-	702	1023	-	-
HCM Lane V/C Ratio	0.049	-	0.441	0.043	-	-
HCM Control Delay (s)	8	-	14.1	8.7	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	2.3	0.1	-	-



Intersection						
Int Delay, s/veh	6.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗	↑	↗	↘	↑
Traffic Vol, veh/h	66	167	295	53	238	106
Future Vol, veh/h	66	167	295	53	238	106
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	150	-	150	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	72	182	321	58	259	115

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	954	321	0	0	379	0
Stage 1	321	-	-	-	-	-
Stage 2	633	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	287	720	-	-	1179	-
Stage 1	735	-	-	-	-	-
Stage 2	529	-	-	-	-	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	224	720	-	-	1179	-
Mov Cap-2 Maneuver	224	-	-	-	-	-
Stage 1	735	-	-	-	-	-
Stage 2	413	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.5	0	6.2
HCM LOS	C		

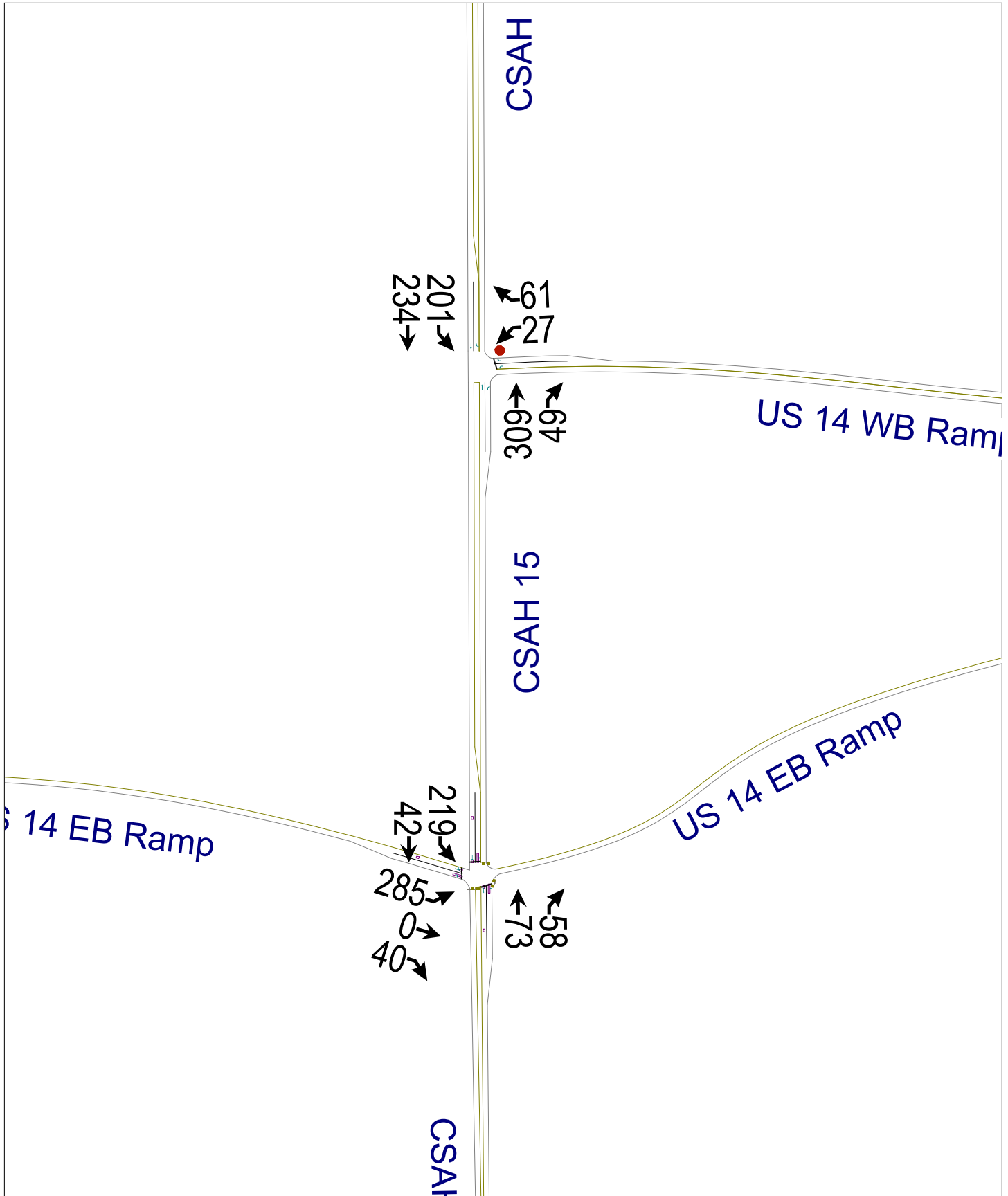
Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	224	720	1179
HCM Lane V/C Ratio	-	-	0.32	0.252	0.219
HCM Control Delay (s)	-	-	28.5	11.7	8.9
HCM Lane LOS	-	-	D	B	A
HCM 95th %tile Q(veh)	-	-	1.3	1	0.8

Intersection						
Int Delay, s/veh	7.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↖	↗	↗	↖
Traffic Vol, veh/h	282	50	27	66	91	81
Future Vol, veh/h	282	50	27	66	91	81
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	150	150	-	-	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	307	54	29	72	99	88

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	229	99	187	0	0
Stage 1	99	-	-	-	-
Stage 2	130	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	759	957	1387	-	-
Stage 1	925	-	-	-	-
Stage 2	896	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	743	957	1387	-	-
Mov Cap-2 Maneuver	743	-	-	-	-
Stage 1	906	-	-	-	-
Stage 2	896	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.6	2.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1387	-	743	957	-	-
HCM Lane V/C Ratio	0.021	-	0.413	0.057	-	-
HCM Control Delay (s)	7.7	-	13.2	9	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	2	0.2	-	-



Intersection						
Int Delay, s/veh	3.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗	↑	↗	↘	↑
Traffic Vol, veh/h	27	61	309	49	201	234
Future Vol, veh/h	27	61	309	49	201	234
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	150	-	150	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	29	66	336	53	218	254

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1026	336	0	0	389
Stage 1	336	-	-	-	-
Stage 2	690	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	260	706	-	-	1170
Stage 1	724	-	-	-	-
Stage 2	498	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	212	706	-	-	1170
Mov Cap-2 Maneuver	212	-	-	-	-
Stage 1	724	-	-	-	-
Stage 2	405	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.9	0	4.1
HCM LOS	B		

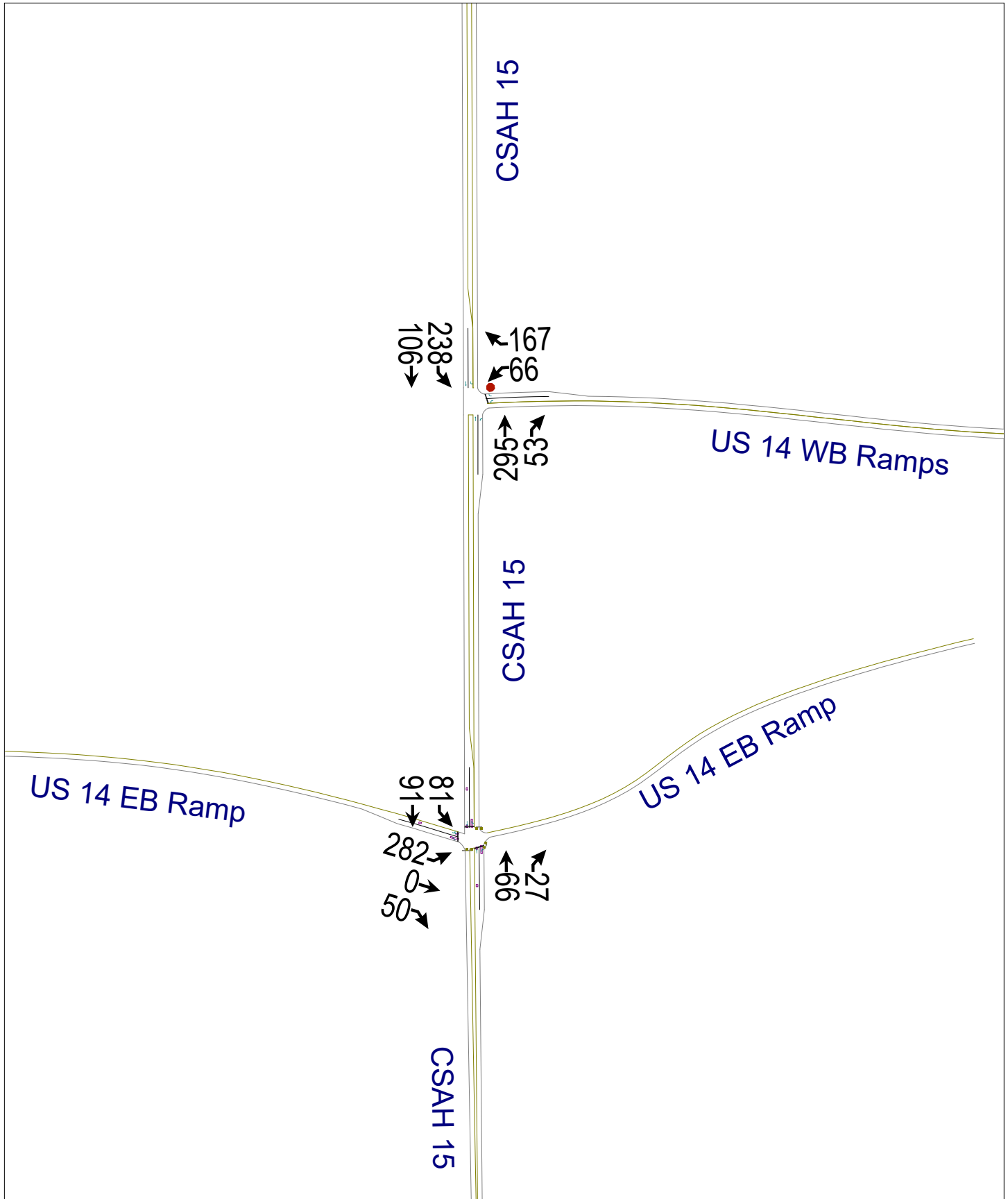
Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	212	706	1170
HCM Lane V/C Ratio	-	-	0.138	0.094	0.187
HCM Control Delay (s)	-	-	24.7	10.6	8.8
HCM Lane LOS	-	-	C	B	A
HCM 95th %tile Q(veh)	-	-	0.5	0.3	0.7

Folded North - Traditional South Alternative at CSAH 15
20: CSAH 15 & US 14 EB Ramp

2040 AM Peak Hour
12/02/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗					↑	↖	↗	↑	
Traffic Volume (veh/h)	285	0	40	0	0	0	0	73	58	219	42	0
Future Volume (veh/h)	285	0	40	0	0	0	0	73	58	219	42	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	310	0	43				0	79	63	238	46	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	432	0	384				0	411	348	761	1006	0
Arrive On Green	0.24	0.00	0.24				0.00	0.22	0.22	0.21	0.54	0.00
Sat Flow, veh/h	1781	0	1585				0	1870	1585	1781	1870	0
Grp Volume(v), veh/h	310	0	43				0	79	63	238	46	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				0	1870	1585	1781	1870	0
Q Serve(g_s), s	7.3	0.0	1.0				0.0	1.6	1.5	4.0	0.5	0.0
Cycle Q Clear(g_c), s	7.3	0.0	1.0				0.0	1.6	1.5	4.0	0.5	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	432	0	384				0	411	348	761	1006	0
V/C Ratio(X)	0.72	0.00	0.11				0.00	0.19	0.18	0.31	0.05	0.00
Avail Cap(c_a), veh/h	1173	0	1044				0	904	766	897	1643	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	15.8	0.0	13.4				0.0	14.5	14.4	8.6	5.0	0.0
Incr Delay (d2), s/veh	2.3	0.0	0.1				0.0	0.2	0.2	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	0.0	0.3				0.0	0.6	0.5	1.2	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.1	0.0	13.6				0.0	14.7	14.7	8.9	5.0	0.0
LnGrp LOS	B	A	B				A	B	B	A	A	A
Approach Vol, veh/h		353						142			284	
Approach Delay, s/veh		17.5						14.7			8.2	
Approach LOS		B						B			A	
Timer - Assigned Phs	1	2		4				6				
Phs Duration (G+Y+Rc), s	14.5	15.0		16.0				29.5				
Change Period (Y+Rc), s	5.0	5.0		5.0				5.0				
Max Green Setting (Gmax), s	13.0	22.0		30.0				40.0				
Max Q Clear Time (g_c+I1), s	6.0	3.6		9.3				2.5				
Green Ext Time (p_c), s	0.4	0.5		1.9				0.2				
Intersection Summary												
HCM 6th Ctrl Delay			13.6									
HCM 6th LOS			B									



Intersection						
Int Delay, s/veh	6.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗	↑	↗	↘	↑
Traffic Vol, veh/h	66	167	295	53	238	106
Future Vol, veh/h	66	167	295	53	238	106
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	150	-	150	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	72	182	321	58	259	115

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	954	321	0	0	379	0
Stage 1	321	-	-	-	-	-
Stage 2	633	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	287	720	-	-	1179	-
Stage 1	735	-	-	-	-	-
Stage 2	529	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	224	720	-	-	1179	-
Mov Cap-2 Maneuver	224	-	-	-	-	-
Stage 1	735	-	-	-	-	-
Stage 2	413	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.5	0	6.2
HCM LOS	C		

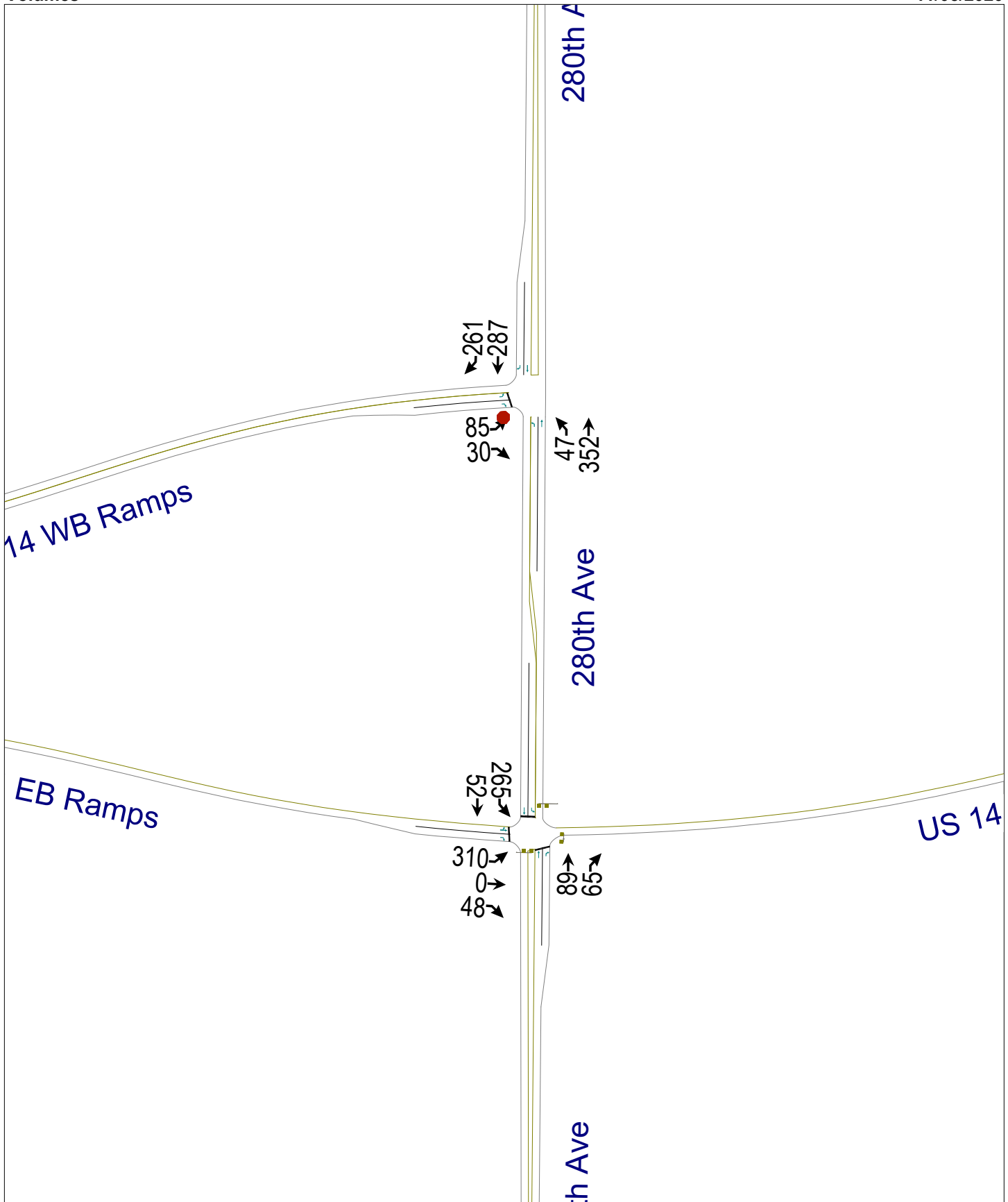
Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	224	720	1179
HCM Lane V/C Ratio	-	-	0.32	0.252	0.219
HCM Control Delay (s)	-	-	28.5	11.7	8.9
HCM Lane LOS	-	-	D	B	A
HCM 95th %tile Q(veh)	-	-	1.3	1	0.8

Folded North - Traditional South Alternative at CSAH 15
 20: CSAH 15 & US 14 EB Ramp

2040 PM Peak Hour
 12/02/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗					↑	↖	↗	↑	
Traffic Volume (veh/h)	282	0	50	0	0	0	0	66	27	81	91	0
Future Volume (veh/h)	282	0	50	0	0	0	0	66	27	81	91	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	307	0	54				0	72	29	88	99	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	441	0	392				0	448	380	716	959	0
Arrive On Green	0.25	0.00	0.25				0.00	0.24	0.24	0.15	0.51	0.00
Sat Flow, veh/h	1781	0	1585				0	1870	1585	1781	1870	0
Grp Volume(v), veh/h	307	0	54				0	72	29	88	99	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				0	1870	1585	1781	1870	0
Q Serve(g_s), s	6.5	0.0	1.1				0.0	1.3	0.6	1.3	1.1	0.0
Cycle Q Clear(g_c), s	6.5	0.0	1.1				0.0	1.3	0.6	1.3	1.1	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	441	0	392				0	448	380	716	959	0
V/C Ratio(X)	0.70	0.00	0.14				0.00	0.16	0.08	0.12	0.10	0.00
Avail Cap(c_a), veh/h	1323	0	1178				0	986	836	956	1748	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	14.3	0.0	12.2				0.0	12.5	12.3	8.1	5.2	0.0
Incr Delay (d2), s/veh	2.0	0.0	0.2				0.0	0.2	0.1	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.0	0.3				0.0	0.4	0.2	0.4	0.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.3	0.0	12.4				0.0	12.7	12.4	8.2	5.3	0.0
LnGrp LOS	B	A	B				A	B	B	A	A	A
Approach Vol, veh/h		361						101			187	
Approach Delay, s/veh		15.7						12.6			6.6	
Approach LOS		B						B			A	
Timer - Assigned Phs	1	2		4				6				
Phs Duration (G+Y+Rc), s	11.4	15.0		15.3				26.4				
Change Period (Y+Rc), s	5.0	5.0		5.0				5.0				
Max Green Setting (Gmax), s	12.0	22.0		31.0				39.0				
Max Q Clear Time (g_c+I1), s	3.3	3.3		8.5				3.1				
Green Ext Time (p_c), s	0.1	0.3		2.0				0.5				
Intersection Summary												
HCM 6th Ctrl Delay			12.6									
HCM 6th LOS			B									



Intersection						
Int Delay, s/veh	2.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↙	↗	↙	↗	↗	↗
Traffic Vol, veh/h	85	30	47	352	287	261
Future Vol, veh/h	85	30	47	352	287	261
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	150	250	-	-	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	92	33	51	383	312	284



















Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	797	312	596	0	-	0
Stage 1	312	-	-	-	-	-
Stage 2	485	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	356	728	980	-	-	-
Stage 1	742	-	-	-	-	-
Stage 2	619	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	337	728	980	-	-	-
Mov Cap-2 Maneuver	337	-	-	-	-	-
Stage 1	703	-	-	-	-	-
Stage 2	619	-	-	-	-	-

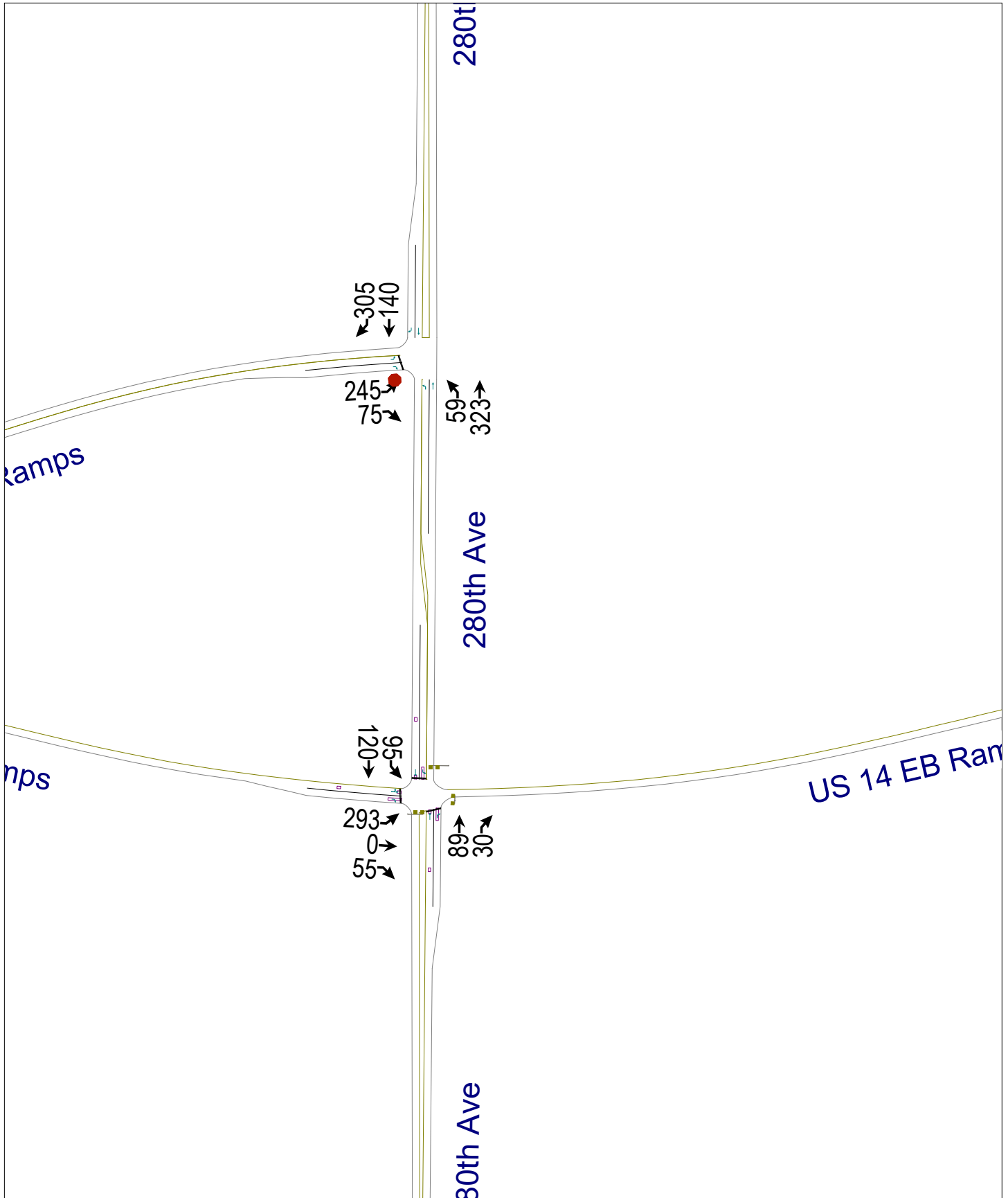
Approach	EB	NB	SB
HCM Control Delay, s	17.2	1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	980	-	337	728	-	-
HCM Lane V/C Ratio	0.052	-	0.274	0.045	-	-
HCM Control Delay (s)	8.9	-	19.7	10.2	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.2	-	1.1	0.1	-	-

Folded North - Traditional South Alternative at 280th Avenue
 20: 280th Ave & US 14 EB Ramps

2040 AM Peak Hour
 11/05/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	310	0	48	0	0	0	0	89	65	265	52	0
Future Volume (veh/h)	310	0	48	0	0	0	0	89	65	265	52	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	337	0	52				0	97	71	288	57	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	412	0	366				0	565	479	737	1063	0
Arrive On Green	0.23	0.00	0.23				0.00	0.30	0.30	0.17	0.57	0.00
Sat Flow, veh/h	1781	0	1585				0	1870	1585	1781	1870	0
Grp Volume(v), veh/h	337	0	52				0	97	71	288	57	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				0	1870	1585	1781	1870	0
Q Serve(g_s), s	10.7	0.0	1.6				0.0	2.3	2.0	5.8	0.8	0.0
Cycle Q Clear(g_c), s	10.7	0.0	1.6				0.0	2.3	2.0	5.8	0.8	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	412	0	366				0	565	479	737	1063	0
V/C Ratio(X)	0.82	0.00	0.14				0.00	0.17	0.15	0.39	0.05	0.00
Avail Cap(c_a), veh/h	566	0	503				0	565	479	739	1063	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	21.8	0.0	18.3				0.0	15.4	15.2	9.1	5.8	0.0
Incr Delay (d2), s/veh	6.7	0.0	0.2				0.0	0.7	0.7	0.3	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	0.0	0.5				0.0	1.0	0.7	1.8	0.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.5	0.0	18.5				0.0	16.0	15.9	9.4	5.8	0.0
LnGrp LOS	C	A	B				A	B	B	A	A	A
Approach Vol, veh/h		389						168			345	
Approach Delay, s/veh		27.1						16.0			8.8	
Approach LOS		C						B			A	
Timer - Assigned Phs	1	2		4				6				
Phs Duration (G+Y+Rc), s	15.9	24.1		19.8				40.0				
Change Period (Y+Rc), s	6.0	6.0		6.0				6.0				
Max Green Setting (Gmax), s	10.0	18.0		19.0				34.0				
Max Q Clear Time (g_c+I1), s	7.8	4.3		12.7				2.8				
Green Ext Time (p_c), s	0.2	0.5		1.1				0.2				
Intersection Summary												
HCM 6th Ctrl Delay			18.1									
HCM 6th LOS			B									



Intersection						
Int Delay, s/veh	6.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↙	↗	↙	↗	↗	↗
Traffic Vol, veh/h	245	75	59	323	140	305
Future Vol, veh/h	245	75	59	323	140	305
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	150	250	-	-	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	266	82	64	351	152	332



















Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	631	152	484	0	-	0
Stage 1	152	-	-	-	-	-
Stage 2	479	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	445	894	1079	-	-	-
Stage 1	876	-	-	-	-	-
Stage 2	623	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	419	894	1079	-	-	-
Mov Cap-2 Maneuver	419	-	-	-	-	-
Stage 1	824	-	-	-	-	-
Stage 2	623	-	-	-	-	-

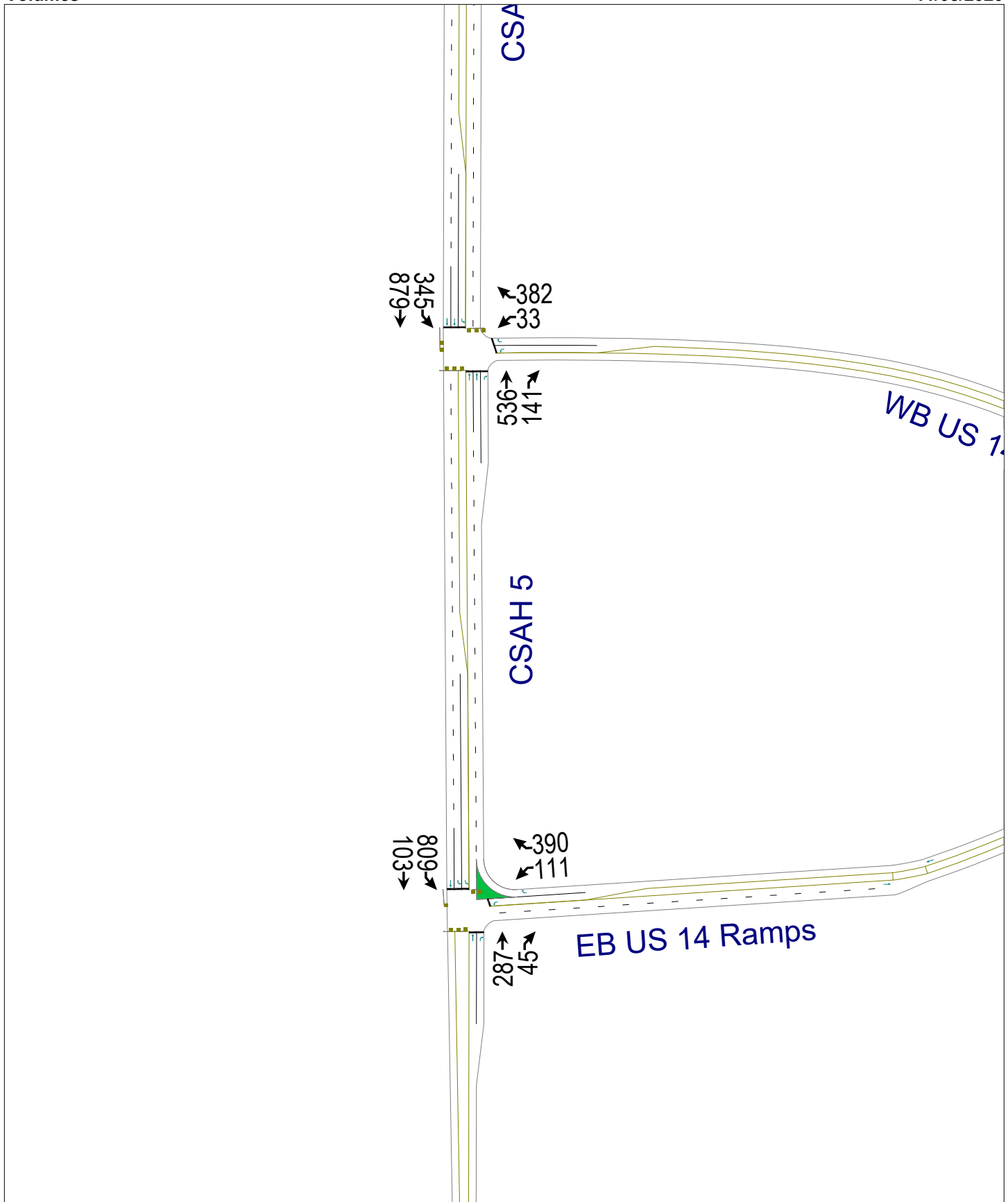
Approach	EB	NB	SB
HCM Control Delay, s	23.2	1.3	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1079	-	419	894	-	-
HCM Lane V/C Ratio	0.059	-	0.636	0.091	-	-
HCM Control Delay (s)	8.5	-	27.4	9.4	-	-
HCM Lane LOS	A	-	D	A	-	-
HCM 95th %tile Q(veh)	0.2	-	4.3	0.3	-	-

Folded North - Traditional South Alternative at 280th Ave
 20: 280th Ave & US 14 EB Ramps















2040 PM Peak Hour
 11/05/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	293	0	55	0	0	0	0	89	30	95	120	0
Future Volume (veh/h)	293	0	55	0	0	0	0	89	30	95	120	0
Initial Q (Qb), veh	0	0	0					0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	318	0	60				0	97	33	103	130	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	395	0	352				0	628	532	745	1076	0
Arrive On Green	0.22	0.00	0.22				0.00	0.34	0.34	0.14	0.58	0.00
Sat Flow, veh/h	1781	0	1585				0	1870	1585	1781	1870	0
Grp Volume(v), veh/h	318	0	60				0	97	33	103	130	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				0	1870	1585	1781	1870	0
Q Serve(g_s), s	10.0	0.0	1.8				0.0	2.1	0.8	1.8	1.9	0.0
Cycle Q Clear(g_c), s	10.0	0.0	1.8				0.0	2.1	0.8	1.8	1.9	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	395	0	352				0	628	532	745	1076	0
V/C Ratio(X)	0.80	0.00	0.17				0.00	0.15	0.06	0.14	0.12	0.00
Avail Cap(c_a), veh/h	572	0	509				0	628	532	800	1076	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	21.8	0.0	18.6				0.0	13.8	13.3	7.8	5.7	0.0
Incr Delay (d2), s/veh	5.3	0.0	0.2				0.0	0.5	0.2	0.1	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	0.0	0.6				0.0	0.9	0.3	0.6	0.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.1	0.0	18.8				0.0	14.3	13.6	7.9	6.0	0.0
LnGrp LOS	C	A	B				A	B	B	A	A	A
Approach Vol, veh/h		378						130			233	
Approach Delay, s/veh		25.8						14.1			6.8	
Approach LOS		C						B			A	
Timer - Assigned Phs	1	2		4				6				
Phs Duration (G+Y+Rc), s	14.2	25.8		19.1				40.0				
Change Period (Y+Rc), s	6.0	6.0		6.0				6.0				
Max Green Setting (Gmax), s	10.0	18.0		19.0				34.0				
Max Q Clear Time (g_c+I1), s	3.8	4.1		12.0				3.9				
Green Ext Time (p_c), s	0.1	0.4		1.2				0.7				
Intersection Summary												
HCM 6th Ctrl Delay			17.8									
HCM 6th LOS			B									



Folded Diamond Alternative at CSAH 5
10: CSAH 5 & WB US 14 Ramps

2040 AM Peak Hour
11/05/2020

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			 			 
Traffic Volume (veh/h)	33	382	536	141	345	879
Future Volume (veh/h)	33	382	536	141	345	879
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	36	415	583	153	375	955
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	690	1296	578	419	2369
Arrive On Green	0.20	0.20	0.12	0.12	0.24	0.67
Sat Flow, veh/h	1781	1585	3647	1585	1781	3647
Grp Volume(v), veh/h	36	415	583	153	375	955
Grp Sat Flow(s),veh/h/ln	1781	1585	1777	1585	1781	1777
Q Serve(g_s), s	1.5	18.0	13.7	7.9	18.4	11.0
Cycle Q Clear(g_c), s	1.5	18.0	13.7	7.9	18.4	11.0
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	356	690	1296	578	419	2369
V/C Ratio(X)	0.10	0.60	0.45	0.26	0.89	0.40
Avail Cap(c_a), veh/h	356	690	1296	578	594	2369
HCM Platoon Ratio	1.00	1.00	0.33	0.33	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.88	0.88	1.00	1.00
Uniform Delay (d), s/veh	29.4	19.4	31.2	28.6	33.3	6.8
Incr Delay (d2), s/veh	0.1	1.5	1.0	1.0	12.2	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	0.6	6.5	6.6	3.3	9.0	3.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	29.5	20.9	32.2	29.6	45.5	7.3
LnGrp LOS	C	C	C	C	D	A
Approach Vol, veh/h	451		736			1330
Approach Delay, s/veh	21.6		31.7			18.1
Approach LOS	C		C			B
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	27.2	38.8			66.0	24.0
Change Period (Y+Rc), s	6.0	6.0			6.0	6.0
Max Green Setting (Gmax), s	30.0	24.0			60.0	18.0
Max Q Clear Time (g_c+I1), s	20.4	15.7			13.0	20.0
Green Ext Time (p_c), s	0.8	2.8			8.3	0.0
Intersection Summary						
HCM 6th Ctrl Delay			22.7			
HCM 6th LOS			C			

Folded Diamond Alternative at CSAH 5
20: CSAH 5 & EB US 14 Ramps

2040 AM Peak Hour
11/05/2020



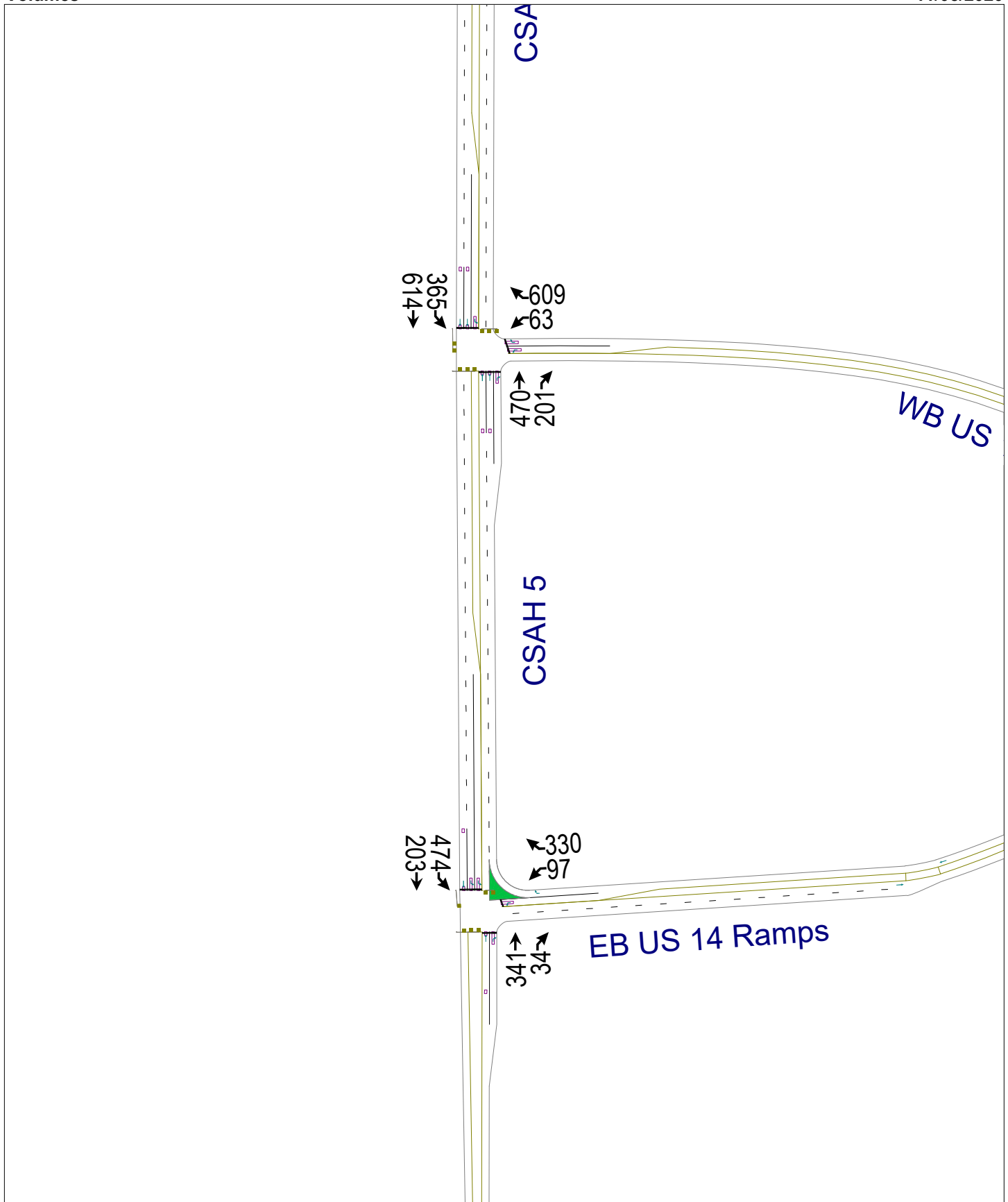
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	111	390	287	45	809	103
Future Volume (veh/h)	111	390	287	45	809	103
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	121	0	312	49	879	112
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	188		774	656	970	1423
Arrive On Green	0.11	0.00	0.41	0.41	0.47	1.00
Sat Flow, veh/h	1781	1585	1870	1585	3456	1870
Grp Volume(v), veh/h	121	0	312	49	879	112
Grp Sat Flow(s),veh/h/ln	1781	1585	1870	1585	1728	1870
Q Serve(g_s), s	5.9	0.0	10.6	1.7	21.1	0.0
Cycle Q Clear(g_c), s	5.9	0.0	10.6	1.7	21.1	0.0
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	188		774	656	970	1423
V/C Ratio(X)	0.64		0.40	0.07	0.91	0.08
Avail Cap(c_a), veh/h	356		774	656	1152	1423
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.67	1.67
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.96	0.96
Uniform Delay (d), s/veh	38.6	0.0	18.6	16.0	22.8	0.0
Incr Delay (d2), s/veh	3.6	0.0	1.6	0.2	8.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	0.0	4.7	0.6	7.4	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	42.2	0.0	20.1	16.2	31.7	0.1
LnGrp LOS	D		C	B	C	A
Approach Vol, veh/h	121	A	361		991	
Approach Delay, s/veh	42.2		19.6		28.2	
Approach LOS	D		B		C	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	31.3	43.2			74.5	15.5
Change Period (Y+Rc), s	6.0	6.0			6.0	6.0
Max Green Setting (Gmax), s	30.0	24.0			60.0	18.0
Max Q Clear Time (g_c+I1), s	23.1	12.6			2.0	7.9
Green Ext Time (p_c), s	2.1	1.5			0.6	0.2

Intersection Summary

HCM 6th Ctrl Delay	27.2
HCM 6th LOS	C













Notes

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



Folded Diamond Alternative at CSAH 5
10: CSAH 5 & WB US 14 Ramps

2040 PM Peak Hour
11/05/2020

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	63	609	470	201	365	614
Future Volume (veh/h)	63	609	470	201	365	614
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	68	662	511	218	397	667
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	711	1249	557	443	2369
Arrive On Green	0.20	0.20	0.12	0.12	0.25	0.67
Sat Flow, veh/h	1781	1585	3647	1585	1781	3647
Grp Volume(v), veh/h	68	662	511	218	397	667
Grp Sat Flow(s),veh/h/ln	1781	1585	1777	1585	1781	1777
Q Serve(g_s), s	2.9	18.0	12.0	11.5	19.4	6.9
Cycle Q Clear(g_c), s	2.9	18.0	12.0	11.5	19.4	6.9
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	356	711	1249	557	443	2369
V/C Ratio(X)	0.19	0.93	0.41	0.39	0.90	0.28
Avail Cap(c_a), veh/h	356	711	1249	557	653	2369
HCM Platoon Ratio	1.00	1.00	0.33	0.33	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.90	0.90	1.00	1.00
Uniform Delay (d), s/veh	29.9	23.5	31.1	30.9	32.7	6.2
Incr Delay (d2), s/veh	0.3	18.9	0.9	1.9	11.0	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	1.2	15.9	5.8	5.1	9.4	2.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	30.2	42.4	32.0	32.7	43.7	6.5
LnGrp LOS	C	D	C	C	D	A
Approach Vol, veh/h	730		729			1064
Approach Delay, s/veh	41.3		32.2			20.3
Approach LOS	D		C			C
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	28.4	37.6			66.0	24.0
Change Period (Y+Rc), s	6.0	6.0			6.0	6.0
Max Green Setting (Gmax), s	33.0	21.0			60.0	18.0
Max Q Clear Time (g_c+I1), s	21.4	14.0			8.9	20.0
Green Ext Time (p_c), s	1.0	2.3			5.2	0.0
Intersection Summary						
HCM 6th Ctrl Delay			29.8			
HCM 6th LOS			C			

Folded Diamond Alternative at CSAH 5
 20: CSAH 5 & EB US 14 Ramps

2040 PM Peak Hour
 11/05/2020



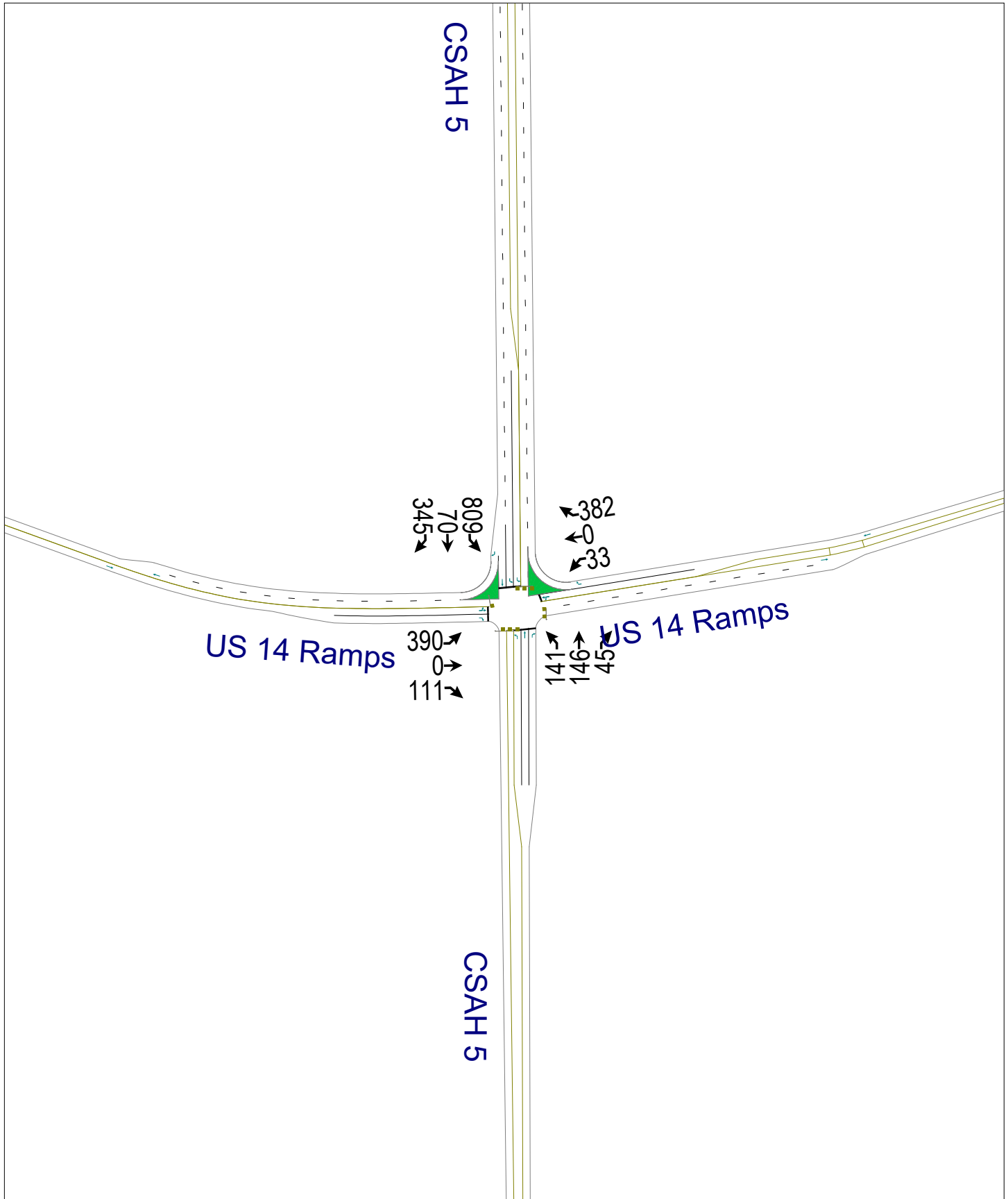
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	97	330	341	34	474	203
Future Volume (veh/h)	97	330	341	34	474	203
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	105	0	371	37	515	221
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	184		975	826	607	1428
Arrive On Green	0.10	0.00	0.52	0.52	0.29	1.00
Sat Flow, veh/h	1781	1585	1870	1585	3456	1870
Grp Volume(v), veh/h	105	0	371	37	515	221
Grp Sat Flow(s),veh/h/ln	1781	1585	1870	1585	1728	1870
Q Serve(g_s), s	5.1	0.0	10.7	1.0	12.6	0.0
Cycle Q Clear(g_c), s	5.1	0.0	10.7	1.0	12.6	0.0
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	184		975	826	607	1428
V/C Ratio(X)	0.57		0.38	0.04	0.85	0.15
Avail Cap(c_a), veh/h	356		975	826	845	1428
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.67	1.67
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.98	0.98
Uniform Delay (d), s/veh	38.5	0.0	12.9	10.6	30.7	0.0
Incr Delay (d2), s/veh	2.8	0.0	1.1	0.1	5.8	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	2.3	0.0	4.4	0.4	4.9	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	41.3	0.0	14.0	10.7	36.5	0.2
LnGrp LOS	D		B	B	D	A
Approach Vol, veh/h	105	A	408			736
Approach Delay, s/veh	41.3		13.7			25.6
Approach LOS	D		B			C
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	21.8	52.9			74.7	15.3
Change Period (Y+Rc), s	6.0	6.0			6.0	6.0
Max Green Setting (Gmax), s	22.0	32.0			60.0	18.0
Max Q Clear Time (g_c+I1), s	14.6	12.7			2.0	7.1
Green Ext Time (p_c), s	1.2	2.2			1.3	0.2

Intersection Summary

HCM 6th Ctrl Delay	23.0
HCM 6th LOS	C

Notes

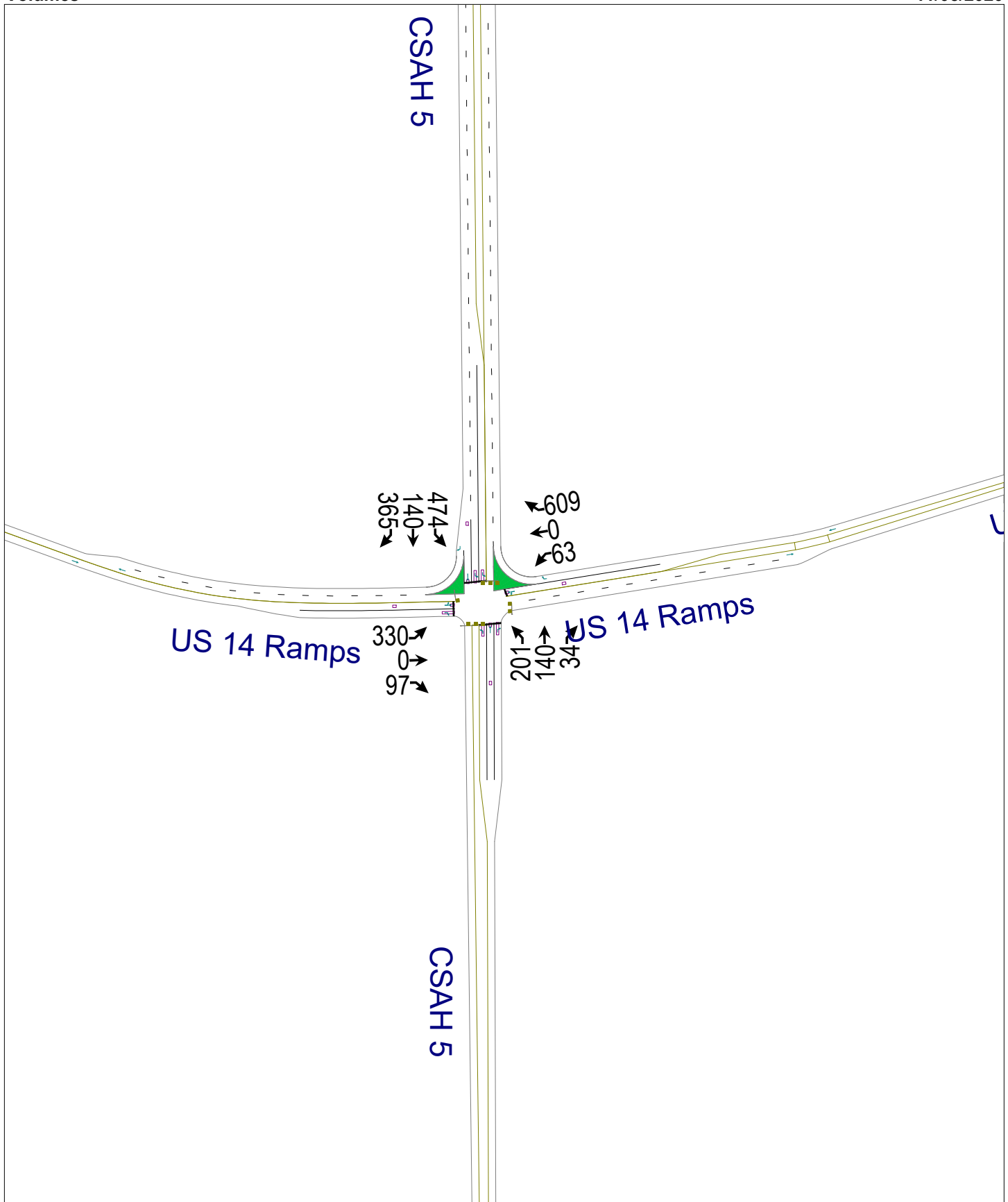
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.



Offset Single Point Alternative at CSAH 5
10: CSAH 5 & US 14 Ramps























2040 AM Peak Hour
11/05/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	390	0	111	33	0	382	141	146	45	809	70	345
Future Volume (veh/h)	390	0	111	33	0	382	141	146	45	809	70	345
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	424	0	121	36	0	0	153	159	49	879	76	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	569	0	445	151	0		194	420	356	1019	769	
Arrive On Green	0.28	0.00	0.28	0.28	0.00	0.00	0.11	0.22	0.22	0.29	0.41	0.00
Sat Flow, veh/h	1745	0	1585	252	0	1585	1781	1870	1585	3456	1870	1585
Grp Volume(v), veh/h	424	0	121	36	0	0	153	159	49	879	76	0
Grp Sat Flow(s),veh/h/ln	1745	0	1585	252	0	1585	1781	1870	1585	1728	1870	1585
Q Serve(g_s), s	0.0	0.0	5.4	2.5	0.0	0.0	7.5	6.5	2.2	21.7	2.2	0.0
Cycle Q Clear(g_c), s	20.2	0.0	5.4	22.7	0.0	0.0	7.5	6.5	2.2	21.7	2.2	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	569	0	445	151	0		194	420	356	1019	769	
V/C Ratio(X)	0.74	0.00	0.27	0.24	0.00		0.79	0.38	0.14	0.86	0.10	
Avail Cap(c_a), veh/h	912	0	827	458	0		356	420	356	1382	769	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.6	0.0	25.2	41.3	0.0	0.0	39.1	29.6	27.9	30.0	16.3	0.0
Incr Delay (d2), s/veh	2.0	0.0	0.3	0.8	0.0	0.0	7.1	2.6	0.8	4.4	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.6	0.0	2.0	0.8	0.0	0.0	3.6	3.1	0.9	9.2	1.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.5	0.0	25.6	42.1	0.0	0.0	46.2	32.2	28.7	34.5	16.5	0.0
LnGrp LOS	C	A	C	D	A		D	C	C	C	B	
Approach Vol, veh/h		545			36	A		361			955	A
Approach Delay, s/veh		31.0			42.1			37.6			33.0	
Approach LOS		C			D			D			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	32.6	26.2		31.2	15.8	43.0		31.2				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	36.0	19.0		47.0	18.0	37.0		47.0				
Max Q Clear Time (g_c+I1), s	23.7	8.5		22.2	9.5	4.2		24.7				
Green Ext Time (p_c), s	2.9	0.7		3.0	0.2	0.4		0.1				
Intersection Summary												
HCM 6th Ctrl Delay			33.5									
HCM 6th LOS			C									
Notes												
Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												



Offset Single Point Alternative at CSAH 5
10: CSAH 5 & US 14 Ramps

2040 PM Peak Hour
11/05/2020

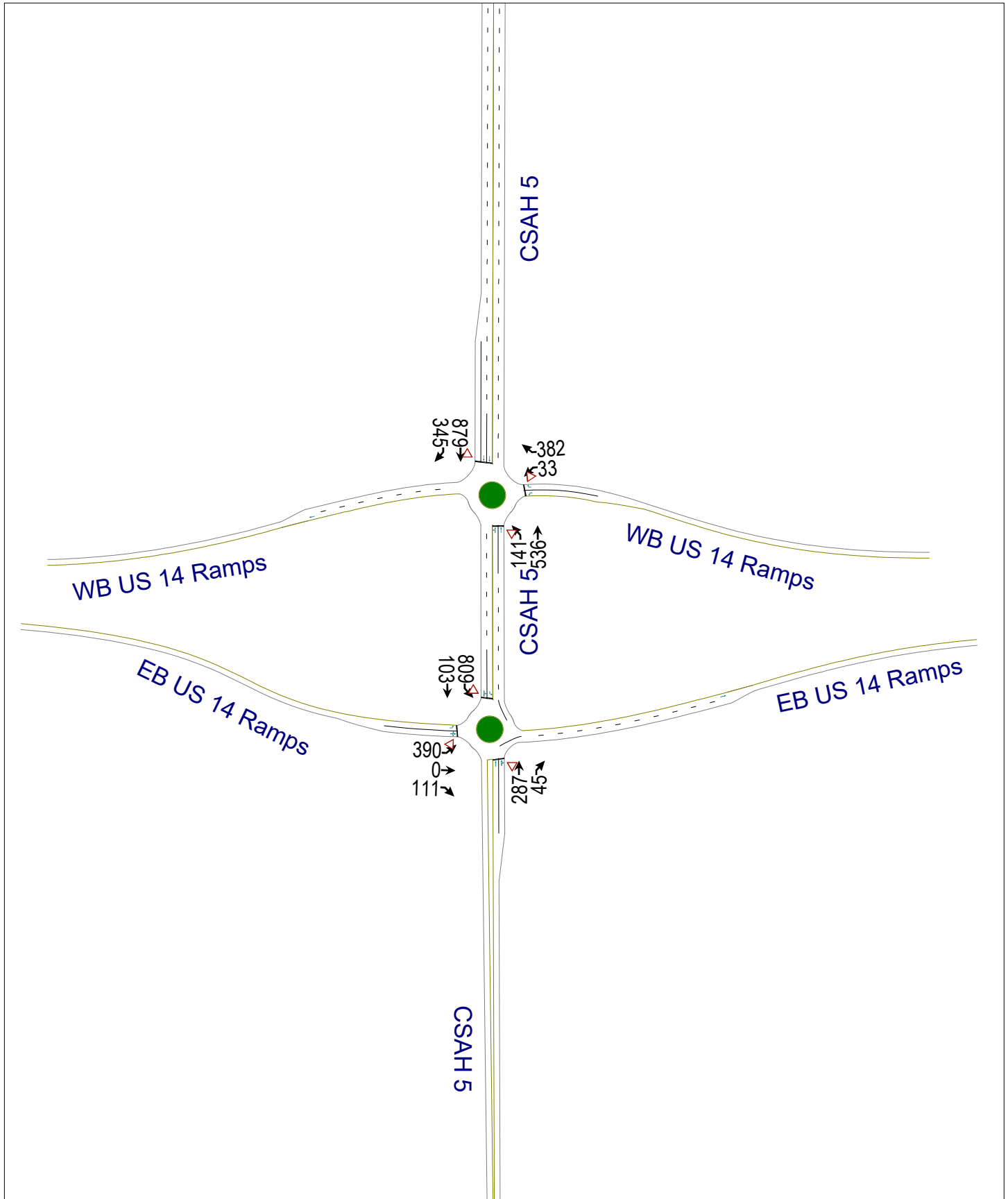
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	330	0	97	63	0	609	201	140	34	474	140	365
Future Volume (veh/h)	330	0	97	63	0	609	201	140	34	474	140	365
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	359	0	105	68	0	0	218	152	37	515	152	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	545	0	419	185	0		262	637	540	637	706	
Arrive On Green	0.26	0.00	0.26	0.26	0.00	0.00	0.15	0.34	0.34	0.18	0.38	0.00
Sat Flow, veh/h	1744	0	1585	382	0	1585	1781	1870	1585	3456	1870	1585
Grp Volume(v), veh/h	359	0	105	68	0	0	218	152	37	515	152	0
Grp Sat Flow(s),veh/h/ln	1744	0	1585	382	0	1585	1781	1870	1585	1728	1870	1585
Q Serve(g_s), s	0.0	0.0	4.4	4.4	0.0	0.0	10.1	5.0	1.3	12.2	4.7	0.0
Cycle Q Clear(g_c), s	15.8	0.0	4.4	20.2	0.0	0.0	10.1	5.0	1.3	12.2	4.7	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	545	0	419	185	0		262	637	540	637	706	
V/C Ratio(X)	0.66	0.00	0.25	0.37	0.00		0.83	0.24	0.07	0.81	0.22	
Avail Cap(c_a), veh/h	953	0	875	556	0		502	637	540	1055	706	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	28.9	0.0	24.7	38.2	0.0	0.0	35.3	20.2	19.0	33.3	18.0	0.0
Incr Delay (d2), s/veh	1.4	0.0	0.3	1.2	0.0	0.0	6.8	0.9	0.2	2.5	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.6	0.0	1.6	1.4	0.0	0.0	4.7	2.2	0.5	5.1	2.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.3	0.0	25.0	39.4	0.0	0.0	42.1	21.1	19.2	35.8	18.7	0.0
LnGrp LOS	C	A	C	D	A		D	C	B	D	B	
Approach Vol, veh/h		464			68	A		407			667	A
Approach Delay, s/veh		29.1			39.4			32.2			31.9	
Approach LOS		C			D			C			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	21.7	35.0		28.5	18.5	38.2		28.5				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	26.0	29.0		47.0	24.0	31.0		47.0				
Max Q Clear Time (g_c+I1), s	14.2	7.0		17.8	12.1	6.7		22.2				
Green Ext Time (p_c), s	1.5	0.9		2.5	0.5	0.7		0.3				

Intersection Summary

HCM 6th Ctrl Delay	31.5
HCM 6th LOS	C

Notes

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



Traditional Diamond with Roundabouts

Vistro File: H:\...\TD_RABs.vistro

Scenario 1 AM Peak Hour

Report File: H:\...\2040 AM - Report.pdf

12/14/2020

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	CSAH 5 and US 14 North Ramps	Roundabout	HCM 6th Edition	WB Right		7.6	A
2	CSAH 5 and US 14 South Ramps	Roundabout	HCM 6th Edition	NB Thru		10.9	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: CSAH 5 and US 14 North Ramps

Control Type:	Roundabout	Delay (sec / veh):	7.6
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes		

Intersection Setup

Name	CSAH 5			CSAH 5			US 14 WB On-Ramp			US 14 EB Off-Ramp		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			30.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	CSAH 5			CSAH 5			US 14 WB On-Ramp			US 14 EB Off-Ramp		
Base Volume Input [veh/h]	141	536	0	0	879	345	0	0	0	33	0	382
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	141	536	0	0	879	345	0	0	0	33	0	382
Peak Hour Factor	0.9200	0.9200	1.0000	1.0000	0.9200	0.9200	1.0000	1.0000	1.0000	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	38	146	0	0	239	94	0	0	0	9	0	104
Total Analysis Volume [veh/h]	153	583	0	0	955	375	0	0	0	36	0	415
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Number of Conflicting Circulating Lanes	2			2			1			2		
Circulating Flow Rate [veh/h]	0			193			1011			751		
Exiting Flow Rate [veh/h]	1011			1018			156			0		
Demand Flow Rate [veh/h]	141	536	0	0	879	345	0	0	0	33	0	382
Adjusted Demand Flow Rate [veh/h]	153	583	0	0	955	375	0	0	0	36	0	415

Lanes

Overwrite Calculated Critical Headway	No	No	No	No	No		No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00	4.00		4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No	No		No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00	3.00		3.00	3.00
A (intercept)	1350.00	1420.00	1350.00	1420.00	1380.00		1350.00	1420.00
B (coefficient)	0.00092	0.00085	0.00092	0.00085	0.00102		0.00092	0.00085
HV Adjustment Factor	0.98	0.98	0.98	0.98	0.98		0.98	0.98
Entry Flow Rate [veh/h]	353	398	458	517	0		37	424
Capacity of Entry and Bypass Lanes [veh/h]	1350	1420	1131	1206	1177		677	751
Pedestrian Impedance	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Capacity per Entry Lane [veh/h]	1324	1393	1109	1182	1154		664	736
X, volume / capacity	0.26	0.28	0.40	0.43	0.33		0.05	0.56

Movement, Approach, & Intersection Results

Lane LOS	A	A	A	A	A		A	B
95th-Percentile Queue Length [veh]	1.05	1.16	1.99	2.19	1.42		0.17	3.57
95th-Percentile Queue Length [ft]	26.31	28.93	49.83	54.77	35.59		4.29	89.18
Approach Delay [s/veh]	4.99			7.11			0.00	13.24
Approach LOS	A			A			A	B
Intersection Delay [s/veh]	7.59							
Intersection LOS	A							

Intersection Level Of Service Report
Intersection 2: CSAH 5 and US 14 South Ramps

Control Type:	Roundabout	Delay (sec / veh):	10.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	CSAH 5			CSAH 5			US 14 EB Off-Ramp			US 14 EB On-Ramp		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↑			↙↑			↙↑↑					
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	0	0	0	1	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			35.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	CSAH 5			CSAH 5			US 14 EB Off-Ramp			US 14 EB On-Ramp		
Base Volume Input [veh/h]	0	287	45	809	103	0	390	0	111	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	287	45	809	103	0	390	0	111	0	0	0
Peak Hour Factor	1.0000	0.9200	0.9200	0.9200	0.9200	1.0000	0.9200	0.9200	0.9200	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	78	12	220	28	0	106	0	30	0	0	0
Total Analysis Volume [veh/h]	0	312	49	879	112	0	424	0	121	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Number of Conflicting Circulating Lanes	2			2			2			1		
Circulating Flow Rate [veh/h]	1329			0			1011			751		
Exiting Flow Rate [veh/h]	238			751			0			947		
Demand Flow Rate [veh/h]	0	287	45	809	103	0	390	0	111	0	0	0
Adjusted Demand Flow Rate [veh/h]	0	312	49	879	112	0	424	0	121	0	0	0

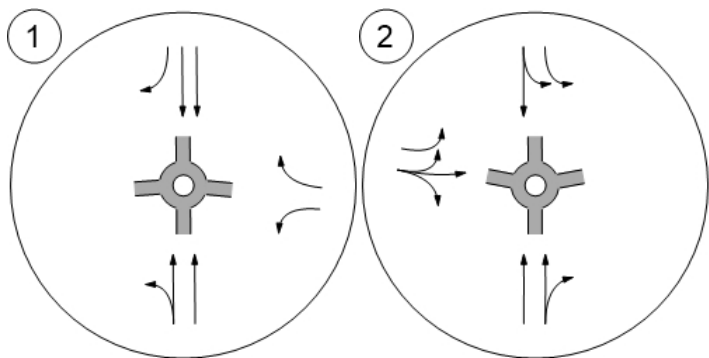
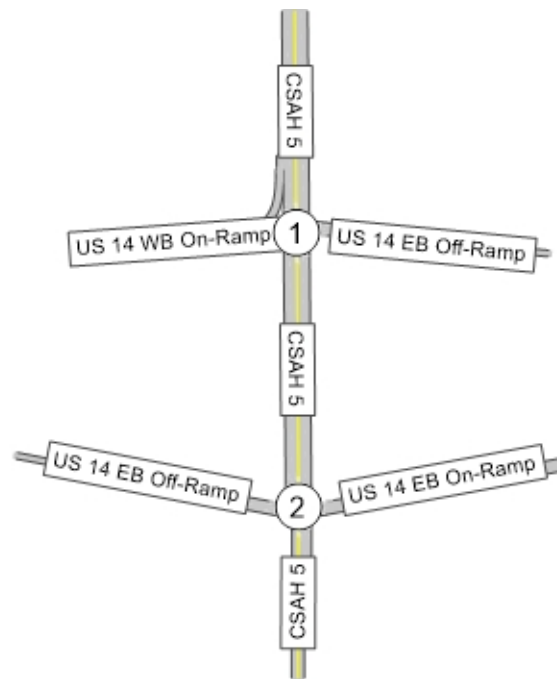
Lanes

Override Calculated Critical Headway	No	No	No	No	No	No	
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00	4.00	4.00	
Override Calculated Follow-Up Time	No	No	No	No	No	No	
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00	3.00	3.00	
A (intercept)	1350.00	1420.00	1350.00	1420.00	1350.00	1420.00	
B (coefficient)	0.00092	0.00085	0.00092	0.00085	0.00092	0.00085	
HV Adjustment Factor	0.98	0.98	0.98	0.98	0.98	0.98	
Entry Flow Rate [veh/h]	174	196	536	476	295	262	
Capacity of Entry and Bypass Lanes [veh/h]	398	459	1350	1420	533	602	
Pedestrian Impedance	1.00	1.00	1.00	1.00	1.00	1.00	
Capacity per Entry Lane [veh/h]	390	450	1324	1393	523	590	
X, volume / capacity	0.44	0.43	0.40	0.33	0.55	0.43	

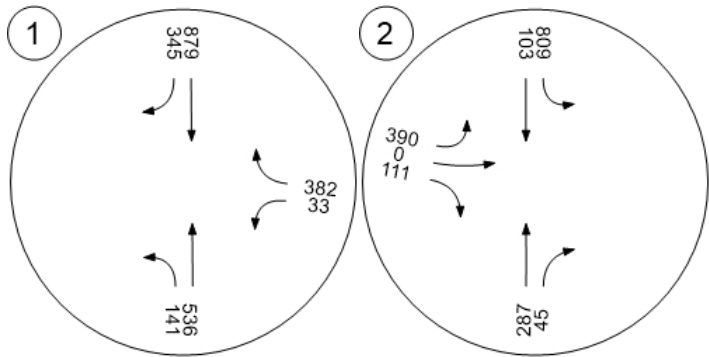
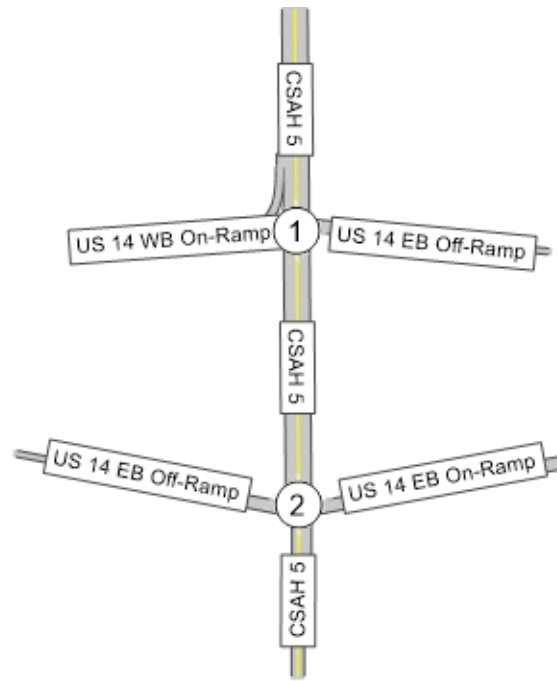
Movement, Approach, & Intersection Results

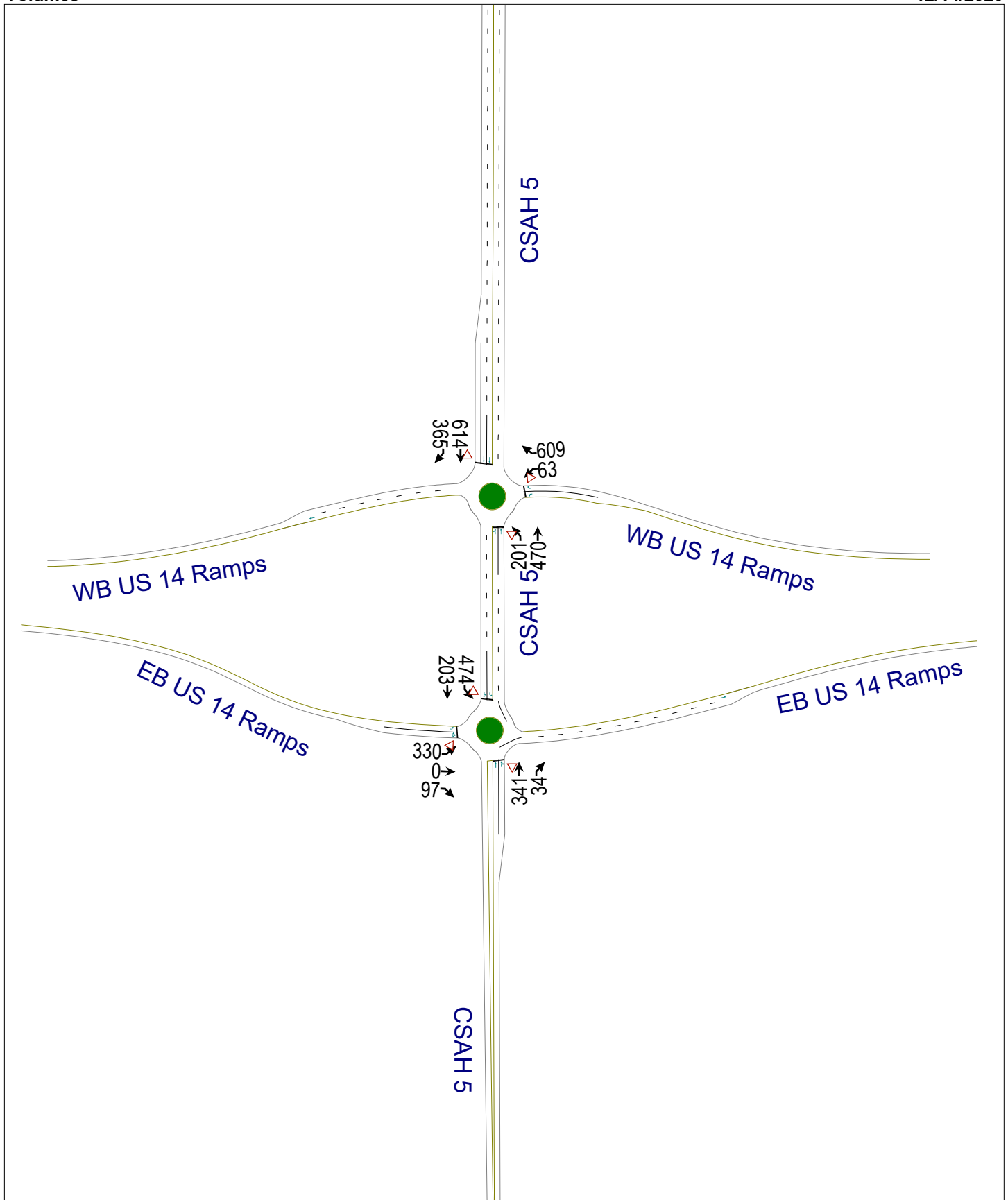
Lane LOS	C	C	A	A	C	B	
95th-Percentile Queue Length [veh]	2.15	2.09	1.94	1.49	3.33	2.19	
95th-Percentile Queue Length [ft]	53.65	52.14	48.41	37.23	83.31	54.74	
Approach Delay [s/veh]	17.06		6.05		15.52		0.00
Approach LOS	C		A		C		A
Intersection Delay [s/veh]	10.86						
Intersection LOS	B						

Lane Configuration and Traffic Control



Traffic Volume - Base Volume





Traditional Diamond with Roundabouts

Vistro File: H:\...\TD_RABs.vistro

Scenario 2 PM Peak Hour

Report File: H:\...\2040 PM - Report.pdf

12/14/2020

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	CSAH 5 and US 14 North Ramps	Roundabout	HCM 6th Edition	WB Right		13.9	B
2	CSAH 5 and US 14 South Ramps	Roundabout	HCM 6th Edition	NB Thru		7.7	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: CSAH 5 and US 14 North Ramps

Control Type:	Roundabout	Delay (sec / veh):	13.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	CSAH 5			CSAH 5			US 14 WB On-Ramp			US 14 EB Off-Ramp		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			30.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	CSAH 5			CSAH 5			US 14 WB On-Ramp			US 14 EB Off-Ramp		
Base Volume Input [veh/h]	201	470	0	0	614	365	0	0	0	63	0	609
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	201	470	0	0	614	365	0	0	0	63	0	609
Peak Hour Factor	0.9200	0.9200	1.0000	1.0000	0.9200	0.9200	1.0000	1.0000	1.0000	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	55	128	0	0	167	99	0	0	0	17	0	165
Total Analysis Volume [veh/h]	218	511	0	0	667	397	0	0	0	68	0	662
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Number of Conflicting Circulating Lanes	2			2			1			2		
Circulating Flow Rate [veh/h]	0			292			750			744		
Exiting Flow Rate [veh/h]	750			1196			222			0		
Demand Flow Rate [veh/h]	201	470	0	0	614	365	0	0	0	63	0	609
Adjusted Demand Flow Rate [veh/h]	218	511	0	0	667	397	0	0	0	68	0	662

Lanes

Overwrite Calculated Critical Headway	No	No	No	No	No		No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00	4.00		4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No	No		No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00	3.00		3.00	3.00
A (intercept)	1350.00	1420.00	1350.00	1420.00	1380.00		1350.00	1420.00
B (coefficient)	0.00092	0.00085	0.00092	0.00085	0.00102		0.00092	0.00085
HV Adjustment Factor	0.98	0.98	0.98	0.98	0.98		0.98	0.98
Entry Flow Rate [veh/h]	350	395	320	361	0		70	676
Capacity of Entry and Bypass Lanes [veh/h]	1350	1420	1033	1109	1100		682	755
Pedestrian Impedance	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Capacity per Entry Lane [veh/h]	1324	1393	1012	1087	1079		668	740
X, volume / capacity	0.26	0.28	0.31	0.33	0.37		0.10	0.89

Movement, Approach, & Intersection Results

Lane LOS	A	A	A	A	A		A	E
95th-Percentile Queue Length [veh]	1.04	1.14	1.33	1.42	1.71		0.34	11.62
95th-Percentile Queue Length [ft]	25.98	28.55	33.16	35.62	42.84		8.46	290.52
Approach Delay [s/veh]	4.96			6.80			0.00	33.11
Approach LOS	A			A			A	D
Intersection Delay [s/veh]	13.88							
Intersection LOS	B							

Intersection Level Of Service Report
Intersection 2: CSAH 5 and US 14 South Ramps

Control Type:	Roundabout	Delay (sec / veh):	7.7
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes		

Intersection Setup

Name	CSAH 5			CSAH 5			US 14 EB Off-Ramp			US 14 EB On-Ramp		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↑			↙↑			↙↑↑					
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	0	0	0	1	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			35.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	CSAH 5			CSAH 5			US 14 EB Off-Ramp			US 14 EB On-Ramp		
Base Volume Input [veh/h]	0	341	34	474	203	0	330	0	97	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	341	34	474	203	0	330	0	97	0	0	0
Peak Hour Factor	1.0000	0.9200	0.9200	0.9200	0.9200	1.0000	0.9200	0.9200	0.9200	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	93	9	129	55	0	90	0	26	0	0	0
Total Analysis Volume [veh/h]	0	371	37	515	221	0	359	0	105	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Number of Conflicting Circulating Lanes	2			2			2			1		
Circulating Flow Rate [veh/h]	891			0			751			745		
Exiting Flow Rate [veh/h]	333			745			0			563		
Demand Flow Rate [veh/h]	0	341	34	474	203	0	330	0	97	0	0	0
Adjusted Demand Flow Rate [veh/h]	0	371	37	515	221	0	359	0	105	0	0	0

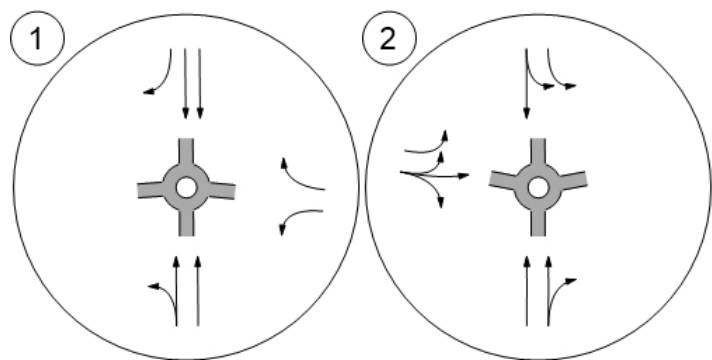
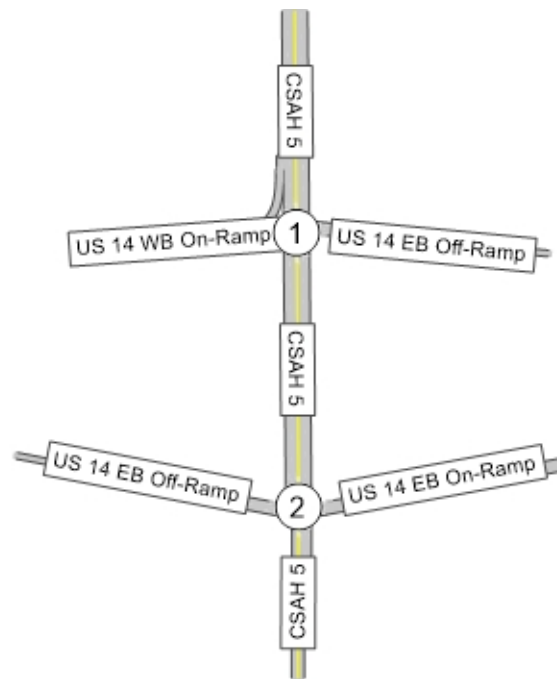
Lanes

Overwrite Calculated Critical Headway	No	No	No	No	No	No	
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00	4.00	4.00	
Overwrite Calculated Follow-Up Time	No	No	No	No	No	No	
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00	3.00	3.00	
A (intercept)	1350.00	1420.00	1350.00	1420.00	1350.00	1420.00	
B (coefficient)	0.00092	0.00085	0.00092	0.00085	0.00092	0.00085	
HV Adjustment Factor	0.98	0.98	0.98	0.98	0.98	0.98	
Entry Flow Rate [veh/h]	196	221	398	353	251	223	
Capacity of Entry and Bypass Lanes [veh/h]	595	666	1350	1420	677	751	
Pedestrian Impedance	1.00	1.00	1.00	1.00	1.00	1.00	
Capacity per Entry Lane [veh/h]	583	653	1324	1393	664	736	
X, volume / capacity	0.33	0.33	0.29	0.25	0.37	0.30	

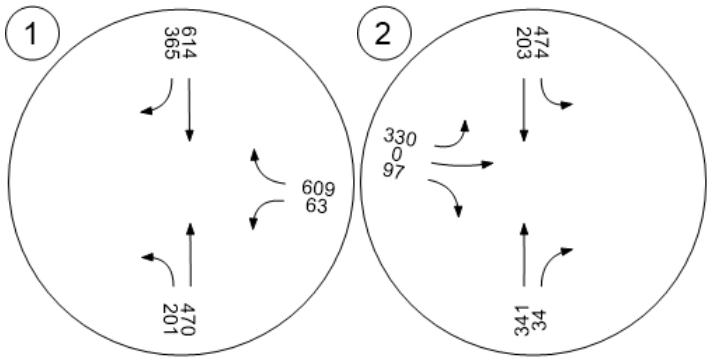
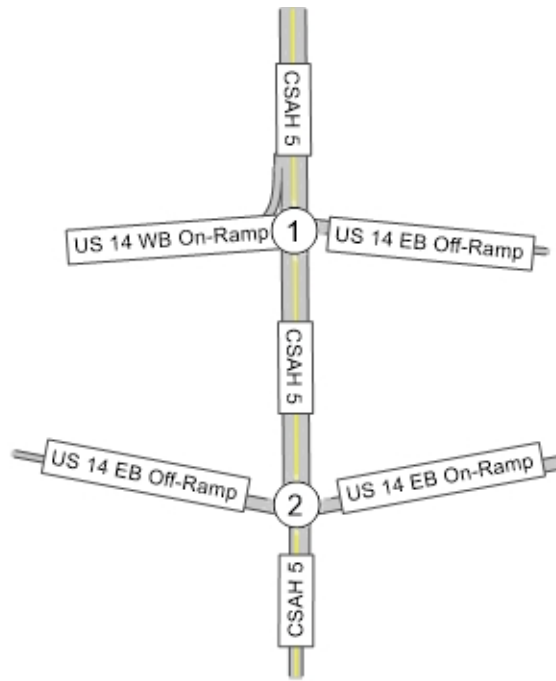
Movement, Approach, & Intersection Results

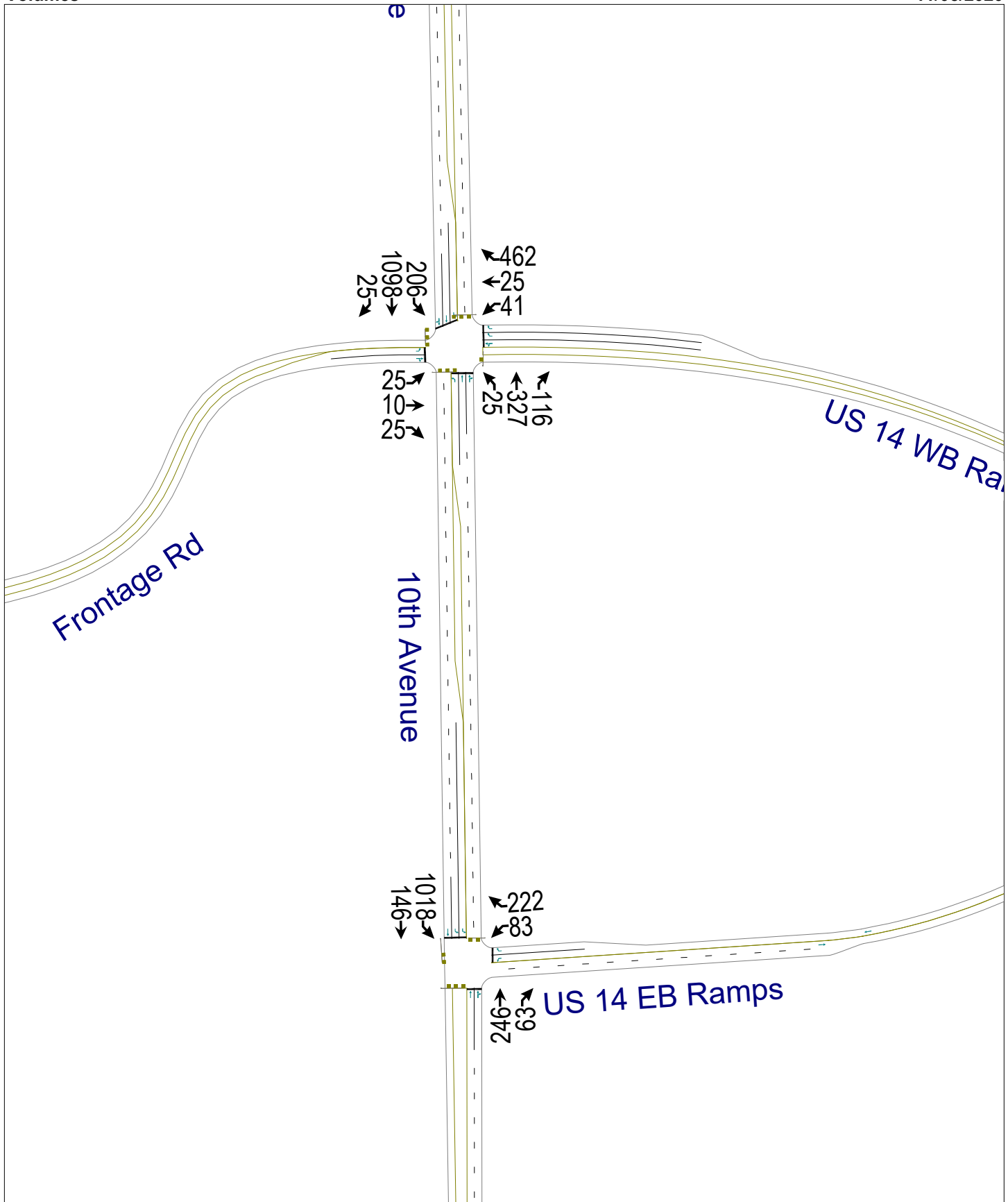
Lane LOS	B	A	A	A	B	A	
95th-Percentile Queue Length [veh]	1.43	1.45	1.24	0.98	1.71	1.24	
95th-Percentile Queue Length [ft]	35.73	36.21	31.01	24.61	42.78	31.02	
Approach Delay [s/veh]	10.32		5.02		9.49		0.00
Approach LOS	B		A		A		A
Intersection Delay [s/veh]	7.66						
Intersection LOS	A						

Lane Configuration and Traffic Control



Traffic Volume - Base Volume





Folded Diamond Alternative at 10th Avenue
 10: 10th Avenue & Frontage Rd/US 14 WB Ramps

2040 AM Peak Hour

11/05/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	10	25	41	25	462	25	327	116	206	1098	25
Future Volume (veh/h)	25	10	25	41	25	462	25	327	116	206	1098	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	27	11	27	45	27	502	27	355	126	224	1193	27
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	217	95	234	236	128	554	383	1262	441	720	1737	39
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.22	0.98	0.98	0.11	0.49	0.49
Sat Flow, veh/h	874	480	1178	862	642	2790	1781	2582	903	1781	3552	80
Grp Volume(v), veh/h	27	0	38	72	0	502	27	243	238	224	597	623
Grp Sat Flow(s),veh/h/ln	874	0	1658	1504	0	1395	1781	1777	1708	1781	1777	1856
Q Serve(g_s), s	2.4	0.0	1.7	2.1	0.0	15.8	0.0	0.4	0.4	0.0	23.3	23.3
Cycle Q Clear(g_c), s	6.2	0.0	1.7	3.8	0.0	15.8	0.0	0.4	0.4	0.0	23.3	23.3
Prop In Lane	1.00		0.71	0.62		1.00	1.00		0.53	1.00		0.04
Lane Grp Cap(c), veh/h	217	0	329	364	0	554	383	869	835	720	869	907
V/C Ratio(X)	0.12	0.00	0.12	0.20	0.00	0.91	0.07	0.28	0.29	0.31	0.69	0.69
Avail Cap(c_a), veh/h	218	0	332	366	0	558	383	869	835	721	869	907
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.94	0.94	0.94	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.0	0.0	29.6	30.4	0.0	35.2	18.0	0.5	0.5	9.8	17.7	17.7
Incr Delay (d2), s/veh	0.3	0.0	0.2	0.3	0.0	18.4	0.1	0.8	0.8	0.2	4.4	4.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.7	1.3	0.0	6.6	0.3	0.3	0.3	2.1	9.7	10.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.3	0.0	29.7	30.7	0.0	53.6	18.1	1.3	1.3	10.0	22.1	21.9
LnGrp LOS	C	A	C	C	A	D	B	A	A	B	C	C
Approach Vol, veh/h		65			574			508			1444	
Approach Delay, s/veh		31.2			50.7			2.2			20.2	
Approach LOS		C			D			A			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	16.0	50.0		23.9	16.0	50.0		23.9				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	10.0	44.0		18.0	10.0	44.0		18.0				
Max Q Clear Time (g_c+I1), s	2.0	2.4		8.2	2.0	25.3		17.8				
Green Ext Time (p_c), s	0.4	3.1		0.1	0.0	7.9		0.1				

Intersection Summary

HCM 6th Ctrl Delay	23.7
HCM 6th LOS	C

Folded Diamond Alternative at 10th Avenue
 20: 10th Avenue & US 14 EB Ramps

2040 AM Peak Hour
 11/05/2020



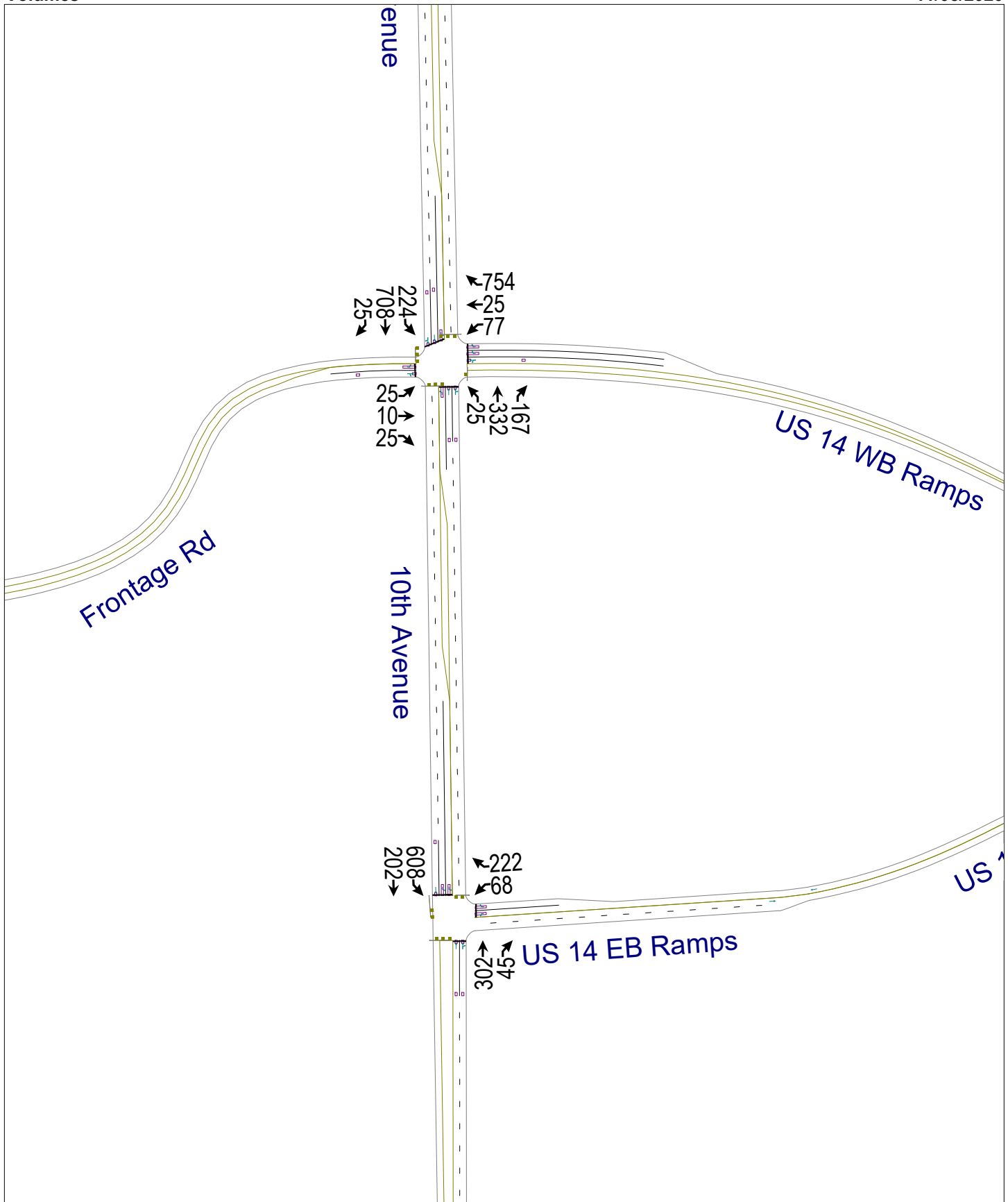
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	83	222	246	63	1018	146
Future Volume (veh/h)	83	222	246	63	1018	146
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	90	241	267	68	1107	159
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	210	756	911	228	1239	1400
Arrive On Green	0.12	0.12	0.32	0.32	0.60	1.00
Sat Flow, veh/h	1781	1585	2910	704	3456	1870
Grp Volume(v), veh/h	90	241	167	168	1107	159
Grp Sat Flow(s),veh/h/ln	1781	1585	1777	1744	1728	1870
Q Serve(g_s), s	4.2	8.4	6.3	6.5	24.9	0.0
Cycle Q Clear(g_c), s	4.2	8.4	6.3	6.5	24.9	0.0
Prop In Lane	1.00	1.00		0.40	1.00	
Lane Grp Cap(c), veh/h	210	756	574	564	1239	1400
V/C Ratio(X)	0.43	0.32	0.29	0.30	0.89	0.11
Avail Cap(c_a), veh/h	238	780	574	564	1574	1400
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.67	1.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.84	0.84
Uniform Delay (d), s/veh	36.9	14.5	22.7	22.8	16.6	0.0
Incr Delay (d2), s/veh	1.4	0.2	1.3	1.4	5.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	2.9	2.7	2.8	6.6	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	38.2	14.8	24.0	24.2	21.5	0.1
LnGrp LOS	D	B	C	C	C	A
Approach Vol, veh/h	331		335			1266
Approach Delay, s/veh	21.2		24.1			18.8
Approach LOS	C		C			B
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	38.3	35.1			73.4	16.6
Change Period (Y+Rc), s	6.0	6.0			6.0	6.0
Max Green Setting (Gmax), s	41.0	19.0			66.0	12.0
Max Q Clear Time (g_c+I1), s	26.9	8.5			2.0	10.4
Green Ext Time (p_c), s	4.0	1.3			0.9	0.2

Intersection Summary

HCM 6th Ctrl Delay	20.1
HCM 6th LOS	C

Notes

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



Folded Diamond Alternative at 10th Avenue
 10: 10th Avenue & Frontage Rd/US 14 WB Ramps

2040 PM Peak Hour

11/05/2020



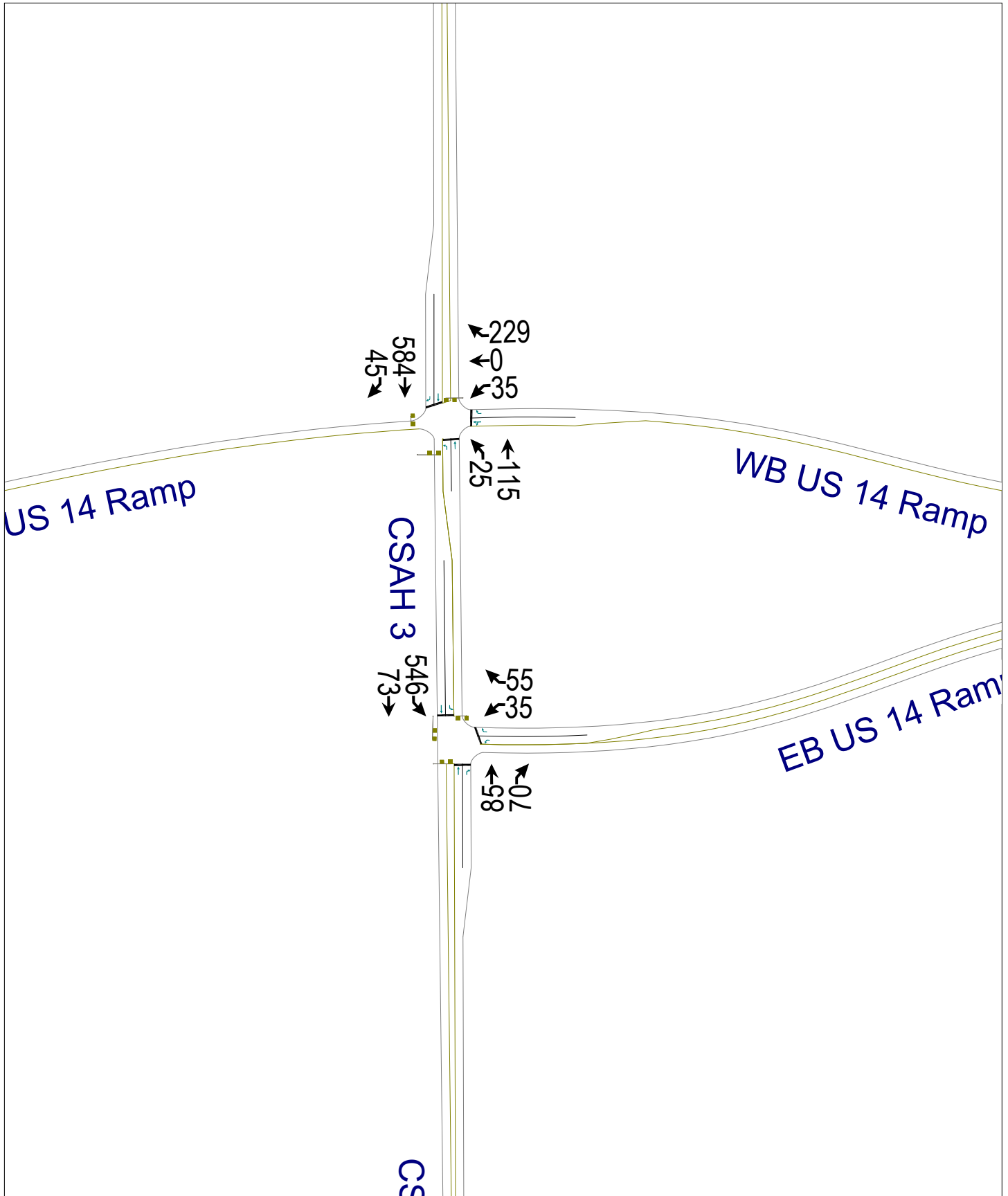
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	10	25	77	25	754	25	332	167	224	708	25
Future Volume (veh/h)	25	10	25	77	25	754	25	332	167	224	708	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	27	11	27	84	27	820	27	361	182	243	770	27
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	240	149	366	396	118	866	279	741	368	446	1323	46
Arrive On Green	0.31	0.31	0.31	0.31	0.31	0.31	0.07	0.43	0.43	0.11	0.38	0.38
Sat Flow, veh/h	650	480	1178	1051	381	2790	1781	2301	1141	1781	3502	123
Grp Volume(v), veh/h	27	0	38	111	0	820	27	277	266	243	391	406
Grp Sat Flow(s),veh/h/ln	650	0	1658	1432	0	1395	1781	1777	1665	1781	1777	1848
Q Serve(g_s), s	2.9	0.0	1.5	4.3	0.0	25.8	0.0	10.1	10.4	0.0	15.8	15.8
Cycle Q Clear(g_c), s	8.7	0.0	1.5	5.8	0.0	25.8	0.0	10.1	10.4	0.0	15.8	15.8
Prop In Lane	1.00		0.71	0.76		1.00	1.00		0.69	1.00		0.07
Lane Grp Cap(c), veh/h	240	0	515	514	0	866	279	573	537	446	671	698
V/C Ratio(X)	0.11	0.00	0.07	0.22	0.00	0.95	0.10	0.48	0.50	0.54	0.58	0.58
Avail Cap(c_a), veh/h	241	0	516	516	0	868	378	573	537	546	671	698
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.93	0.93	0.93	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.7	0.0	21.9	23.6	0.0	30.3	29.2	20.3	20.4	29.5	22.3	22.3
Incr Delay (d2), s/veh	0.2	0.0	0.1	0.2	0.0	19.0	0.1	2.7	3.0	1.0	3.7	3.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.6	1.7	0.0	10.5	0.5	4.2	4.0	4.8	6.9	7.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.9	0.0	22.0	23.8	0.0	49.3	29.4	23.0	23.4	30.5	26.0	25.9
LnGrp LOS	C	A	C	C	A	D	C	C	C	C	C	C
Approach Vol, veh/h		65			931			570			1040	
Approach Delay, s/veh		24.0			46.3			23.5			27.0	
Approach LOS		C			D			C			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	16.0	35.0		33.9	11.0	40.0		33.9				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	15.0	29.0		28.0	10.0	34.0		28.0				
Max Q Clear Time (g_c+I1), s	2.0	12.4		10.7	2.0	17.8		27.8				
Green Ext Time (p_c), s	0.6	3.0		0.3	0.0	4.4		0.1				
Intersection Summary												
HCM 6th Ctrl Delay				33.0								
HCM 6th LOS				C								

Folded Diamond Alternative at 10th Avenue
 20: 10th Avenue & US 14 EB Ramps

2040 PM Peak Hour
 11/05/2020





















Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	68	222	302	45	608	202
Future Volume (veh/h)	68	222	302	45	608	202
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	74	241	328	49	661	220
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	239	662	1187	176	981	1370
Arrive On Green	0.13	0.13	0.38	0.38	0.47	1.00
Sat Flow, veh/h	1781	1585	3199	459	3456	1870
Grp Volume(v), veh/h	74	241	186	191	661	220
Grp Sat Flow(s),veh/h/ln	1781	1585	1777	1788	1728	1870
Q Serve(g_s), s	3.4	9.4	6.5	6.6	13.3	0.0
Cycle Q Clear(g_c), s	3.4	9.4	6.5	6.6	13.3	0.0
Prop In Lane	1.00	1.00		0.26	1.00	
Lane Grp Cap(c), veh/h	239	662	679	683	981	1370
V/C Ratio(X)	0.31	0.36	0.27	0.28	0.67	0.16
Avail Cap(c_a), veh/h	396	802	679	683	1229	1370
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.67	1.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.94	0.94
Uniform Delay (d), s/veh	35.2	18.0	19.2	19.2	20.5	0.0
Incr Delay (d2), s/veh	0.7	0.3	1.0	1.0	1.0	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	1.5	3.3	2.8	2.8	4.3	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	35.9	18.3	20.2	20.2	21.4	0.2
LnGrp LOS	D	B	C	C	C	A
Approach Vol, veh/h	315		377			881
Approach Delay, s/veh	22.5		20.2			16.1
Approach LOS	C		C			B
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	31.5	40.4			71.9	18.1
Change Period (Y+Rc), s	6.0	6.0			6.0	6.0
Max Green Setting (Gmax), s	32.0	20.0			58.0	20.0
Max Q Clear Time (g_c+I1), s	15.3	8.6			2.0	11.4
Green Ext Time (p_c), s	2.3	1.6			1.3	0.7
Intersection Summary						
HCM 6th Ctrl Delay			18.4			
HCM 6th LOS			B			



Traditional North - Folded South Alternative at CSAH 3
 1: CSAH 3 & WB US 14 Ramp

2040 AM Peak Hour
 11/05/2020

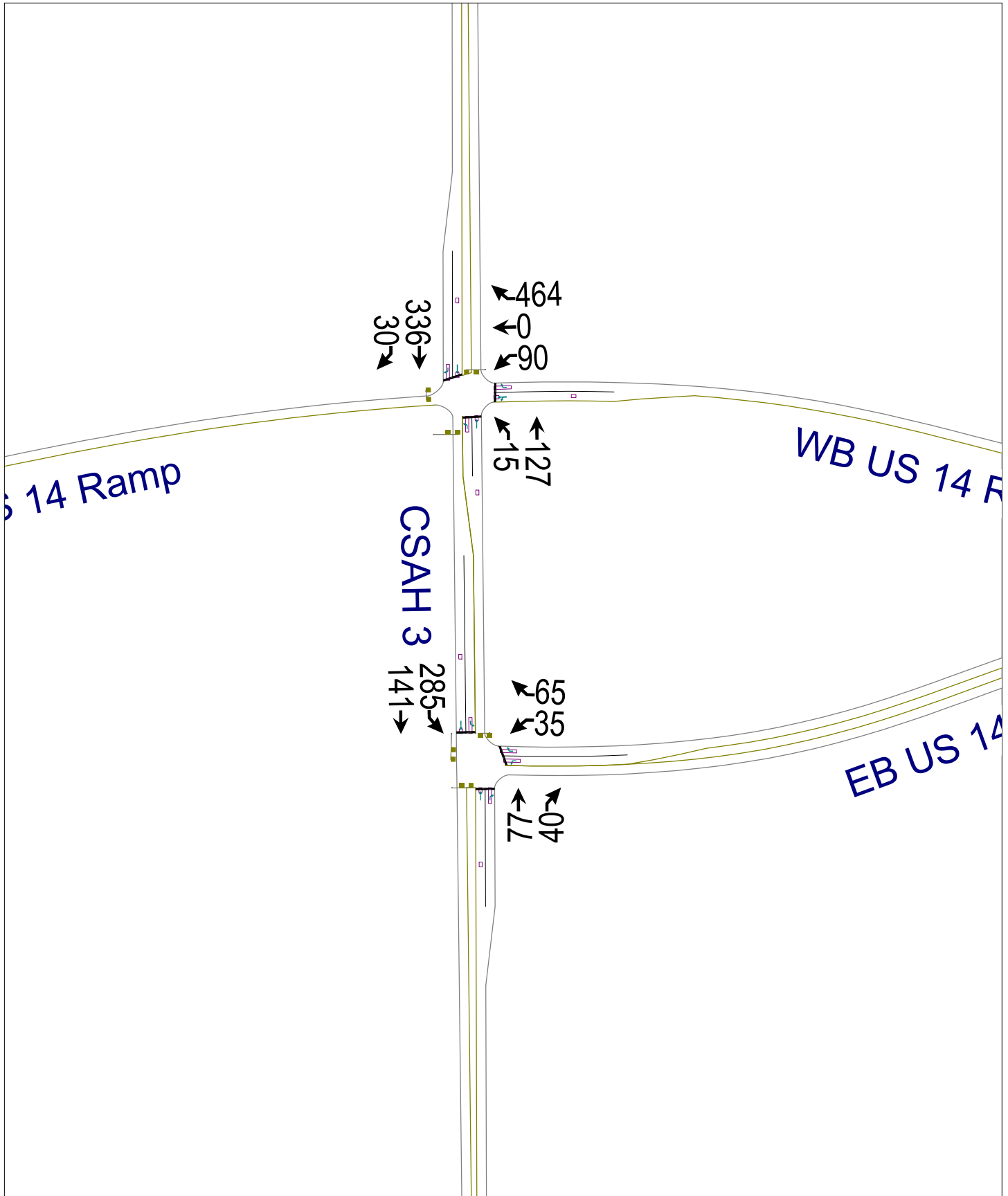
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	35	0	229	25	115	0	0	584	45
Future Volume (veh/h)	0	0	0	35	0	229	25	115	0	0	584	45
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No			No		
Adj Sat Flow, veh/h/ln				1870	1870	1870	1870	1870	0	0	1870	1870
Adj Flow Rate, veh/h				38	0	249	27	125	0	0	635	49
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	0	0	2	2
Cap, veh/h				317	0	282	439	1288	0	0	1062	900
Arrive On Green				0.18	0.00	0.18	0.11	1.00	0.00	0.00	0.57	0.57
Sat Flow, veh/h				1781	0	1585	1781	1870	0	0	1870	1585
Grp Volume(v), veh/h				38	0	249	27	125	0	0	635	49
Grp Sat Flow(s),veh/h/ln				1781	0	1585	1781	1870	0	0	1870	1585
Q Serve(g_s), s				1.6	0.0	13.8	0.5	0.0	0.0	0.0	20.0	1.2
Cycle Q Clear(g_c), s				1.6	0.0	13.8	0.5	0.0	0.0	0.0	20.0	1.2
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				317	0	282	439	1288	0	0	1062	900
V/C Ratio(X)				0.12	0.00	0.88	0.06	0.10	0.00	0.00	0.60	0.05
Avail Cap(c_a), veh/h				356	0	317	539	1288	0	0	1062	900
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.99	0.99	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				31.1	0.0	36.1	8.1	0.0	0.0	0.0	12.7	8.7
Incr Delay (d2), s/veh				0.2	0.0	22.4	0.1	0.1	0.0	0.0	2.5	0.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				0.7	0.0	6.9	0.2	0.1	0.0	0.0	8.1	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				31.2	0.0	58.5	8.1	0.1	0.0	0.0	15.2	8.8
LnGrp LOS				C	A	E	A	A	A	A	B	A
Approach Vol, veh/h					287			152			684	
Approach Delay, s/veh					54.9			1.6			14.8	
Approach LOS					D			A			B	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		68.0			10.9	57.1		22.0				
Change Period (Y+Rc), s		6.0			6.0	6.0		6.0				
Max Green Setting (Gmax), s		60.0			10.0	44.0		18.0				
Max Q Clear Time (g_c+I1), s		2.0			2.5	22.0		15.8				
Green Ext Time (p_c), s		0.7			0.0	4.4		0.2				
Intersection Summary												
HCM 6th Ctrl Delay											23.2	
HCM 6th LOS											C	

Traditional North - Folded South Alternative at CSAH 3
4: CSAH 3 & EB US 14 Ramp

2040 AM Peak Hour
11/05/2020





















Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	35	55	85	70	546	73
Future Volume (veh/h)	35	55	85	70	546	73
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	38	60	92	76	593	79
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	181	771	587	497	685	1431
Arrive On Green	0.10	0.10	0.31	0.31	0.64	1.00
Sat Flow, veh/h	1781	1585	1870	1585	1781	1870
Grp Volume(v), veh/h	38	60	92	76	593	79
Grp Sat Flow(s),veh/h/ln	1781	1585	1870	1585	1781	1870
Q Serve(g_s), s	1.8	1.8	3.2	3.1	24.1	0.0
Cycle Q Clear(g_c), s	1.8	1.8	3.2	3.1	24.1	0.0
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	181	771	587	497	685	1431
V/C Ratio(X)	0.21	0.08	0.16	0.15	0.87	0.06
Avail Cap(c_a), veh/h	317	892	587	497	752	1431
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.67	1.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.85	0.85
Uniform Delay (d), s/veh	37.1	12.3	22.3	22.3	14.2	0.0
Incr Delay (d2), s/veh	0.6	0.0	0.6	0.7	8.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.6	1.5	1.2	6.8	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	37.7	12.4	22.9	22.9	22.6	0.1
LnGrp LOS	D	B	C	C	C	A
Approach Vol, veh/h	98		168			672
Approach Delay, s/veh	22.2		22.9			20.0
Approach LOS	C		C			B
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	40.6	34.2			74.9	15.1
Change Period (Y+Rc), s	6.0	6.0			6.0	6.0
Max Green Setting (Gmax), s	38.0	18.0			62.0	16.0
Max Q Clear Time (g_c+I1), s	26.1	5.2			2.0	3.8
Green Ext Time (p_c), s	1.7	0.5			0.4	0.2
Intersection Summary						
HCM 6th Ctrl Delay			20.7			
HCM 6th LOS			C			















Traditional North - Folded South Alternative at CSAH 3
 1: CSAH 3 & WB US 14 Ramp

2040 PM Peak Hour
 11/05/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	90	0	464	15	127	0	0	336	30
Future Volume (veh/h)	0	0	0	90	0	464	15	127	0	0	336	30
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No		No		No		No		No
Adj Sat Flow, veh/h/ln				1870	1870	1870	1870	1870	0	0	1870	1870
Adj Flow Rate, veh/h				98	0	504	16	138	0	0	365	33
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	0	0	2	2
Cap, veh/h				574	0	511	447	1018	0	0	825	699
Arrive On Green				0.32	0.00	0.32	0.07	1.00	0.00	0.00	0.44	0.44
Sat Flow, veh/h				1781	0	1585	1781	1870	0	0	1870	1585
Grp Volume(v), veh/h				98	0	504	16	138	0	0	365	33
Grp Sat Flow(s),veh/h/ln				1781	0	1585	1781	1870	0	0	1870	1585
Q Serve(g_s), s				3.6	0.0	28.4	0.4	0.0	0.0	0.0	12.2	1.1
Cycle Q Clear(g_c), s				3.6	0.0	28.4	0.4	0.0	0.0	0.0	12.2	1.1
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				574	0	511	447	1018	0	0	825	699
V/C Ratio(X)				0.17	0.00	0.99	0.04	0.14	0.00	0.00	0.44	0.05
Avail Cap(c_a), veh/h				574	0	511	579	1018	0	0	825	699
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				21.9	0.0	30.3	12.0	0.0	0.0	0.0	17.5	14.4
Incr Delay (d2), s/veh				0.1	0.0	36.3	0.0	0.3	0.0	0.0	1.7	0.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.5	0.0	15.4	0.1	0.1	0.0	0.0	5.3	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				22.0	0.0	66.6	12.0	0.3	0.0	0.0	19.2	14.5
LnGrp LOS				C	A	E	B	A	A	A	B	B
Approach Vol, veh/h					602			154			398	
Approach Delay, s/veh					59.3			1.5			18.8	
Approach LOS					E			A			B	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		55.0			9.3	45.7		35.0				
Change Period (Y+Rc), s		6.0			6.0	6.0		6.0				
Max Green Setting (Gmax), s		49.0			10.0	33.0		29.0				
Max Q Clear Time (g_c+I1), s		2.0			2.4	14.2		30.4				
Green Ext Time (p_c), s		0.8			0.0	2.1		0.0				
Intersection Summary												
HCM 6th Ctrl Delay											37.6	
HCM 6th LOS											D	



















Traditional North - Folded South Alternative at CSAH 3
4: CSAH 3 & EB US 14 Ramp

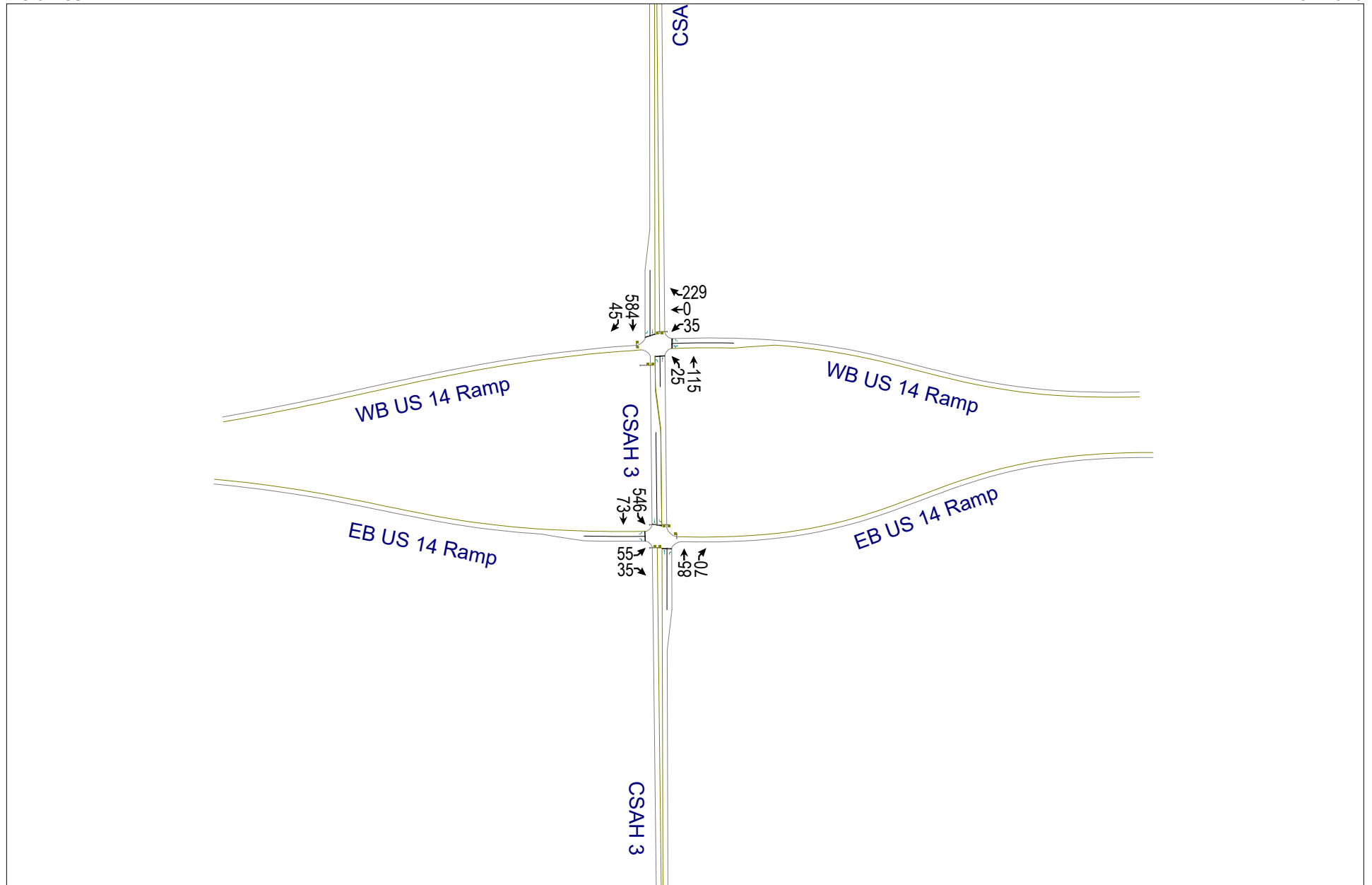
2040 PM Peak Hour
11/05/2020

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	35	65	77	40	285	141
Future Volume (veh/h)	35	65	77	40	285	141
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	38	71	84	43	310	153
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	185	584	807	684	472	1427
Arrive On Green	0.10	0.10	0.43	0.43	0.44	1.00
Sat Flow, veh/h	1781	1585	1870	1585	1781	1870
Grp Volume(v), veh/h	38	71	84	43	310	153
Grp Sat Flow(s),veh/h/ln	1781	1585	1870	1585	1781	1870
Q Serve(g_s), s	1.8	2.7	2.4	1.4	12.3	0.0
Cycle Q Clear(g_c), s	1.8	2.7	2.4	1.4	12.3	0.0
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	185	584	807	684	472	1427
V/C Ratio(X)	0.21	0.12	0.10	0.06	0.66	0.11
Avail Cap(c_a), veh/h	356	737	807	684	673	1427
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.67	1.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.97	0.97
Uniform Delay (d), s/veh	36.9	18.8	15.2	15.0	21.9	0.0
Incr Delay (d2), s/veh	0.5	0.1	0.3	0.2	1.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	1.0	1.0	0.5	4.3	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	37.5	18.9	15.5	15.1	23.4	0.1
LnGrp LOS	D	B	B	B	C	A
Approach Vol, veh/h	109		127			463
Approach Delay, s/veh	25.4		15.4			15.7
Approach LOS	C		B			B
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	29.8	44.8			74.7	15.3
Change Period (Y+Rc), s	6.0	6.0			6.0	6.0
Max Green Setting (Gmax), s	34.0	20.0			60.0	18.0
Max Q Clear Time (g_c+I1), s	14.3	4.4			2.0	4.7
Green Ext Time (p_c), s	0.9	0.4			0.9	0.2
Intersection Summary						
HCM 6th Ctrl Delay			17.2			
HCM 6th LOS			B			

Traditional Diamond Alternative at CSAH 3
1: CSAH 3 & WB US 14 Ramp

AM Peak Hour
12/01/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	35	0	229	25	115	0	0	584	45
Future Volume (veh/h)	0	0	0	35	0	229	25	115	0	0	584	45
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No			No		
Adj Sat Flow, veh/h/ln				1870	1870	1870	1870	1870	0	0	1870	1870
Adj Flow Rate, veh/h				38	0	249	27	125	0	0	635	49
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	0	0	2	2
Cap, veh/h				317	0	282	439	1288	0	0	1062	900
Arrive On Green				0.18	0.00	0.18	0.05	0.69	0.00	0.00	0.57	0.57
Sat Flow, veh/h				1781	0	1585	1781	1870	0	0	1870	1585
Grp Volume(v), veh/h				38	0	249	27	125	0	0	635	49
Grp Sat Flow(s),veh/h/ln				1781	0	1585	1781	1870	0	0	1870	1585
Q Serve(g_s), s				1.6	0.0	13.8	0.5	2.0	0.0	0.0	20.0	1.2
Cycle Q Clear(g_c), s				1.6	0.0	13.8	0.5	2.0	0.0	0.0	20.0	1.2
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				317	0	282	439	1288	0	0	1062	900
V/C Ratio(X)				0.12	0.00	0.88	0.06	0.10	0.00	0.00	0.60	0.05
Avail Cap(c_a), veh/h				356	0	317	539	1288	0	0	1062	900
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.94	0.94	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				31.1	0.0	36.1	8.6	4.7	0.0	0.0	12.7	8.7
Incr Delay (d2), s/veh				0.2	0.0	22.4	0.1	0.1	0.0	0.0	2.5	0.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				0.7	0.0	6.9	0.2	0.7	0.0	0.0	8.1	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				31.2	0.0	58.5	8.6	4.8	0.0	0.0	15.2	8.8
LnGrp LOS				C	A	E	A	A	A	A	B	A
Approach Vol, veh/h					287			152			684	
Approach Delay, s/veh					54.9			5.5			14.8	
Approach LOS					D			A			B	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		68.0			10.9	57.1		22.0				
Change Period (Y+Rc), s		6.0			6.0	6.0		6.0				
Max Green Setting (Gmax), s		60.0			10.0	44.0		18.0				
Max Q Clear Time (g_c+I1), s		4.0			2.5	22.0		15.8				
Green Ext Time (p_c), s		0.7			0.0	4.4		0.2				
Intersection Summary												
HCM 6th Ctrl Delay											23.8	
HCM 6th LOS											C	

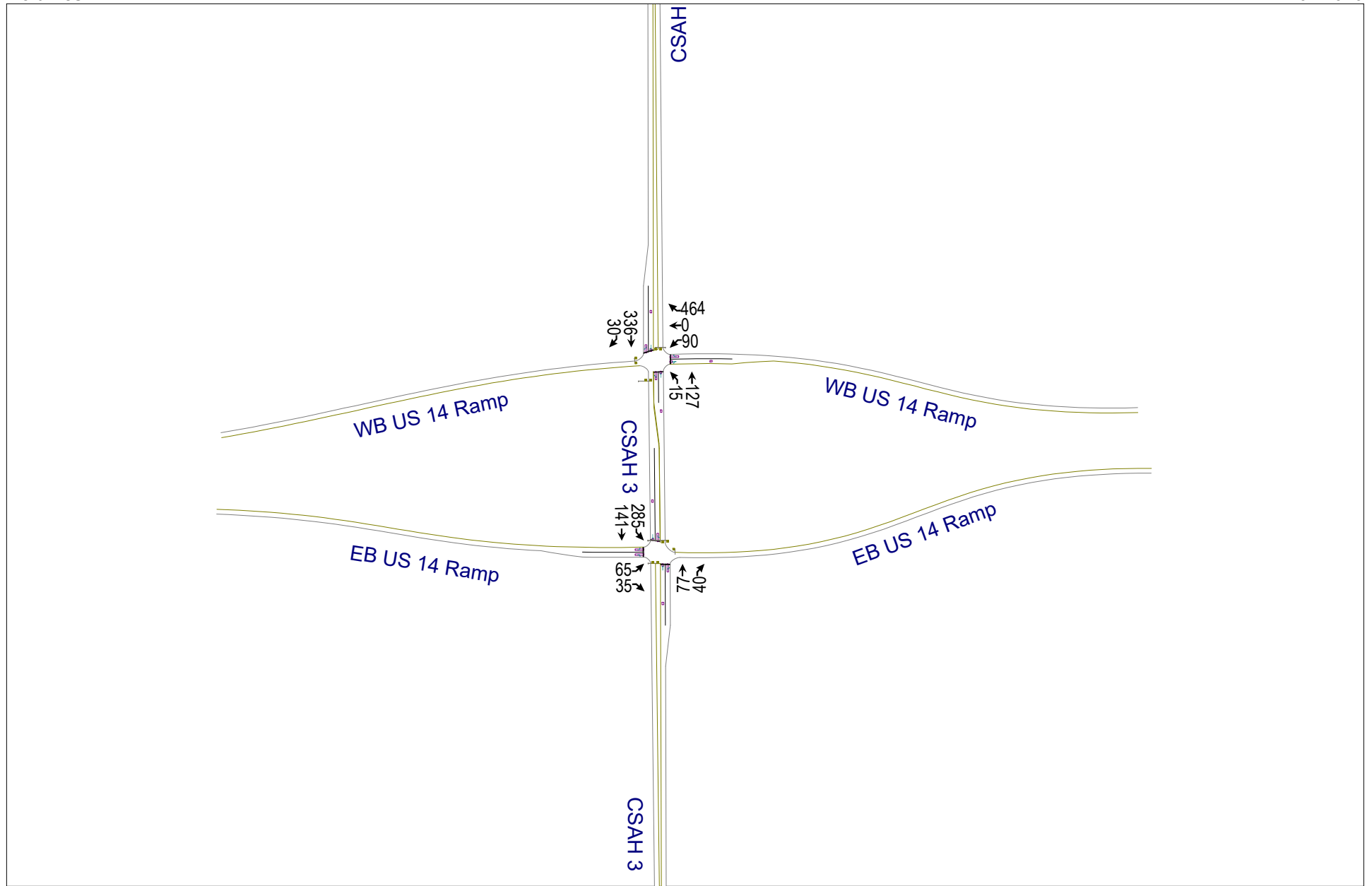


Traditional Diamond Alternative at CSAH 3
4: CSAH 3 & EB US 14 Ramp

AM Peak Hour
12/01/2020





















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	0	35	0	0	0	0	85	70	546	73	0
Future Volume (veh/h)	55	0	35	0	0	0	0	85	70	546	73	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1870	0	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	60	0	38				0	92	76	593	79	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	0	2				0	2	2	2	2	0
Cap, veh/h	181	0	161				0	207	176	1047	1431	0
Arrive On Green	0.10	0.00	0.10				0.00	0.11	0.11	0.98	1.00	0.00
Sat Flow, veh/h	1781	0	1585				0	1870	1585	1781	1870	0
Grp Volume(v), veh/h	60	0	38				0	92	76	593	79	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				0	1870	1585	1781	1870	0
Q Serve(g_s), s	2.8	0.0	2.0				0.0	4.1	4.0	1.3	0.0	0.0
Cycle Q Clear(g_c), s	2.8	0.0	2.0				0.0	4.1	4.0	1.3	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	181	0	161				0	207	176	1047	1431	0
V/C Ratio(X)	0.33	0.00	0.24				0.00	0.44	0.43	0.57	0.06	0.00
Avail Cap(c_a), veh/h	198	0	176				0	374	317	1047	1431	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.67	1.67	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.85	0.85	0.00
Uniform Delay (d), s/veh	37.6	0.0	37.2				0.0	37.4	37.4	0.4	0.0	0.0
Incr Delay (d2), s/veh	1.1	0.0	0.7				0.0	1.5	1.7	0.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	0.8				0.0	1.9	1.6	0.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.7	0.0	38.0				0.0	38.9	39.0	1.0	0.0	0.0
LnGrp LOS	D	A	D				A	D	D	A	A	A
Approach Vol, veh/h		98						168			672	
Approach Delay, s/veh		38.4						39.0			0.9	
Approach LOS		D						D			A	
Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	58.9	16.0				74.9		15.1				
Change Period (Y+Rc), s	6.0	6.0				6.0		6.0				
Max Green Setting (Gmax), s	44.0	18.0				68.0		10.0				
Max Q Clear Time (g_c+I1), s	3.3	6.1				2.0		4.8				
Green Ext Time (p_c), s	2.1	0.5				0.4		0.1				
Intersection Summary												
HCM 6th Ctrl Delay			11.6									
HCM 6th LOS			B									



Traditional Diamond Alternative at CSAH 3
1: CSAH 3 & WB US 14 Ramp

PM Peak Hour
12/01/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	90	0	464	15	127	0	0	336	30
Future Volume (veh/h)	0	0	0	90	0	464	15	127	0	0	336	30
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No			No		
Adj Sat Flow, veh/h/ln				1870	1870	1870	1870	1870	0	0	1870	1870
Adj Flow Rate, veh/h				98	0	504	16	138	0	0	365	33
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	0	0	2	2
Cap, veh/h				574	0	511	447	1018	0	0	825	699
Arrive On Green				0.32	0.00	0.32	0.04	0.54	0.00	0.00	0.44	0.44
Sat Flow, veh/h				1781	0	1585	1781	1870	0	0	1870	1585
Grp Volume(v), veh/h				98	0	504	16	138	0	0	365	33
Grp Sat Flow(s),veh/h/ln				1781	0	1585	1781	1870	0	0	1870	1585
Q Serve(g_s), s				3.6	0.0	28.4	0.4	3.3	0.0	0.0	12.2	1.1
Cycle Q Clear(g_c), s				3.6	0.0	28.4	0.4	3.3	0.0	0.0	12.2	1.1
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				574	0	511	447	1018	0	0	825	699
V/C Ratio(X)				0.17	0.00	0.99	0.04	0.14	0.00	0.00	0.44	0.05
Avail Cap(c_a), veh/h				574	0	511	579	1018	0	0	825	699
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.94	0.94	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				21.9	0.0	30.3	12.5	10.1	0.0	0.0	17.5	14.4
Incr Delay (d2), s/veh				0.1	0.0	36.3	0.0	0.3	0.0	0.0	1.7	0.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.5	0.0	15.4	0.2	1.3	0.0	0.0	5.3	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				22.0	0.0	66.6	12.5	10.3	0.0	0.0	19.2	14.5
LnGrp LOS				C	A	E	B	B	A	A	B	B
Approach Vol, veh/h					602			154			398	
Approach Delay, s/veh					59.3			10.6			18.8	
Approach LOS					E			B			B	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		55.0			9.3	45.7		35.0				
Change Period (Y+Rc), s		6.0			6.0	6.0		6.0				
Max Green Setting (Gmax), s		49.0			10.0	33.0		29.0				
Max Q Clear Time (g_c+I1), s		5.3			2.4	14.2		30.4				
Green Ext Time (p_c), s		0.8			0.0	2.1		0.0				
Intersection Summary												
HCM 6th Ctrl Delay											38.8	
HCM 6th LOS											D	

Traditional Diamond Alternative at CSAH 3
4: CSAH 3 & EB US 14 Ramp

PM Peak Hour
12/01/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	0	35	0	0	0	0	77	40	285	141	0
Future Volume (veh/h)	65	0	35	0	0	0	0	77	40	285	141	0
Initial Q (Qb), veh	0	0	0					0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00					1.00	1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00					1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1870	0	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	71	0	38				0	84	43	310	153	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	0	2				0	2	2	2	2	0
Cap, veh/h	185	0	165				0	208	176	1042	1427	0
Arrive On Green	0.10	0.00	0.10				0.00	0.11	0.11	0.98	1.00	0.00
Sat Flow, veh/h	1781	0	1585				0	1870	1585	1781	1870	0
Grp Volume(v), veh/h	71	0	38				0	84	43	310	153	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				0	1870	1585	1781	1870	0
Q Serve(g_s), s	3.3	0.0	2.0				0.0	3.8	2.2	0.5	0.0	0.0
Cycle Q Clear(g_c), s	3.3	0.0	2.0				0.0	3.8	2.2	0.5	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	185	0	165				0	208	176	1042	1427	0
V/C Ratio(X)	0.38	0.00	0.23				0.00	0.40	0.24	0.30	0.11	0.00
Avail Cap(c_a), veh/h	396	0	352				0	416	352	1042	1427	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.67	1.67	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.97	0.97	0.00
Uniform Delay (d), s/veh	37.6	0.0	37.0				0.0	37.2	36.6	0.4	0.0	0.0
Incr Delay (d2), s/veh	1.3	0.0	0.7				0.0	1.3	0.7	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	0.8				0.0	1.8	0.9	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.9	0.0	37.7				0.0	38.5	37.3	0.6	0.0	0.0
LnGrp LOS	D	A	D				A	D	D	A	A	A
Approach Vol, veh/h		109						127			463	
Approach Delay, s/veh		38.5						38.1			0.4	
Approach LOS		D						D			A	
Timer - Assigned Phs	1	2				6		8				
Phs Duration (G+Y+Rc), s	58.7	16.0				74.7		15.3				
Change Period (Y+Rc), s	6.0	6.0				6.0		6.0				
Max Green Setting (Gmax), s	32.0	20.0				58.0		20.0				
Max Q Clear Time (g_c+I1), s	2.5	5.8				2.0		5.3				
Green Ext Time (p_c), s	0.9	0.4				0.9		0.2				
Intersection Summary												
HCM 6th Ctrl Delay			13.2									
HCM 6th LOS			B									