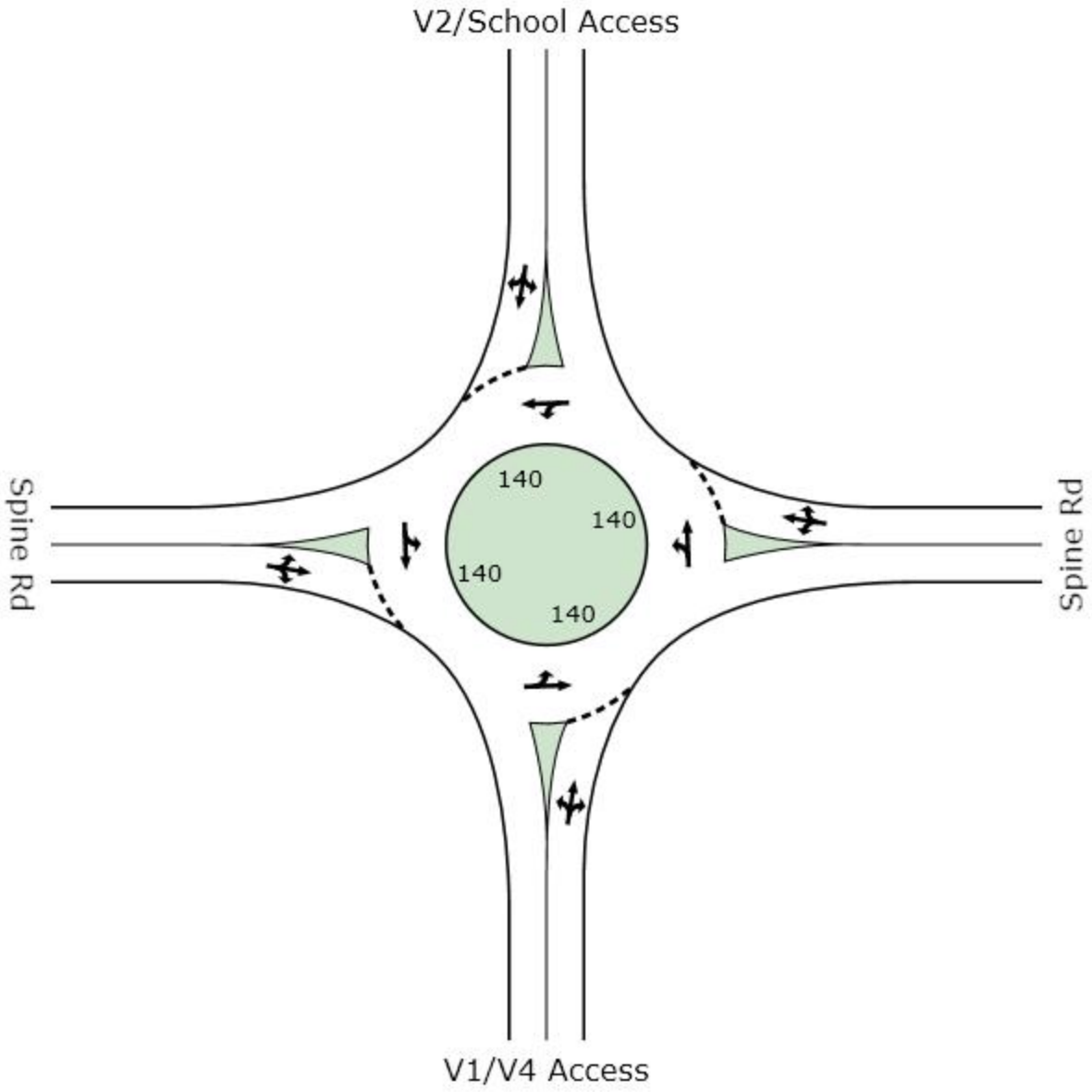


**TRACY HILLS SPECIFIC PLAN
DRAFT SUBSEQUENT ENVIRONMENTAL IMPACT REPORT
VOLUME II
DECEMBER 2014**

**APPENDIX H-5
INTERCHANGE ROUNDABOUT ANALYSIS (SIDRA), DATED FALL
2014**



MOVEMENT SUMMARY

Site: Intersection 6 No Connection
AM

New Site
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: V1/V4 Access											
3	L	8	1.0	0.174	17.6	LOS B	1.1	26.9	0.77	0.90	28.2
8	T	42	1.0	0.174	9.3	LOS A	1.1	26.9	0.77	0.76	30.8
18	R	61	1.0	0.174	10.6	LOS B	1.1	26.9	0.77	0.79	30.7
Approach		110	1.0	0.174	10.6	LOS B	1.1	26.9	0.77	0.78	30.6
East: Spine Rd											
1	L	45	1.0	0.261	13.4	LOS B	1.6	39.8	0.42	0.84	30.2
6	T	214	1.0	0.261	5.1	LOS A	1.6	39.8	0.42	0.45	33.0
16	R	32	1.0	0.261	6.4	LOS A	1.6	39.8	0.42	0.54	32.6
Approach		291	1.0	0.261	6.5	LOS A	1.6	39.8	0.42	0.52	32.5
North: V2/School Access											
7	L	152	1.0	0.184	13.9	LOS B	1.0	26.1	0.48	0.72	29.1
4	T	10	1.0	0.184	5.6	LOS A	1.0	26.1	0.48	0.48	32.0
14	R	24	1.0	0.184	6.9	LOS A	1.0	26.1	0.48	0.54	31.7
Approach		186	1.0	0.184	12.5	LOS B	1.0	26.1	0.48	0.68	29.5
West: Spine Rd											
5	L	128	1.0	0.530	14.0	LOS B	4.2	106.5	0.58	0.82	30.0
2	T	468	1.0	0.530	5.7	LOS A	4.2	106.5	0.58	0.51	32.0
12	R	2	1.0	0.530	7.0	LOS A	4.2	106.5	0.58	0.60	31.9
Approach		599	1.0	0.530	7.5	LOS A	4.2	106.5	0.58	0.58	31.5
All Vehicles		1186	1.0	0.530	8.4	LOS A	4.2	106.5	0.54	0.60	31.3

Level of Service (LOS) Method: Delay (HCM 2000).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay per movement

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model used.

Processed: Friday, February 21, 2014 2:57:14 PM

SIDRA INTERSECTION 5.1.5.2006

Project: K:\SJC_LDEV\Tracy Hills SP\Traffic\Tentative Map Review\Spine Rd Analysis\Sidra\2.21 Update

\Intersection 6 - update.sip

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MOVEMENT SUMMARY

Site: Intersection 6 No Connection
PM

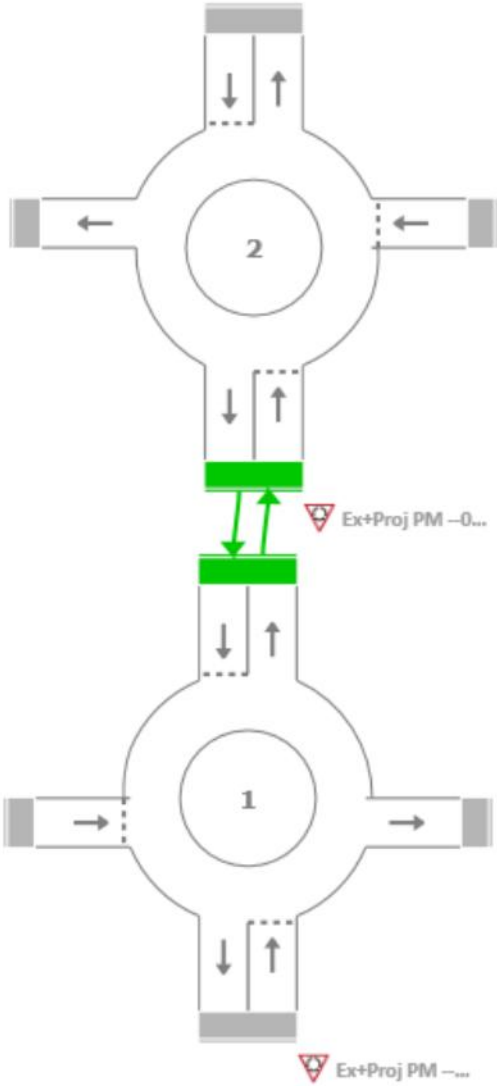
New Site
Roundabout

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: V1/V4 Access											
3	L	5	1.0	0.125	16.0	LOS B	0.7	18.3	0.68	0.84	28.7
8	T	6	1.0	0.125	7.7	LOS A	0.7	18.3	0.68	0.66	31.1
18	R	80	1.0	0.125	9.1	LOS A	0.7	18.3	0.68	0.70	31.1
Approach		92	1.0	0.125	9.4	LOS A	0.7	18.3	0.68	0.71	31.0
East: Spine Rd											
1	L	142	1.0	0.636	12.5	LOS B	7.0	177.0	0.23	0.84	30.2
6	T	752	1.0	0.636	4.2	LOS A	7.0	177.0	0.23	0.33	34.3
16	R	98	1.0	0.636	5.6	LOS A	7.0	177.0	0.23	0.44	33.5
Approach		993	1.0	0.636	5.6	LOS A	7.0	177.0	0.23	0.42	33.5
North: V2/School Access											
7	L	52	1.0	0.172	19.5	LOS B	1.0	26.3	0.80	0.89	26.8
4	T	12	1.0	0.172	11.2	LOS B	1.0	26.3	0.80	0.79	29.1
14	R	36	1.0	0.172	12.6	LOS B	1.0	26.3	0.80	0.81	28.9
Approach		100	1.0	0.172	16.0	LOS B	1.0	26.3	0.80	0.85	27.7
West: Spine Rd											
5	L	14	1.0	0.491	14.0	LOS B	3.6	91.9	0.54	0.87	30.2
2	T	537	1.0	0.491	5.7	LOS A	3.6	91.9	0.54	0.50	32.5
12	R	4	1.0	0.491	7.0	LOS A	3.6	91.9	0.54	0.59	32.3
Approach		555	1.0	0.491	5.9	LOS A	3.6	91.9	0.54	0.51	32.4
All Vehicles		1740	1.0	0.636	6.5	LOS A	7.0	177.0	0.39	0.49	32.6

Level of Service (LOS) Method: Delay (HCM 2000).
 Roundabout LOS Method: Same as Signalised Intersections.
 Vehicle movement LOS values are based on average delay per movement
 Intersection and Approach LOS values are based on average delay for all vehicle movements.
 Roundabout Capacity Model: SIDRA Standard.
 SIDRA Standard Delay Model used.

NETWORK LAYOUT

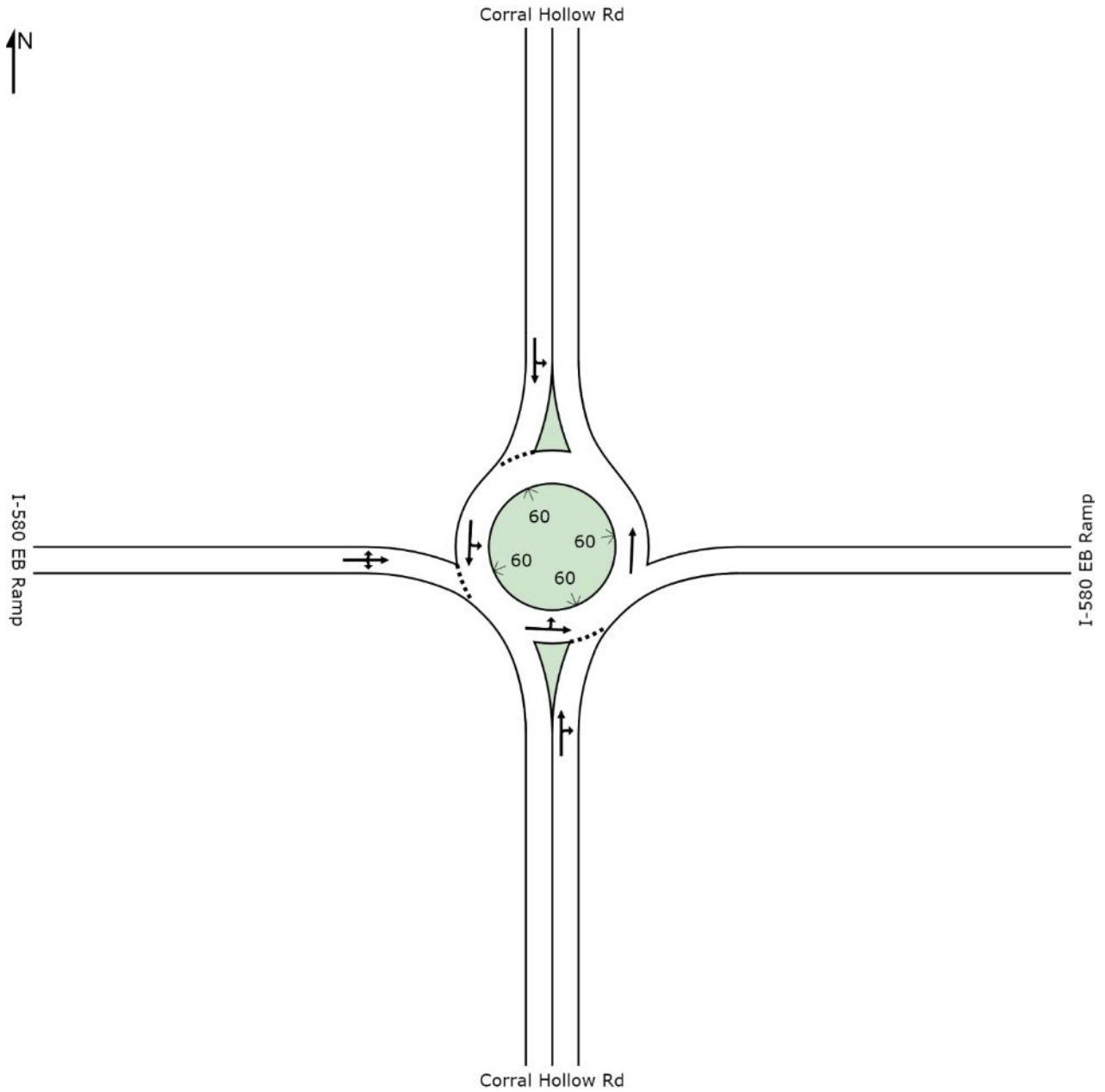
☉☉ Network: Ex+Proj PM - Corral Hollow/I-580 Interchange



SITE LAYOUT

Site: Ex+Proj PM -- 01 Corral Hollow/I-580 EB Ramps

Roundabout



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SIDRA INTERSECTION 6.0.18.4502

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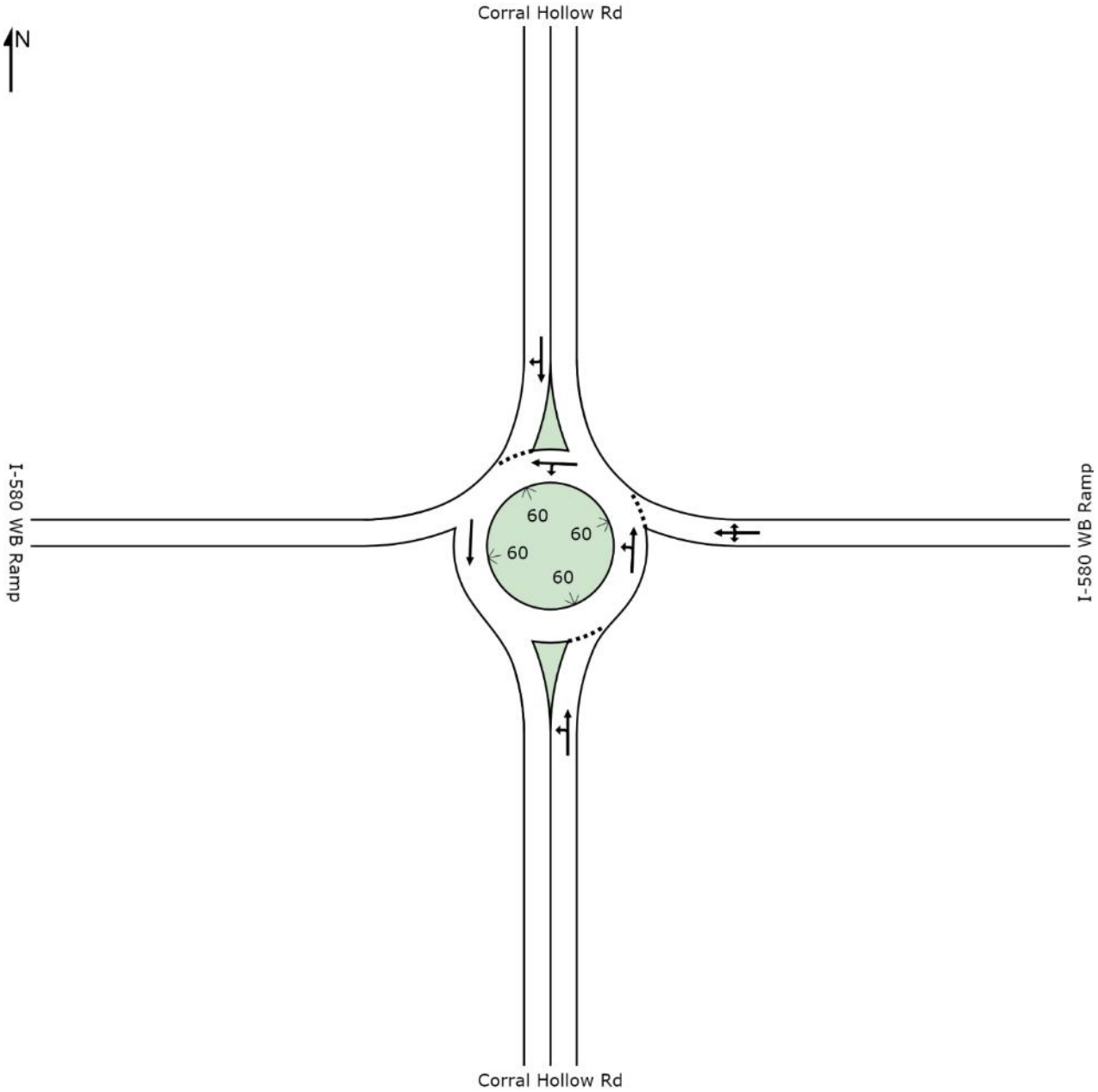
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8000965, KIMLEY-HORN & ASSOCIATES INC, NETWORK / Enterprise

SIDRA
INTERSECTION 6

SITE LAYOUT

Site: Ex+Proj PM --02 Corral Hollow/I-580 WB Ramps

Roundabout



NETWORK SUMMARY

Network: Ex+Proj PM - Corral Hollow/I-580 Interchange

New Network

Network Performance - Hourly Values				
Performance Measure	Vehicles	Per Unit Distance	Percent	Persons
Network Level of Service (LOS)	LOS F			
Travel Time Index	0.00			
Speed Efficiency	0.09			
Congestion Coefficient	10.56			
Travel Speed	3.8 mph			3.8 mph
Travel Distance (Total)	1710.1 veh-mi/h			2052.2 pers-mi/h
Travel Time (Total)	451.6 veh-h/h			542.0 pers-h/h
Travel Distance (Average)	1783 ft			1590 ft
Travel Time (Average)	321.1 sec	950.7 sec/mi		286.4 sec
Idling Time (Average)	206.7 sec	612.1 sec/mi	64.39 %	
Running Time (Average)	114.3 sec	338.6 sec/mi	35.61 %	
Desired Speed	40.0 mph			
Desired Trip Time	30.4 sec	90.0 sec/mi		
Travel Delay	290.7 sec	860.7 sec/mi	90.53 %	
Demand Flows (Total)	5677 veh/h			6813 pers/h
Arrival Flows (Total)	5064 veh/h			6813 pers/h
Percent Heavy Vehicles (Demand)	3.0 %			
Percent Heavy Vehicles (Arrival)	3.4 %			
Degree of Saturation	2.230			
Control Delay (Total)	408.85 veh-h/h			490.62 pers-h/h
Control Delay (Average)	290.6 sec			259.3 sec
Control Delay (Worst Lane)	583.1 sec			
Control Delay (Worst Movement)	586.0 sec			586.0 sec
Geometric Delay (Average)	6.6 sec			
Stop-Line Delay (Average)	251.7 sec			
Queue Storage Ratio (Worst Lane)	4.48			
Total Effective Stops	18259 veh/h			21911 pers/h
Effective Stop Rate	3.61 per veh	10.7 per mi		3.22 per pers
Proportion Queued	0.69			0.69
Performance Index	1692.0			1692.0
Cost (Total)	6519.15 \$/h	3.81 \$/mi		6519.15 \$/h
Fuel Consumption (Total)	169.3 gal/h	0.099 gal/mi		
Fuel Economy	10.1 mpg			
Carbon Dioxide (Total)	1511.7 kg/h	884.0 g/mi		
Hydrocarbons (Total)	1.116 kg/h	0.653 g/mi		
Carbon Monoxide (Total)	5.363 kg/h	3.136 g/mi		
NOx (Total)	1.270 kg/h	0.743 g/mi		

Network Model Accuracy Level (variations in lane degrees of saturation): -0.8 % to 0.9 %

Number of Iterations: 5

Network Level of Service (LOS) Method: HCM 2010.

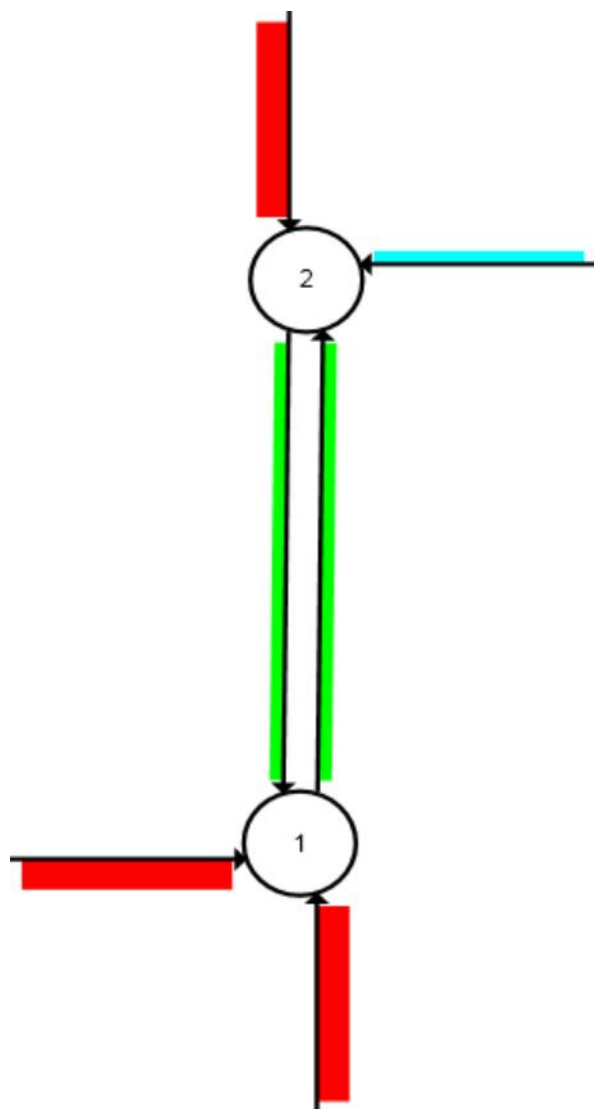
Model used: US HCM (Customary).

Network Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	2,725,044 veh/y	3,270,052 pers/y
Delay	196,248 veh-h/y	235,498 pers-h/y
Effective Stops	8,764,547 veh/y	10,517,460 pers/y
Travel Distance	820,866 veh-mi/y	985,039 pers-mi/y
Travel Time	216,781 veh-h/y	260,137 pers-h/y
Cost	3,129,194 \$/y	3,129,194 \$/y
Fuel Consumption	81,277 gal/y	
Carbon Dioxide	725,631 kg/y	
Hydrocarbons	536 kg/y	
Carbon Monoxide	2,574 kg/y	
NOx	610 kg/y	

SITE LEVEL OF SERVICE

Approach Level of Service for Network Sites

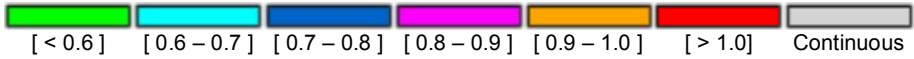
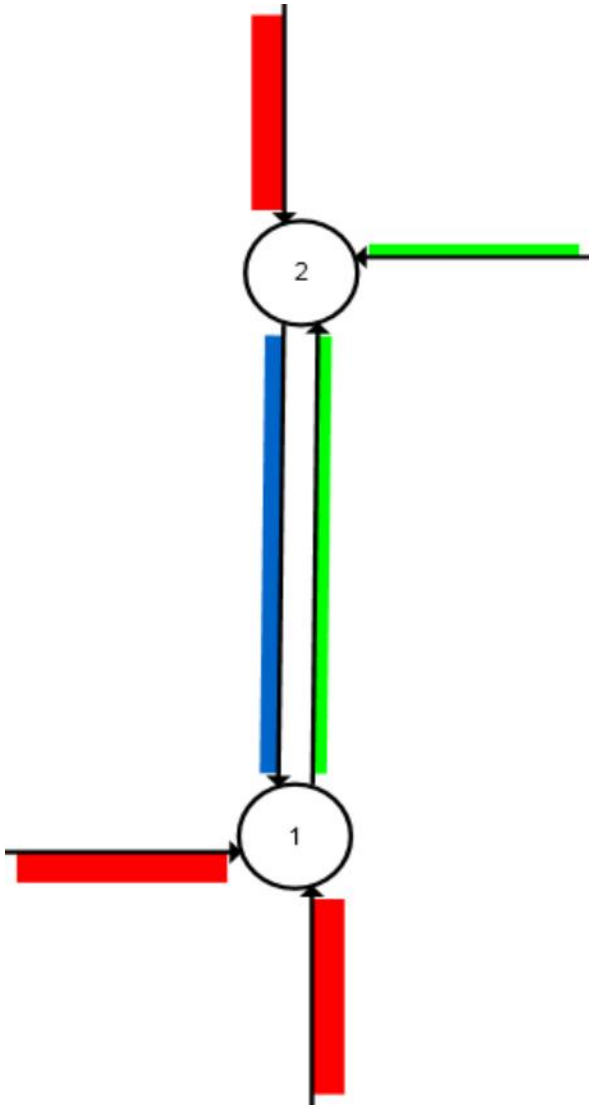
Network: Ex+Proj PM - Corral Hollow/I-580 Interchange



DEGREE OF SATURATION

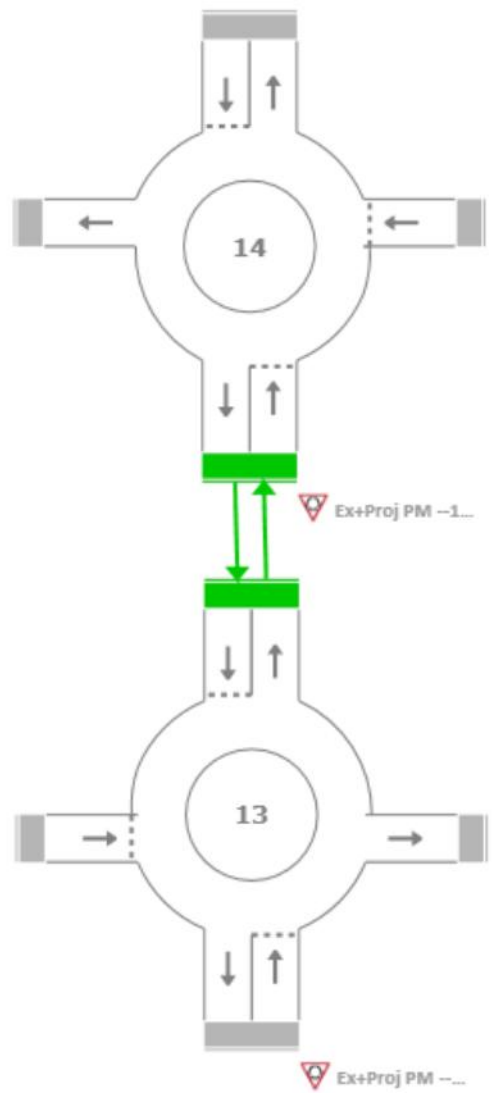
Ratio of Demand Volume to Capacity (v/c ratio)

Network: Ex+Proj PM - Corral Hollow/I-580 Interchange



NETWORK LAYOUT

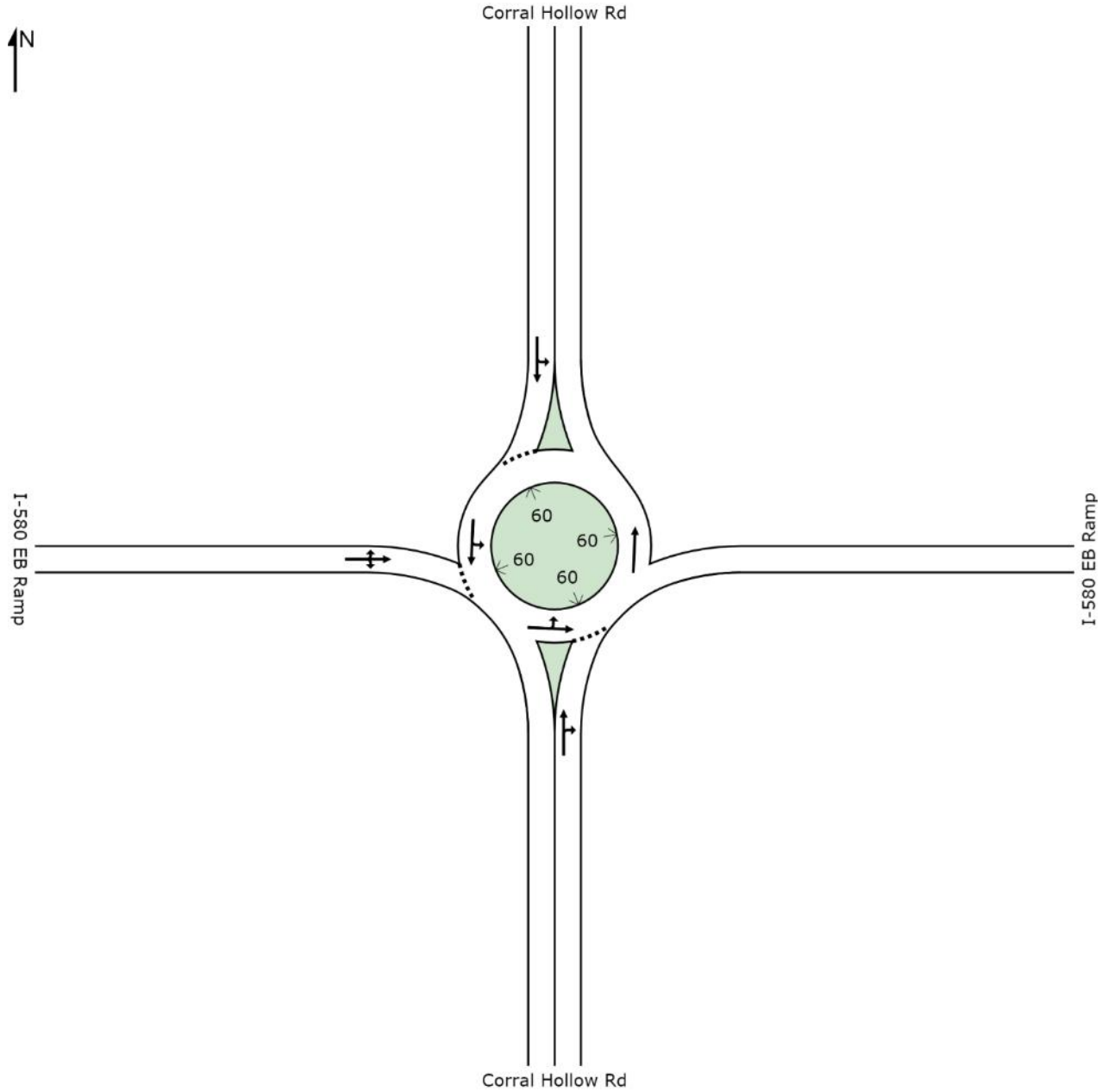
Network: Ex+Proj PM - Mtn House/I-580 Interchange



SITE LAYOUT

Site: Ex+Proj PM -- 13 Mtn House/I-580 EB Ramps

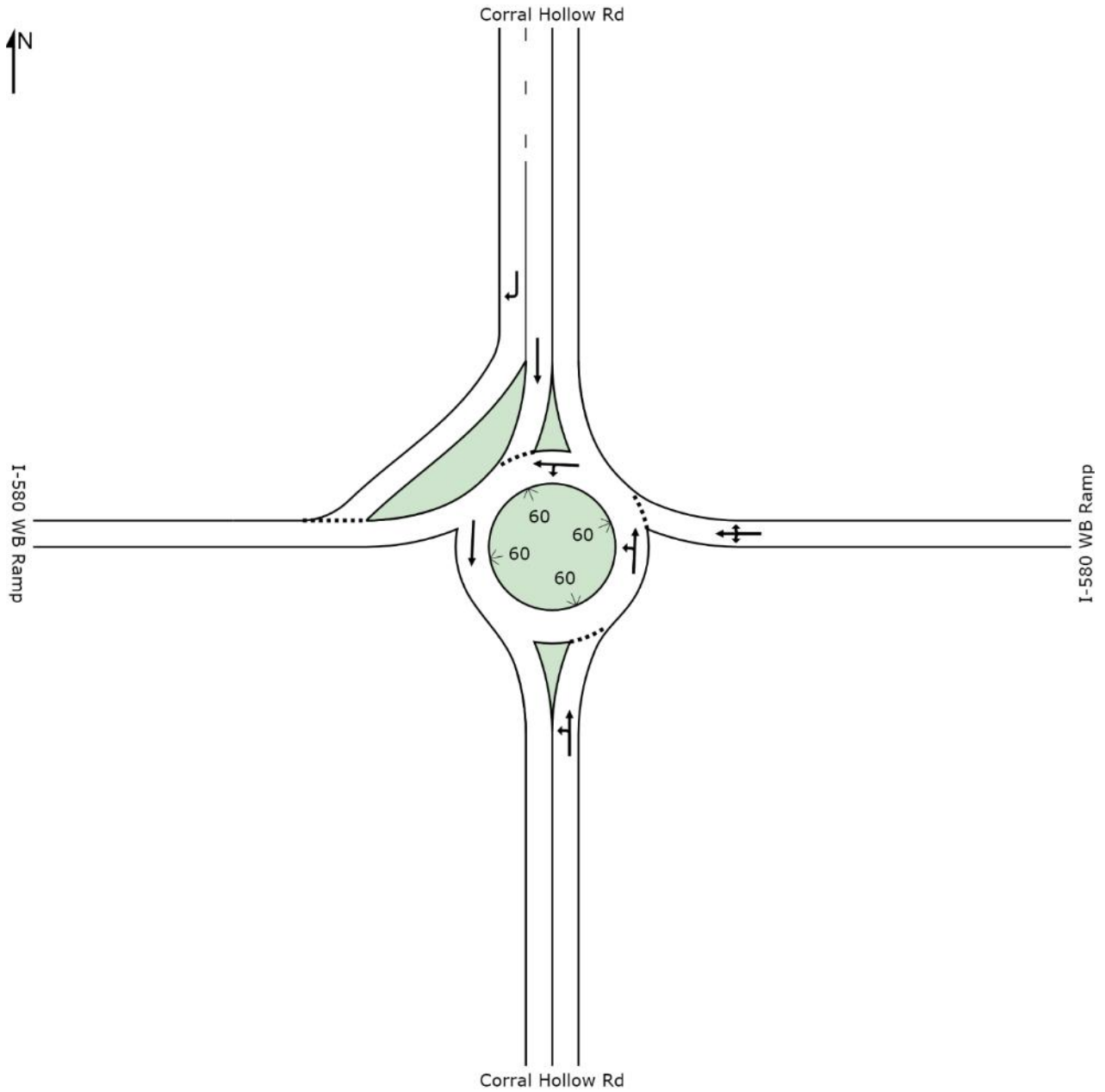
Roundabout



SITE LAYOUT

Site: Ex+Proj PM --14 Mtn House/I-580 WB Ramps

Roundabout



NETWORK SUMMARY

Network: Ex+Proj PM - Mtn House/I-580 Interchange

New Network

Network Performance - Hourly Values				
Performance Measure	Vehicles	Per Unit Distance	Percent	Persons
Network Level of Service (LOS)	LOS D			
Travel Time Index	3.59			
Speed Efficiency	0.42			
Congestion Coefficient	2.36			
Travel Speed	16.9 mph			16.9 mph
Travel Distance (Total)	946.3 veh-mi/h			1135.5 pers-mi/h
Travel Time (Total)	55.9 veh-h/h			67.0 pers-h/h
Travel Distance (Average)	1534 ft			1495 ft
Travel Time (Average)	61.8 sec	212.5 sec/mi		60.2 sec
Idling Time (Average)	18.5 sec	63.7 sec/mi	29.97 %	
Running Time (Average)	43.2 sec	148.8 sec/mi	70.03 %	
Desired Speed	40.0 mph			
Desired Trip Time	26.2 sec	90.0 sec/mi		
Travel Delay	35.6 sec	122.5 sec/mi	57.65 %	
Demand Flows (Total)	3342 veh/h			4011 pers/h
Arrival Flows (Total)	3256 veh/h			4011 pers/h
Percent Heavy Vehicles (Demand)	3.0 %			
Percent Heavy Vehicles (Arrival)	3.1 %			
Degree of Saturation	1.202			
Control Delay (Total)	31.92 veh-h/h			38.31 pers-h/h
Control Delay (Average)	35.3 sec			34.4 sec
Control Delay (Worst Lane)	119.3 sec			
Control Delay (Worst Movement)	119.8 sec			119.8 sec
Geometric Delay (Average)	7.3 sec			
Stop-Line Delay (Average)	27.8 sec			
Queue Storage Ratio (Worst Lane)	1.30			
Total Effective Stops	3623 veh/h			4348 pers/h
Effective Stop Rate	1.11 per veh	3.8 per mi		1.08 per pers
Proportion Queued	0.40			0.40
Performance Index	190.2			190.2
Cost (Total)	866.35 \$/h	0.92 \$/mi		866.35 \$/h
Fuel Consumption (Total)	29.0 gal/h	0.031 gal/mi		
Fuel Economy	32.7 mpg			
Carbon Dioxide (Total)	258.6 kg/h	273.2 g/mi		
Hydrocarbons (Total)	0.139 kg/h	0.147 g/mi		
Carbon Monoxide (Total)	0.893 kg/h	0.943 g/mi		
NOx (Total)	0.335 kg/h	0.354 g/mi		

Network Model Accuracy Level (variations in lane degrees of saturation): 0.0 % to 0.0 %

Number of Iterations: 2

Network Level of Service (LOS) Method: HCM 2010.

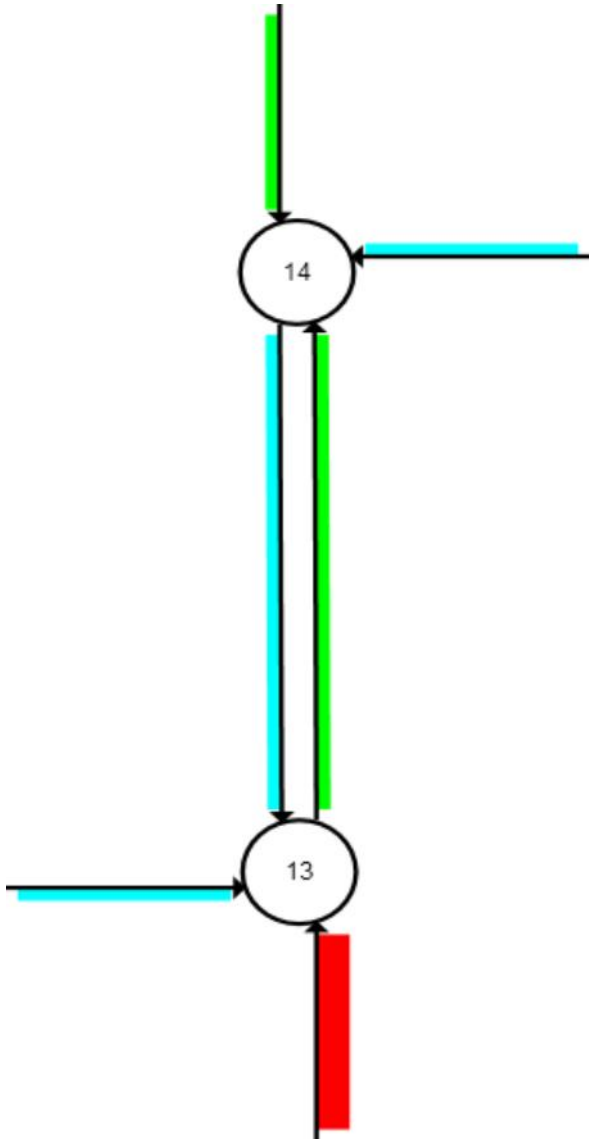
Model used: US HCM (Customary).

Network Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	1,604,348 veh/y	1,925,217 pers/y
Delay	15,322 veh-h/y	18,386 pers-h/y
Effective Stops	1,739,069 veh/y	2,086,883 pers/y
Travel Distance	454,212 veh-mi/y	545,054 pers-mi/y
Travel Time	26,810 veh-h/y	32,173 pers-h/y
Cost	415,849 \$/y	415,849 \$/y
Fuel Consumption	13,902 gal/y	
Carbon Dioxide	124,110 kg/y	
Hydrocarbons	67 kg/y	
Carbon Monoxide	428 kg/y	
NOx	161 kg/y	

SITE LEVEL OF SERVICE

Approach Level of Service for Network Sites

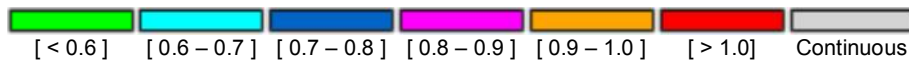
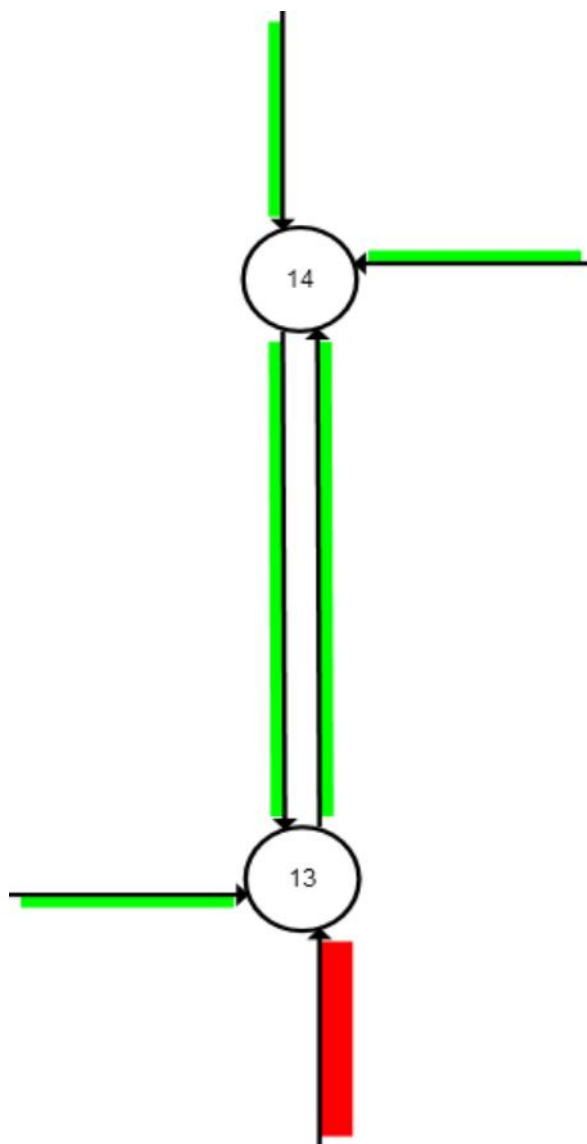
Network: Ex+Proj PM - Mtn House/I-580 Interchange



DEGREE OF SATURATION

Ratio of Demand Volume to Capacity (v/c ratio)

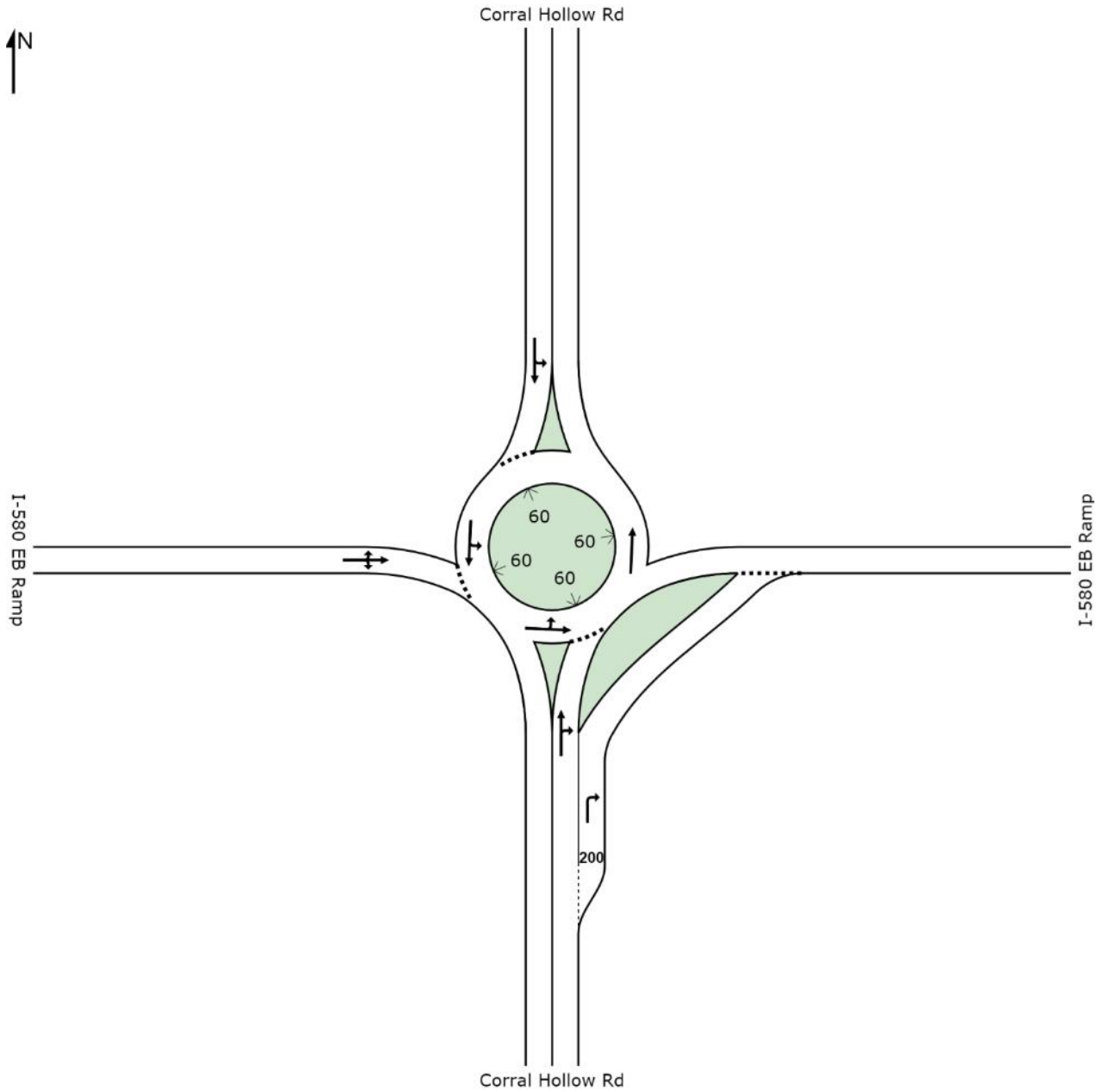
Network: Ex+Proj PM - Mtn House/I-580 Interchange



SITE LAYOUT

 Site: Ex+Proj PM -- Modified 13 Mtn House/I-580 EB Ramps

Modified Intersection 13
Roundabout



NETWORK SUMMARY

Network: Existing+Proj PM - 13 Modified

Network Performance - Hourly Values				
Performance Measure	Vehicles	Per Unit Distance	Percent	Persons
Network Level of Service (LOS)	LOS B			
Travel Time Index	6.71			
Speed Efficiency	0.70			
Congestion Coefficient	1.42			
Travel Speed	28.1 mph			28.1 mph
Travel Distance (Total)	959.5 veh-mi/h			1151.4 pers-mi/h
Travel Time (Total)	34.1 veh-h/h			40.9 pers-h/h
Travel Distance (Average)	1516 ft			1516 ft
Travel Time (Average)	36.7 sec	127.9 sec/mi		36.7 sec
Idling Time (Average)	0.8 sec	2.7 sec/mi	2.12 %	
Running Time (Average)	35.9 sec	125.2 sec/mi	97.88 %	
Desired Speed	40.0 mph			
Desired Trip Time	25.8 sec	90.0 sec/mi		
Travel Delay	10.9 sec	37.9 sec/mi	29.63 %	
Demand Flows (Total)	3342 veh/h			4011 pers/h
Arrival Flows (Total)	3342 veh/h			4011 pers/h
Percent Heavy Vehicles (Demand)	3.0 %			
Percent Heavy Vehicles (Arrival)	3.0 %			
Degree of Saturation	0.777			
Control Delay (Total)	9.80 veh-h/h			11.76 pers-h/h
Control Delay (Average)	10.6 sec			10.6 sec
Control Delay (Worst Lane)	18.0 sec			
Control Delay (Worst Movement)	20.1 sec			20.1 sec
Geometric Delay (Average)	7.4 sec			
Stop-Line Delay (Average)	3.1 sec			
Queue Storage Ratio (Worst Lane)	0.23			
Total Effective Stops	2325 veh/h			2790 pers/h
Effective Stop Rate	0.70 per veh	2.4 per mi		0.70 per pers
Proportion Queued	0.37			0.37
Performance Index	75.9			75.9
Cost (Total)	556.07 \$/h	0.58 \$/mi		556.07 \$/h
Fuel Consumption (Total)	21.7 gal/h	0.023 gal/mi		
Fuel Economy	44.2 mpg			
Carbon Dioxide (Total)	193.9 kg/h	202.1 g/mi		
Hydrocarbons (Total)	0.085 kg/h	0.088 g/mi		
Carbon Monoxide (Total)	0.660 kg/h	0.688 g/mi		
NOx (Total)	0.294 kg/h	0.306 g/mi		

Network Model Accuracy Level (variations in lane degrees of saturation): 0.0 % to 0.0 %

Number of Iterations: 2

Network Level of Service (LOS) Method: HCM 2010.

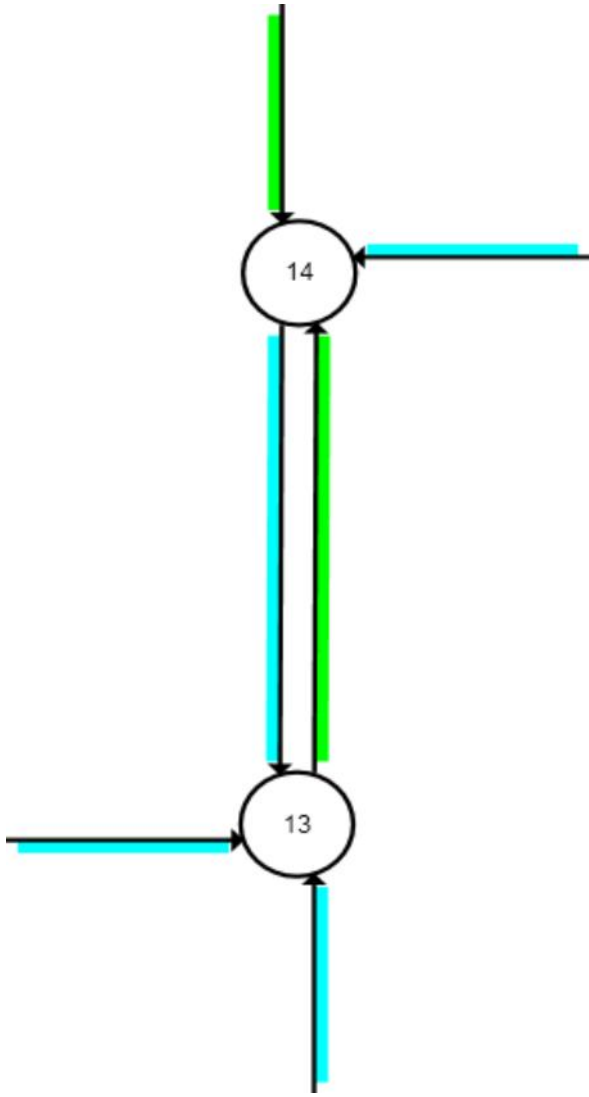
Model used: US HCM (Customary).

Network Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	1,604,348 veh/y	1,925,217 pers/y
Delay	4,706 veh-h/y	5,647 pers-h/y
Effective Stops	1,115,927 veh/y	1,339,113 pers/y
Travel Distance	460,545 veh-mi/y	552,654 pers-mi/y
Travel Time	16,361 veh-h/y	19,634 pers-h/y
Cost	266,915 \$/y	266,915 \$/y
Fuel Consumption	10,427 gal/y	
Carbon Dioxide	93,090 kg/y	
Hydrocarbons	41 kg/y	
Carbon Monoxide	317 kg/y	
NOx	141 kg/y	

SITE LEVEL OF SERVICE

Approach Level of Service for Network Sites

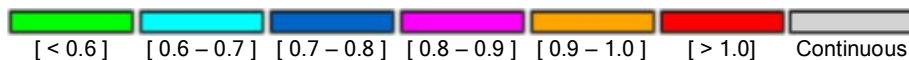
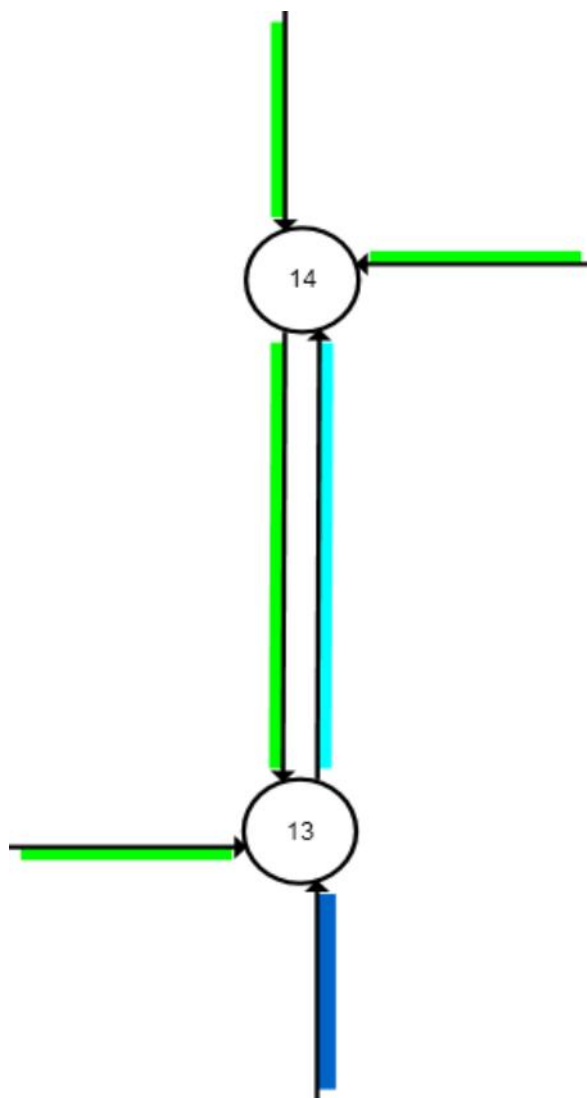
Network: Existing+Proj PM - 13 Modified



DEGREE OF SATURATION

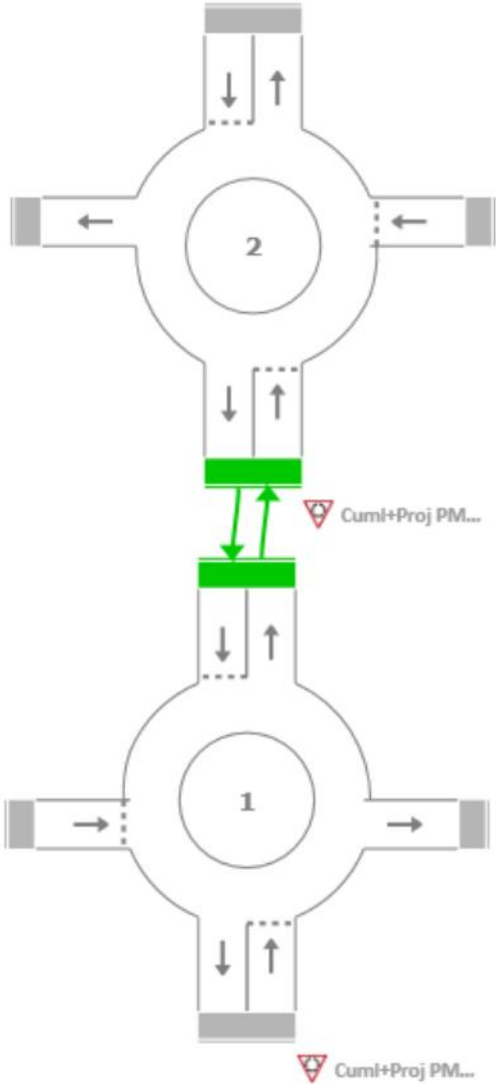
Ratio of Demand Volume to Capacity (v/c ratio)

Network: Existing+Proj PM - 13 Modified



NETWORK LAYOUT

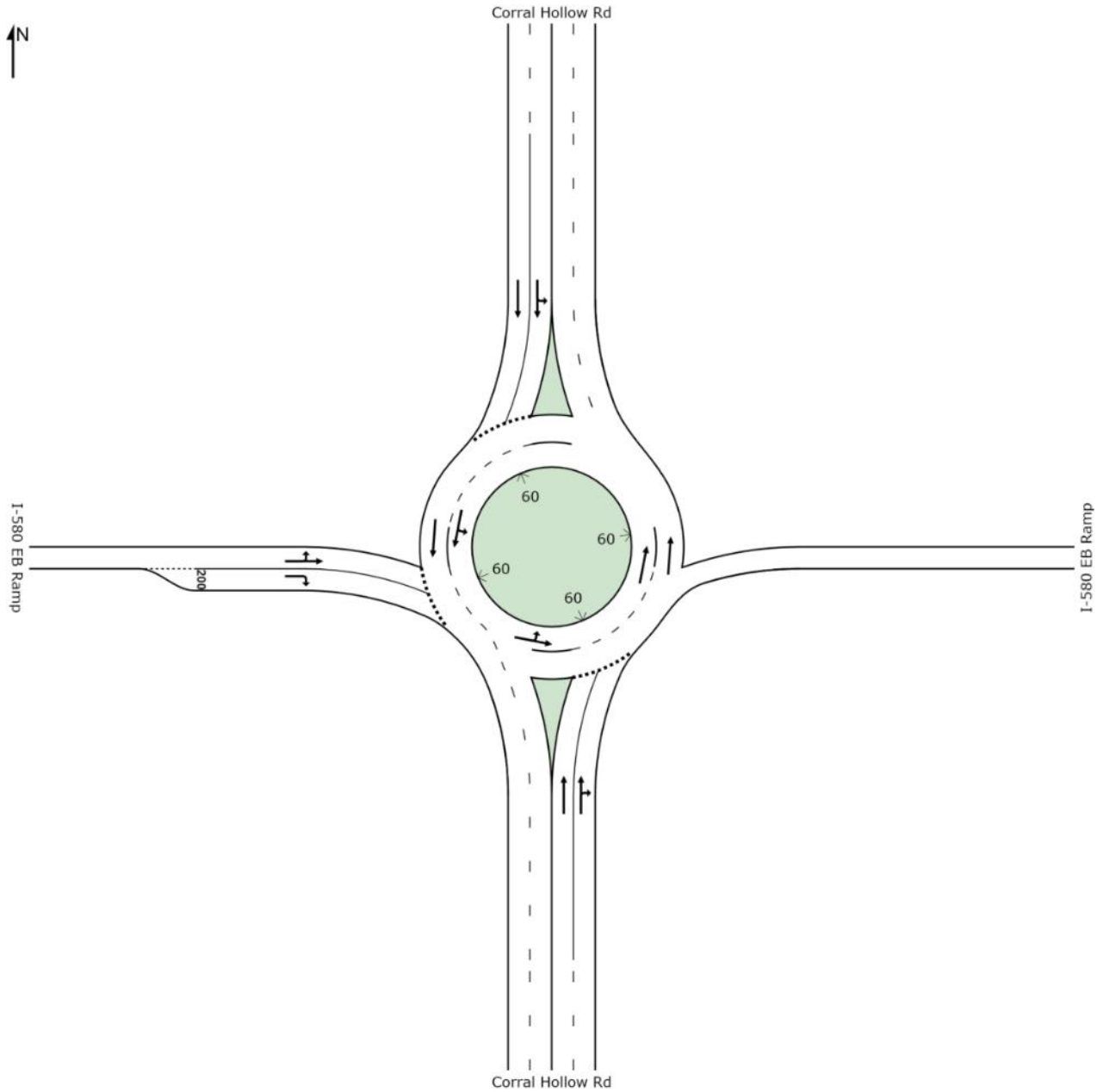
☉☉ Network: Cuml+Proj PM - Corral Hollow/I-580 Interchange



SITE LAYOUT

 Site: Cuml+Proj PM -- 01 Corral Hollow/I-580 EB Ramps

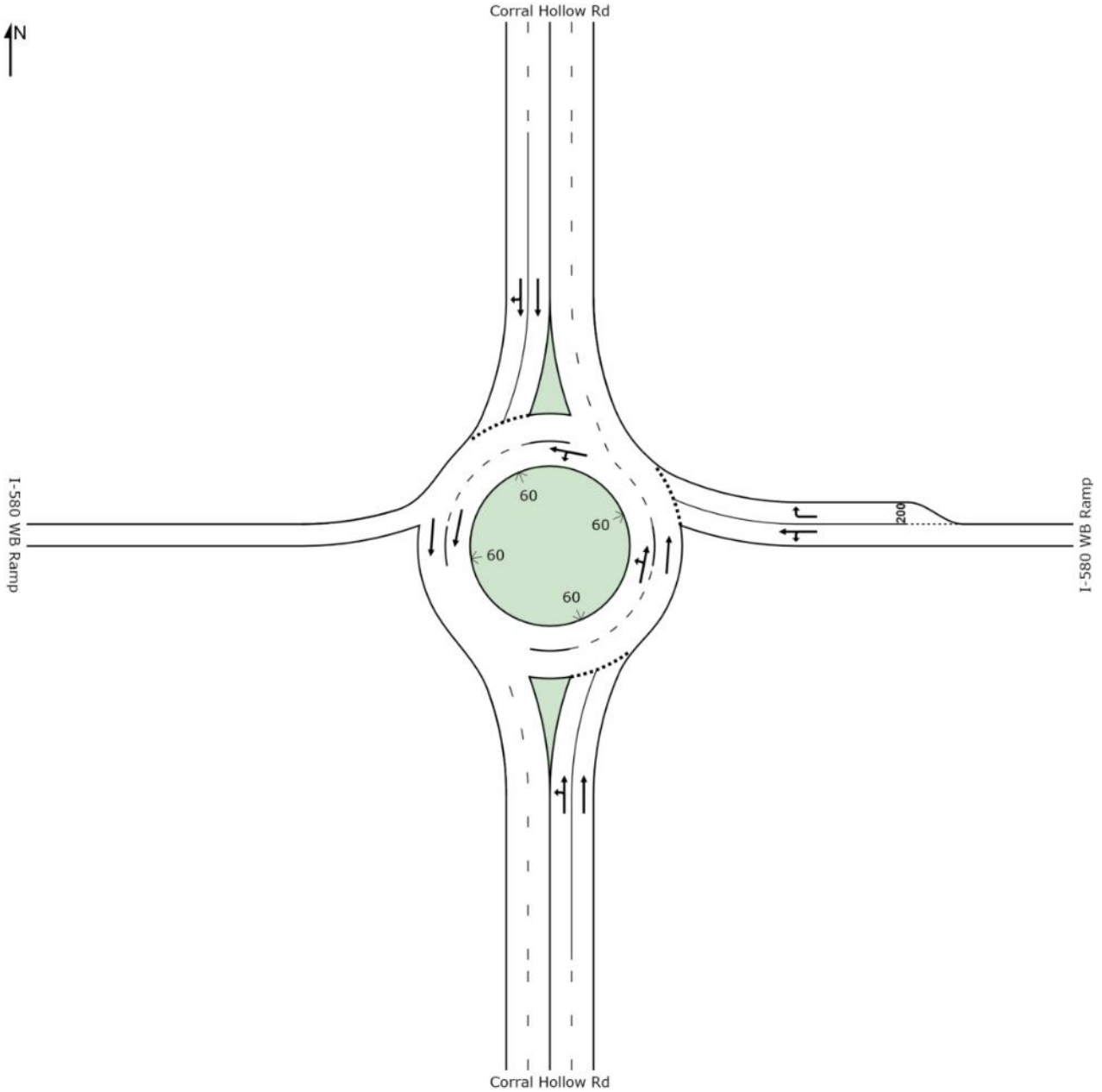
Cuml+Proj PM Corral Hollow Ramps
Roundabout



SITE LAYOUT

Site: Cuml+Proj PM --02 Corral Hollow/I-580 WB Ramps

Roundabout



Created: Wednesday, March 19, 2014 8:05:56 AM
SIDRA INTERSECTION 6.0.18.4502

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Project: K:\SJC_LDEV\097008014-Tracy Hills SP-Tracy-LWF\Traffic\Sidra\Caltrans Roundabouts.sip6
8000965, KIMLEY-HORN & ASSOCIATES INC, NETWORK / Enterprise

**SIDRA
INTERSECTION 6**

NETWORK SUMMARY

Network: Cuml+Proj PM - Corral Hollow/I-580 Interchange

New Network

Network Performance - Hourly Values				
Performance Measure	Vehicles	Per Unit Distance	Percent	Persons
Network Level of Service (LOS)	LOS E			
Travel Time Index	2.39			
Speed Efficiency	0.32			
Congestion Coefficient	3.17			
Travel Speed	12.6 mph			12.6 mph
Travel Distance (Total)	1533.8 veh-mi/h			1840.6 pers-mi/h
Travel Time (Total)	121.5 veh-h/h			145.9 pers-h/h
Travel Distance (Average)	1610 ft			1554 ft
Travel Time (Average)	87.0 sec	285.3 sec/mi		84.0 sec
Idling Time (Average)	38.5 sec	126.4 sec/mi	44.31 %	
Running Time (Average)	48.4 sec	158.9 sec/mi	55.69 %	
Desired Speed	40.0 mph			
Desired Trip Time	27.4 sec	90.0 sec/mi		
Travel Delay	59.5 sec	195.3 sec/mi	68.45 %	
Demand Flows (Total)	5210 veh/h			6252 pers/h
Arrival Flows (Total)	5031 veh/h			6252 pers/h
Percent Heavy Vehicles (Demand)	3.0 %			
Percent Heavy Vehicles (Arrival)	3.1 %			
Degree of Saturation	1.379			
Control Delay (Total)	82.86 veh-h/h			99.43 pers-h/h
Control Delay (Average)	59.3 sec			57.3 sec
Control Delay (Worst Lane)	201.2 sec			
Control Delay (Worst Movement)	201.2 sec			201.2 sec
Geometric Delay (Average)	7.6 sec			
Stop-Line Delay (Average)	51.5 sec			
Queue Storage Ratio (Worst Lane)	1.49			
Total Effective Stops	6761 veh/h			8113 pers/h
Effective Stop Rate	1.34 per veh	4.4 per mi		1.30 per pers
Proportion Queued	0.49			0.48
Performance Index	292.8			292.8
Cost (Total)	1835.70 \$/h	1.20 \$/mi		1835.70 \$/h
Fuel Consumption (Total)	57.0 gal/h	0.037 gal/mi		
Fuel Economy	26.9 mpg			
Carbon Dioxide (Total)	508.7 kg/h	331.7 g/mi		
Hydrocarbons (Total)	0.301 kg/h	0.196 g/mi		
Carbon Monoxide (Total)	1.772 kg/h	1.155 g/mi		
NOx (Total)	0.590 kg/h	0.384 g/mi		

Network Model Accuracy Level (variations in lane degrees of saturation): 0.0 % to 0.0 %

Number of Iterations: 2

Network Level of Service (LOS) Method: HCM 2010.

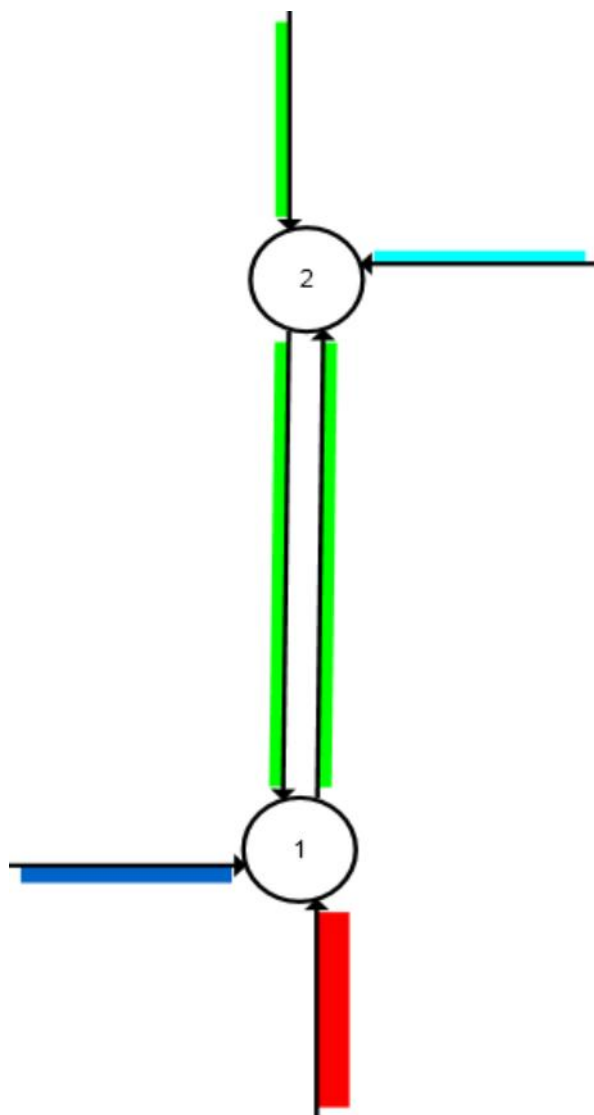
Model used: US HCM (Customary).

Network Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	2,500,696 veh/y	3,000,835 pers/y
Delay	39,772 veh-h/y	47,727 pers-h/y
Effective Stops	3,245,259 veh/y	3,894,310 pers/y
Travel Distance	736,222 veh-mi/y	883,466 pers-mi/y
Travel Time	58,342 veh-h/y	70,010 pers-h/y
Cost	881,135 \$/y	881,135 \$/y
Fuel Consumption	27,352 gal/y	
Carbon Dioxide	244,190 kg/y	
Hydrocarbons	144 kg/y	
Carbon Monoxide	851 kg/y	
NOx	283 kg/y	

SITE LEVEL OF SERVICE

Approach Level of Service for Network Sites

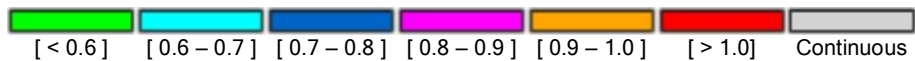
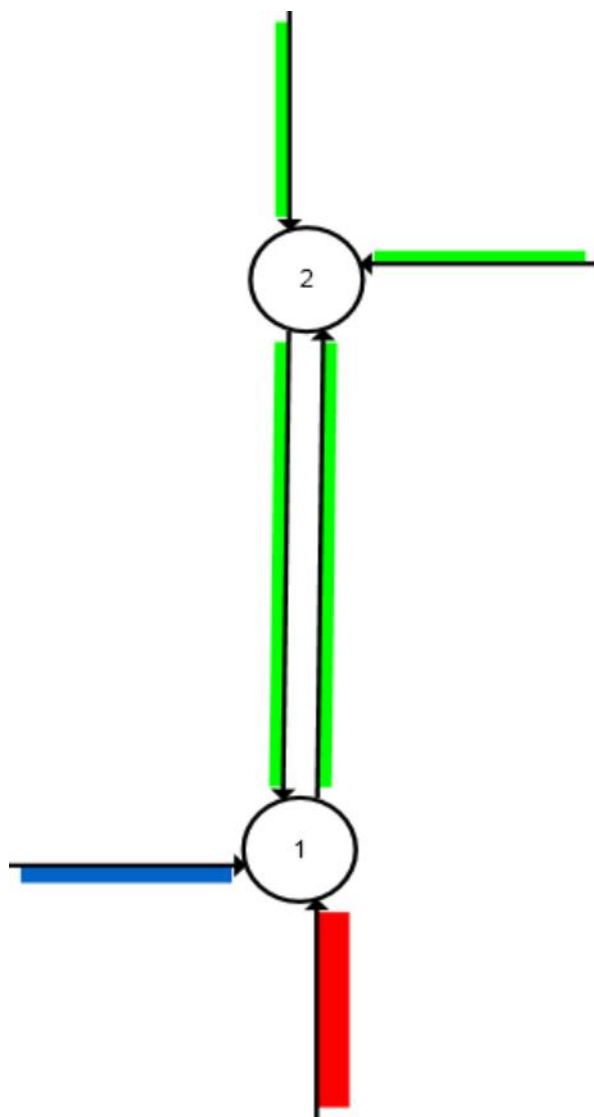
Network: Cumi+Proj PM - Corral Hollow/I-580 Interchange



DEGREE OF SATURATION

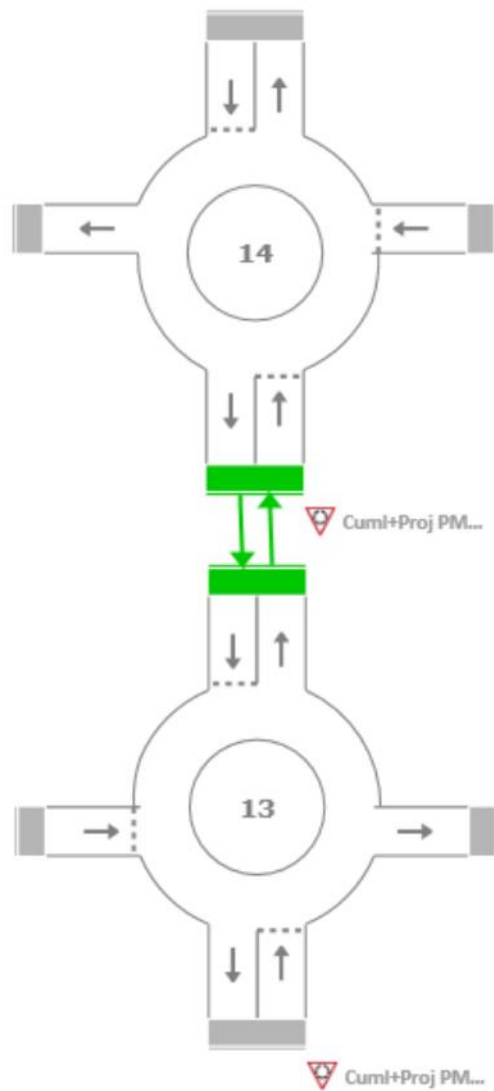
Ratio of Demand Volume to Capacity (v/c ratio)

Network: Cumi+Proj PM - Corral Hollow/I-580 Interchange



NETWORK LAYOUT

Network: Cuml+Proj PM - Mtn House/I-580 Ramps



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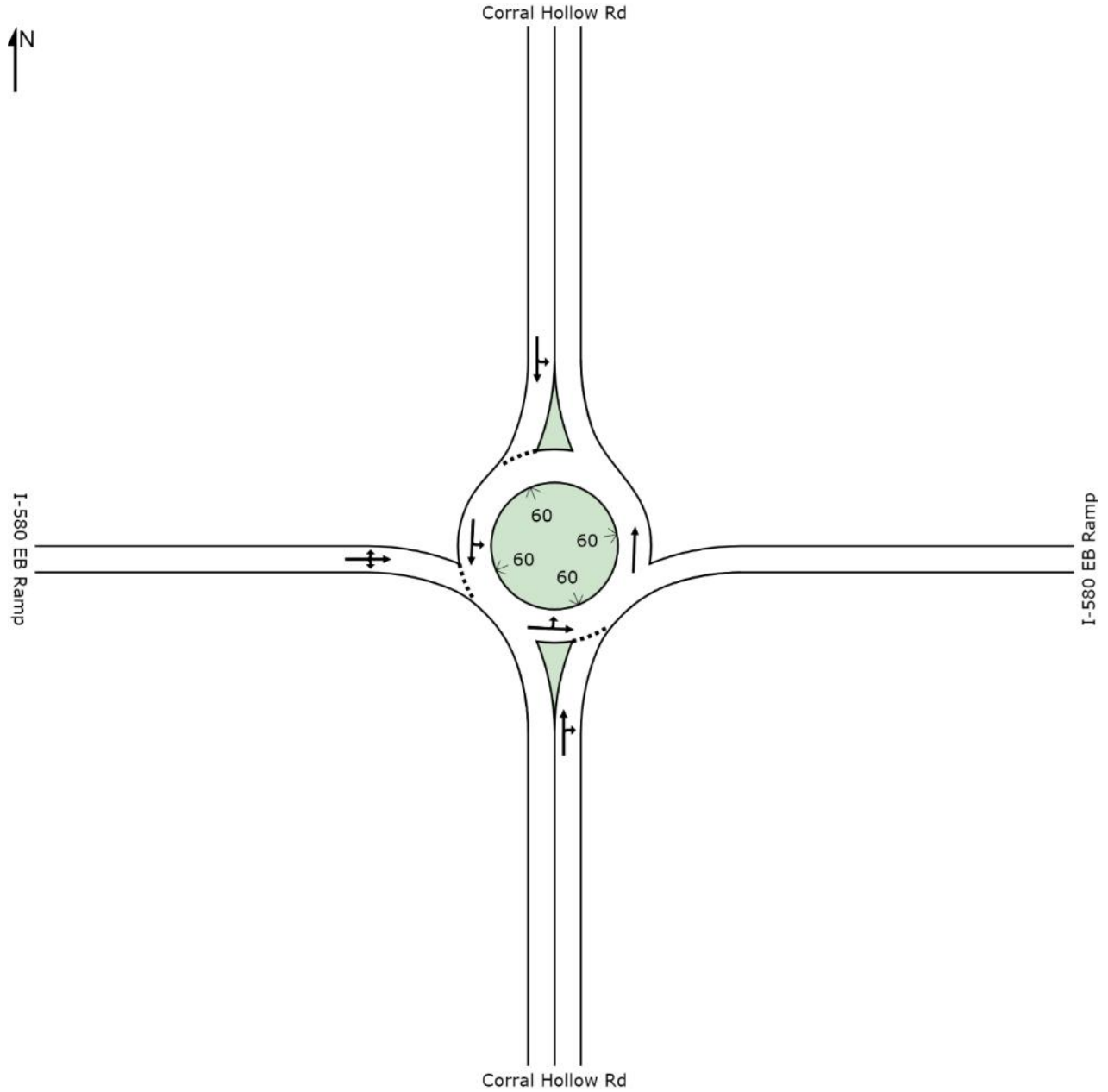
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INTERSECTION 6

SITE LAYOUT

Site: Cuml+Proj PM -- 13 Mtn House/I-580 EB Ramps

Roundabout



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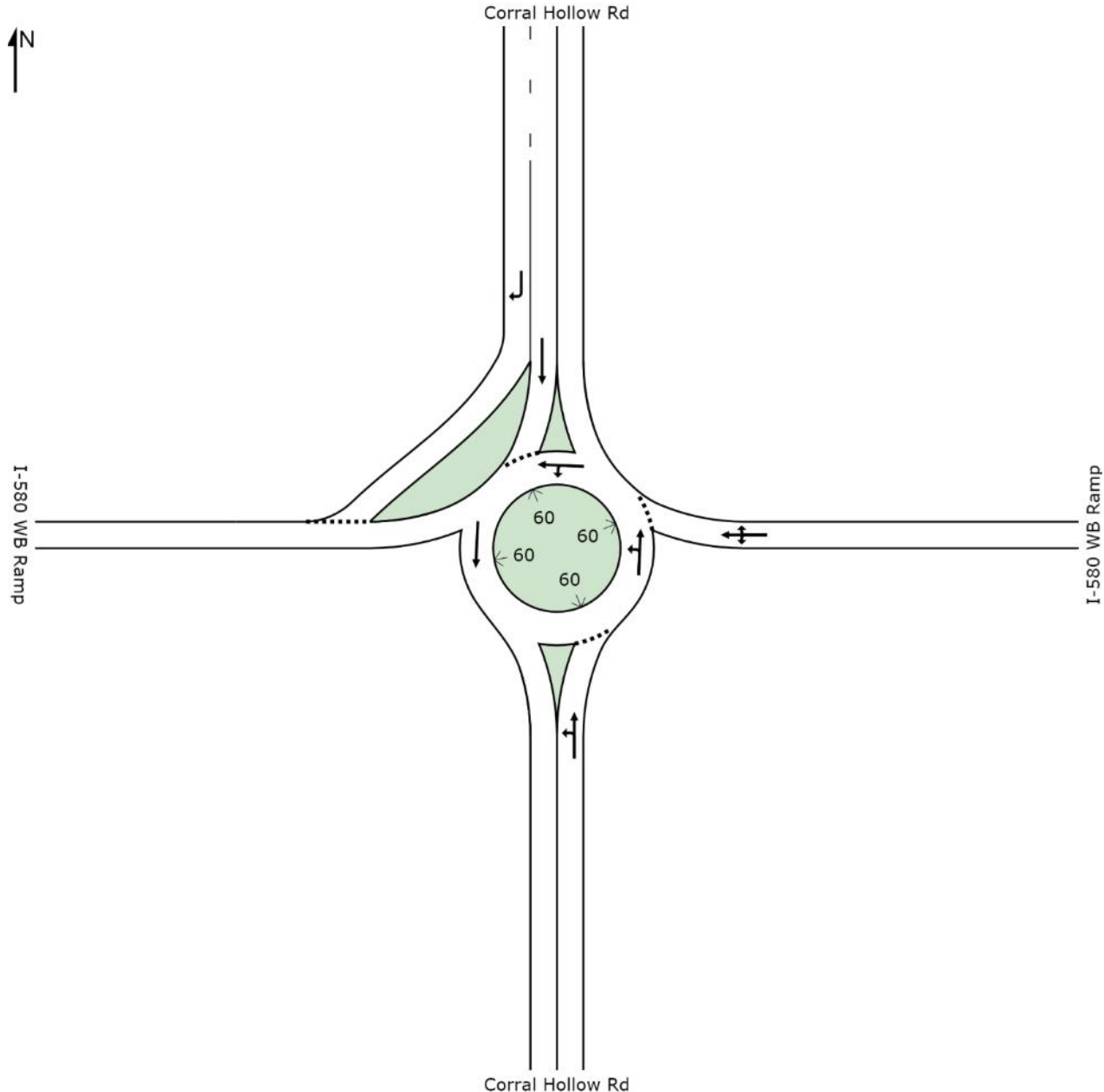
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**SIDRA
INTERSECTION 6**

SITE LAYOUT

Site: Cuml+Proj PM --14 Mtn House/I-580 WB Ramps

Roundabout



NETWORK SUMMARY

Network: Cuml+Proj PM - Mtn House/I-580 Ramps

New Network

Network Performance - Hourly Values				
Performance Measure	Vehicles	Per Unit Distance	Percent	Persons
Network Level of Service (LOS)	LOS F			
Travel Time Index	0.75			
Speed Efficiency	0.17			
Congestion Coefficient	5.97			
Travel Speed	6.7 mph			6.7 mph
Travel Distance (Total)	1139.1 veh-mi/h			1366.9 pers-mi/h
Travel Time (Total)	170.1 veh-h/h			204.1 pers-h/h
Travel Distance (Average)	1539 ft			1433 ft
Travel Time (Average)	156.7 sec	537.6 sec/mi		145.9 sec
Idling Time (Average)	102.2 sec	350.9 sec/mi	65.26 %	
Running Time (Average)	54.4 sec	186.7 sec/mi	34.74 %	
Desired Speed	40.0 mph			
Desired Trip Time	26.2 sec	90.0 sec/mi		
Travel Delay	130.4 sec	447.6 sec/mi	83.26 %	
Demand Flows (Total)	4198 veh/h			5037 pers/h
Arrival Flows (Total)	3909 veh/h			5037 pers/h
Percent Heavy Vehicles (Demand)	3.0 %			
Percent Heavy Vehicles (Arrival)	3.2 %			
Degree of Saturation	2.041			
Control Delay (Total)	141.22 veh-h/h			169.46 pers-h/h
Control Delay (Average)	130.1 sec			121.1 sec
Control Delay (Worst Lane)	495.4 sec			
Control Delay (Worst Movement)	496.0 sec			496.0 sec
Geometric Delay (Average)	7.5 sec			
Stop-Line Delay (Average)	122.1 sec			
Queue Storage Ratio (Worst Lane)	3.59			
Total Effective Stops	6794 veh/h			8152 pers/h
Effective Stop Rate	1.74 per veh	6.0 per mi		1.62 per pers
Proportion Queued	0.51			0.50
Performance Index	525.9			525.9
Cost (Total)	2482.41 \$/h	2.18 \$/mi		2482.41 \$/h
Fuel Consumption (Total)	68.8 gal/h	0.060 gal/mi		
Fuel Economy	16.5 mpg			
Carbon Dioxide (Total)	614.5 kg/h	539.5 g/mi		
Hydrocarbons (Total)	0.419 kg/h	0.368 g/mi		
Carbon Monoxide (Total)	2.163 kg/h	1.899 g/mi		
NOx (Total)	0.592 kg/h	0.520 g/mi		

Network Model Accuracy Level (variations in lane degrees of saturation): 0.0 % to 0.0 %

Number of Iterations: 2

Network Level of Service (LOS) Method: HCM 2010.

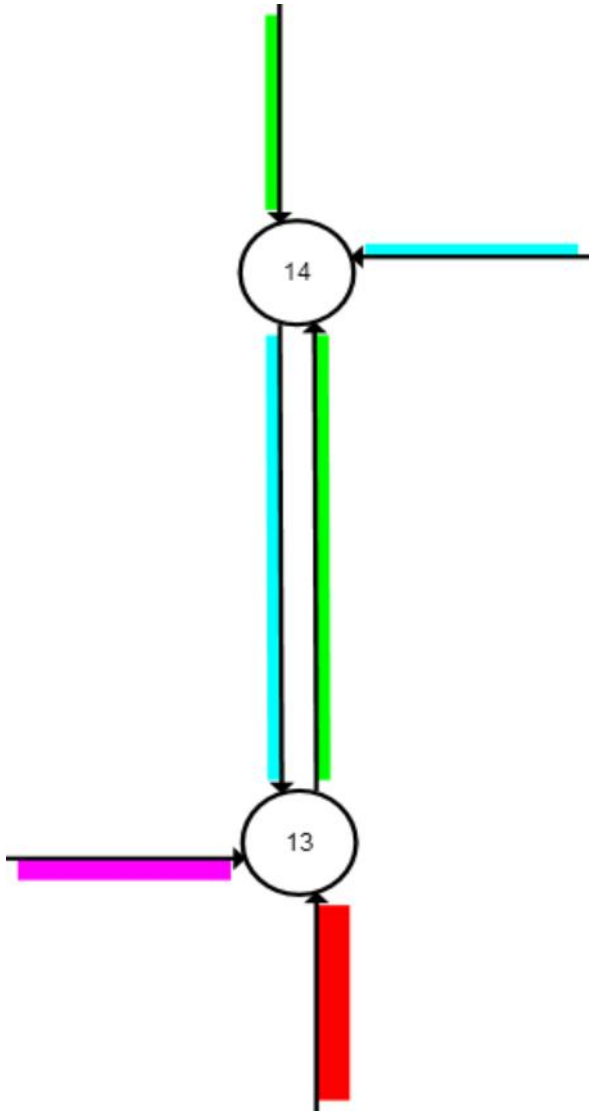
Model used: US HCM (Customary).

Network Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	2,014,957 veh/y	2,417,948 pers/y
Delay	67,783 veh-h/y	81,340 pers-h/y
Effective Stops	3,260,985 veh/y	3,913,183 pers/y
Travel Distance	546,753 veh-mi/y	656,103 pers-mi/y
Travel Time	81,649 veh-h/y	97,979 pers-h/y
Cost	1,191,556 \$/y	1,191,556 \$/y
Fuel Consumption	33,039 gal/y	
Carbon Dioxide	294,963 kg/y	
Hydrocarbons	201 kg/y	
Carbon Monoxide	1,038 kg/y	
NOx	284 kg/y	

SITE LEVEL OF SERVICE

Approach Level of Service for Network Sites

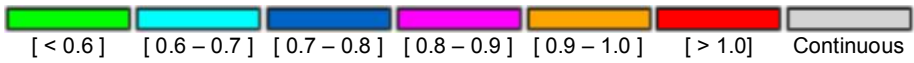
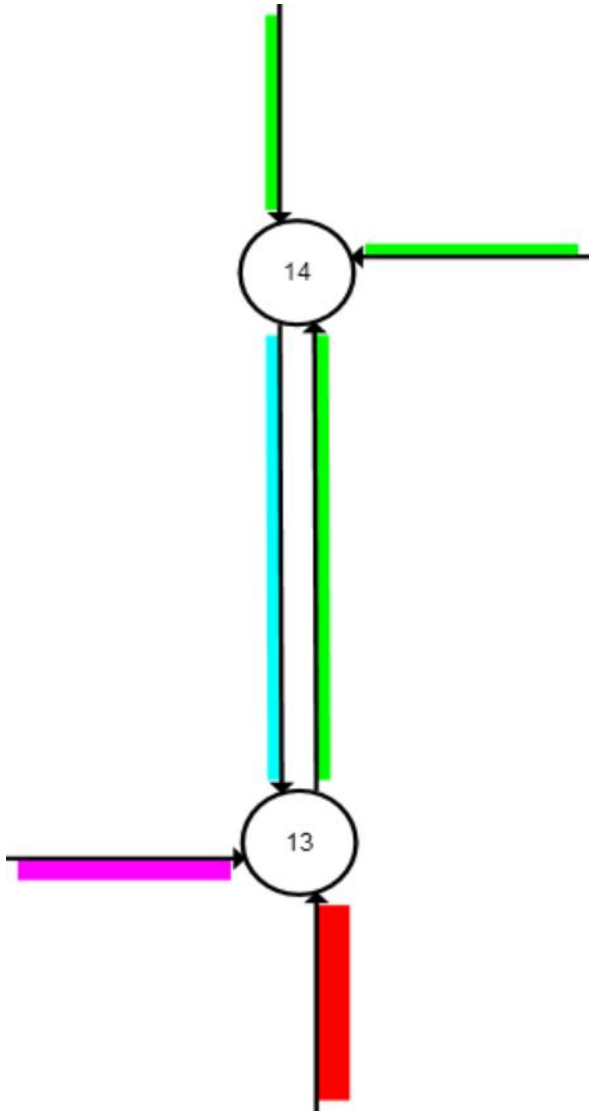
Network: Cumi+Proj PM - Mtn House/I-580 Ramps



DEGREE OF SATURATION

Ratio of Demand Volume to Capacity (v/c ratio)

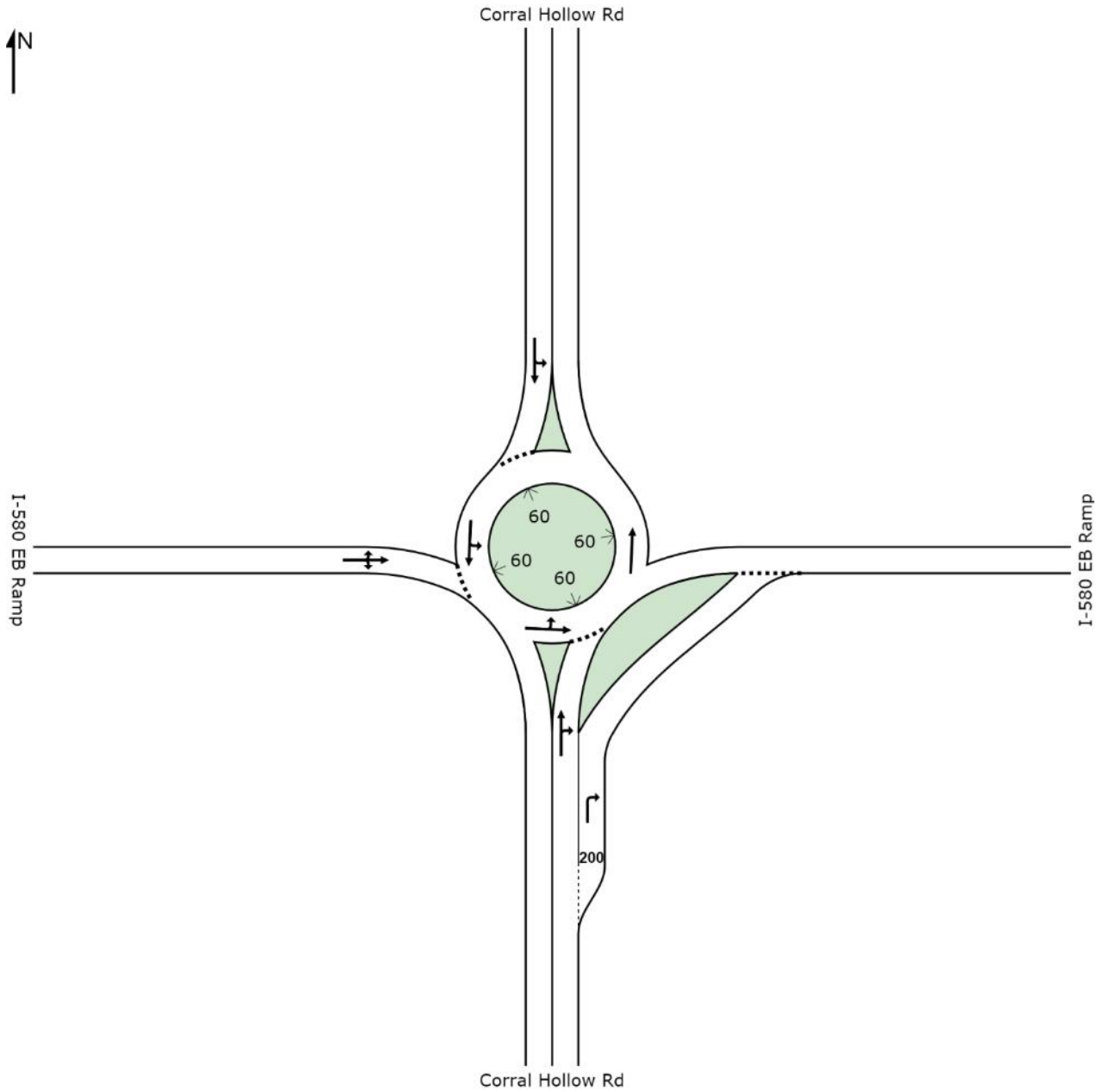
Network: Cuml+Proj PM - Mtn House/I-580 Ramps



SITE LAYOUT

 Site: Cuml+Proj PM -- Modified 13 Mtn House/I-580 EB Ramps

Modified Intersestion 13
Roundabout



NETWORK SUMMARY

Network: Cuml+Proj PM - 13 Modified

Network Performance - Hourly Values				
Performance Measure	Vehicles	Per Unit Distance	Percent	Persons
Network Level of Service (LOS)	LOS E			
Travel Time Index	3.22			
Speed Efficiency	0.39			
Congestion Coefficient	2.57			
Travel Speed	15.6 mph			15.6 mph
Travel Distance (Total)	1165.1 veh-mi/h			1398.1 pers-mi/h
Travel Time (Total)	74.8 veh-h/h			89.7 pers-h/h
Travel Distance (Average)	1508 ft			1465 ft
Travel Time (Average)	66.0 sec	231.1 sec/mi		64.1 sec
Idling Time (Average)	21.6 sec	75.8 sec/mi	32.79 %	
Running Time (Average)	44.4 sec	155.3 sec/mi	67.21 %	
Desired Speed	40.0 mph			
Desired Trip Time	25.7 sec	90.0 sec/mi		
Travel Delay	40.3 sec	141.1 sec/mi	61.05 %	
Demand Flows (Total)	4198 veh/h			5037 pers/h
Arrival Flows (Total)	4078 veh/h			5037 pers/h
Percent Heavy Vehicles (Demand)	3.0 %			
Percent Heavy Vehicles (Arrival)	3.1 %			
Degree of Saturation	1.267			
Control Delay (Total)	45.23 veh-h/h			54.28 pers-h/h
Control Delay (Average)	39.9 sec			38.8 sec
Control Delay (Worst Lane)	153.6 sec			
Control Delay (Worst Movement)	153.4 sec			153.4 sec
Geometric Delay (Average)	7.6 sec			
Stop-Line Delay (Average)	32.0 sec			
Queue Storage Ratio (Worst Lane)	1.48			
Total Effective Stops	4945 veh/h			5934 pers/h
Effective Stop Rate	1.21 per veh	4.2 per mi		1.18 per pers
Proportion Queued	0.50			0.50
Performance Index	235.2			235.2
Cost (Total)	1151.32 \$/h	0.99 \$/mi		1151.32 \$/h
Fuel Consumption (Total)	37.7 gal/h	0.032 gal/mi		
Fuel Economy	30.9 mpg			
Carbon Dioxide (Total)	336.5 kg/h	288.8 g/mi		
Hydrocarbons (Total)	0.186 kg/h	0.159 g/mi		
Carbon Monoxide (Total)	1.163 kg/h	0.998 g/mi		
NOx (Total)	0.427 kg/h	0.366 g/mi		

Network Model Accuracy Level (variations in lane degrees of saturation): 0.0 % to 0.0 %

Number of Iterations: 2

Network Level of Service (LOS) Method: HCM 2010.

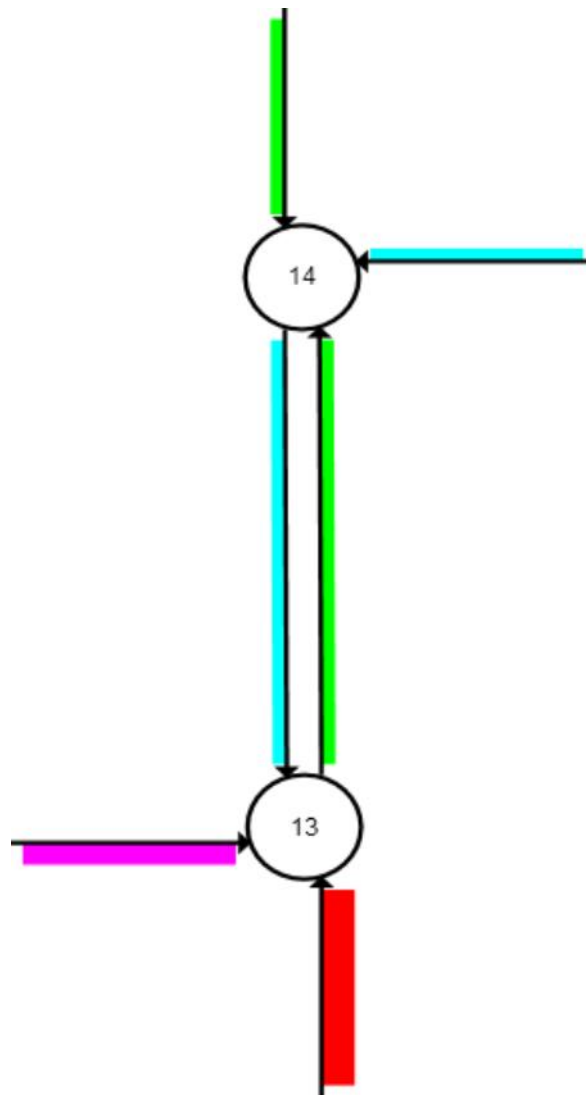
Model used: US HCM (Customary).

Network Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	2,014,957 veh/y	2,417,948 pers/y
Delay	21,712 veh-h/y	26,054 pers-h/y
Effective Stops	2,373,644 veh/y	2,848,373 pers/y
Travel Distance	559,257 veh-mi/y	671,109 pers-mi/y
Travel Time	35,894 veh-h/y	43,073 pers-h/y
Cost	552,635 \$/y	552,635 \$/y
Fuel Consumption	18,090 gal/y	
Carbon Dioxide	161,507 kg/y	
Hydrocarbons	89 kg/y	
Carbon Monoxide	558 kg/y	
NOx	205 kg/y	

SITE LEVEL OF SERVICE

Approach Level of Service for Network Sites

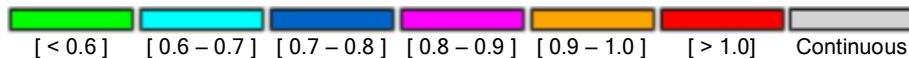
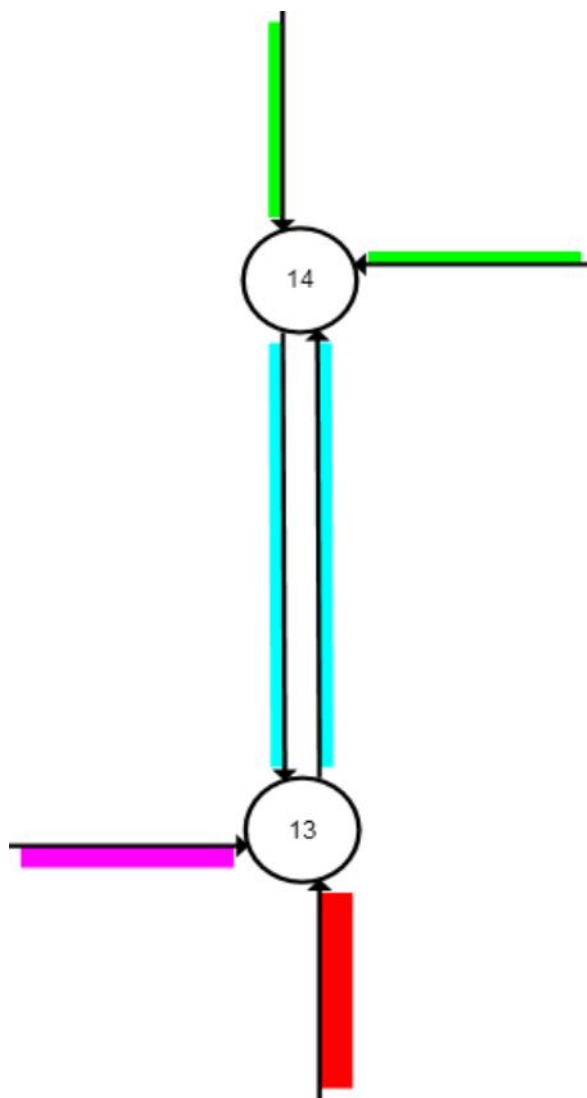
Network: Cuml+Proj PM - 13 Modified



DEGREE OF SATURATION

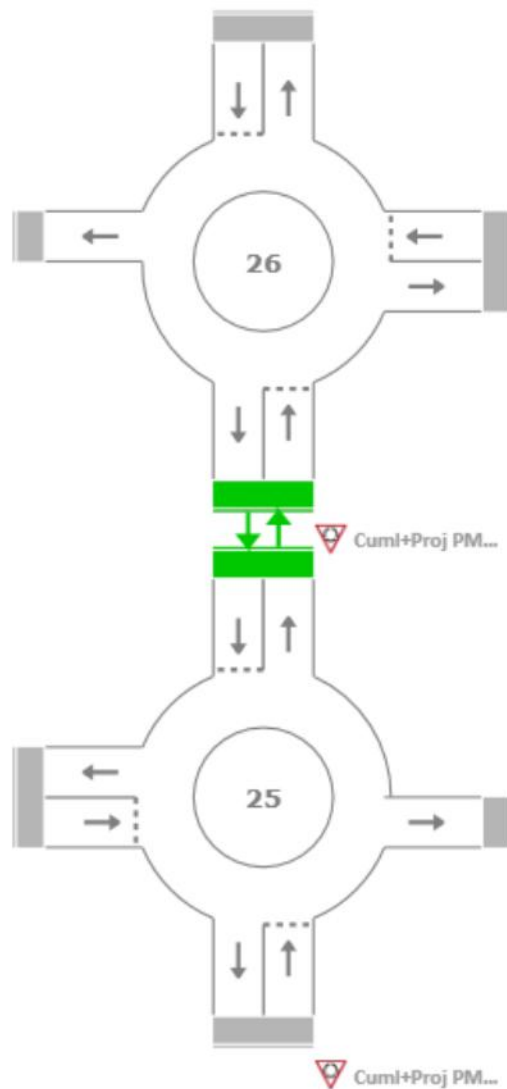
Ratio of Demand Volume to Capacity (v/c ratio)

Network: Cuml+Proj PM - 13 Modified



NETWORK LAYOUT

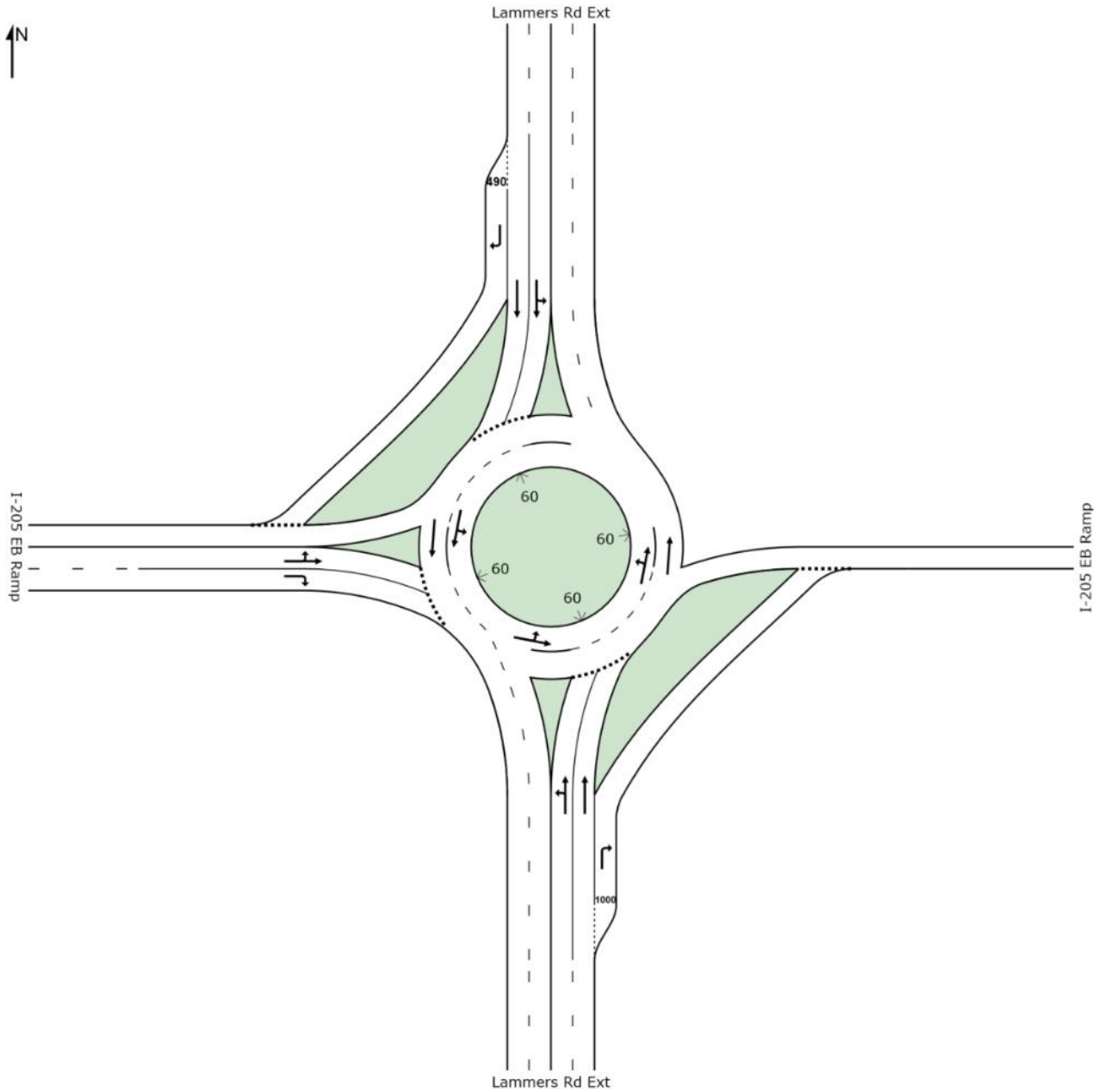
Network: Cuml+Proj PM - LammersExt/I-205 Ramps



SITE LAYOUT

Site: Cuml+Proj PM -- 25 Lammers/I-205 EB Ramps

Roundabout



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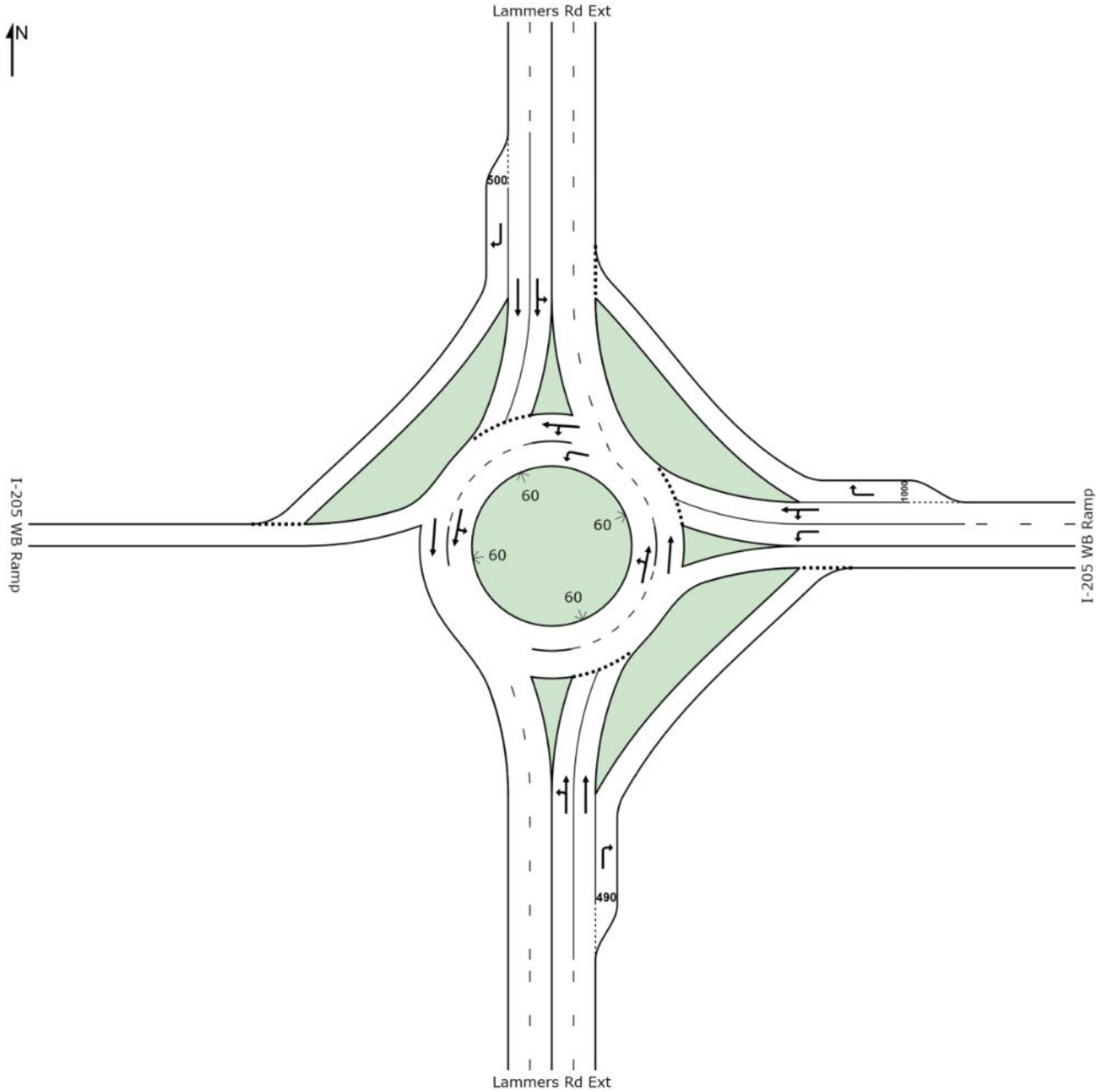
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**SIDRA
INTERSECTION 6**

SITE LAYOUT

Site: Cuml+Proj PM -- 26 Lammers/I-205 WB Ramps

Roundabout



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**SIDRA
INTERSECTION 6**

NETWORK SUMMARY

Network: Cuml+Proj PM - LammersExt/I-205 Ramps

Network Performance - Hourly Values				
Performance Measure	Vehicles	Per Unit Distance	Percent	Persons
Network Level of Service (LOS)	LOS F			
Travel Time Index	0.10			
Speed Efficiency	0.11			
Congestion Coefficient	9.19			
Travel Speed	4.4 mph			4.4 mph
Travel Distance (Total)	4653.3 veh-mi/h			5584.0 pers-mi/h
Travel Time (Total)	1069.0 veh-h/h			1282.8 pers-h/h
Travel Distance (Average)	1695 ft			1466 ft
Travel Time (Average)	265.5 sec	827.0 sec/mi		229.7 sec
Idling Time (Average)	167.3 sec	521.1 sec/mi	63.00 %	
Running Time (Average)	98.2 sec	306.0 sec/mi	37.00 %	
Desired Speed	40.0 mph			
Desired Trip Time	28.9 sec	90.0 sec/mi		
Travel Delay	236.6 sec	737.0 sec/mi	89.12 %	
Demand Flows (Total)	16757 veh/h			20108 pers/h
Arrival Flows (Total)	14498 veh/h			20108 pers/h
Percent Heavy Vehicles (Demand)	8.7 %			
Percent Heavy Vehicles (Arrival)	10.1 %			
Degree of Saturation	2.549			
Control Delay (Total)	952.52 veh-h/h			1143.03 pers-h/h
Control Delay (Average)	236.5 sec			204.6 sec
Control Delay (Worst Lane)	715.2 sec			
Control Delay (Worst Movement)	720.7 sec			720.7 sec
Geometric Delay (Average)	6.8 sec			
Stop-Line Delay (Average)	204.8 sec			
Queue Storage Ratio (Worst Lane)	4.63			
Total Effective Stops	40271 veh/h			48325 pers/h
Effective Stop Rate	2.78 per veh	8.7 per mi		2.40 per pers
Proportion Queued	0.67			0.66
Performance Index	2636.6			2636.6
Cost (Total)	15815.50 \$/h	3.40 \$/mi		15815.50 \$/h
Fuel Consumption (Total)	429.5 gal/h	0.092 gal/mi		
Fuel Economy	10.8 mpg			
Carbon Dioxide (Total)	3861.7 kg/h	829.9 g/mi		
Hydrocarbons (Total)	2.687 kg/h	0.577 g/mi		
Carbon Monoxide (Total)	13.269 kg/h	2.852 g/mi		
NOx (Total)	4.431 kg/h	0.952 g/mi		

Network Model Accuracy Level (variations in lane degrees of saturation): -1.3 % to 1.2 %

Number of Iterations: 10

Network Level of Service (LOS) Method: HCM 2010.

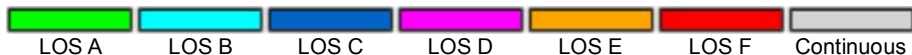
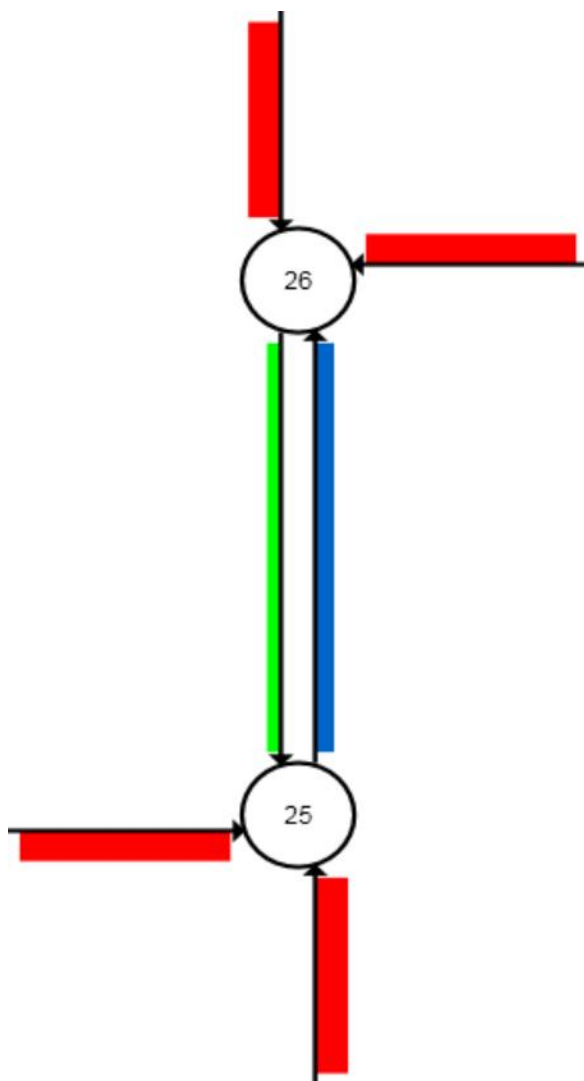
Model used: US HCM (Customary).

Network Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	8,043,131 veh/y	9,651,756 pers/y
Delay	457,211 veh-h/y	548,654 pers-h/y
Effective Stops	19,329,980 veh/y	23,195,970 pers/y
Travel Distance	2,233,599 veh-mi/y	2,680,319 pers-mi/y
Travel Time	513,128 veh-h/y	615,754 pers-h/y
Cost	7,591,438 \$/y	7,591,438 \$/y
Fuel Consumption	206,136 gal/y	
Carbon Dioxide	1,853,614 kg/y	
Hydrocarbons	1,290 kg/y	
Carbon Monoxide	6,369 kg/y	
NOx	2,127 kg/y	

SITE LEVEL OF SERVICE

Approach Level of Service for Network Sites

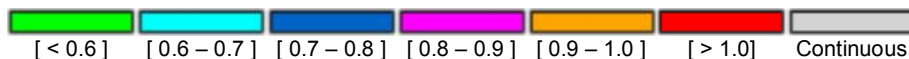
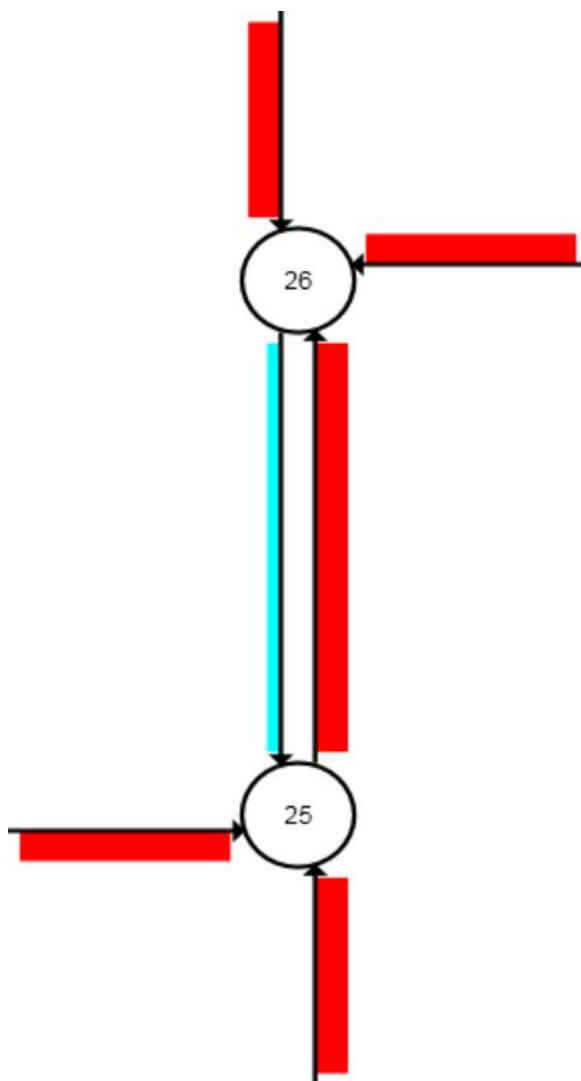
Network: Cuml+Proj PM - LammersExt/I-205 Ramps



DEGREE OF SATURATION

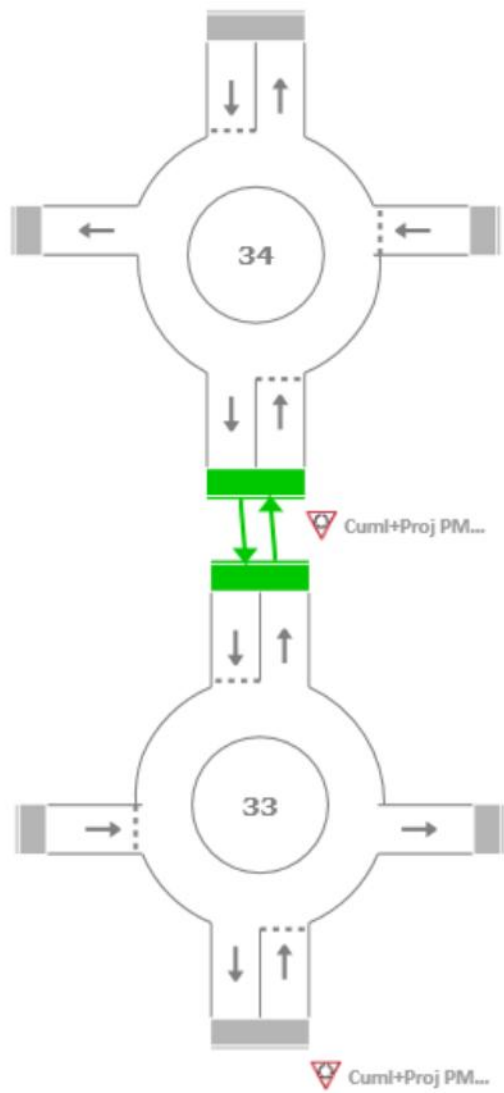
Ratio of Demand Volume to Capacity (v/c ratio)

Network: Cuml+Proj PM - LammersExt/I-205 Ramps



NETWORK LAYOUT

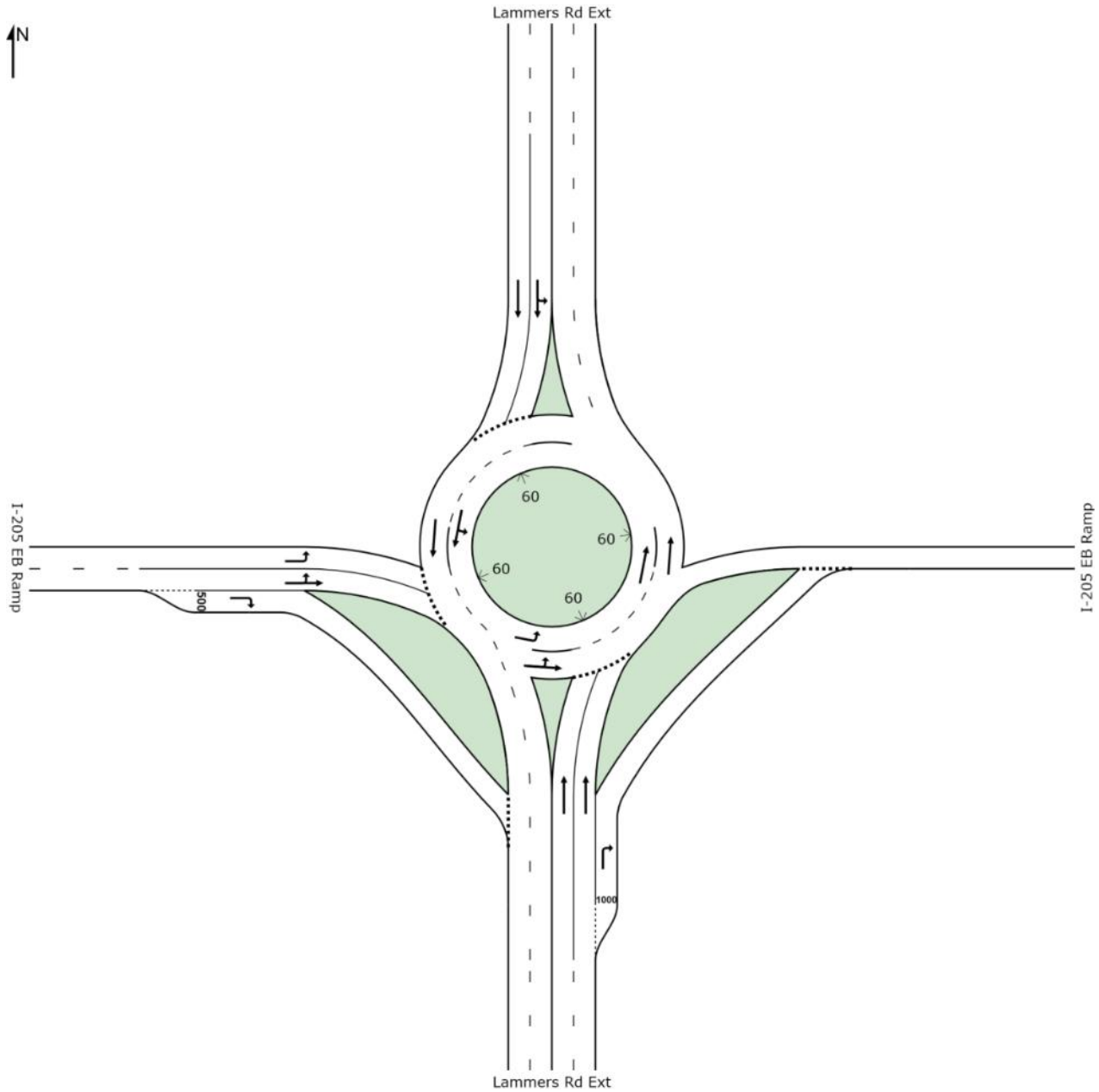
☉☉ Network: Cuml+Proj PM - Chrisman/I-205 Ramps



SITE LAYOUT

Site: Cuml+Proj PM -- 33 Chrisman/I-205 EB Ramps

Roundabout



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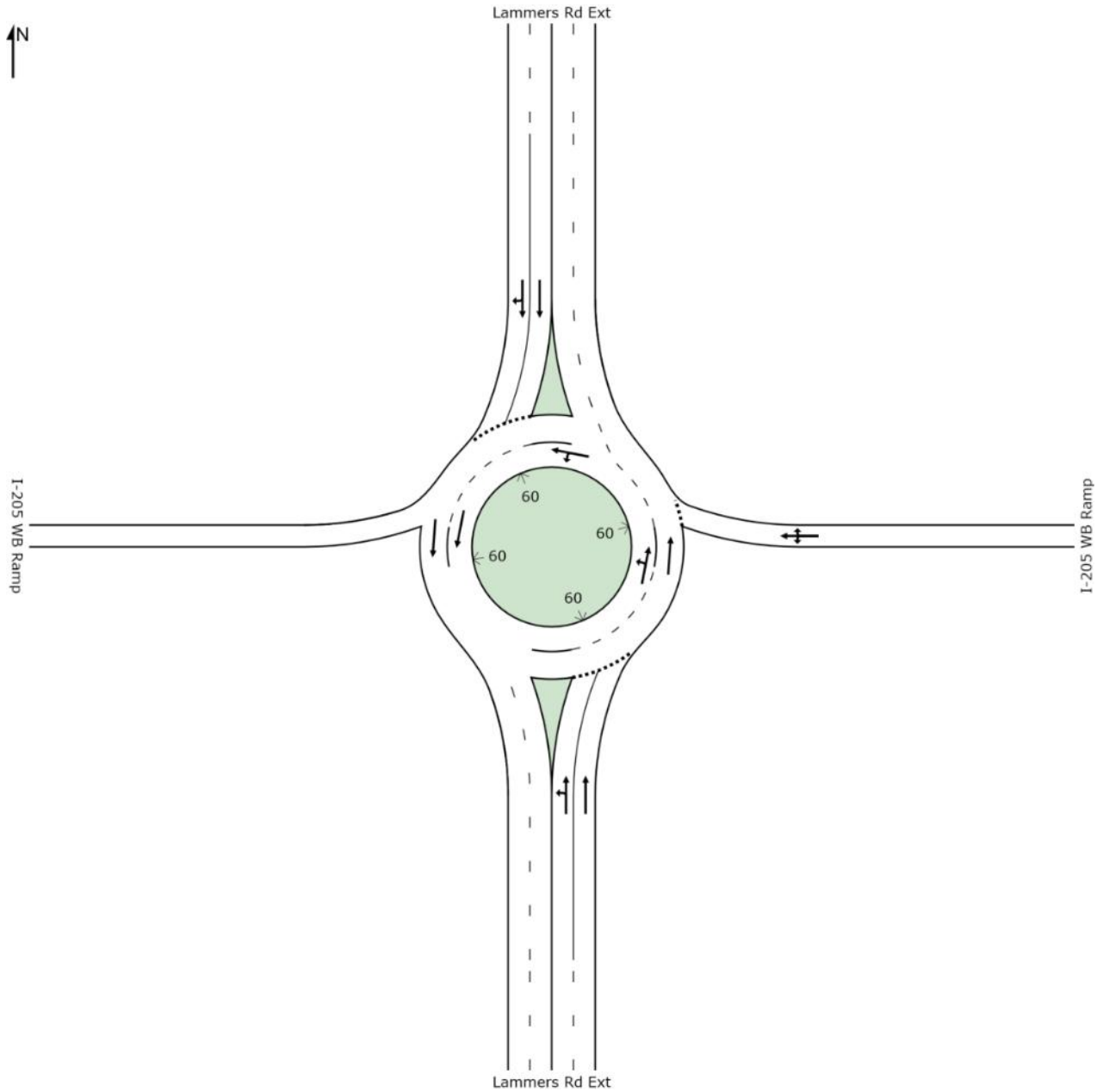
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**SIDRA
INTERSECTION 6**

SITE LAYOUT

Site: Cuml+Proj PM -- 34 Chrisman/I-205 WB Ramps

Roundabout



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SIDRA
INTERSECTION 6

NETWORK SUMMARY

Network: Cuml+Proj PM - Chrisman/I-205 Ramps

Network Performance - Hourly Values				
Performance Measure	Vehicles	Per Unit Distance	Percent	Persons
Network Level of Service (LOS)	LOS F			
Travel Time Index	0.00			
Speed Efficiency	0.04			
Congestion Coefficient	28.20			
Travel Speed	1.4 mph			1.4 mph
Travel Distance (Total)	4500.8 veh-mi/h			5401.0 pers-mi/h
Travel Time (Total)	3173.4 veh-h/h			3808.1 pers-h/h
Travel Distance (Average)	1803 ft			1556 ft
Travel Time (Average)	866.7 sec	2538.3 sec/mi		748.1 sec
Idling Time (Average)	767.7 sec	2248.2 sec/mi	88.57 %	
Running Time (Average)	99.1 sec	290.1 sec/mi	11.43 %	
Desired Speed	40.0 mph			
Desired Trip Time	30.7 sec	90.0 sec/mi		
Travel Delay	836.0 sec	2448.3 sec/mi	96.45 %	
Demand Flows (Total)	15270 veh/h			18324 pers/h
Arrival Flows (Total)	13181 veh/h			18324 pers/h
Percent Heavy Vehicles (Demand)	4.3 %			
Percent Heavy Vehicles (Arrival)	5.0 %			
Degree of Saturation	7.770			
Control Delay (Total)	3060.11 veh-h/h			3672.14 pers-h/h
Control Delay (Average)	835.8 sec			721.4 sec
Control Delay (Worst Lane)	3069.2 sec			
Control Delay (Worst Movement)	3070.5 sec			3070.5 sec
Geometric Delay (Average)	6.9 sec			
Stop-Line Delay (Average)	819.7 sec			
Queue Storage Ratio (Worst Lane)	18.94			
Total Effective Stops	45768 veh/h			54921 pers/h
Effective Stop Rate	3.47 per veh	10.2 per mi		3.00 per pers
Proportion Queued	0.70			0.69
Performance Index	6212.2			6212.2
Cost (Total)	44902.03 \$/h	9.98 \$/mi		44902.03 \$/h
Fuel Consumption (Total)	1111.5 gal/h	0.247 gal/mi		
Fuel Economy	4.0 mpg			
Carbon Dioxide (Total)	9934.7 kg/h	2207.3 g/mi		
Hydrocarbons (Total)	7.777 kg/h	1.728 g/mi		
Carbon Monoxide (Total)	35.352 kg/h	7.855 g/mi		
NOx (Total)	8.267 kg/h	1.837 g/mi		

Network Model Accuracy Level (variations in lane degrees of saturation): -0.9 % to 0.8 %

Number of Iterations: 4

Network Level of Service (LOS) Method: HCM 2010.

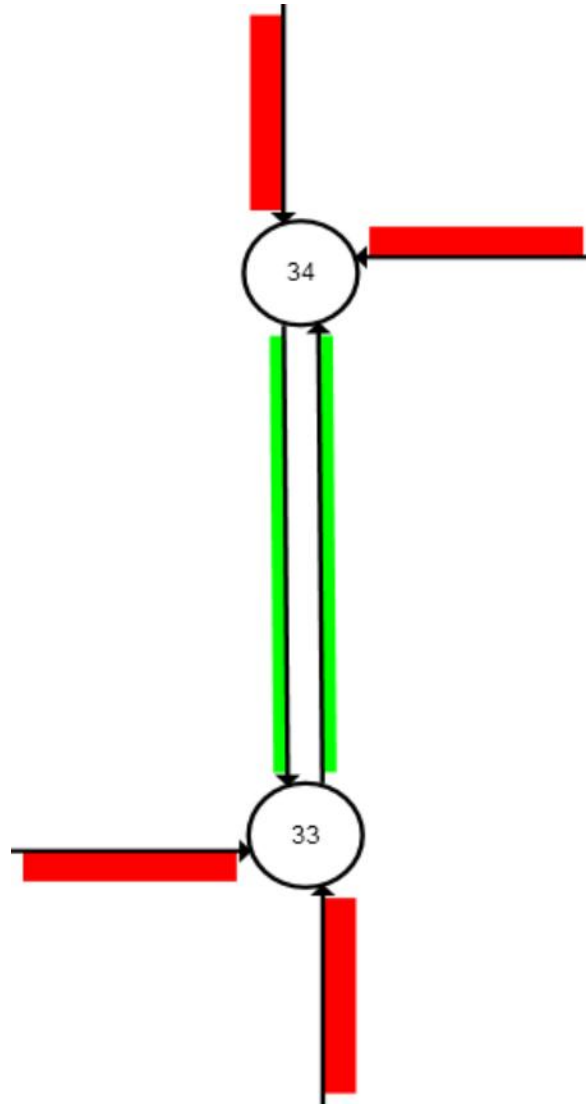
Model used: US HCM (Customary).

Network Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	7,329,693 veh/y	8,795,632 pers/y
Delay	1,468,854 veh-h/y	1,762,625 pers-h/y
Effective Stops	21,968,530 veh/y	26,362,230 pers/y
Travel Distance	2,160,386 veh-mi/y	2,592,463 pers-mi/y
Travel Time	1,523,247 veh-h/y	1,827,896 pers-h/y
Cost	21,552,980 \$/y	21,552,980 \$/y
Fuel Consumption	533,518 gal/y	
Carbon Dioxide	4,768,655 kg/y	
Hydrocarbons	3,733 kg/y	
Carbon Monoxide	16,969 kg/y	
NOx	3,968 kg/y	

SITE LEVEL OF SERVICE

Approach Level of Service for Network Sites

☉☉ Network: Cuml+Proj PM - Chrisman/I-205 Ramps



DEGREE OF SATURATION

Ratio of Demand Volume to Capacity (v/c ratio)

Network: Cuml+Proj PM - Chrisman/I-205 Ramps

