Residence Inn
Traffic Impact Study
Final Report

Prepared for the City of Santa Rosa

Submitted by
W-Trans

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Executive Summary

The proposed project is a 114-room Residence Inn hotel to be located on Round Barn Circle in the City of Santa Rosa. Based on standard trip generation rates it would be expected to generate an average of 931 trips daily, including 68 during the weekday p.m. peak hour. On weekends, 99 trips would be expected during the peak hour.

Six intersections in the vicinity of the project were evaluated for safety and operational concerns. Five of the six are currently operating acceptably during both peaks studied, and had collisions at a rate that is less than the Statewide average for that type of intersection.

Mendocino Avenue/Fountaingrove Parkway currently operates at LOS E during the evening peak hour and has an above-average collision rate. The congestion associated with LOS E operation as well as the skewed alignment of the intersection and merge lanes likely contribute to the above-average rate of collisions, though it is noted that the actual rate is not substantially higher than the average so no remedial action appears necessary. Because LOS E is considered unacceptable under the standards applied, operation of Mendocino Avenue was evaluated to determine if the City's standard is met. It was determined that Mendocino Avenue is operating at LOS D, so the single intersection at LOS E is considered acceptable. Upon adding project trips to existing volumes, no substantial changes to operation are expected, resulting in less-than-significant impacts. Under Future volumes, the intersection of Mendocino Avenue/ Fountaingrove Parkway is expected to continue operating unacceptably, but because the arterial segment is expected to operate at LOS D, this is considered acceptable. Likewise, with project trips added operation of the arterial segment is acceptable, making the impact less-than-significant.

Facilities for alternative modes are adequate, though it is recommended that secure parking for 12 bicycles be provided at the site. Parking as proposed for passenger vehicles is adequate to meet the requirements of the City's code.

Introduction

This report presents an analysis of the potential traffic impacts that would be associated with development of a proposed hotel project on the west of Round Barn Circle in the City of Santa Rosa. The traffic study was completed in accordance with the criteria established by the City of Santa Rosa, and is consistent with standard traffic engineering techniques.

Prelude

The purpose of a traffic impact study is to provide City staff and policy makers with data that they can use to make an informed decision regarding the potential traffic impacts of a proposed project, and any associated improvements that would be required in order to mitigate these impacts to a level of insignificance as defined by the City's General Plan or other policies. Vehicular traffic impacts are typically evaluated by determining the number of new trips that the proposed use would be expected to generate, distributing these trips to the surrounding street system based on existing travel patterns or anticipated travel patterns specific to the proposed project, then analyzing the impact the new traffic would be expected to have on critical intersections or roadway segments. Impacts relative to access for pedestrians, bicyclists, and to transit are also addressed.

Project Profile

The proposed project includes the construction of a Residence Inn with 114 rooms to be located on west side of Round Barn Circle. The project site would be accessed via two new driveways on Round Barn Circle. The project location is shown in Figure 1.

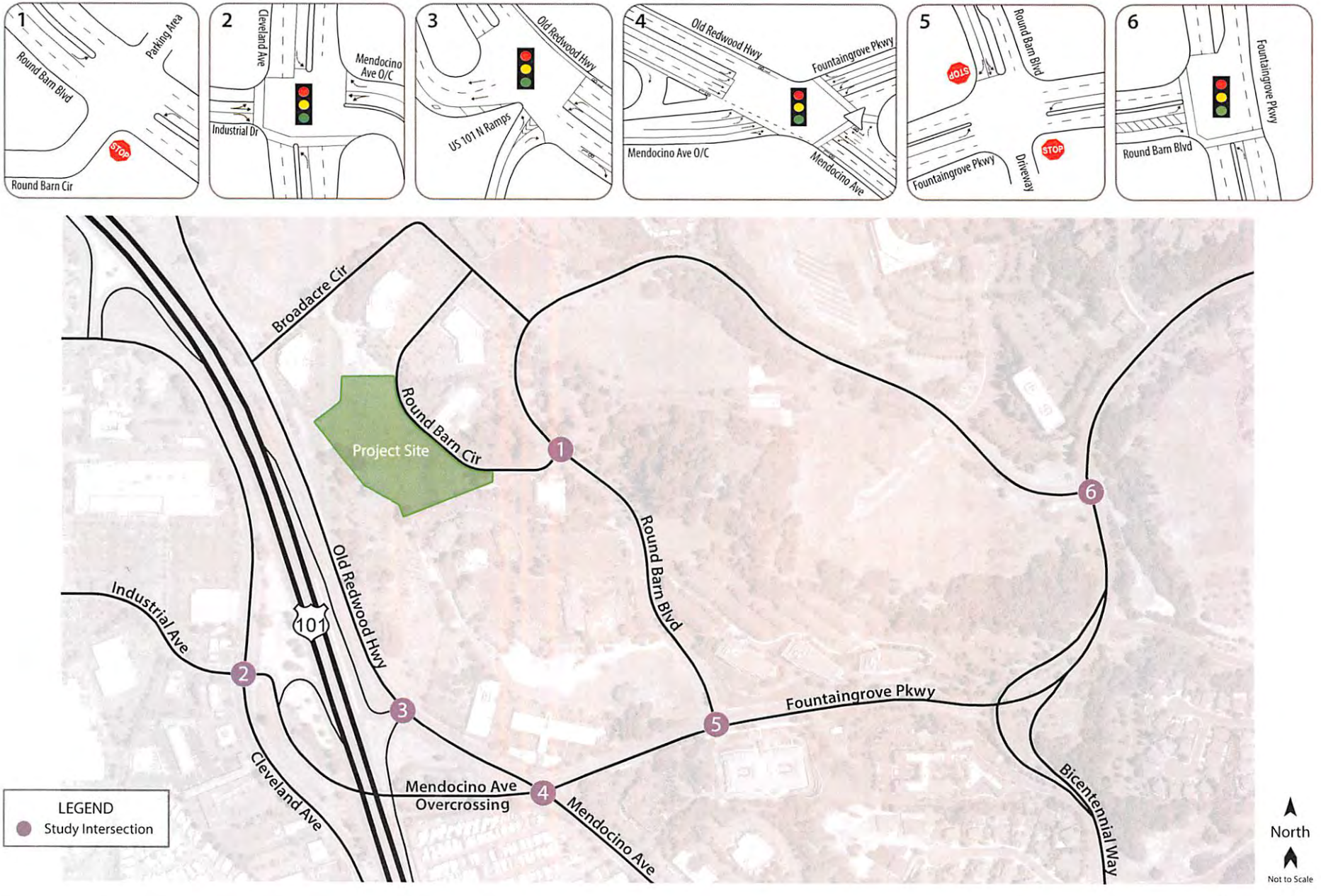

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Figure 1 – Study Area and Lane Configurations

Transportation Setting

Operational Analysis

Study Area and Periods

The study area was coordinated with City staff and consists of the following intersections:

1. Round Barn Circle/Round Barn Boulevard
2. Cleveland Avenue/Industrial Drive
3. Mendocino Avenue/US 101 North Ramps
4. Mendocino Avenue/Fountaingrove Parkway
5. Round Barn Boulevard/Fountaingrove Parkway (lower)
6. Round Barn Boulevard/Fountaingrove Parkway (upper)

Operating conditions during the weekday p.m. and weekend midday peak periods were evaluated to capture the highest potential impacts for the proposed project as well as the highest volumes on the local transportation network. The weekday p.m. peak hour occurs between 4:00 and 6:00 p.m. and typically reflects the highest level of congestion during the homeward bound commute. The peak period evaluated for weekends was 11:30 a.m. to 1:30 p.m.

Study Intersections

Round Barn Boulevard/Round Barn Circle is an unsignalized tee intersection with the terminating Round Barn Circle approach stop-controlled.

Cleveland Avenue/Industrial Drive is a signalized four-legged intersection. The northbound and southbound Cleveland Avenue approaches have protected left-turn phasing. The eastbound Industrial Drive and westbound Mendocino Avenue Overcrossing approaches are split phased with right-turn overlap phasing. The intersection has marked crosswalks on the south and west legs.

Mendocino Avenue/US 101 North Ramps is a signalized tee intersection. The northbound Mendocino Avenue approach has protected left-turn phasing. The off-ramp from US 101 North has a right-turn overlap phase.

Mendocino Avenue/Fountaingrove Parkway is a skewed signalized four-legged intersection. All approaches have protected left-turn phasing, and the westbound Fountaingrove Parkway approach has a right-turn overlap phase. The northbound and southbound Mendocino Avenue approaches have channelized right-turn lanes. Crosswalks are provided on the south and east legs.

Round Barn Boulevard/Fountaingrove Parkway (lower) is an unsignalized tee intersection that is stop-controlled at the southbound approach and includes a marked crosswalk on the south leg.

Round Barn Boulevard/Fountaingrove Parkway (upper) is a signalized tee intersection with crosswalks on the north and west legs. There is protected left-turn phasing for the movement from Fountaingrove Parkway.

Collision History

The collision history for the study area was reviewed to determine any trends or patterns that may indicate a safety issue. Collision rates were calculated based on records available from the California Highway Patrol as published

in their Statewide Integrated Traffic Records System (SWITRS) reports. The most current five-year period available is January 1, 2012 through December 31, 2016.

As presented in Table 1, the calculated collision rates for the study intersections were compared to average collision rates for similar facilities statewide, as indicated in *2014 Collision Data on California State Highways*, California Department of Transportation (Caltrans). Calculated collision rates for the study intersections were lower than the statewide average at five of the six study intersections. Because there is no way to differentiate between the crashes that occurred at the upper versus lower intersections of Round Barn Boulevard and Fountaingrove Parkway, the crashes were split between the two locations, but even if two-thirds of the crashes were assigned to one of the two intersections instead of half, the resulting rate would be equal to the statewide average, so the conclusion that there is not a safety concern would remain the same.

Table 1 – Collision Rates at the Study Intersections

Study Intersection	Number of Collisions (2012-2016)	Calculated Collision Rate (c/mve)	Statewide Average Collision Rate (c/mve)
1. Round Barn Blvd/Round Barn Cir	1	0.15	0.18
2. Cleveland Ave/Industrial Dr	11	0.21	0.27
3. Mendocino Ave/US 101 North Ramps	14	0.26	0.27
4. Mendocino Ave/Fountaingrove Pkwy	25	**0.32**	0.27
5. Round Barn Blvd/Fountaingrove Pkwy (lower)	4	0.14	0.21
6. Round Barn Blvd/Fountaingrove Pkwy (upper)	4	0.14	0.21

Note: c/mve = collisions per million vehicles entering; **bold** text = collision rate is higher than the statewide average

At the one intersection that had an above average rate, of the 25 reported collisions at Mendocino Avenue/ Fountaingrove Parkway, 15 involved two vehicles traveling in the same direction and either hitting in a sideswipe or rear-end crash. These collisions generally resulted from unsafe speed, and are typical of conditions at a congested intersection. Given that the rate is only marginally above average, remedial action does not appear to be warranted.

The collision rate calculations are provided in Appendix A.

Alternative Modes

Pedestrian Facilities

Pedestrian facilities include sidewalks, crosswalks, and pedestrian signal phases, curb ramps, curb extensions, and various streetscape amenities such as lighting, benches, etc. In general, a network of sidewalks, crosswalks, pedestrian signals, and curb ramps provide access for pedestrians within the vicinity of the proposed project site. Continuous sidewalk is provided on Round Barn Boulevard both along the project frontage as well as north and south of the project site. Similarly, sidewalks are provided on Bicentennial Way along the project frontage and extend east and west beyond the project limits. Marked pedestrian crossings are provided at each study intersection.

Bicycle Facilities

The *Highway Design Manual*, Caltrans, 2012, classifies bikeways into three categories used by the City:

- **Class I Multi-Use Path** – a completely separated right-of-way for the exclusive use of bicycles and pedestrians with cross flows of motorized traffic minimized.
- **Class II Bike Lane** – a striped and signed lane for one-way bike travel on a street or highway.
- **Class III Bike Route** – signing only for shared use with motor vehicles within the same travel lane on a street or highway.

In the project area, Class II bike lanes are provided on Mendocino Avenue and extend from College Avenue past the City Limits to Mark West Springs Road. A Class I bike path is provided on Fountaingrove Parkway from Mendocino Avenue to Parker Hill Drive. Class II bike lanes exist on a short segment of Cleveland Avenue and are planned to extend from Hopper Avenue to West 9th Street. Table 2 summarizes the existing and planned bicycle facilities in the project vicinity.

Table 2 – Bicycle Facility Summary

Status Facility	Class	Length (miles)	Begin Point	End Point
Existing				
Fountaingrove Pkwy	I	4.16	Mendocino Ave	Parker Hill Dr
Mendocino Ave	II	2.26	College Ave	Mark West Springs Rd
Cleveland Ave	II	0.70	North of Edwards Ave	Ridgeway Ave
Proposed				
Cleveland Ave	II	1.57	Hopper Ave	North of Edwards Ave
Cleveland Ave	II	0.50	Ridgeway Ave	West 9th St

Source: *Santa Rosa Bicycle and Pedestrian Master Plan*, City of Santa Rosa, 2014

Transit Facilities

Santa Rosa CityBus (SRCT) Routes 10 provides transit from the study area to the regional transfer point at Coddingtown Mall. The nearest bus stop is located on Round Barn Boulevard about one-quarter mile east of the project. Route 10 operates Monday through Friday with approximately thirty-minute headways from 6:15 a.m. to 7:15 p.m. On weekends, service is provided hourly from 7:45 a.m. to 4:45 p.m.

Two bicycles can be carried on most SRCT buses. Bike rack space is on a first come, first served basis. Additional bicycles are allowed on SRCT buses at the discretion of the driver.

Dial-a-ride, also known as paratransit, or door-to-door service, is available for those who are unable to independently use the transit system due to a physical or mental disability. Sonoma County Paratransit is designed to serve the needs of individuals with disabilities within Santa Rosa and the greater Santa Rosa area.

Capacity Analysis

Intersection Level of Service Methodologies

Level of Service (LOS) is used to rank traffic operation on various types of facilities based on traffic volumes and roadway capacity using a series of letter designations ranging from A to F. Generally, Level of Service A represents free flow conditions and Level of Service F represents forced flow or breakdown conditions. A unit of measure that indicates a level of delay generally accompanies the LOS designation.

The study intersections were analyzed using the signalized methodology published in the *Highway Capacity Manual* (HCM), Transportation Research Board, 2010. This source contains methodologies for various types of intersection control, all of which are related to a measurement of delay in average number of seconds per vehicle. The signalized methodology is based on factors including traffic volumes, green time for each movement, phasing, whether or not the signals are coordinated, truck traffic, and pedestrian activity. Average stopped delay per vehicle in seconds is used as the basis for evaluation in this LOS methodology. For purposes of this study, delays were calculated using signal timing provided by the City. The intersection of Mendocino Avenue/Bicentennial Way has a left-turn phase that both leads and lags; this additional phase results in non-standard phasing and had to be analyzed using HCM 2000.

The ranges of delay associated with the various levels of service are indicated in Table 3.

Table 3 – Signalized Intersection Level of Service Criteria	
LOS A	Delay of 0 to 10 seconds. Most vehicles arrive during the green phase, so do not stop at all.
LOS B	Delay of 10 to 20 seconds. More vehicles stop than with LOS A, but many drivers still do not have to stop.
LOS C	Delay of 20 to 35 seconds. The number of vehicles stopping is significant, although many still pass through without stopping.
LOS D	Delay of 35 to 55 seconds. The influence of congestion is noticeable, and most vehicles have to stop.
LOS E	Delay of 55 to 80 seconds. Most, if not all, vehicles must stop and drivers consider the delay excessive.
LOS F	Delay of more than 80 seconds. Vehicles may wait through more than one cycle to clear the intersection.

Reference: *Highway Capacity Manual*, Transportation Research Board, 2010

Arterial Segment Level of Service Methodology

The roadway segment Level of Service methodology found in Chapter 15, "Urban and Suburban Arterials," of the HCM is the basis of the analysis performed for the study road segment. This method does not address the capacity of a facility, but rather determines a Level of Service based on average through-vehicle travel speed. In essence, congestion occurs as traffic volumes increase, and the overall travel speed is reduced due to increased delay. Therefore, the slower the average travel speed, the lower the Level of Service.

As described in the HCM, there are various arterial classifications with different free flow travel speeds and, hence, different Level of Service speeds. The relationship between arterial classification and Level of Service speed is presented in Table 4.

Table 4 – Arterial Level of Service Criteria				
Arterial Class	**I**	**II**	**III**	**IV**
Range of Free Flow Speeds (mph)	55 to 45	45 to 35	35 to 30	35 to 25
Typical Free Flow Speed (mph)	50	40	35	30
Level of Service	**Average Travel Speed (mph)**			
A	> 42	> 35	> 30	> 25
B	> 34	> 28	> 24	> 19
C	> 27	> 22	> 18	> 13
D	> 21	> 17	> 14	> 9
E	> 16	> 13	> 10	> 7
F	≤ 16	≤ 13	≤ 10	≤ 7

Traffic Operation Standards

The City of Santa Rosa's adopted Level of Service (LOS) Standard is contained in *Santa Rosa General Plan 2035*. Standard TD-1 states that the City will try to maintain a Level of Service (LOS) D or better along all major corridors. Exceptions to meeting this standard are allowed where attainment would result in significant environmental degradation; where topography or environmental impacts make the improvement impossible; or where attainment would ensure loss of an area's unique character.

While a corridor level of service is applied by the City in its analysis of the entire City as part of the environmental documentation supporting the General Plan, this type of analysis only provides relevant data when performed on a much longer segment than the one included as the study area for the project. Therefore, although the City's standard does not specify criteria for intersections, for the purposes of this study a minimum operation of LOS D for the overall operation of signalized intersections was applied.

If the service level of an individual intersection fell below LOS D, the corridor was evaluated to determine if the City's operational standard is met.

While two of the study intersections include freeway ramps, the City's operational standard was applied, as is typically the case for locations that are crucial to a local jurisdictions circulation system.

Existing Conditions

The Existing Conditions scenario provides an evaluation of current operation based on existing traffic volumes during the weekday p.m. and weekend midday peak periods. This condition does not include project-generated traffic volumes.

Intersection Levels of Service

Under existing conditions, five of the six study intersections are operating at an acceptable level of service; Mendocino Avenue/Fountaingrove Parkway is currently operating unacceptably at LOS E during the weekday p.m. peak hour. The existing traffic volumes are shown in Figure 2. A summary of the intersection level of service calculations is contained in Table 5, and copies of the Level of Service calculations are provided in Appendix B.

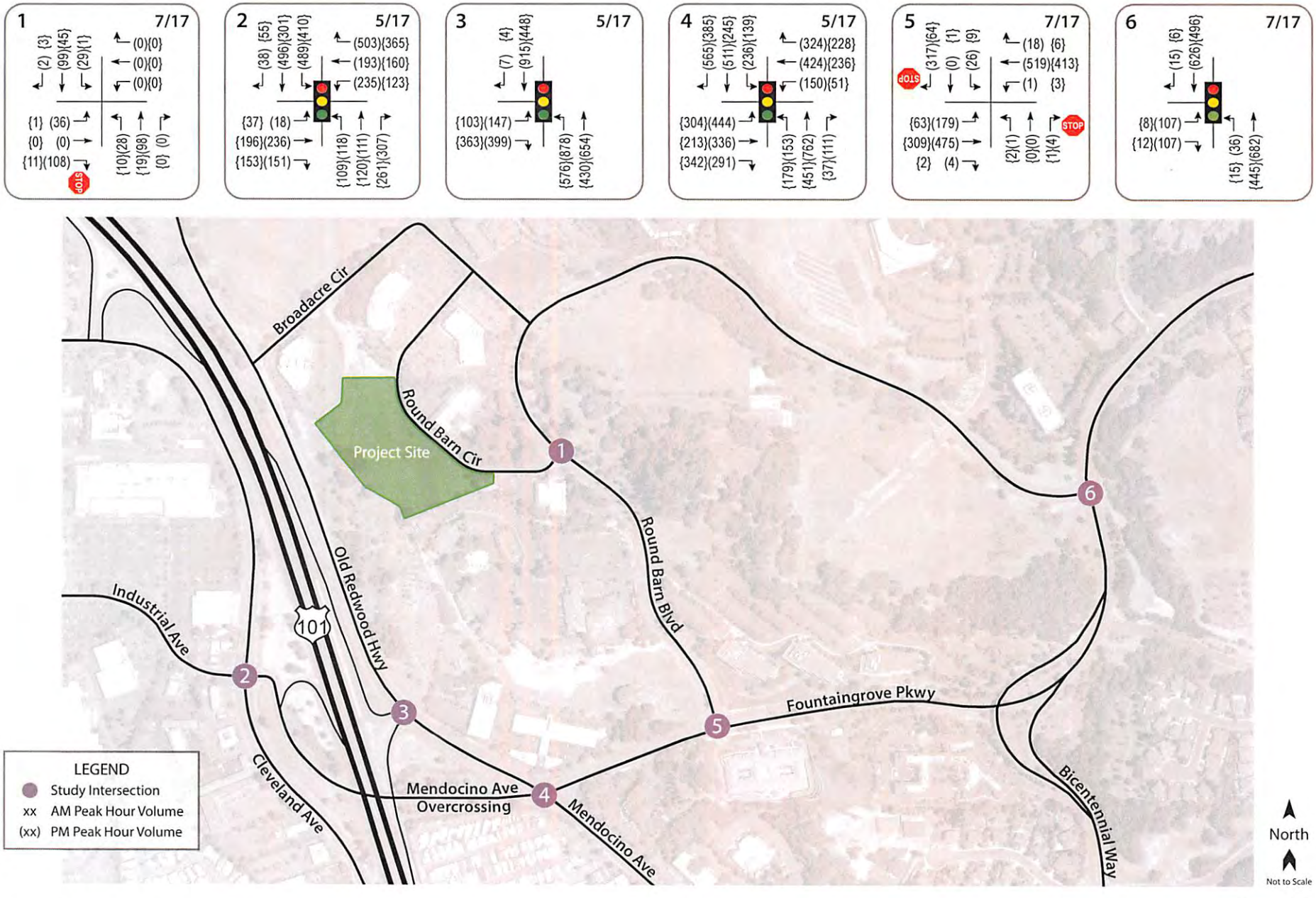

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Figure 2 – Existing Traffic Volumes

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Table 5 – Existing Peak Hour Intersection Levels of Service

Study Intersection *Approach*	Weekday PM Peak		Saturday Peak	
	Delay	LOS	Delay	LOS
1. Round Barn Blvd/Round Barn Cir	4.6	A	2.0	A
Eastbound (Round Barn) Approach	*9.9*	*A*	*8.5*	*A*
2. Cleveland Ave/Industrial Dr	31.9	C	22.5	C
3. Mendocino Ave/US 101 North Ramps	23.5	C	22.4	C
4. Mendocino Ave/Fountaingrove Pkwy	**60.1**	**E**	36.1	D
5. Round Barn Blvd/Fountaingrove Pkwy (lower)	4.6	A	1.6	A
Southbound (Round Barn) Approach	*15.5*	*C*	*10.9*	*B*
6. Round Barn Blvd/Fountaingrove Pkwy (upper)	7.9	A	2.5	A

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics;* **Bold** text indicates unacceptable operation

Roadway Levels of Service

Because the intersection of Mendocino Avenue/Fountaingrove Parkway is currently operating at LOS E during the weekday p.m. peak period, and therefore below the operational standard of LOS D, further analysis was performed to determine the arterial service level on Mendocino Avenue. The SIMTRAFFIC application of Synchro was used to determine the average travel speed on Mendocino Avenue between the on-ramp to US 101 North and Administration Drive-Chanate Road. This analysis takes into account the queued vehicles at the signalized intersections, so the reported speed is an average of both stopped vehicles and moving vehicles in the network. With a free-flow speed of about 40 to 45 mph, Mendocino Avenue was considered a Class II arterial. As shown in Table 6, the average speed in on Mendocino Avenue each direction based on ten simulation runs is 19 mph. For Class II arterials, this represents LOS D operation, which is acceptable under the City's standard.

Table 6 – Existing PM Peak Hour Average Travel Speed on Mendocino Avenue

Northbound		Southbound	
Speed	LOS	Speed	LOS
19	D	18	D

Notes: Speed is reported in miles per hour (mph)

Future Conditions

Segment volumes for the horizon year of 2040 were obtained from the County's gravity demand model and translated to turning movement volumes at each of the study intersections using the "Furness" method. The Furness method is an iterative process that employs existing turning movement data, existing link volumes, and future link volumes to project likely turning future movement volumes at intersections. The City plans to signalize the intersection of Fountaingrove Parkway/Round Barn Boulevard (lower), and this project is included in the City's facilities fee. This improvement was assumed for the analysis of Future conditions.

Intersection Operation

Under the anticipated Future volumes, four of the six study intersections are expected to operate at acceptable levels of service. Future volumes are shown in Figure 3 and operating conditions are summarized in Table 7.

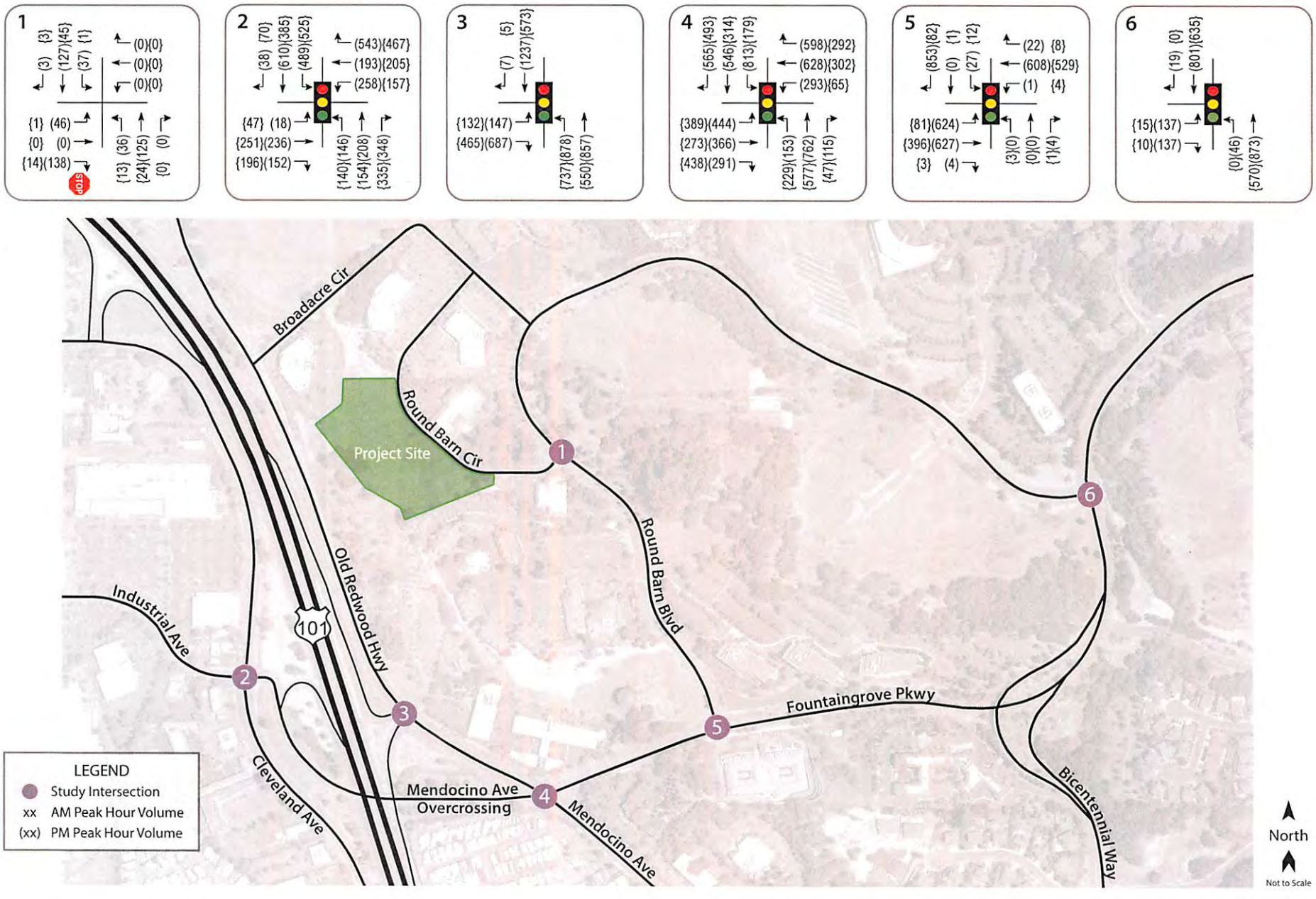

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Figure 3 – Future Traffic Volumes

W-Trans

Table 7 – Future Peak Hour Intersection Levels of Service

Study Intersection *Approach*	Weekday PM Peak		Saturday Peak	
	Delay	LOS	Delay	LOS
1. Round Barn Blvd/Round Barn Cir	4.9	A	2.3	A
Eastbound (Round Barn) Approach	*10.5*	*B*	*8.5*	*A*
2. Cleveland Ave/Industrial Dr	41.4	D	35.7	D
3. Mendocino Ave/US 101 North Ramps	25.9	C	23.0	C
4. Mendocino Ave/Fountaingrove Pkwy	**135.8**	**F**	43.4	D
5. Round Barn Blvd/Fountaingrove Pkwy (lower)	35.0	D	9.8	A
6. Round Barn Blvd/Fountaingrove Pkwy (upper)	8.5	A	1.2	A

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics;* **Bold** text indicates unacceptable operation

Arterial Operation

Because LOS F operation is projected at Mendocino Avenue/Fountaingrove Parkway under future volumes, the operation of the arterial was evaluated. As shown in Table 8, the arterial is operating acceptably during both peak periods; therefore, operation is considered acceptable.

Table 8 – Future PM Peak Hour Average Travel Speed on Mendocino Avenue

Northbound		Southbound	
Speed	LOS	Speed	LOS
17	D	20	D

Notes: Speed is reported in miles per hour (mph)

Project Description

The proposed project is a 114-room hotel to be located on currently vacant lands. Two driveways on Round Barn Circle would provide access to the parking lot. The site plan is shown in Figure 4.

Trip Generation

The anticipated trip generation for the proposed project was estimated using standard rates published by the Institute of Transportation Engineers (ITE) in *Trip Generation Manual*, 9th Edition, 2012. For the proposed use the rates for Hotel (LU #310) was applied to the 114-unit Residence Inn. Based on application of these standard rates, the proposed project is expected to generate an average of 931 net new trips per day, including 68 p.m. peak hour trips and 99 trips during the weekend peak hour. The expected trip generation potential for the proposed project is indicated in Table 9.

Source: DesignCell Architecture 8/17

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Figure 4 – Site Plan

Table 9 – Trip Generation Summary											
Land Use	Units	Daily		Weekday PM Peak Hour				Saturday Peak Hour			
		Rate	Trips	Rate	Trips	In	Out	Rate	Trips	In	Out
Hotel	114	8.17	931	0.60	68	35	33	.87	99	50	49

It is noted that the project as evaluated included 115 rooms, or one more outbound trip during each of the two study periods. The analysis is therefore slightly conservative.

Trip Distribution

The pattern used to allocate new project trips to the street network reflects the location at a crossroads as well as the connections to US 101. The applied trip distribution percentages are shown in Table 10.

Table 10 – Trip Distribution Assumptions	
Route	Percent
To/from the north via US 101	35
To/from the south via US 101	45
To/from the south via Mendocino Ave	5
To/from the south via Cleveland Ave	5
To/from the east via Fountaingrove Pkwy	5
To/from the west via Industrial Drive	5
TOTAL	**100**

Existing plus Project Conditions

Intersection Operation

Upon the addition of project-related traffic to the Existing volumes, the study intersections are expected to continue operating acceptable levels of service except Mendocino Avenue/Fountaingrove Parkway, which would continue to operate at LOS E. Project traffic volumes are shown in Figure 5, and operating conditions are summarized Table 11.

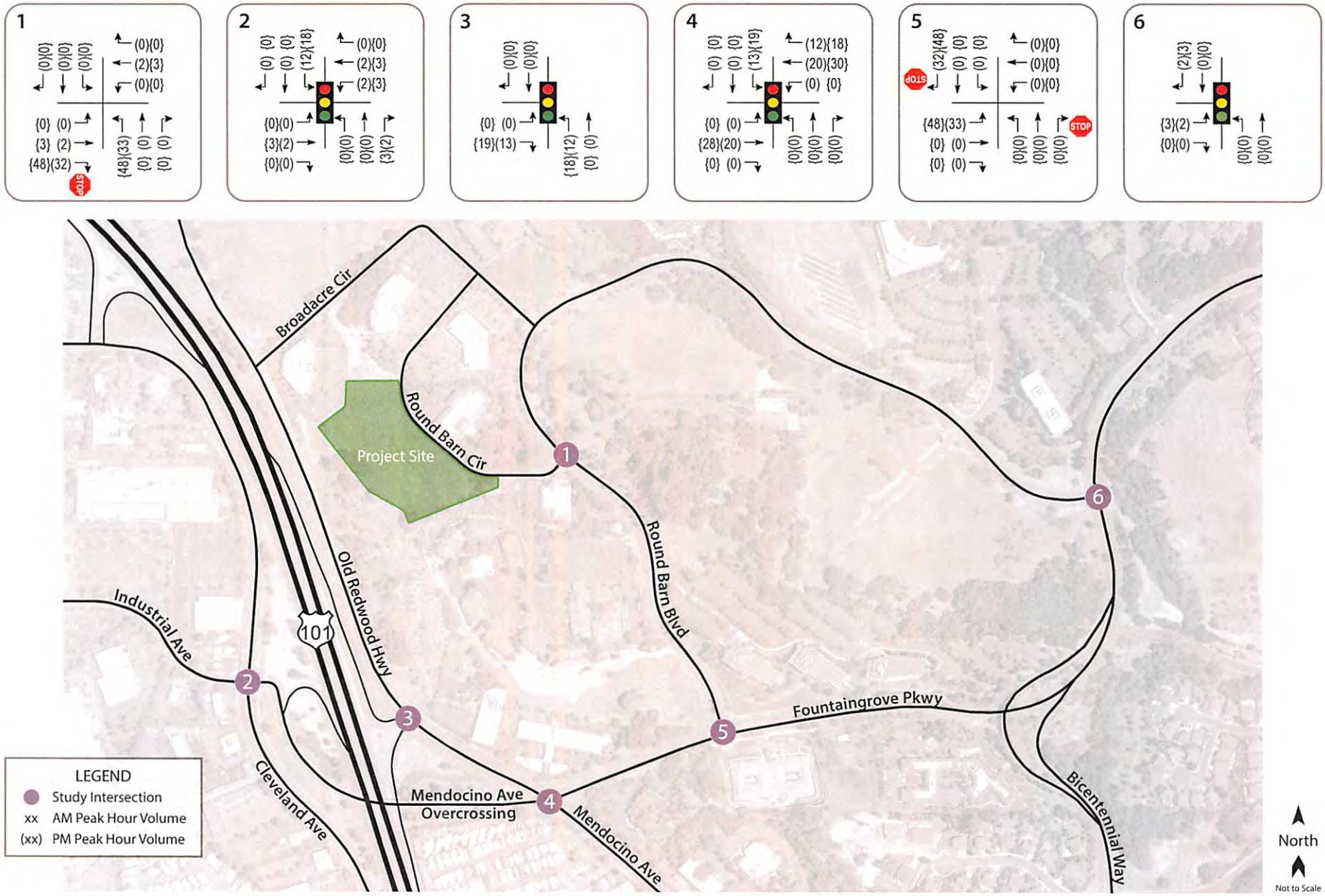

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Figure 5 – Project Traffic Volumes

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Table 11 – Existing and Existing plus Project Peak Hour Intersection Levels of Service

Study Intersection *Approach*	Existing Conditions				Existing plus Project			
	Weekday PM Peak		Saturday Peak		Weekday PM Peak		Saturday Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1. Round Barn Blvd/Round Barn Cir	4.6	A	2.0	A	5.4	A	5.3	A
Eastbound (Round Barn) Approach	*9.9*	*A*	*8.5*	*A*	*10.2*	*B*	*8.8*	*A*
2. Cleveland Ave/Industrial Dr	31.9	C	22.5	C	33.0	C	23.2	C
3. Mendocino Ave/US 101 North Ramps	23.5	C	22.4	C	23.5	C	22.4	C
4. Mendocino Ave/Fountaingrove Pkwy	**60.1**	**E**	36.1	D	**63.0**	**E**	37.0	D
5. Round Barn Blvd/Fountaingrove Pkwy (lower)	4.6	A	1.6	A	5.2	A	2.4	A
Southbound (Round Barn) Approach	*15.5*	*C*	*10.9*	*B*	*16.4*	*C*	*11.0*	*B*
6. Round Barn Blvd/Fountaingrove Pkwy (upper)	7.9	A	2.5	A	7.9	A	2.6	A

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics;* **Bold** text indicates unacceptable operation

Finding – The study intersections are expected to continue operating at the same levels of service upon the addition of project-generated traffic. As noted for Existing operation, because Mendocino Avenue/ Fountaingrove Parkway is operating at LOS E, operation of the arterial segment was also evaluated.

Arterial Operation

Upon adding project-generated trips to Mendocino Avenue, speeds are expected to remain virtually constant, though a 1-mph increase (or improvement) is projected in the southbound direction. While this result is counter-intuitive, it is noted that because of the random seeding of vehicles for micro-simulation and the stochastic nature of the model, results vary from one run to the next, which is why ten runs were performed. Similarly, the average of ten runs may vary from one set of runs to another for the same data set. As shown in Table 12, the conclusion that can reasonably be drawn from this analysis is that the addition of project traffic will result in little, if any, change in operating conditions along Mendocino Avenue.

Table 12 – Existing and Existing plus Project PM Peak Hour Average Travel Speed on Mendocino Avenue

Existing Conditions				Existing plus Project			
Northbound		Southbound		Northbound		Southbound	
Speed	LOS	Speed	LOS	Speed	LOS	Speed	LOS
19	D	18	D	19	D	19	D

Notes: Speed is reported in miles per hour (mph)

Finding – The project is expected to have a less-than-significant impact on arterial traffic operation.

Future plus Project Conditions

Intersection Operation

Upon the addition of project-generated traffic to the anticipated Future volumes, the study intersections are expected to continue operating acceptably. These results are summarized in Table 13.

Table 13 – Future and Future plus Project Peak Hour Intersection Levels of Service

Study Intersection *Approach*	Future Conditions				Future plus Project			
	Weekday PM Peak		Saturday Peak		Weekday PM Peak		Saturday Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1. Round Barn Blvd/Round Barn Cir	4.9	A	2.3	A	5.6	A	5.3	A
Eastbound (Round Barn) Approach	*10.5*	*B*	*8.5*	*A*	*11.1*	*B*	*8.8*	*B*
2. Cleveland Ave/Industrial Dr	41.4	D	35.7	D	43.4	D	38.7	D
3. Mendocino Ave/US 101 North Ramps	25.9	C	23.0	C	25.9	C	23.0	C
4. Mendocino Ave/Fountaingrove Pkwy	**135.8**	**F**	43.4	D	**142.7**	**F**	48.3	D
5. Round Barn Blvd/Fountaingrove Pkwy (lower)	35.0	D	9.8	A	41.1	D	10.8	B
6. RoundBarn Blvd/Fountaingrove Pkwy (upper)	8.5	A	1.2	A	8.5	A	1.4	A

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics;* **Bold** text indicates unacceptable operation

Finding – The study intersections are expected to continue operating at the same Levels of Service with project traffic added to Future volumes as without it.

Arterial Operation

Upon adding project-generated trips to Mendocino Avenue, speeds are expected to remain virtually constant, though a 1-mph increase (or improvement) is projected in the northbound direction. As previously noted, this occurs due to the random seeding of vehicles for micro-simulation. As shown in Table 14, the arterial is operating acceptably during both peak periods; therefore, operation is considered acceptable.

Table 14 – Future and Future plus Project PM Peak Hour Average Travel Speed on Mendocino Avenue

Future Conditions				Future plus Project			
Northbound		Southbound		Northbound		Southbound	
Speed	LOS	Speed	LOS	Speed	LOS	Speed	LOS
17	D	20	D	18	D	19	D

Notes: Speed is reported in miles per hour (mph)

Finding – The project is expected to have a less-than-significant impact at Mendocino Avenue/Fountaingrove Parkway because the arterial segment is projected to continue operating acceptably upon adding project-generated traffic.

Alternative Modes

Pedestrian Facilities

Sidewalks exist along the east side of the project site on Round Barn Circle. The proposed site plans include sidewalk along the project frontage as well as connections between the site and sidewalks on Round Barn Circle.

Finding – Pedestrian facilities serving the project site will be adequate upon completion of the sidewalk proposed as part of the project.

Bicycle Facilities

Existing bicycle facilities, including a bike path on Fountaingrove Parkway and bike lanes on Mendocino Avenue, provide adequate access for bicyclists.

Bicycle Storage

Existing and planned bicycle facilities, per the City's *Bicycle and Pedestrian Master Plan*, would provide adequate access for bicyclists. However, the proposed site plan does not include bicycle parking at the hotel. While the majority of hotel guests are expected to travel by vehicle, some employees may wish to travel to and from the hotel by bike. According to the City of Santa Rosa's municipal code, Chapter 20.36.040, hotel land uses are required to provide one bicycle parking space plus one space per ten guest rooms. Based on City requirements, with plans for 114 rooms, the hotel would be required to provide 12 bicycle parking spaces.

Finding – Bicycle facilities serving the project site are adequate. However, there is no planned bicycle parking and provision of bicycles on-site for use by guests would further promote use of this mode of transportations.

Recommendation – To meet City requirements, 12 bicycle parking spaces should be provided on-site.

Transit

Existing transit routes are adequate to accommodate project-generated transit trips. Existing stops are within acceptable walking distance of the site.

Finding – Transit facilities serving the project site are adequate.

Parking

The project was analyzed to determine whether the proposed parking supply would be sufficient for the anticipated parking demand. The project site as proposed would provide a total of 116 parking spaces.

Required Parking

City parking supply requirements are based on the City of Santa Rosa's Municipal Code, Chapter 20-36; Parking and Loading Standards. Based on the City's standard of one space per guest room, the proposed project would be required to provide 114 parking spaces. With a planned supply of 116 parking spaces, parking would meet the City's requirements.

Conclusions and Recommendations

Conclusions

- The proposed hotel would be expected to generate an average of 931 daily trips with 68 trips during the weekday p.m. peak hour and 99 trips during the weekend p.m. peak hour.
- Five of the six study intersections are currently operating acceptably at LOS D or better and are expected to continue doing so under all volume scenarios evaluated with one exception. The intersection of Mendocino Avenue/Fountaingrove Parkway is currently operating at LOS E during the p.m. peak hour and is expected to drop to LOS F operation under Future volumes.
- An arterial analysis indicates that the Mendocino Avenue corridor is operating at LOS D during the p.m. peak hour under current volumes and is expected to do so under future volumes and upon adding project-generated trips. The project's impact is therefore less-than-significant.
- Pedestrian, bicycle, and transit facilities are generally adequate to serve the project site. However, the site plan does not include plans for bicycle parking.
- The proposed parking supply for the hotel of 116 spaces meets the City's parking requirement of one space per room.

Recommendations

- Secure parking for a minimum of twelve bicycles should be provided on-site.

Study Participants and References

Study Participants

Principal in Charge	Dalene J. Whitlock, PE, PTOE
Assistant Engineer	Kevin Rangel, EIT
Graphics/Editing/Formatting	Alex Scrobonia

References

2014 Collision Data on California State Highways, California Department of Transportation, 2017
Guide for the Preparation of Traffic Impact Studies, California Department of Transportation, 2002
Highway Capacity Manual, Transportation Research Board, 2000
Highway Capacity Manual, Transportation Research Board, 2010
Highway Design Manual, 6th Edition, California Department of Transportation, 2012
Santa Rosa Bicycle and Pedestrian Master Plan, City of Santa Rosa, 2014
Santa Rosa City Code, Quality Code Publishing, 2017
Santa Rosa CityBus, http://srcity.org/1661/Maps-and-Schedules
Santa Rosa General Plan 2035, City of Santa Rosa, 2014
Statewide Integrated Traffic Records System (SWITRS), California Highway Patrol, 2012-2016
Trip Generation Manual, 9th Edition, Institute of Transportation Engineers, 2012

SRO450

Appendix A

Collision Rate Calculations

Intersection Collision Rate Calculations

Residence Inn Traffic Impact Study

Intersection # 1: Round Barn Circle & Round Barn Boulevard
Date of Count: Wednesday, August 30, 2017

Number of Collisions: 1
Number of Injuries: 0
Number of Fatalities: 0
ADT: 3600
Start Date: January 1, 2012
End Date: December 31, 2016
Number of Years: 5

Intersection Type: Tee
Control Type: Stop & Yield Controls
Area: Urban

$$\text{collision rate} = \frac{\text{Number of Collisions} \times 1 \text{ Million}}{\text{ADT} \times 365 \text{ Days per Year} \times \text{Number of Years}}$$

$$\text{collision rate} = \frac{1 \times 1{,}000{,}000}{3{,}600 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	0.15 c/mve	0.0%	0.0%
Statewide Average*	0.18 c/mve	0.7%	36.4%

ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2013 Collision Data on California State Highways, Caltrans

Intersection # 2: Cleveland Avenue & Industrial Drive
Date of Count: Wednesday, August 30, 2017

Number of Collisions: 11
Number of Injuries: 4
Number of Fatalities: 0
ADT: 29000
Start Date: January 1, 2012
End Date: December 31, 2016
Number of Years: 5

Intersection Type: Four-Legged
Control Type: Signals
Area: Urban

$$\text{collision rate} = \frac{\text{Number of Collisions} \times 1 \text{ Million}}{\text{ADT} \times 365 \text{ Days per Year} \times \text{Number of Years}}$$

$$\text{collision rate} = \frac{11 \times 1{,}000{,}000}{29{,}000 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	0.21 c/mve	0.0%	36.4%
Statewide Average*	0.27 c/mve	0.4%	41.9%

ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2013 Collision Data on California State Highways, Caltrans

Intersection Collision Rate Calculations

Residence Inn Traffic Impact Study

Intersection # 3: Mendocino Avenue & US 101 Northbound Ramps
Date of Count: Wednesday, August 30, 2017

Number of Collisions: 14
Number of Injuries: 8
Number of Fatalities: 0
ADT: 30000
Start Date: January 1, 2012
End Date: December 31, 2016
Number of Years: 5

Intersection Type: Four-Legged
Control Type: Signals
Area: Urban

$$\text{collision rate} = \frac{\text{Number of Collisions} \times 1 \text{ Million}}{\text{ADT} \times 365 \text{ Days per Year} \times \text{Number of Years}}$$

$$\text{collision rate} = \frac{14 \times 1{,}000{,}000}{30{,}000 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	0.26 c/mve	0.0%	57.1%
Statewide Average*	0.27 c/mve	0.4%	41.9%

ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2013 Collision Data on California State Highways, Caltrans

Intersection # 4: Mendoncino Avenue & Fountaingrove Parkway
Date of Count: Wednesday, August 30, 2017

Number of Collisions: 25
Number of Injuries: 16
Number of Fatalities: 0
ADT: 43100
Start Date: January 1, 2012
End Date: December 31, 2016
Number of Years: 5

Intersection Type: Four-Legged
Control Type: Signals
Area: Urban

$$\text{collision rate} = \frac{\text{Number of Collisions} \times 1 \text{ Million}}{\text{ADT} \times 365 \text{ Days per Year} \times \text{Number of Years}}$$

$$\text{collision rate} = \frac{25 \times 1{,}000{,}000}{43{,}100 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	0.32 c/mve	0.0%	64.0%
Statewide Average*	0.27 c/mve	0.4%	41.9%

ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2013 Collision Data on California State Highways, Caltrans

Intersection Collision Rate Calculaions

Residence Inn Traffic Impact Study

Intersection # 5: Round Barn Boulevard & Fountaingrove Parkway

Date of Count: Wednesday, August 30, 2017

Number of Collisions: 4
Number of Injuries: 3
Number of Fatalities: 0
ADT: 16000
Start Date: January 1, 2012
End Date: December 31, 2016
Number of Years: 5

Intersection Type: Tee
Control Type: Signals
Area: Urban

$$\text{collision rate} = \frac{\text{Number of Collisions x 1 Million}}{\text{ADT x 365 Days per Year x Number of Years}}$$

$$\text{collision rate} = \frac{4 \times 1{,}000{,}000}{16{,}000 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	0.14 c/mve	0.0%	75.0%
Statewide Average*	0.21 c/mve	0.3%	42.4%

ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2013 Collision Data on California State Highways, Caltrans

Intersection # 6: Round Barn Boulevard & Fountaingrove Parkway

Date of Count: Wednesday, August 30, 2017

Number of Collisions: 4
Number of Injuries: 3
Number of Fatalities: 0
ADT: 15700
Start Date: January 1, 2012
End Date: December 31, 2016
Number of Years: 5

Intersection Type: Tee
Control Type: Signals
Area: Urban

$$\text{collision rate} = \frac{\text{Number of Collisions x 1 Million}}{\text{ADT x 365 Days per Year x Number of Years}}$$

$$\text{collision rate} = \frac{4 \times 1{,}000{,}000}{15{,}700 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	0.14 c/mve	0.0%	75.0%
Statewide Average*	0.21 c/mve	0.3%	42.4%

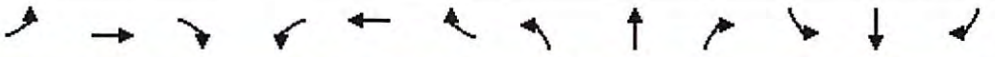
ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2013 Collision Data on California State Highways, Caltrans

Appendix B

Intersection Level of Service Calculations

HCM Unsignalized Intersection Capacity Analysis
1: Round Barn Blvd & Round Barn Circle

09/21/2017



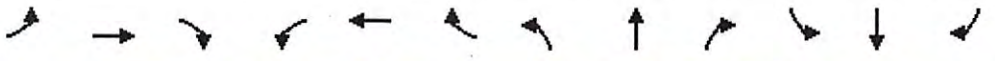
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	0	108	0	0	0	28	98	0	29	99	2
Future Volume (Veh/h)	36	0	108	0	0	0	28	98	0	29	99	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	36	0	108	0	0	0	28	98	0	29	99	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	263	312	50	370	313	49	101			98		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	263	312	50	370	313	49	101			98		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	100	89	100	100	100	98			98		
cM capacity (veh/h)	649	579	1007	487	578	1009	1489			1493		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	144	0	28	65	33	29	66	35
Volume Left	36	0	28	0	0	29	0	0
Volume Right	108	0	0	0	0	0	0	2
cSH	885	1700	1489	1700	1700	1493	1700	1700
Volume to Capacity	0.16	0.00	0.02	0.04	0.02	0.02	0.04	0.02
Queue Length 95th (ft)	14	0	1	0	0	1	0	0
Control Delay (s)	9.9	0.0	7.5	0.0	0.0	7.5	0.0	0.0
Lane LOS	A	A	A			A		
Approach Delay (s)	9.9	0.0	1.7			1.7		
Approach LOS	A	A						

Intersection Summary				
Average Delay	4.6			
Intersection Capacity Utilization	23.6%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
1: Round Barn Blvd & Round Barn Circle

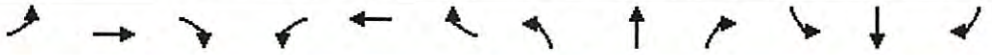
09/21/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	0	11	0	0	0	10	19	0	1	45	3
Future Volume (Veh/h)	1	0	11	0	0	0	10	19	0	1	45	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1	0	11	0	0	0	10	19	0	1	45	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	78	88	24	74	89	10	48			19		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	78	88	24	74	89	10	48			19		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	99	100	100	100	99			100		
cM capacity (veh/h)	897	796	1047	893	795	1069	1557			1596		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	12	0	10	13	6	1	30	18
Volume Left	1	0	10	0	0	1	0	0
Volume Right	11	0	0	0	0	0	0	3
cSH	1032	1700	1557	1700	1700	1596	1700	1700
Volume to Capacity	0.01	0.00	0.01	0.01	0.00	0.00	0.02	0.01
Queue Length 95th (ft)	1	0	0	0	0	0	0	0
Control Delay (s)	8.5	0.0	7.3	0.0	0.0	7.3	0.0	0.0
Lane LOS	A	A	A			A		
Approach Delay (s)	8.5	0.0	2.5			0.1		
Approach LOS	A	A						

Intersection Summary				
Average Delay	2.0			
Intersection Capacity Utilization	17.2%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	236	151	235	193	503	118	111	307	489	496	38
Future Volume (veh/h)	18	236	151	235	193	503	118	111	307	489	496	38
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.97	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
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	18	236	121	235	193	415	118	111	97	489	496	16
Adj No. of Lanes	0	1	1	0	1	1	1	2	0	1	2	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	24	310	410	274	225	919	148	167	132	551	1133	36
Arrive On Green	0.18	0.18	0.18	0.28	0.28	0.28	0.08	0.09	0.09	0.31	0.32	0.32
Sat Flow, veh/h	132	1725	1548	995	818	1552	1774	1858	1464	1774	3500	113
Grp Volume(v), veh/h	254	0	121	428	0	415	118	105	103	489	251	261
Grp Sat Flow(s),veh/h/ln	1856	0	1548	1813	0	1552	1774	1770	1552	1774	1770	1843
Q Serve(g_s), s	12.5	0.0	6.0	21.5	0.0	0.0	6.3	5.5	6.2	25.1	10.7	10.7
Cycle Q Clear(g_c), s	12.5	0.0	6.0	21.5	0.0	0.0	6.3	5.5	6.2	25.1	10.7	10.7
Prop In Lane	0.07		1.00	0.55		1.00	1.00		0.94	1.00		0.06
Lane Grp Cap(c), veh/h	334	0	410	499	0	919	148	159	140	551	573	596
V/C Ratio(X)	0.76	0.00	0.29	0.86	0.00	0.45	0.80	0.66	0.74	0.89	0.44	0.44
Avail Cap(c_a), veh/h	629	0	656	624	0	1026	315	303	265	1147	1133	1180
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.3	0.0	28.2	33.0	0.0	11.1	43.2	42.2	42.5	31.4	25.5	25.6
Incr Delay (d2), s/veh	3.6	0.0	0.4	9.6	0.0	0.3	3.7	1.7	2.8	2.0	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.8	0.0	2.6	12.0	0.0	6.1	3.2	2.8	2.8	12.5	5.3	5.5
LnGrp Delay(d),s/veh	40.9	0.0	28.6	42.5	0.0	11.5	46.9	43.9	45.3	33.4	25.7	25.7
LnGrp LOS	D		C	D		B	D	D	D	C	C	C
Approach Vol, veh/h		375			843			326			1001	
Approach Delay, s/veh		37.0			27.2			45.4			29.5	
Approach LOS		D			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		20.9	11.0	34.6		29.4	33.4	12.2
Change Period (Y+Rc), s		3.6	3.0	3.6		3.0	3.6	* 3.6
Max Green Setting (Gmax), s		32.5	17.0	61.4		33.0	62.0	* 16
Max Q Clear Time (g_c+I1), s		14.5	8.3	12.7		23.5	27.1	8.2
Green Ext Time (p_c), s		1.8	0.1	2.6		2.9	2.6	0.4

Intersection Summary	
HCM 2010 Ctrl Delay	31.9
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	196	153	123	160	365	109	120	261	410	301	55
Future Volume (veh/h)	37	196	153	123	160	365	109	120	261	410	301	55
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.97	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
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	37	196	123	123	160	277	109	120	51	410	301	33
Adj No. of Lanes	0	1	1	0	1	1	1	2	0	1	2	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	55	291	416	168	219	763	141	293	118	487	1042	113
Arrive On Green	0.19	0.19	0.19	0.21	0.21	0.21	0.08	0.12	0.12	0.27	0.32	0.32
Sat Flow, veh/h	293	1555	1548	792	1031	1548	1774	2444	982	1774	3220	350
Grp Volume(v), veh/h	233	0	123	283	0	277	109	85	86	410	164	170
Grp Sat Flow(s),veh/h/ln	1848	0	1548	1823	0	1548	1774	1770	1657	1774	1770	1800
Q Serve(g_s), s	7.8	0.0	4.2	9.7	0.0	0.0	4.0	3.0	3.2	14.6	4.6	4.7
Cycle Q Clear(g_c), s	7.8	0.0	4.2	9.7	0.0	0.0	4.0	3.0	3.2	14.6	4.6	4.7
Prop In Lane	0.16		1.00	0.43		1.00	1.00		0.59	1.00		0.19
Lane Grp Cap(c), veh/h	346	0	416	387	0	763	141	212	198	487	573	583
V/C Ratio(X)	0.67	0.00	0.30	0.73	0.00	0.36	0.77	0.40	0.43	0.84	0.29	0.29
Avail Cap(c_a), veh/h	899	0	879	901	0	1199	451	434	407	1646	1626	1655
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.2	0.0	19.5	24.6	0.0	10.7	30.2	27.2	27.3	22.9	16.8	16.9
Incr Delay (d2), s/veh	2.3	0.0	0.4	2.7	0.0	0.3	3.4	0.5	0.6	1.5	0.1	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	0.0	1.9	5.2	0.0	3.1	2.1	1.5	1.5	7.3	2.3	2.3
LnGrp Delay(d),s/veh	27.5	0.0	19.9	27.2	0.0	11.0	33.6	27.6	27.9	24.4	16.9	17.0
LnGrp LOS	C		B	C		B	C	C	C	C	B	B
Approach Vol, veh/h		356			560			280			744	
Approach Delay, s/veh		24.9			19.2			30.0			21.1	
Approach LOS		C			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		16.1	8.3	25.2		17.2	21.9	11.6
Change Period (Y+Rc), s		3.6	3.0	3.6		3.0	3.6	* 3.6
Max Green Setting (Gmax), s		32.5	17.0	61.4		33.0	62.0	* 16
Max Q Clear Time (g_c+I1), s		9.8	6.0	6.7		11.7	16.6	5.2
Green Ext Time (p_c), s		1.7	0.1	1.8		2.5	1.8	0.4

Intersection Summary	
HCM 2010 Ctrl Delay	22.5
HCM 2010 LOS	C

Notes

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	147	399	878	654	915	7
Future Volume (veh/h)	147	399	878	654	915	7
Number	7	14	5	2	6	16
Initial Q (Qb), veh	11	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1824
Adj Flow Rate, veh/h	147	311	878	654	915	5
Adj No. of Lanes	1	1	2	2	2	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	228	745	1179	2926	1546	8
Arrive On Green	0.11	0.11	0.31	0.79	0.43	0.43
Sat Flow, veh/h	1774	1583	3442	3632	3702	20
Grp Volume(v), veh/h	147	311	878	654	449	471
Grp Sat Flow(s),veh/h/ln	1774	1583	1721	1770	1770	1859
Q Serve(g_s), s	7.6	0.0	22.6	4.5	18.4	18.4
Cycle Q Clear(g_c), s	7.6	0.0	22.6	4.5	18.4	18.4
Prop In Lane	1.00	1.00	1.00			0.01
Lane Grp Cap(c), veh/h	228	745	1179	2926	758	796
V/C Ratio(X)	0.65	0.42	0.74	0.22	0.59	0.59
Avail Cap(c_a), veh/h	332	781	1053	2797	758	796
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.55	0.55	1.00	1.00
Uniform Delay (d), s/veh	40.5	17.1	27.8	2.0	20.8	20.8
Incr Delay (d2), s/veh	2.3	0.3	1.8	0.1	3.4	3.2
Initial Q Delay(d3),s/veh	47.6	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.1	8.2	10.5	1.8	9.7	10.1
LnGrp Delay(d),s/veh	90.3	17.4	29.7	2.1	24.2	24.0
LnGrp LOS	F	B	C	A	C	C
Approach Vol, veh/h	458			1532	920	
Approach Delay, s/veh	40.8			17.9	24.1	
Approach LOS	D			B	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		80.4		14.6	34.4	46.0		
Change Period (Y+Rc), s		5.3		* 4.2	5.3	* 5.3		
Max Green Setting (Gmax), s		67.7		* 18	22.8	* 41		
Max Q Clear Time (g_c+I1), s		6.5		9.6	24.6	20.4		
Green Ext Time (p_c), s		14.4		0.8	0.0	6.4		

Intersection Summary	
HCM 2010 Ctrl Delay	23.5
HCM 2010 LOS	C

Notes

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	103	363	576	430	448	4
Future Volume (veh/h)	103	363	576	430	448	4
Number	7	14	5	2	6	16
Initial Q (Qb), veh	11	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1824
Adj Flow Rate, veh/h	103	275	576	430	448	2
Adj No. of Lanes	1	1	2	2	2	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	186	658	1071	2815	1548	7
Arrive On Green	0.08	0.08	0.33	0.82	0.43	0.43
Sat Flow, veh/h	1774	1583	3442	3632	3706	16
Grp Volume(v), veh/h	103	275	576	430	219	231
Grp Sat Flow(s),veh/h/ln	1774	1583	1721	1770	1770	1859
Q Serve(g_s), s	5.4	0.0	12.8	2.4	7.7	7.7
Cycle Q Clear(g_c), s	5.4	0.0	12.8	2.4	7.7	7.7
Prop In Lane	1.00	1.00	1.00			0.01
Lane Grp Cap(c), veh/h	186	658	1071	2815	758	797
V/C Ratio(X)	0.56	0.42	0.54	0.15	0.29	0.29
Avail Cap(c_a), veh/h	332	820	1139	2885	758	797
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.87	0.87	1.00	1.00
Uniform Delay (d), s/veh	41.5	19.6	27.2	2.4	17.7	17.7
Incr Delay (d2), s/veh	1.9	0.3	0.5	0.1	1.0	0.9
Initial Q Delay(d3),s/veh	56.8	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.8	7.2	6.3	1.3	3.9	4.1
LnGrp Delay(d),s/veh	100.3	19.9	27.6	2.5	18.7	18.6
LnGrp LOS	F	B	C	A	B	B
Approach Vol, veh/h	378			1006	450	
Approach Delay, s/veh	41.8			16.9	18.7	
Approach LOS	D			B	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		82.7		12.3	36.7	46.0		
Change Period (Y+Rc), s		5.3		* 4.2	5.3	* 5.3		
Max Green Setting (Gmax), s		67.7		* 18	22.8	* 41		
Max Q Clear Time (g_c+I1), s		4.4		7.4	14.8	9.7		
Green Ext Time (p_c), s		7.6		0.7	3.7	3.0		

Intersection Summary	
HCM 2010 Ctrl Delay	22.4
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	444	336	291	150	424	324	153	762	111	236	511	565
Future Volume (veh/h)	444	336	291	150	424	324	153	762	111	236	511	565
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	2	10	2	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1937
Adj Flow Rate, veh/h	444	336	155	150	424	282	153	762	0	236	511	0
Adj No. of Lanes	2	2	0	2	1	1	1	2	0	2	2	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	442	558	252	285	367	478	233	1208	0	362	1188	553
Arrive On Green	0.13	0.24	0.24	0.08	0.20	0.20	0.13	0.34	0.00	0.11	0.34	0.00
Sat Flow, veh/h	3442	2358	1065	3442	1863	1583	1774	3632	0	3442	3539	1647
Grp Volume(v), veh/h	444	250	241	150	424	282	153	762	0	236	511	0
Grp Sat Flow(s),veh/h/ln	1721	1770	1654	1721	1863	1583	1774	1770	0	1721	1770	1647
Q Serve(g_s), s	12.2	11.9	12.3	4.0	18.7	8.4	7.8	17.2	0.0	6.3	10.6	0.0
Cycle Q Clear(g_c), s	12.2	11.9	12.3	4.0	18.7	8.4	7.8	17.2	0.0	6.3	10.6	0.0
Prop In Lane	1.00		0.64	1.00		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	442	419	391	285	367	478	233	1208	0	362	1188	553
V/C Ratio(X)	1.00	0.60	0.62	0.53	1.16	0.59	0.66	0.63	0.00	0.65	0.43	0.00
Avail Cap(c_a), veh/h	442	427	399	290	367	478	233	1208	0	605	1188	553
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.82	0.82	0.00
Uniform Delay (d), s/veh	41.4	32.2	32.4	41.9	38.2	11.5	39.2	26.3	0.0	40.8	24.5	0.0
Incr Delay (d2), s/veh	43.9	1.5	2.0	0.8	96.8	1.3	5.2	2.5	0.0	0.6	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.8	80.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.5	6.0	5.8	2.1	29.4	4.0	4.2	8.8	0.0	3.0	5.3	0.0
LnGrp Delay(d),s/veh	85.4	33.8	34.4	43.4	215.2	13.2	44.4	28.8	0.0	41.5	25.4	0.0
LnGrp LOS	F	C	C	D	F	B	D	C		D	C	
Approach Vol, veh/h		935			856			915			747	
Approach Delay, s/veh		58.4			118.5			31.4			30.5	
Approach LOS		E			F			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.6	27.4	18.8	36.2	17.0	23.0	16.3	38.7
Change Period (Y+Rc), s	4.8	* 4.8	6.3	4.3	4.8	4.3	6.3	* 6.3
Max Green Setting (Gmax), s	8.0	* 23	12.5	31.9	12.2	18.7	16.7	* 28
Max Q Clear Time (g_c+I1), s	6.0	14.3	9.8	12.6	14.2	20.7	8.3	19.2
Green Ext Time (p_c), s	0.0	2.0	0.2	1.9	0.0	0.0	0.3	2.4

Intersection Summary	
HCM 2010 Ctrl Delay	60.1
HCM 2010 LOS	E

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	304	213	342	51	236	228	179	451	37	139	245	385
Future Volume (veh/h)	304	213	342	51	236	228	179	451	37	139	245	385
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	2	10	2	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1937
Adj Flow Rate, veh/h	304	213	206	51	236	186	179	451	0	139	245	0
Adj No. of Lanes	2	2	0	2	1	1	1	2	0	2	2	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	388	351	309	217	306	402	334	1417	0	353	1188	553
Arrive On Green	0.11	0.20	0.20	0.06	0.15	0.15	0.19	0.41	0.00	0.10	0.34	0.00
Sat Flow, veh/h	3442	1770	1555	3442	1863	1583	1774	3632	0	3442	3539	1647
Grp Volume(v), veh/h	304	213	206	51	236	186	179	451	0	139	245	0
Grp Sat Flow(s),veh/h/ln	1721	1770	1555	1721	1863	1583	1774	1770	0	1721	1770	1647
Q Serve(g_s), s	8.2	10.5	11.7	1.3	11.7	6.0	8.6	8.2	0.0	3.6	4.7	0.0
Cycle Q Clear(g_c), s	8.2	10.5	11.7	1.3	11.7	6.0	8.6	8.2	0.0	3.6	4.7	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	388	351	309	217	306	402	334	1417	0	353	1188	553
V/C Ratio(X)	0.78	0.61	0.67	0.24	0.77	0.46	0.54	0.32	0.00	0.39	0.21	0.00
Avail Cap(c_a), veh/h	442	427	375	290	367	474	344	1437	0	605	1188	553
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.95	0.95	0.00
Uniform Delay (d), s/veh	41.0	34.7	35.2	42.4	38.9	13.5	34.8	19.6	0.0	39.9	22.5	0.0
Incr Delay (d2), s/veh	6.6	0.6	2.0	0.2	6.4	0.3	0.7	0.6	0.0	0.3	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.8	33.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	5.1	5.2	0.8	10.5	2.8	4.3	4.2	0.0	1.7	2.3	0.0
LnGrp Delay(d),s/veh	47.7	35.3	37.2	43.4	78.8	14.1	35.6	20.2	0.0	40.1	22.9	0.0
LnGrp LOS	D	D	D	D	E	B	D	C		D	C	
Approach Vol, veh/h		723			473			630			384	
Approach Delay, s/veh		41.0			49.5			24.6			29.1	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.7	23.4	24.7	36.2	15.5	18.6	16.0	44.9
Change Period (Y+Rc), s	4.8	* 4.8	6.3	4.3	4.8	4.3	6.3	* 6.3
Max Green Setting (Gmax), s	8.0	* 23	12.5	31.9	12.2	18.7	16.7	* 28
Max Q Clear Time (g_c+I1), s	3.3	13.7	10.6	6.7	10.2	13.7	5.6	10.2
Green Ext Time (p_c), s	0.0	1.6	0.1	0.9	0.6	0.6	0.2	1.9

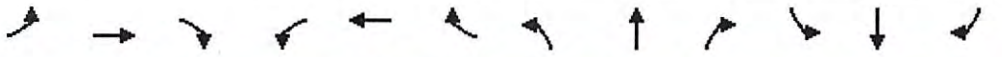
Intersection Summary	
HCM 2010 Ctrl Delay	36.1
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	179	475	4	1	519	18	1	0	4	26	0	317
Future Volume (Veh/h)	179	475	4	1	519	18	1	0	4	26	0	317
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	179	475	4	1	519	18	1	0	4	26	0	317
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		759										
pX, platoon unblocked												
vC, conflicting volume	537			479			1414	1374	240	1130	1367	268
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	537			479			1414	1374	240	1130	1367	268
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	83			100			98	100	99	81	100	57
cM capacity (veh/h)	1027			1080			48	119	762	137	120	730

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2
Volume Total	179	317	162	1	346	191	5	26	317
Volume Left	179	0	0	1	0	0	1	26	0
Volume Right	0	0	4	0	0	18	4	0	317
cSH	1027	1700	1700	1080	1700	1700	191	137	730
Volume to Capacity	0.17	0.19	0.10	0.00	0.20	0.11	0.03	0.19	0.43
Queue Length 95th (ft)	16	0	0	0	0	0	2	17	55
Control Delay (s)	9.2	0.0	0.0	8.3	0.0	0.0	24.3	37.5	13.7
Lane LOS	A			A			C	E	B
Approach Delay (s)	2.5			0.0			24.3	15.5	
Approach LOS							C	C	

Intersection Summary				
Average Delay	4.6			
Intersection Capacity Utilization	47.9%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	63	309	2	3	413	6	2	0	1	9	1	64
Future Volume (Veh/h)	63	309	2	3	413	6	2	0	1	9	1	64
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	63	309	2	3	413	6	2	0	1	9	1	64
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		759										
pX, platoon unblocked												
vC, conflicting volume	419			311			713	861	156	704	859	210
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	419			311			713	861	156	704	859	210
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			100			99	100	100	97	100	92
cM capacity (veh/h)	1137			1246			280	275	862	309	276	796

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2
Volume Total	63	206	105	3	275	144	3	10	64
Volume Left	63	0	0	3	0	0	2	9	0
Volume Right	0	0	2	0	0	6	1	0	64
cSH	1137	1700	1700	1246	1700	1700	361	306	796
Volume to Capacity	0.06	0.12	0.06	0.00	0.16	0.08	0.01	0.03	0.08
Queue Length 95th (ft)	4	0	0	0	0	0	1	3	7
Control Delay (s)	8.4	0.0	0.0	7.9	0.0	0.0	15.1	17.2	9.9
Lane LOS	A			A			C	C	A
Approach Delay (s)	1.4			0.1			15.1	10.9	
Approach LOS							C	B	

Intersection Summary				
Average Delay	1.6			
Intersection Capacity Utilization	28.9%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	107	107	36	682	626	15
Future Volume (veh/h)	107	107	36	682	626	15
Number	5	12	3	8	4	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	107	107	36	682	626	15
Adj No. of Lanes	1	1	1	2	2	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	162	199	61	2911	2652	64
Arrive On Green	0.09	0.09	0.03	0.82	0.75	0.75
Sat Flow, veh/h	1774	1583	1774	3632	3626	85
Grp Volume(v), veh/h	107	107	36	682	313	328
Grp Sat Flow(s),veh/h/ln	1774	1583	1774	1770	1770	1848
Q Serve(g_s), s	4.7	5.1	1.6	3.4	4.3	4.3
Cycle Q Clear(g_c), s	4.7	5.1	1.6	3.4	4.3	4.3
Prop In Lane	1.00	1.00	1.00			0.05
Lane Grp Cap(c), veh/h	162	199	61	2911	1328	1387
V/C Ratio(X)	0.66	0.54	0.59	0.23	0.24	0.24
Avail Cap(c_a), veh/h	554	549	355	2911	1328	1387
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.2	32.8	38.1	1.6	3.0	3.0
Incr Delay (d2), s/veh	1.7	0.8	3.3	0.2	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	2.2	0.8	1.7	2.2	2.3
LnGrp Delay(d),s/veh	36.9	33.6	41.4	1.7	3.4	3.4
LnGrp LOS	D	C	D	A	A	A
Approach Vol, veh/h	214			718	641	
Approach Delay, s/veh	35.3			3.7	3.4	
Approach LOS	D			A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		10.3	5.8	63.9				69.7
Change Period (Y+Rc), s		3.0	3.0	3.9				3.9
Max Green Setting (Gmax), s		25.0	16.0	29.1				48.1
Max Q Clear Time (g_c+I1), s		7.1	3.6	6.3				5.4
Green Ext Time (p_c), s		0.3	0.0	5.9				6.5

Intersection Summary	
HCM 2010 Ctrl Delay	7.9
HCM 2010 LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	12	15	445	496	6
Future Volume (veh/h)	8	12	15	445	496	6
Number	5	12	3	8	4	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	8	12	15	445	496	6
Adj No. of Lanes	1	1	1	2	2	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	40	64	31	3155	2994	36
Arrive On Green	0.02	0.02	0.02	0.89	0.84	0.84
Sat Flow, veh/h	1774	1583	1774	3632	3675	43
Grp Volume(v), veh/h	8	12	15	445	245	257
Grp Sat Flow(s),veh/h/ln	1774	1583	1774	1770	1770	1855
Q Serve(g_s), s	0.4	0.6	0.7	1.3	2.1	2.1
Cycle Q Clear(g_c), s	0.4	0.6	0.7	1.3	2.1	2.1
Prop In Lane	1.00	1.00	1.00			0.02
Lane Grp Cap(c), veh/h	40	64	31	3155	1480	1551
V/C Ratio(X)	0.20	0.19	0.48	0.14	0.17	0.17
Avail Cap(c_a), veh/h	554	523	355	3155	1480	1551
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.4	37.1	38.9	0.5	1.2	1.2
Incr Delay (d2), s/veh	0.9	0.5	4.1	0.1	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.3	0.4	0.6	1.1	1.2
LnGrp Delay(d),s/veh	39.3	37.7	43.0	0.6	1.5	1.5
LnGrp LOS	D	D	D	A	A	A
Approach Vol, veh/h	20			460	502	
Approach Delay, s/veh	38.3			2.0	1.5	
Approach LOS	D			A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		4.8	4.4	70.8				75.2
Change Period (Y+Rc), s		3.0	3.0	3.9				3.9
Max Green Setting (Gmax), s		25.0	16.0	29.1				48.1
Max Q Clear Time (g_c+I1), s		2.6	2.7	4.1				3.3
Green Ext Time (p_c), s		0.0	0.0	3.9				4.1

Intersection Summary	
HCM 2010 Ctrl Delay	2.5
HCM 2010 LOS	A

Arterial Level of Service: NB Mendocino Ave #1

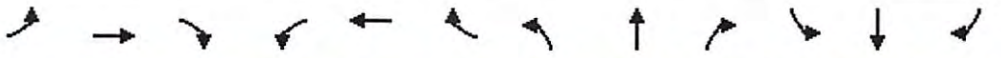
Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Chanate Road	18	52.3	66.4	0.1	7
Bicentennial Way	20	24.3	55.5	0.4	27
Project Dwy	27	3.4	12.1	0.1	29
	30	2.0	24.7	0.3	37
Fountaingrove Pkwy	4	29.8	36.2	0.1	8
US 101 NB	3	5.3	16.2	0.1	28
Total		117.1	211.0	1.1	19

Arterial Level of Service: SB Mendocino Ave #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Mendocino O/C	4	40.4	49.2	0.1	9
	30	2.3	13.3	0.1	22
Kaiser Dwy	27	1.8	24.5	0.3	38
Bicentennial Way	20	35.0	42.4	0.1	8
Administration Dr	18	19.8	62.9	0.4	24
Total		99.3	192.2	1.0	18

HCM Unsignalized Intersection Capacity Analysis
1: Round Barn Blvd & Round Barn Circle

09/21/2017



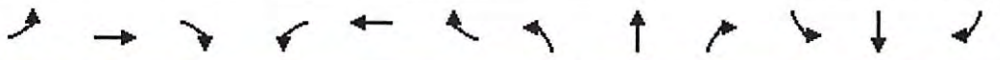
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	0	138	0	0	0	36	125	0	37	127	3
Future Volume (Veh/h)	46	0	138	0	0	0	36	125	0	37	127	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	46	0	138	0	0	0	36	125	0	37	127	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	337	400	65	472	401	62	130			125		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	337	400	65	472	401	62	130			125		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	92	100	86	100	100	100	98			97		
cM capacity (veh/h)	570	511	986	393	510	989	1453			1459		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	184	0	36	83	42	37	85	45
Volume Left	46	0	36	0	0	37	0	0
Volume Right	138	0	0	0	0	0	0	3
cSH	834	1700	1453	1700	1700	1459	1700	1700
Volume to Capacity	0.22	0.00	0.02	0.05	0.02	0.03	0.05	0.03
Queue Length 95th (ft)	21	0	2	0	0	2	0	0
Control Delay (s)	10.5	0.0	7.5	0.0	0.0	7.5	0.0	0.0
Lane LOS	B	A	A			A		
Approach Delay (s)	10.5	0.0	1.7			1.7		
Approach LOS	B	A						

Intersection Summary				
Average Delay	4.9			
Intersection Capacity Utilization	28.0%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
1: Round Barn Blvd & Round Barn Circle

09/21/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	0	14	0	0	0	13	24	0	1	45	3
Future Volume (Veh/h)	1	0	14	0	0	0	13	24	0	1	45	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1	0	14	0	0	0	13	24	0	1	45	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	86	98	24	88	100	12	48			24		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	86	98	24	88	100	12	48			24		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	99	100	100	100	99			100		
cM capacity (veh/h)	884	784	1047	869	782	1065	1557			1589		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	15	0	13	16	8	1	30	18
Volume Left	1	0	13	0	0	1	0	0
Volume Right	14	0	0	0	0	0	0	3
cSH	1034	1700	1557	1700	1700	1589	1700	1700
Volume to Capacity	0.01	0.00	0.01	0.01	0.00	0.00	0.02	0.01
Queue Length 95th (ft)	1	0	1	0	0	0	0	0
Control Delay (s)	8.5	0.0	7.3	0.0	0.0	7.3	0.0	0.0
Lane LOS	A	A	A			A		
Approach Delay (s)	8.5	0.0	2.6			0.1		
Approach LOS	A	A						

Intersection Summary				
Average Delay	2.3			
Intersection Capacity Utilization	17.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	236	152	258	193	543	146	208	348	489	610	38
Future Volume (veh/h)	18	236	152	258	193	543	146	208	348	489	610	38
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.97	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
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	18	236	122	258	193	455	146	208	138	489	610	16
Adj No. of Lanes	0	1	1	0	1	1	1	2	0	1	2	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	23	298	423	282	211	912	174	258	162	547	1199	31
Arrive On Green	0.17	0.17	0.17	0.27	0.27	0.27	0.10	0.12	0.12	0.31	0.34	0.34
Sat Flow, veh/h	132	1725	1547	1036	775	1552	1774	2063	1298	1774	3524	92
Grp Volume(v), veh/h	254	0	122	451	0	455	146	177	169	489	306	320
Grp Sat Flow(s),veh/h/ln	1856	0	1547	1811	0	1552	1774	1770	1592	1774	1770	1846
Q Serve(g_s), s	14.9	0.0	7.1	27.4	0.0	0.0	9.2	11.0	11.8	29.9	15.7	15.7
Cycle Q Clear(g_c), s	14.9	0.0	7.1	27.4	0.0	0.0	9.2	11.0	11.8	29.9	15.7	15.7
Prop In Lane	0.07		1.00	0.57		1.00	1.00		0.82	1.00		0.05
Lane Grp Cap(c), veh/h	320	0	423	494	0	912	174	221	199	547	602	628
V/C Ratio(X)	0.79	0.00	0.29	0.91	0.00	0.50	0.84	0.80	0.85	0.89	0.51	0.51
Avail Cap(c_a), veh/h	531	0	598	526	0	939	265	255	230	968	956	998
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.1	0.0	32.8	40.0	0.0	14.0	50.3	48.3	48.7	37.5	29.9	29.9
Incr Delay (d2), s/veh	4.4	0.0	0.4	19.8	0.0	0.4	8.2	12.4	20.5	2.4	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.0	0.0	3.1	16.4	0.0	8.4	4.9	6.2	6.4	15.0	7.7	8.0
LnGrp Delay(d),s/veh	49.5	0.0	33.2	59.8	0.0	14.4	58.6	60.8	69.2	39.9	30.1	30.1
LnGrp LOS	D		C	E		B	E	E	E	D	C	C
Approach Vol, veh/h		376			906			492			1115	
Approach Delay, s/veh		44.2			37.0			63.0			34.4	
Approach LOS		D			D			E			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		23.2	14.2	42.3		34.0	38.6	17.8
Change Period (Y+Rc), s		3.6	3.0	3.6		3.0	3.6	* 3.6
Max Green Setting (Gmax), s		32.5	17.0	61.4		33.0	62.0	* 16
Max Q Clear Time (g_c+I1), s		16.9	11.2	17.7		29.4	31.9	13.8
Green Ext Time (p_c), s		1.7	0.1	3.2		1.6	3.1	0.4

Intersection Summary	
HCM 2010 Ctrl Delay	41.4
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	47	251	196	157	205	467	140	154	334	525	385	70
Future Volume (veh/h)	47	251	196	157	205	467	140	154	334	525	385	70
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.97	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
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	47	251	166	157	205	379	140	154	124	525	385	48
Adj No. of Lanes	0	1	1	0	1	1	1	2	0	1	2	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	58	312	462	185	242	879	170	208	155	577	1091	135
Arrive On Green	0.20	0.20	0.20	0.23	0.23	0.23	0.10	0.11	0.11	0.33	0.34	0.34
Sat Flow, veh/h	291	1557	1549	791	1032	1550	1774	1911	1422	1774	3170	393
Grp Volume(v), veh/h	298	0	166	362	0	379	140	142	136	525	214	219
Grp Sat Flow(s),veh/h/ln	1848	0	1549	1823	0	1550	1774	1770	1564	1774	1770	1793
Q Serve(g_s), s	16.2	0.0	8.9	19.9	0.0	0.0	8.1	8.2	8.9	29.8	9.5	9.6
Cycle Q Clear(g_c), s	16.2	0.0	8.9	19.9	0.0	0.0	8.1	8.2	8.9	29.8	9.5	9.6
Prop In Lane	0.16		1.00	0.43		1.00	1.00		0.91	1.00		0.22
Lane Grp Cap(c), veh/h	370	0	462	427	0	879	170	192	170	577	609	617
V/C Ratio(X)	0.81	0.00	0.36	0.85	0.00	0.43	0.82	0.74	0.80	0.91	0.35	0.36
Avail Cap(c_a), veh/h	571	0	631	572	0	1002	287	276	244	1046	1034	1047
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.1	0.0	29.2	38.4	0.0	13.4	46.7	45.4	45.7	34.0	25.7	25.8
Incr Delay (d2), s/veh	4.8	0.0	0.5	8.8	0.0	0.3	3.8	2.7	7.4	2.5	0.1	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.8	0.0	3.8	11.1	0.0	6.4	4.2	4.1	4.2	15.0	4.7	4.8
LnGrp Delay(d),s/veh	44.9	0.0	29.7	47.2	0.0	13.7	50.5	48.0	53.2	36.5	25.9	25.9
LnGrp LOS	D		C	D		B	D	D	D	D	C	C
Approach Vol, veh/h		464			741			418			958	
Approach Delay, s/veh		39.4			30.1			50.5			31.7	
Approach LOS		D			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		24.6	13.1	39.8		27.6	37.8	15.0
Change Period (Y+Rc), s		3.6	3.0	3.6		3.0	3.6	* 3.6
Max Green Setting (Gmax), s		32.5	17.0	61.4		33.0	62.0	* 16
Max Q Clear Time (g_c+I1), s		18.2	10.1	11.6		21.9	31.8	10.9
Green Ext Time (p_c), s		2.0	0.1	2.4		2.7	2.4	0.5

Intersection Summary	
HCM 2010 Ctrl Delay	35.7
HCM 2010 LOS	D

Notes

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	147	687	878	857	1237	7
Future Volume (veh/h)	147	687	878	857	1237	7
Number	7	14	5	2	6	16
Initial Q (Qb), veh	11	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1824
Adj Flow Rate, veh/h	147	599	878	857	1237	5
Adj No. of Lanes	1	1	2	2	2	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	237	747	1164	2911	1549	6
Arrive On Green	0.12	0.12	0.30	0.78	0.43	0.43
Sat Flow, veh/h	1774	1583	3442	3632	3708	15
Grp Volume(v), veh/h	147	599	878	857	606	636
Grp Sat Flow(s),veh/h/ln	1774	1583	1721	1770	1770	1860
Q Serve(g_s), s	7.6	5.4	22.8	6.6	28.2	28.3
Cycle Q Clear(g_c), s	7.6	5.4	22.8	6.6	28.2	28.3
Prop In Lane	1.00	1.00	1.00			0.01
Lane Grp Cap(c), veh/h	237	747	1164	2911	758	797
V/C Ratio(X)	0.62	0.80	0.75	0.29	0.80	0.80
Avail Cap(c_a), veh/h	332	770	1029	2772	758	797
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.29	0.29	1.00	1.00
Uniform Delay (d), s/veh	40.0	22.1	28.2	2.3	23.6	23.6
Incr Delay (d2), s/veh	2.0	5.7	1.1	0.1	8.6	8.2
Initial Q Delay(d3),s/veh	40.8	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.7	18.0	10.4	2.6	15.6	16.3
LnGrp Delay(d),s/veh	82.8	27.8	29.3	2.4	32.2	31.8
LnGrp LOS	F	C	C	A	C	C
Approach Vol, veh/h	746			1735	1242	
Approach Delay, s/veh	38.6			16.0	32.0	
Approach LOS	D			B	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		79.7		15.3	33.7	46.0		
Change Period (Y+Rc), s		5.3		* 4.2	5.3	* 5.3		
Max Green Setting (Gmax), s		67.7		* 18	22.8	* 41		
Max Q Clear Time (g_c+I1), s		8.6		9.6	24.8	30.3		
Green Ext Time (p_c), s		18.8		1.5	0.0	6.1		

Intersection Summary	
HCM 2010 Ctrl Delay	25.9
HCM 2010 LOS	C

Notes

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	132	465	737	550	573	5
Future Volume (veh/h)	132	465	737	550	573	5
Number	7	14	5	2	6	16
Initial Q (Qb), veh	11	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1824
Adj Flow Rate, veh/h	132	377	737	550	573	3
Adj No. of Lanes	1	1	2	2	2	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	216	688	1077	2821	1546	8
Arrive On Green	0.10	0.10	0.31	0.80	0.43	0.43
Sat Flow, veh/h	1774	1583	3442	3632	3703	19
Grp Volume(v), veh/h	132	377	737	550	281	295
Grp Sat Flow(s),veh/h/ln	1774	1583	1721	1770	1770	1859
Q Serve(g_s), s	6.8	0.0	17.8	3.6	10.2	10.2
Cycle Q Clear(g_c), s	6.8	0.0	17.8	3.6	10.2	10.2
Prop In Lane	1.00	1.00	1.00			0.01
Lane Grp Cap(c), veh/h	216	688	1077	2821	758	796
V/C Ratio(X)	0.61	0.55	0.68	0.19	0.37	0.37
Avail Cap(c_a), veh/h	332	791	1076	2820	758	796
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.75	0.75	1.00	1.00
Uniform Delay (d), s/veh	40.7	20.0	28.5	2.3	18.4	18.4
Incr Delay (d2), s/veh	2.1	0.5	1.4	0.1	1.4	1.3
Initial Q Delay(d3),s/veh	48.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.5	9.9	8.6	1.7	5.3	5.5
LnGrp Delay(d),s/veh	90.8	20.5	30.0	2.4	19.8	19.8
LnGrp LOS	F	C	C	A	B	B
Approach Vol, veh/h	509			1287	576	
Approach Delay, s/veh	38.7			18.2	19.8	
Approach LOS	D			B	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		81.0		14.0	35.0	46.0		
Change Period (Y+Rc), s		5.3		* 4.2	5.3	* 5.3		
Max Green Setting (Gmax), s		67.7		* 18	22.8	* 41		
Max Q Clear Time (g_c+I1), s		5.6		8.8	19.8	12.2		
Green Ext Time (p_c), s		10.9		1.0	2.0	4.0		

Intersection Summary	
HCM 2010 Ctrl Delay	23.0
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	444	366	291	293	628	598	153	762	115	813	546	565
Future Volume (veh/h)	444	366	291	293	628	598	153	762	115	813	546	565
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	2	10	2	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1937
Adj Flow Rate, veh/h	444	366	155	293	628	556	153	762	0	813	546	0
Adj No. of Lanes	2	2	0	2	1	1	1	2	0	2	2	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	442	572	238	290	367	590	1503	3491	0	605	1188	553
Arrive On Green	0.13	0.24	0.24	0.08	0.20	0.20	0.85	0.99	0.00	0.18	0.34	0.00
Sat Flow, veh/h	3442	2424	1010	3442	1863	1583	1774	3632	0	3442	3539	1647
Grp Volume(v), veh/h	444	265	256	293	628	556	153	762	0	813	546	0
Grp Sat Flow(s),veh/h/ln	1721	1770	1664	1721	1863	1583	1774	1770	0	1721	1770	1647
Q Serve(g_s), s	12.2	12.8	13.2	8.0	18.7	18.7	1.4	0.4	0.0	16.7	11.5	0.0
Cycle Q Clear(g_c), s	12.2	12.8	13.2	8.0	18.7	18.7	1.4	0.4	0.0	16.7	11.5	0.0
Prop In Lane	1.00		0.61	1.00		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	442	417	392	290	367	590	1503	3491	0	605	1188	553
V/C Ratio(X)	1.00	0.64	0.65	1.01	1.71	0.94	0.10	0.22	0.00	1.34	0.46	0.00
Avail Cap(c_a), veh/h	442	427	401	290	367	590	1503	3491	0	605	1188	553
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.44	0.44	0.00
Uniform Delay (d), s/veh	41.4	32.6	32.8	43.5	38.2	165.2	1.2	0.0	0.0	39.2	24.8	0.0
Incr Delay (d2), s/veh	43.9	2.3	2.8	55.7	332.1	23.4	0.0	0.1	0.0	159.7	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	24.6	54.2	1.4	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.5	6.5	6.3	7.0	53.4	4.1	0.6	0.2	0.0	21.3	5.7	0.0
LnGrp Delay(d),s/veh	85.4	34.9	35.6	123.8	424.5	190.1	1.2	0.2	0.0	198.8	25.3	0.0
LnGrp LOS	F	C	D	F	F	F	A	A		F	C	
Approach Vol, veh/h		965			1477			915			1359	
Approach Delay, s/veh		58.3			276.6			0.3			129.1	
Approach LOS		E			F			A			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.8	27.2	88.8	36.2	17.0	23.0	23.0	102.0
Change Period (Y+Rc), s	4.8	* 4.8	6.3	4.3	4.8	4.3	6.3	* 6.3
Max Green Setting (Gmax), s	8.0	* 23	12.5	31.9	12.2	18.7	16.7	* 28
Max Q Clear Time (g_c+I1), s	10.0	15.2	3.4	13.5	14.2	20.7	18.7	2.4
Green Ext Time (p_c), s	0.0	1.9	2.5	2.0	0.0	0.0	0.0	3.5

Intersection Summary	
HCM 2010 Ctrl Delay	135.8
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	389	273	438	65	302	292	229	577	47	179	314	493
Future Volume (veh/h)	389	273	438	65	302	292	229	577	47	179	314	493
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	2	10	2	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1937
Adj Flow Rate, veh/h	389	273	302	65	302	250	229	577	0	179	314	0
Adj No. of Lanes	2	2	0	2	1	1	1	2	0	2	2	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	442	419	368	240	357	455	253	1249	0	359	1188	553
Arrive On Green	0.13	0.24	0.24	0.07	0.18	0.18	0.15	0.36	0.00	0.10	0.34	0.00
Sat Flow, veh/h	3442	1770	1557	3442	1863	1583	1774	3632	0	3442	3539	1647
Grp Volume(v), veh/h	389	273	302	65	302	250	229	577	0	179	314	0
Grp Sat Flow(s),veh/h/ln	1721	1770	1557	1721	1863	1583	1774	1770	0	1721	1770	1647
Q Serve(g_s), s	10.6	13.2	17.5	1.7	15.0	7.5	12.0	11.9	0.0	4.7	6.1	0.0
Cycle Q Clear(g_c), s	10.6	13.2	17.5	1.7	15.0	7.5	12.0	11.9	0.0	4.7	6.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	442	419	368	240	357	455	253	1249	0	359	1188	553
V/C Ratio(X)	0.88	0.65	0.82	0.27	0.85	0.55	0.91	0.46	0.00	0.50	0.26	0.00
Avail Cap(c_a), veh/h	442	427	375	290	367	477	259	1261	0	605	1188	553
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.89	0.89	0.00
Uniform Delay (d), s/veh	40.7	32.7	34.4	42.0	38.0	11.9	40.1	23.8	0.0	40.2	23.0	0.0
Incr Delay (d2), s/veh	17.6	2.7	12.4	0.2	15.4	0.6	31.1	1.2	0.0	0.4	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.7	37.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.1	6.8	8.7	0.9	14.1	3.5	8.1	6.0	0.0	2.2	3.1	0.0
LnGrp Delay(d),s/veh	58.3	35.4	46.7	42.9	90.5	12.8	71.2	25.0	0.0	40.6	23.5	0.0
LnGrp LOS	E	D	D	D	F	B	E	C		D	C	
Approach Vol, veh/h		964			617			806			493	
Approach Delay, s/veh		48.2			54.0			38.1			29.7	
Approach LOS		D			D			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.4	27.3	20.2	36.2	17.0	21.6	16.2	40.1
Change Period (Y+Rc), s	4.8	* 4.8	6.3	4.3	4.8	4.3	6.3	* 6.3
Max Green Setting (Gmax), s	8.0	* 23	12.5	31.9	12.2	18.7	16.7	* 28
Max Q Clear Time (g_c+I1), s	3.7	19.5	14.0	8.1	12.6	17.0	6.7	13.9
Green Ext Time (p_c), s	0.0	1.2	0.0	1.1	0.0	0.3	0.2	2.3

Intersection Summary	
HCM 2010 Ctrl Delay	43.4
HCM 2010 LOS	D

Notes

HCM 2010 Signalized Intersection Summary
5: Fountaingrove Pkwy & Round Barn Blvd

06/29/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	624	627	4	1	608	22	0	0	4	27	0	853
Future Volume (veh/h)	624	627	4	1	608	22	0	0	4	27	0	853
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	624	627	4	1	608	22	0	0	4	27	0	853
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	0	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	629	2011	13	2	711	26	8	0	7	387	0	908
Arrive On Green	0.35	0.56	0.56	0.00	0.20	0.20	0.00	0.00	0.00	0.22	0.00	0.22
Sat Flow, veh/h	1774	3605	23	1774	3484	126	1774	0	1583	1774	0	1583
Grp Volume(v), veh/h	624	308	323	1	309	321	0	0	4	27	0	853
Grp Sat Flow(s),veh/h/ln	1774	1770	1859	1774	1770	1841	1774	0	1583	1774	0	1583
Q Serve(g_s), s	25.7	6.8	6.8	0.0	12.3	12.3	0.0	0.0	0.2	0.9	0.0	16.0
Cycle Q Clear(g_c), s	25.7	6.8	6.8	0.0	12.3	12.3	0.0	0.0	0.2	0.9	0.0	16.0
Prop In Lane	1.00		0.01	1.00		0.07	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	629	987	1037	2	361	376	8	0	7	387	0	908
V/C Ratio(X)	0.99	0.31	0.31	0.41	0.85	0.86	0.00	0.00	0.59	0.07	0.00	0.94
Avail Cap(c_a), veh/h	629	987	1037	97	386	402	387	0	346	387	0	908
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.5	8.7	8.7	36.6	28.1	28.1	0.0	0.0	36.4	22.7	0.0	14.5
Incr Delay (d2), s/veh	33.6	0.2	0.2	85.4	16.0	15.7	0.0	0.0	62.3	0.1	0.0	17.2
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	18.3	3.4	3.6	0.1	7.6	7.9	0.0	0.0	0.2	0.4	0.0	20.0
LnGrp Delay(d),s/veh	57.1	8.8	8.8	122.0	44.1	43.8	0.0	0.0	98.7	22.8	0.0	31.7
LnGrp LOS	E	A	A	F	D	D			F	C		C
Approach Vol, veh/h		1255			631			4			880	
Approach Delay, s/veh		32.8			44.1			98.7			31.4	
Approach LOS		C			D			F			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		4.3	4.1	44.9		20.0	30.0	19.0
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		16.0	4.0	38.0		16.0	26.0	16.0
Max Q Clear Time (g_c+I1), s		2.2	2.0	8.8		18.0	27.7	14.3
Green Ext Time (p_c), s		0.0	0.0	4.2		0.0	0.0	0.6

Intersection Summary	
HCM 2010 Ctrl Delay	35.0
HCM 2010 LOS	D

HCM 2010 Signalized Intersection Summary
5: Fountaingrove Pkwy & Round Barn Blvd

07/02/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	81	396	3	4	529	8	3	0	1	12	1	82
Future Volume (veh/h)	81	396	3	4	529	8	3	0	1	12	1	82
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	81	396	3	4	529	8	3	0	1	12	1	82
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	0	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	119	1222	9	8	988	15	8	0	7	123	10	225
Arrive On Green	0.07	0.34	0.34	0.00	0.28	0.28	0.00	0.00	0.00	0.07	0.07	0.07
Sat Flow, veh/h	1774	3600	27	1774	3569	54	1774	0	1583	1644	137	1583
Grp Volume(v), veh/h	81	195	204	4	262	275	3	0	1	13	0	82
Grp Sat Flow(s),veh/h/ln	1774	1770	1858	1774	1770	1853	1774	0	1583	1781	0	1583
Q Serve(g_s), s	1.2	2.3	2.3	0.1	3.5	3.5	0.0	0.0	0.0	0.2	0.0	1.3
Cycle Q Clear(g_c), s	1.2	2.3	2.3	0.1	3.5	3.5	0.0	0.0	0.0	0.2	0.0	1.3
Prop In Lane	1.00		0.01	1.00		0.03	1.00		1.00	0.92		1.00
Lane Grp Cap(c), veh/h	119	601	630	8	490	513	8	0	7	133	0	225
V/C Ratio(X)	0.68	0.32	0.32	0.52	0.54	0.54	0.39	0.00	0.14	0.10	0.00	0.37
Avail Cap(c_a), veh/h	1664	2425	2546	256	1021	1069	1024	0	914	1027	0	1020
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	12.6	6.8	6.8	13.8	8.5	8.5	13.8	0.0	13.8	12.0	0.0	10.8
Incr Delay (d2), s/veh	6.7	0.3	0.3	44.2	0.9	0.9	28.6	0.0	9.2	0.3	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	1.1	1.2	0.1	1.8	1.9	0.1	0.0	0.0	0.1	0.0	0.6
LnGrp Delay(d),s/veh	19.4	7.1	7.1	58.0	9.4	9.4	42.3	0.0	23.0	12.3	0.0	11.8
LnGrp LOS	B	A	A	E	A	A	D		C	B		B
Approach Vol, veh/h		480			541			4			95	
Approach Delay, s/veh		9.2			9.8			37.5			11.8	
Approach LOS		A			A			D			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		4.1	4.1	13.4		6.1	5.9	11.7
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		16.0	4.0	38.0		16.0	26.0	16.0
Max Q Clear Time (g_c+I1), s		2.0	2.1	4.3		3.3	3.2	5.5
Green Ext Time (p_c), s		0.0	0.0	2.5		0.2	0.2	2.2

Intersection Summary	
HCM 2010 Ctrl Delay	9.8
HCM 2010 LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	137	137	46	873	801	19
Future Volume (veh/h)	137	137	46	873	801	19
Number	5	12	3	8	4	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	137	137	46	873	801	19
Adj No. of Lanes	1	1	1	2	2	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	195	238	71	2845	2566	61
Arrive On Green	0.11	0.11	0.04	0.80	0.73	0.73
Sat Flow, veh/h	1774	1583	1774	3632	3627	84
Grp Volume(v), veh/h	137	137	46	873	401	419
Grp Sat Flow(s),veh/h/ln	1774	1583	1774	1770	1770	1848
Q Serve(g_s), s	6.0	6.4	2.0	5.1	6.4	6.4
Cycle Q Clear(g_c), s	6.0	6.4	2.0	5.1	6.4	6.4
Prop In Lane	1.00	1.00	1.00			0.05
Lane Grp Cap(c), veh/h	195	238	71	2845	1285	1342
V/C Ratio(X)	0.70	0.58	0.65	0.31	0.31	0.31
Avail Cap(c_a), veh/h	554	558	355	2845	1285	1342
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.3	31.6	37.8	2.0	3.9	3.9
Incr Delay (d2), s/veh	1.7	0.8	3.7	0.3	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	2.9	1.1	2.5	3.3	3.5
LnGrp Delay(d),s/veh	36.1	32.5	41.5	2.3	4.5	4.5
LnGrp LOS	D	C	D	A	A	A
Approach Vol, veh/h	274			919	820	
Approach Delay, s/veh	34.3			4.3	4.5	
Approach LOS	C			A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		11.8	6.2	62.0				68.2
Change Period (Y+Rc), s		3.0	3.0	3.9				3.9
Max Green Setting (Gmax), s		25.0	16.0	29.1				48.1
Max Q Clear Time (g_c+I1), s		8.4	4.0	8.4				7.1
Green Ext Time (p_c), s		0.4	0.0	7.9				9.4

Intersection Summary	
HCM 2010 Ctrl Delay	8.5
HCM 2010 LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	10	0	570	635	0
Future Volume (veh/h)	15	10	0	570	635	0
Number	5	12	3	8	4	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	15	10	0	570	635	0
Adj No. of Lanes	1	1	1	2	2	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	47	0	2	3140	3140	0
Arrive On Green	0.03	0.03	0.00	0.89	0.89	0.00
Sat Flow, veh/h	1774	1583	1774	3632	3725	0
Grp Volume(v), veh/h	15	10	0	570	635	0
Grp Sat Flow(s),veh/h/ln	1774	1583	1774	1770	1770	0
Q Serve(g_s), s	0.7	2.1	0.0	1.7	2.0	0.0
Cycle Q Clear(g_c), s	0.7	2.1	0.0	1.7	2.0	0.0
Prop In Lane	1.00	1.00	1.00			0.00
Lane Grp Cap(c), veh/h	47	-17	2	3140	3140	0
V/C Ratio(X)	0.32	-0.58	0.00	0.18	0.20	0.00
Avail Cap(c_a), veh/h	554	435	355	3140	3140	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	38.2	0.0	0.0	0.6	0.6	0.0
Incr Delay (d2), s/veh	1.4	0.0	0.0	0.1	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.0	0.8	0.9	0.0
LnGrp Delay(d),s/veh	39.6	0.0	0.0	0.7	0.8	0.0
LnGrp LOS	D			A	A	
Approach Vol, veh/h	25			570	635	
Approach Delay, s/veh	23.8			0.7	0.8	
Approach LOS	C			A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		5.1	0.0	74.9				74.9
Change Period (Y+Rc), s		3.0	3.0	3.9				3.9
Max Green Setting (Gmax), s		25.0	16.0	29.1				48.1
Max Q Clear Time (g_c+I1), s		4.1	0.0	4.0				3.7
Green Ext Time (p_c), s		0.0	0.0	5.8				6.3

Intersection Summary	
HCM 2010 Ctrl Delay	1.2
HCM 2010 LOS	A

Arterial Level of Service: NB Mendocino Ave #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Chanate Road	18	69.5	83.6	0.1	6
Bicentennial Way	20	22.8	53.4	0.4	28
Project Dwy	27	3.4	12.1	0.1	29
	30	2.4	25.1	0.3	37
Fountaingrove Pkwy	4	37.4	44.0	0.1	7
US 101 NB	3	5.9	16.6	0.1	28
Total		141.4	234.8	1.1	17

Arterial Level of Service: SB Mendocino Ave #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Mendocino O/C	4	39.7	48.8	0.1	9
	30	2.2	13.2	0.1	22
Kaiser Dwy	27	1.1	22.9	0.3	40
Bicentennial Way	20	28.8	36.0	0.1	10
Administration Dr	18	17.9	58.9	0.4	25
Total		89.7	179.7	1.0	20

HCM Unsignalized Intersection Capacity Analysis
1: Round Barn Blvd & Round Barn Circle

09/21/2017

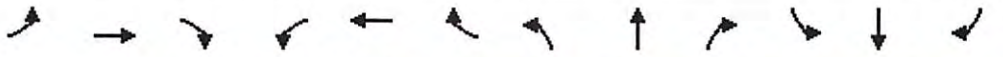
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	2	140	0	2	0	61	98	0	29	99	2
Future Volume (Veh/h)	36	2	140	0	2	0	61	98	0	29	99	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	36	2	140	0	2	0	61	98	0	29	99	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	330	378	50	468	379	49	101			98		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	330	378	50	468	379	49	101			98		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	100	86	100	100	100	96			98		
cM capacity (veh/h)	571	520	1007	392	519	1009	1489			1493		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	178	2	61	65	33	29	66	35
Volume Left	36	0	61	0	0	29	0	0
Volume Right	140	0	0	0	0	0	0	2
cSH	864	519	1489	1700	1700	1493	1700	1700
Volume to Capacity	0.21	0.00	0.04	0.04	0.02	0.02	0.04	0.02
Queue Length 95th (ft)	19	0	3	0	0	1	0	0
Control Delay (s)	10.2	12.0	7.5	0.0	0.0	7.5	0.0	0.0
Lane LOS	B	B	A			A		
Approach Delay (s)	10.2	12.0	2.9			1.7		
Approach LOS	B	B						

Intersection Summary				
Average Delay	5.4			
Intersection Capacity Utilization	34.1%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
1: Round Barn Blvd & Round Barn Circle

09/21/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	3	59	0	3	0	58	19	0	1	45	3
Future Volume (Veh/h)	1	3	59	0	3	0	58	19	0	1	45	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1	3	59	0	3	0	58	19	0	1	45	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	176	184	24	220	185	10	48			19		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	176	184	24	220	185	10	48			19		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	94	100	100	100	96			100		
cM capacity (veh/h)	746	683	1047	655	681	1069	1557			1596		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	63	3	58	13	6	1	30	18
Volume Left	1	0	58	0	0	1	0	0
Volume Right	59	0	0	0	0	0	0	3
cSH	1015	681	1557	1700	1700	1596	1700	1700
Volume to Capacity	0.06	0.00	0.04	0.01	0.00	0.00	0.02	0.01
Queue Length 95th (ft)	5	0	3	0	0	0	0	0
Control Delay (s)	8.8	10.3	7.4	0.0	0.0	7.3	0.0	0.0
Lane LOS	A	B	A			A		
Approach Delay (s)	8.8	10.3	5.6			0.1		
Approach LOS	A	B						

Intersection Summary				
Average Delay	5.3			
Intersection Capacity Utilization	21.3%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	238	151	237	195	503	118	111	309	501	496	38
Future Volume (veh/h)	18	238	151	237	195	503	118	111	309	501	496	38
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.97	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
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	18	238	121	237	195	415	118	111	99	501	496	16
Adj No. of Lanes	0	1	1	0	1	1	1	2	0	1	2	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	23	310	409	273	225	927	147	166	133	561	1152	37
Arrive On Green	0.18	0.18	0.18	0.27	0.27	0.27	0.08	0.09	0.09	0.32	0.33	0.33
Sat Flow, veh/h	131	1726	1548	995	818	1552	1774	1841	1478	1774	3500	113
Grp Volume(v), veh/h	256	0	121	432	0	415	118	106	104	501	251	261
Grp Sat Flow(s),veh/h/ln	1856	0	1548	1813	0	1552	1774	1770	1549	1774	1770	1843
Q Serve(g_s), s	13.0	0.0	6.2	22.5	0.0	0.0	6.5	5.8	6.5	26.6	11.0	11.0
Cycle Q Clear(g_c), s	13.0	0.0	6.2	22.5	0.0	0.0	6.5	5.8	6.5	26.6	11.0	11.0
Prop In Lane	0.07		1.00	0.55		1.00	1.00		0.95	1.00		0.06
Lane Grp Cap(c), veh/h	333	0	409	498	0	927	147	159	139	561	583	607
V/C Ratio(X)	0.77	0.00	0.30	0.87	0.00	0.45	0.80	0.67	0.74	0.89	0.43	0.43
Avail Cap(c_a), veh/h	609	0	639	604	0	1018	305	293	257	1111	1097	1143
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.7	0.0	29.2	34.2	0.0	11.2	44.6	43.6	43.9	32.3	26.0	26.0
Incr Delay (d2), s/veh	3.7	0.0	0.4	11.0	0.0	0.3	3.8	1.8	2.9	2.1	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.0	0.0	2.7	12.7	0.0	6.2	3.3	2.9	2.9	13.4	5.4	5.6
LnGrp Delay(d),s/veh	42.4	0.0	29.6	45.1	0.0	11.6	48.4	45.4	46.9	34.3	26.1	26.1
LnGrp LOS	D		C	D		B	D	D	D	C	C	C
Approach Vol, veh/h		377			847			328			1013	
Approach Delay, s/veh		38.3			28.7			47.0			30.2	
Approach LOS		D			C			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		21.4	11.2	36.2		30.2	34.9	12.5
Change Period (Y+Rc), s		3.6	3.0	3.6		3.0	3.6	* 3.6
Max Green Setting (Gmax), s		32.5	17.0	61.4		33.0	62.0	* 16
Max Q Clear Time (g_c+I1), s		15.0	8.5	13.0		24.5	28.6	8.5
Green Ext Time (p_c), s		1.7	0.1	2.7		2.8	2.7	0.4

Intersection Summary	
HCM 2010 Ctrl Delay	33.0
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	199	153	126	163	365	109	120	264	428	301	55
Future Volume (veh/h)	37	199	153	126	163	365	109	120	264	428	301	55
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.97	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
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	37	199	123	126	163	277	109	120	54	428	301	33
Adj No. of Lanes	0	1	1	0	1	1	1	2	0	1	2	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	54	292	415	170	220	779	141	278	118	502	1058	115
Arrive On Green	0.19	0.19	0.19	0.21	0.21	0.21	0.08	0.12	0.12	0.28	0.33	0.33
Sat Flow, veh/h	290	1558	1548	795	1028	1549	1774	2400	1019	1774	3220	350
Grp Volume(v), veh/h	236	0	123	289	0	277	109	87	87	428	164	170
Grp Sat Flow(s),veh/h/ln	1848	0	1548	1823	0	1549	1774	1770	1649	1774	1770	1800
Q Serve(g_s), s	8.2	0.0	4.4	10.2	0.0	0.0	4.2	3.1	3.4	15.7	4.7	4.8
Cycle Q Clear(g_c), s	8.2	0.0	4.4	10.2	0.0	0.0	4.2	3.1	3.4	15.7	4.7	4.8
Prop In Lane	0.16		1.00	0.44		1.00	1.00		0.62	1.00		0.19
Lane Grp Cap(c), veh/h	346	0	415	389	0	779	141	205	191	502	581	591
V/C Ratio(X)	0.68	0.00	0.30	0.74	0.00	0.36	0.77	0.42	0.46	0.85	0.28	0.29
Avail Cap(c_a), veh/h	871	0	855	872	0	1189	437	421	392	1595	1576	1603
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.1	0.0	20.2	25.3	0.0	10.6	31.1	28.3	28.4	23.4	17.1	17.2
Incr Delay (d2), s/veh	2.4	0.0	0.4	2.8	0.0	0.3	3.4	0.5	0.6	1.6	0.1	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	0.0	1.9	5.4	0.0	3.2	2.2	1.6	1.6	7.8	2.3	2.4
LnGrp Delay(d),s/veh	28.5	0.0	20.5	28.1	0.0	10.9	34.6	28.8	29.1	25.0	17.2	17.3
LnGrp LOS	C		C	C		B	C	C	C	C	B	B
Approach Vol, veh/h		359			566			283			762	
Approach Delay, s/veh		25.8			19.7			31.1			21.6	
Approach LOS		C			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		16.5	8.5	26.2		17.7	23.1	11.6
Change Period (Y+Rc), s		3.6	3.0	3.6		3.0	3.6	* 3.6
Max Green Setting (Gmax), s		32.5	17.0	61.4		33.0	62.0	* 16
Max Q Clear Time (g_c+I1), s		10.2	6.2	6.8		12.2	17.7	5.4
Green Ext Time (p_c), s		1.8	0.1	1.8		2.5	1.8	0.4

Intersection Summary	
HCM 2010 Ctrl Delay	23.2
HCM 2010 LOS	C

Notes

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	147	399	878	654	915	7
Future Volume (veh/h)	147	399	878	654	915	7
Number	7	14	5	2	6	16
Initial Q (Qb), veh	11	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1824
Adj Flow Rate, veh/h	147	311	878	654	915	5
Adj No. of Lanes	1	1	2	2	2	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	228	745	1179	2926	1546	8
Arrive On Green	0.11	0.11	0.31	0.79	0.43	0.43
Sat Flow, veh/h	1774	1583	3442	3632	3702	20
Grp Volume(v), veh/h	147	311	878	654	449	471
Grp Sat Flow(s),veh/h/ln	1774	1583	1721	1770	1770	1859
Q Serve(g_s), s	7.6	0.0	22.6	4.5	18.4	18.4
Cycle Q Clear(g_c), s	7.6	0.0	22.6	4.5	18.4	18.4
Prop In Lane	1.00	1.00	1.00			0.01
Lane Grp Cap(c), veh/h	228	745	1179	2926	758	796
V/C Ratio(X)	0.65	0.42	0.74	0.22	0.59	0.59
Avail Cap(c_a), veh/h	332	781	1053	2797	758	796
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.54	0.54	1.00	1.00
Uniform Delay (d), s/veh	40.5	17.1	27.8	2.0	20.8	20.8
Incr Delay (d2), s/veh	2.3	0.3	1.8	0.1	3.4	3.2
Initial Q Delay(d3),s/veh	47.6	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.1	8.2	10.4	1.8	9.7	10.1
LnGrp Delay(d),s/veh	90.3	17.4	29.6	2.1	24.2	24.0
LnGrp LOS	F	B	C	A	C	C
Approach Vol, veh/h	458			1532	920	
Approach Delay, s/veh	40.8			17.9	24.1	
Approach LOS	D			B	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		80.4		14.6	34.4	46.0		
Change Period (Y+Rc), s		5.3		* 4.2	5.3	* 5.3		
Max Green Setting (Gmax), s		67.7		* 18	22.8	* 41		
Max Q Clear Time (g_c+I1), s		6.5		9.6	24.6	20.4		
Green Ext Time (p_c), s		14.4		0.8	0.0	6.4		

Intersection Summary	
HCM 2010 Ctrl Delay	23.5
HCM 2010 LOS	C

Notes

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	103	363	576	430	448	4
Future Volume (veh/h)	103	363	576	430	448	4
Number	7	14	5	2	6	16
Initial Q (Qb), veh	11	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1824
Adj Flow Rate, veh/h	103	275	576	430	448	2
Adj No. of Lanes	1	1	2	2	2	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	186	658	1071	2815	1548	7
Arrive On Green	0.08	0.08	0.33	0.82	0.43	0.43
Sat Flow, veh/h	1774	1583	3442	3632	3706	16
Grp Volume(v), veh/h	103	275	576	430	219	231
Grp Sat Flow(s),veh/h/ln	1774	1583	1721	1770	1770	1859
Q Serve(g_s), s	5.4	0.0	12.8	2.4	7.7	7.7
Cycle Q Clear(g_c), s	5.4	0.0	12.8	2.4	7.7	7.7
Prop In Lane	1.00	1.00	1.00			0.01
Lane Grp Cap(c), veh/h	186	658	1071	2815	758	797
V/C Ratio(X)	0.56	0.42	0.54	0.15	0.29	0.29
Avail Cap(c_a), veh/h	332	820	1139	2885	758	797
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.86	0.86	1.00	1.00
Uniform Delay (d), s/veh	41.5	19.6	27.2	2.4	17.7	17.7
Incr Delay (d2), s/veh	1.9	0.3	0.5	0.1	1.0	0.9
Initial Q Delay(d3),s/veh	56.8	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.8	7.2	6.3	1.3	3.9	4.1
LnGrp Delay(d),s/veh	100.3	19.9	27.6	2.5	18.7	18.6
LnGrp LOS	F	B	C	A	B	B
Approach Vol, veh/h	378			1006	450	
Approach Delay, s/veh	41.8			16.9	18.7	
Approach LOS	D			B	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		82.7		12.3	36.7	46.0		
Change Period (Y+Rc), s		5.3		* 4.2	5.3	* 5.3		
Max Green Setting (Gmax), s		67.7		* 18	22.8	* 41		
Max Q Clear Time (g_c+I1), s		4.4		7.4	14.8	9.7		
Green Ext Time (p_c), s		7.6		0.7	3.7	3.0		

Intersection Summary	
HCM 2010 Ctrl Delay	22.4
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	444	356	291	150	444	336	153	762	111	249	511	565
Future Volume (veh/h)	444	356	291	150	444	336	153	762	111	249	511	565
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	2	10	2	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1937
Adj Flow Rate, veh/h	444	356	155	150	444	294	153	762	0	249	511	0
Adj No. of Lanes	2	2	0	2	1	1	1	2	0	2	2	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	442	568	243	285	367	478	233	1208	0	362	1188	553
Arrive On Green	0.13	0.24	0.24	0.08	0.20	0.20	0.13	0.34	0.00	0.11	0.34	0.00
Sat Flow, veh/h	3442	2403	1027	3442	1863	1583	1774	3632	0	3442	3539	1647
Grp Volume(v), veh/h	444	260	251	150	444	294	153	762	0	249	511	0
Grp Sat Flow(s),veh/h/ln	1721	1770	1661	1721	1863	1583	1774	1770	0	1721	1770	1647
Q Serve(g_s), s	12.2	12.5	12.9	4.0	18.7	8.8	7.8	17.2	0.0	6.6	10.6	0.0
Cycle Q Clear(g_c), s	12.2	12.5	12.9	4.0	18.7	8.8	7.8	17.2	0.0	6.6	10.6	0.0
Prop In Lane	1.00		0.62	1.00		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	442	419	393	285	367	478	233	1208	0	362	1188	553
V/C Ratio(X)	1.00	0.62	0.64	0.53	1.21	0.61	0.66	0.63	0.00	0.69	0.43	0.00
Avail Cap(c_a), veh/h	442	427	400	290	367	478	233	1208	0	605	1188	553
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.82	0.82	0.00
Uniform Delay (d), s/veh	41.4	32.5	32.6	41.9	38.2	11.6	39.2	26.3	0.0	41.0	24.5	0.0
Incr Delay (d2), s/veh	43.9	2.0	2.5	0.8	117.6	1.7	5.2	2.5	0.0	0.7	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.8	76.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.5	6.3	6.2	2.1	31.6	4.2	4.2	8.8	0.0	3.2	5.3	0.0
LnGrp Delay(d),s/veh	85.4	34.4	35.1	43.4	232.5	13.7	44.4	28.8	0.0	41.7	25.4	0.0
LnGrp LOS	F	C	D	D	F	B	D	C		D	C	
Approach Vol, veh/h		955			888			915			760	
Approach Delay, s/veh		58.3			128.1			31.4			30.8	
Approach LOS		E			F			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.6	27.4	18.8	36.2	17.0	23.0	16.3	38.7
Change Period (Y+Rc), s	4.8	* 4.8	6.3	4.3	4.8	4.3	6.3	* 6.3
Max Green Setting (Gmax), s	8.0	* 23	12.5	31.9	12.2	18.7	16.7	* 28
Max Q Clear Time (g_c+I1), s	6.0	14.9	9.8	12.6	14.2	20.7	8.6	19.2
Green Ext Time (p_c), s	0.0	1.9	0.2	1.9	0.0	0.0	0.3	2.4

Intersection Summary	
HCM 2010 Ctrl Delay	63.0
HCM 2010 LOS	E

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	304	241	342	51	266	246	179	451	37	158	245	385
Future Volume (veh/h)	304	241	342	51	266	246	179	451	37	158	245	385
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	2	10	2	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1937
Adj Flow Rate, veh/h	304	241	206	51	266	204	179	451	0	158	245	0
Adj No. of Lanes	2	2	0	2	1	1	1	2	0	2	2	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	389	390	318	217	331	427	308	1361	0	357	1188	553
Arrive On Green	0.11	0.21	0.21	0.06	0.17	0.17	0.18	0.39	0.00	0.10	0.34	0.00
Sat Flow, veh/h	3442	1837	1500	3442	1863	1583	1774	3632	0	3442	3539	1647
Grp Volume(v), veh/h	304	232	215	51	266	204	179	451	0	158	245	0
Grp Sat Flow(s),veh/h/ln	1721	1770	1567	1721	1863	1583	1774	1770	0	1721	1770	1647
Q Serve(g_s), s	8.2	11.3	11.9	1.3	13.2	6.4	8.8	8.5	0.0	4.1	4.7	0.0
Cycle Q Clear(g_c), s	8.2	11.3	11.9	1.3	13.2	6.4	8.8	8.5	0.0	4.1	4.7	0.0
Prop In Lane	1.00		0.96	1.00		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	389	376	333	217	331	427	308	1361	0	357	1188	553
V/C Ratio(X)	0.78	0.62	0.65	0.24	0.80	0.48	0.58	0.33	0.00	0.44	0.21	0.00
Avail Cap(c_a), veh/h	442	427	378	290	367	476	317	1379	0	605	1188	553
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.95	0.95	0.00
Uniform Delay (d), s/veh	41.0	33.9	34.2	42.4	38.4	12.8	36.1	20.6	0.0	40.0	22.5	0.0
Incr Delay (d2), s/veh	6.6	1.2	2.0	0.2	9.9	0.3	1.6	0.7	0.0	0.3	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.8	33.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	5.7	5.3	0.8	11.9	3.0	4.4	4.3	0.0	2.0	2.3	0.0
LnGrp Delay(d),s/veh	47.5	35.1	36.2	43.4	81.6	13.4	37.7	21.3	0.0	40.3	22.9	0.0
LnGrp LOS	D	D	D	D	F	B	D	C		D	C	
Approach Vol, veh/h		751			521			630			403	
Approach Delay, s/veh		40.5			51.2			25.9			29.7	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.7	24.8	23.3	36.2	15.5	20.0	16.1	43.3
Change Period (Y+Rc), s	4.8	* 4.8	6.3	4.3	4.8	4.3	6.3	* 6.3
Max Green Setting (Gmax), s	8.0	* 23	12.5	31.9	12.2	18.7	16.7	* 28
Max Q Clear Time (g_c+I1), s	3.3	13.9	10.8	6.7	10.2	15.2	6.1	10.5
Green Ext Time (p_c), s	0.0	1.7	0.1	0.9	0.6	0.5	0.2	1.9

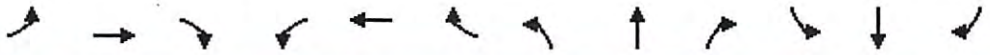
Intersection Summary	
HCM 2010 Ctrl Delay	37.0
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	212	475	4	1	519	18	1	0	4	26	0	349
Future Volume (Veh/h)	212	475	4	1	519	18	1	0	4	26	0	349
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	212	475	4	1	519	18	1	0	4	26	0	349
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		759										
pX, platoon unblocked												
vC, conflicting volume	537			479			1512	1440	240	1196	1433	268
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	537			479			1512	1440	240	1196	1433	268
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	79			100			97	100	99	78	100	52
cM capacity (veh/h)	1027			1080			36	104	762	119	105	730

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2
Volume Total	212	317	162	1	346	191	5	26	349
Volume Left	212	0	0	1	0	0	1	26	0
Volume Right	0	0	4	0	0	18	4	0	349
cSH	1027	1700	1700	1080	1700	1700	152	119	730
Volume to Capacity	0.21	0.19	0.10	0.00	0.20	0.11	0.03	0.22	0.48
Queue Length 95th (ft)	19	0	0	0	0	0	3	20	65
Control Delay (s)	9.4	0.0	0.0	8.3	0.0	0.0	29.5	43.7	14.4
Lane LOS	A			A			D	E	B
Approach Delay (s)	2.9			0.0			29.5	16.4	
Approach LOS							D	C	

Intersection Summary				
Average Delay	5.2			
Intersection Capacity Utilization	49.9%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	111	309	2	3	413	6	2	0	1	9	1	112
Future Volume (Veh/h)	111	309	2	3	413	6	2	0	1	9	1	112
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	111	309	2	3	413	6	2	0	1	9	1	112
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		759										
pX, platoon unblocked												
vC, conflicting volume	419			311			857	957	156	800	955	210
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	419			311			857	957	156	800	955	210
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	90			100			99	100	100	96	100	86
cM capacity (veh/h)	1137			1246			199	231	862	255	231	796

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2
Volume Total	111	206	105	3	275	144	3	10	112
Volume Left	111	0	0	3	0	0	2	9	0
Volume Right	0	0	2	0	0	6	1	0	112
cSH	1137	1700	1700	1246	1700	1700	267	252	796
Volume to Capacity	0.10	0.12	0.06	0.00	0.16	0.08	0.01	0.04	0.14
Queue Length 95th (ft)	8	0	0	0	0	0	1	3	12
Control Delay (s)	8.5	0.0	0.0	7.9	0.0	0.0	18.6	19.9	10.3
Lane LOS	A			A			C	C	B
Approach Delay (s)	2.2			0.1			18.6	11.0	
Approach LOS							C	B	

Intersection Summary				
Average Delay	2.4			
Intersection Capacity Utilization	31.9%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	109	107	36	682	626	17
Future Volume (veh/h)	109	107	36	682	626	17
Number	5	12	3	8	4	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	109	107	36	682	626	17
Adj No. of Lanes	1	1	1	2	2	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	162	199	61	2911	2642	72
Arrive On Green	0.09	0.09	0.03	0.82	0.75	0.75
Sat Flow, veh/h	1774	1583	1774	3632	3613	96
Grp Volume(v), veh/h	109	107	36	682	315	328
Grp Sat Flow(s),veh/h/ln	1774	1583	1774	1770	1770	1846
Q Serve(g_s), s	4.8	5.1	1.6	3.4	4.3	4.3
Cycle Q Clear(g_c), s	4.8	5.1	1.6	3.4	4.3	4.3
Prop In Lane	1.00	1.00	1.00			0.05
Lane Grp Cap(c), veh/h	162	199	61	2911	1328	1385
V/C Ratio(X)	0.67	0.54	0.59	0.23	0.24	0.24
Avail Cap(c_a), veh/h	554	549	355	2911	1328	1385
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.2	32.8	38.1	1.6	3.0	3.0
Incr Delay (d2), s/veh	1.8	0.8	3.3	0.2	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	2.2	0.8	1.7	2.3	2.3
LnGrp Delay(d),s/veh	37.0	33.6	41.4	1.8	3.4	3.4
LnGrp LOS	D	C	D	A	A	A
Approach Vol, veh/h	216			718	643	
Approach Delay, s/veh	35.3			3.7	3.4	
Approach LOS	D			A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		10.3	5.8	63.9				69.7
Change Period (Y+Rc), s		3.0	3.0	3.9				3.9
Max Green Setting (Gmax), s		25.0	16.0	29.1				48.1
Max Q Clear Time (g_c+I1), s		7.1	3.6	6.3				5.4
Green Ext Time (p_c), s		0.3	0.0	5.9				6.5

Intersection Summary	
HCM 2010 Ctrl Delay	7.9
HCM 2010 LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	12	15	445	496	9
Future Volume (veh/h)	11	12	15	445	496	9
Number	5	12	3	8	4	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	11	12	15	445	496	9
Adj No. of Lanes	1	1	1	2	2	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	44	68	31	3145	2964	54
Arrive On Green	0.03	0.03	0.02	0.89	0.83	0.83
Sat Flow, veh/h	1774	1583	1774	3632	3650	64
Grp Volume(v), veh/h	11	12	15	445	247	258
Grp Sat Flow(s),veh/h/ln	1774	1583	1774	1770	1770	1851
Q Serve(g_s), s	0.5	0.6	0.7	1.3	2.2	2.2
Cycle Q Clear(g_c), s	0.5	0.6	0.7	1.3	2.2	2.2
Prop In Lane	1.00	1.00	1.00			0.03
Lane Grp Cap(c), veh/h	44	68	31	3145	1475	1543
V/C Ratio(X)	0.25	0.18	0.48	0.14	0.17	0.17
Avail Cap(c_a), veh/h	554	523	355	3145	1475	1543
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.3	36.9	38.9	0.6	1.3	1.3
Incr Delay (d2), s/veh	1.1	0.5	4.1	0.1	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.3	0.4	0.7	1.1	1.2
LnGrp Delay(d),s/veh	39.3	37.4	43.0	0.7	1.5	1.5
LnGrp LOS	D	D	D	A	A	A
Approach Vol, veh/h	23			460	505	
Approach Delay, s/veh	38.3			2.0	1.5	
Approach LOS	D			A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		5.0	4.4	70.6				75.0
Change Period (Y+Rc), s		3.0	3.0	3.9				3.9
Max Green Setting (Gmax), s		25.0	16.0	29.1				48.1
Max Q Clear Time (g_c+I1), s		2.6	2.7	4.2				3.3
Green Ext Time (p_c), s		0.0	0.0	3.9				4.1

Intersection Summary	
HCM 2010 Ctrl Delay	2.6
HCM 2010 LOS	A

Arterial Level of Service: NB Mendocino Ave #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Chanate Road	18	46.0	60.3	0.1	8
Bicentennial Way	20	29.3	60.1	0.4	25
Project Dwy	27	3.9	12.4	0.1	28
	30	2.2	25.0	0.3	37
Fountaingrove Pkwy	4	30.6	37.0	0.1	8
US 101 NB	3	5.4	16.2	0.1	28
Total		117.5	211.0	1.1	19

Arterial Level of Service: SB Mendocino Ave #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Mendocino O/C	4	39.3	48.1	0.1	10
	30	2.2	13.3	0.1	22
Kaiser Dwy	27	1.9	24.5	0.3	38
Bicentennial Way	20	32.7	40.0	0.1	9
Administration Dr	18	16.7	58.5	0.4	26
Total		92.7	184.3	1.0	19

HCM Unsignalized Intersection Capacity Analysis
1: Round Barn Blvd & Round Barn Circle

09/21/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	2	170	0	2	0	69	125	0	37	127	3
Future Volume (Veh/h)	46	2	170	0	2	0	69	125	0	37	127	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	46	2	170	0	2	0	69	125	0	37	127	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	404	466	65	572	467	62	130			125		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	404	466	65	572	467	62	130			125		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	91	100	83	100	100	100	95			97		
cM capacity (veh/h)	500	458	986	314	457	989	1453			1459		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	218	2	69	83	42	37	85	45
Volume Left	46	0	69	0	0	37	0	0
Volume Right	170	0	0	0	0	0	0	3
cSH	811	457	1453	1700	1700	1459	1700	1700
Volume to Capacity	0.27	0.00	0.05	0.05	0.02	0.03	0.05	0.03
Queue Length 95th (ft)	27	0	4	0	0	2	0	0
Control Delay (s)	11.1	12.9	7.6	0.0	0.0	7.5	0.0	0.0
Lane LOS	B	B	A			A		
Approach Delay (s)	11.1	12.9	2.7			1.7		
Approach LOS	B	B						

Intersection Summary				
Average Delay	5.6			
Intersection Capacity Utilization	37.2%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
1: Round Barn Blvd & Round Barn Circle

09/21/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	3	62	0	3	0	61	24	0	1	45	3
Future Volume (Veh/h)	1	3	62	0	3	0	61	24	0	1	45	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1	3	62	0	3	0	61	24	0	1	45	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	184	194	24	234	196	12	48			24		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	184	194	24	234	196	12	48			24		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	94	100	100	100	96			100		
cM capacity (veh/h)	735	672	1047	637	671	1065	1557			1589		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	66	3	61	16	8	1	30	18
Volume Left	1	0	61	0	0	1	0	0
Volume Right	62	0	0	0	0	0	0	3
cSH	1015	671	1557	1700	1700	1589	1700	1700
Volume to Capacity	0.07	0.00	0.04	0.01	0.00	0.00	0.02	0.01
Queue Length 95th (ft)	5	0	3	0	0	0	0	0
Control Delay (s)	8.8	10.4	7.4	0.0	0.0	7.3	0.0	0.0
Lane LOS	A	B	A			A		
Approach Delay (s)	8.8	10.4	5.3			0.1		
Approach LOS	A	B						

Intersection Summary				
Average Delay	5.3			
Intersection Capacity Utilization	21.6%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	238	152	260	195	543	146	208	350	501	610	38
Future Volume (veh/h)	18	238	152	260	195	543	146	208	350	501	610	38
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.97	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
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	18	238	122	260	195	455	146	208	140	501	610	16
Adj No. of Lanes	0	1	1	0	1	1	1	2	0	1	2	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	22	297	422	281	210	918	174	255	163	557	1219	32
Arrive On Green	0.17	0.17	0.17	0.27	0.27	0.27	0.10	0.12	0.12	0.31	0.35	0.35
Sat Flow, veh/h	131	1726	1547	1035	776	1552	1774	2051	1308	1774	3524	92
Grp Volume(v), veh/h	256	0	122	455	0	455	146	178	170	501	306	320
Grp Sat Flow(s),veh/h/ln	1856	0	1547	1811	0	1552	1774	1770	1589	1774	1770	1846
Q Serve(g_s), s	15.5	0.0	7.3	28.6	0.0	0.0	9.5	11.5	12.3	31.6	16.0	16.0
Cycle Q Clear(g_c), s	15.5	0.0	7.3	28.6	0.0	0.0	9.5	11.5	12.3	31.6	16.0	16.0
Prop In Lane	0.07		1.00	0.57		1.00	1.00		0.82	1.00		0.05
Lane Grp Cap(c), veh/h	320	0	422	491	0	918	174	220	198	557	612	639
V/C Ratio(X)	0.80	0.00	0.29	0.93	0.00	0.50	0.84	0.81	0.86	0.90	0.50	0.50
Avail Cap(c_a), veh/h	515	0	584	511	0	935	258	248	223	940	928	968
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.5	0.0	33.8	41.5	0.0	14.1	51.9	49.9	50.2	38.4	30.3	30.3
Incr Delay (d2), s/veh	4.6	0.0	0.4	22.7	0.0	0.4	9.8	14.1	23.0	3.8	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.4	0.0	3.2	17.4	0.0	8.6	5.1	6.4	6.7	16.0	7.9	8.2
LnGrp Delay(d),s/veh	51.1	0.0	34.2	64.2	0.0	14.5	61.7	64.0	73.2	42.1	30.5	30.5
LnGrp LOS	D		C	E		B	E	E	E	D	C	C
Approach Vol, veh/h		378			910			494			1127	
Approach Delay, s/veh		45.7			39.4			66.5			35.7	
Approach LOS		D			D			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		23.8	14.5	44.1		34.7	40.4	18.2
Change Period (Y+Rc), s		3.6	3.0	3.6		3.0	3.6	* 3.6
Max Green Setting (Gmax), s		32.5	17.0	61.4		33.0	62.0	* 16
Max Q Clear Time (g_c+I1), s		17.5	11.5	18.0		30.6	33.6	14.3
Green Ext Time (p_c), s		1.7	0.1	3.2		1.1	3.2	0.3

Intersection Summary	
HCM 2010 Ctrl Delay	43.4
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	47	254	196	160	208	467	140	154	337	543	385	70
Future Volume (veh/h)	47	254	196	160	208	467	140	154	337	543	385	70
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.97	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
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	47	254	166	160	208	379	140	154	127	543	385	48
Adj No. of Lanes	0	1	1	0	1	1	1	2	0	1	2	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	57	310	459	186	242	892	169	205	156	592	1117	138
Arrive On Green	0.20	0.20	0.20	0.23	0.23	0.23	0.10	0.11	0.11	0.33	0.35	0.35
Sat Flow, veh/h	289	1560	1549	793	1030	1550	1774	1891	1439	1774	3170	393
Grp Volume(v), veh/h	301	0	166	368	0	379	140	143	138	543	214	219
Grp Sat Flow(s),veh/h/ln	1848	0	1549	1823	0	1550	1774	1770	1560	1774	1770	1793
Q Serve(g_s), s	17.3	0.0	9.4	21.5	0.0	0.0	8.6	8.7	9.6	32.6	9.9	10.0
Cycle Q Clear(g_c), s	17.3	0.0	9.4	21.5	0.0	0.0	8.6	8.7	9.6	32.6	9.9	10.0
Prop In Lane	0.16		1.00	0.43		1.00	1.00		0.92	1.00		0.22
Lane Grp Cap(c), veh/h	368	0	459	427	0	892	169	192	169	592	624	632
V/C Ratio(X)	0.82	0.00	0.36	0.86	0.00	0.42	0.83	0.75	0.81	0.92	0.34	0.35
Avail Cap(c_a), veh/h	542	0	604	542	0	990	272	262	231	992	980	992
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.5	0.0	31.0	40.7	0.0	13.6	49.3	48.0	48.4	35.5	26.5	26.5
Incr Delay (d2), s/veh	6.2	0.0	0.5	11.0	0.0	0.3	5.2	4.5	10.7	5.0	0.1	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.4	0.0	4.1	12.1	0.0	6.5	4.4	4.5	4.6	16.8	4.8	5.0
LnGrp Delay(d),s/veh	48.7	0.0	31.4	51.7	0.0	13.9	54.6	52.5	59.0	40.5	26.6	26.6
LnGrp LOS	D		C	D		B	D	D	E	D	C	C
Approach Vol, veh/h		467			747			421			976	
Approach Delay, s/veh		42.6			32.5			55.3			34.3	
Approach LOS		D			C			E			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		25.7	13.5	42.7		29.0	40.6	15.6
Change Period (Y+Rc), s		3.6	3.0	3.6		3.0	3.6	* 3.6
Max Green Setting (Gmax), s		32.5	17.0	61.4		33.0	62.0	* 16
Max Q Clear Time (g_c+I1), s		19.3	10.6	12.0		23.5	34.6	11.6
Green Ext Time (p_c), s		2.0	0.1	2.4		2.5	2.4	0.4

Intersection Summary	
HCM 2010 Ctrl Delay	38.7
HCM 2010 LOS	D

Notes

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	147	687	878	857	1237	7
Future Volume (veh/h)	147	687	878	857	1237	7
Number	7	14	5	2	6	16
Initial Q (Qb), veh	11	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1824
Adj Flow Rate, veh/h	147	599	878	857	1237	5
Adj No. of Lanes	1	1	2	2	2	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	237	747	1164	2911	1549	6
Arrive On Green	0.12	0.12	0.30	0.78	0.43	0.43
Sat Flow, veh/h	1774	1583	3442	3632	3708	15
Grp Volume(v), veh/h	147	599	878	857	606	636
Grp Sat Flow(s),veh/h/ln	1774	1583	1721	1770	1770	1860
Q Serve(g_s), s	7.6	5.4	22.8	6.6	28.2	28.3
Cycle Q Clear(g_c), s	7.6	5.4	22.8	6.6	28.2	28.3
Prop In Lane	1.00	1.00	1.00			0.01
Lane Grp Cap(c), veh/h	237	747	1164	2911	758	797
V/C Ratio(X)	0.62	0.80	0.75	0.29	0.80	0.80
Avail Cap(c_a), veh/h	332	770	1029	2772	758	797
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.27	0.27	1.00	1.00
Uniform Delay (d), s/veh	40.0	22.1	28.2	2.3	23.6	23.6
Incr Delay (d2), s/veh	2.0	5.7	1.0	0.1	8.6	8.2
Initial Q Delay(d3),s/veh	40.8	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.7	18.0	10.4	2.6	15.6	16.3
LnGrp Delay(d),s/veh	82.8	27.8	29.2	2.4	32.2	31.8
LnGrp LOS	F	C	C	A	C	C
Approach Vol, veh/h	746			1735	1242	
Approach Delay, s/veh	38.6			16.0	32.0	
Approach LOS	D			B	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		79.7		15.3	33.7	46.0		
Change Period (Y+Rc), s		5.3		* 4.2	5.3	* 5.3		
Max Green Setting (Gmax), s		67.7		* 18	22.8	* 41		
Max Q Clear Time (g_c+I1), s		8.6		9.6	24.8	30.3		
Green Ext Time (p_c), s		18.8		1.5	0.0	6.1		

Intersection Summary	
HCM 2010 Ctrl Delay	25.9
HCM 2010 LOS	C

Notes

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	132	465	737	550	573	5
Future Volume (veh/h)	132	465	737	550	573	5
Number	7	14	5	2	6	16
Initial Q (Qb), veh	11	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1824
Adj Flow Rate, veh/h	132	377	737	550	573	3
Adj No. of Lanes	1	1	2	2	2	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	216	688	1077	2821	1546	8
Arrive On Green	0.10	0.10	0.31	0.80	0.43	0.43
Sat Flow, veh/h	1774	1583	3442	3632	3703	19
Grp Volume(v), veh/h	132	377	737	550	281	295
Grp Sat Flow(s),veh/h/ln	1774	1583	1721	1770	1770	1859
Q Serve(g_s), s	6.8	0.0	17.8	3.6	10.2	10.2
Cycle Q Clear(g_c), s	6.8	0.0	17.8	3.6	10.2	10.2
Prop In Lane	1.00	1.00	1.00			0.01
Lane Grp Cap(c), veh/h	216	688	1077	2821	758	796
V/C Ratio(X)	0.61	0.55	0.68	0.19	0.37	0.37
Avail Cap(c_a), veh/h	332	791	1076	2820	758	796
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.74	0.74	1.00	1.00
Uniform Delay (d), s/veh	40.7	20.0	28.5	2.3	18.4	18.4
Incr Delay (d2), s/veh	2.1	0.5	1.4	0.1	1.4	1.3
Initial Q Delay(d3),s/veh	48.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.5	9.9	8.6	1.7	5.3	5.5
LnGrp Delay(d),s/veh	90.8	20.5	30.0	2.4	19.8	19.8
LnGrp LOS	F	C	C	A	B	B
Approach Vol, veh/h	509			1287	576	
Approach Delay, s/veh	38.7			18.2	19.8	
Approach LOS	D			B	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		81.0		14.0	35.0	46.0		
Change Period (Y+Rc), s		5.3		* 4.2	5.3	* 5.3		
Max Green Setting (Gmax), s		67.7		* 18	22.8	* 41		
Max Q Clear Time (g_c+I1), s		5.6		8.8	19.8	12.2		
Green Ext Time (p_c), s		10.9		1.0	2.0	4.0		

Intersection Summary	
HCM 2010 Ctrl Delay	23.0
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	444	386	291	293	648	610	153	762	115	826	546	565
Future Volume (veh/h)	444	386	291	293	648	610	153	762	115	826	546	565
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	2	10	2	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1937
Adj Flow Rate, veh/h	444	386	155	293	648	568	153	762	0	826	546	0
Adj No. of Lanes	2	2	0	2	1	1	1	2	0	2	2	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	442	581	230	290	367	590	1503	3491	0	605	1188	553
Arrive On Green	0.13	0.24	0.24	0.08	0.20	0.20	0.85	0.99	0.00	0.18	0.34	0.00
Sat Flow, veh/h	3442	2465	976	3442	1863	1583	1774	3632	0	3442	3539	1647
Grp Volume(v), veh/h	444	275	266	293	648	568	153	762	0	826	546	0
Grp Sat Flow(s),veh/h/ln	1721	1770	1671	1721	1863	1583	1774	1770	0	1721	1770	1647
Q Serve(g_s), s	12.2	13.4	13.7	8.0	18.7	18.7	1.4	0.4	0.0	16.7	11.5	0.0
Cycle Q Clear(g_c), s	12.2	13.4	13.7	8.0	18.7	18.7	1.4	0.4	0.0	16.7	11.5	0.0
Prop In Lane	1.00		0.58	1.00		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	442	417	394	290	367	590	1503	3491	0	605	1188	553
V/C Ratio(X)	1.00	0.66	0.67	1.01	1.77	0.96	0.10	0.22	0.00	1.37	0.46	0.00
Avail Cap(c_a), veh/h	442	427	403	290	367	590	1503	3491	0	605	1188	553
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.44	0.44	0.00
Uniform Delay (d), s/veh	41.4	32.9	33.0	43.5	38.2	168.6	1.2	0.0	0.0	39.2	24.8	0.0
Incr Delay (d2), s/veh	43.9	2.9	3.4	55.7	356.2	27.7	0.0	0.1	0.0	169.2	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	24.6	52.5	2.2	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.5	6.8	6.7	7.0	55.9	4.9	0.6	0.2	0.0	22.1	5.7	0.0
LnGrp Delay(d),s/veh	85.4	35.7	36.4	123.8	446.9	198.5	1.2	0.2	0.0	208.3	25.3	0.0
LnGrp LOS	F	D	D	F	F	F	A	A		F	C	
Approach Vol, veh/h		985			1509			915			1372	
Approach Delay, s/veh		58.3			290.7			0.3			135.5	
Approach LOS		E			F			A			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.8	27.2	88.8	36.2	17.0	23.0	23.0	102.0
Change Period (Y+Rc), s	4.8	* 4.8	6.3	4.3	4.8	4.3	6.3	* 6.3
Max Green Setting (Gmax), s	8.0	* 23	12.5	31.9	12.2	18.7	16.7	* 28
Max Q Clear Time (g_c+I1), s	10.0	15.7	3.4	13.5	14.2	20.7	18.7	2.4
Green Ext Time (p_c), s	0.0	1.9	2.5	2.0	0.0	0.0	0.0	3.5

Intersection Summary	
HCM 2010 Ctrl Delay	142.7
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	389	301	438	65	332	310	229	577	47	198	314	493
Future Volume (veh/h)	389	301	438	65	332	310	229	577	47	198	314	493
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	2	10	2	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1937
Adj Flow Rate, veh/h	389	301	302	65	332	268	229	577	0	198	314	0
Adj No. of Lanes	2	2	0	2	1	1	1	2	0	2	2	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	442	433	381	240	367	476	235	1211	0	360	1188	553
Arrive On Green	0.13	0.25	0.25	0.07	0.20	0.20	0.13	0.34	0.00	0.10	0.34	0.00
Sat Flow, veh/h	3442	1770	1557	3442	1863	1583	1774	3632	0	3442	3539	1647
Grp Volume(v), veh/h	389	301	302	65	332	268	229	577	0	198	314	0
Grp Sat Flow(s),veh/h/ln	1721	1770	1557	1721	1863	1583	1774	1770	0	1721	1770	1647
Q Serve(g_s), s	10.6	14.6	17.1	1.7	16.6	7.9	12.2	12.2	0.0	5.2	6.1	0.0
Cycle Q Clear(g_c), s	10.6	14.6	17.1	1.7	16.6	7.9	12.2	12.2	0.0	5.2	6.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	442	433	381	240	367	476	235	1211	0	360	1188	553
V/C Ratio(X)	0.88	0.69	0.79	0.27	0.91	0.56	0.98	0.48	0.00	0.55	0.26	0.00
Avail Cap(c_a), veh/h	442	442	389	290	367	477	235	1213	0	605	1188	553
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.89	0.89	0.00
Uniform Delay (d), s/veh	40.7	32.6	33.6	42.0	38.2	11.5	41.1	24.6	0.0	40.4	23.0	0.0
Incr Delay (d2), s/veh	17.6	3.8	9.6	0.2	24.6	0.9	51.5	1.3	0.0	0.4	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.7	55.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.1	7.6	8.4	0.9	17.7	3.7	9.3	6.2	0.0	2.5	3.1	0.0
LnGrp Delay(d),s/veh	58.3	36.4	43.2	42.9	118.4	12.7	92.6	25.9	0.0	40.8	23.5	0.0
LnGrp LOS	E	D	D	D	F	B	F	C		D	C	
Approach Vol, veh/h		992			665			806			512	
Approach Delay, s/veh		47.1			68.4			44.8			30.2	
Approach LOS		D			E			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.4	28.5	18.9	36.2	17.0	22.9	16.2	38.9
Change Period (Y+Rc), s	4.8	* 4.8	6.3	4.3	4.8	4.3	6.3	* 6.3
Max Green Setting (Gmax), s	8.0	* 23	12.5	31.9	12.2	18.7	16.7	* 28
Max Q Clear Time (g_c+I1), s	3.7	19.1	14.2	8.1	12.6	18.6	7.2	14.2
Green Ext Time (p_c), s	0.0	1.3	0.0	1.1	0.0	0.0	0.2	2.3

Intersection Summary	
HCM 2010 Ctrl Delay	48.3
HCM 2010 LOS	D

Notes

HCM 2010 Signalized Intersection Summary
5: Fountaingrove Pkwy & Round Barn Blvd

06/29/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	657	627	4	1	608	22	1	0	4	27	0	885
Future Volume (veh/h)	657	627	4	1	608	22	1	0	4	27	0	885
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	657	627	4	1	608	22	1	0	4	27	0	885
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	0	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	629	2010	13	2	711	26	9	0	8	387	0	906
Arrive On Green	0.35	0.56	0.56	0.00	0.20	0.20	0.01	0.00	0.01	0.22	0.00	0.22
Sat Flow, veh/h	1774	3605	23	1774	3484	126	1774	0	1583	1774	0	1583
Grp Volume(v), veh/h	657	308	323	1	309	321	1	0	4	27	0	885
Grp Sat Flow(s),veh/h/ln	1774	1770	1859	1774	1770	1841	1774	0	1583	1774	0	1583
Q Serve(g_s), s	26.0	6.8	6.8	0.0	12.3	12.4	0.0	0.0	0.2	0.9	0.0	16.0
Cycle Q Clear(g_c), s	26.0	6.8	6.8	0.0	12.3	12.4	0.0	0.0	0.2	0.9	0.0	16.0
Prop In Lane	1.00		0.01	1.00		0.07	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	629	986	1036	2	361	376	9	0	8	387	0	906
V/C Ratio(X)	1.04	0.31	0.31	0.41	0.85	0.86	0.11	0.00	0.48	0.07	0.00	0.98
Avail Cap(c_a), veh/h	629	986	1036	97	386	401	387	0	345	387	0	906
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.7	8.7	8.7	36.6	28.1	28.2	36.3	0.0	36.4	22.8	0.0	15.2
Incr Delay (d2), s/veh	48.2	0.2	0.2	85.6	16.1	15.7	4.9	0.0	36.8	0.1	0.0	24.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	21.0	3.4	3.6	0.1	7.6	7.9	0.0	0.0	0.2	0.4	0.0	23.1
LnGrp Delay(d),s/veh	71.8	8.9	8.9	122.2	44.2	43.9	41.2	0.0	73.2	22.8	0.0	39.3
LnGrp LOS	F	A	A	F	D	D	D		E	C		D
Approach Vol, veh/h		1288			631			5			912	
Approach Delay, s/veh		41.0			44.2			66.8			38.8	
Approach LOS		D			D			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		4.4	4.1	44.9		20.0	30.0	19.0
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		16.0	4.0	38.0		16.0	26.0	16.0
Max Q Clear Time (g_c+I1), s		2.2	2.0	8.8		18.0	28.0	14.4
Green Ext Time (p_c), s		0.0	0.0	4.2		0.0	0.0	0.6

Intersection Summary	
HCM 2010 Ctrl Delay	41.1
HCM 2010 LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	129	396	3	4	529	8	3	0	1	12	1	130
Future Volume (veh/h)	129	396	3	4	529	8	3	0	1	12	1	130
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	129	396	3	4	529	8	3	0	1	12	1	130
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	0	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	173	1289	10	8	946	14	8	0	7	171	14	319
Arrive On Green	0.10	0.36	0.36	0.00	0.26	0.26	0.00	0.00	0.00	0.10	0.10	0.10
Sat Flow, veh/h	1774	3600	27	1774	3569	54	1774	0	1583	1644	137	1583
Grp Volume(v), veh/h	129	195	204	4	262	275	3	0	1	13	0	130
Grp Sat Flow(s),veh/h/ln	1774	1770	1858	1774	1770	1853	1774	0	1583	1781	0	1583
Q Serve(g_s), s	2.1	2.4	2.4	0.1	3.9	3.9	0.1	0.0	0.0	0.2	0.0	2.2
Cycle Q Clear(g_c), s	2.1	2.4	2.4	0.1	3.9	3.9	0.1	0.0	0.0	0.2	0.0	2.2
Prop In Lane	1.00		0.01	1.00		0.03	1.00		1.00	0.92		1.00
Lane Grp Cap(c), veh/h	173	634	665	8	469	491	8	0	7	185	0	319
V/C Ratio(X)	0.75	0.31	0.31	0.52	0.56	0.56	0.39	0.00	0.14	0.07	0.00	0.41
Avail Cap(c_a), veh/h	1526	2225	2336	235	937	981	939	0	838	943	0	993
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.3	7.0	7.0	15.0	9.6	9.6	15.0	0.0	15.0	12.2	0.0	10.5
Incr Delay (d2), s/veh	6.3	0.3	0.3	44.4	1.0	1.0	28.7	0.0	9.3	0.2	0.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	1.2	1.2	0.1	2.0	2.1	0.1	0.0	0.0	0.1	0.0	1.0
LnGrp Delay(d),s/veh	19.5	7.3	7.3	59.4	10.6	10.6	43.7	0.0	24.3	12.4	0.0	11.3
LnGrp LOS	B	A	A	E	B	B	D		C	B		B
Approach Vol, veh/h		528			541			4			143	
Approach Delay, s/veh		10.3			11.0			38.8			11.4	
Approach LOS		B			B			D			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		4.1	4.1	14.8		7.1	6.9	12.0
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s		16.0	4.0	38.0		16.0	26.0	16.0
Max Q Clear Time (g_c+I1), s		2.1	2.1	4.4		4.2	4.1	5.9
Green Ext Time (p_c), s		0.0	0.0	2.5		0.3	0.3	2.1

Intersection Summary	
HCM 2010 Ctrl Delay	10.8
HCM 2010 LOS	B

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	139	137	46	873	801	21
Future Volume (veh/h)	139	137	46	873	801	21
Number	5	12	3	8	4	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	139	137	46	873	801	21
Adj No. of Lanes	1	1	1	2	2	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	195	238	71	2844	2559	67
Arrive On Green	0.11	0.11	0.04	0.80	0.73	0.73
Sat Flow, veh/h	1774	1583	1774	3632	3617	92
Grp Volume(v), veh/h	139	137	46	873	402	420
Grp Sat Flow(s),veh/h/ln	1774	1583	1774	1770	1770	1846
Q Serve(g_s), s	6.1	6.4	2.0	5.1	6.4	6.4
Cycle Q Clear(g_c), s	6.1	6.4	2.0	5.1	6.4	6.4
Prop In Lane	1.00	1.00	1.00			0.05
Lane Grp Cap(c), veh/h	195	238	71	2844	1285	1341
V/C Ratio(X)	0.71	0.58	0.65	0.31	0.31	0.31
Avail Cap(c_a), veh/h	554	558	355	2844	1285	1341
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.4	31.6	37.8	2.0	3.9	3.9
Incr Delay (d2), s/veh	1.8	0.8	3.7	0.3	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	2.9	1.1	2.5	3.4	3.5
LnGrp Delay(d),s/veh	36.2	32.5	41.5	2.3	4.5	4.5
LnGrp LOS	D	C	D	A	A	A
Approach Vol, veh/h	276			919	822	
Approach Delay, s/veh	34.3			4.3	4.5	
Approach LOS	C			A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		11.8	6.2	62.0				68.2
Change Period (Y+Rc), s		3.0	3.0	3.9				3.9
Max Green Setting (Gmax), s		25.0	16.0	29.1				48.1
Max Q Clear Time (g_c+I1), s		8.4	4.0	8.4				7.1
Green Ext Time (p_c), s		0.4	0.0	7.9				9.4

Intersection Summary	
HCM 2010 Ctrl Delay	8.5
HCM 2010 LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	18	10	0	570	635	3
Future Volume (veh/h)	18	10	0	570	635	3
Number	5	12	3	8	4	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	18	10	0	570	635	3
Adj No. of Lanes	1	1	1	2	2	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	51	0	2	3131	3196	15
Arrive On Green	0.03	0.03	0.00	0.88	0.88	0.88
Sat Flow, veh/h	1774	1583	1774	3632	3705	17
Grp Volume(v), veh/h	18	10	0	570	311	327
Grp Sat Flow(s),veh/h/ln	1774	1583	1774	1770	1770	1860
Q Serve(g_s), s	0.8	2.3	0.0	1.8	2.0	2.0
Cycle Q Clear(g_c), s	0.8	2.3	0.0	1.8	2.0	2.0
Prop In Lane	1.00	1.00	1.00			0.01
Lane Grp Cap(c), veh/h	51	-14	2	3131	1566	1645
V/C Ratio(X)	0.35	-0.74	0.00	0.18	0.20	0.20
Avail Cap(c_a), veh/h	554	435	355	3131	1566	1645
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.1	0.0	0.0	0.6	0.6	0.6
Incr Delay (d2), s/veh	1.5	0.0	0.0	0.1	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	0.8	1.1	1.1
LnGrp Delay(d),s/veh	39.6	0.0	0.0	0.8	0.9	0.9
LnGrp LOS	D			A	A	A
Approach Vol, veh/h	28			570	638	
Approach Delay, s/veh	25.5			0.8	0.9	
Approach LOS	C			A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		5.3	0.0	74.7				74.7
Change Period (Y+Rc), s		3.0	3.0	3.9				3.9
Max Green Setting (Gmax), s		25.0	16.0	29.1				48.1
Max Q Clear Time (g_c+I1), s		4.3	0.0	4.0				3.8
Green Ext Time (p_c), s		0.0	0.0	5.3				5.6

Intersection Summary	
HCM 2010 Ctrl Delay	1.4
HCM 2010 LOS	A

Arterial Level of Service: NB Mendocino Ave #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Chanate Road	18	61.5	75.5	0.1	6
Bicentennial Way	20	24.7	56.1	0.4	27
Project Dwy	27	3.4	12.0	0.1	29
	30	2.1	24.8	0.3	37
Fountaingrove Pkwy	4	34.0	40.5	0.1	7
US 101 NB	3	5.6	16.2	0.1	28
Total		131.3	225.1	1.1	18

Arterial Level of Service: SB Mendocino Ave #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Mendocino O/C	4	39.3	48.4	0.1	9
	30	2.2	13.3	0.1	22
Kaiser Dwy	27	1.2	23.0	0.3	40
Bicentennial Way	20	29.0	36.3	0.1	10
Administration Dr	18	20.9	62.0	0.4	24
Total		92.6	183.1	1.0	19

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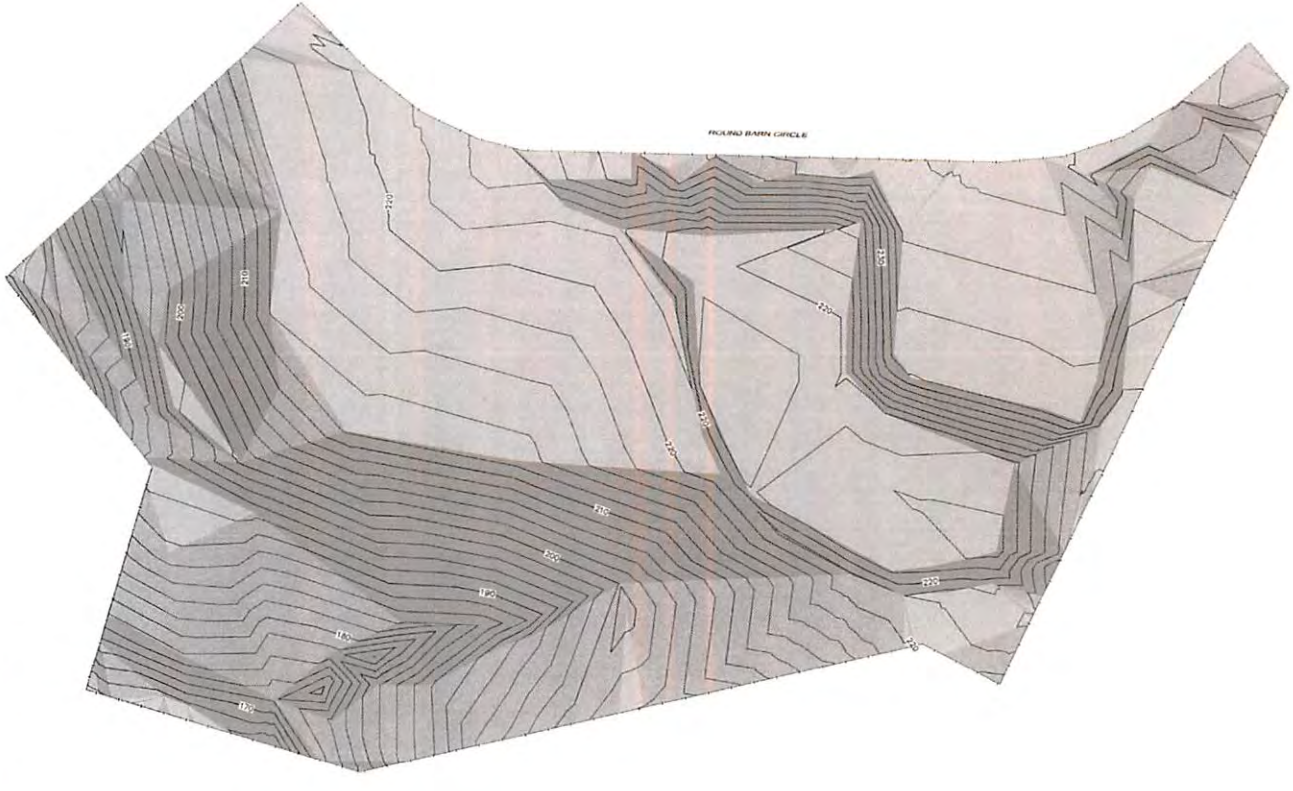

SLOPE TABLE				
No	Min Slope	Max Slope	Area	Color
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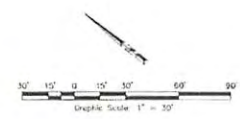
2	10%	25%	48,693	
3	>25%		63,554	



May 15, 2017

SLOPE ANALYSIS EXHIBIT

Residence Inn Santa Rosa by Marriott
6 Broadacre Circle, (Round Barn Circle)
Santa Rosa CA
APN: 173-029-008

adobe associates, inc.

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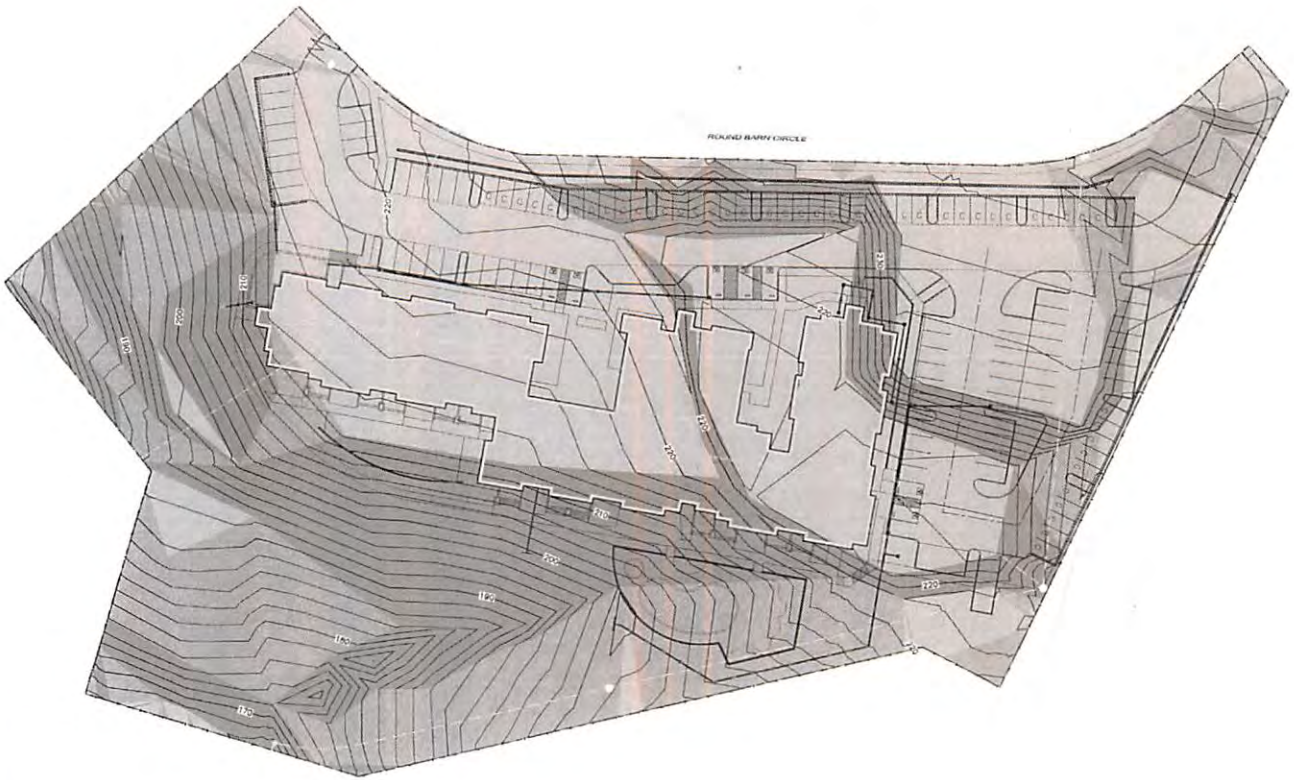

SLOPE TABLE				
No	Min Slope	Max Slope	Area	Color
1	0%	10%	87,983	
2	10%	25%	48,693	
3			63,554	

May 18, 2017

SLOPE ANALYSIS EXHIBIT

Residence Inn Santa Rosa by Marriott
0 Broadacre Circle, (Round Barn Circle)
Santa Rosa CA
APN: 173-020-008

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