Traffic Impact Study for the Yolanda Mixed-Use Project

Prepared for the City of Santa Rosa

Submitted by
W-Trans

February 7, 2019

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Table of Contents

Appendices

A. Caltrans Letter and Response-to-Comments Letter
B. Collision Rate Calculations
C. Intersection Level of Service Calculations
D. Site Specific Surveys
E. Queuing Calculations
F. Turn Lane Warrants and AutoTURN Analysis
G. Drive Thru Queuing Calculations
H. In-N-Out Project Description and Queue Management Plan

Executive Summary

The proposed Yolanda Mixed-Use project would include construction of 252 apartment units and a 3,867 square-foot In-N-Out Burger restaurant at 325 Yolanda Avenue and 2532 Santa Rosa Avenue respectively in the City of Santa Rosa. It is understood that subsequent to preparation of this analysis the mixed-use project was separated into two distinct and independent projects. This analysis included both projects and in consideration of the results, it is assumed that separating the projects into two analyses would not yield different or new conclusions. Separate access is proposed for the two uses with access to the residential component occurring via two driveways on Yolanda Avenue and access to the In-N-Out occurring via two driveways, one of which would be on Santa Rosa Avenue and the other on Yolanda Avenue.

Based on standard trip generation rates for the residential use and site-specific rates for the In-N-Out Burger restaurant, and assuming some trips to the In-N-Out would be pass-by trips, the proposed project would be expected to generate a total of 3,630 net new trips per day, including 209 during the morning peak hour and 279 during the evening peak hour. The housing component would be expected to generate 1,371 trips daily, including 91 during the morning peak hour and 111 during the evening peak hour. The In-N-Out project is expected to generate an average of 3,012 trips daily, with 157 of these during the morning peak hour and 224 during the p.m. peak hour. After deducting pass-by trips, the In-N-Out would be expected to generate 2,259 net new trips daily, with 118 of these occurring during the morning peak hour and 168 during the evening peak hour.

The seven study intersections are currently operating acceptably at LOS D or better and would be expected to continue doing so with the addition of project-generated traffic.

With the addition of trips associated with approved and pending projects to existing volumes, the study intersections are expected to continue operating acceptably at LOS D or better, except Yolanda Avenue/Petaluma Hill Road, which is expected to operate unacceptably at LOS E during the p.m. peak hour. Upon the addition of project traffic to Baseline conditions, the intersection of Yolanda Avenue/Petaluma Hill Road would continue operating unacceptably; however, because the delay would increase by 3.6 seconds which is less than the applied significance standard of five seconds, the project's impact was deemed less-than-significant. It is noted that this intersection would be expected to operate acceptably with the construction of a southbound right-turn lane, which is a planned future improvement included in the Farmers Lane Extension project. Under anticipated future volumes and with planned improvements, the study intersections are expected to operate acceptably during both peak hours, with and without project-generated volumes.

Under all scenarios, the estimated 95th percentile queues for the US 101 off-ramps at Corby Avenue and at Santa Rosa Avenue would be accommodated within the available stacking space on the hook ramps; therefore, queues would not spill onto the freeway mainline. The estimated 95th percentile queues for the westbound approach to Yolanda Avenue/Santa Rosa Avenue extend past the proposed location for the In-N-Out driveway on Yolanda Avenue. Since there are alternate access points on Santa Rosa Avenue and planned improvements to widen Yolanda Avenue in the future, queuing on Yolanda Avenue is not expected to be an impact. Queuing at the In-N-Out drive-through was also reviewed and stacking space in the drive-through is expected to be adequate as proposed.

Facilities providing access to the site via alternative modes, including pedestrians, bicyclists, and transit riders, are adequate and would be improved with the project. The project should include improvements along its Yolanda Avenue frontage to complete the planned Class II bike lane. Racks or other structures to provide secure parking facilities for at least 46 bicycles should be provided on-site for the residential development and at least one secure bicycle parking space should be provided for the In-N-Out Burger.

Sight distances at all project driveways are adequate. Landscaping at all project driveways should be maintained to provide clear sight lines. A two-way left-turn lane should be installed on Yolanda Avenue at the project's driveways.

Emergency vehicle access and circulation was evaluated and determined to be adequate for the proposed residential and restaurant layouts.

The proposed parking supply of 410 residential spaces and 75 spaces for the In-N-Out Burger are adequate to satisfy the anticipated peak parking demand based on standard parking rates and site-specific rates developed for In-N-Out restaurants, respectively.

Introduction

This report presents an analysis of the potential traffic impacts that would be associated with a proposed development including 252 apartments and an In-N-Out fast food restaurant at 325 Yolanda Avenue and 2532 Santa Rosa Avenue respectively in the City of Santa Rosa. The traffic study was completed in accordance with the criteria established by the City of Santa Rosa, reflects a scope of work approved by City staff, and is consistent with standard traffic engineering techniques. Caltrans commented on the draft report as it applies to the In-N-Out Burger project application. The Caltrans letter and a response-to-comments letter are provided in Appendix A.

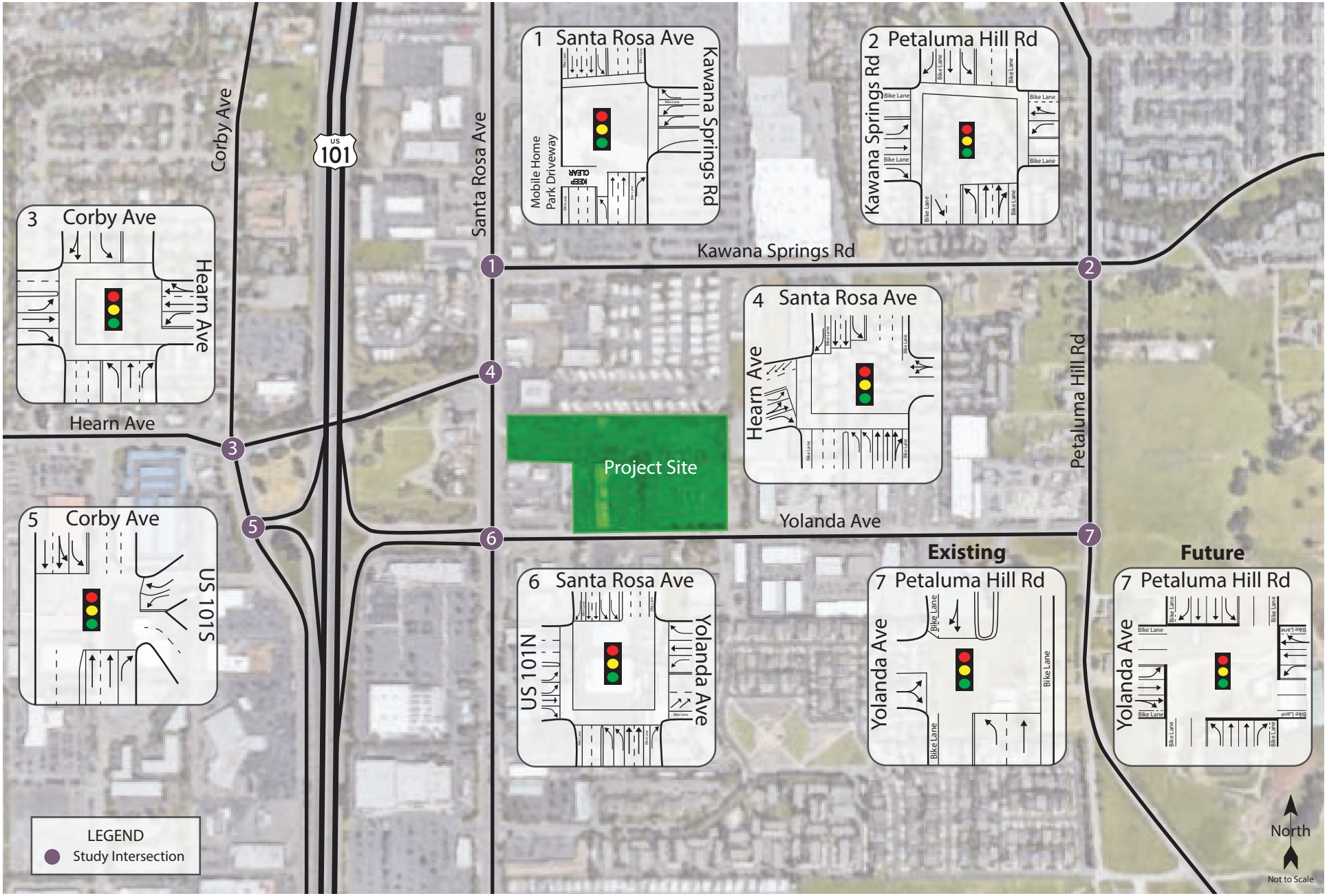
Prelude

The purpose of a traffic impact study is to provide City staff and policy makers with data 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 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 development of 252 apartments and an In-N-Out fast food restaurant on a site that is currently under limited use for storage. The two land uses would have separate access, with two driveways on Yolanda Avenue proposed for the residential development and two driveways, including one on Yolanda Avenue and one on Santa Rosa Avenue, for the In-N-Out restaurant.

The project site is located at 325 Yolanda Avenue and 2532 Santa Rosa Avenue, as shown in Figure 1.



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Traffic Impact Study for the Yolanda Mixed-Use Project

Figure 1 – Study Area and Lane Configurations

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Transportation Setting

Operational Analysis

Study Area and Periods

The study area selected with input from City staff consists of the sections of Yolanda Avenue and Santa Rosa Avenue fronting the project site and the project access points as well as the following intersections.

1. Kawana Springs Road/Santa Rosa Avenue
2. Kawana Springs Road/Petaluma Hill Road
3. Hearn Avenue/Corby Avenue
4. Hearn Avenue/Santa Rosa Avenue
5. US 101 South Ramps/Corby Avenue
6. Yolanda Avenue-US 101 North Ramps/Santa Rosa Avenue
7. Yolanda Avenue/Petaluma Hill Road

Operating conditions during the a.m. and p.m. 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 morning peak hour occurs between 7:00 and 9:00 a.m. and reflects conditions during the home to work or school commute, while the 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.

Study Intersections

Kawana Springs Road/Santa Rosa Avenue is a four-legged signalized intersection with protected left-turn phasing on the northbound and southbound approaches and split phasing on the eastbound and westbound approaches as well as right-turn overlaps on the westbound and northbound approaches. Marked pedestrian crosswalks and phasing are provided on the north and east legs.

Kawana Springs Road/Petaluma Hill Road is a signalized four-legged intersection with protected-permitted left-turn phasing on each approach. There are right-turn overlaps in the southbound and eastbound directions. There are crosswalks with pedestrian phasing on all but the south leg.

Hearn Avenue/Corby Avenue is a signalized four-legged intersection. All approaches have protected left-turn phasing, and the northbound Corby Avenue approach has a right-turn overlap phase. Crosswalks are provided on the north, south and west legs.

Hearn Avenue/Santa Rosa Avenue is a skewed signalized four-legged intersection. Protected left-turn phasing is provided for the northbound and southbound approaches. The southbound Santa Rosa Avenue and eastbound Hearn Avenue approaches have right-turn overlap phasing and the westbound and eastbound Hearn Avenue approaches operate with split-phasing. The east leg of the intersection is a private commercial driveway. Crosswalks are provided on the south and west legs.

US 101 South Ramps/Corby Avenue is a signalized tee-intersection with split phasing for Corby Avenue. The southbound US 101 off-ramp approach has a right-turn overlap phase and the southbound on-ramp includes a ramp meter.

Yolanda Avenue-US 101 North Ramps/Santa Rosa Avenue is a four-legged, signalized intersection with protected left-turn phasing on all approaches and a right-turn overlap phase on the southbound Sana Rosa

Avenue approach. The northbound US 101 on-ramp includes ramp metering during peak traffic hours. There are marked crosswalks on the south, east, and west legs.

Yolanda Avenue/Petaluma Hill Road is a signalized tee-intersection that includes protected left-turn phasing for the movement from northbound Petaluma Hill Road.

The locations of the study intersections and the existing lane configurations and controls are shown in Figure 1.

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, 2013 through December 31, 2017.

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 equal to or below the statewide average at four of the seven study intersections, indicating that there is no readily-apparent safety concern at these locations. The collision rate calculations are provided in Appendix B.

Table 1 – Collision Rates at the Study Intersections

Study Intersection	Number of Collisions (2013-2017)	Calculated Collision Rate (c/mve)	Statewide Average Collision Rate (c/mve)
1. Kawana Springs Rd/Santa Rosa Ave	14	0.27	0.27
2. Kawana Springs Rd/Petaluma Hill Rd	**15**	**0.32**	0.27
3. Hearn Ave/Corby Ave	**30**	**0.53**	0.27
4. Hearn Ave/Santa Rosa Ave	19	0.26	0.27
5. US 101S Ramps/Corby Ave	4	0.11	0.21
6. Yolanda Ave-US 101N/Santa Rosa Ave	**25**	**0.35**	0.27
7. Yolanda Ave/Petaluma Hill Rd	9	0.23	0.27

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

Because the collision rate for Kawana Springs Road/Petaluma Hill Road was at least marginally higher than the statewide average, the crashes at this location were reviewed in greater detail. The most common types of collisions that occurred at this location were rear-end and broadside with the primary cause being right-of-way violation and unsafe speeds. While rear-end collisions are generally common for busy signalized intersections, broadside collisions may be associated with the permitted left-turn phasing that is present on all approaches. It is noted that more than half of the collisions at the intersection occurred where vehicles were traveling on Petaluma Hill Road. Though it would lead to increased delay at the intersection, it is recommended that protected left-turn phasing be considered if this trend of collisions continues. Alternatively, the City may wish to consider changing to the Flashing Yellow Arrow indications if the experience of nearby communities that are using them, including Petaluma and Windsor, indicates that driver compliance is superior with this type of display.

Of the 30 reported collisions that occurred at the intersection of Hearn Avenue/Corby Avenue, 15 were rear-end collisions and ten were broadside collisions. These collisions generally resulted from unsafe speed and are typical of conditions at a congested intersection. The percent of collisions resulting in injuries was 46.9 percent for the

study period, compared to a 37.9 percent average Statewide. The City of Santa Rosa Capital Improvement Program identifies improvements to the Hearn Avenue interchange at US 101 that would ease traffic congestion and improve operation. The improved operation associated with these planned modifications would reasonably be expected to enhance operation.

Further review of the collisions recorded at Yolanda Avenue-US 101 North Ramps/Santa Rosa Avenue indicates that fifteen of the 25 collisions were rear-end collisions, eleven of which occurred on the northbound and southbound approaches to the intersection. This type of crash is common at signalized intersections where there is congestion, especially during peak periods. It is suggested that the City consider investigating improvements to coordination on Santa Rosa Avenue and increasing enforcement in the area to address this situation.

Alternative Modes

Pedestrian Facilities

Pedestrian facilities include sidewalks, crosswalks, 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 near the proposed project site; however, sidewalk gaps, obstacles, and barriers can be found in the immediate vicinity of the project area.

- **Santa Rosa Avenue** – Full sidewalk connectivity exists along Santa Rosa Avenue. Intersections with major and minor streets near the project site include pedestrian phasing, curb ramps, and marked crosswalks. Lighting is provided by overhead street lights along both sides of the street.

- **Yolanda Avenue** – Intermittent sidewalk coverage exists on Yolanda Avenue with significant gaps on both sides of the street between the project frontage and Petaluma Hill Road. Sidewalks exist west of the proposed project site on both sides of Yolanda Avenue and connect to the existing pedestrian network on Santa Rosa Avenue. Lighting is provided by overhead street lights.

- **Hearn Avenue** – Sidewalk coverage on the segment of Hearn Avenue between Corby Avenue and Santa Rosa Avenue is intermittent with no sidewalks on the north side and sidewalk gaps on the south side of Hearn Avenue. Lighting on Hearn Avenue is provided at the intersections with Corby Avenue and Santa Rosa Avenue, but not along the US 101 overcrossing segment.

- **Kawana Springs Road** – Intermittent sidewalk coverage is provided on Kawana Springs Road, with large gaps on the south side of the road between Santa Rosa Avenue and Petaluma Hill Road. Lighting is provided by overhead lights, mainly on the north side of the street.

Bicycle Facilities

The *Highway Design Manual*, Caltrans, 2017, classifies bikeways into three categories used in Santa Rosa:

- **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.

There are existing Class II bike lanes along Petaluma Hill Road and Santa Rosa Avenue and future bicycle facilities are planned along several streets in the immediate project vicinity. Table 2 summarizes the existing and planned bicycle facilities in the project vicinity, as contained in the *Santa Rosa Bicycle and Pedestrian Master Plan*.

Table 2 – Bicycle Facility Summary				
Status **Facility**	**Class**	**Length (miles)**	**Begin Point**	**End Point**
Existing				
Colgan Creek Trail	I	0.60	Colgan Ave	Petaluma Hill Rd
Kawana Springs Rd	II	0.50	Petaluma Hill Rd	Brookwood Ave
Kawana Springs Rd (WB)	II	0.50	Santa Rosa Ave	Petaluma Hill Rd
Petaluma Hill Rd	II	1.10	Pressley St	Yolanda Ave
Santa Rosa Ave	II	3.68	Todd Rd	3rd St
Planned				
Colgan Creek Trail	I	0.69	Kawana Springs Rd	Farmers Ln Extension
Corby Ave	III	1.28	Earle St	Dowd Dr
Dowd Dr	III	0.54	Corby Ave Extension	Wiljan Ct
Farmers Ln Extension	II	0.84	Bennett Valley Rd	Petaluma Hill Rd/Yolanda Ave
Hearn Ave	II	0.42	SMART RR Tracks	Santa Rosa Ave (Hearn O/C)
Kawana Springs Rd	II	0.50	Brookwood Ave	Sonoma Academy
Petaluma Hill Rd	II	0.32	Yolanda Ave	Southern City Limits
Santa Rosa Ave	II	1.02	Bellevue Ave	Todd Rd
Yolanda Ave	II	0.50	Petaluma Hill Rd	Santa Rosa Ave

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

Transit Facilities

Transit Services in the City of Santa Rosa, and throughout Sonoma County, are provided by Santa Rosa "CityBus" and Sonoma County Transit (SCT). There are two transit stops within what is typically considered acceptable walking distance (one quarter-mile) of the site. CityBus Routes 3 and 5 provide loop service to destinations throughout Santa Rosa and stop on Santa Rosa Avenue just south of the Yolanda Avenue intersection, and on Yolanda Avenue just west of the project site. These routes operate Monday through Friday with 30-minute headways between 6:00 a.m. and 8:00 p.m. Saturday and Sunday service operates with approximately one-hour headways between 6:00 a.m. and 8:00 p.m. and 10:00 a.m. and 4:30 p.m., respectively.

SCT Routes 44, 48, and 54 provide regional service to destinations throughout Santa Rosa and Petaluma. These routes operate on weekdays between 5:30 a.m. and 10:30 p.m. with half-hourly to hourly headways. Routes 44 and 48 operate on weekends with one hour to one-and-a-half hour headways between 7:00 a.m. and 10:00 p.m.

Two to three bicycles can be carried on most CityBus and SCT buses. Bike rack space is on a first-come, first-served basis. Additional bicycles are allowed on SCT 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. SCT Paratransit is designed to serve the needs of individuals with disabilities within Sonoma and the greater County of Sonoma 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 the signals are coordinated or not, 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 obtained from Caltrans and the City of Santa Rosa for intersections under their respective jurisdictions.

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

Traffic Operation Standards

City of Santa Rosa

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 much longer segments than the ones included in the study area for the project. Therefore, although the City's standard does not specify criteria for intersections, for the purposes of this study, as is standard practice for such studies, a minimum operation of LOS D for the overall operation of signalized intersections was applied.

Caltrans

Caltrans indicates that they endeavor to maintain operation at the transition from LOS C to LOS D.

For the two study intersections that include freeway ramps, and are therefore under the jurisdiction of Caltrans, for analysis purposes the City's operational standard was applied, as is typically the case for locations that are crucial to a local jurisdiction's circulation system.

Existing Conditions

The Existing Conditions scenario provides an evaluation of current operation based on existing traffic volumes during the a.m. and p.m. peak periods. This condition does not include project-generated traffic volumes. Volume data was collected in March 2017, June 2018, and September 2018.

Intersection Levels of Service

The study intersections are currently operating acceptably at LOS D or better during both peak periods studied. The existing traffic volumes are shown in Figure 2. A summary of the intersection level of service calculations is contained in Table 4, and copies of the Level of Service calculations are provided in Appendix C.

Table 4– Existing Peak Hour Intersection Levels of Service

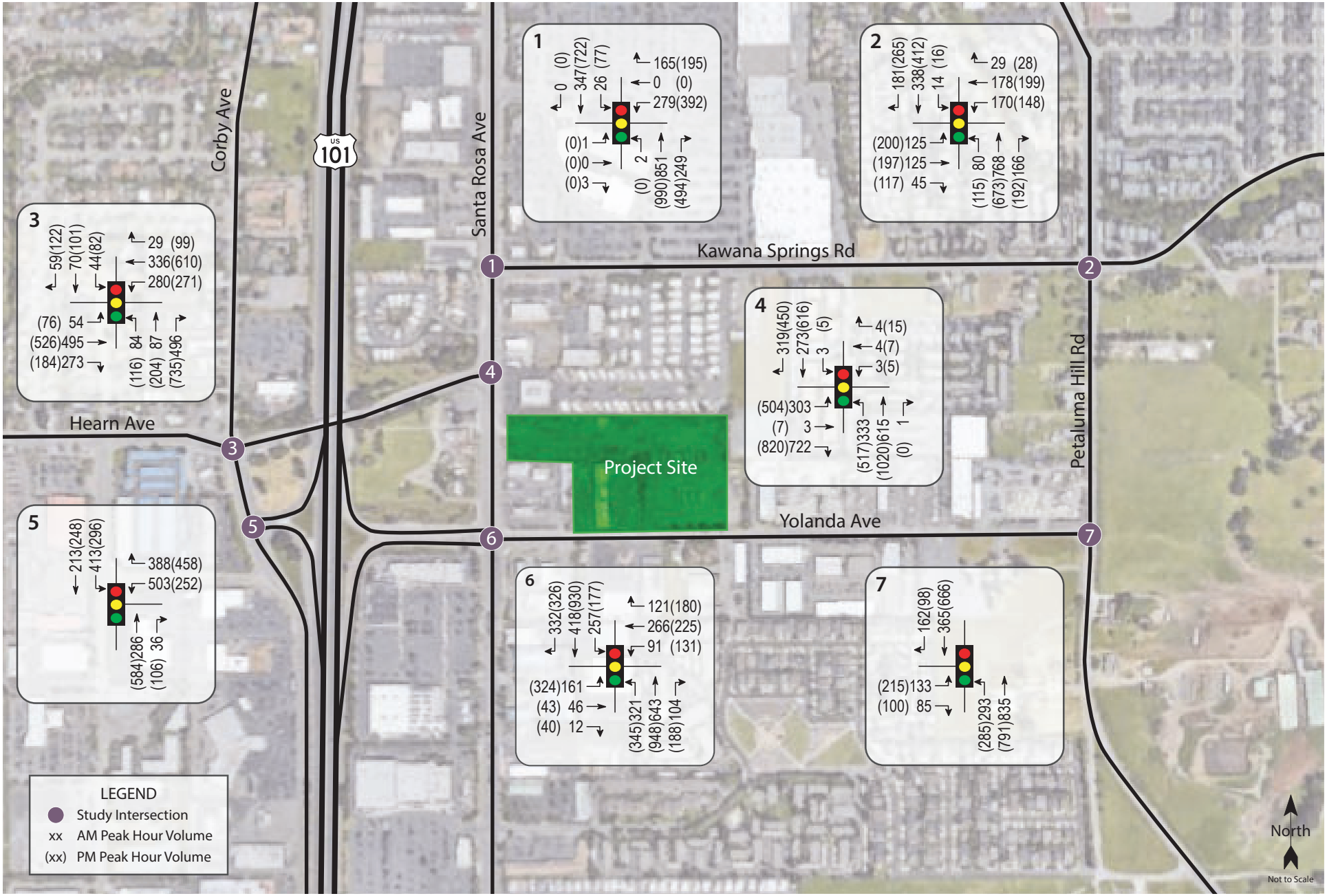
Study Intersection	AM Peak		PM Peak	
	Delay	LOS	Delay	LOS
1. Kawana Springs Rd/Santa Rosa Ave	17.0	B	15.1	B
2. Kawana Springs Rd/Petaluma Hill Rd	23.6	C	24.7	C
3. Hearn Ave/Corby Ave	32.4	C	38.1	D
4. Hearn Ave/Santa Rosa Ave	19.3	B	33.2	C
5. US 101S Ramps/Corby Ave	15.4	B	16.8	B
6. Yolanda Ave-US 101N Ramps/Santa Rosa Ave	25.7	C	30.6	C
7. Yolanda Ave/Petaluma Hill Rd	13.4	B	36.0	D

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service

Baseline Conditions

Baseline (Existing plus Approved plus Pending) operating conditions were determined with traffic from approved and pending projects in and near the study area added to the existing volumes. As directed by staff, the following projects contained in the *Citywide Summary of Pending Development Report* were considered for the Baseline Conditions. The same trip generation and distribution assumptions used in the traffic studies for the various projects, where available, were used in this analysis. Standard rates as published in *Trip Generation Manual*, 10th Edition, 2017, were applied.

Kawana Springs Senior Assisted Living Center is a planned 112-unit assisted living facility to be located at 450 and 500 Kawana Springs Road. Within the building, 71 suites would be provided for senior assisted care and 31 suites for senior memory care, for a total of 119 beds. Additionally, there would be ten single-bedroom apartments available to rent for employees. Based on trip generation rates, the project is expected to generate 381 new trips per day, including 28 trips during the morning peak hour and 37 trips during the evening peak hour.



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Traffic Impact Study for the Yolanda Mixed-Use Project

Figure 2- Existing Traffic Volumes

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Kawana Meadows is an approved 86-unit single family residential development that would be located at 1162 Kawana Springs Road. Based on the use of ITE rates, the project would be expected to generate 812 daily trips on average, with 64 trips during the morning peak hour and 85 trips during the evening peak hour.

The Farmstead is an approved multifamily residential development that would include 20 dwelling units located at 1315 Lia Lane. This project would be expected to generate 146 daily trips, with nine trips during the a.m. peak hour and eleven trips during the p.m. peak hour, per ITE rates.

Kawana Springs Apartment Homes is an approved 120-unit multifamily residential development that would be located at 2604 Petaluma Hill Road. The trip generation for this project was estimated using standard ITE rates for "Multifamily Housing (Mid-Rise)" (LU #221). The estimated trip generation would include 653 daily trips on average, with 43 trips during the morning peak period and 53 trips during the evening peak period.

Santa Rosa Village includes the development of 126 apartment units and 98.5 ksf of shopping center on a site that is currently vacant, located at 2660 Petaluma Hill Road. The approved project would connect to the adjacent Kawana Springs Apartment Homes project. Based on application of standard ITE rates, the project would be expected to generate 4,403 daily trips, with 138 trips during the a.m. peak hour and 430 trips during the p.m. peak hour.

Green Trove Wellness Cultivation and Manufacturing is a pending 24,000 square foot cannabis cultivation and manufacturing facility that would be located at 368 Yolanda Avenue. It was determined that cannabis cultivation is most closely aligned with what would be considered a light industrial use so standard rates for "General Light Industrial" (Land Use #110) were applied to the project. Based on these standard rates, the project would be anticipated to generate 119 daily trips on average, with 17 trips during the morning peak period and 15 trips during the evening peak period.

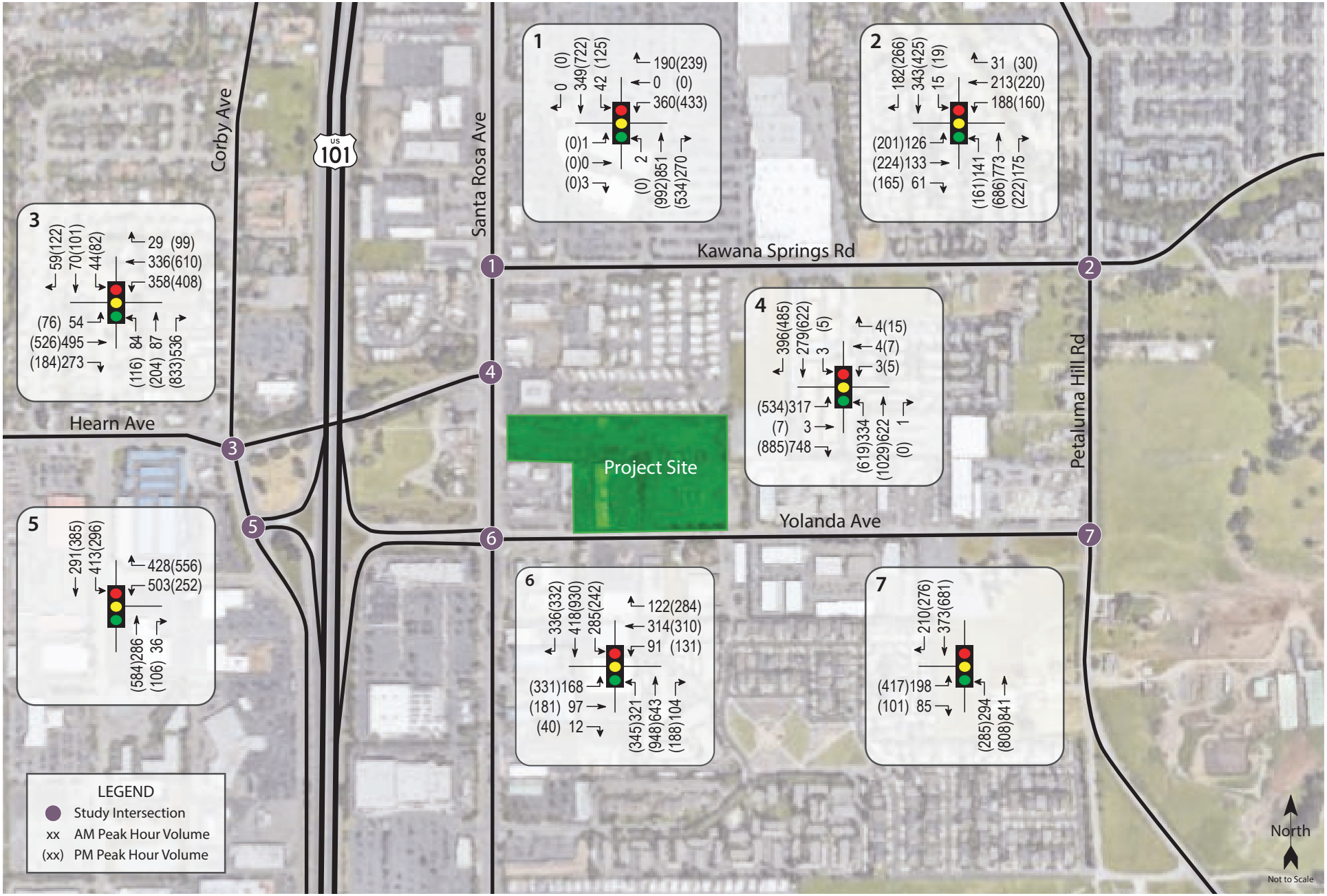
Upon adding trips from the approved and pending projects to existing volumes, the study intersections are expected to continue operating at acceptable service levels, except Yolanda Avenue/Petaluma Hill Road, which would deteriorate to unacceptable LOS E operation during the p.m. peak period. These results are summarized in Table 5, and Baseline volumes are shown in Figure 3.

Table 5 – Baseline Peak Hour Intersection Levels of Service

Study Intersection	AM Peak		PM Peak	
	Delay	LOS	Delay	LOS
1. Kawana Springs Rd/Santa Rosa Ave	21.8	C	17.3	B
2. Kawana Springs Rd/Petaluma Hill Rd	24.4	C	25.8	C
3. Hearn Ave/Corby Ave	35.3	D	49.0	D
4. Hearn Ave/Santa Rosa Ave	19.8	B	35.3	D
5. US 101S Ramps/Corby Ave	16.0	B	18.3	B
6. Yolanda Ave-US 101N Ramps/Santa Rosa Ave	32.9	C	37.3	D
7. Yolanda Ave/Petaluma Hill Rd	16.8	B	**77.6**	**E**
with SB Right-Turn Pocket and Overlap Phase	12.9	B	39.2	D

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; **Bold** text = deficient operation; shaded cells reflect operation with improvements

The intersection of Yolanda Avenue/Petaluma Hill Road would operate acceptably at LOS D with the addition of a southbound right-turn pocket and overlap phase. Construction of the southbound right-turn pocket at the Petaluma Hill Road/Yolanda Avenue intersection is included in plans for the future Farmers Lane Extension project.



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Traffic Impact Study for the Yolanda Mixed-Use Project

Figure 3- Baseline Traffic Volumes

Future Conditions

Segment volumes for the horizon year of 2040 were obtained from the Sonoma County Transportation Authority's (SCTA) 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 turn movement data, existing link volumes, and future link volumes to project likely turning future movement volumes at intersections.

The following roadway improvements are included in the long-range future modeling conducted for buildout conditions both with and without the project:

Farmers Lane Extension – The intersection of Yolanda Avenue/Petaluma Hill Road is the southern terminus for the Farmers Lane extension. As planned, Farmers Lane would be the east leg of the intersection. At full buildout, the four-legged intersection would have left-turn lanes, two through lanes and right-turn lanes in the north-south directions and in the east-west directions, left-turn lanes, through and through/right-turn lanes with bike lanes on all approaches.

Yolanda Avenue Widening – Yolanda Avenue would be widened as a supplement to the Farmers Lane Extension to include two travel lanes in the eastbound direction, a center two-way left-turn lane, and one westbound lane together with six-foot wide bicycle lanes and sidewalks between Santa Rosa Avenue and Petaluma Hill Road.

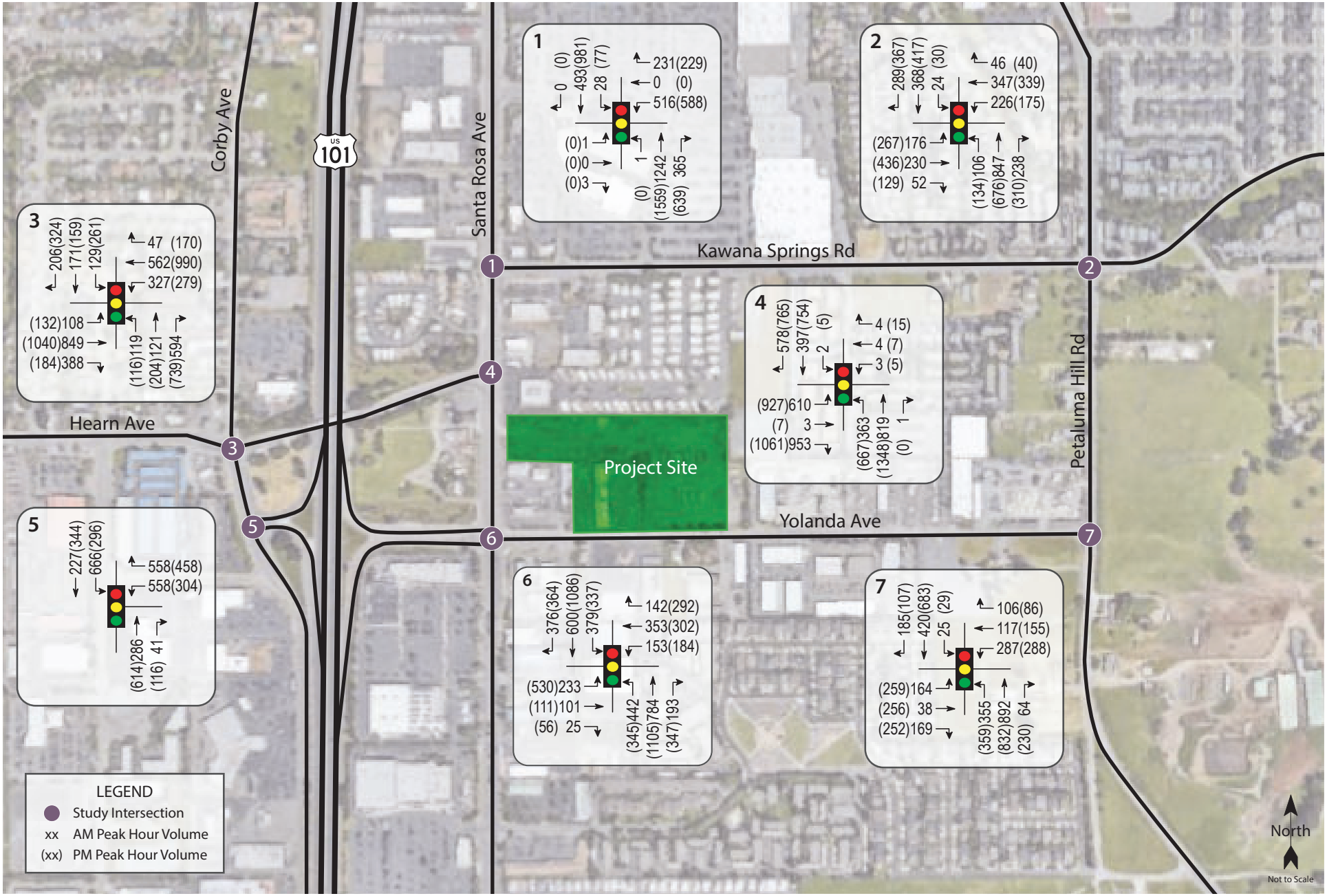
Hearn Avenue Interchange Reconstruction – The Caltrans Project Approval and Environmental Document (PA&ED) to replace and widen the Hearn Avenue overcrossing at US 101, along with associated intersection and ramp improvements, has been completed and the project is in the 95 percent design phase. Ultimately, the new overpass is anticipated to include four vehicle travel lanes plus turn pockets, bicycle lanes, sidewalks, and signal upgrades. As part of the project, the US 101 South off-ramp at Corby Avenue would be widened to include an additional right-turn lane.

Under the anticipated Future volumes, and with the addition of improvements described above, the study intersections are expected to operate acceptably at LOS D or better during both peak hours. Future volumes are shown in Figure 4 and operating conditions are summarized in Table 6.

Table 6 – Future Peak Hour Intersection Levels of Service

Study Intersection	AM Peak		PM Peak	
	Delay	LOS	Delay	LOS
1. Kawana Springs Rd/Santa Rosa Ave	18.6	B	20.3	C
2. Kawana Springs Rd/Petaluma Hill Rd	28.5	C	30.0	C
3. Hearn Ave/Corby Ave	50.2	D	48.0	D
4. Hearn Ave/Santa Rosa Ave	26.5	C	34.4	C
5. US 101S Ramps/Corby Ave	19.0	B	14.5	B
6. Yolanda Ave-US 101N Ramps/Santa Rosa Ave	43.4	D	41.5	D
7. Yolanda Ave-Farmers Ln/Petaluma Hill Rd	28.4	C	34.2	C

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service



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Traffic Impact Study for the Yolanda Mixed-Use Project

Figure 4- Future Traffic Volumes

Project Description

The proposed project includes the development of 252 apartments and a 3,867 square-foot In-N-Out Burger fast food restaurant on a site that is currently under limited use for storage. The two land uses would have separate access, with two driveways on Yolanda Avenue proposed for the residential development and two driveways, including one on Yolanda Avenue and one on Santa Rosa Avenue, for the In-N-Out Burger. The proposed project site plan is shown in Figure 5.

Site Surveys

In-N-Out Burger has a higher demand compared with other fast food restaurants with drive-through service. This non-standard demand means that standard trip generation rates, parking demand rates and methodologies to determine drive-through lane queuing behavior may not accurately depict the expected demand for an In-N-Out Burger location. Thus, sites in Santa Clara County and surrounding areas were surveyed to establish an appropriate demand for this study. Results from these surveys were used to derive expected trip generation rates, parking generation and drive-through lane queue storage requirements. Each survey included documentation of trip generation, parking occupancy and drive-through lane queue. Sizes of each survey site were approximated by aerial photography. Each survey site was chosen based on similar characteristics to the proposed project site (such as proximity to major roadways, building size, well defined parking limits, etc.). Building sizes for each surveyed site were provided by City of Mountain View and City of Union City staff. Summaries of the site surveys are provided in Appendix D.

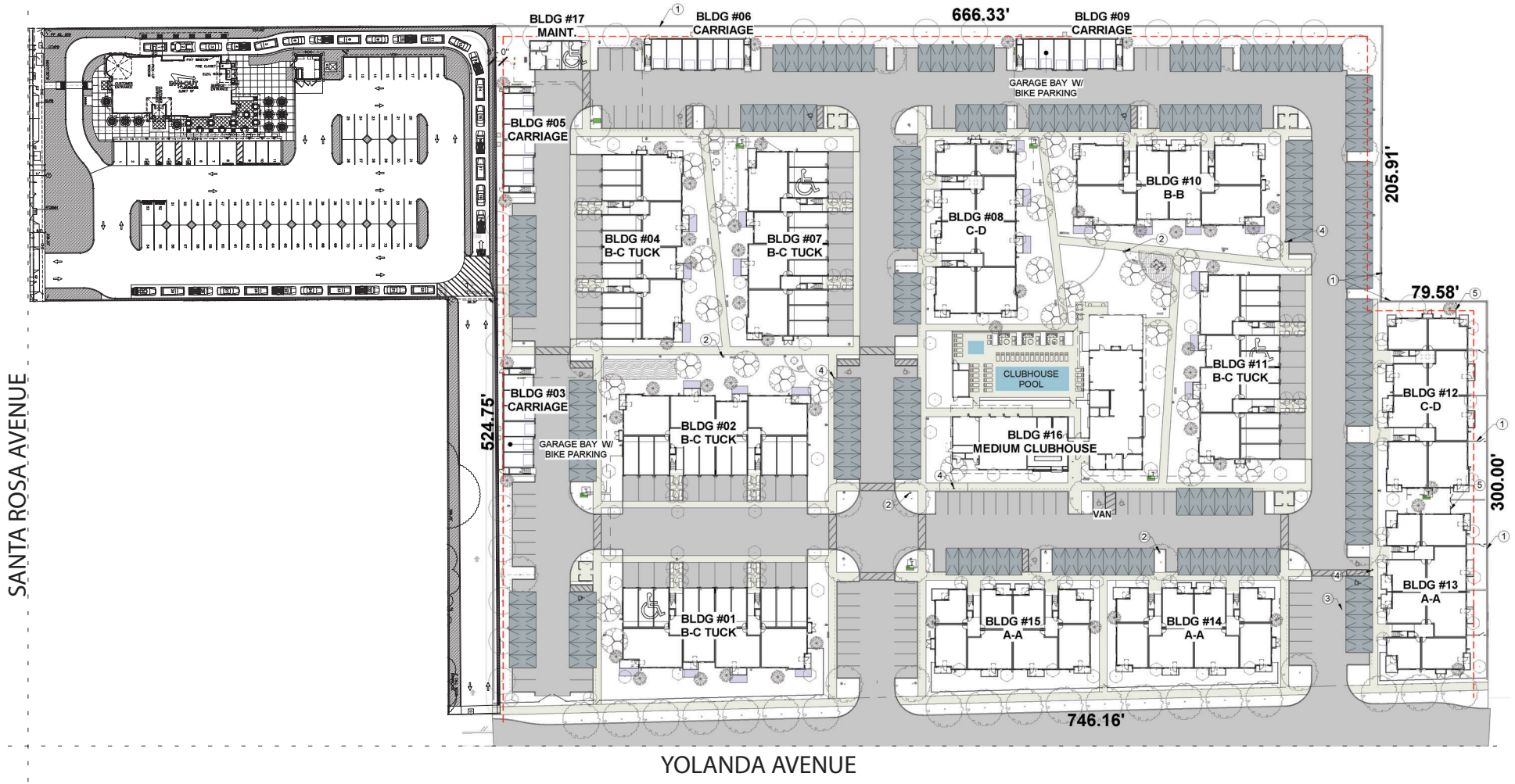
These surveys were conducted on Thursday September 14, 2017 and Saturday, September 16, 2017 at the following In-N-Out Burger locations with the size of each location shown:

1. Mountain View – 1159 N. Rengstorff Avenue (3,100 square feet)
2. Mountain View – 53 El Camino Real (2,972 square feet)
3. Union City – 32060 Union Landing Boulevard (3,160 square feet)

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*, 10th Edition, 2017 for the housing component. The rates for mid-rise multi-family housing (Land Use #221) were applied to the residential units.

In-N-Out Burger has an unusually high popularity and using standard rates for "Fast-Food Restaurant with Drive-Through Window" (ITE LU #934) may not accurately predict the potential project trips. To identify appropriate trip generation rates, survey data for nine In-N-Out Burger locations was reviewed. The average observed daily trip rate at the surveyed locations is greater than the rate published by ITE for LU #934. Similarly, the observed p.m. peak hour trip rate is greater than the rates for ITE LU #934. Since the observed rates are higher, and more conservative than those published in the ITE *Trip Generation Manual*, these were used to calculate the expected trip potential for the project. Since the proposed business hours do not encompass the a.m. peak hour, only the weekday p.m. peak hour trips were estimated using site-specific rates, while the Fast Food with Drive-through (Land Use #934) morning peak hour rates were applied to the proposed In-N-Out Burger restaurant. It is noted that the restaurant does not operate during the morning peak hour, so application of the standard rates yields a conservative analysis reflecting activity at a restaurant that, unlike the proposed restaurant, is open in the morning.



sro476.ai 11/18

Traffic Impact Study for the Yolanda Mixed-Use Project

Figure 5- Site Plan

Pass-by Trips

A portion of the traffic associated with the fast food use would be drawn from existing traffic on nearby streets. These vehicle trips are not considered "new," but are instead comprised of drivers who are already driving on the adjacent street and choose to make an interim stop. These trips are referred to as "pass-by." The percentage of these pass-by trips was based on information provided in the *Trip Generation Handbook*, 3rd Edition, Institute of Transportation Engineers, 2014. Information on pass-by as a function of daily trips is not provided in the ITE reference; however, pass-by rates of 49 and 50 percent are documented for the a.m. and p.m. peak periods respectively. It was conservatively assumed that half the published rate, or 25 percent of trips would be pass-by trips, since In-N-Out Burger is more likely a "destination" type restaurant than other fast food establishments.

Total Project Trip Generation

Based on application of these assumptions, the proposed project is expected to generate an average of 4,383 trips per day, including 248 a.m. peak hour trips and 335 trips during the p.m. peak hour. After deductions are made to reflect pass-by traffic at the restaurant, the project is expected to generate 3,630 net new trips daily, with 209 occurring during the a.m. peak hour and 279 during the p.m. peak hour. It is again noted that In-N-Out Burger is closed during the morning peak hour, so the actual trip generation associated with the project would likely be less than half of what was used for analysis purposes. These results are summarized in Table 7. Additionally, the trip generation results associated with application of standards rates are provided for reference.

Table 7 – Trip Generation Summary

Land Use	Units	Daily		AM Peak Hour				PM Peak Hour			
		Rate	Trips	Rate	Trips	In	Out	Rate	Trips	In	Out
Fast-Food Restaurant	3.9 ksf			40.19	157	80	77				
In-N-Out Site Specific	3.9 ksf	772.37	3,012					57.32	224	116	108
Pass-by		*-25%*	*-753*	*-25%*	*-39*	*-20*	*-19*	*-25%*	*-56*	*-29*	*-27*
Multi-family Housing	252 du	5.44	1,371	0.36	91	24	67	0.44	111	68	43
Total Trips at Driveways			4,383		248	104	144		335	184	151
Total			**3,630**		**209**	**84**	**125**		**279**	**155**	**124**
For Reference Purposes Only (No Trip Credits Applied)											
Fast-Food Restaurant	*3.9 ksf*	*470.95*	*1,837*					*32.67*	*127*	*66*	*61*

Note: ksf = 1,000 square feet; du = dwelling unit

Trip Distribution

Existing Conditions

The pattern used to allocate new project trips to the street network under existing conditions was determined based on familiarity with the surrounding area. The distribution assumptions are shown in Table 8.

Table 8 – Near-term Trip Distribution Assumptions	
Route	**Percent**
From/to south via US 101 at Hearn Ave/Yolanda Ave	45
From/to north via US 101 at Hearn Ave/Yolanda Ave	30
From/to north via Santa Rosa Ave	15
From/to north via Petaluma Hill Rd	5
From/to south via Petaluma Hill Rd	5
TOTAL	**100**

Future Conditions

Planned improvements such as the Farmers Lane Extension were taken into consideration to determine the distribution of new project trips to the street network under future conditions. The distribution assumptions for evaluating future conditions are shown in Table 9.

Table 9 – Future Trip Distribution Assumptions	
Route	**Percent**
From/to south via US 101 at Hearn Ave/Yolanda Ave	40
From/to north via US 101 at Hearn Ave/Yolanda Ave	30
From/to north via Santa Rosa Ave	10
From/to east via Farmers Ln Extension	15
From/to south via Petaluma Hill Rd	5
TOTAL	**100**

Vehicle Miles Traveled

While the City has not yet adopted a policy regarding vehicle miles traveled (VMT), the project's contribution was estimated for informational purposes only. Vehicle miles traveled associated with the project were calculated by multiplying the estimated number of trips and the average trip distance for the Traffic Analysis Zone (TAZ) in which the project is located. Using the daily trips generated for 252 dwelling units (du) as determined above using the standard trip generation rate, and an average distance of 4.53 miles traveled per daily trip in the project's location as available from the Sonoma County Transportation Authority (SCTA) 2010 *Comprehensive Transportation Plan* (CTP), the estimated VMT for the residential component of the project is 6,210 vehicle miles traveled. The VMT for the In-N-Out Burger was estimated using the daily staffing levels and average home to work trip distance. Daily employees, rather than total daily trips, are considered when estimating VMT for retail because they would make up most new trips. Small retail tends to have a negligible effect on VMT at a regional level because retail trips would typically be re-routed from other retail destinations. The proposed In-N-Out Burger would be expected to generate a VMT of 703 miles. Together the two components have an estimated VMT of 6,913. These results are shown in Table 10.

Table 10 – VMT Summary			
Land Use	**Daily Trips/Employees**	**Average Trip Length**	**Calculated Daily VMT**
Multi-family Housing	1,371 Trips	9.76 mi	6,210
In-N-Out Burger	36 Employees	9.76 mi	703
Total			**6,913**

As stated in the Proposed CEQA Guidelines Section 15064.3, Subdivision (b)(1), projects including residential, retail, and office space, as well as projects that are a mix of these uses, that are located within half-a-mile of an existing major transit stop or an existing stop along a high-quality transit corridor will have a less-than-significant impact on VMT.

Finding – The calculated total daily VMT for the project is 6,913 miles and the project is located directly adjacent to Santa Rosa Avenue, a high-quality transit corridor. The project is therefore presumed to have a less-than-significant impact on vehicle miles traveled.

Intersection Operation

Existing plus Project Conditions

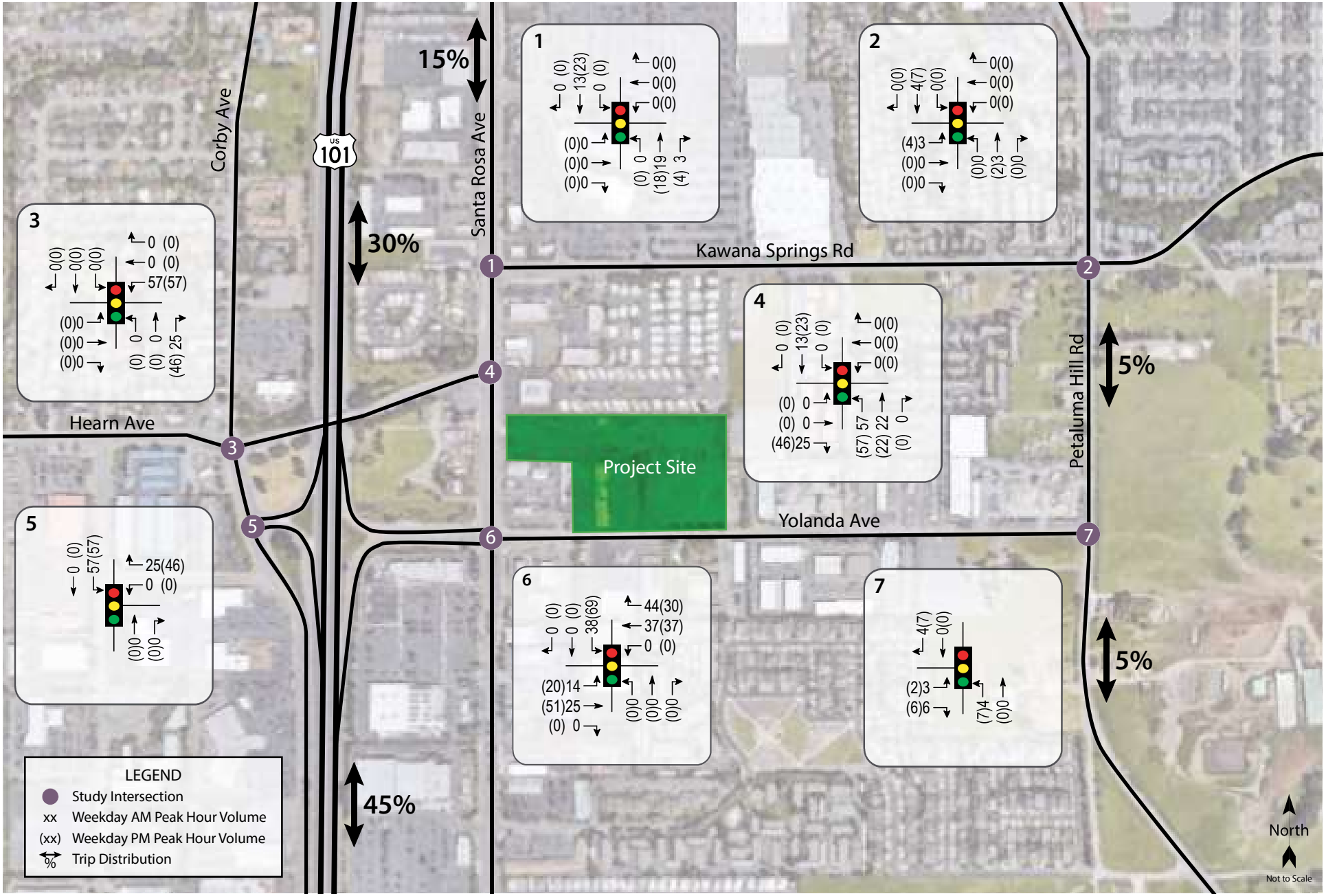
Upon the addition of project-related traffic to Existing volumes, the study intersections are expected to continue operating acceptably at LOS D or better. These results are summarized in Table 11. Project traffic volumes routed under the near-term trip distribution assumptions are shown in Figure 6.

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

Study Intersection	**Existing Conditions**				**Existing plus Project**			
	AM Peak		**PM Peak**		**AM Peak**		**PM Peak**	
	Delay	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
1. Kawana Springs Rd/Santa Rosa Ave	17.0	B	15.1	B	16.8	B	14.9	B
2. Kawana Springs Rd/Petaluma Hill Rd	23.6	C	24.7	C	23.7	C	24.9	C
3. Hearn Ave/Corby Ave	32.4	C	38.1	D	37.0	D	42.0	D
4. Hearn Ave/Santa Rosa Ave	19.3	B	33.2	C	19.7	B	35.4	D
5. 101S Ramps/Corby Ave	15.4	B	16.8	B	15.6	B	17.4	B
6. Yolanda Ave-101N/Santa Rosa Ave	25.7	C	30.6	C	31.7	C	33.6	C
7. Yolanda Ave/Petaluma Hill Rd	13.4	B	36.0	D	13.8	B	41.0	D

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service

It should be noted that with the addition of project-related traffic volumes, average delay at the intersection of Kawana Springs Road/Santa Rosa Avenue was calculated to slightly decrease during both peak hours. While this is counter-intuitive, this condition occurs when a project adds trips to movements that are currently underutilized or have delays that are below the intersection average, resulting in a better balance between approaches and lower overall average delay. The project adds traffic predominantly to the northbound and southbound through movements, which have average delays lower than the average for the intersection as a whole, resulting in a slight reduction in the overall average delay. The conclusion could incorrectly be drawn that the project improves



sro476.ai 10/18

Traffic Impact Study for the Yolanda Mixed-Use Project

Figure 6- Project Traffic Volumes with Near-Term Trip Distribution Assumptions

operation based on this data alone; however, it is more appropriate to conclude that the project trips are expected to make use of excess capacity, so drivers will experience little, if any, change in conditions because of the project.

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

Baseline plus Project Conditions

With project-related traffic added to Baseline volumes, the study intersections are expected to operate acceptably at LOS D or better, except for the intersection of Yolanda Avenue/Petaluma Hill Road, which would operate at unacceptable Level of Service F during the evening peak period. These results are summarized in Table 12.

Table 12 – Baseline and Baseline plus Project Peak Hour Intersection Levels of Service

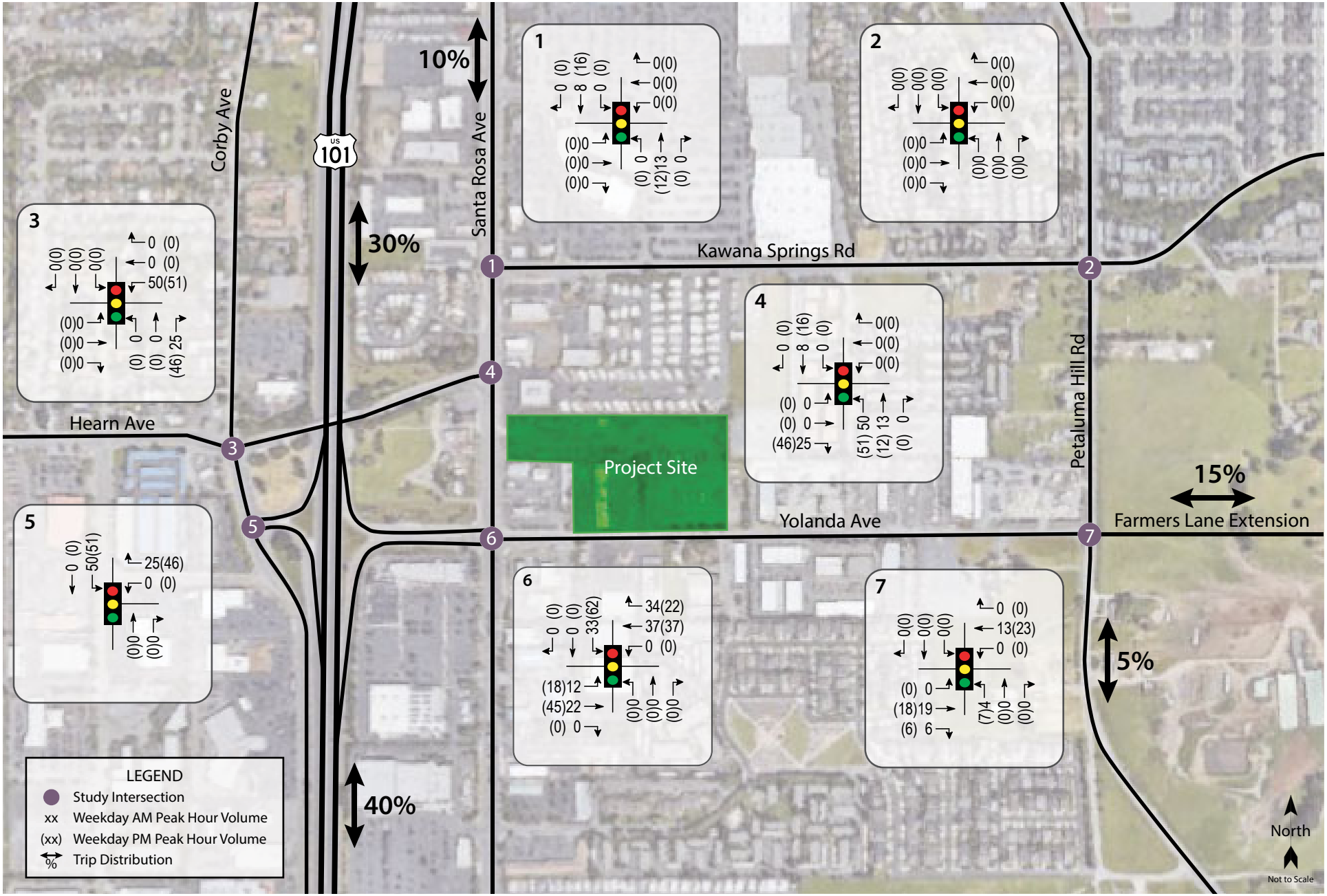
Study Intersection		Baseline Conditions				Baseline plus Project			
		AM Peak		PM Peak		AM Peak		PM Peak	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1.	Kawana Springs Rd/Santa Rosa Ave	21.8	C	17.3	B	21.7	C	17.1	B
2.	Kawana Springs Rd/Petaluma Hill Rd	24.4	C	25.8	C	24.5	C	26.0	C
3.	Hearn Ave/Corby Ave	35.3	D	49.0	D	42.0	D	52.4	D
4.	Hearn Ave/Santa Rosa Ave	19.8	B	35.3	D	20.3	C	33.8	C
5.	101S Ramps/Corby Ave	16.0	B	18.3	B	16.1	B	19.4	B
6.	Yolanda Ave-101N/Santa Rosa Ave	32.9	C	37.3	D	39.1	D	45.4	D
7.	Yolanda Ave/Petaluma Hill Rd	16.8	B	**77.6**	**E**	17.3	B	**81.2**	**F**
	with SB RT lane and overlap phase	12.9	B	39.2	D	13.3	B	41.0	D

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; **Bold** text = deficient operation; shaded cells reflect operation with improvements

Finding – Upon the addition of project-generated traffic, the study intersection of Yolanda Avenue/Petaluma Hill Road is expected to operate unacceptably at LOS F. The City does not have a criterion for the increase in delay that is allowed at an intersection already operating unacceptably, so the County of Sonoma's criteria, which states that the project's impact would be considered significant and cumulatively considerable if it causes the average delay to increase by five seconds or more, was applied. The project would increase the delay at the intersection by 4.1 seconds; therefore, the project would be considered to have a less-than-significant impact if this standard were used. The intersection would be expected to operate at an acceptable LOS D with the addition of improvements that include a southbound right-turn lane and right-turn overlap phase, as included in the City's plans for the Farmers Lane extension project. It is assumed that funding for this project is included in the City's facilities fees, to which the developer would be contributing, thereby paying their proportional share of the cost of these improvements.

Future plus Project Conditions

Upon the addition of project-generated traffic to the anticipated Future volumes, and with the planned improvements, the study intersections are expected to continue operating acceptably at LOS D or better. Project traffic volumes routed under the future trip distribution assumptions are shown in Figure 7. The Future plus Project operating conditions are summarized in Table 13.



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Traffic Impact Study for the Yolanda Mixed-Use Project

Figure 7- Project Traffic Volumes with Future Trip Distribution Assumptions

Table 13 – Future and Future plus Project Peak Hour Intersection Levels of Service								
Study Intersection	**Future Conditions**				**Future plus Project**			
	AM Peak		**PM Peak**		**AM Peak**		**PM Peak**	
	Delay	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
1. Kawana Springs Rd/Santa Rosa Ave	18.6	B	20.3	C	18.6	B	20.3	C
2. Kawana Springs Rd/Petaluma Hill Rd	28.5	C	30.0	C	28.5	C	30.0	C
3. Hearn Ave/Corby Ave	50.2	D	48.0	D	54.6	D	52.9	D
4. Hearn Ave/Santa Rosa Ave	26.5	C	34.4	C	29.0	C	37.8	C
5. 101S Ramps/Corby Ave	19.0	B	14.5	B	19.9	B	14.5	B
6. Yolanda Ave-101N/Santa Rosa Ave	43.4	D	41.5	D	44.5	B	46.3	D
7. Yolanda Ave-Farmers Ln/Petaluma Hill Rd	28.4	C	34.2	C	28.9	C	35.1	C

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service

Finding – The study intersections are expected to operate acceptably at LOS D or better upon the addition of project-generated traffic to anticipated future volumes.

Queuing

Signalized Intersection

Under each scenario, the projected 95th percentile queues for the westbound approach to Santa Rosa Avenue/ Yolanda Avenue were determined to identify any impacts on the proposed In-N-Out driveway on Yolanda Avenue associated with queuing. Projected 95th percentile queues were also determined for the US 101 off-ramps at Santa Rosa Avenue/Yolanda Avenue and at Corby Avenue/Hearn Avenue. The 95th percentile queue is the projected length that the queue will be at or less than 95 percent of the time. Summarized in Table 14 are the predicted queue lengths for movements on the westbound approach that have queues exceeding the available storage space or that would extend beyond the project driveway. Copies of the SIMTRAFFIC queuing projections are contained in Appendix E.

It is noted that for all conditions, queue lengths are projected to decrease in several lanes upon adding project-generated traffic. This can be attributed to the stochastic nature of SIMTRAFFIC. Because the queuing analysis is based on numerous runs with varying traffic patterns and random seeding of vehicle arrivals, reduced queues are occasionally projected despite increased volumes.

Table 14 – 95th Percentile Queues Exceeding Available Storage

Study Intersection Approach	Available Storage	Maximum Queues											
		AM Peak Hour						PM Peak Hour					
		E	E+P	B	B+P	F	F+P	E	E+P	B	B+P	F	F+P
Corby Avenue/US 101S Ramps													
WB Left-turn lane	600†	238	245	242	232	237	249	191	223	241	257	175	181
WB Right-turn lane	600†	258	262	295	239	260	309	205	285	310	319	145	121
Santa Rosa Ave/Yolanda Ave													
WB Left-turn lane	140	**167**	**163**	**162**	**172**	**161**	**169**	**161**	**165**	**173**	**166**	**173**	**169**
WB Thru lane	280*	**351**	**323**	**413**	**330**	**343**	**334**	**404**	**336**	**415**	**332**	**331**	**341**
WB Right-turn lane	230	192	193	192	197	80	122	188	189	183	176	159	217
EB Left-turn lane	1,200†	141	154	138	133	177	197	294	310	382	436	321	329
EB Thru lane	1,200†	64	82	111	114	100	74	77	168	265	393	133	170
EB Right-turn lane	1,200†	18	26	22	20	39	17	43	78	108	134	72	102

Notes: All distances are measured in feet; E = existing conditions; E+P = existing plus project conditions; F = future conditions; F+P = future plus project conditions; **Bold** text = queue length exceeds available storage; * Distance to the proposed In-N-Out Burger driveway from the intersection; † Distance to freeway mainline from the intersection

At the intersections of Corby Avenue/US 101S Ramps and Santa Rosa Avenue/Yolanda Avenue-US 101N Ramps vehicle queues are anticipated to stack up within the hook ramp storage space without spilling back onto the freeway mainline.

The proposed project driveway on Yolanda Avenue is about 280 feet east of the intersection with Santa Rosa Avenue. Under all conditions, without and with the proposed project, the queued vehicles in the westbound through lane would extend past the proposed driveway. Based on observations of the existing conditions, the signal operation provides sufficient time to clear out the westbound vehicles on Yolanda Avenue during each cycle. Though the westbound queue is expected to extend past the project driveway at times, the signal provides gaps in traffic and an opportunity for drivers to turn left out of the site. Vehicles turning left into the site from the eastbound Yolanda Avenue travel lane would need to wait for a gap in traffic in the westbound travel lane. The eastbound lane and roadway shoulder combined are approximately 20 feet wide at this location, so following vehicles could pass on the right, therefore not needing to wait until the turning vehicle can make the maneuver. It is noted that patrons of the proposed In-N-Out Burger would also have the option of exiting and entering via driveways on Santa Rosa Avenue.

Further, there are plans to widen Yolanda Avenue between Santa Rosa Avenue and Petaluma Hill Road. The plans include the addition of a two-way left-turn lane, which would better facilitate the exiting left-turn maneuver from the proposed driveway by allowing exiting vehicles to enter the two-way left-turn lane before merging into the eastbound travel lane. The two-way left-turn lane would also provide storage space for entering left-turning vehicles, removing them from the eastbound Yolanda Avenue travel lane. Based on the above, even though the westbound queues from the nearby intersection would extend past the proposed driveway on Yolanda Avenue, drivers would be expected to experience limited delays or have path options to avoid the queued traffic.

Finding – Projected 95th percentile queues are not expected to spill onto the US 101N or US 101S mainlines.

Finding – The westbound queues for the intersection of Yolanda Avenue/Santa Rosa Avenue intersection extend past the proposed In-N-Out driveway under all scenarios, with and without the project. However, this situation is common and not expected to result in any significant operational impacts.

Alternative Modes

Pedestrian Facilities

Given that the site is surrounded by primarily commercial land uses, with some residential land uses to the north of the site, it is reasonable to assume that some project residents will want to walk, bicycle, and/or use transit to reach their destinations. The proposed sidewalk that would be constructed on Yolanda Avenue along the project frontage as part of the project would effectively connect the site to the surrounding pedestrian network on Santa Rosa Avenue. In general, the pedestrian network surrounding the project site is well-connected and provides adequate access for pedestrians.

Finding – Upon completion of the sidewalk that is part of the proposed project, pedestrian facilities serving the project site will be adequate and will be tied into the areawide network of facilities.

Bicycle Facilities

Existing bike lanes on Petaluma Hill Road and Santa Rosa Avenue along with planned future bicycle facilities provide adequate access for bicyclists. Residents of the proposed development may wish to bike to the commercial uses along Santa Rosa Avenue or recreationally along Petaluma Hill Road; therefore, the project should be responsible for installing a Class II bike lane along the north side of Yolanda Avenue per the City's *Bicycle and Pedestrian Master Plan*.

Finding – Bicycle facilities serving the project site are adequate.

Recommendation – The applicant should provide a Class II bike lane along the north side of Yolanda Avenue to implement planned facilities for this roadway.

Bicycle Storage

The project site plan indicates that bike parking would be provided and that 69 of the 252 dwelling units would have private garages that could be used for bicycle storage. According to the City of Santa Rosa's Municipal Code, Chapter 20.36.040, multifamily dwellings are required to provide bicycle storage at the rate of one space per four units if the units do not have a private garage or private storage space; therefore, the 183 residential units that would not have garages would require 46 bicycle parking spaces. Per the City's Code, restaurants are required to provide one bicycle space per 4,000 square feet.

Recommendation – The applicant should provide at least 46 bicycle parking spaces for the residential development and at least one bicycle storage space for the proposed In-N-Out Burger.

Transit

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

Finding – Transit facilities serving the project site are adequate.

Access and Circulation

Site Access

The proposed residential development would be accessed via two new driveways on Yolanda Avenue. The proposed In-N-Out Burger would be accessed via one exclusive right-in/right-out driveway on Santa Rosa Avenue, at the location of the existing curb cut, and a new full access driveway on Yolanda Avenue, just east of the McDonald's driveway.

Sight Distance

At driveways a substantially clear line of sight should be maintained between the driver of a vehicle waiting on the driveway and the driver of an approaching vehicle. Adequate time should be provided for the waiting vehicle to either cross, turn left, or turn right, without requiring the through traffic to radically alter their speed. Sight distances along Santa Rosa Avenue and Yolanda Avenue were evaluated based on sight distance criteria contained in the *Highway Design Manual* published by Caltrans. The recommended sight distance for driveway approaches is based on stopping sight distance for the approach travel speeds. Additionally, the sight distance needed for a following driver to stop if there is a vehicle waiting to turn into a side street or driveway is evaluated based on the stopping sight distance criterion and the approach speed on the major street.

At the four project driveways (two each for the residential and restaurant components), the roadways are flat and straight in both directions. Based on design speeds of 35 mph along Santa Rosa and Yolanda Avenue, the minimum stopping sight distance needed is 250 feet for each driveway.

Sight distance along Yolanda Avenue at the location of the proposed easternmost project driveway would be obstructed by the low-hanging branches of the nearby trees. To achieve adequate sight lines, the trees on either side of the driveway should be trimmed to at least seven feet above the roadway. Sight lines at the location of the western driveway of the proposed residential development extend for more than 400 feet in both directions, which is adequate for speeds more than 45 mph.

Sight lines along Yolanda Avenue from the proposed In-N-Out driveway extend approximately 350 feet west towards the intersection with Santa Rosa Avenue and more than 400 feet east, which is sufficient to accommodate vehicle speeds greater than 40 mph. Drivers exiting the proposed In-N-Out driveway on Santa Rosa Avenue have clear sight lines that extend approximately 350 feet south to the intersection with Yolanda Avenue which exceeds the required stopping sight distance for the 35-mph speed limit.

Since both Santa Rosa Avenue and Yolanda Avenue are flat and straight, drivers following a vehicle that slows to turn into a driveway would have more than adequate sight distance to observe and react to such maneuvers.

Finding – Stopping sight distances at and approaching the project driveways are adequate to meet the applied criteria for both entering and exiting movements, except that stopping sight distance at the easternmost project driveway is obscured by low-hanging branches on nearby trees.

Recommendation – To provide adequate sight distance from the proposed easternmost project driveway, the applicant should ensure nearby trees are trimmed so nothing hangs below a height of seven feet. Because landscaping and signs can impede clear sight lines, any new plantings or signs should be designed to ensure that adequate sight lines will be maintained.

Access Analysis

Left-Turn Lane Warrants

The widening of Yolanda Avenue, which includes the addition of a two-way left-turn lane, is a planned future improvement. The need for a left-turn lane on Yolanda Avenue at the In-N-Out Burger and residential development driveways were evaluated based on criteria contained in the *Intersection Channelization Design Guide*, National Cooperative Highway Research Program (NCHRP) Report No. 279, Transportation Research Board, 1985, as well as an update of the methodology developed by the Washington State Department of Transportation and published in the *Method For Prioritizing Intersection Improvements*, January 1997. The NCHRP report references a methodology developed by M. D. Harmelink that includes equations that can be applied to expected or actual traffic volumes to determine the need for a left-turn pocket based on safety issues.

The need for left-turn channelization in the form of a left-turn pocket on Yolanda Avenue was evaluated based on Baseline plus Project p.m. peak hour volumes. Under Baseline plus Project conditions, a left-turn lane is warranted on Yolanda Avenue at the In-N-Out Burger driveway and at the western residential development driveway. It is noted that the need for a left-turn lane was not evaluated under Future plus Project conditions because a two-way left-turn lane is already planned on Yolanda Avenue to accommodate future increases in volumes. A copy of the warrant analysis is provided in Appendix F.

Recommendation – The applicant should construct a two-way left-turn lane on Yolanda Avenue along the project frontage consistent with the ultimate planned cross-section along the frontage.

Site Circulation

The AutoTURN application of AutoCAD was used to evaluate the adequacy of access for emergency vehicles for both the restaurant and residential development sites. As designed, there would be no anticipated issues with fire truck access. Exhibits showing the expected travel paths are provided in Appendix F.

Finding – On-site circulation for both the restaurant and the residential development is expected to operate acceptably.

Drive-Through Operation

Based on the proposed site plan, the drive-through would have capacity for 19 vehicles to queue in the main drive-through aisle with an additional 11 queuing spaces alongside the drive aisle to and from Santa Rosa Avenue. In total, the drive-through would have capacity for 30 vehicles to queue without stacking into the drive aisles and restricting circulation within the project site. As shown in the site plan, the project proposes "Keep Clear" markings between the end of the main drive-through aisle and the beginning of the supplementary queuing lane to allow adequate vehicular circulation to and from Yolanda Avenue.

Of the projected 87 inbound trips during the p.m. peak hour, it was conservatively assumed that an average of two-thirds of In-N-Out customers would use the drive-through as opposed to entering the facility. It is understood that In-N-Out's service rate goal, the amount of time it takes to serve each customer, is 30 to 40 seconds, though, for the purposes of the analysis, it was conservatively assumed to match the typical fast food service rate of one minute per customer.

Using standard queuing theory together with a peak arrival rate of 58 vehicles per hour (two-thirds of inbound trips) and a conservative service rate of one minute, there is a 93 percent probability that a customer will have to wait eight to nine minutes. The 95th percentile queue is generally applied as the acceptable limit for on-site circulation impact assessment and was determined to be 21 vehicles for the proposed drive-through, which exceeds the drive-through aisle stacking capacity of 19 vehicles. However, the anticipated peak stacking can be accommodated with the

additional drive-through stacking space for 11 vehicles that would be provided parallel to the driveway aisle off Santa Rosa Avenue. Therefore, the total queuing capacity for 30 vehicles is adequate to serve the projected traffic. The queuing analysis calculations are included in Appendix G.

In addition to the above queuing analysis, it is noted that surveys were conducted at three In-N-Out Burger locations in Northern California. According to the surveys, the maximum number of vehicles in the drive-through lane was 17 during the p.m. peak hour and 31 during the weekend peak hour. Averaging the maximum number of queued vehicles at the three surveyed locations shows that approximately 16 and 25 vehicles are expected to queue during the p.m. peak hour on a weekday and weekend day, respectively. Each of the locations surveyed use a single lane drive-through with a single service point for taking orders, a single point for accepting payment and a single point for the delivery of food to each vehicle. A summary of findings is provided in Table 15.

Table 15 – In-N-Out Burger Maximum Length of Drive-Through

Time Period	Maximum Number of Cars Observed in Drive-Through Lane			
	1159 Rengstorff Ave	53 El Camino Real	32060 Union Landing Blvd	Average
Weekday 4:00 - 4:15 p.m.	7	6	17	10.0
Weekday 4:15 - 4:30 p.m.	4	3	17	8.0
Weekday 4:30 - 4:45 p.m.	8	9	13	10.0
Weekday 4:45 - 5:00 p.m.	9	11	2	7.3
Weekday 5:00 - 5:15 p.m.	7	7	14	9.3
Weekday 5:15 - 5:30 p.m.	10	11	12	11.0
Weekday 5:30 - 5:45 p.m.	13	17	12	14.0
Weekday 5:45 - 6:00 p.m.	12	16	12	13.3
Weekday Maximum	**13**	**17**	**17**	**15.7**
Weekend 12:00 - 12:15 p.m.	25	17	13	18.3
Weekend 12:15 - 12:30 p.m.	22	15	14	17.0
Weekend 12:30 - 12:45 p.m.	28	17	17	20.7
Weekend 12:45 - 1:00 p.m.	31	18	12	20.3
Weekend 1:00 - 1:15 p.m.	30	19	11	20.0
Weekend 1:15 - 1:30 p.m.	23	15	14	17.3
Weekend 1:30 - 1:45 p.m.	28	13	20	20.3
Weekend 1:45 - 2:00 p.m.	29	15	25	23.0
Weekend Maximum	**31**	**19**	**25**	**25.0**

It is noted that the proposed In-N-Out to be located at 2532 Santa Rosa Avenue is located four miles away from the nearest In-N-Out to the north and four miles from the nearest In-N-Out to the south; therefore, demand is expected to be lower and better regionally distributed for the proposed site than for the three locations studied.

The project applicant provided a drive-through queuing management plan in the project description. The plan states that once the drive-through queue reaches a length of eight autos, an employee would be deployed with a hand-held ordering tablet. The use of these tablets shortens the time required to fill orders and allows for faster food production, shorter wait times, and a faster discharge of the queue. This location would be equipped with

three cooking stations. Two cooking stations would be in operation at all times and the third would be used during periods of high demand. The third station is typically used at existing restaurants in response to high drive-through demand, and usually increases the speed at which drive-through orders are fulfilled. Copies of the In-N-Out Burger project description and drive-through queuing management plan are included in Appendix H.

Finding – The anticipated 95th percentile queue for the drive-through is 21 vehicles. Thus the 30-vehicle capacity drive-through lanes would provide adequate storage to accommodate anticipated demand.

Finding – Review of the drive-through queuing management plan indicated that it is similar to what is used at several other In-N-Out Burger Restaurants. Observations of this plan at other locations suggests that this plan would be adequate to manage the maximum queue lengths.

Parking

The project was analyzed to determine if the proposed off-street parking supply would be sufficient for the anticipated parking demand. The project site as proposed would provide 256 covered and 154 uncovered parking spaces for the residential development for a total of 410 on-site parking spaces, and 75 parking spaces for the In-N-Out.

According to the surveys conducted at three In-N-Out Burger locations in Northern California, the maximum average parking rate for the weekday p.m. peak and weekend peak is 10.97 and 16.80 spaces per thousand square feet of floor area, respectively. Applying the higher average peak rate to determine the peak parking demand for the proposed project would result in an expected peak parking demand of 66 parking spaces. A summary of findings is provided in Table 16.

Table 16 – In-N-Out Burger Parking Occupancy Survey and Rate Calculation

Survey Location	Size (ksf)	No. of Spaces	Weekday			Weekend		
			Rate (Calc'd)	Max. Occupied	%	Rate (Calc'd)	Max. Occupied	%
1. 1159 Rengstorff Ave	3.10	67	9.35	29	43.3%	21.29	66	98.5%
2. 53 El Camino Real	2.97	52	12.79	38	73.1%	15.82	47	90.4%
3. 32060 Union Landing Blvd	3.16	42	10.76	34	81.0%	13.29	42	100.0%
Survey Average	**3.08**	**54**	**10.97**	**33.7**	**65.8%**	**16.80**	**51.7**	**96.3%**
2532 Santa Rosa Ave	3.90	75	16.80	66		16.80	66	

Note: ksf = 1,000 square feet

The City of Santa Rosa parking supply requirements are based on the City's Municipal Code, Chapter 20-36, Parking and Loading Standards. Based on these rates, a total of 497 spaces would be required for the residential use and, for comparison purposes, 52 spaces would be required for the In-N-Out. As proposed, the residential component of the project would experience a shortfall of 87 spaces based on the City rates.

Parking demand for the residential development and In-N-Out were estimated using peak 85th percentile rates published for "Low/Mid-Rise Apartment, Urban" (ITE LU#221) and "Fast-Food Restaurant w/Drive-Through Window" (ITE LU#934) by ITE in *Parking Generation*, 4th Edition, 2010. The expected parking demand for the proposed project is 465 parking spaces, which is satisfied for both the residential and retail components by the proposed on-site parking supply.

The parking analysis is summarized in Table 17.

Table 17 – Parking Analysis			
Land Use	**Units**	**Rate**	**Parking Spaces**
City Required Parking			
Multifamily Dwelling – 1 Bedroom Units	133 du	1.5 space/unit with 1 covered space	199.5
Multifamily Dwelling – 2+ Bedroom Units	119 du	2.5 space/unit with 1 covered space	297.5
Residential Sub-Total			*497*
Restaurant	3.9 ksf	1 space/75 sf	52
City Required Parking Total			*549*
ITE Parking Demand			
Low/Mid-Rise Apartment, Urban	252 du	1.61 space/du	406
Fast Food Restaurant w/ Drive-Through	3.9 ksf	15.13 space/du	59
Total Using ITE Rates			*465*
Proposed Parking Supply			
Residential			410
Restaurant			75

Notes: ksf = 1,000 square feet; sf = square feet; du = dwelling unit

Finding – The proposed parking supply for the project would be sufficient to accommodate the anticipated parking demand based on ITE rates for the proposed land uses and site-specific rates for the In-N-Out Burger restaurant.

Conclusions and Recommendations

Conclusions

- The proposed project is expected to generate an average of 3,630 net new trips per day, including 209 a.m. peak hour trips and 279 trips during the p.m. peak hour.
- Under Existing conditions, the study intersections operate acceptably at LOS D or better during both peak periods and they would be expected to continue operating at these service levels with the addition of project-generated traffic.
- Upon the addition of traffic associated with approved and pending projects in the surrounding vicinity, the study intersections are expected to continue operating acceptably at LOS D or better except for Yolanda Avenue/Petaluma Hill Road, which would operate unacceptably at LOS F during the p.m. peak hour. The intersection of Yolanda Avenue/Petaluma Hill Road would experience the deterioration in service level without or with the project, and the project would be expected to add less than five seconds to the average delay, so this was deemed less than significant.
- Under anticipated future volumes and with planned improvements, the study intersections are expected to continue operating acceptably at LOS D or better overall during both peak hours and upon the addition of project traffic.
- The 95th percentile queues on the US 101 off-ramps at Corby Avenue and Santa Rosa Avenue are projected to fit within the available ramp stacking spaces.
- The westbound queues from Yolanda Avenue/Santa Rosa Avenue are expected to extend past the project driveway on Yolanda Avenue under all scenarios. However, this is not expected to be an impact since there are alternate access points to the site, and circulation options will increase when the Yolanda Avenue widening project is constructed.
- Access for pedestrians and transit riders is generally adequate and would be improved through construction of new sidewalk along the project frontage, as proposed.
- Access for bicyclists is adequate with the provision of bike parking, as proposed.
- Sight distances at the project driveways are adequate.
- A left-turn lane into the project site from Yolanda Avenue is warranted.
- Fire truck access and circulation is expected to operate acceptably for the proposed In-N-Out Burger and residential development layouts.
- As proposed, the In-N-Out Burger site plan has sufficient stacking space for 30 vehicles in the drive-through lanes, which is adequate to accommodate anticipated 95th percentile queues.
- Based on site-specific parking rates for the In-N-Out Burger and ITE's parking demand, the proposed supplies for the restaurant and apartments are expected to be adequate.

Recommendations

- The project should include improvements along the Yolanda Avenue frontage to complete the Class II bike lane.

- Secure parking facilities for at least 46 bicycles should be provided on-site for the residential development and at least one bicycle parking space should be provided for the In-N-Out Burger.

- To maintain sight lines for vehicles leaving the site, it is recommended that landscaping be trimmed such that tree canopies are at least seven feet above the ground. Low-lying vegetation should no greater than three feet in height. Any signs or monuments planned along the project's frontage should not obstruct sight distance at the project driveway.

- The project should install a two-way left-turn lane on Yolanda Avenue along the project frontage connecting to the existing left-turn pocket at Yolanda Avenue/Santa Rosa Avenue.

Study Participants and References

Study Participants

Principal in Charge	Dalene J. Whitlock, PE, PTOE
Assistant Engineer	Kevin Rangel, EIT
Graphics	Katia Wolfe
Editing/Formatting	Katia Wolfe
Report Review	Dalene J. Whitlock, PE, PTOE

References

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Appendix A

Caltrans Letter and Response-to-Comments Letter

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Making Conservation a California Way of Life!

Janury 23, 2019

Ms. Susie Murray
Project Planner
City of Santa Rosa
Planning and Economic Development Department
100 Santa Rosa Avenue, Room 3
Santa Rosa, CA 95404

GTS # 04-SON-2019-00359
GTS ID 13900
SON - 101 – 18.48
PRJ18-086

In-N-Out Burger at 2532 Santa Rosa Avenue – Application

Dear Ms. Murray:

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the above referenced project. In tandem with the Metropolitan Transportation Commission's (MTC) Sustainable Communities Strategy (SCS), Caltrans' mission signals a modernization of our approach to evaluate and mitigate impacts to the State Transportation Network (STN). Caltrans' Strategic Management Plan 2015-2020 aims to reduce Vehicle Miles Traveled (VMT) by tripling bicycle and doubling both pedestrian and transit travel by 2020. Our comments are based on the Application.

Project Understanding

The applicant proposes to construct an In-N-Out Burger drive-thru fast-food restaurant that consists of approximately 3,867-square foot (sf) restaurant with a drive-through window. The project site will not have a delivery dock, or a designated delivery parking bay required on the premises because deliveries would be made by In-N-Out owned and operated vehicles, after the restaurant is closed to the public, between the hours of 2 AM and 9 AM. The project site is located 420 feet from the US 101/Santa Rosa and Yolanda Avenue interchange.

Clarification

Please clarify in graphic and text the project site access and number of parking spaces.

Multimodal Improvements

The Lead Agency should identify project-generated travel demand and estimate the costs of transit and active transportation improvements necessitated by the proposed project; viable funding sources such as development and/or transportation impact fees should also be identified and incorporated in the Conditions of Approval. We encourage a sufficient allocation of fair share contributions toward multimodal and regional transit improvements to fully mitigate cumulative

impacts to regional transportation.

The project should be conditioned to contribute fair share impact fees to the minor interchange improvement project to install Class II bike lanes on the Hearn Avenue Overcrossing, as well construct pedestrian facilities and Class II lanes on Yolanda Avenue. We strongly support measures to increase sustainable mode shares, thereby reducing VMT. Please the link below where the Caltrnas, Distirct 4 Bike Plan can located.

http://www.dot.ca.gov/d4/bikeplan/docs/D4BikePlan_ProjectList.pdf

Operations Analysis

The analysis should identify if adequate storage capacity is available for turning movements at the intersections and on the freeway ramps listed above, and determine whether queues will spill back onto the freeway mainline. Demand volumes should be used for this type of evaluation rather than output volumes or constrained flow volumes. Please provide trip generation, trip distribution, and trip assignment estimates for this project. To avoid traffic conflicts such as inadequate weaving distances and queues spilling back onto the freeway, the project should evaluate the adequacy of freeway segment operations in the project vicinity.

Project-generated trips should be added to existing and future scenario traffic volumes to avoid traffic conflicts due to queue formation for the US 101 intersections and ramps listed below:

- Santa Rosa/Yolanda Avenue on- and off-ramps; and
- Corby Avenue/Hearn Avenue on- and off-ramps.

Vehicle Trip Reduction

In Caltrans' *Smart Mobility 2010: A Call to Action for the New Decade*, this project falls under **Place 1 Urban Centers**, which includes areas with high density, mixed use places with high jobs-housing ratios, well-connected streets network, high levels of transit service and pedestrian supportive environments with major activity centers and full range of horizontally-and-vertically mixed land uses and with high capacity transit stations/corridors present/planned. Given the intensification of use and the opportunities to reduce VMT, we encourage the City to establish the Transportation Demand Management (TDM) elements described below to promote smart mobility and reduce regional VMT and traffic impacts to the STN.

- Transit fare incentives for employees and patrons on an ongoing basis;
- Project design to encourage walking, bicycling, and convenient transit access;
- Secured bicycle storage facilities located conveniently near entrances to minimize determent of bicycle use due to weather conditions;
- Emergency Ride Home program;

- Participation/Formation in/of a Transportation Management Association (TMA) in partnership with other developments in the area;
- Reducing headway times of nearby City of Santa Rosa bus routes 3 and 5, and Sonoma County Transit bus routes 44, 44X, 48, and 54; and
- Aggressive trip reduction targets with annual Lead Agency monitoring and enforcement.

Transportation Demand Management programs should be documented with annual monitoring reports by an onsite TDM coordinator to demonstrate effectiveness. If the project does not achieve the VMT reduction goals, the reports should also include next steps to take in order to achieve those targets. Also, reducing parking supply can encourage active forms of transportation, reduce regional VMT, and lessen future transportation impacts on US 101 and other nearby State facilities. These smart growth approaches are consistent with the MTC's Regional Transportation Plan/SCS goals and would meet Caltrans Strategic Management Plan sustainability goals.

For additional TDM options, please refer to the Federal Highway Administration's *Integrating Demand Management into the Transportation Planning Process: A Desk Reference* (Chapter 8). The reference is available online at:

http://www.ops.fhwa.dot.gov/publications/fhwahop12035/fhwahop12035.pdf.

Lead Agency

As the Lead Agency, the City of Santa Rosa is responsible for all project mitigation, including any needed improvements to the STN. The project's financing, scheduling, implementation responsibilities and monitoring should be fully discussed for all proposed mitigation measures. Mitigation that includes the requirements of other agencies such as Caltrans are fully enforceable through permit conditions, agreements, or other legally-binding instruments under the control of the City. Please submit a copy of the final staff report and conditions of approval to Caltrans for our review.

Encroachment Permit

Please be advised that any work or traffic control that encroaches onto the State ROW requires an encroachment permit that is issued by Caltrans. To obtain an encroachment permit, a completed encroachment permit application, environmental documentation, and six (6) sets of plans clearly indicating the State ROW, and six (6) copies of signed and stamped traffic control plans must be submitted to: Office of Encroachment Permits, California DOT, District 4, P.O. Box 23660, Oakland, CA 94623-0660. To download the permit application and obtain more information, visit http://www.dot.ca.gov/hq/traffops/developserv/permits/.

Should you have any questions regarding this letter, please call Stephen Conteh at 510-286-5534 or stephen.conteh@dot.ca.gov.

Sincerely,

ser. Jannette Ramirez

PATRICIA MAURICE
District Branch Chief
Local Development - Intergovernmental Review

February 7, 2019

Ms. Susie Murray
City of Santa Rosa
Planning and Economic Development Department
100 Santa Rosa Avenue, Room 3
Santa Rosa, CA 95404

Response to Caltrans Comments on the In-N-Out Burger Project (2532 Santa Rosa Avenue)

Dear Ms. Murray;

We are in receipt of the letter dated January 23, 2019, from Ms. Patricia Maurice of Caltrans District 4 regarding the draft *Traffic Impact Study for the Yolanda Mixed-Use Project*, November 8, 2018 (TIS), and provide the following in response. Note that the comments are paraphrased and provided in italics for ease of review.

Clarification

Clarify in graphic and text the project site access and number of parking spaces.

Figure 5 in the TIS has been updated to include the latest site plan showing the access points and number of parking spaces for the proposed In-N-Out Burger. The access analysis and parking sections of the study further clarify the access and proposed parking spaces for the In-N-Out Burger.

Multimodal Improvements

The City should estimate costs of transit and active transportation improvements necessitated by the proposed project, and potential funding sources should be incorporated into Conditions of Approval.

The City applies a Public Facilities Fee to new development to generate funding for transportation-related improvements. Through payment of this fee the applicants would contribute to the funds needed for planned future improvements.

The project should contribute fair share contributions toward multimodal and regional transit improvements to mitigate impacts to regional transportation.

The City's Public Facilities Fee applicable to this development project will generate funding for planned transportation improvements. The project will be constructing improvements along their frontage, including providing the planned bike lane and sidewalk.

Operations Analysis

The analysis should identify if adequate storage is available for turning movements at the intersections and on the freeway ramps of Santa Rosa Avenue/Yolanda Avenue-US 101N Ramps and Corby Avenue/US 101S Ramps, and determine whether queues will spill back onto the freeway mainline.

The final TIS has been updated to address the anticipated adequacy of stacking space in the queuing section.

Provide trip generation, trip distribution, and trip assignment estimates for this project.

The TIS sets forth the project's anticipated trip generation and distribution. Figures 6 and 7 in the study show project volumes assigned to the roadway network under both near-term and future trip distribution assumptions.

To avoid traffic conflicts such as inadequate weaving distances and queues spilling back onto the freeway, the project should evaluate the adequacy of freeway segment operations in the project vicinity.

Queuing was addressed in the TIS, and as noted above, text as added to specifically discuss the ramps. Adequacy of weaving sections on US 101 is a design issue that would have been addressed when the freeway was reconstructed to add a third lane in each direction approximately 20 years ago. This is not an issue that can be addressed by a development project, nor should it be.

Vehicle Trip Reduction

Given the intensification of use and the opportunities to reduce VMT, we encourage the City to establish Transportation Demand Management (TDM) elements to promote smart mobility and reduce regional VMT and traffic impacts to the STN.

The City of Santa Rosa has taken an aggressive stance on providing facilities for alternative modes as a way of reducing the travel demand for those who live and work in the City. This includes provision of bicycle facilities connecting the site to regional trails as well as bus service. It is noted that the location of this site near several commercial establishments along Santa Rosa Avenue allows both employees and customers to walk or bike to destinations other than restaurants. It is further noted that Sonoma County has a "guaranteed ride home" program that site residents and employees can use.

Lead Agency

As the Lead Agency, the City of Santa Rosa is responsible for all project mitigation, including any needed improvements to the STN.

The City will work with the applicant to implement the recommendations contained in the TIS. No improvements to the STN were identified

Encroachment Permit

An Encroachment Permit is required for any work in the Caltrans ROW.

The project site does not connect to the Caltrans ROW and no work in the ROW is anticipated. Should any such work be identified, an encroachment permit would need to be obtained.

We hope this information adequately addresses the comments from Caltrans. Please contact me if any further clarification is needed.

Sincerely,

Kevin Rangel, EIT
Assistant Engineer II

Dalene J. Whitlock, PE, PTOE
Principal

DJW/kr/SRO476.R2C

Appendix B

Collision Rate Calculations

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Intersection Collision Rate Calculations

Yolanda Apartments TIS

Intersection # 1: Kawana Springs Road & Santa Rosa Avenue

Date of Count: Thursday, September 20, 2018

Number of Collisions: 14
Number of Injuries: 6
Number of Fatalities: 0
ADT: 28700
Start Date: January 1, 2013
End Date: December 31, 2017
Number of Years: 5

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

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

$$\text{collision rate} = \frac{14 \times 1{,}000{,}000}{28{,}700 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.27 c/mve**	**0.0%**	**42.9%**
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 # 2: Kawana Springs Road & Petaluma Hill Road

Date of Count: Thursday, September 20, 2018

Number of Collisions: 15
Number of Injuries: 9
Number of Fatalities: 0
ADT: 25600
Start Date: January 1, 2013
End Date: December 31, 2017
Number of Years: 5

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

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

$$\text{collision rate} = \frac{15 \times 1{,}000{,}000}{25{,}600 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.32 c/mve**	**0.0%**	**60.0%**
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

Yolanda Apartments TIS

Intersection # 3: Hearn Avenue & Corby Avenue

Date of Count: Thursday, June 21, 2018

Number of Collisions: 30
Number of Injuries: 15
Number of Fatalities: 0
ADT: 31300
Start Date: January 1, 2013
End Date: December 31, 2017
Number of Years: 5

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

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

$$\text{collision rate} = \frac{30 \times 1{,}000{,}000}{31{,}300 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.53 c/mve**	**0.0%**	**50.0%**
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 # 4: Hearn Avenue & Santa Rosa Avenue

Date of Count: Thursday, June 21, 2018

Number of Collisions: 19
Number of Injuries: 12
Number of Fatalities: 0
ADT: 39700
Start Date: January 1, 2013
End Date: December 31, 2017
Number of Years: 5

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

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

$$\text{collision rate} = \frac{19 \times 1{,}000{,}000}{39{,}700 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.26 c/mve**	**0.0%**	**63.2%**
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

Yolanda Apartments TIS

Intersection # 5: US 101 South Ramps & Corby Avenue
Date of Count: Thursday, June 21, 2018

Number of Collisions: 4
Number of Injuries: 3
Number of Fatalities: 0
ADT: 19400
Start Date: January 1, 2013
End Date: December 31, 2017
Number of Years: 5

Intersection Type: Tee
Control Type: Signals
Area: Urban

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

$$\text{collision rate} = \frac{4 \times 1{,}000{,}000}{19{,}400 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.11 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: Yolanda Ave. - US 101 North Ramps & Santa Rosa Avenue
Date of Count: Thursday, June 21, 2018

Number of Collisions: 25
Number of Injuries: 15
Number of Fatalities: 0
ADT: 38600
Start Date: January 1, 2013
End Date: December 31, 2017
Number of Years: 5

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

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

$$\text{collision rate} = \frac{25 \times 1{,}000{,}000}{38{,}600 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.35 c/mve**	**0.0%**	**60.0%**
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

Yolanda Apartments TIS

Intersection # 7: Yolanda Avenue & Petaluma Hill Road

Date of Count: Tuesday, March 14, 2017

Number of Collisions: 9
Number of Injuries: 6
Number of Fatalities: 0
ADT: 21600
Start Date: January 1, 2013
End Date: December 31, 2017
Number of Years: 5

Intersection Type: Tee
Control Type: Signals
Area: Suburban

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

$$\text{collision rate} = \frac{9 \times 1{,}000{,}000}{21{,}600 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.23 c/mve**	**0.0%**	**66.7%**
Statewide Average*	**0.27 c/mve**	**0.6%**	**37.3%**

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

Appendix C

Intersection Level of Service Calculations

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HCM 2010 Signalized Intersection Summary
1: Santa Rosa Ave & Kawana Springs Rd

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	0	3	279	0	165	2	851	249	26	347	0
Future Volume (veh/h)	1	0	3	279	0	165	2	851	249	26	347	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	15	0	3	0	18	3	4	9	0
Ped-Bike Adj(A_pbT)	1.00		0.97	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	1900	1863	1863	1863	1863	1863	1863	1863	1863	0
Adj Flow Rate, veh/h	1	0	2	279	0	97	2	851	129	26	347	0
Adj No. of Lanes	0	1	0	2	0	1	1	2	1	1	3	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	0
Cap, veh/h	2	0	4	553	0	273	5	2308	1259	60	3544	0
Arrive On Green	0.00	0.00	0.00	0.14	0.00	0.14	0.00	0.67	0.67	0.03	0.70	0.00
Sat Flow, veh/h	535	0	1070	3548	0	1550	1774	3539	1542	1774	5253	0
Grp Volume(v), veh/h	3	0	0	279	0	97	2	851	129	26	347	0
Grp Sat Flow(s),veh/h/ln	1605	0	0	1774	0	1550	1774	1770	1542	1774	1695	0
Q Serve(g_s), s	0.2	0.0	0.0	6.6	0.0	5.0	0.1	9.4	1.5	1.3	2.0	0.0
Cycle Q Clear(g_c), s	0.2	0.0	0.0	6.6	0.0	5.0	0.1	9.4	1.5	1.3	2.0	0.0
Prop In Lane	0.33		0.67	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	6	0	0	553	0	273	5	2308	1259	60	3544	0
V/C Ratio(X)	0.47	0.00	0.00	0.50	0.00	0.35	0.42	0.37	0.10	0.44	0.10	0.00
Avail Cap(c_a), veh/h	125	0	0	1029	0	492	138	2366	1259	126	3555	0
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	0.00	1.00	0.00	1.00	0.98	0.98	0.98	1.00	1.00	0.00
Uniform Delay (d), s/veh	44.7	0.0	0.0	35.5	0.0	32.9	44.8	8.0	1.8	43.0	4.6	0.0
Incr Delay (d2), s/veh	18.2	0.0	0.0	1.5	0.0	1.7	19.6	0.4	0.2	4.9	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	10.7	0.0	1.3	0.0	0.7	0.0	57.2	0.1	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	4.9	0.0	2.6	0.1	6.4	1.5	2.1	1.3	0.0
LnGrp Delay(d),s/veh	62.9	0.0	0.0	47.7	0.0	35.9	64.4	9.1	2.0	105.1	4.7	0.0
LnGrp LOS	E			D		D	E	A	A	F	A	
Approach Vol, veh/h		3			376			982			373	
Approach Delay, s/veh		62.9			44.6			8.3			11.7	
Approach LOS		E			D			A			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		3.4	3.2	66.5		16.9	6.0	63.8
Change Period (Y+Rc), s		3.0	3.0	3.6		3.9	3.6	3.6
Max Green Setting (Gmax), s		7.0	7.0	36.4		26.1	6.4	36.4
Max Q Clear Time (g_c+I1), s		2.2	2.1	4.0		8.6	3.3	11.4
Green Ext Time (p_c), s		0.0	0.0	2.4		2.6	0.0	6.8

Intersection Summary	
HCM 2010 Ctrl Delay	17.0
HCM 2010 LOS	B

Notes

HCM 2010 Signalized Intersection Summary
2: Petaluma Hill Rd & Kawana Springs Rd

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	125	125	45	170	178	29	80	768	166	14	338	181
Future Volume (veh/h)	125	125	45	170	178	29	80	768	166	14	338	181
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	12	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	1.00		0.98	1.00		0.98
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	1863	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	125	125	5	170	178	18	80	768	139	14	338	109
Adj No. of Lanes	1	1	1	1	1	0	1	2	0	1	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	439	527	514	504	499	51	437	1446	262	287	846	806
Arrive On Green	0.07	0.28	0.28	0.08	0.30	0.30	0.05	0.48	0.48	0.02	0.45	0.45
Sat Flow, veh/h	1774	1863	1539	1774	1661	168	1774	2984	540	1774	1863	1544
Grp Volume(v), veh/h	125	125	5	170	0	196	80	455	452	14	338	109
Grp Sat Flow(s),veh/h/ln	1774	1863	1539	1774	0	1829	1774	1770	1754	1774	1863	1544
Q Serve(g_s), s	5.4	5.7	0.2	7.3	0.0	9.2	2.5	19.6	19.6	0.5	13.3	4.0
Cycle Q Clear(g_c), s	5.4	5.7	0.2	7.3	0.0	9.2	2.5	19.6	19.6	0.5	13.3	4.0
Prop In Lane	1.00		1.00	1.00		0.09	1.00		0.31	1.00		1.00
Lane Grp Cap(c), veh/h	439	527	514	504	0	550	437	858	850	287	846	806
V/C Ratio(X)	0.28	0.24	0.01	0.34	0.00	0.36	0.18	0.53	0.53	0.05	0.40	0.14
Avail Cap(c_a), veh/h	514	527	514	548	0	550	571	858	850	446	846	806
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.3	30.3	24.6	23.9	0.0	30.1	15.4	19.7	19.7	16.6	21.0	13.6
Incr Delay (d2), s/veh	0.1	1.1	0.0	0.1	0.0	1.8	0.1	2.3	2.4	0.0	1.4	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.0
%ile BackOfQ(50%),veh/ln	2.7	3.1	0.1	3.5	0.0	5.0	1.2	10.2	10.1	0.2	9.5	1.8
LnGrp Delay(d),s/veh	25.5	31.4	24.6	24.1	0.0	31.9	15.5	22.0	22.0	16.7	24.8	14.0
LnGrp LOS	C	C	C	C		C	B	C	C	B	C	B
Approach Vol, veh/h		255			366			987			461	
Approach Delay, s/veh		28.3			28.3			21.5			22.0	
Approach LOS		C			C			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	12.3	35.0	8.5	54.2	10.3	37.0	5.1	57.6
Change Period (Y+Rc), s	3.0	3.9	3.0	* 4.3	3.0	3.9	3.0	4.3
Max Green Setting (Gmax), s	12.0	31.1	12.0	* 41	12.0	31.1	12.0	40.7
Max Q Clear Time (g_c+I1), s	9.3	7.7	4.5	15.3	7.4	11.2	2.5	21.6
Green Ext Time (p_c), s	0.1	0.6	0.0	1.5	0.1	1.0	0.0	3.9

Intersection Summary	
HCM 2010 Ctrl Delay	23.6
HCM 2010 LOS	C

Notes

HCM 2010 Signalized Intersection Summary
3: Corby Avenue & Hearn Avenue

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	54	495	273	280	336	29	84	87	496	44	70	59
Future Volume (veh/h)	54	495	273	280	336	29	84	87	496	44	70	59
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	3	0	2	1	0	1	0	2	0	2	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	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	1863	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	54	495	263	280	336	28	84	87	450	44	70	59
Adj No. of Lanes	1	1	1	1	2	0	1	1	1	1	1	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	78	744	622	355	1839	152	110	465	704	72	222	175
Arrive On Green	0.04	0.40	0.40	0.20	0.56	0.56	0.06	0.25	0.25	0.04	0.23	0.23
Sat Flow, veh/h	1774	1863	1556	1774	3304	274	1774	1863	1563	1774	933	787
Grp Volume(v), veh/h	54	495	263	280	179	185	84	87	450	44	0	129
Grp Sat Flow(s),veh/h/ln	1774	1863	1556	1774	1770	1808	1774	1863	1563	1774	0	1720
Q Serve(g_s), s	3.3	23.9	13.4	16.5	5.5	5.6	5.1	4.1	24.6	2.7	0.0	6.9
Cycle Q Clear(g_c), s	3.3	23.9	13.4	16.5	5.5	5.6	5.1	4.1	24.6	2.7	0.0	6.9
Prop In Lane	1.00		1.00	1.00		0.15	1.00		1.00	1.00		0.46
Lane Grp Cap(c), veh/h	78	744	622	355	985	1006	110	465	704	72	0	392
V/C Ratio(X)	0.69	0.67	0.42	0.79	0.18	0.18	0.77	0.19	0.64	0.62	0.00	0.33
Avail Cap(c_a), veh/h	177	746	623	355	985	1006	177	505	740	177	0	469
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.97	0.97	0.97	0.93	0.93	0.93	1.00	0.00	1.00
Uniform Delay (d), s/veh	51.8	27.3	23.9	42.0	12.1	12.1	50.9	32.5	23.7	51.9	0.0	35.7
Incr Delay (d2), s/veh	4.0	4.7	2.1	15.7	0.4	0.4	3.9	0.1	1.2	3.2	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.4	0.0	1.1	0.0	0.0	2.6	0.0	0.2	0.0	0.0	0.3
%ile BackOfQ(50%),veh/ln	1.7	13.8	6.1	10.0	2.9	3.0	2.8	2.1	11.2	1.4	0.0	3.6
LnGrp Delay(d),s/veh	55.8	32.4	26.0	58.9	12.5	12.5	57.4	32.6	25.0	55.1	0.0	36.1
LnGrp LOS	E	C	C	E	B	B	E	C	C	E		D
Approach Vol, veh/h		812			644			621			173	
Approach Delay, s/veh		31.9			32.6			30.5			41.0	
Approach LOS		C			C			C			D	

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	25.0	47.3	9.6	28.1	7.8	64.4	7.4	30.3
Change Period (Y+Rc), s	3.0	3.2	3.0	* 3.2	3.0	3.2	3.0	3.2
Max Green Setting (Gmax), s	22.0	34.8	11.0	* 30	11.0	45.8	11.0	29.8
Max Q Clear Time (g_c+I1), s	18.5	25.9	7.1	8.9	5.3	7.6	4.7	26.6
Green Ext Time (p_c), s	0.3	4.6	0.0	0.4	0.0	2.3	0.0	0.5

Intersection Summary	
HCM 2010 Ctrl Delay	32.4
HCM 2010 LOS	C

Notes

HCM 2010 Signalized Intersection Summary
4: Santa Rosa Avenue & Hearn Avenue/Private Driveway

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	303	3	722	3	4	4	333	615	1	3	273	319
Future Volume (veh/h)	303	3	722	3	4	4	333	615	1	3	273	319
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	1	1	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.97	1.00		0.98
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	1863	1900	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	305	0	568	3	4	3	333	615	1	3	273	316
Adj No. of Lanes	2	0	1	0	1	0	2	3	0	1	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	1057	0	870	6	9	6	874	2839	5	7	1017	918
Arrive On Green	0.30	0.00	0.30	0.01	0.01	0.01	0.25	0.54	0.54	0.00	0.09	0.09
Sat Flow, veh/h	3548	0	1571	523	698	523	3442	5243	9	1774	3539	1554
Grp Volume(v), veh/h	305	0	568	10	0	0	333	398	218	3	273	316
Grp Sat Flow(s),veh/h/ln	1774	0	1571	1744	0	0	1721	1695	1861	1774	1770	1554
Q Serve(g_s), s	5.9	0.0	0.0	0.5	0.0	0.0	7.2	5.5	5.5	0.2	6.4	10.3
Cycle Q Clear(g_c), s	5.9	0.0	0.0	0.5	0.0	0.0	7.2	5.5	5.5	0.2	6.4	10.3
Prop In Lane	1.00		1.00	0.30		0.30	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	1057	0	870	21	0	0	874	1836	1008	7	1017	918
V/C Ratio(X)	0.29	0.00	0.65	0.47	0.00	0.00	0.38	0.22	0.22	0.42	0.27	0.34
Avail Cap(c_a), veh/h	1057	0	870	116	0	0	874	1836	1008	114	1017	918
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	0.68	0.00	0.68	1.00	0.00	0.00	0.88	0.88	0.88	0.99	0.99	0.99
Uniform Delay (d), s/veh	24.3	0.0	14.2	44.2	0.0	0.0	27.7	10.7	10.7	44.8	32.0	12.6
Incr Delay (d2), s/veh	0.5	0.0	2.6	5.8	0.0	0.0	0.2	0.2	0.4	13.8	0.1	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	3.0	0.0	10.4	0.3	0.0	0.0	3.5	2.6	2.9	0.1	3.2	7.7
LnGrp Delay(d),s/veh	24.7	0.0	16.8	49.9	0.0	0.0	28.0	11.0	11.2	58.6	32.1	12.8
LnGrp LOS	C		B	D			C	B	B	E	C	B
Approach Vol, veh/h		873			10			949			592	
Approach Delay, s/veh		19.6			49.9			17.0			21.9	
Approach LOS		B			D			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		30.0	26.4	29.4		4.1	3.6	52.3
Change Period (Y+Rc), s		3.2	3.6	* 3.6		3.0	3.2	3.6
Max Green Setting (Gmax), s		26.8	21.8	* 22		6.0	5.8	38.4
Max Q Clear Time (g_c+I1), s		7.9	9.2	12.3		2.5	2.2	7.5
Green Ext Time (p_c), s		3.3	0.9	2.1		0.0	0.0	4.3

Intersection Summary	
HCM 2010 Ctrl Delay	19.3
HCM 2010 LOS	B

Notes

HCM 2010 Signalized Intersection Summary
5: Corby Avenue & US 101 SB Ramps

01/31/2019

Movement	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations								
Traffic Volume (veh/h)	503	388	286	36	413	213		
Future Volume (veh/h)	503	388	286	36	413	213		
Number	7	14	6	16	5	2		
Initial Q (Qb), veh	1	1	1	0	0	1		
Ped-Bike Adj(A_pbT)	1.00	1.00		0.98	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	1863		
Adj Flow Rate, veh/h	503	379	286	36	413	213		
Adj No. of Lanes	1	1	2	1	2	1		
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	632	889	718	314	731	384		
Arrive On Green	0.36	0.36	0.20	0.20	0.21	0.21		
Sat Flow, veh/h	1774	1583	3632	1546	3548	1863		
Grp Volume(v), veh/h	503	379	286	36	413	213		
Grp Sat Flow(s),veh/h/ln	1774	1583	1770	1546	1774	1863		
Q Serve(g_s), s	12.4	6.7	3.4	0.9	5.1	5.0		
Cycle Q Clear(g_c), s	12.4	6.7	3.4	0.9	5.1	5.0		
Prop In Lane	1.00	1.00		1.00	1.00			
Lane Grp Cap(c), veh/h	632	889	718	314	731	384		
V/C Ratio(X)	0.80	0.43	0.40	0.11	0.57	0.56		
Avail Cap(c_a), veh/h	1129	1333	1598	698	1602	841		
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	14.5	6.2	16.9	16.0	17.6	17.6		
Incr Delay (d2), s/veh	2.3	0.3	0.4	0.2	0.7	1.3		
Initial Q Delay(d3),s/veh	0.1	0.0	0.0	0.0	0.0	0.1		
%ile BackOfQ(50%),veh/ln	6.7	4.4	1.8	0.4	2.6	2.8		
LnGrp Delay(d),s/veh	16.9	6.5	17.3	16.1	18.2	19.0		
LnGrp LOS	B	A	B	B	B	B		
Approach Vol, veh/h	882		322			626		
Approach Delay, s/veh	12.5		17.2			18.5		
Approach LOS	B		B			B		

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		14.0		20.8		13.9		
Change Period (Y+Rc), s		4.0		3.5		4.0		
Max Green Setting (Gmax), s		22.0		31.0		22.0		
Max Q Clear Time (g_c+I1), s		7.1		14.4		5.4		
Green Ext Time (p_c), s		2.5		2.9		1.7		

Intersection Summary	
HCM 2010 Ctrl Delay	15.4
HCM 2010 LOS	B

Notes

HCM 2010 Signalized Intersection Summary
6: Santa Rosa Avenue & US 101 NB Ramps/Yolanda Ave

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	161	46	12	91	266	121	321	643	104	257	418	332
Future Volume (veh/h)	161	46	12	91	266	121	321	643	104	257	418	332
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	2	2	0	1	1	1	0	1	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.98
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	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	161	46	11	91	266	110	321	643	104	257	418	295
Adj No. of Lanes	2	1	1	1	1	1	2	2	1	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	240	103	88	315	298	253	401	1760	764	356	1713	861
Arrive On Green	0.07	0.06	0.06	0.18	0.16	0.16	0.12	0.50	0.50	0.17	0.81	0.81
Sat Flow, veh/h	3442	1863	1583	1774	1863	1583	3442	3539	1537	3442	3539	1554
Grp Volume(v), veh/h	161	46	11	91	266	110	321	643	104	257	418	295
Grp Sat Flow(s),veh/h/ln	1721	1863	1583	1774	1863	1583	1721	1770	1537	1721	1770	1554
Q Serve(g_s), s	4.1	2.2	0.5	4.0	12.6	4.4	8.2	10.0	3.3	6.4	2.5	4.1
Cycle Q Clear(g_c), s	4.1	2.2	0.5	4.0	12.6	4.4	8.2	10.0	3.3	6.4	2.5	4.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	240	103	88	315	298	253	401	1760	764	356	1713	861
V/C Ratio(X)	0.67	0.44	0.13	0.29	0.89	0.43	0.80	0.37	0.14	0.72	0.24	0.34
Avail Cap(c_a), veh/h	539	339	289	315	298	253	474	1762	765	627	1714	863
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.67	1.67	1.67
Upstream Filter(I)	1.00	1.00	1.00	0.68	0.68	0.68	1.00	1.00	1.00	0.81	0.81	0.81
Uniform Delay (d), s/veh	40.9	41.2	25.3	32.3	37.2	20.4	38.8	13.9	12.3	36.0	4.7	3.7
Incr Delay (d2), s/veh	3.2	3.0	0.6	0.3	20.1	0.8	8.1	0.6	0.4	2.2	0.3	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.4	3.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	1.2	0.2	2.2	8.6	2.0	4.4	5.1	1.6	3.1	1.3	1.9
LnGrp Delay(d),s/veh	44.1	44.1	25.9	33.0	60.4	21.2	47.1	14.5	12.7	38.3	5.0	4.6
LnGrp LOS	D	D	C	C	E	C	D	B	B	D	A	A
Approach Vol, veh/h		218			467			1068			970	
Approach Delay, s/veh		43.2			45.8			24.1			13.7	
Approach LOS		D			D			C			B	

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	19.9	8.6	14.0	47.5	10.2	18.3	12.8	48.7
Change Period (Y+Rc), s	3.9	3.6	3.6	3.9	3.9	* 3.9	3.9	* 3.9
Max Green Setting (Gmax), s	12.1	16.4	12.4	34.1	14.1	* 14	16.4	* 30
Max Q Clear Time (g_c+I1), s	6.0	4.2	10.2	6.1	6.1	14.6	8.4	12.0
Green Ext Time (p_c), s	0.1	0.1	0.3	4.1	0.3	0.0	0.5	4.6

Intersection Summary	
HCM 2010 Ctrl Delay	25.7
HCM 2010 LOS	C

Notes

HCM 2010 Signalized Intersection Summary
7: Petaluma Hill Rd & Yolanda Ave

01/31/2019

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	133	85	293	835	365	162
Future Volume (veh/h)	133	85	293	835	365	162
Number	5	12	3	8	4	14
Initial Q (Qb), veh	1	0	0	0	5	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	1900	1863	1863	1863	1900
Adj Flow Rate, veh/h	133	46	293	835	365	137
Adj No. of Lanes	0	0	1	1	1	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	0	2	2	2	2
Cap, veh/h	197	58	373	1205	490	168
Arrive On Green	0.14	0.14	0.21	0.65	0.37	0.37
Sat Flow, veh/h	1272	440	1774	1863	1283	482
Grp Volume(v), veh/h	180	0	293	835	0	502
Grp Sat Flow(s),veh/h/ln	1722	0	1774	1863	0	1765
Q Serve(g_s), s	4.4	0.0	6.9	12.6	0.0	11.1
Cycle Q Clear(g_c), s	4.4	0.0	6.9	12.6	0.0	11.1
Prop In Lane	0.74	0.26	1.00			0.27
Lane Grp Cap(c), veh/h	256	0	373	1205	0	658
V/C Ratio(X)	0.70	0.00	0.79	0.69	0.00	0.76
Avail Cap(c_a), veh/h	977	0	1007	1692	0	1603
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.5	0.0	18.0	5.4	0.0	13.4
Incr Delay (d2), s/veh	3.5	0.0	3.7	0.7	0.0	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	1.8
%ile BackOfQ(50%),veh/ln	3.1	0.0	4.0	7.1	0.0	7.1
LnGrp Delay(d),s/veh	23.0	0.0	21.7	6.1	0.0	17.1
LnGrp LOS	C		C	A		B
Approach Vol, veh/h	180			1128	502	
Approach Delay, s/veh	23.0			10.2	17.1	
Approach LOS	C			B	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		9.7	12.3	22.0				34.3
Change Period (Y+Rc), s		3.6	3.0	5.8				5.8
Max Green Setting (Gmax), s		25.0	25.0	40.0				40.0
Max Q Clear Time (g_c+I1), s		6.4	8.9	13.1				14.6
Green Ext Time (p_c), s		0.5	0.7	3.1				6.1

Intersection Summary	
HCM 2010 Ctrl Delay	13.4
HCM 2010 LOS	B

Notes

HCM 2010 Signalized Intersection Summary
1: Santa Rosa Ave & Kawana Springs Rd

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	392	0	195	0	990	494	77	722	0
Future Volume (veh/h)	0	0	0	392	0	195	0	990	494	77	722	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	15	0	3	0	8	3	4	9	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.96	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	1900	1863	1863	1863	1863	1863	1863	1863	1863	0
Adj Flow Rate, veh/h	0	0	0	392	0	80	0	990	282	77	722	0
Adj No. of Lanes	0	1	0	2	0	1	1	2	1	1	3	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	0
Cap, veh/h	0	2	0	603	0	340	1	2438	1309	110	3955	0
Arrive On Green	0.00	0.00	0.00	0.16	0.00	0.16	0.00	1.00	1.00	0.06	0.78	0.00
Sat Flow, veh/h	0	1863	0	3548	0	1559	1774	3539	1527	1774	5253	0
Grp Volume(v), veh/h	0	0	0	392	0	80	0	990	282	77	722	0
Grp Sat Flow(s),veh/h/ln	0	1863	0	1774	0	1559	1774	1770	1527	1774	1695	0
Q Serve(g_s), s	0.0	0.0	0.0	12.5	0.0	5.1	0.0	0.0	0.0	5.1	4.4	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	12.5	0.0	5.1	0.0	0.0	0.0	5.1	4.4	0.0
Prop In Lane	0.00		0.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	0	2	0	603	0	340	1	2438	1309	110	3955	0
V/C Ratio(X)	0.00	0.00	0.00	0.65	0.00	0.24	0.00	0.41	0.22	0.70	0.18	0.00
Avail Cap(c_a), veh/h	0	109	0	949	0	505	103	2456	1310	169	3963	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	1.00	0.00	1.00	0.00	0.93	0.93	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	47.4	0.0	39.1	0.0	0.0	0.0	55.7	3.6	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	2.5	0.0	0.8	0.0	0.5	0.3	7.7	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	12.7	0.0	0.7	0.0	0.1	0.0	31.2	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	8.5	0.0	2.8	0.0	0.2	0.6	4.2	2.5	0.0
LnGrp Delay(d),s/veh	0.0	0.0	0.0	62.6	0.0	40.6	0.0	0.6	0.4	94.5	3.8	0.0
LnGrp LOS				E		D		A	A	F	A	
Approach Vol, veh/h		0			472			1272			799	
Approach Delay, s/veh		0.0			58.9			0.6			12.5	
Approach LOS					E			A			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		0.0	0.0	97.1		22.9	10.2	86.9
Change Period (Y+Rc), s		3.0	3.0	3.6		3.9	3.6	3.6
Max Green Setting (Gmax), s		7.0	7.0	60.4		32.1	11.4	55.4
Max Q Clear Time (g_c+I1), s		0.0	0.0	6.4		14.5	7.1	2.0
Green Ext Time (p_c), s		0.0	0.0	5.7		3.4	0.0	10.5

Intersection Summary	
HCM 2010 Ctrl Delay	15.1
HCM 2010 LOS	B

Notes

HCM 2010 Signalized Intersection Summary
2: Petaluma Hill Rd & Kawana Springs Rd

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	200	197	117	148	199	28	115	673	192	16	412	265
Future Volume (veh/h)	200	197	117	148	199	28	115	673	192	16	412	265
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	12	0
Ped-Bike Adj(A_pbT)	0.99		0.98	1.00		0.97	1.00		1.00	1.00		0.97
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	1863	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	200	197	64	148	199	24	115	673	173	16	412	138
Adj No. of Lanes	1	1	1	1	1	0	1	2	0	1	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	486	615	603	485	506	61	336	1202	309	272	735	756
Arrive On Green	0.09	0.33	0.33	0.08	0.31	0.31	0.06	0.43	0.43	0.02	0.39	0.39
Sat Flow, veh/h	1774	1863	1548	1774	1626	196	1774	2789	717	1774	1863	1536
Grp Volume(v), veh/h	200	197	64	148	0	223	115	427	419	16	412	138
Grp Sat Flow(s),veh/h/ln	1774	1863	1548	1774	0	1822	1774	1770	1736	1774	1863	1536
Q Serve(g_s), s	7.4	7.9	2.6	5.6	0.0	9.6	3.7	18.1	18.1	0.5	17.2	5.0
Cycle Q Clear(g_c), s	7.4	7.9	2.6	5.6	0.0	9.6	3.7	18.1	18.1	0.5	17.2	5.0
Prop In Lane	1.00		1.00	1.00		0.11	1.00		0.41	1.00		1.00
Lane Grp Cap(c), veh/h	486	615	603	485	0	567	336	762	748	272	735	756
V/C Ratio(X)	0.41	0.32	0.11	0.30	0.00	0.39	0.34	0.56	0.56	0.06	0.56	0.18
Avail Cap(c_a), veh/h	531	615	603	565	0	567	475	762	748	447	735	756
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.0	25.1	19.5	20.7	0.0	27.0	18.0	21.4	21.4	18.3	24.5	14.3
Incr Delay (d2), s/veh	0.2	1.4	0.4	0.1	0.0	2.0	0.2	3.0	3.0	0.0	3.1	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.4	0.0
%ile BackOfQ(50%),veh/ln	3.6	4.3	1.2	2.7	0.0	5.2	1.8	9.4	9.2	0.3	12.0	2.2
LnGrp Delay(d),s/veh	20.2	26.4	19.9	20.9	0.0	29.1	18.2	24.3	24.4	18.3	32.0	14.8
LnGrp LOS	C	C	B	C		C	B	C	C	B	C	B
Approach Vol, veh/h		461			371			961			566	
Approach Delay, s/veh		22.8			25.8			23.6			27.4	
Approach LOS		C			C			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	10.5	36.9	8.8	43.8	12.5	35.0	5.2	47.4
Change Period (Y+Rc), s	3.0	3.9	3.0	* 4.3	3.0	3.9	3.0	4.3
Max Green Setting (Gmax), s	12.0	31.1	12.0	* 31	12.0	31.1	12.0	30.7
Max Q Clear Time (g_c+I1), s	7.6	9.9	5.7	19.2	9.4	11.6	2.5	20.1
Green Ext Time (p_c), s	0.1	1.3	0.1	1.6	0.1	1.2	0.0	2.8

Intersection Summary	
HCM 2010 Ctrl Delay	24.7
HCM 2010 LOS	C

Notes

HCM 2010 Signalized Intersection Summary
3: Corby Avenue & Hearn Avenue

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	76	526	184	271	610	99	116	204	735	82	101	122
Future Volume (veh/h)	76	526	184	271	610	99	116	204	735	82	101	122
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	1	7	4	1	1	0	0	2	3	0	1	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		0.98
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	1863	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	76	526	174	271	610	96	116	204	682	82	101	121
Adj No. of Lanes	1	1	1	1	2	0	1	1	1	1	1	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	100	634	538	371	1536	240	142	506	763	104	211	226
Arrive On Green	0.05	0.35	0.35	0.21	0.50	0.50	0.08	0.27	0.27	0.06	0.25	0.25
Sat Flow, veh/h	1774	1863	1549	1774	3055	480	1774	1863	1582	1774	766	918
Grp Volume(v), veh/h	76	526	174	271	353	353	116	204	682	82	0	222
Grp Sat Flow(s),veh/h/ln	1774	1863	1549	1774	1770	1766	1774	1863	1582	1774	0	1684
Q Serve(g_s), s	4.7	28.2	9.1	15.7	13.6	13.7	7.1	9.9	29.8	5.0	0.0	12.5
Cycle Q Clear(g_c), s	4.7	28.2	9.1	15.7	13.6	13.7	7.1	9.9	29.8	5.0	0.0	12.5
Prop In Lane	1.00		1.00	1.00		0.27	1.00		1.00	1.00		0.55
Lane Grp Cap(c), veh/h	100	634	538	371	889	887	142	506	763	104	0	421
V/C Ratio(X)	0.76	0.83	0.32	0.73	0.40	0.40	0.81	0.40	0.89	0.79	0.00	0.53
Avail Cap(c_a), veh/h	177	649	540	371	890	888	161	505	760	161	0	459
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.85	0.85	0.85	0.83	0.83	0.83	1.00	0.00	1.00
Uniform Delay (d), s/veh	51.3	34.1	26.8	40.7	17.0	17.1	49.8	33.0	26.3	51.1	0.0	35.8
Incr Delay (d2), s/veh	4.3	12.0	1.6	10.3	1.1	1.1	18.2	0.2	10.8	5.8	0.0	0.4
Initial Q Delay(d3),s/veh	3.0	5.2	0.6	0.2	0.0	0.0	0.0	0.2	1.0	0.0	0.0	0.1
%ile BackOfQ(50%),veh/ln	2.6	18.8	4.7	8.9	7.0	7.0	4.2	5.4	21.9	2.6	0.0	6.0
LnGrp Delay(d),s/veh	58.5	51.3	29.0	51.2	18.2	18.2	68.0	33.3	38.1	56.8	0.0	36.2
LnGrp LOS	E	D	C	D	B	B	E	C	D	E		D
Approach Vol, veh/h		776			977			1002			304	
Approach Delay, s/veh		47.0			27.3			40.6			41.8	
Approach LOS		D			C			D			D	

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	26.0	41.5	11.8	30.6	9.0	58.5	9.5	33.0
Change Period (Y+Rc), s	3.0	3.2	3.0	* 3.2	3.0	3.2	3.0	3.2
Max Green Setting (Gmax), s	23.0	34.8	10.0	* 30	11.0	46.8	10.0	29.8
Max Q Clear Time (g_c+I1), s	17.7	30.2	9.1	14.5	6.7	15.7	7.0	31.8
Green Ext Time (p_c), s	0.4	2.6	0.0	0.7	0.0	5.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	38.1
HCM 2010 LOS	D

Notes

HCM 2010 Signalized Intersection Summary
4: Santa Rosa Avenue & Hearn Avenue/Private Driveway

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	504	7	820	5	7	15	517	1020	0	5	616	450
Future Volume (veh/h)	504	7	820	5	7	15	517	1020	0	5	616	450
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	1	1	0	0	0	1	1	0	0	0	1
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.99
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	1863	1900	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	509	0	649	5	7	11	517	1020	0	5	616	437
Adj No. of Lanes	2	0	1	0	1	0	2	3	0	1	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	822	0	647	8	12	18	616	3210	0	11	1611	1078
Arrive On Green	0.23	0.00	0.23	0.02	0.02	0.02	0.18	0.63	0.00	0.00	0.31	0.31
Sat Flow, veh/h	3548	0	1559	370	518	813	3442	5253	0	1774	3539	1560
Grp Volume(v), veh/h	509	0	649	23	0	0	517	1020	0	5	616	437
Grp Sat Flow(s),veh/h/ln	1774	0	1559	1701	0	0	1721	1695	0	1774	1770	1560
Q Serve(g_s), s	15.4	0.0	27.8	1.6	0.0	0.0	17.4	11.1	0.0	0.3	16.4	16.5
Cycle Q Clear(g_c), s	15.4	0.0	27.8	1.6	0.0	0.0	17.4	11.1	0.0	0.3	16.4	16.5
Prop In Lane	1.00		1.00	0.22		0.48	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	822	0	647	38	0	0	616	3210	0	11	1611	1078
V/C Ratio(X)	0.62	0.00	1.00	0.61	0.00	0.00	0.84	0.32	0.00	0.44	0.38	0.41
Avail Cap(c_a), veh/h	822	0	643	128	0	0	855	3210	0	130	1615	1079
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67
Upstream Filter(I)	0.42	0.00	0.42	1.00	0.00	0.00	0.76	0.76	0.00	0.97	0.97	0.97
Uniform Delay (d), s/veh	41.4	0.0	35.2	58.1	0.0	0.0	47.7	10.2	0.0	59.5	28.4	10.8
Incr Delay (d2), s/veh	0.6	0.0	23.6	5.7	0.0	0.0	4.2	0.2	0.0	9.3	0.7	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	5.6	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.6	0.0	17.1	0.8	0.0	0.0	8.7	5.3	0.0	0.2	8.2	12.9
LnGrp Delay(d),s/veh	42.0	0.0	64.3	63.8	0.0	0.0	52.0	10.4	0.0	68.9	29.1	11.9
LnGrp LOS	D		F	E			D	B		E	C	B
Approach Vol, veh/h		1158			23			1537			1058	
Approach Delay, s/veh		54.5			63.8			24.4			22.2	
Approach LOS		D			E			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		31.0	25.0	58.4		5.7	4.0	79.4
Change Period (Y+Rc), s		3.2	3.6	* 3.6		3.0	3.2	3.6
Max Green Setting (Gmax), s		27.8	29.8	* 40		9.0	8.8	61.4
Max Q Clear Time (g_c+I1), s		29.8	19.4	18.5		3.6	2.3	13.1
Green Ext Time (p_c), s		0.0	1.5	6.1		0.0	0.0	9.4

Intersection Summary	
HCM 2010 Ctrl Delay	33.2
HCM 2010 LOS	C

Notes

HCM 2010 Signalized Intersection Summary
5: Corby Avenue & US 101 SB Ramps

01/31/2019

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	252	458	584	106	296	248
Future Volume (veh/h)	252	458	584	106	296	248
Number	7	14	6	16	5	2
Initial Q (Qb), veh	13	0	0	0	0	1
Ped-Bike Adj(A_pbT)	1.00	1.00		0.98	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	1863
Adj Flow Rate, veh/h	252	452	584	104	303	239
Adj No. of Lanes	1	1	2	1	2	1
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	527	794	966	423	739	378
Arrive On Green	0.29	0.29	0.28	0.28	0.20	0.20
Sat Flow, veh/h	1774	1583	3632	1550	3548	1863
Grp Volume(v), veh/h	252	452	584	104	303	239
Grp Sat Flow(s),veh/h/ln	1774	1583	1770	1550	1774	1863
Q Serve(g_s), s	5.8	10.1	7.1	2.6	3.7	5.8
Cycle Q Clear(g_c), s	5.8	10.1	7.1	2.6	3.7	5.8
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	527	794	966	423	739	378
V/C Ratio(X)	0.48	0.57	0.60	0.25	0.41	0.63
Avail Cap(c_a), veh/h	968	1184	2504	1096	1578	828
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	16.2	8.9	16.5	14.8	17.6	18.2
Incr Delay (d2), s/veh	0.7	0.6	0.6	0.3	0.4	1.7
Initial Q Delay(d3),s/veh	8.4	0.0	0.0	0.0	0.0	0.1
%ile BackOfQ(50%),veh/ln	5.6	6.4	3.7	1.2	1.9	3.3
LnGrp Delay(d),s/veh	25.3	9.5	17.1	15.1	18.0	20.1
LnGrp LOS	C	A	B	B	B	C
Approach Vol, veh/h	704		688			542
Approach Delay, s/veh	15.2		16.8			18.9
Approach LOS	B		B			B

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		14.0		17.8		17.7		
Change Period (Y+Rc), s		4.0		3.5		4.0		
Max Green Setting (Gmax), s		22.0		27.0		35.0		
Max Q Clear Time (g_c+I1), s		7.8		12.1		9.1		
Green Ext Time (p_c), s		2.2		2.2		4.6		

Intersection Summary	
HCM 2010 Ctrl Delay	16.8
HCM 2010 LOS	B

Notes

HCM 2010 Signalized Intersection Summary
6: Santa Rosa Avenue & US 101 NB Ramps/Yolanda Ave

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	324	43	40	131	225	180	345	948	188	177	930	326
Future Volume (veh/h)	324	43	40	131	225	180	345	948	188	177	930	326
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	2	0	0	1	1	0	2	1	0	0	0	1
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.98
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	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	324	43	33	131	225	161	345	948	184	177	930	310
Adj No. of Lanes	2	1	1	1	1	1	2	2	1	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	78	66	379	264	224	409	1940	840	246	1779	960
Arrive On Green	0.11	0.04	0.04	0.21	0.14	0.14	0.12	0.55	0.55	0.09	0.67	0.67
Sat Flow, veh/h	3442	1863	1583	1774	1863	1583	3442	3539	1536	3442	3539	1558
Grp Volume(v), veh/h	324	43	33	131	225	161	345	948	184	177	930	310
Grp Sat Flow(s),veh/h/ln	1721	1863	1583	1774	1863	1583	1721	1770	1536	1721	1770	1558
Q Serve(g_s), s	11.1	2.7	2.0	7.5	14.2	9.8	11.8	19.8	7.4	6.0	16.1	8.4
Cycle Q Clear(g_c), s	11.1	2.7	2.0	7.5	14.2	9.8	11.8	19.8	7.4	6.0	16.1	8.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	389	78	66	379	264	224	409	1940	840	246	1779	960
V/C Ratio(X)	0.83	0.55	0.50	0.35	0.85	0.72	0.84	0.49	0.22	0.72	0.52	0.32
Avail Cap(c_a), veh/h	462	317	269	378	317	269	470	1940	842	470	1778	959
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	0.55	0.55	0.55	1.00	1.00	1.00	0.61	0.61	0.61
Uniform Delay (d), s/veh	52.2	56.4	37.5	40.1	50.4	35.1	51.9	16.8	14.0	53.1	12.5	7.1
Incr Delay (d2), s/veh	10.7	6.0	5.8	0.3	10.1	4.0	11.7	0.9	0.6	2.5	0.7	0.5
Initial Q Delay(d3),s/veh	1.1	0.0	0.0	0.1	0.7	0.0	1.1	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.0	1.5	1.0	3.9	8.2	4.5	6.5	9.9	3.3	2.9	7.9	3.8
LnGrp Delay(d),s/veh	64.0	62.4	43.3	40.5	61.2	39.1	64.7	17.7	14.6	55.6	13.2	7.6
LnGrp LOS	E	E	D	D	E	D	E	B	B	E	B	A
Approach Vol, veh/h		400			517			1477			1417	
Approach Delay, s/veh		62.2			49.1			28.3			17.3	
Approach LOS		E			D			C			B	

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	29.5	8.6	17.7	64.2	17.3	20.8	12.2	69.7
Change Period (Y+Rc), s	3.9	3.6	3.6	3.9	3.9	* 3.9	3.9	* 3.9
Max Green Setting (Gmax), s	16.1	20.4	16.4	52.1	16.1	* 20	16.4	* 52
Max Q Clear Time (g_c+I1), s	9.5	4.7	13.8	18.1	13.1	16.2	8.0	21.8
Green Ext Time (p_c), s	0.2	0.2	0.3	9.6	0.3	0.7	0.3	8.8

Intersection Summary	
HCM 2010 Ctrl Delay	30.6
HCM 2010 LOS	C

Notes

HCM 2010 Signalized Intersection Summary
7: Petaluma Hill Rd & Yolanda Ave

01/31/2019

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	215	100	285	791	666	98
Future Volume (veh/h)	215	100	285	791	666	98
Number	5	12	3	8	4	14
Initial Q (Qb), veh	1	0	0	0	5	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	1900	1863	1863	1863	1900
Adj Flow Rate, veh/h	215	71	285	791	666	92
Adj No. of Lanes	0	0	1	1	1	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	0	2	2	2	2
Cap, veh/h	434	26	325	1190	740	40
Arrive On Green	0.19	0.19	0.19	0.68	0.46	0.46
Sat Flow, veh/h	1291	426	1774	1863	1597	221
Grp Volume(v), veh/h	287	0	285	791	0	758
Grp Sat Flow(s),veh/h/ln	1723	0	1774	1863	0	1817
Q Serve(g_s), s	12.4	0.0	11.9	18.0	0.0	30.0
Cycle Q Clear(g_c), s	12.4	0.0	11.9	18.0	0.0	30.0
Prop In Lane	0.75	0.25	1.00			0.12
Lane Grp Cap(c), veh/h	460	0	325	1190	0	781
V/C Ratio(X)	0.62	0.00	0.88	0.66	0.00	0.97
Avail Cap(c_a), veh/h	560	0	577	1272	0	945
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	34.7	0.0	37.4	10.7	0.0	27.1
Incr Delay (d2), s/veh	1.5	0.0	7.5	1.2	0.0	20.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	10.2
%ile BackOfQ(50%),veh/ln	12.0	0.0	7.9	13.2	0.0	26.6
LnGrp Delay(d),s/veh	36.2	0.0	44.9	11.9	0.0	57.8
LnGrp LOS	D		D	B		E
Approach Vol, veh/h	287			1076	758	
Approach Delay, s/veh	36.2			20.7	57.8	
Approach LOS	D			C	E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		18.6	17.5	40.8				58.3
Change Period (Y+Rc), s		3.6	3.0	5.8				5.8
Max Green Setting (Gmax), s		25.0	25.0	40.0				40.0
Max Q Clear Time (g_c+I1), s		14.4	13.9	32.0				20.0
Green Ext Time (p_c), s		0.6	0.6	3.0				5.2

Intersection Summary	
HCM 2010 Ctrl Delay	36.0
HCM 2010 LOS	D

Notes

HCM 2010 Signalized Intersection Summary
1: Santa Rosa Ave & Kawana Springs Rd

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	0	3	360	0	190	2	851	270	42	349	0
Future Volume (veh/h)	1	0	3	360	0	190	2	851	270	42	349	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	15	0	3	0	18	3	4	9	0
Ped-Bike Adj(A_pbT)	1.00		0.97	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	1900	1863	1863	1863	1863	1863	1863	1863	1863	0
Adj Flow Rate, veh/h	1	0	2	360	0	122	2	851	150	42	349	0
Adj No. of Lanes	0	1	0	2	0	1	1	2	1	1	3	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	0
Cap, veh/h	2	0	4	639	0	327	5	2197	1245	76	3419	0
Arrive On Green	0.00	0.00	0.00	0.17	0.00	0.17	0.00	0.42	0.42	0.04	0.67	0.00
Sat Flow, veh/h	535	0	1070	3548	0	1555	1774	3539	1542	1774	5253	0
Grp Volume(v), veh/h	3	0	0	360	0	122	2	851	150	42	349	0
Grp Sat Flow(s),veh/h/ln	1605	0	0	1774	0	1555	1774	1770	1542	1774	1695	0
Q Serve(g_s), s	0.2	0.0	0.0	8.4	0.0	6.1	0.1	14.8	2.9	2.1	2.2	0.0
Cycle Q Clear(g_c), s	0.2	0.0	0.0	8.4	0.0	6.1	0.1	14.8	2.9	2.1	2.2	0.0
Prop In Lane	0.33		0.67	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	6	0	0	639	0	327	5	2197	1245	76	3419	0
V/C Ratio(X)	0.47	0.00	0.00	0.56	0.00	0.37	0.42	0.39	0.12	0.55	0.10	0.00
Avail Cap(c_a), veh/h	125	0	0	1029	0	508	138	2244	1245	126	3428	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.98	0.98	0.98	1.00	1.00	0.00
Uniform Delay (d), s/veh	44.7	0.0	0.0	34.3	0.0	30.8	44.8	15.2	3.3	42.6	5.3	0.0
Incr Delay (d2), s/veh	18.2	0.0	0.0	1.7	0.0	1.5	19.6	0.5	0.2	6.2	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	9.1	0.0	1.0	0.0	0.8	0.0	44.8	0.1	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	5.9	0.0	3.2	0.1	8.8	2.7	2.5	1.4	0.0
LnGrp Delay(d),s/veh	62.9	0.0	0.0	45.1	0.0	33.3	64.4	16.5	3.5	93.6	5.5	0.0
LnGrp LOS	E			D		C	E	B	A	F	A	
Approach Vol, veh/h		3			482			1003			391	
Approach Delay, s/veh		62.9			42.1			14.6			14.9	
Approach LOS		E			D			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		3.4	3.2	64.3		19.1	6.9	60.7
Change Period (Y+Rc), s		3.0	3.0	3.6		3.9	3.6	3.6
Max Green Setting (Gmax), s		7.0	7.0	36.4		26.1	6.4	36.4
Max Q Clear Time (g_c+I1), s		2.2	2.1	4.2		10.4	4.1	16.8
Green Ext Time (p_c), s		0.0	0.0	2.4		3.3	0.0	6.3

Intersection Summary	
HCM 2010 Ctrl Delay	21.8
HCM 2010 LOS	C

Notes

HCM 2010 Signalized Intersection Summary
2: Petaluma Hill Rd & Kawana Springs Rd

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	126	133	61	188	213	31	141	773	175	15	343	182
Future Volume (veh/h)	126	133	61	188	213	31	141	773	175	15	343	182
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	12	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	1.00		0.98	1.00		0.97
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	1863	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	126	133	21	188	213	20	141	773	148	15	343	110
Adj No. of Lanes	1	1	1	1	1	0	1	2	0	1	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	418	527	530	505	513	48	432	1409	270	277	815	781
Arrive On Green	0.07	0.28	0.28	0.09	0.31	0.31	0.06	0.48	0.48	0.02	0.44	0.44
Sat Flow, veh/h	1774	1863	1539	1774	1674	157	1774	2953	565	1774	1863	1544
Grp Volume(v), veh/h	126	133	21	188	0	233	141	463	458	15	343	110
Grp Sat Flow(s),veh/h/ln	1774	1863	1539	1774	0	1832	1774	1770	1749	1774	1863	1544
Q Serve(g_s), s	5.5	6.1	1.0	8.0	0.0	11.1	4.6	20.4	20.4	0.5	14.0	4.2
Cycle Q Clear(g_c), s	5.5	6.1	1.0	8.0	0.0	11.1	4.6	20.4	20.4	0.5	14.0	4.2
Prop In Lane	1.00		1.00	1.00		0.09	1.00		0.32	1.00		1.00
Lane Grp Cap(c), veh/h	418	527	530	505	0	562	432	845	835	277	815	781
V/C Ratio(X)	0.30	0.25	0.04	0.37	0.00	0.41	0.33	0.55	0.55	0.05	0.42	0.14
Avail Cap(c_a), veh/h	493	527	530	537	0	562	549	845	835	435	815	781
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.4	30.5	24.1	23.3	0.0	30.3	16.4	20.4	20.4	17.5	22.3	14.5
Incr Delay (d2), s/veh	0.1	1.2	0.1	0.2	0.0	2.3	0.2	2.6	2.6	0.0	1.6	0.4
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	2.7	0.0
%ile BackOfQ(50%),veh/ln	2.7	3.3	0.4	3.9	0.0	6.0	2.3	10.5	10.4	0.2	9.9	1.9
LnGrp Delay(d),s/veh	25.6	31.6	24.2	23.5	0.0	32.5	16.6	22.9	22.9	17.6	26.6	14.9
LnGrp LOS	C	C	C	C		C	B	C	C	B	C	B
Approach Vol, veh/h		280			421			1062			468	
Approach Delay, s/veh		28.3			28.5			22.1			23.6	
Approach LOS		C			C			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	13.0	35.0	9.6	52.4	10.4	37.6	5.2	56.8
Change Period (Y+Rc), s	3.0	3.9	3.0	* 4.3	3.0	3.9	3.0	4.3
Max Green Setting (Gmax), s	12.0	31.1	12.0	* 41	12.0	31.1	12.0	40.7
Max Q Clear Time (g_c+I1), s	10.0	8.1	6.6	16.0	7.5	13.1	2.5	22.4
Green Ext Time (p_c), s	0.1	0.7	0.1	1.5	0.1	1.2	0.0	3.9

Intersection Summary	
HCM 2010 Ctrl Delay	24.4
HCM 2010 LOS	C

Notes

HCM 2010 Signalized Intersection Summary
3: Corby Avenue & Hearn Avenue

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	54	495	273	358	336	29	84	87	536	44	70	59
Future Volume (veh/h)	54	495	273	358	336	29	84	87	536	44	70	59
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	3	0	2	1	0	1	0	2	0	2	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	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	1863	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	54	495	263	358	336	28	84	87	490	44	70	59
Adj No. of Lanes	1	1	1	1	2	0	1	1	1	1	1	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	78	668	558	419	1816	150	107	475	771	72	232	180
Arrive On Green	0.04	0.36	0.36	0.24	0.55	0.55	0.06	0.25	0.25	0.04	0.23	0.23
Sat Flow, veh/h	1774	1863	1555	1774	3304	274	1774	1863	1563	1774	934	787
Grp Volume(v), veh/h	54	495	263	358	179	185	84	87	490	44	0	129
Grp Sat Flow(s),veh/h/ln	1774	1863	1555	1774	1770	1808	1774	1863	1563	1774	0	1720
Q Serve(g_s), s	3.3	25.6	14.4	21.2	5.6	5.6	5.1	4.0	25.6	2.7	0.0	6.8
Cycle Q Clear(g_c), s	3.3	25.6	14.4	21.2	5.6	5.6	5.1	4.0	25.6	2.7	0.0	6.8
Prop In Lane	1.00		1.00	1.00		0.15	1.00		1.00	1.00		0.46
Lane Grp Cap(c), veh/h	78	668	558	419	973	994	107	475	771	72	0	404
V/C Ratio(X)	0.69	0.74	0.47	0.85	0.18	0.19	0.78	0.18	0.64	0.62	0.00	0.32
Avail Cap(c_a), veh/h	129	666	555	419	973	994	113	488	783	113	0	454
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.95	0.95	0.95	0.92	0.92	0.92	1.00	0.00	1.00
Uniform Delay (d), s/veh	51.8	31.1	27.2	40.4	12.4	12.5	51.1	32.0	21.0	51.9	0.0	35.0
Incr Delay (d2), s/veh	4.0	7.2	2.8	18.6	0.4	0.4	23.9	0.1	1.2	3.2	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.6	0.0	1.1	0.0	0.0	2.9	0.0	0.1	0.0	0.0	0.3
%ile BackOfQ(50%),veh/ln	1.7	15.0	6.6	12.9	2.9	3.0	3.4	2.1	11.7	1.4	0.0	3.6
LnGrp Delay(d),s/veh	55.8	38.9	30.1	60.1	12.8	12.8	77.8	32.1	22.3	55.1	0.0	35.5
LnGrp LOS	E	D	C	E	B	B	E	C	C	E		D
Approach Vol, veh/h		812			722			661			173	
Approach Delay, s/veh		37.2			36.3			30.6			40.5	
Approach LOS		D			D			C			D	

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	29.0	42.5	9.6	28.9	7.8	63.7	7.4	31.1
Change Period (Y+Rc), s	3.0	3.2	3.0	* 3.2	3.0	3.2	3.0	3.2
Max Green Setting (Gmax), s	26.0	35.8	7.0	* 29	8.0	53.8	7.0	28.8
Max Q Clear Time (g_c+I1), s	23.2	27.6	7.1	8.8	5.3	7.6	4.7	27.6
Green Ext Time (p_c), s	0.3	4.3	0.0	0.4	0.0	2.3	0.0	0.2

Intersection Summary	
HCM 2010 Ctrl Delay	35.3
HCM 2010 LOS	D

Notes

HCM 2010 Signalized Intersection Summary
4: Santa Rosa Avenue & Hearn Avenue/Private Driveway

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	317	3	748	3	4	4	334	622	1	3	279	396
Future Volume (veh/h)	317	3	748	3	4	4	334	622	1	3	279	396
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	1	1	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.97	1.00		0.98
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	1863	1900	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	319	0	594	3	4	3	334	622	1	3	279	393
Adj No. of Lanes	2	0	1	0	1	0	2	3	0	1	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	1057	0	835	6	9	6	798	2839	5	7	1094	952
Arrive On Green	0.30	0.00	0.30	0.01	0.01	0.01	0.23	0.54	0.54	0.00	0.10	0.10
Sat Flow, veh/h	3548	0	1571	523	698	523	3442	5243	8	1774	3539	1555
Grp Volume(v), veh/h	319	0	594	10	0	0	334	402	221	3	279	393
Grp Sat Flow(s),veh/h/ln	1774	0	1571	1744	0	0	1721	1695	1861	1774	1770	1555
Q Serve(g_s), s	6.2	0.0	4.6	0.5	0.0	0.0	7.4	5.6	5.6	0.2	6.5	12.7
Cycle Q Clear(g_c), s	6.2	0.0	4.6	0.5	0.0	0.0	7.4	5.6	5.6	0.2	6.5	12.7
Prop In Lane	1.00		1.00	0.30		0.30	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	1057	0	835	21	0	0	798	1836	1008	7	1094	952
V/C Ratio(X)	0.30	0.00	0.71	0.47	0.00	0.00	0.42	0.22	0.22	0.42	0.25	0.41
Avail Cap(c_a), veh/h	1057	0	835	116	0	0	834	1836	1008	114	1094	952
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	0.65	0.00	0.65	1.00	0.00	0.00	0.86	0.86	0.86	0.98	0.98	0.98
Uniform Delay (d), s/veh	24.4	0.0	16.0	44.2	0.0	0.0	29.4	10.7	10.7	44.8	30.8	12.3
Incr Delay (d2), s/veh	0.5	0.0	3.4	5.8	0.0	0.0	0.3	0.2	0.4	13.7	0.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.0	2.9	0.3	0.0	0.0	3.6	2.6	2.9	0.1	3.2	9.7
LnGrp Delay(d),s/veh	24.9	0.0	19.5	49.9	0.0	0.0	29.7	11.0	11.2	58.5	31.0	12.6
LnGrp LOS	C		B	D			C	B	B	E	C	B
Approach Vol, veh/h		913			10			957			675	
Approach Delay, s/veh		21.3			49.9			17.6			20.4	
Approach LOS		C			D			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		30.0	24.5	31.4		4.1	3.6	52.3
Change Period (Y+Rc), s		3.2	3.6	* 3.6		3.0	3.2	3.6
Max Green Setting (Gmax), s		26.8	21.8	* 22		6.0	5.8	38.4
Max Q Clear Time (g_c+I1), s		8.2	9.4	14.7		2.5	2.2	7.6
Green Ext Time (p_c), s		3.5	0.9	2.1		0.0	0.0	4.4

Intersection Summary	
HCM 2010 Ctrl Delay	19.8
HCM 2010 LOS	B

Notes

HCM 2010 Signalized Intersection Summary
5: Corby Avenue & US 101 SB Ramps

01/31/2019

Movement	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations								
Traffic Volume (veh/h)	503	428	286	36	413	291		
Future Volume (veh/h)	503	428	286	36	413	291		
Number	7	14	6	16	5	2		
Initial Q (Qb), veh	1	1	1	0	0	1		
Ped-Bike Adj(A_pbT)	1.00	1.00		0.98	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	1863		
Adj Flow Rate, veh/h	503	419	286	36	413	291		
Adj No. of Lanes	1	1	2	1	2	1		
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	627	929	678	297	829	435		
Arrive On Green	0.35	0.35	0.19	0.19	0.23	0.23		
Sat Flow, veh/h	1774	1583	3632	1546	3548	1863		
Grp Volume(v), veh/h	503	419	286	36	413	291		
Grp Sat Flow(s),veh/h/ln	1774	1583	1770	1546	1774	1863		
Q Serve(g_s), s	13.3	7.7	3.7	1.0	5.2	7.4		
Cycle Q Clear(g_c), s	13.3	7.7	3.7	1.0	5.2	7.4		
Prop In Lane	1.00	1.00		1.00	1.00			
Lane Grp Cap(c), veh/h	627	929	678	297	829	435		
V/C Ratio(X)	0.80	0.45	0.42	0.12	0.50	0.67		
Avail Cap(c_a), veh/h	1062	1317	1504	657	1507	791		
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	15.5	6.1	18.5	17.5	17.4	18.4		
Incr Delay (d2), s/veh	2.4	0.3	0.4	0.2	0.5	1.8		
Initial Q Delay(d3),s/veh	0.1	0.0	0.0	0.0	0.0	0.1		
%ile BackOfQ(50%),veh/ln	7.1	5.5	1.9	0.4	2.6	4.1		
LnGrp Delay(d),s/veh	18.0	6.4	19.0	17.6	17.9	20.2		
LnGrp LOS	B	A	B	B	B	C		
Approach Vol, veh/h	922		322			704		
Approach Delay, s/veh	12.8		18.8			18.8		
Approach LOS	B		B			B		
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		16.1		21.8		13.9		
Change Period (Y+Rc), s		4.0		3.5		4.0		
Max Green Setting (Gmax), s		22.0		31.0		22.0		
Max Q Clear Time (g_c+I1), s		9.4		15.3		5.7		
Green Ext Time (p_c), s		2.7		3.1		1.7		

Intersection Summary	
HCM 2010 Ctrl Delay	16.0
HCM 2010 LOS	B

Notes

HCM 2010 Signalized Intersection Summary
6: Santa Rosa Avenue & US 101 NB Ramps/Yolanda Ave

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	168	97	12	91	314	122	321	643	104	285	418	336
Future Volume (veh/h)	168	97	12	91	314	122	321	643	104	285	418	336
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	2	2	0	1	1	1	0	1	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.98
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	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	168	97	11	91	314	111	321	643	104	285	418	299
Adj No. of Lanes	2	1	1	1	1	1	2	2	1	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	248	142	120	283	298	253	401	1723	748	414	1705	857
Arrive On Green	0.07	0.08	0.08	0.16	0.16	0.16	0.12	0.49	0.49	0.18	0.80	0.80
Sat Flow, veh/h	3442	1863	1583	1774	1863	1583	3442	3539	1537	3442	3539	1554
Grp Volume(v), veh/h	168	97	11	91	314	111	321	643	104	285	418	299
Grp Sat Flow(s),veh/h/ln	1721	1863	1583	1774	1863	1583	1721	1770	1537	1721	1770	1554
Q Serve(g_s), s	4.3	4.6	0.5	4.1	14.4	4.4	8.2	10.2	3.4	7.1	2.6	4.3
Cycle Q Clear(g_c), s	4.3	4.6	0.5	4.1	14.4	4.4	8.2	10.2	3.4	7.1	2.6	4.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	248	142	120	283	298	253	401	1723	748	414	1705	857
V/C Ratio(X)	0.68	0.68	0.09	0.32	1.05	0.44	0.80	0.37	0.14	0.69	0.25	0.35
Avail Cap(c_a), veh/h	539	339	289	283	298	253	474	1724	749	627	1706	863
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.67	1.67	1.67
Upstream Filter(I)	1.00	1.00	1.00	0.63	0.63	0.63	1.00	1.00	1.00	0.79	0.79	0.79
Uniform Delay (d), s/veh	40.7	40.5	23.8	33.7	37.8	19.4	38.8	14.5	12.8	34.5	4.8	3.9
Incr Delay (d2), s/veh	3.2	5.7	0.3	0.4	56.1	0.7	8.1	0.6	0.4	1.6	0.3	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.5	22.6	0.0	0.2	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	2.6	0.2	2.3	14.0	1.9	4.4	5.2	1.6	3.4	1.4	2.0
LnGrp Delay(d),s/veh	44.0	46.3	24.1	34.6	116.5	20.2	47.1	15.1	13.2	36.1	5.1	4.8
LnGrp LOS	D	D	C	C	F	C	D	B	B	D	A	A
Approach Vol, veh/h		276			516			1068			1002	
Approach Delay, s/veh		44.0			81.4			24.6			13.8	
Approach LOS		D			F			C			B	
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	18.2	10.4	14.0	47.3	10.4	18.3	13.6	47.8				
Change Period (Y+Rc), s	3.9	3.6	3.6	3.9	3.9	* 3.9	3.9	* 3.9				
Max Green Setting (Gmax), s	12.1	16.4	12.4	34.1	14.1	* 14	16.4	* 30				
Max Q Clear Time (g_c+I1), s	6.1	6.6	10.2	6.3	6.3	16.4	9.1	12.2				
Green Ext Time (p_c), s	0.1	0.3	0.3	4.1	0.3	0.0	0.6	4.5				

Intersection Summary	
HCM 2010 Ctrl Delay	32.9
HCM 2010 LOS	C

Notes

HCM 2010 Signalized Intersection Summary
7: Petaluma Hill Rd & Yolanda Ave

01/31/2019

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	198	85	294	841	373	210
Future Volume (veh/h)	198	85	294	841	373	210
Number	5	12	3	8	4	14
Initial Q (Qb), veh	1	0	0	0	5	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	1900	1863	1863	1863	1900
Adj Flow Rate, veh/h	198	46	294	841	373	185
Adj No. of Lanes	0	0	1	1	1	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	0	2	2	2	2
Cap, veh/h	269	54	361	1206	476	210
Arrive On Green	0.18	0.18	0.21	0.65	0.39	0.39
Sat Flow, veh/h	1402	326	1774	1863	1167	579
Grp Volume(v), veh/h	245	0	294	841	0	558
Grp Sat Flow(s),veh/h/ln	1735	0	1774	1863	0	1745
Q Serve(g_s), s	7.3	0.0	8.6	15.7	0.0	15.6
Cycle Q Clear(g_c), s	7.3	0.0	8.6	15.7	0.0	15.6
Prop In Lane	0.81	0.19	1.00			0.33
Lane Grp Cap(c), veh/h	325	0	361	1206	0	686
V/C Ratio(X)	0.75	0.00	0.81	0.70	0.00	0.81
Avail Cap(c_a), veh/h	798	0	816	1370	0	1284
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.7	0.0	22.2	6.6	0.0	16.2
Incr Delay (d2), s/veh	3.6	0.0	4.5	1.3	0.0	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	2.1
%ile BackOfQ(50%),veh/ln	4.6	0.0	4.9	9.0	0.0	9.5
LnGrp Delay(d),s/veh	26.2	0.0	26.7	8.0	0.0	20.6
LnGrp LOS	C		C	A		C
Approach Vol, veh/h	245			1135	558	
Approach Delay, s/veh	26.2			12.8	20.6	
Approach LOS	C			B	C	

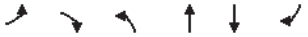
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		13.3	14.2	26.9				41.1
Change Period (Y+Rc), s		3.6	3.0	5.8				5.8
Max Green Setting (Gmax), s		25.0	25.0	40.0				40.0
Max Q Clear Time (g_c+I1), s		9.3	10.6	17.6				17.7
Green Ext Time (p_c), s		0.6	0.7	3.5				5.9

Intersection Summary	
HCM 2010 Ctrl Delay	16.8
HCM 2010 LOS	B

Notes

HCM 2010 Signalized Intersection Summary
7: Petaluma Hill Rd & Yolanda Ave

01/31/2019



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	198	85	294	841	373	210
Future Volume (veh/h)	198	85	294	841	373	210
Number	5	12	3	8	4	14
Initial Q (Qb), veh	1	0	0	0	5	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	1900	1863	1863	1863	1863
Adj Flow Rate, veh/h	198	46	294	841	373	185
Adj No. of Lanes	0	0	1	1	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	0	2	2	2	2
Cap, veh/h	265	56	372	1072	539	448
Arrive On Green	0.18	0.18	0.21	0.57	0.28	0.28
Sat Flow, veh/h	1402	326	1774	1863	1863	1548
Grp Volume(v), veh/h	245	0	294	841	373	185
Grp Sat Flow(s),veh/h/ln	1735	0	1774	1863	1863	1548
Q Serve(g_s), s	5.2	0.0	6.0	13.5	6.9	3.7
Cycle Q Clear(g_c), s	5.2	0.0	6.0	13.5	6.9	3.7
Prop In Lane	0.81	0.19	1.00			1.00
Lane Grp Cap(c), veh/h	322	0	372	1072	539	448
V/C Ratio(X)	0.76	0.00	0.79	0.78	0.69	0.41
Avail Cap(c_a), veh/h	605	0	646	1803	979	814
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.5	0.0	14.9	6.5	12.7	11.3
Incr Delay (d2), s/veh	3.7	0.0	3.8	1.3	1.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	2.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.0	3.4	7.3	4.5	1.7
LnGrp Delay(d),s/veh	19.2	0.0	18.7	7.8	16.3	11.9
LnGrp LOS	B		B	A	B	B
Approach Vol, veh/h	245			1135	558	
Approach Delay, s/veh	19.2			10.6	14.9	
Approach LOS	B			B	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		10.6	11.1	16.7				27.8
Change Period (Y+Rc), s		3.6	3.0	5.8				5.8
Max Green Setting (Gmax), s		13.4	14.0	20.2				37.2
Max Q Clear Time (g_c+I1), s		7.2	8.0	8.9				15.5
Green Ext Time (p_c), s		0.4	0.4	2.1				5.8

Intersection Summary	
HCM 2010 Ctrl Delay	12.9
HCM 2010 LOS	B

Notes

HCM 2010 Signalized Intersection Summary
1: Santa Rosa Ave & Kawana Springs Rd

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	433	0	239	0	992	534	125	722	0
Future Volume (veh/h)	0	0	0	433	0	239	0	992	534	125	722	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	15	0	3	0	8	3	4	9	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.96	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	1900	1863	1863	1863	1863	1863	1863	1863	1863	0
Adj Flow Rate, veh/h	0	0	0	433	0	124	0	992	322	125	722	0
Adj No. of Lanes	0	1	0	2	0	1	1	2	1	1	3	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	0
Cap, veh/h	0	2	0	648	0	407	1	2292	1264	157	3889	0
Arrive On Green	0.00	0.00	0.00	0.17	0.00	0.17	0.00	1.00	1.00	0.08	0.77	0.00
Sat Flow, veh/h	0	1863	0	3548	0	1561	1774	3539	1525	1774	5253	0
Grp Volume(v), veh/h	0	0	0	433	0	124	0	992	322	125	722	0
Grp Sat Flow(s),veh/h/ln	0	1863	0	1774	0	1561	1774	1770	1525	1774	1695	0
Q Serve(g_s), s	0.0	0.0	0.0	13.8	0.0	7.7	0.0	0.0	0.0	8.3	4.6	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	13.8	0.0	7.7	0.0	0.0	0.0	8.3	4.6	0.0
Prop In Lane	0.00		0.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	0	2	0	648	0	407	1	2292	1264	157	3889	0
V/C Ratio(X)	0.00	0.00	0.00	0.67	0.00	0.30	0.00	0.43	0.25	0.79	0.19	0.00
Avail Cap(c_a), veh/h	0	109	0	949	0	552	103	2304	1265	169	3896	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	1.00	0.00	1.00	0.00	0.92	0.92	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	46.6	0.0	36.1	0.0	0.0	0.0	54.1	4.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	2.5	0.0	0.9	0.0	0.6	0.4	21.4	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	11.6	0.0	0.6	0.0	0.2	0.1	22.7	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	9.1	0.0	3.9	0.0	0.2	0.7	6.6	2.7	0.0
LnGrp Delay(d),s/veh	0.0	0.0	0.0	60.7	0.0	37.6	0.0	0.7	0.5	98.3	4.2	0.0
LnGrp LOS				E		D		A	A	F	A	
Approach Vol, veh/h		0			557			1314			847	
Approach Delay, s/veh		0.0			55.6			0.7			18.1	
Approach LOS					E			A			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		0.0	0.0	95.5		24.5	13.8	81.7
Change Period (Y+Rc), s		3.0	3.0	3.6		3.9	3.6	3.6
Max Green Setting (Gmax), s		7.0	7.0	60.4		32.1	11.4	55.4
Max Q Clear Time (g_c+I1), s		0.0	0.0	6.6		15.8	10.3	2.0
Green Ext Time (p_c), s		0.0	0.0	5.7		4.0	0.0	10.8

Intersection Summary	
HCM 2010 Ctrl Delay	17.3
HCM 2010 LOS	B

Notes

HCM 2010 Signalized Intersection Summary
2: Petaluma Hill Rd & Kawana Springs Rd

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	201	224	165	160	220	30	161	686	222	19	425	266
Future Volume (veh/h)	201	224	165	160	220	30	161	686	222	19	425	266
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	12	0
Ped-Bike Adj(A_pbT)	0.99		0.98	1.00		0.97	1.00		1.00	1.00		0.97
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	1863	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	201	224	112	160	220	26	161	686	203	19	425	139
Adj No. of Lanes	1	1	1	1	1	0	1	2	0	1	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	469	608	620	458	507	60	337	1150	340	260	705	733
Arrive On Green	0.10	0.33	0.33	0.08	0.31	0.31	0.07	0.43	0.43	0.02	0.38	0.38
Sat Flow, veh/h	1774	1863	1548	1774	1630	193	1774	2695	797	1774	1863	1536
Grp Volume(v), veh/h	201	224	112	160	0	246	161	450	439	19	425	139
Grp Sat Flow(s),veh/h/ln	1774	1863	1548	1774	0	1823	1774	1770	1722	1774	1863	1536
Q Serve(g_s), s	7.5	9.2	4.7	6.0	0.0	10.8	5.3	19.6	19.6	0.6	18.4	5.2
Cycle Q Clear(g_c), s	7.5	9.2	4.7	6.0	0.0	10.8	5.3	19.6	19.6	0.6	18.4	5.2
Prop In Lane	1.00		1.00	1.00		0.11	1.00		0.46	1.00		1.00
Lane Grp Cap(c), veh/h	469	608	620	458	0	567	337	755	735	260	705	733
V/C Ratio(X)	0.43	0.37	0.18	0.35	0.00	0.43	0.48	0.60	0.60	0.07	0.60	0.19
Avail Cap(c_a), veh/h	513	608	620	529	0	567	449	755	735	429	705	733
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.3	25.8	19.5	20.7	0.0	27.4	18.8	22.0	22.0	19.1	26.0	15.2
Incr Delay (d2), s/veh	0.2	1.7	0.6	0.2	0.0	2.4	0.4	3.5	3.6	0.0	3.8	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.2	0.0
%ile BackOfQ(50%),veh/ln	3.7	5.0	2.1	2.9	0.0	5.8	2.6	10.2	10.0	0.3	12.9	2.3
LnGrp Delay(d),s/veh	20.5	27.5	20.1	20.9	0.0	29.9	19.2	25.5	25.6	19.2	35.1	15.8
LnGrp LOS	C	C	C	C		C	B	C	C	B	D	B
Approach Vol, veh/h		537			406			1050			583	
Approach Delay, s/veh		23.3			26.3			24.6			30.0	
Approach LOS		C			C			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	11.0	36.5	10.3	42.2	12.6	35.0	5.5	47.0
Change Period (Y+Rc), s	3.0	3.9	3.0	* 4.3	3.0	3.9	3.0	4.3
Max Green Setting (Gmax), s	12.0	31.1	12.0	* 31	12.0	31.1	12.0	30.7
Max Q Clear Time (g_c+I1), s	13.0	11.2	7.3	20.4	9.5	12.8	2.6	21.6
Green Ext Time (p_c), s	0.1	1.6	0.1	1.6	0.1	1.3	0.0	2.8

Intersection Summary	
HCM 2010 Ctrl Delay	25.8
HCM 2010 LOS	C

Notes

HCM 2010 Signalized Intersection Summary
3: Corby Avenue & Hearn Avenue

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	76	526	184	408	610	99	116	204	833	82	101	122
Future Volume (veh/h)	76	526	184	408	610	99	116	204	833	82	101	122
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	1	7	4	1	1	0	0	2	3	0	1	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		0.98
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	1863	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	76	526	174	408	610	96	116	204	780	82	101	121
Adj No. of Lanes	1	1	1	1	2	0	1	1	1	1	1	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	100	655	541	452	1676	262	113	422	777	104	216	200
Arrive On Green	0.05	0.35	0.35	0.25	0.55	0.55	0.06	0.23	0.23	0.06	0.22	0.22
Sat Flow, veh/h	1774	1863	1549	1774	3055	480	1774	1863	1581	1774	766	918
Grp Volume(v), veh/h	76	526	174	408	353	353	116	204	780	82	0	222
Grp Sat Flow(s),veh/h/ln	1774	1863	1549	1774	1770	1766	1774	1863	1581	1774	0	1684
Q Serve(g_s), s	4.7	28.2	9.1	24.5	12.4	12.4	7.0	10.5	24.8	5.0	0.0	13.0
Cycle Q Clear(g_c), s	4.7	28.2	9.1	24.5	12.4	12.4	7.0	10.5	24.8	5.0	0.0	13.0
Prop In Lane	1.00		1.00	1.00		0.27	1.00		1.00	1.00		0.55
Lane Grp Cap(c), veh/h	100	655	541	452	970	968	113	422	777	104	0	373
V/C Ratio(X)	0.76	0.80	0.32	0.90	0.36	0.36	1.03	0.48	1.00	0.79	0.00	0.59
Avail Cap(c_a), veh/h	161	649	540	452	970	968	113	420	760	177	0	444
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.77	0.77	0.77	0.78	0.78	0.78	1.00	0.00	1.00
Uniform Delay (d), s/veh	51.3	32.9	26.6	39.8	14.1	14.1	51.5	37.1	28.0	51.1	0.0	38.5
Incr Delay (d2), s/veh	4.4	10.0	1.6	19.8	0.8	0.8	82.4	0.3	29.6	4.8	0.0	0.6
Initial Q Delay(d3),s/veh	3.0	4.2	0.6	0.4	0.0	0.0	0.4	0.3	13.8	0.0	0.0	0.1
%ile BackOfQ(50%),veh/ln	2.6	18.2	4.7	14.7	6.3	6.3	6.0	5.7	32.8	2.6	0.0	6.2
LnGrp Delay(d),s/veh	58.6	47.1	28.8	59.9	14.9	14.9	134.3	37.7	71.4	55.9	0.0	39.2
LnGrp LOS	E	D	C	E	B	B	F	D	F	E		D
Approach Vol, veh/h		776			1114			1100			304	
Approach Delay, s/veh		44.2			31.4			71.8			43.7	
Approach LOS		D			C			E			D	

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	11.0	41.5	10.0	27.5	9.0	63.5	9.5	28.0
Change Period (Y+Rc), s	3.0	3.2	3.0	* 3.2	3.0	3.2	3.0	3.2
Max Green Setting (Gmax), s	28.0	33.8	7.0	* 29	10.0	51.8	11.0	24.8
Max Q Clear Time (g_c+I1), s	26.5	30.2	9.0	15.0	6.7	14.4	7.0	26.8
Green Ext Time (p_c), s	0.2	2.1	0.0	0.7	0.0	5.1	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	49.0
HCM 2010 LOS	D

Notes

HCM 2010 Signalized Intersection Summary
4: Santa Rosa Avenue & Hearn Avenue/Private Driveway

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	537	7	885	5	7	15	619	1029	0	5	622	485
Future Volume (veh/h)	537	7	885	5	7	15	619	1029	0	5	622	485
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	1	1	0	0	0	1	1	0	0	0	1
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.99
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	1863	1900	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	542	0	714	5	7	11	619	1029	0	5	622	472
Adj No. of Lanes	2	0	1	0	1	0	2	3	0	1	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	822	0	690	8	12	18	703	3210	0	11	1520	1039
Arrive On Green	0.23	0.00	0.23	0.02	0.02	0.02	0.20	0.63	0.00	0.00	0.29	0.29
Sat Flow, veh/h	3548	0	1559	370	518	813	3442	5253	0	1774	3539	1560
Grp Volume(v), veh/h	542	0	714	23	0	0	619	1029	0	5	622	472
Grp Sat Flow(s),veh/h/ln	1774	0	1559	1701	0	0	1721	1695	0	1774	1770	1560
Q Serve(g_s), s	16.6	0.0	27.8	1.6	0.0	0.0	21.0	11.2	0.0	0.3	17.0	19.2
Cycle Q Clear(g_c), s	16.6	0.0	27.8	1.6	0.0	0.0	21.0	11.2	0.0	0.3	17.0	19.2
Prop In Lane	1.00		1.00	0.22		0.48	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	822	0	690	38	0	0	703	3210	0	11	1520	1039
V/C Ratio(X)	0.66	0.00	1.03	0.61	0.00	0.00	0.88	0.32	0.00	0.44	0.41	0.45
Avail Cap(c_a), veh/h	822	0	683	128	0	0	855	3210	0	130	1525	1039
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67
Upstream Filter(I)	0.29	0.00	0.29	1.00	0.00	0.00	0.71	0.71	0.00	0.96	0.96	0.96
Uniform Delay (d), s/veh	41.8	0.0	33.5	58.1	0.0	0.0	46.4	10.2	0.0	59.5	30.4	12.7
Incr Delay (d2), s/veh	0.6	0.0	28.0	5.7	0.0	0.0	6.8	0.2	0.0	9.3	0.8	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	5.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.2	0.0	18.2	0.8	0.0	0.0	10.7	5.4	0.0	0.2	8.5	14.5
LnGrp Delay(d),s/veh	42.4	0.0	66.6	63.8	0.0	0.0	53.3	10.4	0.0	68.8	31.2	14.0
LnGrp LOS	D		F	E			D	B		E	C	B
Approach Vol, veh/h		1256			23			1648			1099	
Approach Delay, s/veh		56.1			63.8			26.5			24.0	
Approach LOS		E			E			C			C	

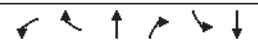
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		31.0	28.0	55.3		5.7	4.0	79.4
Change Period (Y+Rc), s		3.2	3.6	* 3.6		3.0	3.2	3.6
Max Green Setting (Gmax), s		27.8	29.8	* 40		9.0	8.8	61.4
Max Q Clear Time (g_c+I1), s		29.8	23.0	21.2		3.6	2.3	13.2
Green Ext Time (p_c), s		0.0	1.4	6.1		0.0	0.0	9.5

Intersection Summary	
HCM 2010 Ctrl Delay	35.3
HCM 2010 LOS	D

Notes

HCM 2010 Signalized Intersection Summary
5: Corby Avenue & US 101 SB Ramps

01/31/2019



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	252	556	584	106	296	385
Future Volume (veh/h)	252	556	584	106	296	385
Number	7	14	6	16	5	2
Initial Q (Qb), veh	13	0	0	0	0	1
Ped-Bike Adj(A_pbT)	1.00	1.00		0.98	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	1863
Adj Flow Rate, veh/h	252	550	584	104	227	482
Adj No. of Lanes	1	1	2	1	1	2
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	581	858	918	402	383	786
Arrive On Green	0.32	0.32	0.26	0.26	0.21	0.21
Sat Flow, veh/h	1774	1583	3632	1549	1774	3725
Grp Volume(v), veh/h	252	550	584	104	227	482
Grp Sat Flow(s),veh/h/ln	1774	1583	1770	1549	1774	1863
Q Serve(g_s), s	6.3	14.0	8.3	3.0	6.6	6.6
Cycle Q Clear(g_c), s	6.3	14.0	8.3	3.0	6.6	6.6
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	581	858	918	402	383	786
V/C Ratio(X)	0.43	0.64	0.64	0.26	0.59	0.61
Avail Cap(c_a), veh/h	846	1088	2188	958	689	1448
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	16.6	9.3	19.2	17.2	20.5	20.3
Incr Delay (d2), s/veh	0.5	0.8	0.7	0.3	1.5	0.8
Initial Q Delay(d3),s/veh	6.4	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	8.9	4.2	1.4	3.4	3.6
LnGrp Delay(d),s/veh	23.5	10.1	19.9	17.5	21.9	21.1
LnGrp LOS	C	B	B	B	C	C
Approach Vol, veh/h	802		688			709
Approach Delay, s/veh	14.4		19.6			21.4
Approach LOS	B		B			C

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		15.9		21.9		18.8		
Change Period (Y+Rc), s		4.0		3.5		4.0		
Max Green Setting (Gmax), s		22.0		27.0		35.0		
Max Q Clear Time (g_c+I1), s		8.6		16.0		10.3		
Green Ext Time (p_c), s		3.3		2.4		4.6		

Intersection Summary	
HCM 2010 Ctrl Delay	18.3
HCM 2010 LOS	B

Notes

HCM 2010 Signalized Intersection Summary
6: Santa Rosa Avenue & US 101 NB Ramps/Yolanda Ave

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	331	181	40	131	310	284	345	948	188	242	930	332
Future Volume (veh/h)	331	181	40	131	310	284	345	948	188	242	930	332
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	2	0	0	1	1	0	2	1	0	0	0	1
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.98
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	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	331	181	33	131	310	265	345	948	184	242	930	316
Adj No. of Lanes	2	1	1	1	1	1	2	2	1	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	396	217	184	302	317	269	409	1760	767	326	1687	914
Arrive On Green	0.11	0.12	0.12	0.17	0.17	0.17	0.12	0.50	0.50	0.09	0.47	0.47
Sat Flow, veh/h	3442	1863	1583	1774	1863	1583	3442	3539	1535	3442	3539	1557
Grp Volume(v), veh/h	331	181	33	131	310	265	345	948	184	242	930	316
Grp Sat Flow(s),veh/h/ln	1721	1863	1583	1774	1863	1583	1721	1770	1535	1721	1770	1557
Q Serve(g_s), s	11.3	11.4	1.8	7.9	19.9	16.3	11.8	22.1	8.2	8.3	22.6	12.7
Cycle Q Clear(g_c), s	11.3	11.4	1.8	7.9	19.9	16.3	11.8	22.1	8.2	8.3	22.6	12.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	396	217	184	302	317	269	409	1760	767	326	1687	914
V/C Ratio(X)	0.84	0.84	0.18	0.43	0.98	0.98	0.84	0.54	0.24	0.74	0.55	0.35
Avail Cap(c_a), veh/h	462	317	269	302	317	269	470	1760	763	470	1667	913
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.09	0.09	0.09	1.00	1.00	1.00	0.53	0.53	0.53
Uniform Delay (d), s/veh	52.1	51.9	31.3	44.7	49.7	33.4	51.9	20.8	17.1	52.9	22.3	13.0
Incr Delay (d2), s/veh	11.2	12.0	0.5	0.1	10.8	13.0	11.7	1.2	0.7	2.0	0.7	0.6
Initial Q Delay(d3),s/veh	1.1	0.0	0.0	0.1	3.4	0.0	1.1	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.2	6.6	0.8	4.1	11.6	8.2	6.5	11.2	3.6	4.0	11.0	5.7
LnGrp Delay(d),s/veh	64.5	63.9	31.8	44.9	63.9	46.5	64.7	21.9	17.8	54.9	23.0	13.6
LnGrp LOS	E	E	C	D	E	D	E	C	B	D	C	B
Approach Vol, veh/h		545			706			1477			1488	
Approach Delay, s/veh		62.3			53.8			31.4			26.2	
Approach LOS		E			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	24.3	17.6	17.7	60.4	17.5	24.3	14.6	63.6
Change Period (Y+Rc), s	3.9	3.6	3.6	3.9	3.9	* 3.9	3.9	* 3.9
Max Green Setting (Gmax), s	16.1	20.4	16.4	52.1	16.1	* 20	16.4	* 52
Max Q Clear Time (g_c+I1), s	19.3	13.4	13.8	24.6	13.3	21.9	10.3	24.1
Green Ext Time (p_c), s	0.1	0.5	0.3	9.0	0.3	0.0	0.4	8.6

Intersection Summary	
HCM 2010 Ctrl Delay	37.3
HCM 2010 LOS	D

Notes

HCM 2010 Signalized Intersection Summary
7: Petaluma Hill Rd & Yolanda Ave

01/31/2019

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	417	101	285	808	681	276
Future Volume (veh/h)	417	101	285	808	681	276
Number	5	12	3	8	4	14
Initial Q (Qb), veh	1	0	0	0	5	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	1900	1863	1863	1863	1900
Adj Flow Rate, veh/h	417	72	285	808	681	270
Adj No. of Lanes	0	0	1	1	1	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	0	2	2	2	2
Cap, veh/h	441	21	251	1229	778	117
Arrive On Green	0.26	0.26	0.14	0.66	0.49	0.49
Sat Flow, veh/h	1484	256	1774	1863	1260	500
Grp Volume(v), veh/h	490	0	285	808	0	951
Grp Sat Flow(s),veh/h/ln	1743	0	1774	1863	0	1760
Q Serve(g_s), s	31.4	0.0	17.0	31.3	0.0	59.2
Cycle Q Clear(g_c), s	31.4	0.0	17.0	31.3	0.0	59.2
Prop In Lane	0.85	0.15	1.00			0.28
Lane Grp Cap(c), veh/h	462	0	251	1229	0	895
V/C Ratio(X)	1.06	0.00	1.13	0.66	0.00	1.06
Avail Cap(c_a), veh/h	456	0	251	1229	0	868
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	44.3	0.0	51.5	12.2	0.0	30.4
Incr Delay (d2), s/veh	59.1	0.0	97.7	1.3	0.0	48.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	18.7
%ile BackOfQ(50%),veh/ln	22.8	0.0	15.1	16.4	0.0	46.6
LnGrp Delay(d),s/veh	103.4	0.0	149.2	13.5	0.0	97.3
LnGrp LOS	F		F	B		F
Approach Vol, veh/h	490			1093	951	
Approach Delay, s/veh	103.4			48.9	97.3	
Approach LOS	F			D	F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		35.0	20.0	65.0				85.0
Change Period (Y+Rc), s		3.6	3.0	5.8				5.8
Max Green Setting (Gmax), s		31.4	17.0	59.2				79.2
Max Q Clear Time (g_c+I1), s		33.4	19.0	61.2				33.3
Green Ext Time (p_c), s		0.0	0.0	0.0				6.4

Intersection Summary	
HCM 2010 Ctrl Delay	77.6
HCM 2010 LOS	E

Notes

HCM 2010 Signalized Intersection Summary
7: Petaluma Hill Rd & Yolanda Ave

01/31/2019

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	417	101	285	808	681	276
Future Volume (veh/h)	417	101	285	808	681	276
Number	5	12	3	8	4	14
Initial Q (Qb), veh	1	0	0	0	5	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1900	1863	1863	1863	1863
Adj Flow Rate, veh/h	417	72	285	808	681	270
Adj No. of Lanes	0	0	1	1	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	0	2	2	2	2
Cap, veh/h	462	59	300	1110	732	606
Arrive On Green	0.30	0.30	0.17	0.59	0.39	0.39
Sat Flow, veh/h	1484	256	1774	1863	1863	1543
Grp Volume(v), veh/h	490	0	285	808	681	270
Grp Sat Flow(s),veh/h/ln	1743	0	1774	1863	1863	1543
Q Serve(g_s), s	24.2	0.0	14.0	27.3	30.9	11.4
Cycle Q Clear(g_c), s	24.2	0.0	14.0	27.3	30.9	11.4
Prop In Lane	0.85	0.15	1.00			1.00
Lane Grp Cap(c), veh/h	522	0	300	1110	732	606
V/C Ratio(X)	0.94	0.00	0.95	0.73	0.93	0.45
Avail Cap(c_a), veh/h	530	0	302	1138	757	627
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.6	0.0	36.5	12.8	26.2	19.8
Incr Delay (d2), s/veh	24.6	0.0	38.4	2.3	17.7	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	4.8	0.0
%ile BackOfQ(50%),veh/ln	15.6	0.0	10.1	14.7	21.3	4.9
LnGrp Delay(d),s/veh	55.2	0.0	74.9	15.1	48.8	20.3
LnGrp LOS	E		E	B	D	C
Approach Vol, veh/h	490			1093	951	
Approach Delay, s/veh	55.2			30.7	40.7	
Approach LOS	E			C	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		29.9	18.0	40.2				58.2
Change Period (Y+Rc), s		3.6	3.0	5.8				5.8
Max Green Setting (Gmax), s		26.8	15.0	35.8				53.8
Max Q Clear Time (g_c+I1), s		26.2	16.0	32.9				29.3
Green Ext Time (p_c), s		0.1	0.0	1.4				5.7

Intersection Summary	
HCM 2010 Ctrl Delay	39.2
HCM 2010 LOS	D

Notes

HCM 2010 Signalized Intersection Summary
1: Santa Rosa Ave & Kawana Springs Rd

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	0	3	516	0	231	1	1242	365	28	493	0
Future Volume (veh/h)	1	0	3	516	0	231	1	1242	365	28	493	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	10	0	5	0	10	5	5	10	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.99	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	1900	1863	1863	1863	1863	1863	1863	1863	1863	0
Adj Flow Rate, veh/h	1	0	2	516	0	163	1	1242	245	28	493	0
Adj No. of Lanes	0	1	0	2	0	1	1	2	1	1	3	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	0
Cap, veh/h	2	0	4	776	0	386	2	2081	1258	65	3206	0
Arrive On Green	0.00	0.00	0.00	0.21	0.00	0.21	0.00	0.60	0.60	0.03	0.63	0.00
Sat Flow, veh/h	535	0	1070	3548	0	1561	1774	3539	1541	1774	5253	0
Grp Volume(v), veh/h	3	0	0	516	0	163	1	1242	245	28	493	0
Grp Sat Flow(s),veh/h/ln	1605	0	0	1774	0	1561	1774	1770	1541	1774	1695	0
Q Serve(g_s), s	0.2	0.0	0.0	12.1	0.0	8.0	0.1	19.5	3.2	1.4	3.6	0.0
Cycle Q Clear(g_c), s	0.2	0.0	0.0	12.1	0.0	8.0	0.1	19.5	3.2	1.4	3.6	0.0
Prop In Lane	0.33		0.67	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	6	0	0	776	0	386	2	2081	1258	65	3206	0
V/C Ratio(X)	0.47	0.00	0.00	0.66	0.00	0.42	0.41	0.60	0.19	0.43	0.15	0.00
Avail Cap(c_a), veh/h	125	0	0	1029	0	497	138	2118	1259	126	3213	0
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	0.00	1.00	0.00	1.00	0.94	0.94	0.94	1.00	1.00	0.00
Uniform Delay (d), s/veh	44.7	0.0	0.0	32.6	0.0	29.0	44.9	12.3	2.0	42.9	7.0	0.0
Incr Delay (d2), s/veh	18.2	0.0	0.0	2.1	0.0	1.6	34.5	1.2	0.3	4.4	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	3.6	0.0	2.1	0.0	0.4	0.1	74.2	0.1	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	7.0	0.0	4.3	0.0	11.0	3.6	2.6	2.1	0.0
LnGrp Delay(d),s/veh	62.9	0.0	0.0	38.2	0.0	32.6	79.4	13.9	2.5	121.5	7.2	0.0
LnGrp LOS	E			D		C	E	B	A	F	A	
Approach Vol, veh/h		3			679			1488			521	
Approach Delay, s/veh		62.9			36.9			12.0			13.3	
Approach LOS		E			D			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		3.4	3.1	60.5		23.0	6.1	57.5
Change Period (Y+Rc), s		3.0	3.0	3.6		3.9	3.6	3.6
Max Green Setting (Gmax), s		7.0	7.0	36.4		26.1	6.4	36.4
Max Q Clear Time (g_c+I1), s		2.2	2.1	5.6		14.1	3.4	21.5
Green Ext Time (p_c), s		0.0	0.0	3.5		4.2	0.0	8.4

Intersection Summary	
HCM 2010 Ctrl Delay	18.6
HCM 2010 LOS	B

Notes

HCM 2010 Signalized Intersection Summary
2: Petaluma Hill Rd & Kawana Springs Rd

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	176	230	52	226	347	46	106	847	238	24	368	289
Future Volume (veh/h)	176	230	52	226	347	46	106	847	238	24	368	289
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	12	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.97
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	1863	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	176	230	12	226	347	35	106	847	211	24	368	217
Adj No. of Lanes	1	1	1	1	1	0	1	2	0	1	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	337	527	523	459	500	50	371	1269	316	231	800	802
Arrive On Green	0.09	0.28	0.28	0.11	0.30	0.30	0.05	0.45	0.45	0.03	0.43	0.43
Sat Flow, veh/h	1774	1863	1557	1774	1662	168	1774	2796	696	1774	1863	1544
Grp Volume(v), veh/h	176	230	12	226	0	382	106	536	522	24	368	217
Grp Sat Flow(s),veh/h/ln	1774	1863	1557	1774	0	1829	1774	1770	1722	1774	1863	1544
Q Serve(g_s), s	7.6	11.1	0.6	9.7	0.0	20.3	3.5	26.1	26.1	0.8	15.4	8.7
Cycle Q Clear(g_c), s	7.6	11.1	0.6	9.7	0.0	20.3	3.5	26.1	26.1	0.8	15.4	8.7
Prop In Lane	1.00		1.00	1.00		0.09	1.00		0.40	1.00		1.00
Lane Grp Cap(c), veh/h	337	527	523	459	0	551	371	803	782	231	800	802
V/C Ratio(X)	0.52	0.44	0.02	0.49	0.00	0.69	0.29	0.67	0.67	0.10	0.46	0.27
Avail Cap(c_a), veh/h	375	527	523	465	0	551	498	803	782	374	800	802
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.0	32.3	24.5	23.7	0.0	34.0	17.4	23.5	23.5	19.0	23.3	14.9
Incr Delay (d2), s/veh	0.5	2.6	0.1	0.3	0.0	7.0	0.2	4.4	4.5	0.1	1.9	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	3.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	6.1	0.3	4.7	0.0	11.3	1.7	13.6	13.3	0.4	10.9	3.9
LnGrp Delay(d),s/veh	26.5	34.9	24.6	24.0	0.0	41.0	17.5	27.9	28.0	19.1	28.2	15.7
LnGrp LOS	C	C	C	C		D	B	C	C	B	C	B
Approach Vol, veh/h		418			608			1164			609	
Approach Delay, s/veh		31.1			34.7			27.0			23.4	
Approach LOS		C			C			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	14.7	35.0	8.8	51.6	12.6	37.0	6.1	54.2
Change Period (Y+Rc), s	3.0	3.9	3.0	* 4.3	3.0	3.9	3.0	4.3
Max Green Setting (Gmax), s	12.0	31.1	12.0	* 41	12.0	31.1	12.0	40.7
Max Q Clear Time (g_c+I1), s	11.7	13.1	5.5	17.4	9.6	22.3	2.8	28.1
Green Ext Time (p_c), s	0.0	1.2	0.1	1.8	0.1	1.5	0.0	4.0

Intersection Summary	
HCM 2010 Ctrl Delay	28.5
HCM 2010 LOS	C

Notes

HCM 2010 Signalized Intersection Summary
3: Corby Avenue & Hearn Avenue

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	108	849	388	327	562	47	119	121	594	129	171	206
Future Volume (veh/h)	108	849	388	327	562	47	119	121	594	129	171	206
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	3	0	2	1	0	1	0	2	0	2	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	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	1863	1863	1863	1900
Adj Flow Rate, veh/h	108	849	378	327	562	46	119	121	548	129	171	206
Adj No. of Lanes	1	2	0	1	2	0	1	1	2	1	1	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	134	951	403	323	1648	134	129	428	1121	157	234	210
Arrive On Green	0.08	0.39	0.39	0.18	0.50	0.50	0.07	0.23	0.23	0.09	0.24	0.24
Sat Flow, veh/h	1774	2374	1051	1774	3308	270	1774	1863	2726	1774	769	926
Grp Volume(v), veh/h	108	632	595	327	300	308	119	121	548	129	0	377
Grp Sat Flow(s),veh/h/ln	1774	1770	1655	1774	1770	1808	1774	1863	1363	1774	0	1695
Q Serve(g_s), s	6.6	37.1	37.6	20.0	11.3	11.3	7.3	5.9	16.4	7.9	0.0	23.9
Cycle Q Clear(g_c), s	6.6	37.1	37.6	20.0	11.3	11.3	7.3	5.9	16.4	7.9	0.0	23.9
Prop In Lane	1.00		0.63	1.00		0.15	1.00		1.00	1.00		0.55
Lane Grp Cap(c), veh/h	134	696	653	323	881	901	129	428	1121	157	0	414
V/C Ratio(X)	0.81	0.91	0.91	1.01	0.34	0.34	0.92	0.28	0.49	0.82	0.00	0.91
Avail Cap(c_a), veh/h	210	693	648	323	881	900	129	420	1121	242	0	447
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.87	0.87	0.87	0.95	0.95	0.95	1.00	0.00	1.00
Uniform Delay (d), s/veh	50.0	31.6	31.8	45.0	16.7	16.7	50.8	34.9	24.3	49.3	0.0	40.7
Incr Delay (d2), s/veh	5.6	17.7	19.3	50.4	0.9	0.9	53.4	0.1	0.1	6.9	0.0	20.7
Initial Q Delay(d3),s/veh	0.0	0.4	0.4	21.9	0.0	0.0	5.6	0.0	0.0	0.0	0.0	1.9
%ile BackOfQ(50%),veh/ln	3.4	21.8	21.0	16.3	5.8	5.9	5.8	3.1	6.4	4.2	0.0	14.1
LnGrp Delay(d),s/veh	55.7	49.7	51.5	117.3	17.6	17.6	109.8	35.0	24.5	56.1	0.0	63.3
LnGrp LOS	E	D	D	F	B	B	F	D	C	E		E
Approach Vol, veh/h		1335			935			788			506	
Approach Delay, s/veh		51.0			52.5			39.0			61.5	
Approach LOS		D			D			D			E	

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	23.0	46.3	11.0	29.7	11.3	58.0	12.7	28.0
Change Period (Y+Rc), s	3.0	3.2	3.0	* 3.2	3.0	3.2	3.0	3.2
Max Green Setting (Gmax), s	20.0	40.8	8.0	* 29	13.0	47.8	15.0	21.8
Max Q Clear Time (g_c+I1), s	22.0	39.6	9.3	25.9	8.6	13.3	9.9	18.4
Green Ext Time (p_c), s	0.0	1.1	0.0	0.5	0.0	4.1	0.1	0.7

Intersection Summary	
HCM 2010 Ctrl Delay	50.2
HCM 2010 LOS	D

Notes

HCM 2010 Signalized Intersection Summary
4: Santa Rosa Avenue & Hearn Avenue/Private Driveway

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	610	3	953	3	4	4	363	819	1	2	397	578
Future Volume (veh/h)	610	3	953	3	4	4	363	819	1	2	397	578
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	1	1	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.97	1.00		0.98
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	1863	1900	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	612	0	799	3	4	3	363	819	1	2	397	575
Adj No. of Lanes	2	0	1	0	1	0	2	3	0	1	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	1232	0	802	6	9	6	555	2627	3	5	1196	1076
Arrive On Green	0.35	0.00	0.35	0.01	0.01	0.01	0.16	0.50	0.50	0.00	0.34	0.34
Sat Flow, veh/h	3548	0	1572	523	698	523	3442	5245	6	1774	3539	1556
Grp Volume(v), veh/h	612	0	799	10	0	0	363	529	291	2	397	575
Grp Sat Flow(s),veh/h/ln	1774	0	1572	1744	0	0	1721	1695	1861	1774	1770	1556
Q Serve(g_s), s	12.9	0.0	32.7	0.5	0.0	0.0	9.4	8.8	8.8	0.1	7.9	17.5
Cycle Q Clear(g_c), s	12.9	0.0	32.7	0.5	0.0	0.0	9.4	8.8	8.8	0.1	7.9	17.5
Prop In Lane	1.00		1.00	0.30		0.30	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	1232	0	802	21	0	0	555	1698	932	5	1196	1076
V/C Ratio(X)	0.50	0.00	1.00	0.47	0.00	0.00	0.65	0.31	0.31	0.42	0.33	0.53
Avail Cap(c_a), veh/h	1232	0	802	92	0	0	580	1698	932	93	1196	1076
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)	0.51	0.00	0.51	1.00	0.00	0.00	0.76	0.76	0.76	0.96	0.96	0.96
Uniform Delay (d), s/veh	24.4	0.0	23.3	46.6	0.0	0.0	37.3	14.0	14.0	47.3	23.4	7.5
Incr Delay (d2), s/veh	0.7	0.0	21.9	5.9	0.0	0.0	1.9	0.4	0.7	19.1	0.2	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.4	0.0	19.5	0.3	0.0	0.0	4.6	4.2	4.7	0.1	3.9	15.2
LnGrp Delay(d),s/veh	25.2	0.0	48.2	52.5	0.0	0.0	39.2	14.4	14.7	66.4	23.6	8.0
LnGrp LOS	C		D	D			D	B	B	E	C	A
Approach Vol, veh/h		1411			10			1183			974	
Approach Delay, s/veh		38.2			52.5			22.1			14.5	
Approach LOS		D			D			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		36.2	18.9	35.7		4.2	3.5	51.2
Change Period (Y+Rc), s		3.2	3.6	* 3.6		3.0	3.2	3.6
Max Green Setting (Gmax), s		33.0	16.0	* 28		5.0	5.0	39.0
Max Q Clear Time (g_c+I1), s		34.7	11.4	19.5		2.5	2.1	10.8
Green Ext Time (p_c), s		0.0	0.6	3.3		0.0	0.0	6.0

Intersection Summary	
HCM 2010 Ctrl Delay	26.5
HCM 2010 LOS	C

Notes

HCM 2010 Signalized Intersection Summary
5: Corby Avenue & US 101 SB Ramps

10/03/2018

Movement	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations								
Traffic Volume (veh/h)	558	558	286	41	666	227		
Future Volume (veh/h)	558	558	286	41	666	227		
Number	7	14	6	16	5	2		
Initial Q (Qb), veh	1	1	1	0	0	1		
Ped-Bike Adj(A_pbT)	1.00	1.00		0.98	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	1863		
Adj Flow Rate, veh/h	558	549	286	41	666	227		
Adj No. of Lanes	1	2	2	1	2	1		
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	657	1689	646	282	814	440		
Arrive On Green	0.37	0.37	0.18	0.18	0.24	0.24		
Sat Flow, veh/h	1774	2787	3632	1545	3442	1863		
Grp Volume(v), veh/h	558	549	286	41	666	227		
Grp Sat Flow(s),veh/h/ln	1774	1393	1770	1545	1721	1863		
Q Serve(g_s), s	15.7	5.3	3.9	1.2	10.0	5.8		
Cycle Q Clear(g_c), s	15.7	5.3	3.9	1.2	10.0	5.8		
Prop In Lane	1.00	1.00		1.00	1.00			
Lane Grp Cap(c), veh/h	657	1689	646	282	814	440		
V/C Ratio(X)	0.85	0.32	0.44	0.15	0.82	0.52		
Avail Cap(c_a), veh/h	770	1868	709	310	886	479		
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	15.8	5.3	19.8	18.7	19.7	18.2		
Incr Delay (d2), s/veh	7.9	0.1	0.5	0.2	5.7	0.9		
Initial Q Delay(d3),s/veh	0.1	0.0	0.0	0.0	0.0	0.1		
%ile BackOfQ(50%),veh/ln	9.2	3.3	2.0	0.5	5.4	3.2		
LnGrp Delay(d),s/veh	23.8	5.4	20.3	18.9	25.4	19.2		
LnGrp LOS	C	A	C	B	C	B		
Approach Vol, veh/h	1107		327			893		
Approach Delay, s/veh	14.7		20.2			23.8		
Approach LOS	B		C			C		

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		16.9		23.6		13.9		
Change Period (Y+Rc), s		4.0		3.5		4.0		
Max Green Setting (Gmax), s		14.0		23.6		10.9		
Max Q Clear Time (g_c+I1), s		12.0		17.7		5.9		
Green Ext Time (p_c), s		0.9		2.4		0.8		

Intersection Summary	
HCM 2010 Ctrl Delay	19.0
HCM 2010 LOS	B

HCM 2010 Signalized Intersection Summary
6: Santa Rosa Avenue & US 101 NB Ramps/Yolanda Ave

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	233	101	25	153	353	142	442	784	193	379	600	376
Future Volume (veh/h)	233	101	25	153	353	142	442	784	193	379	600	376
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	2	2	0	1	1	1	0	1	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
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	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	233	101	24	153	353	131	442	784	193	379	600	339
Adj No. of Lanes	2	1	1	1	1	1	2	2	1	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	300	146	124	415	416	373	392	1422	624	477	1505	775
Arrive On Green	0.09	0.08	0.08	0.23	0.22	0.22	0.11	0.40	0.40	0.13	0.43	0.43
Sat Flow, veh/h	3442	1863	1583	1774	1863	1583	3442	3539	1553	3442	3539	1553
Grp Volume(v), veh/h	233	101	24	153	353	131	442	784	193	379	600	339
Grp Sat Flow(s),veh/h/ln	1721	1863	1583	1774	1863	1583	1721	1770	1553	1721	1770	1553
Q Serve(g_s), s	6.6	5.3	1.1	7.2	18.2	5.1	11.4	17.0	8.5	10.7	11.7	13.6
Cycle Q Clear(g_c), s	6.6	5.3	1.1	7.2	18.2	5.1	11.4	17.0	8.5	10.7	11.7	13.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	300	146	124	415	416	373	392	1422	624	477	1505	775
V/C Ratio(X)	0.78	0.69	0.19	0.37	0.85	0.35	1.13	0.55	0.31	0.79	0.40	0.44
Avail Cap(c_a), veh/h	337	596	507	412	564	480	392	1429	627	578	1506	799
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	1.00	0.59	0.59	0.59
Uniform Delay (d), s/veh	44.7	44.9	27.5	32.3	37.4	16.5	44.3	23.0	20.5	41.7	19.9	16.2
Incr Delay (d2), s/veh	9.8	5.8	0.8	0.5	8.8	0.6	84.5	1.5	1.3	3.8	0.5	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.3	1.1	0.0	8.1	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	3.0	0.5	3.9	10.8	2.2	10.5	8.7	4.0	5.3	5.9	6.2
LnGrp Delay(d),s/veh	54.5	50.7	28.2	33.1	47.3	17.0	136.9	24.6	21.8	45.5	20.4	17.3
LnGrp LOS	D	D	C	C	D	B	F	C	C	D	C	B
Approach Vol, veh/h		358			637			1419			1318	
Approach Delay, s/veh		51.7			37.7			59.2			26.8	
Approach LOS		D			D			E			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	27.1	11.4	15.0	46.5	12.6	25.9	17.2	44.3
Change Period (Y+Rc), s	3.9	3.6	3.6	3.9	3.9	* 3.9	3.9	* 3.9
Max Green Setting (Gmax), s	8.1	32.0	11.4	33.5	9.8	* 30	16.8	* 28
Max Q Clear Time (g_c+I1), s	9.2	7.3	13.4	15.6	8.6	20.2	12.7	19.0
Green Ext Time (p_c), s	0.0	0.5	0.0	5.1	0.1	1.8	0.5	4.1

Intersection Summary	
HCM 2010 Ctrl Delay	43.4
HCM 2010 LOS	D

Notes

HCM 2010 Signalized Intersection Summary
7: Petaluma Hill Rd & Yolanda Ave

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	164	38	169	287	117	106	355	892	64	25	420	185
Future Volume (veh/h)	164	38	169	287	117	106	355	892	64	25	420	185
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	1	0	0	0	0	0	0	0	0	0	5	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
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	1863	1863	1863	1863
Adj Flow Rate, veh/h	164	38	130	287	117	106	355	892	64	25	420	160
Adj No. of Lanes	1	2	0	1	2	0	1	2	1	1	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	199	182	162	321	315	262	580	1870	1123	325	1482	826
Arrive On Green	0.11	0.10	0.10	0.18	0.17	0.17	0.13	0.53	0.53	0.02	0.42	0.42
Sat Flow, veh/h	1774	1770	1583	1774	1837	1526	1774	3539	1583	1774	3539	1549
Grp Volume(v), veh/h	164	38	130	287	112	111	355	892	64	25	420	160
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1593	1774	1770	1583	1774	1770	1549
Q Serve(g_s), s	10.0	2.2	8.8	17.4	6.2	6.8	11.8	17.5	1.3	0.9	8.6	5.9
Cycle Q Clear(g_c), s	10.0	2.2	8.8	17.4	6.2	6.8	11.8	17.5	1.3	0.9	8.6	5.9
Prop In Lane	1.00		1.00	1.00		0.96	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	199	182	162	321	304	273	580	1870	1123	325	1482	826
V/C Ratio(X)	0.82	0.21	0.80	0.89	0.37	0.40	0.61	0.48	0.06	0.08	0.28	0.19
Avail Cap(c_a), veh/h	295	290	259	444	438	394	744	1870	1123	362	1486	826
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	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.9	45.3	48.3	44.0	40.3	40.6	14.1	16.4	4.8	17.5	21.3	13.5
Incr Delay (d2), s/veh	11.2	0.6	8.8	15.7	0.7	1.0	1.1	0.9	0.1	0.1	0.5	0.5
Initial Q Delay(d3),s/veh	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
%ile BackOfQ(50%),veh/ln	5.7	1.1	4.3	9.9	3.1	3.1	6.0	8.8	0.6	0.4	4.7	2.6
LnGrp Delay(d),s/veh	60.0	45.8	57.1	59.7	41.1	41.5	15.1	17.2	4.9	17.6	21.9	14.0
LnGrp LOS	E	D	E	E	D	D	B	B	A	B	C	B
Approach Vol, veh/h		332			510			1311			605	
Approach Delay, s/veh		57.3			51.7			16.1			19.6	
Approach LOS		E			D			B			B	

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	24.4	15.8	19.1	50.7	16.7	23.5	7.2	62.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	27.5	18.0	24.5	22.0	18.3	27.2	5.0	41.5
Max Q Clear Time (g_c+I1), s	19.4	10.8	13.8	10.6	12.0	8.8	2.9	19.5
Green Ext Time (p_c), s	0.5	0.5	0.8	2.3	0.2	1.2	0.0	6.1

Intersection Summary	
HCM 2010 Ctrl Delay	28.4
HCM 2010 LOS	C

HCM 2010 Signalized Intersection Summary
1: Santa Rosa Ave & Kawana Springs Rd

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	588	0	229	0	1559	639	77	981	0
Future Volume (veh/h)	0	0	0	588	0	229	0	1559	639	77	981	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	10	0	5	0	10	5	5	10	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	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	1900	1863	1863	1863	1863	1863	1863	1863	1863	0
Adj Flow Rate, veh/h	0	0	0	588	0	145	0	1559	622	77	981	0
Adj No. of Lanes	0	1	0	2	0	1	1	2	1	1	3	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	0
Cap, veh/h	0	2	0	769	0	425	1	2234	1313	114	3693	0
Arrive On Green	0.00	0.00	0.00	0.21	0.00	0.21	0.00	0.64	0.64	0.06	0.73	0.00
Sat Flow, veh/h	0	1863	0	3548	0	1568	1774	3539	1530	1774	5253	0
Grp Volume(v), veh/h	0	0	0	588	0	145	0	1559	622	77	981	0
Grp Sat Flow(s),veh/h/ln	0	1863	0	1774	0	1568	1774	1770	1530	1774	1695	0
Q Serve(g_s), s	0.0	0.0	0.0	18.8	0.0	9.0	0.0	33.8	12.1	5.1	7.8	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	18.8	0.0	9.0	0.0	33.8	12.1	5.1	7.8	0.0
Prop In Lane	0.00		0.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	0	2	0	769	0	425	1	2234	1313	114	3693	0
V/C Ratio(X)	0.00	0.00	0.00	0.76	0.00	0.34	0.00	0.70	0.47	0.68	0.27	0.00
Avail Cap(c_a), veh/h	0	109	0	949	0	507	103	2271	1315	169	3698	0
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)	0.00	0.00	0.00	1.00	0.00	1.00	0.00	0.79	0.79	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	44.7	0.0	35.8	0.0	15.2	2.4	55.6	5.8	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	4.3	0.0	1.0	0.0	1.5	1.0	6.9	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	5.2	0.0	1.5	0.0	0.5	0.2	43.4	0.1	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	11.0	0.0	4.9	0.0	18.7	13.6	4.8	4.3	0.0
LnGrp Delay(d),s/veh	0.0	0.0	0.0	54.2	0.0	38.3	0.0	17.2	3.6	105.9	6.0	0.0
LnGrp LOS				D		D		B	A	F	A	
Approach Vol, veh/h		0			733			2181			1058	
Approach Delay, s/veh		0.0			51.1			13.3			13.3	
Approach LOS					D			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		0.0	0.0	90.9		29.1	10.2	80.6
Change Period (Y+Rc), s		3.0	3.0	3.6		3.9	3.6	3.6
Max Green Setting (Gmax), s		7.0	7.0	60.4		32.1	11.4	55.4
Max Q Clear Time (g_c+I1), s		0.0	0.0	9.8		20.8	7.1	35.8
Green Ext Time (p_c), s		0.0	0.0	8.5		4.3	0.0	13.9

Intersection Summary	
HCM 2010 Ctrl Delay	20.3
HCM 2010 LOS	C

Notes

HCM 2010 Signalized Intersection Summary
2: Petaluma Hill Rd & Kawana Springs Rd

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	267	436	129	175	339	40	134	676	310	30	417	367
Future Volume (veh/h)	267	436	129	175	339	40	134	676	310	30	417	367
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	12	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.98	1.00		0.98
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	1863	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	267	436	76	175	339	36	134	676	291	30	417	240
Adj No. of Lanes	1	1	1	1	1	0	1	2	0	1	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	414	638	642	350	513	55	301	946	407	223	680	750
Arrive On Green	0.12	0.34	0.34	0.09	0.31	0.31	0.06	0.40	0.40	0.03	0.37	0.37
Sat Flow, veh/h	1774	1863	1578	1774	1651	175	1774	2394	1031	1774	1863	1544
Grp Volume(v), veh/h	267	436	76	175	0	375	134	500	467	30	417	240
Grp Sat Flow(s),veh/h/ln	1774	1863	1578	1774	0	1826	1774	1770	1655	1774	1863	1544
Q Serve(g_s), s	9.8	20.1	3.0	6.6	0.0	17.8	4.5	23.8	23.8	1.0	18.3	9.5
Cycle Q Clear(g_c), s	9.8	20.1	3.0	6.6	0.0	17.8	4.5	23.8	23.8	1.0	18.3	9.5
Prop In Lane	1.00		1.00	1.00		0.10	1.00		0.62	1.00		1.00
Lane Grp Cap(c), veh/h	414	638	642	350	0	568	301	700	654	223	680	750
V/C Ratio(X)	0.65	0.68	0.12	0.50	0.00	0.66	0.45	0.71	0.71	0.13	0.61	0.32
Avail Cap(c_a), veh/h	418	638	642	410	0	568	425	700	654	376	680	750
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.6	28.2	18.5	22.0	0.0	29.9	19.8	25.5	25.5	20.6	27.0	15.8
Incr Delay (d2), s/veh	2.6	5.8	0.4	0.4	0.0	5.9	0.4	6.1	6.5	0.1	4.1	1.1
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	5.8	0.0
%ile BackOfQ(50%),veh/ln	5.0	11.3	1.4	3.2	0.0	9.9	2.2	12.7	12.0	0.5	13.0	4.3
LnGrp Delay(d),s/veh	23.2	34.0	18.9	22.4	0.0	35.8	20.2	31.6	32.0	20.7	36.9	17.0
LnGrp LOS	C	C	B	C		D	C	C	C	C	D	B
Approach Vol, veh/h		779			550			1101			687	
Approach Delay, s/veh		28.8			31.5			30.4			29.2	
Approach LOS		C			C			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	11.6	38.2	9.4	40.8	14.8	35.0	6.4	43.8
Change Period (Y+Rc), s	3.0	3.9	3.0	* 4.3	3.0	3.9	3.0	4.3
Max Green Setting (Gmax), s	12.0	31.1	12.0	* 31	12.0	31.1	12.0	30.7
Max Q Clear Time (g_c+I1), s	8.6	22.1	6.5	20.3	11.8	19.8	3.0	25.8
Green Ext Time (p_c), s	0.1	2.0	0.1	1.7	0.0	1.7	0.0	2.0

Intersection Summary	
HCM 2010 Ctrl Delay	30.0
HCM 2010 LOS	C

Notes

HCM 2010 Signalized Intersection Summary
3: Corby Avenue & Hearn Avenue

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	132	1040	184	279	990	170	116	204	739	261	159	324
Future Volume (veh/h)	132	1040	184	279	990	170	116	204	739	261	159	324
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	3	0	2	1	0	1	0	2	0	2	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	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	1863	1863	1863	1900
Adj Flow Rate, veh/h	132	1040	174	279	990	169	116	204	693	261	159	324
Adj No. of Lanes	1	2	0	1	2	0	1	1	2	1	1	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	161	1171	189	284	1364	231	124	364	978	292	223	278
Arrive On Green	0.09	0.38	0.38	0.16	0.45	0.45	0.07	0.20	0.20	0.16	0.29	0.29
Sat Flow, veh/h	1774	3027	505	1774	3015	514	1774	1863	2726	1774	547	1115
Grp Volume(v), veh/h	132	607	607	279	581	578	116	204	693	261	0	483
Grp Sat Flow(s),veh/h/ln	1774	1770	1763	1774	1770	1759	1774	1863	1363	1774	0	1662
Q Serve(g_s), s	7.3	32.2	32.4	15.7	26.8	26.9	6.5	9.9	19.5	14.4	0.0	29.0
Cycle Q Clear(g_c), s	7.3	32.2	32.4	15.7	26.8	26.9	6.5	9.9	19.5	14.4	0.0	29.0
Prop In Lane	1.00		0.29	1.00		0.29	1.00		1.00	1.00		0.67
Lane Grp Cap(c), veh/h	161	680	678	284	800	796	124	364	978	292	0	490
V/C Ratio(X)	0.82	0.89	0.89	0.98	0.73	0.73	0.93	0.56	0.71	0.89	0.00	0.99
Avail Cap(c_a), veh/h	195	677	675	284	800	795	124	364	978	319	0	482
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.64	0.64	0.64	0.85	0.85	0.85	1.00	0.00	1.00
Uniform Delay (d), s/veh	44.6	29.0	29.0	42.0	22.4	22.4	46.4	36.4	28.0	40.9	0.0	35.5
Incr Delay (d2), s/veh	16.8	16.4	16.7	38.8	3.7	3.8	54.4	1.0	1.7	23.1	0.0	37.2
Initial Q Delay(d3),s/veh	0.0	0.3	0.3	17.7	0.0	0.0	7.1	0.0	0.1	0.0	0.0	8.1
%ile BackOfQ(50%),veh/ln	4.3	19.1	19.1	12.3	14.0	13.9	5.4	5.2	8.6	8.9	0.0	19.7
LnGrp Delay(d),s/veh	61.5	45.7	46.0	98.5	26.1	26.2	107.8	37.4	29.8	64.0	0.0	80.8
LnGrp LOS	E	D	D	F	C	C	F	D	C	E		F
Approach Vol, veh/h		1346			1438			1013			744	
Approach Delay, s/veh		47.4			40.2			40.3			74.9	
Approach LOS		D			D			D			E	

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	19.0	41.5	10.0	32.2	12.1	48.4	19.5	22.7
Change Period (Y+Rc), s	3.0	3.2	3.0	* 3.2	3.0	3.2	3.0	3.2
Max Green Setting (Gmax), s	16.0	35.8	7.0	* 29	11.0	40.8	18.0	17.8
Max Q Clear Time (g_c+I1), s	17.7	34.4	8.5	31.0	9.3	28.9	16.4	21.5
Green Ext Time (p_c), s	0.0	1.2	0.0	0.0	0.0	6.1	0.1	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	48.0
HCM 2010 LOS	D

Notes

HCM 2010 Signalized Intersection Summary
4: Santa Rosa Avenue & Hearn Avenue/Private Driveway

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	927	7	1061	5	7	15	667	1348	0	5	754	765
Future Volume (veh/h)	927	7	1061	5	7	15	667	1348	0	5	754	765
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	1	1	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		0.98
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	1863	1900	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	932	0	907	5	7	14	667	1348	0	5	754	762
Adj No. of Lanes	2	0	1	0	1	0	2	3	0	1	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	1018	0	882	8	11	22	938	2894	0	11	1060	920
Arrive On Green	0.29	0.00	0.29	0.02	0.02	0.02	0.27	0.57	0.00	0.01	0.30	0.30
Sat Flow, veh/h	3548	0	1570	324	454	908	3442	5253	0	1774	3539	1555
Grp Volume(v), veh/h	932	0	907	26	0	0	667	1348	0	5	754	762
Grp Sat Flow(s),veh/h/ln	1774	0	1570	1686	0	0	1721	1695	0	1774	1770	1555
Q Serve(g_s), s	29.2	0.0	33.0	1.8	0.0	0.0	20.1	17.9	0.0	0.3	21.8	34.4
Cycle Q Clear(g_c), s	29.2	0.0	33.0	1.8	0.0	0.0	20.1	17.9	0.0	0.3	21.8	34.4
Prop In Lane	1.00		1.00	0.19		0.54	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	1018	0	882	41	0	0	938	2894	0	11	1060	920
V/C Ratio(X)	0.92	0.00	1.03	0.63	0.00	0.00	0.71	0.47	0.00	0.44	0.71	0.83
Avail Cap(c_a), veh/h	1018	0	882	73	0	0	1077	2894	0	77	1060	920
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)	0.36	0.00	0.36	1.00	0.00	0.00	0.45	0.45	0.00	0.93	0.93	0.93
Uniform Delay (d), s/veh	39.6	0.0	25.3	55.6	0.0	0.0	37.7	14.5	0.0	56.9	35.9	17.0
Incr Delay (d2), s/veh	5.9	0.0	25.8	5.7	0.0	0.0	0.9	0.2	0.0	8.9	2.1	6.0
Initial Q Delay(d3),s/veh	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.1	0.0	21.2	0.9	0.0	0.0	9.7	8.4	0.0	0.2	11.0	25.7
LnGrp Delay(d),s/veh	45.5	0.0	55.0	61.3	0.0	0.0	38.6	14.8	0.0	65.8	38.0	22.9
LnGrp LOS	D		F	E			D	B		E	D	C
Approach Vol, veh/h		1839			26			2015			1521	
Approach Delay, s/veh		50.2			61.3			22.7			30.5	
Approach LOS		D			E			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		36.2	34.9	38.0		5.8	3.9	69.0
Change Period (Y+Rc), s		3.2	3.6	* 3.6		3.0	3.2	3.6
Max Green Setting (Gmax), s		33.0	36.0	* 28		5.0	5.0	59.0
Max Q Clear Time (g_c+I1), s		35.0	22.1	36.4		3.8	2.3	19.9
Green Ext Time (p_c), s		0.0	2.2	0.0		0.0	0.0	13.4

Intersection Summary	
HCM 2010 Ctrl Delay	34.4
HCM 2010 LOS	C

Notes

HCM 2010 Signalized Intersection Summary
5: Corby Avenue & US 101 SB Ramps

10/03/2018

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	304	458	614	116	296	344
Future Volume (veh/h)	304	458	614	116	296	344
Number	7	14	6	16	5	2
Initial Q (Qb), veh	1	1	1	0	0	1
Ped-Bike Adj(A_pbT)	1.00	1.00		0.98	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	1863
Adj Flow Rate, veh/h	304	449	614	116	296	344
Adj No. of Lanes	1	2	2	1	2	1
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	415	1338	877	383	849	460
Arrive On Green	0.23	0.23	0.25	0.25	0.25	0.25
Sat Flow, veh/h	1774	2787	3632	1547	3442	1863
Grp Volume(v), veh/h	304	449	614	116	296	344
Grp Sat Flow(s),veh/h/ln	1774	1393	1770	1547	1721	1863
Q Serve(g_s), s	6.7	4.2	6.7	2.6	3.0	7.2
Cycle Q Clear(g_c), s	6.7	4.2	6.7	2.6	3.0	7.2
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	415	1338	877	383	849	460
V/C Ratio(X)	0.73	0.34	0.70	0.30	0.35	0.75
Avail Cap(c_a), veh/h	526	1512	1090	477	1060	574
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	15.1	6.8	14.5	12.9	13.1	14.8
Incr Delay (d2), s/veh	3.9	0.1	1.5	0.4	0.2	4.2
Initial Q Delay(d3),s/veh	0.2	0.0	0.0	0.0	0.0	0.1
%ile BackOfQ(50%),veh/ln	3.8	2.4	3.5	1.1	1.4	4.3
LnGrp Delay(d),s/veh	19.1	7.0	16.0	13.4	13.4	19.1
LnGrp LOS	B	A	B	B	B	B
Approach Vol, veh/h	753		730			640
Approach Delay, s/veh	11.9		15.6			16.5
Approach LOS	B		B			B

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		14.4		13.4		14.4		
Change Period (Y+Rc), s		4.0		3.5		4.0		
Max Green Setting (Gmax), s		13.0		12.5		13.0		
Max Q Clear Time (g_c+I1), s		9.2		8.7		8.7		
Green Ext Time (p_c), s		1.2		1.2		1.8		

Intersection Summary	
HCM 2010 Ctrl Delay	14.5
HCM 2010 LOS	B

HCM 2010 Signalized Intersection Summary
6: Santa Rosa Avenue & US 101 NB Ramps/Yolanda Ave

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	530	111	56	184	302	292	345	1105	347	337	1086	364
Future Volume (veh/h)	530	111	56	184	302	292	345	1105	347	337	1086	364
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	2	2	0	1	1	1	0	1	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
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	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	530	111	55	184	302	281	345	1105	347	337	1086	327
Adj No. of Lanes	2	1	1	1	1	1	2	2	1	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	601	158	135	504	360	316	344	1295	572	375	1345	854
Arrive On Green	0.17	0.08	0.08	0.28	0.19	0.19	0.10	0.37	0.37	0.11	0.38	0.38
Sat Flow, veh/h	3442	1863	1583	1774	1863	1583	3442	3539	1552	3442	3539	1551
Grp Volume(v), veh/h	530	111	55	184	302	281	345	1105	347	337	1086	327
Grp Sat Flow(s),veh/h/ln	1721	1863	1583	1774	1863	1583	1721	1770	1552	1721	1770	1551
Q Serve(g_s), s	15.0	5.8	2.7	8.3	15.7	13.4	10.0	28.6	18.1	9.7	27.4	11.9
Cycle Q Clear(g_c), s	15.0	5.8	2.7	8.3	15.7	13.4	10.0	28.6	18.1	9.7	27.4	11.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	601	158	135	504	360	316	344	1295	572	375	1345	854
V/C Ratio(X)	0.88	0.70	0.41	0.36	0.84	0.89	1.00	0.85	0.61	0.90	0.81	0.38
Avail Cap(c_a), veh/h	650	596	507	503	438	372	344	1308	574	375	1350	868
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	1.00	0.19	0.19	0.19
Uniform Delay (d), s/veh	40.3	44.5	28.6	28.7	39.0	22.9	45.0	29.3	25.8	44.0	27.8	13.0
Incr Delay (d2), s/veh	12.8	5.5	2.0	0.4	11.5	19.9	49.1	7.3	4.7	5.9	1.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.2	1.4	0.0	10.5	0.0	0.1	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.2	3.2	1.2	4.4	9.6	7.5	7.6	15.4	8.6	4.9	13.6	5.2
LnGrp Delay(d),s/veh	53.1	50.1	30.6	29.4	51.9	42.8	104.6	36.6	30.6	49.9	28.9	13.3
LnGrp LOS	D	D	C	C	D	D	F	D	C	D	C	B
Approach Vol, veh/h		696			767			1797			1750	
Approach Delay, s/veh		50.8			43.1			48.5			30.0	
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	32.2	12.1	13.6	42.1	21.4	23.0	14.8	40.9
Change Period (Y+Rc), s	3.9	3.6	3.6	3.9	3.9	* 3.9	3.9	* 3.9
Max Green Setting (Gmax), s	10.4	32.0	10.0	32.6	18.9	* 24	10.9	* 32
Max Q Clear Time (g_c+I1), s	10.3	7.8	12.0	29.4	17.0	17.7	11.7	30.6
Green Ext Time (p_c), s	0.0	0.7	0.0	2.3	0.4	1.4	0.0	0.8

Intersection Summary	
HCM 2010 Ctrl Delay	41.5
HCM 2010 LOS	D

Notes

HCM 2010 Signalized Intersection Summary
7: Petaluma Hill Rd & Yolanda Ave

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	259	256	252	288	155	86	359	832	230	29	683	107
Future Volume (veh/h)	259	256	252	288	155	86	359	832	230	29	683	107
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	1	0	0	0	0	0	0	0	0	0	5	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
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	1863	1863	1863	1863
Adj Flow Rate, veh/h	259	256	213	288	155	86	359	832	230	29	683	82
Adj No. of Lanes	1	2	0	1	2	0	1	2	1	1	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	295	318	255	321	415	219	441	1487	952	259	1024	711
Arrive On Green	0.17	0.17	0.17	0.18	0.19	0.19	0.16	0.42	0.42	0.03	0.29	0.29
Sat Flow, veh/h	1774	1869	1499	1774	2242	1182	1774	3539	1583	1774	3539	1548
Grp Volume(v), veh/h	259	242	227	288	121	120	359	832	230	29	683	82
Grp Sat Flow(s),veh/h/ln	1774	1770	1598	1774	1770	1654	1774	1770	1583	1774	1770	1548
Q Serve(g_s), s	12.8	11.8	12.4	14.3	5.4	5.8	12.1	16.0	6.1	1.0	15.3	2.7
Cycle Q Clear(g_c), s	12.8	11.8	12.4	14.3	5.4	5.8	12.1	16.0	6.1	1.0	15.3	2.7
Prop In Lane	1.00		0.94	1.00		0.71	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	295	301	272	321	328	306	441	1487	952	259	1024	711
V/C Ratio(X)	0.88	0.80	0.83	0.90	0.37	0.39	0.81	0.56	0.24	0.11	0.67	0.12
Avail Cap(c_a), veh/h	306	354	320	325	374	349	470	1487	952	307	1027	711
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	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.7	35.9	36.1	36.0	32.1	32.2	19.3	19.8	8.4	21.4	28.4	14.1
Incr Delay (d2), s/veh	23.6	10.9	15.2	25.7	0.7	0.8	10.1	1.5	0.6	0.2	3.4	0.3
Initial Q Delay(d3),s/veh	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0
%ile BackOfQ(50%),veh/ln	8.4	6.7	6.6	9.3	2.7	2.7	7.2	8.1	2.8	0.5	8.3	1.2
LnGrp Delay(d),s/veh	61.0	46.8	51.3	61.7	32.7	33.0	29.4	21.3	9.0	21.6	32.3	14.4
LnGrp LOS	E	D	D	E	C	C	C	C	A	C	C	B
Approach Vol, veh/h		728			529			1421			794	
Approach Delay, s/veh		53.3			48.6			21.4			30.1	
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	20.8	19.8	18.8	30.6	19.4	21.2	7.1	42.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	16.5	18.0	15.5	22.0	15.5	19.0	5.0	32.5
Max Q Clear Time (g_c+I1), s	16.3	14.4	14.1	17.3	14.8	7.8	3.0	18.0
Green Ext Time (p_c), s	0.0	1.0	0.2	1.9	0.1	1.0	0.0	5.3

Intersection Summary	
HCM 2010 Ctrl Delay	34.2
HCM 2010 LOS	C

HCM 2010 Signalized Intersection Summary
1: Santa Rosa Ave & Kawana Springs Rd

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	0	3	279	0	165	2	870	252	26	360	0
Future Volume (veh/h)	1	0	3	279	0	165	2	870	252	26	360	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	15	0	3	0	18	3	4	9	0
Ped-Bike Adj(A_pbT)	1.00		0.97	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	1900	1863	1863	1863	1863	1863	1863	1863	1863	0
Adj Flow Rate, veh/h	1	0	2	279	0	97	2	870	132	26	360	0
Adj No. of Lanes	0	1	0	2	0	1	1	2	1	1	3	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	0
Cap, veh/h	2	0	4	553	0	273	5	2307	1259	60	3544	0
Arrive On Green	0.00	0.00	0.00	0.14	0.00	0.14	0.00	0.67	0.67	0.03	0.70	0.00
Sat Flow, veh/h	535	0	1070	3548	0	1550	1774	3539	1542	1774	5253	0
Grp Volume(v), veh/h	3	0	0	279	0	97	2	870	132	26	360	0
Grp Sat Flow(s),veh/h/ln	1605	0	0	1774	0	1550	1774	1770	1542	1774	1695	0
Q Serve(g_s), s	0.2	0.0	0.0	6.6	0.0	5.0	0.1	9.7	1.6	1.3	2.1	0.0
Cycle Q Clear(g_c), s	0.2	0.0	0.0	6.6	0.0	5.0	0.1	9.7	1.6	1.3	2.1	0.0
Prop In Lane	0.33		0.67	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	6	0	0	553	0	273	5	2307	1259	60	3544	0
V/C Ratio(X)	0.47	0.00	0.00	0.50	0.00	0.35	0.42	0.38	0.10	0.44	0.10	0.00
Avail Cap(c_a), veh/h	125	0	0	1029	0	492	138	2366	1259	126	3555	0
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	0.00	1.00	0.00	1.00	0.98	0.98	0.98	1.00	1.00	0.00
Uniform Delay (d), s/veh	44.7	0.0	0.0	35.5	0.0	32.9	44.8	8.0	1.8	43.0	4.6	0.0
Incr Delay (d2), s/veh	18.2	0.0	0.0	1.5	0.0	1.7	19.6	0.5	0.2	4.9	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	10.7	0.0	1.3	0.0	0.7	0.0	57.2	0.1	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	4.9	0.0	2.6	0.1	6.5	1.6	2.1	1.3	0.0
LnGrp Delay(d),s/veh	62.9	0.0	0.0	47.7	0.0	35.9	64.4	9.2	2.0	105.1	4.7	0.0
LnGrp LOS	E			D		D	E	A	A	F	A	
Approach Vol, veh/h		3			376			1004			386	
Approach Delay, s/veh		62.9			44.6			8.4			11.5	
Approach LOS		E			D			A			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		3.4	3.2	66.5		16.9	6.0	63.8
Change Period (Y+Rc), s		3.0	3.0	3.6		3.9	3.6	3.6
Max Green Setting (Gmax), s		7.0	7.0	36.4		26.1	6.4	36.4
Max Q Clear Time (g_c+I1), s		2.2	2.1	4.1		8.6	3.3	11.7
Green Ext Time (p_c), s		0.0	0.0	2.5		2.6	0.0	6.9

Intersection Summary	
HCM 2010 Ctrl Delay	16.8
HCM 2010 LOS	B

Notes

HCM 2010 Signalized Intersection Summary
2: Petaluma Hill Rd & Kawana Springs Rd

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	128	125	45	170	178	29	80	771	166	14	342	181
Future Volume (veh/h)	128	125	45	170	178	29	80	771	166	14	342	181
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	12	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	1.00		0.98	1.00		0.98
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	1863	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	128	125	5	170	178	18	80	771	139	14	342	109
Adj No. of Lanes	1	1	1	1	1	0	1	2	0	1	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	439	527	514	504	497	50	434	1447	261	286	845	808
Arrive On Green	0.07	0.28	0.28	0.08	0.30	0.30	0.05	0.48	0.48	0.02	0.45	0.45
Sat Flow, veh/h	1774	1863	1539	1774	1661	168	1774	2986	538	1774	1863	1544
Grp Volume(v), veh/h	128	125	5	170	0	196	80	457	453	14	342	109
Grp Sat Flow(s),veh/h/ln	1774	1863	1539	1774	0	1829	1774	1770	1754	1774	1863	1544
Q Serve(g_s), s	5.6	5.7	0.2	7.3	0.0	9.2	2.5	19.7	19.7	0.5	13.5	4.0
Cycle Q Clear(g_c), s	5.6	5.7	0.2	7.3	0.0	9.2	2.5	19.7	19.7	0.5	13.5	4.0
Prop In Lane	1.00		1.00	1.00		0.09	1.00		0.31	1.00		1.00
Lane Grp Cap(c), veh/h	439	527	514	504	0	548	434	858	850	286	845	808
V/C Ratio(X)	0.29	0.24	0.01	0.34	0.00	0.36	0.18	0.53	0.53	0.05	0.40	0.13
Avail Cap(c_a), veh/h	513	527	514	548	0	548	569	858	850	445	845	808
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.3	30.3	24.6	24.0	0.0	30.2	15.4	19.7	19.7	16.6	21.0	13.5
Incr Delay (d2), s/veh	0.1	1.1	0.0	0.1	0.0	1.8	0.1	2.4	2.4	0.0	1.4	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.0
%ile BackOfQ(50%),veh/ln	2.7	3.1	0.1	3.5	0.0	5.0	1.2	10.2	10.1	0.2	9.6	1.8
LnGrp Delay(d),s/veh	25.4	31.4	24.6	24.1	0.0	32.1	15.5	22.1	22.1	16.7	24.9	13.9
LnGrp LOS	C	C	C	C		C	B	C	C	B	C	B
Approach Vol, veh/h		258			366			990			465	
Approach Delay, s/veh		28.3			28.4			21.5			22.1	
Approach LOS		C			C			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	12.3	35.0	8.5	54.2	10.5	36.8	5.1	57.6
Change Period (Y+Rc), s	3.0	3.9	3.0	* 4.3	3.0	3.9	3.0	4.3
Max Green Setting (Gmax), s	12.0	31.1	12.0	* 41	12.0	31.1	12.0	40.7
Max Q Clear Time (g_c+I1), s	9.3	7.7	4.5	15.5	7.6	11.2	2.5	21.7
Green Ext Time (p_c), s	0.1	0.6	0.0	1.5	0.1	1.0	0.0	3.9

Intersection Summary	
HCM 2010 Ctrl Delay	23.7
HCM 2010 LOS	C

Notes

HCM 2010 Signalized Intersection Summary
3: Corby Avenue & Hearn Avenue

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	54	495	273	337	336	29	84	87	521	44	70	59
Future Volume (veh/h)	54	495	273	337	336	29	84	87	521	44	70	59
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	3	0	2	1	0	1	0	2	0	2	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	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	1863	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	54	495	263	337	336	28	84	87	475	44	70	59
Adj No. of Lanes	1	1	1	1	2	0	1	1	1	1	1	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	78	724	604	355	1801	149	110	492	722	72	245	184
Arrive On Green	0.04	0.39	0.39	0.20	0.55	0.55	0.06	0.26	0.26	0.04	0.24	0.24
Sat Flow, veh/h	1774	1863	1555	1774	3304	274	1774	1863	1563	1774	934	787
Grp Volume(v), veh/h	54	495	263	337	179	185	84	87	475	44	0	129
Grp Sat Flow(s),veh/h/ln	1774	1863	1555	1774	1770	1808	1774	1863	1563	1774	0	1720
Q Serve(g_s), s	3.3	24.3	13.7	20.6	5.6	5.7	5.1	4.0	26.0	2.7	0.0	6.8
Cycle Q Clear(g_c), s	3.3	24.3	13.7	20.6	5.6	5.7	5.1	4.0	26.0	2.7	0.0	6.8
Prop In Lane	1.00		1.00	1.00		0.15	1.00		1.00	1.00		0.46
Lane Grp Cap(c), veh/h	78	724	604	355	965	985	110	492	722	72	0	411
V/C Ratio(X)	0.69	0.68	0.44	0.95	0.19	0.19	0.77	0.18	0.66	0.62	0.00	0.31
Avail Cap(c_a), veh/h	177	725	605	355	965	985	177	505	740	177	0	469
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.96	0.96	0.96	0.93	0.93	0.93	1.00	0.00	1.00
Uniform Delay (d), s/veh	51.8	28.3	24.8	43.7	12.7	12.7	50.9	31.3	23.3	51.9	0.0	34.6
Incr Delay (d2), s/veh	4.0	5.2	2.3	35.7	0.4	0.4	3.8	0.1	1.5	3.2	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.4	0.0	4.6	0.0	0.0	2.6	0.0	0.2	0.0	0.0	0.2
%ile BackOfQ(50%),veh/ln	1.7	14.1	6.2	14.4	2.9	3.0	2.8	2.0	11.8	1.4	0.0	3.5
LnGrp Delay(d),s/veh	55.8	33.9	27.1	84.0	13.1	13.1	57.3	31.3	25.0	55.1	0.0	35.1
LnGrp LOS	E	C	C	F	B	B	E	C	C	E		D
Approach Vol, veh/h		812			701			646			173	
Approach Delay, s/veh		33.1			47.2			30.0			40.2	
Approach LOS		C			D			C			D	

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	25.0	46.0	9.6	29.4	7.8	63.2	7.4	31.6
Change Period (Y+Rc), s	3.0	3.2	3.0	* 3.2	3.0	3.2	3.0	3.2
Max Green Setting (Gmax), s	22.0	34.8	11.0	* 30	11.0	45.8	11.0	29.8
Max Q Clear Time (g_c+I1), s	22.6	26.3	7.1	8.8	5.3	7.7	4.7	28.0
Green Ext Time (p_c), s	0.0	4.4	0.0	0.4	0.0	2.3	0.0	0.3

Intersection Summary	
HCM 2010 Ctrl Delay	37.0
HCM 2010 LOS	D

Notes

HCM 2010 Signalized Intersection Summary
4: Santa Rosa Avenue & Hearn Avenue/Private Driveway

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	303	3	747	3	4	4	390	637	1	3	286	319
Future Volume (veh/h)	303	3	747	3	4	4	390	637	1	3	286	319
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	1	1	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.97	1.00		0.98
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	1863	1900	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	305	0	593	3	4	3	390	637	1	3	286	316
Adj No. of Lanes	2	0	1	0	1	0	2	3	0	1	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	1057	0	869	6	9	6	872	2839	4	7	1018	919
Arrive On Green	0.30	0.00	0.30	0.01	0.01	0.01	0.25	0.54	0.54	0.00	0.09	0.09
Sat Flow, veh/h	3548	0	1571	523	698	523	3442	5243	8	1774	3539	1554
Grp Volume(v), veh/h	305	0	593	10	0	0	390	412	226	3	286	316
Grp Sat Flow(s),veh/h/ln	1774	0	1571	1744	0	0	1721	1695	1861	1774	1770	1554
Q Serve(g_s), s	5.9	0.0	1.4	0.5	0.0	0.0	8.6	5.7	5.7	0.2	6.8	10.3
Cycle Q Clear(g_c), s	5.9	0.0	1.4	0.5	0.0	0.0	8.6	5.7	5.7	0.2	6.8	10.3
Prop In Lane	1.00		1.00	0.30		0.30	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	1057	0	869	21	0	0	872	1836	1008	7	1018	919
V/C Ratio(X)	0.29	0.00	0.68	0.47	0.00	0.00	0.45	0.22	0.22	0.42	0.28	0.34
Avail Cap(c_a), veh/h	1057	0	869	116	0	0	872	1836	1008	114	1018	919
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	0.66	0.00	0.66	1.00	0.00	0.00	0.86	0.86	0.86	0.99	0.99	0.99
Uniform Delay (d), s/veh	24.3	0.0	14.6	44.2	0.0	0.0	28.3	10.8	10.8	44.8	32.1	12.5
Incr Delay (d2), s/veh	0.5	0.0	2.9	5.8	0.0	0.0	0.3	0.2	0.4	13.8	0.1	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	3.0	0.0	1.3	0.3	0.0	0.0	4.1	2.7	3.0	0.1	3.3	7.7
LnGrp Delay(d),s/veh	24.7	0.0	17.5	49.9	0.0	0.0	28.6	11.0	11.2	58.6	32.2	12.8
LnGrp LOS	C		B	D			C	B	B	E	C	B
Approach Vol, veh/h		898			10			1028			605	
Approach Delay, s/veh		20.0			49.9			17.7			22.2	
Approach LOS		B			D			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		30.0	26.4	29.5		4.1	3.6	52.3
Change Period (Y+Rc), s		3.2	3.6	* 3.6		3.0	3.2	3.6
Max Green Setting (Gmax), s		26.8	21.8	* 22		6.0	5.8	38.4
Max Q Clear Time (g_c+I1), s		7.9	10.6	12.3		2.5	2.2	7.7
Green Ext Time (p_c), s		3.4	1.1	2.2		0.0	0.0	4.5

Intersection Summary	
HCM 2010 Ctrl Delay	19.7
HCM 2010 LOS	B

Notes

HCM 2010 Signalized Intersection Summary
5: Corby Avenue & US 101 SB Ramps

01/31/2019

Movement	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations								
Traffic Volume (veh/h)	503	413	286	36	470	213		
Future Volume (veh/h)	503	413	286	36	470	213		
Number	7	14	6	16	5	2		
Initial Q (Qb), veh	1	1	1	0	0	1		
Ped-Bike Adj(A_pbT)	1.00	1.00		0.98	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	1863		
Adj Flow Rate, veh/h	503	404	286	36	470	213		
Adj No. of Lanes	1	1	2	1	2	1		
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	632	902	706	309	758	398		
Arrive On Green	0.36	0.36	0.20	0.20	0.21	0.21		
Sat Flow, veh/h	1774	1583	3632	1546	3548	1863		
Grp Volume(v), veh/h	503	404	286	36	470	213		
Grp Sat Flow(s),veh/h/ln	1774	1583	1770	1546	1774	1863		
Q Serve(g_s), s	12.6	7.3	3.5	0.9	6.0	5.0		
Cycle Q Clear(g_c), s	12.6	7.3	3.5	0.9	6.0	5.0		
Prop In Lane	1.00	1.00		1.00	1.00			
Lane Grp Cap(c), veh/h	632	902	706	309	758	398		
V/C Ratio(X)	0.80	0.45	0.41	0.12	0.62	0.53		
Avail Cap(c_a), veh/h	1108	1326	1569	685	1573	826		
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	14.8	6.2	17.4	16.4	17.9	17.6		
Incr Delay (d2), s/veh	2.3	0.3	0.4	0.2	0.8	1.1		
Initial Q Delay(d3),s/veh	0.1	0.0	0.0	0.0	0.0	0.1		
%ile BackOfQ(50%),veh/ln	6.8	4.9	1.8	0.4	3.0	2.9		
LnGrp Delay(d),s/veh	17.2	6.6	17.8	16.6	18.7	18.8		
LnGrp LOS	B	A	B	B	B	B		
Approach Vol, veh/h	907		322			683		
Approach Delay, s/veh	12.5		17.7			18.7		
Approach LOS	B		B			B		
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		14.6		21.2		13.9		
Change Period (Y+Rc), s		4.0		3.5		4.0		
Max Green Setting (Gmax), s		22.0		31.0		22.0		
Max Q Clear Time (g_c+I1), s		8.0		14.6		5.5		
Green Ext Time (p_c), s		2.6		3.0		1.7		

Intersection Summary	
HCM 2010 Ctrl Delay	15.6
HCM 2010 LOS	B

Notes

HCM 2010 Signalized Intersection Summary
6: Santa Rosa Avenue & US 101 NB Ramps/Yolanda Ave

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	175	71	12	91	303	165	321	643	104	295	418	332
Future Volume (veh/h)	175	71	12	91	303	165	321	643	104	295	418	332
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	2	2	0	1	1	1	0	1	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.98
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	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	175	71	11	91	303	154	321	643	104	295	418	295
Adj No. of Lanes	2	1	1	1	1	1	2	2	1	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	256	115	98	312	298	253	401	1705	740	422	1697	857
Arrive On Green	0.07	0.06	0.06	0.18	0.16	0.16	0.12	0.48	0.48	0.18	0.80	0.80
Sat Flow, veh/h	3442	1863	1583	1774	1863	1583	3442	3539	1536	3442	3539	1554
Grp Volume(v), veh/h	175	71	11	91	303	154	321	643	104	295	418	295
Grp Sat Flow(s),veh/h/ln	1721	1863	1583	1774	1863	1583	1721	1770	1536	1721	1770	1554
Q Serve(g_s), s	4.5	3.3	0.5	4.0	14.4	6.2	8.2	10.3	3.4	7.3	2.6	4.3
Cycle Q Clear(g_c), s	4.5	3.3	0.5	4.0	14.4	6.2	8.2	10.3	3.4	7.3	2.6	4.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	256	115	98	312	298	253	401	1705	740	422	1697	857
V/C Ratio(X)	0.68	0.62	0.11	0.29	1.02	0.61	0.80	0.38	0.14	0.70	0.25	0.34
Avail Cap(c_a), veh/h	539	339	289	312	298	253	474	1706	741	627	1698	863
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.67	1.67	1.67
Upstream Filter(I)	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00	0.79	0.79	0.79
Uniform Delay (d), s/veh	40.6	41.2	24.7	32.4	37.8	19.9	38.8	14.8	13.0	34.3	4.9	4.0
Incr Delay (d2), s/veh	3.2	5.3	0.5	0.3	47.0	2.8	8.1	0.6	0.4	1.7	0.3	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.4	23.6	0.0	0.2	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	1.9	0.2	2.2	13.3	2.9	4.4	5.2	1.6	3.5	1.4	1.9
LnGrp Delay(d),s/veh	43.9	46.5	25.2	33.1	108.4	22.7	47.1	15.4	13.5	36.0	5.2	4.8
LnGrp LOS	D	D	C	C	F	C	D	B	B	D	A	A
Approach Vol, veh/h		257			548			1068			1008	
Approach Delay, s/veh		43.8			71.8			24.8			14.1	
Approach LOS		D			E			C			B	
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	19.7	9.1	14.0	47.1	10.6	18.3	13.8	47.3				
Change Period (Y+Rc), s	3.9	3.6	3.6	3.9	3.9	* 3.9	3.9	* 3.9				
Max Green Setting (Gmax), s	12.1	16.4	12.4	34.1	14.1	* 14	16.4	* 30				
Max Q Clear Time (g_c+I1), s	6.0	5.3	10.2	6.3	6.5	16.4	9.3	12.3				
Green Ext Time (p_c), s	0.1	0.2	0.3	4.1	0.3	0.0	0.6	4.5				

Intersection Summary	
HCM 2010 Ctrl Delay	31.7
HCM 2010 LOS	C

Notes

HCM 2010 Signalized Intersection Summary
7: Petaluma Hill Rd & Yolanda Ave

01/31/2019

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	136	91	297	835	365	166
Future Volume (veh/h)	136	91	297	835	365	166
Number	5	12	3	8	4	14
Initial Q (Qb), veh	1	0	0	0	5	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	1900	1863	1863	1863	1900
Adj Flow Rate, veh/h	136	52	297	835	365	141
Adj No. of Lanes	0	0	1	1	1	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	0	2	2	2	2
Cap, veh/h	200	65	375	1205	487	171
Arrive On Green	0.15	0.15	0.21	0.65	0.37	0.37
Sat Flow, veh/h	1236	473	1774	1863	1272	491
Grp Volume(v), veh/h	189	0	297	835	0	506
Grp Sat Flow(s),veh/h/ln	1718	0	1774	1863	0	1763
Q Serve(g_s), s	4.8	0.0	7.2	13.0	0.0	11.5
Cycle Q Clear(g_c), s	4.8	0.0	7.2	13.0	0.0	11.5
Prop In Lane	0.72	0.28	1.00			0.28
Lane Grp Cap(c), veh/h	266	0	375	1205	0	658
V/C Ratio(X)	0.71	0.00	0.79	0.69	0.00	0.77
Avail Cap(c_a), veh/h	946	0	977	1642	0	1554
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.9	0.0	18.4	5.6	0.0	13.9
Incr Delay (d2), s/veh	3.5	0.0	3.8	0.8	0.0	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	1.8
%ile BackOfQ(50%),veh/ln	3.3	0.0	4.2	7.3	0.0	7.3
LnGrp Delay(d),s/veh	23.4	0.0	22.2	6.3	0.0	17.6
LnGrp LOS	C		C	A		B
Approach Vol, veh/h	189			1132	506	
Approach Delay, s/veh	23.4			10.5	17.6	
Approach LOS	C			B	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		10.2	12.7	22.5				35.2
Change Period (Y+Rc), s		3.6	3.0	5.8				5.8
Max Green Setting (Gmax), s		25.0	25.0	40.0				40.0
Max Q Clear Time (g_c+I1), s		6.8	9.2	13.5				15.0
Green Ext Time (p_c), s		0.5	0.7	3.1				6.0

Intersection Summary	
HCM 2010 Ctrl Delay	13.8
HCM 2010 LOS	B

Notes

HCM 2010 Signalized Intersection Summary
1: Santa Rosa Ave & Kawana Springs Rd

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	392	0	195	0	1008	498	77	745	0
Future Volume (veh/h)	0	0	0	392	0	195	0	1008	498	77	745	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	15	0	3	0	8	3	4	9	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.96	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	1900	1863	1863	1863	1863	1863	1863	1863	1863	0
Adj Flow Rate, veh/h	0	0	0	392	0	80	0	1008	286	77	745	0
Adj No. of Lanes	0	1	0	2	0	1	1	2	1	1	3	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	0
Cap, veh/h	0	2	0	603	0	340	1	2438	1309	110	3955	0
Arrive On Green	0.00	0.00	0.00	0.16	0.00	0.16	0.00	1.00	1.00	0.06	0.78	0.00
Sat Flow, veh/h	0	1863	0	3548	0	1559	1774	3539	1527	1774	5253	0
Grp Volume(v), veh/h	0	0	0	392	0	80	0	1008	286	77	745	0
Grp Sat Flow(s),veh/h/ln	0	1863	0	1774	0	1559	1774	1770	1527	1774	1695	0
Q Serve(g_s), s	0.0	0.0	0.0	12.5	0.0	5.1	0.0	0.0	0.0	5.1	4.5	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	12.5	0.0	5.1	0.0	0.0	0.0	5.1	4.5	0.0
Prop In Lane	0.00		0.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	0	2	0	603	0	340	1	2438	1309	110	3955	0
V/C Ratio(X)	0.00	0.00	0.00	0.65	0.00	0.24	0.00	0.41	0.22	0.70	0.19	0.00
Avail Cap(c_a), veh/h	0	109	0	949	0	505	103	2456	1310	169	3963	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	1.00	0.00	1.00	0.00	0.93	0.93	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	47.4	0.0	39.1	0.0	0.0	0.0	55.7	3.6	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	2.5	0.0	0.8	0.0	0.5	0.4	7.7	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	12.7	0.0	0.7	0.0	0.1	0.0	31.2	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	8.5	0.0	2.8	0.0	0.2	0.6	4.2	2.6	0.0
LnGrp Delay(d),s/veh	0.0	0.0	0.0	62.6	0.0	40.6	0.0	0.6	0.4	94.5	3.8	0.0
LnGrp LOS				E		D		A	A	F	A	
Approach Vol, veh/h		0			472			1294			822	
Approach Delay, s/veh		0.0			58.9			0.6			12.3	
Approach LOS					E			A			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		0.0	0.0	97.1		22.9	10.2	86.9
Change Period (Y+Rc), s		3.0	3.0	3.6		3.9	3.6	3.6
Max Green Setting (Gmax), s		7.0	7.0	60.4		32.1	11.4	55.4
Max Q Clear Time (g_c+I1), s		0.0	0.0	6.5		14.5	7.1	2.0
Green Ext Time (p_c), s		0.0	0.0	5.9		3.4	0.0	10.8

Intersection Summary	
HCM 2010 Ctrl Delay	14.9
HCM 2010 LOS	B

Notes

HCM 2010 Signalized Intersection Summary
2: Petaluma Hill Rd & Kawana Springs Rd

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	204	197	117	148	199	28	115	675	192	16	419	265
Future Volume (veh/h)	204	197	117	148	199	28	115	675	192	16	419	265
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	12	0
Ped-Bike Adj(A_pbT)	0.99		0.98	1.00		0.97	1.00		1.00	1.00		0.97
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	1863	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	204	197	64	148	199	24	115	675	173	16	419	138
Adj No. of Lanes	1	1	1	1	1	0	1	2	0	1	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	488	618	605	487	506	61	330	1199	307	270	733	756
Arrive On Green	0.10	0.33	0.33	0.08	0.31	0.31	0.06	0.43	0.43	0.02	0.39	0.39
Sat Flow, veh/h	1774	1863	1548	1774	1626	196	1774	2791	715	1774	1863	1536
Grp Volume(v), veh/h	204	197	64	148	0	223	115	428	420	16	419	138
Grp Sat Flow(s),veh/h/ln	1774	1863	1548	1774	0	1822	1774	1770	1737	1774	1863	1536
Q Serve(g_s), s	7.6	7.9	2.6	5.6	0.0	9.6	3.7	18.2	18.2	0.5	17.6	5.0
Cycle Q Clear(g_c), s	7.6	7.9	2.6	5.6	0.0	9.6	3.7	18.2	18.2	0.5	17.6	5.0
Prop In Lane	1.00		1.00	1.00		0.11	1.00		0.41	1.00		1.00
Lane Grp Cap(c), veh/h	488	618	605	487	0	567	330	760	746	270	733	756
V/C Ratio(X)	0.42	0.32	0.11	0.30	0.00	0.39	0.35	0.56	0.56	0.06	0.57	0.18
Avail Cap(c_a), veh/h	531	618	605	566	0	567	469	760	746	445	733	756
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.8	25.0	19.5	20.7	0.0	27.0	18.2	21.5	21.5	18.4	24.7	14.3
Incr Delay (d2), s/veh	0.2	1.4	0.4	0.1	0.0	2.0	0.2	3.0	3.1	0.0	3.2	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5	0.0
%ile BackOfQ(50%),veh/ln	3.7	4.3	1.2	2.7	0.0	5.2	1.8	9.4	9.4	0.3	12.3	2.2
LnGrp Delay(d),s/veh	20.1	26.3	19.8	20.9	0.0	29.1	18.4	24.5	24.5	18.4	32.5	14.8
LnGrp LOS	C	C	B	C		C	B	C	C	B	C	B
Approach Vol, veh/h		465			371			963			573	
Approach Delay, s/veh		22.7			25.8			23.8			27.8	
Approach LOS		C			C			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	10.5	37.1	8.8	43.6	12.6	35.0	5.2	47.2
Change Period (Y+Rc), s	3.0	3.9	3.0	* 4.3	3.0	3.9	3.0	4.3
Max Green Setting (Gmax), s	12.0	31.1	12.0	* 31	12.0	31.1	12.0	30.7
Max Q Clear Time (g_c+I1), s	7.6	9.9	5.7	19.6	9.6	11.6	2.5	20.2
Green Ext Time (p_c), s	0.1	1.3	0.1	1.6	0.1	1.2	0.0	2.8

Intersection Summary	
HCM 2010 Ctrl Delay	24.9
HCM 2010 LOS	C

Notes

HCM 2010 Signalized Intersection Summary
3: Corby Avenue & Hearn Avenue

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	76	526	184	328	610	99	116	204	781	82	101	122
Future Volume (veh/h)	76	526	184	328	610	99	116	204	781	82	101	122
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	1	7	4	1	1	0	0	2	3	0	1	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		0.98
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	1863	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	76	526	174	328	610	96	116	204	728	82	101	121
Adj No. of Lanes	1	1	1	1	2	0	1	1	1	1	1	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	100	634	538	371	1536	240	142	506	766	104	214	226
Arrive On Green	0.05	0.35	0.35	0.21	0.50	0.50	0.08	0.27	0.27	0.06	0.25	0.25
Sat Flow, veh/h	1774	1863	1549	1774	3055	480	1774	1863	1582	1774	766	918
Grp Volume(v), veh/h	76	526	174	328	353	353	116	204	728	82	0	222
Grp Sat Flow(s),veh/h/ln	1774	1863	1549	1774	1770	1766	1774	1863	1582	1774	0	1684
Q Serve(g_s), s	4.7	28.2	9.1	19.7	13.6	13.7	7.1	9.9	29.8	5.0	0.0	12.5
Cycle Q Clear(g_c), s	4.7	28.2	9.1	19.7	13.6	13.7	7.1	9.9	29.8	5.0	0.0	12.5
Prop In Lane	1.00		1.00	1.00		0.27	1.00		1.00	1.00		0.55
Lane Grp Cap(c), veh/h	100	634	538	371	889	887	142	506	766	104	0	421
V/C Ratio(X)	0.76	0.83	0.32	0.88	0.40	0.40	0.81	0.40	0.95	0.79	0.00	0.53
Avail Cap(c_a), veh/h	177	649	540	371	890	888	161	505	760	161	0	459
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.81	0.81	0.81	0.81	0.81	0.81	1.00	0.00	1.00
Uniform Delay (d), s/veh	51.3	34.1	26.8	42.3	17.0	17.1	49.8	33.0	27.5	51.1	0.0	35.8
Incr Delay (d2), s/veh	4.3	12.0	1.6	21.4	1.1	1.1	17.9	0.2	18.4	5.8	0.0	0.4
Initial Q Delay(d3),s/veh	3.0	5.2	0.6	0.5	0.0	0.0	0.0	0.2	2.2	0.0	0.0	0.1
%ile BackOfQ(50%),veh/ln	2.6	18.8	4.7	12.1	7.0	7.0	4.2	5.4	26.0	2.6	0.0	6.0
LnGrp Delay(d),s/veh	58.5	51.3	29.0	64.2	18.1	18.1	67.6	33.3	48.1	56.8	0.0	36.2
LnGrp LOS	E	D	C	E	B	B	E	C	D	E		D
Approach Vol, veh/h		776			1034			1048			304	
Approach Delay, s/veh		47.0			32.7			47.4			41.8	
Approach LOS		D			C			D			D	

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	26.0	41.5	11.8	30.6	9.0	58.5	9.5	33.0
Change Period (Y+Rc), s	3.0	3.2	3.0	* 3.2	3.0	3.2	3.0	3.2
Max Green Setting (Gmax), s	23.0	34.8	10.0	* 30	11.0	46.8	10.0	29.8
Max Q Clear Time (g_c+I1), s	21.7	30.2	9.1	14.5	6.7	15.7	7.0	31.8
Green Ext Time (p_c), s	0.1	2.6	0.0	0.7	0.0	5.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	42.0
HCM 2010 LOS	D

Notes

HCM 2010 Signalized Intersection Summary
4: Santa Rosa Avenue & Hearn Avenue/Private Driveway

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	504	7	866	5	7	15	574	1042	0	5	639	450
Future Volume (veh/h)	504	7	866	5	7	15	574	1042	0	5	639	450
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	1	1	0	0	0	1	1	0	0	0	1
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.99
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	1863	1900	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	509	0	695	5	7	11	574	1042	0	5	639	437
Adj No. of Lanes	2	0	1	0	1	0	2	3	0	1	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	822	0	670	8	12	18	660	3210	0	11	1565	1058
Arrive On Green	0.23	0.00	0.23	0.02	0.02	0.02	0.19	0.63	0.00	0.00	0.30	0.30
Sat Flow, veh/h	3548	0	1559	370	518	813	3442	5253	0	1774	3539	1560
Grp Volume(v), veh/h	509	0	695	23	0	0	574	1042	0	5	639	437
Grp Sat Flow(s),veh/h/ln	1774	0	1559	1701	0	0	1721	1695	0	1774	1770	1560
Q Serve(g_s), s	15.4	0.0	27.8	1.6	0.0	0.0	19.4	11.4	0.0	0.3	17.3	17.0
Cycle Q Clear(g_c), s	15.4	0.0	27.8	1.6	0.0	0.0	19.4	11.4	0.0	0.3	17.3	17.0
Prop In Lane	1.00		1.00	0.22		0.48	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	822	0	670	38	0	0	660	3210	0	11	1565	1058
V/C Ratio(X)	0.62	0.00	1.04	0.61	0.00	0.00	0.87	0.32	0.00	0.44	0.41	0.41
Avail Cap(c_a), veh/h	822	0	663	128	0	0	855	3210	0	130	1569	1059
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67
Upstream Filter(I)	0.37	0.00	0.37	1.00	0.00	0.00	0.74	0.74	0.00	0.97	0.97	0.97
Uniform Delay (d), s/veh	41.4	0.0	34.3	58.1	0.0	0.0	47.1	10.3	0.0	59.5	29.7	11.6
Incr Delay (d2), s/veh	0.5	0.0	31.7	5.7	0.0	0.0	5.9	0.2	0.0	9.3	0.8	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	5.2	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.6	0.0	18.8	0.8	0.0	0.0	9.9	5.4	0.0	0.2	8.6	13.0
LnGrp Delay(d),s/veh	41.9	0.0	71.1	63.8	0.0	0.0	53.1	10.5	0.0	68.9	30.4	12.7
LnGrp LOS	D		F	E			D	B		E	C	B
Approach Vol, veh/h		1204			23			1616			1081	
Approach Delay, s/veh		58.8			63.8			25.6			23.5	
Approach LOS		E			E			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		31.0	26.5	56.8		5.7	4.0	79.4
Change Period (Y+Rc), s		3.2	3.6	* 3.6		3.0	3.2	3.6
Max Green Setting (Gmax), s		27.8	29.8	* 40		9.0	8.8	61.4
Max Q Clear Time (g_c+I1), s		29.8	21.4	19.3		3.6	2.3	13.4
Green Ext Time (p_c), s		0.0	1.5	6.3		0.0	0.0	9.7

Intersection Summary	
HCM 2010 Ctrl Delay	35.4
HCM 2010 LOS	D

Notes

HCM 2010 Signalized Intersection Summary
5: Corby Avenue & US 101 SB Ramps

01/31/2019

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	252	504	584	106	353	248
Future Volume (veh/h)	252	504	584	106	353	248
Number	7	14	6	16	5	2
Initial Q (Qb), veh	13	0	0	0	0	1
Ped-Bike Adj(A_pbT)	1.00	1.00		0.98	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	1863
Adj Flow Rate, veh/h	252	498	584	104	353	248
Adj No. of Lanes	1	1	2	1	2	1
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	553	824	944	413	748	384
Arrive On Green	0.31	0.31	0.27	0.27	0.20	0.20
Sat Flow, veh/h	1774	1583	3632	1549	3548	1863
Grp Volume(v), veh/h	252	498	584	104	353	248
Grp Sat Flow(s),veh/h/ln	1774	1583	1770	1549	1774	1863
Q Serve(g_s), s	6.0	11.8	7.6	2.8	4.6	6.4
Cycle Q Clear(g_c), s	6.0	11.8	7.6	2.8	4.6	6.4
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	553	824	944	413	748	384
V/C Ratio(X)	0.46	0.60	0.62	0.25	0.47	0.65
Avail Cap(c_a), veh/h	911	1138	2357	1032	1485	780
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	16.4	9.1	17.7	15.8	18.8	19.3
Incr Delay (d2), s/veh	0.6	0.7	0.7	0.3	0.5	1.8
Initial Q Delay(d3),s/veh	7.3	0.0	0.0	0.0	0.0	0.1
%ile BackOfQ(50%),veh/ln	5.6	7.5	3.9	1.3	2.4	3.6
LnGrp Delay(d),s/veh	24.2	9.8	18.3	16.1	19.3	21.3
LnGrp LOS	C	A	B	B	B	C
Approach Vol, veh/h	750		688			601
Approach Delay, s/veh	14.6		18.0			20.1
Approach LOS	B		B			C

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		14.8		19.6		18.2		
Change Period (Y+Rc), s		4.0		3.5		4.0		
Max Green Setting (Gmax), s		22.0		27.0		35.0		
Max Q Clear Time (g_c+I1), s		8.4		13.8		9.6		
Green Ext Time (p_c), s		2.4		2.3		4.6		

Intersection Summary	
HCM 2010 Ctrl Delay	17.4
HCM 2010 LOS	B

Notes

HCM 2010 Signalized Intersection Summary
6: Santa Rosa Avenue & US 101 NB Ramps/Yolanda Ave

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	344	94	40	131	262	210	345	948	188	246	930	326
Future Volume (veh/h)	344	94	40	131	262	210	345	948	188	246	930	326
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	2	0	0	1	1	0	2	1	0	0	0	1
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.98
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	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	344	94	33	131	262	191	345	948	184	246	930	310
Adj No. of Lanes	2	1	1	1	1	1	2	2	1	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	407	129	110	371	296	251	409	1788	776	315	1702	933
Arrive On Green	0.12	0.07	0.07	0.21	0.16	0.16	0.12	0.51	0.51	0.12	0.64	0.64
Sat Flow, veh/h	3442	1863	1583	1774	1863	1583	3442	3539	1535	3442	3539	1557
Grp Volume(v), veh/h	344	94	33	131	262	191	345	948	184	246	930	310
Grp Sat Flow(s),veh/h/ln	1721	1863	1583	1774	1863	1583	1721	1770	1535	1721	1770	1557
Q Serve(g_s), s	11.8	5.9	1.9	7.6	16.5	11.3	11.8	21.7	8.1	8.3	17.6	9.1
Cycle Q Clear(g_c), s	11.8	5.9	1.9	7.6	16.5	11.3	11.8	21.7	8.1	8.3	17.6	9.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	407	129	110	371	296	251	409	1788	776	315	1702	933
V/C Ratio(X)	0.84	0.73	0.30	0.35	0.89	0.76	0.84	0.53	0.24	0.78	0.55	0.33
Avail Cap(c_a), veh/h	462	317	269	370	317	269	470	1788	775	470	1697	932
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	0.53	0.53	0.53	1.00	1.00	1.00	0.55	0.55	0.55
Uniform Delay (d), s/veh	52.0	54.7	35.0	40.7	49.5	32.3	51.9	20.1	16.7	51.6	14.4	8.1
Incr Delay (d2), s/veh	12.3	7.6	1.5	0.3	14.2	6.2	11.7	1.1	0.7	2.8	0.7	0.5
Initial Q Delay(d3),s/veh	1.1	0.0	0.0	0.1	0.7	0.0	1.1	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.5	3.3	0.9	3.9	9.9	5.4	6.5	10.9	3.5	4.1	8.6	4.1
LnGrp Delay(d),s/veh	65.3	62.4	36.5	41.0	64.5	38.6	64.7	21.3	17.4	54.3	15.1	8.7
LnGrp LOS	E	E	D	D	E	D	E	C	B	D	B	A
Approach Vol, veh/h		471			584			1477			1486	
Approach Delay, s/veh		62.7			50.7			30.9			20.2	
Approach LOS		E			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	28.9	11.9	17.7	61.4	18.0	22.9	14.7	64.5
Change Period (Y+Rc), s	3.9	3.6	3.6	3.9	3.9	* 3.9	3.9	* 3.9
Max Green Setting (Gmax), s	16.1	20.4	16.4	52.1	16.1	* 20	16.4	* 52
Max Q Clear Time (g_c+I1), s	9.6	7.9	13.8	19.6	13.8	18.5	10.3	23.7
Green Ext Time (p_c), s	0.2	0.4	0.3	9.5	0.3	0.4	0.4	8.7

Intersection Summary	
HCM 2010 Ctrl Delay	33.6
HCM 2010 LOS	C

Notes

HCM 2010 Signalized Intersection Summary
7: Petaluma Hill Rd & Yolanda Ave

01/31/2019

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	217	106	292	791	666	105
Future Volume (veh/h)	217	106	292	791	666	105
Number	5	12	3	8	4	14
Initial Q (Qb), veh	1	0	0	0	5	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	1900	1863	1863	1863	1900
Adj Flow Rate, veh/h	217	77	292	791	666	99
Adj No. of Lanes	0	0	1	1	1	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	0	2	2	2	2
Cap, veh/h	437	25	331	1189	734	40
Arrive On Green	0.20	0.20	0.19	0.68	0.45	0.45
Sat Flow, veh/h	1265	449	1774	1863	1579	235
Grp Volume(v), veh/h	295	0	292	791	0	765
Grp Sat Flow(s),veh/h/ln	1720	0	1774	1863	0	1814
Q Serve(g_s), s	13.3	0.0	12.7	18.6	0.0	31.8
Cycle Q Clear(g_c), s	13.3	0.0	12.7	18.6	0.0	31.8
Prop In Lane	0.74	0.26	1.00			0.13
Lane Grp Cap(c), veh/h	463	0	331	1189	0	775
V/C Ratio(X)	0.64	0.00	0.88	0.67	0.00	0.99
Avail Cap(c_a), veh/h	538	0	555	1274	0	908
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	35.1	0.0	37.7	10.8	0.0	27.6
Incr Delay (d2), s/veh	2.0	0.0	8.9	1.2	0.0	25.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	17.6
%ile BackOfQ(50%),veh/ln	12.3	0.0	8.3	13.4	0.0	29.4
LnGrp Delay(d),s/veh	37.0	0.0	46.6	12.0	0.0	70.4
LnGrp LOS	D		D	B		E
Approach Vol, veh/h	295			1083	765	
Approach Delay, s/veh	37.0			21.3	70.4	
Approach LOS	D			C	E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		19.5	18.3	42.1				60.4
Change Period (Y+Rc), s		3.6	3.0	5.8				5.8
Max Green Setting (Gmax), s		25.0	25.0	40.0				40.0
Max Q Clear Time (g_c+I1), s		15.3	14.7	33.8				20.6
Green Ext Time (p_c), s		0.6	0.6	2.6				5.1

Intersection Summary	
HCM 2010 Ctrl Delay	41.0
HCM 2010 LOS	D

Notes

HCM 2010 Signalized Intersection Summary
1: Santa Rosa Ave & Kawana Springs Rd

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	0	3	360	0	190	2	870	273	42	362	0
Future Volume (veh/h)	1	0	3	360	0	190	2	870	273	42	362	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	15	0	3	0	18	3	4	9	0
Ped-Bike Adj(A_pbT)	1.00		0.97	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	1900	1863	1863	1863	1863	1863	1863	1863	1863	0
Adj Flow Rate, veh/h	1	0	2	360	0	122	2	870	153	42	362	0
Adj No. of Lanes	0	1	0	2	0	1	1	2	1	1	3	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	0
Cap, veh/h	2	0	4	639	0	327	5	2196	1245	76	3419	0
Arrive On Green	0.00	0.00	0.00	0.17	0.00	0.17	0.00	0.42	0.42	0.04	0.67	0.00
Sat Flow, veh/h	535	0	1070	3548	0	1555	1774	3539	1542	1774	5253	0
Grp Volume(v), veh/h	3	0	0	360	0	122	2	870	153	42	362	0
Grp Sat Flow(s),veh/h/ln	1605	0	0	1774	0	1555	1774	1770	1542	1774	1695	0
Q Serve(g_s), s	0.2	0.0	0.0	8.4	0.0	6.1	0.1	15.2	3.0	2.1	2.2	0.0
Cycle Q Clear(g_c), s	0.2	0.0	0.0	8.4	0.0	6.1	0.1	15.2	3.0	2.1	2.2	0.0
Prop In Lane	0.33		0.67	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	6	0	0	639	0	327	5	2196	1245	76	3419	0
V/C Ratio(X)	0.47	0.00	0.00	0.56	0.00	0.37	0.42	0.40	0.12	0.55	0.11	0.00
Avail Cap(c_a), veh/h	125	0	0	1029	0	508	138	2244	1245	126	3428	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.98	0.98	0.98	1.00	1.00	0.00
Uniform Delay (d), s/veh	44.7	0.0	0.0	34.3	0.0	30.8	44.8	15.3	3.3	42.6	5.4	0.0
Incr Delay (d2), s/veh	18.2	0.0	0.0	1.7	0.0	1.5	19.6	0.5	0.2	6.2	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	9.1	0.0	1.0	0.0	0.8	0.0	44.8	0.1	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	5.9	0.0	3.2	0.1	9.1	2.7	2.5	1.4	0.0
LnGrp Delay(d),s/veh	62.9	0.0	0.0	45.1	0.0	33.3	64.4	16.6	3.5	93.6	5.5	0.0
LnGrp LOS	E			D		C	E	B	A	F	A	
Approach Vol, veh/h		3			482			1025			404	
Approach Delay, s/veh		62.9			42.1			14.8			14.6	
Approach LOS		E			D			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		3.4	3.2	64.3		19.1	6.9	60.7
Change Period (Y+Rc), s		3.0	3.0	3.6		3.9	3.6	3.6
Max Green Setting (Gmax), s		7.0	7.0	36.4		26.1	6.4	36.4
Max Q Clear Time (g_c+I1), s		2.2	2.1	4.2		10.4	4.1	17.2
Green Ext Time (p_c), s		0.0	0.0	2.5		3.3	0.0	6.4

Intersection Summary	
HCM 2010 Ctrl Delay	21.7
HCM 2010 LOS	C

Notes

HCM 2010 Signalized Intersection Summary
2: Petaluma Hill Rd & Kawana Springs Rd

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	129	133	61	188	213	31	141	776	175	15	347	182
Future Volume (veh/h)	129	133	61	188	213	31	141	776	175	15	347	182
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	12	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	1.00		0.98	1.00		0.97
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	1863	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	129	133	21	188	213	20	141	776	148	15	347	110
Adj No. of Lanes	1	1	1	1	1	0	1	2	0	1	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	419	527	530	505	511	48	429	1410	269	276	814	783
Arrive On Green	0.07	0.28	0.28	0.09	0.31	0.31	0.06	0.48	0.48	0.02	0.44	0.44
Sat Flow, veh/h	1774	1863	1539	1774	1674	157	1774	2955	564	1774	1863	1544
Grp Volume(v), veh/h	129	133	21	188	0	233	141	465	459	15	347	110
Grp Sat Flow(s),veh/h/ln	1774	1863	1539	1774	0	1832	1774	1770	1749	1774	1863	1544
Q Serve(g_s), s	5.6	6.1	1.0	8.0	0.0	11.1	4.6	20.5	20.5	0.5	14.2	4.2
Cycle Q Clear(g_c), s	5.6	6.1	1.0	8.0	0.0	11.1	4.6	20.5	20.5	0.5	14.2	4.2
Prop In Lane	1.00		1.00	1.00		0.09	1.00		0.32	1.00		1.00
Lane Grp Cap(c), veh/h	419	527	530	505	0	559	429	844	835	276	814	783
V/C Ratio(X)	0.31	0.25	0.04	0.37	0.00	0.42	0.33	0.55	0.55	0.05	0.43	0.14
Avail Cap(c_a), veh/h	492	527	530	537	0	559	546	844	835	434	814	783
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.4	30.5	24.1	23.4	0.0	30.4	16.5	20.4	20.4	17.5	22.4	14.5
Incr Delay (d2), s/veh	0.2	1.2	0.1	0.2	0.0	2.3	0.2	2.6	2.6	0.0	1.6	0.4
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	2.7	0.0
%ile BackOfQ(50%),veh/ln	2.7	3.3	0.4	3.9	0.0	6.0	2.3	10.5	10.4	0.2	10.0	1.9
LnGrp Delay(d),s/veh	25.5	31.6	24.2	23.6	0.0	32.7	16.6	23.0	23.0	17.6	26.7	14.9
LnGrp LOS	C	C	C	C		C	B	C	C	B	C	B
Approach Vol, veh/h		283			421			1065			472	
Approach Delay, s/veh		28.3			28.6			22.1			23.7	
Approach LOS		C			C			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	13.0	35.0	9.6	52.4	10.5	37.5	5.2	56.8
Change Period (Y+Rc), s	3.0	3.9	3.0	* 4.3	3.0	3.9	3.0	4.3
Max Green Setting (Gmax), s	12.0	31.1	12.0	* 41	12.0	31.1	12.0	40.7
Max Q Clear Time (g_c+I1), s	10.0	8.1	6.6	16.2	7.6	13.1	2.5	22.5
Green Ext Time (p_c), s	0.1	0.7	0.1	1.5	0.1	1.2	0.0	3.9

Intersection Summary	
HCM 2010 Ctrl Delay	24.5
HCM 2010 LOS	C

Notes

HCM 2010 Signalized Intersection Summary
3: Corby Avenue & Hearn Avenue

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	54	495	273	415	336	29	84	87	561	44	70	59
Future Volume (veh/h)	54	495	273	415	336	29	84	87	561	44	70	59
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	3	0	2	1	0	1	0	2	0	2	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	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	1863	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	54	495	263	415	336	28	84	87	515	44	70	59
Adj No. of Lanes	1	1	1	1	2	0	1	1	1	1	1	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	78	653	552	419	1788	148	107	496	784	72	270	187
Arrive On Green	0.04	0.35	0.35	0.24	0.54	0.54	0.06	0.26	0.26	0.04	0.24	0.24
Sat Flow, veh/h	1774	1863	1554	1774	3304	274	1774	1863	1563	1774	934	787
Grp Volume(v), veh/h	54	495	263	415	179	185	84	87	515	44	0	129
Grp Sat Flow(s),veh/h/ln	1774	1863	1554	1774	1770	1808	1774	1863	1563	1774	0	1720
Q Serve(g_s), s	3.3	25.9	14.6	25.7	5.7	5.8	5.1	4.0	27.1	2.7	0.0	6.8
Cycle Q Clear(g_c), s	3.3	25.9	14.6	25.7	5.7	5.8	5.1	4.0	27.1	2.7	0.0	6.8
Prop In Lane	1.00		1.00	1.00		0.15	1.00		1.00	1.00		0.46
Lane Grp Cap(c), veh/h	78	653	552	419	958	978	107	496	784	72	0	418
V/C Ratio(X)	0.69	0.76	0.48	0.99	0.19	0.19	0.78	0.18	0.66	0.62	0.00	0.31
Avail Cap(c_a), veh/h	129	650	542	419	957	978	113	488	783	113	0	454
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.94	0.94	0.94	0.92	0.92	0.92	1.00	0.00	1.00
Uniform Delay (d), s/veh	51.8	31.9	27.5	42.0	12.9	12.9	51.1	31.1	20.8	51.9	0.0	34.3
Incr Delay (d2), s/veh	4.0	8.0	2.9	40.2	0.4	0.4	23.7	0.1	1.5	3.2	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.6	0.0	12.5	0.0	0.0	2.9	0.0	0.1	0.0	0.0	0.2
%ile BackOfQ(50%),veh/ln	1.7	15.4	6.6	18.8	3.0	3.1	3.4	2.0	12.3	1.4	0.0	3.5
LnGrp Delay(d),s/veh	55.8	40.5	30.5	94.7	13.3	13.3	77.7	31.1	22.4	55.1	0.0	34.7
LnGrp LOS	E	D	C	F	B	B	E	C	C	E		C
Approach Vol, veh/h		812			779			686			173	
Approach Delay, s/veh		38.3			56.7			30.3			39.9	
Approach LOS		D			E			C			D	

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	29.0	41.6	9.6	29.8	7.8	62.7	7.4	32.0
Change Period (Y+Rc), s	3.0	3.2	3.0	* 3.2	3.0	3.2	3.0	3.2
Max Green Setting (Gmax), s	26.0	35.8	7.0	* 29	8.0	53.8	7.0	28.8
Max Q Clear Time (g_c+I1), s	27.7	27.9	7.1	8.8	5.3	7.8	4.7	29.1
Green Ext Time (p_c), s	0.0	4.2	0.0	0.4	0.0	2.3	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	42.0
HCM 2010 LOS	D

Notes

HCM 2010 Signalized Intersection Summary
4: Santa Rosa Avenue & Hearn Avenue/Private Driveway

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	317	3	773	3	4	4	391	644	1	3	292	396
Future Volume (veh/h)	317	3	773	3	4	4	391	644	1	3	292	396
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	1	1	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.97	1.00		0.98
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	1863	1900	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	319	0	619	3	4	3	391	644	1	3	292	393
Adj No. of Lanes	2	0	1	0	1	0	2	3	0	1	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	1057	0	834	6	9	6	796	2839	4	7	1096	953
Arrive On Green	0.30	0.00	0.30	0.01	0.01	0.01	0.23	0.54	0.54	0.00	0.10	0.10
Sat Flow, veh/h	3548	0	1571	523	698	523	3442	5243	8	1774	3539	1555
Grp Volume(v), veh/h	319	0	619	10	0	0	391	416	229	3	292	393
Grp Sat Flow(s),veh/h/ln	1774	0	1571	1744	0	0	1721	1695	1861	1774	1770	1555
Q Serve(g_s), s	6.2	0.0	6.5	0.5	0.0	0.0	8.9	5.8	5.8	0.2	6.9	12.7
Cycle Q Clear(g_c), s	6.2	0.0	6.5	0.5	0.0	0.0	8.9	5.8	5.8	0.2	6.9	12.7
Prop In Lane	1.00		1.00	0.30		0.30	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	1057	0	834	21	0	0	796	1836	1008	7	1096	953
V/C Ratio(X)	0.30	0.00	0.74	0.47	0.00	0.00	0.49	0.23	0.23	0.42	0.27	0.41
Avail Cap(c_a), veh/h	1057	0	834	116	0	0	834	1836	1008	114	1096	953
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	0.64	0.00	0.64	1.00	0.00	0.00	0.86	0.86	0.86	0.98	0.98	0.98
Uniform Delay (d), s/veh	24.4	0.0	16.5	44.2	0.0	0.0	30.0	10.8	10.8	44.8	31.0	12.3
Incr Delay (d2), s/veh	0.5	0.0	3.9	5.8	0.0	0.0	0.4	0.2	0.4	13.7	0.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.0	3.6	0.3	0.0	0.0	4.2	2.7	3.0	0.1	3.4	9.7
LnGrp Delay(d),s/veh	24.9	0.0	20.4	49.9	0.0	0.0	30.4	11.0	11.2	58.5	31.1	12.5
LnGrp LOS	C		C	D			C	B	B	E	C	B
Approach Vol, veh/h		938			10			1036			688	
Approach Delay, s/veh		21.9			49.9			18.4			20.6	
Approach LOS		C			D			B			C	

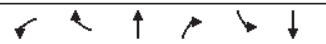
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		30.0	24.4	31.5		4.1	3.6	52.3
Change Period (Y+Rc), s		3.2	3.6	* 3.6		3.0	3.2	3.6
Max Green Setting (Gmax), s		26.8	21.8	* 22		6.0	5.8	38.4
Max Q Clear Time (g_c+I1), s		8.5	10.9	14.7		2.5	2.2	7.8
Green Ext Time (p_c), s		3.6	1.1	2.1		0.0	0.0	4.6

Intersection Summary	
HCM 2010 Ctrl Delay	20.3
HCM 2010 LOS	C

Notes

HCM 2010 Signalized Intersection Summary
5: Corby Avenue & US 101 SB Ramps

01/31/2019



Movement	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations								
Traffic Volume (veh/h)	503	453	286	36	470	291		
Future Volume (veh/h)	503	453	286	36	470	291		
Number	7	14	6	16	5	2		
Initial Q (Qb), veh	1	1	1	0	0	1		
Ped-Bike Adj(A_pbT)	1.00	1.00		0.98	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	1863		
Adj Flow Rate, veh/h	503	444	286	36	470	291		
Adj No. of Lanes	1	1	2	1	2	1		
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	629	935	673	295	838	440		
Arrive On Green	0.35	0.35	0.19	0.19	0.24	0.24		
Sat Flow, veh/h	1774	1583	3632	1546	3548	1863		
Grp Volume(v), veh/h	503	444	286	36	470	291		
Grp Sat Flow(s),veh/h/ln	1774	1583	1770	1546	1774	1863		
Q Serve(g_s), s	13.3	8.3	3.7	1.0	6.1	7.4		
Cycle Q Clear(g_c), s	13.3	8.3	3.7	1.0	6.1	7.4		
Prop In Lane	1.00	1.00		1.00	1.00			
Lane Grp Cap(c), veh/h	629	935	673	295	838	440		
V/C Ratio(X)	0.80	0.48	0.43	0.12	0.56	0.66		
Avail Cap(c_a), veh/h	1053	1313	1491	651	1495	785		
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	15.6	6.1	18.7	17.7	17.7	18.4		
Incr Delay (d2), s/veh	2.4	0.4	0.4	0.2	0.6	1.7		
Initial Q Delay(d3),s/veh	0.1	0.0	0.0	0.0	0.0	0.1		
%ile BackOfQ(50%),veh/ln	7.1	5.9	1.9	0.4	3.0	4.2		
LnGrp Delay(d),s/veh	18.1	6.5	19.2	17.9	18.3	20.2		
LnGrp LOS	B	A	B	B	B	C		
Approach Vol, veh/h	947		322			761		
Approach Delay, s/veh	12.7		19.0			19.0		
Approach LOS	B		B			B		
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		16.3		22.0		13.9		
Change Period (Y+Rc), s		4.0		3.5		4.0		
Max Green Setting (Gmax), s		22.0		31.0		22.0		
Max Q Clear Time (g_c+I1), s		9.4		15.3		5.7		
Green Ext Time (p_c), s		2.9		3.2		1.7		

Intersection Summary	
HCM 2010 Ctrl Delay	16.1
HCM 2010 LOS	B

Notes

HCM 2010 Signalized Intersection Summary
6: Santa Rosa Avenue & US 101 NB Ramps/Yolanda Ave

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	182	122	12	91	351	166	321	643	104	323	418	336
Future Volume (veh/h)	182	122	12	91	351	166	321	643	104	323	418	336
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	2	2	0	1	1	1	0	1	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.98
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	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	182	122	11	91	351	155	321	643	104	323	418	299
Adj No. of Lanes	2	1	1	1	1	1	2	2	1	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	263	167	142	266	298	253	401	1669	724	445	1689	857
Arrive On Green	0.08	0.09	0.09	0.15	0.16	0.16	0.12	0.47	0.47	0.20	0.80	0.80
Sat Flow, veh/h	3442	1863	1583	1774	1863	1583	3442	3539	1536	3442	3539	1554
Grp Volume(v), veh/h	182	122	11	91	351	155	321	643	104	323	418	299
Grp Sat Flow(s),veh/h/ln	1721	1863	1583	1774	1863	1583	1721	1770	1536	1721	1770	1554
Q Serve(g_s), s	4.6	5.7	0.4	4.1	14.4	6.2	8.2	10.6	3.5	8.0	2.7	4.4
Cycle Q Clear(g_c), s	4.6	5.7	0.4	4.1	14.4	6.2	8.2	10.6	3.5	8.0	2.7	4.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	263	167	142	266	298	253	401	1669	724	445	1689	857
V/C Ratio(X)	0.69	0.73	0.08	0.34	1.18	0.61	0.80	0.39	0.14	0.73	0.25	0.35
Avail Cap(c_a), veh/h	539	339	289	266	298	253	474	1670	725	627	1690	863
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.67	1.67	1.67
Upstream Filter(I)	1.00	1.00	1.00	0.62	0.62	0.62	1.00	1.00	1.00	0.77	0.77	0.77
Uniform Delay (d), s/veh	40.5	39.9	22.9	34.4	37.8	19.4	38.8	15.4	13.6	33.8	5.1	4.0
Incr Delay (d2), s/veh	3.2	6.0	0.2	0.5	99.7	2.7	8.1	0.7	0.4	1.9	0.3	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.6	20.2	0.0	0.2	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	3.2	0.2	2.3	17.6	2.9	4.4	5.3	1.7	3.8	1.4	2.0
LnGrp Delay(d),s/veh	43.8	45.9	23.1	35.5	157.8	22.1	47.1	16.1	14.0	35.8	5.3	4.9
LnGrp LOS	D	D	C	D	F	C	D	B	B	D	A	A
Approach Vol, veh/h		315			597			1068			1040	
Approach Delay, s/veh		43.9			103.9			25.2			14.7	
Approach LOS		D			F			C			B	
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	17.4	11.7	14.0	46.9	10.8	18.3	14.6	46.4				
Change Period (Y+Rc), s	3.9	3.6	3.6	3.9	3.9	* 3.9	3.9	* 3.9				
Max Green Setting (Gmax), s	12.1	16.4	12.4	34.1	14.1	* 14	16.4	* 30				
Max Q Clear Time (g_c+I1), s	6.1	7.7	10.2	6.4	6.6	16.4	10.0	12.6				
Green Ext Time (p_c), s	0.1	0.3	0.3	4.1	0.3	0.0	0.6	4.5				

Intersection Summary	
HCM 2010 Ctrl Delay	39.1
HCM 2010 LOS	D

Notes

HCM 2010 Signalized Intersection Summary
7: Petaluma Hill Rd & Yolanda Ave

01/31/2019

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	201	91	298	841	373	214
Future Volume (veh/h)	201	91	298	841	373	214
Number	5	12	3	8	4	14
Initial Q (Qb), veh	1	0	0	0	5	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	1900	1863	1863	1863	1900
Adj Flow Rate, veh/h	201	52	298	841	373	189
Adj No. of Lanes	0	0	1	1	1	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	0	2	2	2	2
Cap, veh/h	271	60	363	1206	473	213
Arrive On Green	0.18	0.18	0.21	0.65	0.39	0.39
Sat Flow, veh/h	1370	355	1774	1863	1157	586
Grp Volume(v), veh/h	254	0	298	841	0	562
Grp Sat Flow(s),veh/h/ln	1732	0	1774	1863	0	1744
Q Serve(g_s), s	7.9	0.0	9.0	16.2	0.0	16.3
Cycle Q Clear(g_c), s	7.9	0.0	9.0	16.2	0.0	16.3
Prop In Lane	0.79	0.20	1.00			0.34
Lane Grp Cap(c), veh/h	332	0	363	1206	0	686
V/C Ratio(X)	0.76	0.00	0.82	0.70	0.00	0.82
Avail Cap(c_a), veh/h	772	0	791	1329	0	1244
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.2	0.0	22.8	6.8	0.0	16.7
Incr Delay (d2), s/veh	3.7	0.0	4.6	1.4	0.0	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	2.1
%ile BackOfQ(50%),veh/ln	4.9	0.0	5.2	9.3	0.0	9.9
LnGrp Delay(d),s/veh	26.9	0.0	27.4	8.2	0.0	21.3
LnGrp LOS	C		C	A		C
Approach Vol, veh/h	254			1139	562	
Approach Delay, s/veh	26.9			13.3	21.3	
Approach LOS	C			B	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		13.9	14.6	27.6				42.1
Change Period (Y+Rc), s		3.6	3.0	5.8				5.8
Max Green Setting (Gmax), s		25.0	25.0	40.0				40.0
Max Q Clear Time (g_c+I1), s		9.9	11.0	18.3				18.2
Green Ext Time (p_c), s		0.6	0.7	3.5				5.8

Intersection Summary	
HCM 2010 Ctrl Delay	17.3
HCM 2010 LOS	B

Notes

HCM 2010 Signalized Intersection Summary
7: Petaluma Hill Rd & Yolanda Ave

01/31/2019

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	201	91	298	841	373	214
Future Volume (veh/h)	201	91	298	841	373	214
Number	5	12	3	8	4	14
Initial Q (Qb), veh	1	0	0	0	5	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	1900	1863	1863	1863	1863
Adj Flow Rate, veh/h	201	52	298	841	373	189
Adj No. of Lanes	0	0	1	1	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	0	2	2	2	2
Cap, veh/h	269	62	374	1061	526	437
Arrive On Green	0.19	0.19	0.21	0.57	0.28	0.28
Sat Flow, veh/h	1370	355	1774	1863	1863	1547
Grp Volume(v), veh/h	254	0	298	841	373	189
Grp Sat Flow(s),veh/h/ln	1732	0	1774	1863	1863	1547
Q Serve(g_s), s	5.4	0.0	6.1	13.7	6.9	3.9
Cycle Q Clear(g_c), s	5.4	0.0	6.1	13.7	6.9	3.9
Prop In Lane	0.79	0.20	1.00			1.00
Lane Grp Cap(c), veh/h	332	0	374	1061	526	437
V/C Ratio(X)	0.77	0.00	0.80	0.79	0.71	0.43
Avail Cap(c_a), veh/h	559	0	600	1609	834	693
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.3	0.0	14.8	6.7	13.0	11.6
Incr Delay (d2), s/veh	3.7	0.0	3.9	1.6	1.8	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	2.2	0.0
%ile BackOfQ(50%),veh/ln	3.2	0.0	3.5	7.4	4.5	1.7
LnGrp Delay(d),s/veh	19.0	0.0	18.7	8.3	17.0	12.3
LnGrp LOS	B		B	A	B	B
Approach Vol, veh/h	254			1139	562	
Approach Delay, s/veh	19.0			11.0	15.4	
Approach LOS	B			B	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		10.8	11.1	16.5				27.6
Change Period (Y+Rc), s		3.6	3.0	5.8				5.8
Max Green Setting (Gmax), s		12.4	13.0	17.2				33.2
Max Q Clear Time (g_c+I1), s		7.4	8.1	8.9				15.7
Green Ext Time (p_c), s		0.3	0.4	1.7				5.4

Intersection Summary	
HCM 2010 Ctrl Delay	13.3
HCM 2010 LOS	B

Notes

HCM 2010 Signalized Intersection Summary
1: Santa Rosa Ave & Kawana Springs Rd

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	433	0	239	0	1010	538	125	745	0
Future Volume (veh/h)	0	0	0	433	0	239	0	1010	538	125	745	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	15	0	3	0	8	3	4	9	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.96	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	1900	1863	1863	1863	1863	1863	1863	1863	1863	0
Adj Flow Rate, veh/h	0	0	0	433	0	124	0	1010	326	125	745	0
Adj No. of Lanes	0	1	0	2	0	1	1	2	1	1	3	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	0
Cap, veh/h	0	2	0	648	0	407	1	2291	1264	157	3889	0
Arrive On Green	0.00	0.00	0.00	0.17	0.00	0.17	0.00	1.00	1.00	0.08	0.77	0.00
Sat Flow, veh/h	0	1863	0	3548	0	1561	1774	3539	1525	1774	5253	0
Grp Volume(v), veh/h	0	0	0	433	0	124	0	1010	326	125	745	0
Grp Sat Flow(s),veh/h/ln	0	1863	0	1774	0	1561	1774	1770	1525	1774	1695	0
Q Serve(g_s), s	0.0	0.0	0.0	13.8	0.0	7.7	0.0	0.0	0.0	8.3	4.8	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	13.8	0.0	7.7	0.0	0.0	0.0	8.3	4.8	0.0
Prop In Lane	0.00		0.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	0	2	0	648	0	407	1	2291	1264	157	3889	0
V/C Ratio(X)	0.00	0.00	0.00	0.67	0.00	0.30	0.00	0.44	0.26	0.79	0.19	0.00
Avail Cap(c_a), veh/h	0	109	0	949	0	552	103	2304	1265	169	3896	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	1.00	0.00	1.00	0.00	0.92	0.92	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	46.6	0.0	36.1	0.0	0.0	0.0	54.1	4.1	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	2.5	0.0	0.9	0.0	0.6	0.5	21.4	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	11.6	0.0	0.6	0.0	0.2	0.1	22.7	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	9.1	0.0	3.9	0.0	0.2	0.7	6.6	2.7	0.0
LnGrp Delay(d),s/veh	0.0	0.0	0.0	60.7	0.0	37.6	0.0	0.7	0.5	98.3	4.2	0.0
LnGrp LOS				E		D		A	A	F	A	
Approach Vol, veh/h		0			557			1336			870	
Approach Delay, s/veh		0.0			55.6			0.7			17.7	
Approach LOS					E			A			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		0.0	0.0	95.5		24.5	13.8	81.7
Change Period (Y+Rc), s		3.0	3.0	3.6		3.9	3.6	3.6
Max Green Setting (Gmax), s		7.0	7.0	60.4		32.1	11.4	55.4
Max Q Clear Time (g_c+I1), s		0.0	0.0	6.8		15.8	10.3	2.0
Green Ext Time (p_c), s		0.0	0.0	5.9		4.0	0.0	11.1

Intersection Summary	
HCM 2010 Ctrl Delay	17.1
HCM 2010 LOS	B

Notes

HCM 2010 Signalized Intersection Summary
2: Petaluma Hill Rd & Kawana Springs Rd

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	205	224	165	160	220	30	161	688	222	19	432	266
Future Volume (veh/h)	205	224	165	160	220	30	161	688	222	19	432	266
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	12	0
Ped-Bike Adj(A_pbT)	0.99		0.98	1.00		0.97	1.00		1.00	1.00		0.97
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	1863	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	205	224	112	160	220	26	161	688	203	19	432	139
Adj No. of Lanes	1	1	1	1	1	0	1	2	0	1	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	472	610	623	459	507	60	332	1147	338	258	703	733
Arrive On Green	0.10	0.33	0.33	0.08	0.31	0.31	0.07	0.43	0.43	0.02	0.38	0.38
Sat Flow, veh/h	1774	1863	1548	1774	1630	193	1774	2697	795	1774	1863	1536
Grp Volume(v), veh/h	205	224	112	160	0	246	161	451	440	19	432	139
Grp Sat Flow(s),veh/h/ln	1774	1863	1548	1774	0	1823	1774	1770	1722	1774	1863	1536
Q Serve(g_s), s	7.6	9.2	4.7	6.0	0.0	10.8	5.3	19.7	19.7	0.6	18.8	5.2
Cycle Q Clear(g_c), s	7.6	9.2	4.7	6.0	0.0	10.8	5.3	19.7	19.7	0.6	18.8	5.2
Prop In Lane	1.00		1.00	1.00		0.11	1.00		0.46	1.00		1.00
Lane Grp Cap(c), veh/h	472	610	623	459	0	567	332	753	733	258	703	733
V/C Ratio(X)	0.43	0.37	0.18	0.35	0.00	0.43	0.49	0.60	0.60	0.07	0.61	0.19
Avail Cap(c_a), veh/h	513	610	623	530	0	567	443	753	733	427	703	733
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.2	25.7	19.4	20.7	0.0	27.4	19.0	22.2	22.2	19.2	26.3	15.2
Incr Delay (d2), s/veh	0.2	1.7	0.6	0.2	0.0	2.4	0.4	3.5	3.6	0.0	4.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.5	0.0
%ile BackOfQ(50%),veh/ln	3.7	5.0	2.1	2.9	0.0	5.8	2.6	10.3	10.0	0.3	13.2	2.3
LnGrp Delay(d),s/veh	20.4	27.4	20.0	20.9	0.0	29.9	19.5	25.7	25.8	19.3	35.7	15.8
LnGrp LOS	C	C	B	C		C	B	C	C	B	D	B
Approach Vol, veh/h		541			406			1052			590	
Approach Delay, s/veh		23.2			26.3			24.8			30.5	
Approach LOS		C			C			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	11.0	36.7	10.3	42.0	12.7	35.0	5.5	46.9
Change Period (Y+Rc), s	3.0	3.9	3.0	* 4.3	3.0	3.9	3.0	4.3
Max Green Setting (Gmax), s	12.0	31.1	12.0	* 31	12.0	31.1	12.0	30.7
Max Q Clear Time (g_c+I1), s	13.0	11.2	7.3	20.8	9.6	12.8	2.6	21.7
Green Ext Time (p_c), s	0.1	1.6	0.1	1.6	0.1	1.3	0.0	2.8

Intersection Summary	
HCM 2010 Ctrl Delay	26.0
HCM 2010 LOS	C

Notes

HCM 2010 Signalized Intersection Summary
3: Corby Avenue & Hearn Avenue

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	76	526	184	465	610	99	116	204	879	82	101	122
Future Volume (veh/h)	76	526	184	465	610	99	116	204	879	82	101	122
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	1	7	4	1	1	0	0	2	3	0	1	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		0.98
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	1863	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	76	526	174	465	610	96	116	204	826	82	101	121
Adj No. of Lanes	1	1	1	1	2	0	1	1	1	1	1	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	100	655	541	452	1676	262	113	422	828	104	264	200
Arrive On Green	0.05	0.35	0.35	0.25	0.55	0.55	0.06	0.23	0.23	0.06	0.22	0.22
Sat Flow, veh/h	1774	1863	1549	1774	3055	480	1774	1863	1581	1774	766	918
Grp Volume(v), veh/h	76	526	174	465	353	353	116	204	826	82	0	222
Grp Sat Flow(s),veh/h/ln	1774	1863	1549	1774	1770	1766	1774	1863	1581	1774	0	1684
Q Serve(g_s), s	4.7	28.2	9.1	28.0	12.4	12.4	7.0	10.5	24.8	5.0	0.0	13.0
Cycle Q Clear(g_c), s	4.7	28.2	9.1	28.0	12.4	12.4	7.0	10.5	24.8	5.0	0.0	13.0
Prop In Lane	1.00		1.00	1.00		0.27	1.00		1.00	1.00		0.55
Lane Grp Cap(c), veh/h	100	655	541	452	970	968	113	422	828	104	0	373
V/C Ratio(X)	0.76	0.80	0.32	1.03	0.36	0.36	1.03	0.48	1.00	0.79	0.00	0.59
Avail Cap(c_a), veh/h	161	649	540	452	970	968	113	420	760	177	0	444
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.72	0.72	0.72	0.76	0.76	0.76	1.00	0.00	1.00
Uniform Delay (d), s/veh	51.3	32.9	26.6	41.0	14.1	14.1	51.5	37.1	26.2	51.1	0.0	38.5
Incr Delay (d2), s/veh	4.4	10.0	1.6	43.8	0.8	0.8	81.2	0.2	26.8	4.8	0.0	0.6
Initial Q Delay(d3),s/veh	3.0	4.2	0.6	7.7	0.0	0.0	0.4	0.3	12.2	0.0	0.0	0.1
%ile BackOfQ(50%),veh/ln	2.6	18.2	4.7	20.2	6.3	6.3	6.0	5.7	33.9	2.6	0.0	6.2
LnGrp Delay(d),s/veh	58.6	47.1	28.8	92.5	14.8	14.8	133.1	37.7	65.2	55.9	0.0	39.2
LnGrp LOS	E	D	C	F	B	B	F	D	E	E		D
Approach Vol, veh/h		776			1171			1146			304	
Approach Delay, s/veh		44.2			45.7			67.2			43.7	
Approach LOS		D			D			E			D	

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	11.0	41.5	10.0	27.5	9.0	63.5	9.5	28.0
Change Period (Y+Rc), s	3.0	3.2	3.0	* 3.2	3.0	3.2	3.0	3.2
Max Green Setting (Gmax), s	8.0	33.8	7.0	* 29	10.0	51.8	11.0	24.8
Max Q Clear Time (g_c+I1), s	30.0	30.2	9.0	15.0	6.7	14.4	7.0	26.8
Green Ext Time (p_c), s	0.0	2.1	0.0	0.7	0.0	5.1	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	52.4
HCM 2010 LOS	D

Notes

HCM 2010 Signalized Intersection Summary
4: Santa Rosa Avenue & Hearn Avenue/Private Driveway

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	537	7	931	5	7	15	676	1051	0	5	645	485
Future Volume (veh/h)	537	7	931	5	7	15	676	1051	0	5	645	485
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	1	1	0	0	0	1	1	0	0	0	1
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.99
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	1863	1900	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	542	0	760	5	7	11	676	1051	0	5	645	472
Adj No. of Lanes	2	0	1	0	1	0	2	3	0	1	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	822	0	754	8	12	18	754	3210	0	11	1445	1015
Arrive On Green	0.23	0.00	0.23	0.02	0.02	0.02	0.22	0.63	0.00	0.00	0.28	0.28
Sat Flow, veh/h	3548	0	1559	370	518	813	3442	5253	0	1774	3539	1560
Grp Volume(v), veh/h	542	0	760	23	0	0	676	1051	0	5	645	472
Grp Sat Flow(s),veh/h/ln	1774	0	1559	1701	0	0	1721	1695	0	1774	1770	1560
Q Serve(g_s), s	16.6	0.0	27.8	1.6	0.0	0.0	22.9	11.5	0.0	0.3	18.0	19.8
Cycle Q Clear(g_c), s	16.6	0.0	27.8	1.6	0.0	0.0	22.9	11.5	0.0	0.3	18.0	19.8
Prop In Lane	1.00		1.00	0.22		0.48	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	822	0	754	38	0	0	754	3210	0	11	1445	1015
V/C Ratio(X)	0.66	0.00	1.01	0.61	0.00	0.00	0.90	0.33	0.00	0.44	0.45	0.46
Avail Cap(c_a), veh/h	822	0	707	128	0	0	855	3210	0	130	1472	1016
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67
Upstream Filter(I)	0.22	0.00	0.22	1.00	0.00	0.00	0.68	0.68	0.00	0.96	0.96	0.96
Uniform Delay (d), s/veh	41.8	0.0	31.1	58.1	0.0	0.0	45.6	10.3	0.0	59.5	32.4	13.6
Incr Delay (d2), s/veh	0.4	0.0	17.4	5.7	0.0	0.0	8.1	0.2	0.0	9.3	1.0	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	4.7	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.2	0.0	16.3	0.8	0.0	0.0	11.8	5.5	0.0	0.2	9.0	14.7
LnGrp Delay(d),s/veh	42.2	0.0	53.2	63.8	0.0	0.0	53.8	10.5	0.0	68.8	33.3	15.1
LnGrp LOS	D		F	E			D	B		E	C	B
Approach Vol, veh/h		1302			23			1727			1122	
Approach Delay, s/veh		48.6			63.8			27.5			25.8	
Approach LOS		D			E			C			C	

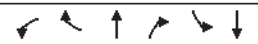
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		31.0	29.8	53.5		5.7	4.0	79.4
Change Period (Y+Rc), s		3.2	3.6	* 3.6		3.0	3.2	3.6
Max Green Setting (Gmax), s		27.8	29.8	* 40		9.0	8.8	61.4
Max Q Clear Time (g_c+I1), s		29.8	24.9	21.8		3.6	2.3	13.5
Green Ext Time (p_c), s		0.0	1.3	6.2		0.0	0.0	9.8

Intersection Summary	
HCM 2010 Ctrl Delay	33.8
HCM 2010 LOS	C

Notes

HCM 2010 Signalized Intersection Summary
5: Corby Avenue & US 101 SB Ramps

01/31/2019



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	252	602	584	106	353	385
Future Volume (veh/h)	252	602	584	106	353	385
Number	7	14	6	16	5	2
Initial Q (Qb), veh	13	0	0	0	0	1
Ped-Bike Adj(A_pbT)	1.00	1.00		0.98	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	1863
Adj Flow Rate, veh/h	252	596	584	104	246	535
Adj No. of Lanes	1	1	2	1	1	2
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	599	891	893	391	399	823
Arrive On Green	0.34	0.34	0.25	0.25	0.22	0.22
Sat Flow, veh/h	1774	1583	3632	1549	1774	3725
Grp Volume(v), veh/h	252	596	584	104	246	535
Grp Sat Flow(s),veh/h/ln	1774	1583	1770	1549	1774	1863
Q Serve(g_s), s	6.7	16.3	9.0	3.3	7.7	8.0
Cycle Q Clear(g_c), s	6.7	16.3	9.0	3.3	7.7	8.0
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	599	891	893	391	399	823
V/C Ratio(X)	0.42	0.67	0.65	0.27	0.62	0.65
Avail Cap(c_a), veh/h	784	1049	2029	888	639	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	17.1	9.5	20.9	18.7	21.7	21.7
Incr Delay (d2), s/veh	0.5	1.3	0.8	0.4	1.6	0.9
Initial Q Delay(d3),s/veh	5.8	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.8	10.5	4.6	1.5	4.0	4.2
LnGrp Delay(d),s/veh	23.4	10.9	21.7	19.1	23.3	22.6
LnGrp LOS	C	B	C	B	C	C
Approach Vol, veh/h	848		688			781
Approach Delay, s/veh	14.6		21.3			22.8
Approach LOS	B		C			C

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		17.5		24.1		19.5		
Change Period (Y+Rc), s		4.0		3.5		4.0		
Max Green Setting (Gmax), s		22.0		27.0		35.0		
Max Q Clear Time (g_c+I1), s		10.0		18.3		11.0		
Green Ext Time (p_c), s		3.5		2.3		4.5		

Intersection Summary	
HCM 2010 Ctrl Delay	19.4
HCM 2010 LOS	B

Notes

HCM 2010 Signalized Intersection Summary
6: Santa Rosa Avenue & US 101 NB Ramps/Yolanda Ave

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	351	232	40	131	347	314	345	948	188	311	930	332
Future Volume (veh/h)	351	232	40	131	347	314	345	948	188	311	930	332
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	2	0	0	1	1	0	2	1	0	0	0	1
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.98
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	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	351	232	33	131	347	295	345	948	184	311	930	316
Adj No. of Lanes	2	1	1	1	1	1	2	2	1	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	414	265	225	265	317	269	409	1673	746	401	1704	914
Arrive On Green	0.12	0.14	0.14	0.15	0.17	0.17	0.12	0.47	0.47	0.11	0.47	0.47
Sat Flow, veh/h	3442	1863	1583	1774	1863	1583	3442	3539	1534	3442	3539	1557
Grp Volume(v), veh/h	351	232	33	131	347	295	345	948	184	311	930	316
Grp Sat Flow(s),veh/h/ln	1721	1863	1583	1774	1863	1583	1721	1770	1534	1721	1770	1557
Q Serve(g_s), s	12.0	14.6	1.7	8.1	20.4	16.1	11.8	23.2	8.6	10.6	22.9	12.7
Cycle Q Clear(g_c), s	12.0	14.6	1.7	8.1	20.4	16.1	11.8	23.2	8.6	10.6	22.9	12.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	414	265	225	265	317	269	409	1673	746	401	1704	914
V/C Ratio(X)	0.85	0.87	0.15	0.49	1.10	1.10	0.84	0.57	0.25	0.78	0.55	0.35
Avail Cap(c_a), veh/h	462	317	269	265	317	269	470	1672	724	470	1648	914
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.09	0.09	0.09	1.00	1.00	1.00	0.46	0.46	0.46
Uniform Delay (d), s/veh	51.9	50.4	30.1	47.0	49.8	37.0	51.9	22.8	18.0	51.5	21.9	13.0
Incr Delay (d2), s/veh	12.8	20.2	0.3	0.1	48.3	49.2	11.7	1.4	0.8	3.3	0.6	0.5
Initial Q Delay(d3),s/veh	1.1	0.0	0.0	0.2	10.3	0.0	1.1	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.6	9.0	0.8	4.2	15.7	11.4	6.5	11.7	3.7	5.2	10.9	5.7
LnGrp Delay(d),s/veh	65.8	70.6	30.4	47.3	108.4	86.3	64.7	24.2	18.8	54.8	22.5	13.5
LnGrp LOS	E	E	C	D	F	F	E	C	B	D	C	B
Approach Vol, veh/h		616			773			1477			1557	
Approach Delay, s/veh		65.7			89.6			33.0			27.1	
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	11.8	20.7	17.7	59.8	18.2	24.3	16.9	60.6
Change Period (Y+Rc), s	3.9	3.6	3.6	3.9	3.9	* 3.9	3.9	* 3.9
Max Green Setting (Gmax), s	10.1	20.4	16.4	52.1	16.1	* 20	16.4	* 52
Max Q Clear Time (g_c+I1), s	10.1	16.6	13.8	24.9	14.0	22.4	12.6	25.2
Green Ext Time (p_c), s	0.1	0.4	0.3	9.0	0.3	0.0	0.4	8.5

Intersection Summary	
HCM 2010 Ctrl Delay	45.4
HCM 2010 LOS	D

Notes

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	419	107	292	808	681	283
Future Volume (veh/h)	419	107	292	808	681	283
Number	5	12	3	8	4	14
Initial Q (Qb), veh	1	0	0	0	5	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	1900	1863	1863	1863	1900
Adj Flow Rate, veh/h	419	78	292	808	681	277
Adj No. of Lanes	0	0	1	1	1	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	0	2	2	2	2
Cap, veh/h	439	23	251	1229	775	119
Arrive On Green	0.26	0.26	0.14	0.66	0.49	0.49
Sat Flow, veh/h	1465	273	1774	1863	1250	508
Grp Volume(v), veh/h	498	0	292	808	0	958
Grp Sat Flow(s),veh/h/ln	1741	0	1774	1863	0	1758
Q Serve(g_s), s	31.4	0.0	17.0	31.3	0.0	59.2
Cycle Q Clear(g_c), s	31.4	0.0	17.0	31.3	0.0	59.2
Prop In Lane	0.84	0.16	1.00			0.29
Lane Grp Cap(c), veh/h	462	0	251	1229	0	894
V/C Ratio(X)	1.08	0.00	1.16	0.66	0.00	1.07
Avail Cap(c_a), veh/h	456	0	251	1229	0	867
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	44.3	0.0	51.5	12.2	0.0	30.4
Incr Delay (d2), s/veh	64.8	0.0	107.6	1.3	0.0	51.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	18.6
%ile BackOfQ(50%),veh/ln	28.6	0.0	15.8	16.4	0.0	47.2
LnGrp Delay(d),s/veh	109.1	0.0	159.1	13.5	0.0	100.0
LnGrp LOS	F		F	B		F
Approach Vol, veh/h	498			1100	958	
Approach Delay, s/veh	109.1			52.2	100.0	
Approach LOS	F			D	F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		35.0	20.0	65.0				85.0
Change Period (Y+Rc), s		3.6	3.0	5.8				5.8
Max Green Setting (Gmax), s		31.4	17.0	59.2				79.2
Max Q Clear Time (g_c+I1), s		33.4	19.0	61.2				33.3
Green Ext Time (p_c), s		0.0	0.0	0.0				6.4

Intersection Summary	
HCM 2010 Ctrl Delay	81.2
HCM 2010 LOS	F

Notes

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	419	107	292	808	681	283
Future Volume (veh/h)	419	107	292	808	681	283
Number	5	12	3	8	4	14
Initial Q (Qb), veh	1	0	0	0	5	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1900	1863	1863	1863	1863
Adj Flow Rate, veh/h	419	78	292	808	681	277
Adj No. of Lanes	0	0	1	1	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	0	2	2	2	2
Cap, veh/h	465	62	298	1105	729	603
Arrive On Green	0.30	0.30	0.17	0.59	0.39	0.39
Sat Flow, veh/h	1465	273	1774	1863	1863	1543
Grp Volume(v), veh/h	498	0	292	808	681	277
Grp Sat Flow(s),veh/h/ln	1741	0	1774	1863	1863	1543
Q Serve(g_s), s	24.8	0.0	14.5	27.8	31.3	11.9
Cycle Q Clear(g_c), s	24.8	0.0	14.5	27.8	31.3	11.9
Prop In Lane	0.84	0.16	1.00			1.00
Lane Grp Cap(c), veh/h	528	0	298	1105	729	603
V/C Ratio(X)	0.94	0.00	0.98	0.73	0.93	0.46
Avail Cap(c_a), veh/h	530	0	300	1126	748	619
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.7	0.0	36.9	13.0	26.5	20.1
Incr Delay (d2), s/veh	25.7	0.0	45.8	2.4	18.6	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	5.2	0.0
%ile BackOfQ(50%),veh/ln	16.1	0.0	10.9	14.9	21.7	5.1
LnGrp Delay(d),s/veh	56.4	0.0	82.7	15.5	50.3	20.7
LnGrp LOS	E		F	B	D	C
Approach Vol, veh/h	498			1100	958	
Approach Delay, s/veh	56.4			33.3	41.8	
Approach LOS	E			C	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		30.4	18.0	40.3				58.3
Change Period (Y+Rc), s		3.6	3.0	5.8				5.8
Max Green Setting (Gmax), s		27.0	15.0	35.6				53.6
Max Q Clear Time (g_c+I1), s		26.8	16.5	33.3				29.8
Green Ext Time (p_c), s		0.0	0.0	1.2				5.6

Intersection Summary	
HCM 2010 Ctrl Delay	41.0
HCM 2010 LOS	D

Notes

HCM 2010 Signalized Intersection Summary
1: Santa Rosa Ave & Kawana Springs Rd

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	0	3	516	0	231	1	1255	365	28	501	0
Future Volume (veh/h)	1	0	3	516	0	231	1	1255	365	28	501	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	10	0	5	0	10	5	5	10	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.99	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	1900	1863	1863	1863	1863	1863	1863	1863	1863	0
Adj Flow Rate, veh/h	1	0	2	516	0	163	1	1255	245	28	501	0
Adj No. of Lanes	0	1	0	2	0	1	1	2	1	1	3	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	0
Cap, veh/h	2	0	4	776	0	386	2	2080	1258	65	3206	0
Arrive On Green	0.00	0.00	0.00	0.21	0.00	0.21	0.00	0.60	0.60	0.03	0.63	0.00
Sat Flow, veh/h	535	0	1070	3548	0	1561	1774	3539	1541	1774	5253	0
Grp Volume(v), veh/h	3	0	0	516	0	163	1	1255	245	28	501	0
Grp Sat Flow(s),veh/h/ln	1605	0	0	1774	0	1561	1774	1770	1541	1774	1695	0
Q Serve(g_s), s	0.2	0.0	0.0	12.1	0.0	8.0	0.1	19.8	3.2	1.4	3.6	0.0
Cycle Q Clear(g_c), s	0.2	0.0	0.0	12.1	0.0	8.0	0.1	19.8	3.2	1.4	3.6	0.0
Prop In Lane	0.33		0.67	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	6	0	0	776	0	386	2	2080	1258	65	3206	0
V/C Ratio(X)	0.47	0.00	0.00	0.66	0.00	0.42	0.41	0.60	0.19	0.43	0.16	0.00
Avail Cap(c_a), veh/h	125	0	0	1029	0	497	138	2118	1259	126	3213	0
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	0.00	1.00	0.00	1.00	0.94	0.94	0.94	1.00	1.00	0.00
Uniform Delay (d), s/veh	44.7	0.0	0.0	32.6	0.0	29.0	44.9	12.4	2.0	42.9	7.0	0.0
Incr Delay (d2), s/veh	18.2	0.0	0.0	2.1	0.0	1.6	34.5	1.2	0.3	4.4	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	3.6	0.0	2.1	0.0	0.4	0.1	74.2	0.1	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	7.0	0.0	4.3	0.0	11.1	3.6	2.6	2.1	0.0
LnGrp Delay(d),s/veh	62.9	0.0	0.0	38.2	0.0	32.6	79.4	14.0	2.5	121.5	7.2	0.0
LnGrp LOS	E			D		C	E	B	A	F	A	
Approach Vol, veh/h		3			679			1501			529	
Approach Delay, s/veh		62.9			36.9			12.2			13.2	
Approach LOS		E			D			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		3.4	3.1	60.5		23.0	6.1	57.5
Change Period (Y+Rc), s		3.0	3.0	3.6		3.9	3.6	3.6
Max Green Setting (Gmax), s		7.0	7.0	36.4		26.1	6.4	36.4
Max Q Clear Time (g_c+I1), s		2.2	2.1	5.6		14.1	3.4	21.8
Green Ext Time (p_c), s		0.0	0.0	3.6		4.2	0.0	8.3

Intersection Summary	
HCM 2010 Ctrl Delay	18.6
HCM 2010 LOS	B

Notes

HCM 2010 Signalized Intersection Summary
2: Petaluma Hill Rd & Kawana Springs Rd

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	176	230	52	226	347	46	106	847	238	24	368	289
Future Volume (veh/h)	176	230	52	226	347	46	106	847	238	24	368	289
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	12	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.97
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	1863	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	176	230	12	226	347	35	106	847	211	24	368	217
Adj No. of Lanes	1	1	1	1	1	0	1	2	0	1	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	337	527	523	459	500	50	371	1269	316	231	800	802
Arrive On Green	0.09	0.28	0.28	0.11	0.30	0.30	0.05	0.45	0.45	0.03	0.43	0.43
Sat Flow, veh/h	1774	1863	1557	1774	1662	168	1774	2796	696	1774	1863	1544
Grp Volume(v), veh/h	176	230	12	226	0	382	106	536	522	24	368	217
Grp Sat Flow(s),veh/h/ln	1774	1863	1557	1774	0	1829	1774	1770	1722	1774	1863	1544
Q Serve(g_s), s	7.6	11.1	0.6	9.7	0.0	20.3	3.5	26.1	26.1	0.8	15.4	8.7
Cycle Q Clear(g_c), s	7.6	11.1	0.6	9.7	0.0	20.3	3.5	26.1	26.1	0.8	15.4	8.7
Prop In Lane	1.00		1.00	1.00		0.09	1.00		0.40	1.00		1.00
Lane Grp Cap(c), veh/h	337	527	523	459	0	551	371	803	782	231	800	802
V/C Ratio(X)	0.52	0.44	0.02	0.49	0.00	0.69	0.29	0.67	0.67	0.10	0.46	0.27
Avail Cap(c_a), veh/h	375	527	523	465	0	551	498	803	782	374	800	802
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.0	32.3	24.5	23.7	0.0	34.0	17.4	23.5	23.5	19.0	23.3	14.9
Incr Delay (d2), s/veh	0.5	2.6	0.1	0.3	0.0	7.0	0.2	4.4	4.5	0.1	1.9	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	3.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	6.1	0.3	4.7	0.0	11.3	1.7	13.6	13.3	0.4	10.9	3.9
LnGrp Delay(d),s/veh	26.5	34.9	24.6	24.0	0.0	41.0	17.5	27.9	28.0	19.1	28.2	15.7
LnGrp LOS	C	C	C	C		D	B	C	C	B	C	B
Approach Vol, veh/h		418			608			1164			609	
Approach Delay, s/veh		31.1			34.7			27.0			23.4	
Approach LOS		C			C			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	14.7	35.0	8.8	51.6	12.6	37.0	6.1	54.2
Change Period (Y+Rc), s	3.0	3.9	3.0	* 4.3	3.0	3.9	3.0	4.3
Max Green Setting (Gmax), s	12.0	31.1	12.0	* 41	12.0	31.1	12.0	40.7
Max Q Clear Time (g_c+I1), s	11.7	13.1	5.5	17.4	9.6	22.3	2.8	28.1
Green Ext Time (p_c), s	0.0	1.2	0.1	1.8	0.1	1.5	0.0	4.0

Intersection Summary	
HCM 2010 Ctrl Delay	28.5
HCM 2010 LOS	C

Notes

HCM 2010 Signalized Intersection Summary
3: Corby Avenue & Hearn Avenue

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	108	849	388	377	562	47	119	121	619	129	171	206
Future Volume (veh/h)	108	849	388	377	562	47	119	121	619	129	171	206
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	3	0	2	1	0	1	0	2	0	2	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	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	1863	1863	1863	1900
Adj Flow Rate, veh/h	108	849	378	377	562	46	119	121	573	129	171	206
Adj No. of Lanes	1	2	0	1	2	0	1	1	2	1	1	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	134	914	382	355	1648	134	129	428	1172	157	235	210
Arrive On Green	0.08	0.37	0.37	0.20	0.50	0.50	0.07	0.23	0.23	0.09	0.24	0.24
Sat Flow, veh/h	1774	2374	1051	1774	3308	270	1774	1863	2726	1774	769	926
Grp Volume(v), veh/h	108	632	595	377	300	308	119	121	573	129	0	377
Grp Sat Flow(s),veh/h/ln	1774	1770	1655	1774	1770	1808	1774	1863	1363	1774	0	1695
Q Serve(g_s), s	6.6	38.3	38.7	22.0	11.3	11.3	7.3	5.9	16.8	7.9	0.0	23.9
Cycle Q Clear(g_c), s	6.6	38.3	38.7	22.0	11.3	11.3	7.3	5.9	16.8	7.9	0.0	23.9
Prop In Lane	1.00		0.64	1.00		0.15	1.00		1.00	1.00		0.55
Lane Grp Cap(c), veh/h	134	665	623	355	881	901	129	428	1172	157	0	414
V/C Ratio(X)	0.81	0.95	0.96	1.06	0.34	0.34	0.92	0.28	0.49	0.82	0.00	0.91
Avail Cap(c_a), veh/h	210	661	618	355	881	900	129	419	1171	258	0	447
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.87	0.87	0.87	0.95	0.95	0.95	1.00	0.00	1.00
Uniform Delay (d), s/veh	50.0	33.5	33.7	44.0	16.7	16.7	50.8	34.9	23.1	49.3	0.0	40.7
Incr Delay (d2), s/veh	5.6	24.5	26.6	62.0	0.9	0.9	53.3	0.1	0.1	4.0	0.0	20.7
Initial Q Delay(d3),s/veh	0.0	0.7	0.9	18.9	0.0	0.0	5.6	0.0	0.0	0.0	0.0	1.9
%ile BackOfQ(50%),veh/ln	3.4	23.5	22.6	18.9	5.8	5.9	5.8	3.1	6.5	4.0	0.0	14.1
LnGrp Delay(d),s/veh	55.7	58.7	61.2	124.9	17.6	17.6	109.7	35.0	23.3	53.3	0.0	63.3
LnGrp LOS	E	E	E	F	B	B	F	D	C	D		E
Approach Vol, veh/h		1335			985			813			506	
Approach Delay, s/veh		59.6			58.7			37.7			60.8	
Approach LOS		E			E			D			E	

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	25.0	44.3	11.0	29.7	11.3	58.0	12.7	28.0
Change Period (Y+Rc), s	3.0	3.2	3.0	* 3.2	3.0	3.2	3.0	3.2
Max Green Setting (Gmax), s	22.0	38.8	8.0	* 29	13.0	47.8	16.0	20.8
Max Q Clear Time (g_c+I1), s	24.0	40.7	9.3	25.9	8.6	13.3	9.9	18.8
Green Ext Time (p_c), s	0.0	0.0	0.0	0.5	0.0	4.1	0.1	0.5

Intersection Summary	
HCM 2010 Ctrl Delay	54.6
HCM 2010 LOS	D

Notes

HCM 2010 Signalized Intersection Summary
4: Santa Rosa Avenue & Hearn Avenue/Private Driveway

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	610	3	978	3	4	4	413	832	1	2	405	578
Future Volume (veh/h)	610	3	978	3	4	4	413	832	1	2	405	578
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	1	1	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.97	1.00		0.98
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	1863	1900	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	612	0	824	3	4	3	413	832	1	2	405	575
Adj No. of Lanes	2	0	1	0	1	0	2	3	0	1	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	1232	0	801	6	9	6	555	2627	3	5	1197	1076
Arrive On Green	0.35	0.00	0.35	0.01	0.01	0.01	0.16	0.50	0.50	0.00	0.34	0.34
Sat Flow, veh/h	3548	0	1572	523	698	523	3442	5245	6	1774	3539	1556
Grp Volume(v), veh/h	612	0	824	10	0	0	413	538	295	2	405	575
Grp Sat Flow(s),veh/h/ln	1774	0	1572	1744	0	0	1721	1695	1861	1774	1770	1556
Q Serve(g_s), s	12.9	0.0	33.0	0.5	0.0	0.0	10.9	8.9	8.9	0.1	8.1	17.5
Cycle Q Clear(g_c), s	12.9	0.0	33.0	0.5	0.0	0.0	10.9	8.9	8.9	0.1	8.1	17.5
Prop In Lane	1.00		1.00	0.30		0.30	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	1232	0	801	21	0	0	555	1698	932	5	1197	1076
V/C Ratio(X)	0.50	0.00	1.03	0.47	0.00	0.00	0.74	0.32	0.32	0.42	0.34	0.53
Avail Cap(c_a), veh/h	1232	0	801	92	0	0	580	1698	932	93	1197	1076
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)	0.47	0.00	0.47	1.00	0.00	0.00	0.73	0.73	0.73	0.96	0.96	0.96
Uniform Delay (d), s/veh	24.4	0.0	23.3	46.6	0.0	0.0	38.0	14.1	14.1	47.3	23.5	7.4
Incr Delay (d2), s/veh	0.7	0.0	29.3	5.9	0.0	0.0	3.7	0.4	0.7	19.1	0.2	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	4.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.4	0.0	21.5	0.3	0.0	0.0	5.4	4.3	4.8	0.1	4.0	15.2
LnGrp Delay(d),s/veh	25.1	0.0	57.0	52.5	0.0	0.0	41.7	14.4	14.7	66.4	23.6	7.9
LnGrp LOS	C		F	D			D	B	B	E	C	A
Approach Vol, veh/h		1436			10			1246			982	
Approach Delay, s/veh		43.4			52.5			23.5			14.5	
Approach LOS		D			D			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		36.2	18.9	35.7		4.2	3.5	51.2
Change Period (Y+Rc), s		3.2	3.6	* 3.6		3.0	3.2	3.6
Max Green Setting (Gmax), s		33.0	16.0	* 28		5.0	5.0	39.0
Max Q Clear Time (g_c+I1), s		35.0	12.9	19.5		2.5	2.1	10.9
Green Ext Time (p_c), s		0.0	0.5	3.3		0.0	0.0	6.1

Intersection Summary	
HCM 2010 Ctrl Delay	29.0
HCM 2010 LOS	C

Notes

HCM 2010 Signalized Intersection Summary
5: Corby Avenue & US 101 SB Ramps

10/09/2018

Movement	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations								
Traffic Volume (veh/h)	558	583	286	41	716	227		
Future Volume (veh/h)	558	583	286	41	716	227		
Number	7	14	6	16	5	2		
Initial Q (Qb), veh	1	1	1	0	0	1		
Ped-Bike Adj(A_pbT)	1.00	1.00		0.98	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	1863		
Adj Flow Rate, veh/h	558	574	286	41	716	227		
Adj No. of Lanes	1	2	2	1	2	1		
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	655	1706	636	278	839	454		
Arrive On Green	0.37	0.37	0.18	0.18	0.24	0.24		
Sat Flow, veh/h	1774	2787	3632	1545	3442	1863		
Grp Volume(v), veh/h	558	574	286	41	716	227		
Grp Sat Flow(s),veh/h/ln	1774	1393	1770	1545	1721	1863		
Q Serve(g_s), s	16.0	5.6	4.0	1.2	11.0	5.8		
Cycle Q Clear(g_c), s	16.0	5.6	4.0	1.2	11.0	5.8		
Prop In Lane	1.00	1.00		1.00	1.00			
Lane Grp Cap(c), veh/h	655	1706	636	278	839	454		
V/C Ratio(X)	0.85	0.34	0.45	0.15	0.85	0.50		
Avail Cap(c_a), veh/h	757	1869	698	305	872	472		
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	16.1	5.2	20.3	19.1	20.0	18.1		
Incr Delay (d2), s/veh	8.3	0.1	0.5	0.2	8.0	0.9		
Initial Q Delay(d3),s/veh	0.1	0.0	0.0	0.0	0.0	0.1		
%ile BackOfQ(50%),veh/ln	9.4	3.5	2.0	0.5	6.1	3.2		
LnGrp Delay(d),s/veh	24.5	5.4	20.8	19.4	28.0	19.0		
LnGrp LOS	C	A	C	B	C	B		
Approach Vol, veh/h	1132		327			943		
Approach Delay, s/veh	14.8		20.6			25.9		
Approach LOS	B		C			C		

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		17.5		23.9		13.9		
Change Period (Y+Rc), s		4.0		3.5		4.0		
Max Green Setting (Gmax), s		14.0		23.6		10.9		
Max Q Clear Time (g_c+I1), s		13.0		18.0		6.0		
Green Ext Time (p_c), s		0.5		2.3		0.8		

Intersection Summary	
HCM 2010 Ctrl Delay	19.9
HCM 2010 LOS	B

HCM 2010 Signalized Intersection Summary
6: Santa Rosa Avenue & US 101 NB Ramps/Yolanda Ave

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	245	123	25	153	390	176	442	784	193	412	600	376
Future Volume (veh/h)	245	123	25	153	390	176	442	784	193	412	600	376
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	2	2	0	1	1	1	0	1	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
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	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	245	123	24	153	390	165	442	784	193	412	600	339
Adj No. of Lanes	2	1	1	1	1	1	2	2	1	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	311	169	144	432	452	398	392	1312	576	502	1425	750
Arrive On Green	0.09	0.09	0.09	0.24	0.24	0.24	0.11	0.37	0.37	0.14	0.40	0.40
Sat Flow, veh/h	3442	1863	1583	1774	1863	1583	3442	3539	1552	3442	3539	1552
Grp Volume(v), veh/h	245	123	24	153	390	165	442	784	193	412	600	339
Grp Sat Flow(s),veh/h/ln	1721	1863	1583	1774	1863	1583	1721	1770	1552	1721	1770	1552
Q Serve(g_s), s	7.0	6.4	1.1	7.2	20.1	6.3	11.4	17.9	8.9	11.7	12.2	14.2
Cycle Q Clear(g_c), s	7.0	6.4	1.1	7.2	20.1	6.3	11.4	17.9	8.9	11.7	12.2	14.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	311	169	144	432	452	398	392	1312	576	502	1425	750
V/C Ratio(X)	0.79	0.73	0.17	0.35	0.86	0.41	1.13	0.60	0.34	0.82	0.42	0.45
Avail Cap(c_a), veh/h	337	596	507	430	564	480	392	1317	578	578	1426	768
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	1.00	0.56	0.56	0.56
Uniform Delay (d), s/veh	44.5	44.3	26.6	31.5	36.5	15.4	44.3	25.5	22.7	41.4	21.5	17.2
Incr Delay (d2), s/veh	11.0	5.8	0.5	0.5	11.0	0.7	84.5	2.0	1.6	4.7	0.5	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.2	1.0	0.0	8.1	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	3.6	0.5	3.8	12.0	2.7	10.5	9.2	4.2	5.8	6.1	6.4
LnGrp Delay(d),s/veh	55.6	50.1	27.1	32.2	48.5	16.1	136.9	27.5	24.3	46.2	22.1	18.3
LnGrp LOS	E	D	C	C	D	B	F	C	C	D	C	B
Approach Vol, veh/h		392			708			1419			1351	
Approach Delay, s/veh		52.1			37.4			61.1			28.5	
Approach LOS		D			D			E			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	28.1	12.7	15.0	44.2	12.9	27.9	18.1	41.1
Change Period (Y+Rc), s	3.9	3.6	3.6	3.9	3.9	* 3.9	3.9	* 3.9
Max Green Setting (Gmax), s	8.1	32.0	11.4	33.5	9.8	* 30	16.8	* 28
Max Q Clear Time (g_c+I1), s	9.2	8.4	13.4	16.2	9.0	22.1	13.7	19.9
Green Ext Time (p_c), s	0.0	0.7	0.0	5.1	0.1	1.8	0.5	3.8

Intersection Summary	
HCM 2010 Ctrl Delay	44.5
HCM 2010 LOS	D

Notes

HCM 2010 Signalized Intersection Summary
7: Petaluma Hill Rd & Yolanda Ave

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	164	57	175	287	130	106	359	892	64	25	420	185
Future Volume (veh/h)	164	57	175	287	130	106	359	892	64	25	420	185
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	1	0	0	0	0	0	0	0	0	0	5	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
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	1863	1863	1863	1863
Adj Flow Rate, veh/h	164	57	136	287	130	106	359	892	64	25	420	160
Adj No. of Lanes	1	2	0	1	2	0	1	2	1	1	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	199	189	169	321	338	256	578	1855	1117	321	1458	815
Arrive On Green	0.11	0.11	0.11	0.18	0.18	0.18	0.14	0.52	0.52	0.02	0.41	0.41
Sat Flow, veh/h	1774	1770	1583	1774	1922	1453	1774	3539	1583	1774	3539	1549
Grp Volume(v), veh/h	164	57	136	287	119	117	359	892	64	25	420	160
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1774	1770	1606	1774	1770	1583	1774	1770	1549
Q Serve(g_s), s	10.0	3.3	9.2	17.4	6.5	7.1	12.1	17.6	1.4	0.9	8.7	6.0
Cycle Q Clear(g_c), s	10.0	3.3	9.2	17.4	6.5	7.1	12.1	17.6	1.4	0.9	8.7	6.0
Prop In Lane	1.00		1.00	1.00		0.90	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	199	189	169	321	311	282	578	1855	1117	321	1458	815
V/C Ratio(X)	0.82	0.30	0.80	0.89	0.38	0.41	0.62	0.48	0.06	0.08	0.29	0.20
Avail Cap(c_a), veh/h	295	290	259	444	438	397	738	1855	1117	359	1462	815
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	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.9	45.3	48.0	44.0	40.1	40.3	14.4	16.7	5.0	17.9	21.8	13.9
Incr Delay (d2), s/veh	11.2	0.9	10.0	15.7	0.8	1.0	1.1	0.9	0.1	0.1	0.5	0.5
Initial Q Delay(d3),s/veh	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
%ile BackOfQ(50%),veh/ln	5.7	1.6	4.5	9.9	3.2	3.2	6.2	8.8	0.6	0.4	4.7	2.7
LnGrp Delay(d),s/veh	60.0	46.2	58.0	59.7	40.8	41.3	15.5	17.6	5.1	18.0	22.4	14.4
LnGrp LOS	E	D	E	E	D	D	B	B	A	B	C	B
Approach Vol, veh/h		357			523			1315			605	
Approach Delay, s/veh		57.1			51.3			16.4			20.1	
Approach LOS		E			D			B			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	24.4	16.3	19.4	49.9	16.7	24.0	7.2	62.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	27.5	18.0	24.5	22.0	18.3	27.2	5.0	41.5
Max Q Clear Time (g_c+I1), s	19.4	11.2	14.1	10.7	12.0	9.1	2.9	19.6
Green Ext Time (p_c), s	0.5	0.5	0.8	2.3	0.2	1.2	0.0	6.1

Intersection Summary	
HCM 2010 Ctrl Delay	28.9
HCM 2010 LOS	C

HCM 2010 Signalized Intersection Summary
1: Santa Rosa Ave & Kawana Springs Rd

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	588	0	229	0	1571	639	77	997	0
Future Volume (veh/h)	0	0	0	588	0	229	0	1571	639	77	997	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	10	0	5	0	10	5	5	10	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	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	1900	1863	1863	1863	1863	1863	1863	1863	1863	0
Adj Flow Rate, veh/h	0	0	0	588	0	145	0	1571	622	77	997	0
Adj No. of Lanes	0	1	0	2	0	1	1	2	1	1	3	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	0
Cap, veh/h	0	2	0	769	0	425	1	2233	1313	114	3693	0
Arrive On Green	0.00	0.00	0.00	0.21	0.00	0.21	0.00	0.64	0.64	0.06	0.73	0.00
Sat Flow, veh/h	0	1863	0	3548	0	1568	1774	3539	1530	1774	5253	0
Grp Volume(v), veh/h	0	0	0	588	0	145	0	1571	622	77	997	0
Grp Sat Flow(s),veh/h/ln	0	1863	0	1774	0	1568	1774	1770	1530	1774	1695	0
Q Serve(g_s), s	0.0	0.0	0.0	18.8	0.0	9.0	0.0	34.3	12.1	5.1	8.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	18.8	0.0	9.0	0.0	34.3	12.1	5.1	8.0	0.0
Prop In Lane	0.00		0.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	0	2	0	769	0	425	1	2233	1313	114	3693	0
V/C Ratio(X)	0.00	0.00	0.00	0.76	0.00	0.34	0.00	0.70	0.47	0.68	0.27	0.00
Avail Cap(c_a), veh/h	0	109	0	949	0	507	103	2271	1315	169	3698	0
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)	0.00	0.00	0.00	1.00	0.00	1.00	0.00	0.79	0.79	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	44.7	0.0	35.8	0.0	15.3	2.4	55.6	5.8	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	4.3	0.0	1.0	0.0	1.5	1.0	6.9	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	5.2	0.0	1.5	0.0	0.5	0.2	43.4	0.1	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	11.0	0.0	4.9	0.0	18.9	13.6	4.8	4.3	0.0
LnGrp Delay(d),s/veh	0.0	0.0	0.0	54.2	0.0	38.3	0.0	17.3	3.6	105.9	6.0	0.0
LnGrp LOS				D		D		B	A	F	A	
Approach Vol, veh/h		0			733			2193			1074	
Approach Delay, s/veh		0.0			51.1			13.4			13.2	
Approach LOS					D			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		0.0	0.0	90.9		29.1	10.2	80.6
Change Period (Y+Rc), s		3.0	3.0	3.6		3.9	3.6	3.6
Max Green Setting (Gmax), s		7.0	7.0	60.4		32.1	11.4	55.4
Max Q Clear Time (g_c+I1), s		0.0	0.0	10.0		20.8	7.1	36.3
Green Ext Time (p_c), s		0.0	0.0	8.7		4.3	0.0	13.7

Intersection Summary	
HCM 2010 Ctrl Delay	20.3
HCM 2010 LOS	C

Notes

HCM 2010 Signalized Intersection Summary
2: Petaluma Hill Rd & Kawana Springs Rd

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	267	436	129	175	339	40	134	676	310	30	417	367
Future Volume (veh/h)	267	436	129	175	339	40	134	676	310	30	417	367
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	12	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.98	1.00		0.98
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	1863	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	267	436	76	175	339	36	134	676	291	30	417	240
Adj No. of Lanes	1	1	1	1	1	0	1	2	0	1	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	414	638	642	350	513	55	301	946	407	223	680	750
Arrive On Green	0.12	0.34	0.34	0.09	0.31	0.31	0.06	0.40	0.40	0.03	0.37	0.37
Sat Flow, veh/h	1774	1863	1578	1774	1651	175	1774	2394	1031	1774	1863	1544
Grp Volume(v), veh/h	267	436	76	175	0	375	134	500	467	30	417	240
Grp Sat Flow(s),veh/h/ln	1774	1863	1578	1774	0	1826	1774	1770	1655	1774	1863	1544
Q Serve(g_s), s	9.8	20.1	3.0	6.6	0.0	17.8	4.5	23.8	23.8	1.0	18.3	9.5
Cycle Q Clear(g_c), s	9.8	20.1	3.0	6.6	0.0	17.8	4.5	23.8	23.8	1.0	18.3	9.5
Prop In Lane	1.00		1.00	1.00		0.10	1.00		0.62	1.00		1.00
Lane Grp Cap(c), veh/h	414	638	642	350	0	568	301	700	654	223	680	750
V/C Ratio(X)	0.65	0.68	0.12	0.50	0.00	0.66	0.45	0.71	0.71	0.13	0.61	0.32
Avail Cap(c_a), veh/h	418	638	642	410	0	568	425	700	654	376	680	750
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.6	28.2	18.5	22.0	0.0	29.9	19.8	25.5	25.5	20.6	27.0	15.8
Incr Delay (d2), s/veh	2.6	5.8	0.4	0.4	0.0	5.9	0.4	6.1	6.5	0.1	4.1	1.1
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	5.8	0.0
%ile BackOfQ(50%),veh/ln	5.0	11.3	1.4	3.2	0.0	9.9	2.2	12.7	12.0	0.5	13.0	4.3
LnGrp Delay(d),s/veh	23.2	34.0	18.9	22.4	0.0	35.8	20.2	31.6	32.0	20.7	36.9	17.0
LnGrp LOS	C	C	B	C		D	C	C	C	C	D	B
Approach Vol, veh/h		779			550			1101			687	
Approach Delay, s/veh		28.8			31.5			30.4			29.2	
Approach LOS		C			C			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	11.6	38.2	9.4	40.8	14.8	35.0	6.4	43.8
Change Period (Y+Rc), s	3.0	3.9	3.0	* 4.3	3.0	3.9	3.0	4.3
Max Green Setting (Gmax), s	12.0	31.1	12.0	* 31	12.0	31.1	12.0	30.7
Max Q Clear Time (g_c+I1), s	8.6	22.1	6.5	20.3	11.8	19.8	3.0	25.8
Green Ext Time (p_c), s	0.1	2.0	0.1	1.7	0.0	1.7	0.0	2.0

Intersection Summary	
HCM 2010 Ctrl Delay	30.0
HCM 2010 LOS	C

Notes

HCM 2010 Signalized Intersection Summary
3: Corby Avenue & Hearn Avenue

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	132	1040	184	330	990	170	116	204	785	261	159	324
Future Volume (veh/h)	132	1040	184	330	990	170	116	204	785	261	159	324
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	3	0	2	1	0	1	0	2	0	2	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	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	1863	1863	1863	1900
Adj Flow Rate, veh/h	132	1040	174	330	990	169	116	204	739	261	159	324
Adj No. of Lanes	1	2	0	1	2	0	1	1	2	1	1	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	161	1171	189	284	1364	231	124	364	978	292	223	278
Arrive On Green	0.09	0.38	0.38	0.16	0.45	0.45	0.07	0.20	0.20	0.16	0.29	0.29
Sat Flow, veh/h	1774	3027	505	1774	3015	514	1774	1863	2726	1774	547	1115
Grp Volume(v), veh/h	132	607	607	330	581	578	116	204	739	261	0	483
Grp Sat Flow(s),veh/h/ln	1774	1770	1763	1774	1770	1759	1774	1863	1363	1774	0	1662
Q Serve(g_s), s	7.3	32.2	32.4	16.0	26.8	26.9	6.5	9.9	19.5	14.4	0.0	29.0
Cycle Q Clear(g_c), s	7.3	32.2	32.4	16.0	26.8	26.9	6.5	9.9	19.5	14.4	0.0	29.0
Prop In Lane	1.00		0.29	1.00		0.29	1.00		1.00	1.00		0.67
Lane Grp Cap(c), veh/h	161	680	678	284	800	796	124	364	978	292	0	490
V/C Ratio(X)	0.82	0.89	0.89	1.16	0.73	0.73	0.93	0.56	0.76	0.89	0.00	0.99
Avail Cap(c_a), veh/h	195	677	675	284	800	795	124	364	978	319	0	482
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.62	0.62	0.62	0.85	0.85	0.85	1.00	0.00	1.00
Uniform Delay (d), s/veh	44.6	29.0	29.0	42.0	22.4	22.4	46.4	36.4	28.6	40.9	0.0	35.5
Incr Delay (d2), s/veh	16.8	16.4	16.7	94.8	3.6	3.6	54.3	1.0	2.6	23.1	0.0	37.2
Initial Q Delay(d3),s/veh	0.0	0.3	0.3	21.5	0.0	0.0	7.1	0.0	0.1	0.0	0.0	8.1
%ile BackOfQ(50%),veh/ln	4.3	19.1	19.1	17.3	13.9	13.9	5.4	5.2	9.5	8.9	0.0	19.7
LnGrp Delay(d),s/veh	61.5	45.7	46.0	158.3	26.0	26.0	107.7	37.4	31.4	64.0	0.0	80.8
LnGrp LOS	E	D	D	F	C	C	F	D	C	E		F
Approach Vol, veh/h		1346			1489			1059			744	
Approach Delay, s/veh		47.4			55.3			40.9			74.9	
Approach LOS		D			E			D			E	

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	19.0	41.5	10.0	32.2	12.1	48.4	19.5	22.7
Change Period (Y+Rc), s	3.0	3.2	3.0	* 3.2	3.0	3.2	3.0	3.2
Max Green Setting (Gmax), s	16.0	35.8	7.0	* 29	11.0	40.8	18.0	17.8
Max Q Clear Time (g_c+I1), s	18.0	34.4	8.5	31.0	9.3	28.9	16.4	21.5
Green Ext Time (p_c), s	0.0	1.2	0.0	0.0	0.0	6.1	0.1	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	52.9
HCM 2010 LOS	D

Notes

HCM 2010 Signalized Intersection Summary
4: Santa Rosa Avenue & Hearn Avenue/Private Driveway

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	927	7	1107	5	7	15	718	1360	0	5	770	765
Future Volume (veh/h)	927	7	1107	5	7	15	718	1360	0	5	770	765
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	1	1	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		0.98
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	1863	1900	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	932	0	953	5	7	14	718	1360	0	5	770	762
Adj No. of Lanes	2	0	1	0	1	0	2	3	0	1	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	1018	0	882	8	11	22	938	2894	0	11	1060	920
Arrive On Green	0.29	0.00	0.29	0.02	0.02	0.02	0.27	0.57	0.00	0.01	0.30	0.30
Sat Flow, veh/h	3548	0	1570	324	454	908	3442	5253	0	1774	3539	1555
Grp Volume(v), veh/h	932	0	953	26	0	0	718	1360	0	5	770	762
Grp Sat Flow(s),veh/h/ln	1774	0	1570	1686	0	0	1721	1695	0	1774	1770	1555
Q Serve(g_s), s	29.2	0.0	33.0	1.8	0.0	0.0	22.1	18.1	0.0	0.3	22.4	34.4
Cycle Q Clear(g_c), s	29.2	0.0	33.0	1.8	0.0	0.0	22.1	18.1	0.0	0.3	22.4	34.4
Prop In Lane	1.00		1.00	0.19		0.54	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	1018	0	882	41	0	0	938	2894	0	11	1060	920
V/C Ratio(X)	0.92	0.00	1.08	0.63	0.00	0.00	0.77	0.47	0.00	0.44	0.73	0.83
Avail Cap(c_a), veh/h	1018	0	882	73	0	0	1077	2894	0	77	1060	920
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)	0.33	0.00	0.33	1.00	0.00	0.00	0.40	0.40	0.00	0.93	0.93	0.93
Uniform Delay (d), s/veh	39.6	0.0	25.3	55.6	0.0	0.0	38.5	14.6	0.0	56.9	36.1	17.0
Incr Delay (d2), s/veh	5.6	0.0	43.8	5.7	0.0	0.0	1.2	0.2	0.0	8.9	2.4	6.0
Initial Q Delay(d3),s/veh	0.0	0.0	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.0	0.0	25.6	0.9	0.0	0.0	10.6	8.5	0.0	0.2	11.3	25.7
LnGrp Delay(d),s/veh	45.2	0.0	72.8	61.3	0.0	0.0	39.6	14.8	0.0	65.8	38.4	22.9
LnGrp LOS	D		F	E			D	B		E	D	C
Approach Vol, veh/h		1885			26			2078			1537	
Approach Delay, s/veh		59.1			61.3			23.4			30.8	
Approach LOS		E			E			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		36.2	34.9	38.0		5.8	3.9	69.0
Change Period (Y+Rc), s		3.2	3.6	* 3.6		3.0	3.2	3.6
Max Green Setting (Gmax), s		33.0	36.0	* 28		5.0	5.0	59.0
Max Q Clear Time (g_c+I1), s		35.0	24.1	36.4		3.8	2.3	20.1
Green Ext Time (p_c), s		0.0	2.3	0.0		0.0	0.0	13.5

Intersection Summary	
HCM 2010 Ctrl Delay	37.8
HCM 2010 LOS	D

Notes

HCM 2010 Signalized Intersection Summary
5: Corby Avenue & US 101 SB Ramps

10/09/2018

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	304	504	614	116	347	344
Future Volume (veh/h)	304	504	614	116	347	344
Number	7	14	6	16	5	2
Initial Q (Qb), veh	1	1	1	0	0	1
Ped-Bike Adj(A_pbT)	1.00	1.00		0.98	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	1863
Adj Flow Rate, veh/h	304	495	614	116	347	344
Adj No. of Lanes	1	2	2	1	2	1
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	417	1344	874	382	852	462
Arrive On Green	0.23	0.23	0.25	0.25	0.25	0.25
Sat Flow, veh/h	1774	2787	3632	1547	3442	1863
Grp Volume(v), veh/h	304	495	614	116	347	344
Grp Sat Flow(s),veh/h/ln	1774	1393	1770	1547	1721	1863
Q Serve(g_s), s	6.7	4.7	6.7	2.6	3.6	7.2
Cycle Q Clear(g_c), s	6.7	4.7	6.7	2.6	3.6	7.2
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	417	1344	874	382	852	462
V/C Ratio(X)	0.73	0.37	0.70	0.30	0.41	0.75
Avail Cap(c_a), veh/h	523	1510	1084	474	1054	571
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	15.1	6.9	14.6	13.0	13.4	14.8
Incr Delay (d2), s/veh	3.9	0.2	1.5	0.4	0.3	4.2
Initial Q Delay(d3),s/veh	0.2	0.0	0.0	0.0	0.0	0.1
%ile BackOfQ(50%),veh/ln	3.8	2.7	3.5	1.1	1.7	4.4
LnGrp Delay(d),s/veh	19.1	7.1	16.2	13.5	13.7	19.1
LnGrp LOS	B	A	B	B	B	B
Approach Vol, veh/h	799		730			691
Approach Delay, s/veh	11.7		15.8			16.4
Approach LOS	B		B			B

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		14.5		13.5		14.5		
Change Period (Y+Rc), s		4.0		3.5		4.0		
Max Green Setting (Gmax), s		13.0		12.5		13.0		
Max Q Clear Time (g_c+I1), s		9.2		8.7		8.7		
Green Ext Time (p_c), s		1.3		1.2		1.8		

Intersection Summary	
HCM 2010 Ctrl Delay	14.5
HCM 2010 LOS	B

HCM 2010 Signalized Intersection Summary
6: Santa Rosa Avenue & US 101 NB Ramps/Yolanda Ave

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	548	156	56	184	339	314	345	1105	347	399	1086	364
Future Volume (veh/h)	548	156	56	184	339	314	345	1105	347	399	1086	364
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	2	2	0	1	1	1	0	1	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
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	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	548	156	55	184	339	303	345	1105	347	399	1086	327
Adj No. of Lanes	2	1	1	1	1	1	2	2	1	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	616	206	175	496	392	343	344	1220	539	375	1271	828
Arrive On Green	0.18	0.11	0.11	0.28	0.21	0.21	0.10	0.35	0.35	0.11	0.36	0.36
Sat Flow, veh/h	3442	1863	1583	1774	1863	1583	3442	3539	1552	3442	3539	1551
Grp Volume(v), veh/h	548	156	55	184	339	303	345	1105	347	399	1086	327
Grp Sat Flow(s),veh/h/ln	1721	1863	1583	1774	1863	1583	1721	1770	1552	1721	1770	1551
Q Serve(g_s), s	15.6	8.1	2.6	8.3	17.6	14.3	10.0	29.6	18.8	10.9	28.3	12.3
Cycle Q Clear(g_c), s	15.6	8.1	2.6	8.3	17.6	14.3	10.0	29.6	18.8	10.9	28.3	12.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	616	206	175	496	392	343	344	1220	539	375	1271	828
V/C Ratio(X)	0.89	0.76	0.31	0.37	0.87	0.88	1.00	0.91	0.64	1.06	0.85	0.40
Avail Cap(c_a), veh/h	650	596	507	495	438	372	344	1232	540	375	1275	842
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	1.00	0.11	0.11	0.11
Uniform Delay (d), s/veh	40.1	43.2	26.7	29.1	38.3	22.0	45.0	31.3	27.5	44.5	29.7	14.0
Incr Delay (d2), s/veh	13.9	5.6	1.0	0.5	15.3	20.2	49.1	11.2	5.8	35.8	0.9	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.2	1.4	0.0	10.5	0.1	0.1	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.6	4.5	1.2	4.4	11.1	8.1	7.6	16.5	9.1	7.0	14.0	5.4
LnGrp Delay(d),s/veh	54.0	48.8	27.7	29.8	55.0	42.2	104.6	42.5	33.4	80.3	30.6	14.2
LnGrp LOS	D	D	C	C	E	D	F	D	C	F	C	B
Approach Vol, veh/h		759			826			1797			1812	
Approach Delay, s/veh		51.0			44.7			52.7			38.6	
Approach LOS		D			D			D			D	

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	31.8	14.7	13.6	39.9	21.8	24.7	14.8	38.7
Change Period (Y+Rc), s	3.9	3.6	3.6	3.9	3.9	* 3.9	3.9	* 3.9
Max Green Setting (Gmax), s	10.4	32.0	10.0	32.6	18.9	* 24	10.9	* 32
Max Q Clear Time (g_c+I1), s	10.3	10.1	12.0	30.3	17.6	19.6	12.9	31.6
Green Ext Time (p_c), s	0.0	0.9	0.0	1.7	0.3	1.2	0.0	0.1

Intersection Summary	
HCM 2010 Ctrl Delay	46.3
HCM 2010 LOS	D

Notes

HCM 2010 Signalized Intersection Summary
7: Petaluma Hill Rd & Yolanda Ave

01/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	259	274	258	288	178	86	366	832	230	29	683	107
Future Volume (veh/h)	259	274	258	288	178	86	366	832	230	29	683	107
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	1	0	0	0	0	0	0	0	0	0	5	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
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	1863	1863	1863	1863
Adj Flow Rate, veh/h	259	274	219	288	178	86	366	832	230	29	683	82
Adj No. of Lanes	1	2	0	1	2	0	1	2	1	1	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	295	334	259	321	449	208	440	1467	943	255	990	696
Arrive On Green	0.17	0.18	0.18	0.18	0.19	0.19	0.16	0.41	0.41	0.03	0.28	0.28
Sat Flow, veh/h	1774	1901	1472	1774	2351	1089	1774	3539	1583	1774	3539	1547
Grp Volume(v), veh/h	259	254	239	288	132	132	366	832	230	29	683	82
Grp Sat Flow(s),veh/h/ln	1774	1770	1603	1774	1770	1671	1774	1770	1583	1774	1770	1547
Q Serve(g_s), s	12.8	12.5	13.0	14.3	5.9	6.2	12.5	16.2	6.2	1.0	15.5	2.8
Cycle Q Clear(g_c), s	12.8	12.5	13.0	14.3	5.9	6.2	12.5	16.2	6.2	1.0	15.5	2.8
Prop In Lane	1.00		0.92	1.00		0.65	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	295	311	282	321	338	319	440	1467	943	255	990	696
V/C Ratio(X)	0.88	0.82	0.85	0.90	0.39	0.41	0.83	0.57	0.24	0.11	0.69	0.12
Avail Cap(c_a), veh/h	306	354	321	325	374	353	461	1467	943	303	992	696
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	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.7	35.7	35.9	36.0	31.8	32.0	19.7	20.2	8.6	22.0	29.2	14.6
Incr Delay (d2), s/veh	23.6	12.5	16.9	25.7	0.7	0.9	11.9	1.6	0.6	0.2	3.9	0.3
Initial Q Delay(d3),s/veh	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0
%ile BackOfQ(50%),veh/ln	8.4	7.2	7.0	9.3	2.9	2.9	7.7	8.2	2.9	0.5	8.5	1.2
LnGrp Delay(d),s/veh	61.0	48.2	52.8	61.7	32.6	32.8	31.6	21.8	9.2	22.2	33.7	14.9
LnGrp LOS	E	D	D	E	C	C	C	C	A	C	C	B
Approach Vol, veh/h		752			552			1428			794	
Approach Delay, s/veh		54.1			47.8			22.3			31.3	
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	20.8	20.3	19.1	29.7	19.4	21.7	7.1	41.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	16.5	18.0	15.5	22.0	15.5	19.0	5.0	32.5
Max Q Clear Time (g_c+I1), s	16.3	15.0	14.5	17.5	14.8	8.2	3.0	18.2
Green Ext Time (p_c), s	0.0	0.9	0.1	1.8	0.1	1.1	0.0	5.2

Intersection Summary	
HCM 2010 Ctrl Delay	35.1
HCM 2010 LOS	D

Appendix D

Site Specific Trip Generation Rates

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Prepared by National Data & Surveying Services

In-N-Out Parking & Queues

Locations: 17-7657
City: Mountain View & Union City,CA

Day: Thursday
Date: 9/14/2017

Parking Study

Time	1. 1159 N Rengstorff,Mountain View			2. 53 El Camino Real, Mountain View				3. 32060 Union Landing, Union City			Grand Total
	Reg	HC	Sub Total	Reg	HC	Reserved	Sub Total	Reg	HC	Sub Total	
Spaces	**63**	**4**	**67**	**44**	**4**	**4**	**52**	**40**	**2**	**42**	**161**
4:00 PM	21	1	22	26	1	2	29	34	0	34	**85**
4:30 PM	23	2	25	22	1	3	26	32	2	34	**85**
5:00 PM	22	2	24	26	0	1	27	23	1	24	**75**
5:30 PM	24	1	25	28	0	1	29	29	0	29	**83**
6:00 PM	28	1	29	36	0	2	38	25	1	26	**93**

Queue Study

Time	1. 1159 N Rengstorff,Mountain View Drive-Thru Max Queue	2. 53 El Camino Real, Mountain View Drive-Thru Max Queue	3. 32060 Union Landing, Union City Drive-Thru Max Queue
4:00 PM	7	6	17
4:15 PM	4	3	17
4:30 PM	8	9	13
4:45 PM	9	11	2
5:00 PM	7	7	14
5:15 PM	10	11	12
5:30 PM	13	17	12
5:45 PM	12	16	12
6:00 PM	6	17	6

NOTES:

2. 53 El Camino Real,Mountain View

- At 5:30pm an In-N-Out employee came out to the drive-thru to manually take orders - didn't appear to have an impact on the queue wait time or shrinking the line at drive-thru.
- The drive-thru can hold 12-13 cars in queue before extending to the street.

Driveway In & Outs

	Site	1		2		3	
	Time	IN	OUT	IN	OUT	IN	OUT
15 Minute Intervals Peak	4:00 PM	13	15	21	28	27	25
	4:15 PM	19	12	19	20	25	32
	4:30 PM	19	24	23	15	11	22
	4:45 PM	19	19	22	23	23	23
	5:00 PM	14	13	26	19	29	28
	5:15 PM	24	15	28	22	27	21
	5:30 PM	24	21	27	24	23	24
	5:45 PM	23	24	32	24	27	24
	Sum	155	143	198	175	192	199
1 Hour Intervals	10:30 AM	68	35	78	60	77	68
	11:30 AM	154	123	178	157	136	108
	12:30 PM	131	159	164	170	154	150
	1:30 PM	116	119	113	114	131	132
	2:30 PM	67	77	99	112	82	102
	3:30 PM	65	67	75	83	118	100
	4:30 PM	76	71	99	79	90	94
	5:30 PM	109	96	117	114	116	105
	6:30 PM	110	113	141	138	137	133
	7:30 PM	107	100	108	111	131	130
	8:30 PM	76	90	113	125	133	136
	9:30 PM	83	81	102	100	110	123
	10:30 PM	52	67	59	66	90	102
	11:30 PM	35	50	29	35	61	67
	12:30 AM	17	21	11	12	11	26
	Sum	1266	1269	1486	1476	1577	1576

Prepared by National Data & Surveying Services

In-N-Out Parking & Queues

Locations: 17-7657
City: Mountain View & Union City,CA

Day: Saturday
Date: 9/16/2017

Parking Study

Time	1. 1159 N Rengstorff,Mountain View			2. 53 El Camino Real, Mountain View					3. 32060 Union Landing, Union City			Grand Total
	Reg	HC	Sub Total	Reg	HC	Reserved	NP	Sub Total	Reg	HC	Sub Total	
Spaces	**63**	**4**	**67**	**44**	**4**	**4**	**0**	**52**	**40**	**2**	**42**	**161**
12:00 PM	44	1	45	39	1	3	0	43	38	2	40	**128**
12:30 PM	50	2	52	42	0	4	0	46	36	2	38	**136**
1:00 PM	45	3	48	41	2	3	1	47	39	1	40	**135**
1:30 PM	63	3	66	39	2	1	0	42	40	2	42	**150**
2:00 PM	53	1	54	38	1	0	0	39	36	1	37	**130**

Queue Study

Time	1. 1159 N Rengstorff,Mountain View	2. 53 El Camino Real, Mountain View	3. 32060 Union Landing, Union City
	Drive-Thru Max Queue	Drive-Thru Max Queue	Drive-Thru Max Queue
12:00 PM	25	17	13
12:15 PM	22	15	14
12:30 PM	28	17	17
12:45 PM	31	18	12
1:00 PM	30	19	11
1:15 PM	23	15	14
1:30 PM	28	13	20
1:45 PM	29	15	25
2:00 PM	x	x	14

Driveway In & Outs

Site	1		2		3	
Time	**IN**	**OUT**	**IN**	**OUT**	**IN**	**OUT**
12:00 PM	38	32	45	47	37	23
12:15 PM	36	38	41	38	39	43
12:30 PM	40	27	38	39	34	36
12:45 PM	39	42	47	45	34	40
1:00 PM	39	40	35	37	38	27
1:15 PM	38	29	42	48	44	39
1:30 PM	41	42	28	27	42	43
1:45 PM	29	37	43	45	33	37
Sum	300	287	319	326	301	288

NOTES:

2. 53 El Camino Real,Mountain View

- A In-N-Out employee manually taking orders halted the queue several times.

Appendix E

Queuing Calculations

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Intersection: 5: Corby Avenue & US 101 SB Ramps

Movement	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	T	T	R	L	LT	T
Maximum Queue (ft)	215	231	46	147	55	119	130	109
Average Queue (ft)	171	109	24	105	28	79	99	68
95th Queue (ft)	238	258	53	168	86	134	143	116
Link Distance (ft)		245	469	469		272	272	272
Upstream Blk Time (%)		2						
Queuing Penalty (veh)		0						
Storage Bay Dist (ft)	195				110			
Storage Blk Time (%)	6	0		6				
Queuing Penalty (veh)	22	0		2				

Intersection: 6: Santa Rosa Avenue & US 101 NB Ramps/Yolanda Ave

Movement	EB	EB	EB	EB	WB	WB	WB	B15	NB	NB	NB	NB
Directions Served	L	L	T	R	L	T	R	T	L	L	T	T
Maximum Queue (ft)	132	98	59	18	134	338	150	127	195	223	378	327
Average Queue (ft)	78	38	27	5	94	215	105	29	125	189	212	152
95th Queue (ft)	141	97	64	18	167	351	192	157	231	256	411	307
Link Distance (ft)	603	603	603			271		2198			434	434
Upstream Blk Time (%)						12					5	0
Queuing Penalty (veh)						53					0	0
Storage Bay Dist (ft)				110	110		125		200	200		
Storage Blk Time (%)			0		3	39	1		0	5	12	7
Queuing Penalty (veh)			0		11	84	2		1	17	38	7

Intersection: 6: Santa Rosa Avenue & US 101 NB Ramps/Yolanda Ave

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	L	T	T	R
Maximum Queue (ft)	154	171	162	144	137	122
Average Queue (ft)	53	128	60	70	90	64
95th Queue (ft)	156	196	180	148	144	119
Link Distance (ft)				608	608	608
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	200	200	200			
Storage Blk Time (%)	0	3	2	0		
Queuing Penalty (veh)	0	6	4	0		

Intersection: 5: Corby Avenue & US 101 SB Ramps

Movement	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	T	T	R	L	LT	T
Maximum Queue (ft)	162	178	160	341	135	100	131	114
Average Queue (ft)	113	119	51	228	75	61	88	75
95th Queue (ft)	191	205	190	378	158	111	143	131
Link Distance (ft)		245	469	469		272	272	272
Upstream Blk Time (%)				0				
Queuing Penalty (veh)				0				
Storage Bay Dist (ft)	195				110			
Storage Blk Time (%)	0	1		30	0			
Queuing Penalty (veh)	1	3		32	0			

Intersection: 6: Santa Rosa Avenue & US 101 NB Ramps/Yolanda Ave

Movement	EB	EB	EB	EB	WB	WB	WB	B15	NB	NB	NB	NB
Directions Served	L	L	T	R	L	T	R	T	L	L	T	T
Maximum Queue (ft)	280	256	76	42	134	335	150	113	209	224	452	437
Average Queue (ft)	182	149	34	19	110	254	119	35	165	210	363	311
95th Queue (ft)	294	270	77	43	161	404	188	148	236	256	545	506
Link Distance (ft)	603	603	603			280		2189			434	434
Upstream Blk Time (%)						17					23	12
Queuing Penalty (veh)						67					0	0
Storage Bay Dist (ft)				110	110		125		200	200		
Storage Blk Time (%)			0		18	49	4		2	21	31	29
Queuing Penalty (veh)			0		72	152	16		11	98	107	54

Intersection: 6: Santa Rosa Avenue & US 101 NB Ramps/Yolanda Ave

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	L	T	T	R
Maximum Queue (ft)	224	152	199	337	367	198
Average Queue (ft)	118	101	73	229	253	120
95th Queue (ft)	270	165	233	368	395	238
Link Distance (ft)				608	608	608
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	200	200	200			
Storage Blk Time (%)	0	0	0	9		
Queuing Penalty (veh)	0	0	1	15		

Intersection: 5: Corby Avenue & US 101 SB Ramps

Movement	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	T	T	R	L	LT	T
Maximum Queue (ft)	214	222	50	143	56	134	145	145
Average Queue (ft)	178	138	25	99	26	88	109	88
95th Queue (ft)	242	295	59	155	78	154	163	154
Link Distance (ft)		245	469	469		272	272	272
Upstream Blk Time (%)		3						
Queuing Penalty (veh)		0						
Storage Bay Dist (ft)	195				110			
Storage Blk Time (%)	7			5	0			
Queuing Penalty (veh)	32			2	0			

Intersection: 6: Santa Rosa Avenue & US 101 NB Ramps/Yolanda Ave

Movement	EB	EB	EB	EB	WB	WB	WB	B15	NB	NB	NB	NB
Directions Served	L	L	T	R	L	T	R	T	L	L	T	T
Maximum Queue (ft)	123	77	112	19	134	342	150	201	200	223	358	306
Average Queue (ft)	82	39	58	5	90	276	101	72	132	194	239	182
95th Queue (ft)	138	84	111	22	162	413	192	275	245	253	435	363
Link Distance (ft)	603	603	603			270		2199			434	434
Upstream Blk Time (%)						29					6	1
Queuing Penalty (veh)						147					0	0
Storage Bay Dist (ft)				110	110		125		200	200		
Storage Blk Time (%)			2		4	51	0		1	10	14	11
Queuing Penalty (veh)			0		19	108	1		3	32	44	12

Intersection: 6: Santa Rosa Avenue & US 101 NB Ramps/Yolanda Ave

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	L	T	T	R
Maximum Queue (ft)	123	180	147	165	144	144
Average Queue (ft)	56	131	61	78	96	74
95th Queue (ft)	152	201	185	170	151	149
Link Distance (ft)				608	608	608
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	200	200	200			
Storage Blk Time (%)	0	3	3			
Queuing Penalty (veh)	0	6	5			

Intersection: 5: Corby Avenue & US 101 SB Ramps

Movement	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	T	T	R	L	LT	T
Maximum Queue (ft)	194	261	180	375	135	100	141	148
Average Queue (ft)	139	190	68	291	84	75	98	102
95th Queue (ft)	241	310	255	507	169	113	154	167
Link Distance (ft)		245	469	469		272	272	272
Upstream Blk Time (%)		11	0	9				
Queuing Penalty (veh)		0	0	0				
Storage Bay Dist (ft)	195				110			
Storage Blk Time (%)	1	13		41	0			
Queuing Penalty (veh)	7	33		43	0			

Intersection: 6: Santa Rosa Avenue & US 101 NB Ramps/Yolanda Ave

Movement	EB	EB	EB	EB	WB	WB	WB	B15	NB	NB	NB	NB
Directions Served	L	L	T	R	L	T	R	T	L	L	T	T
Maximum Queue (ft)	314	268	229	111	134	354	150	316	209	225	448	413
Average Queue (ft)	200	153	145	34	106	312	137	114	170	216	362	294
95th Queue (ft)	382	324	265	108	173	415	183	348	240	252	538	484
Link Distance (ft)	603	603	603			276		2193			434	434
Upstream Blk Time (%)	0					41					26	7
Queuing Penalty (veh)	0					229					0	0
Storage Bay Dist (ft)				110	110		125		200	200		
Storage Blk Time (%)			26	0	11	61	13		2	24	26	25
Queuing Penalty (veh)			11	0	63	255	59		10	114	90	48

Intersection: 6: Santa Rosa Avenue & US 101 NB Ramps/Yolanda Ave

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	L	T	T	R
Maximum Queue (ft)	213	183	224	336	353	186
Average Queue (ft)	86	126	107	242	261	109
95th Queue (ft)	231	204	273	372	397	206
Link Distance (ft)				608	608	608
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	200	200	200			
Storage Blk Time (%)	0	2	1	10		
Queuing Penalty (veh)	0	8	5	25		

Intersection: 5: Corby Avenue & US 101 SB Ramps

Movement	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	R	T	T	R	L	L	T
Maximum Queue (ft)	215	221	61	65	131	105	105	206	138
Average Queue (ft)	176	110	37	37	86	34	94	154	76
95th Queue (ft)	237	260	70	81	155	107	127	236	157
Link Distance (ft)		238	238	470	470			262	262
Upstream Blk Time (%)	0	4						0	0
Queuing Penalty (veh)	0	0						1	0
Storage Bay Dist (ft)	195					120	80		
Storage Blk Time (%)	9				2	0	5	25	
Queuing Penalty (veh)	24				1	0	16	84	

Intersection: 6: Santa Rosa Avenue & US 101 NB Ramps/Yolanda Ave

Movement	EB	EB	EB	EB	WB	WB	WB	B12	NB	NB	NB	NB
Directions Served	L	L	T	R	L	T	R	T	L	L	T	T
Maximum Queue (ft)	169	135	98	35	134	314	80	34	211	225	438	397
Average Queue (ft)	114	66	49	14	102	224	46	7	190	216	333	260
95th Queue (ft)	177	146	100	39	161	343	80	47	243	243	536	451
Link Distance (ft)	603	603	603			270	270	2175			434	434
Upstream Blk Time (%)						6					16	2
Queuing Penalty (veh)						19					0	0
Storage Bay Dist (ft)				110	110				200	200		
Storage Blk Time (%)			1		6	33			5	32	8	9
Queuing Penalty (veh)			0		22	50			19	125	36	16

Intersection: 6: Santa Rosa Avenue & US 101 NB Ramps/Yolanda Ave

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	L	T	T	R
Maximum Queue (ft)	198	166	173	166	178	155
Average Queue (ft)	90	104	117	116	136	87
95th Queue (ft)	205	171	178	169	184	155
Link Distance (ft)				608	608	608
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	200	200	200			
Storage Blk Time (%)	0	0	0	0		
Queuing Penalty (veh)	0	0	1	1		

Intersection: 5: Corby Avenue & US 101 SB Ramps

Movement	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	R	T	T	R	L	L	T
Maximum Queue (ft)	152	129	55	172	242	117	66	91	149
Average Queue (ft)	104	69	36	94	162	66	36	65	100
95th Queue (ft)	175	145	63	216	308	150	86	101	168
Link Distance (ft)		238	238	470	470			262	262
Upstream Blk Time (%)		0							
Queuing Penalty (veh)		0							
Storage Bay Dist (ft)	195					120	80		
Storage Blk Time (%)	1	0			19	0	0	4	
Queuing Penalty (veh)	3	0			23	0	1	6	

Intersection: 6: Santa Rosa Avenue & US 101 NB Ramps/Yolanda Ave

Movement	EB	EB	EB	EB	WB	WB	WB	B12	NB	NB	NB	NB
Directions Served	L	L	T	R	L	T	R	T	L	L	T	T
Maximum Queue (ft)	296	255	122	73	134	300	151	51	197	225	460	456
Average Queue (ft)	203	156	74	28	118	216	92	12	156	212	435	408
95th Queue (ft)	321	269	133	72	173	331	159	80	233	258	517	530
Link Distance (ft)	603	603	603			275	275	2170			434	434
Upstream Blk Time (%)						5					28	16
Queuing Penalty (veh)						14					0	0
Storage Bay Dist (ft)				110	110				200	200		
Storage Blk Time (%)			3	0	15	34			1	12	40	35
Queuing Penalty (veh)			2	0	45	62			7	66	137	123

Intersection: 6: Santa Rosa Avenue & US 101 NB Ramps/Yolanda Ave

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	L	T	T	R
Maximum Queue (ft)	225	148	224	348	353	110
Average Queue (ft)	202	90	148	236	247	75
95th Queue (ft)	284	148	258	357	361	122
Link Distance (ft)				608	608	608
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	200	200	200			
Storage Blk Time (%)	1	0	0	13		
Queuing Penalty (veh)	4	0	0	42		

Intersection: 5: Corby Avenue & US 101 SB Ramps

Movement	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	T	T	R	L	LT	T
Maximum Queue (ft)	217	257	44	158	45	127	143	106
Average Queue (ft)	166	111	26	101	22	88	104	74
95th Queue (ft)	245	262	55	173	60	145	165	118
Link Distance (ft)		245	469	469		272	272	272
Upstream Blk Time (%)		3						
Queuing Penalty (veh)		0						
Storage Bay Dist (ft)	195				110			
Storage Blk Time (%)	6			5				
Queuing Penalty (veh)	26			2				

Intersection: 6: Santa Rosa Avenue & US 101 NB Ramps/Yolanda Ave

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	L	T	R	L	T	R	L	L	T	T	R
Maximum Queue (ft)	148	84	79	21	134	278	150	190	220	404	301	126
Average Queue (ft)	83	32	40	8	87	230	113	123	186	228	167	50
95th Queue (ft)	154	85	82	26	163	323	193	229	250	415	319	144
Link Distance (ft)	603	603	603			269				434	434	
Upstream Blk Time (%)						14				2	0	
Queuing Penalty (veh)						82				0	0	
Storage Bay Dist (ft)				110	110		125	200	200			200
Storage Blk Time (%)			0		2	44	1	0	7	8	5	0
Queuing Penalty (veh)			0		8	114	5	1	21	27	5	0

Intersection: 6: Santa Rosa Avenue & US 101 NB Ramps/Yolanda Ave

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	110	125	125	152	120
Average Queue (ft)	67	85	67	95	69
95th Queue (ft)	122	128	133	157	131
Link Distance (ft)			608	608	608
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	200	200			
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 5: Corby Avenue & US 101 SB Ramps

Movement	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	T	T	R	L	LT	T
Maximum Queue (ft)	202	254	196	404	135	121	137	127
Average Queue (ft)	128	163	78	294	71	83	101	83
95th Queue (ft)	223	285	260	509	159	135	150	134
Link Distance (ft)		245	469	469		272	272	272
Upstream Blk Time (%)		4		4				
Queuing Penalty (veh)		0		0				
Storage Bay Dist (ft)	195				110			
Storage Blk Time (%)	2	5		40	0			
Queuing Penalty (veh)	8	12		42	0			

Intersection: 6: Santa Rosa Avenue & US 101 NB Ramps/Yolanda Ave

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	L	T	R	L	T	R	L	L	T	T	R
Maximum Queue (ft)	287	255	165	88	133	274	150	208	225	459	436	210
Average Queue (ft)	190	140	68	26	107	228	122	162	211	351	287	94
95th Queue (ft)	310	264	168	78	165	336	189	246	251	529	495	238
Link Distance (ft)	603	603	603			264				434	434	
Upstream Blk Time (%)						34				21	5	
Queuing Penalty (veh)						206				0	0	
Storage Bay Dist (ft)				110	110		125	200	200			200
Storage Blk Time (%)			7	0	14	55	6	2	23	23	23	0
Queuing Penalty (veh)			3	0	66	188	23	9	110	80	44	0

Intersection: 6: Santa Rosa Avenue & US 101 NB Ramps/Yolanda Ave

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	118	224	325	331	198
Average Queue (ft)	68	132	249	259	128
95th Queue (ft)	121	247	355	362	249
Link Distance (ft)			608	608	608
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	200	200			
Storage Blk Time (%)		0	9		
Queuing Penalty (veh)		0	22		

Intersection: 5: Corby Avenue & US 101 SB Ramps

Movement	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	T	T	R	L	LT	T
Maximum Queue (ft)	211	216	50	140	43	127	152	118
Average Queue (ft)	170	109	24	99	21	90	107	81
95th Queue (ft)	232	239	61	162	52	151	170	136
Link Distance (ft)		245	469	469		272	272	272
Upstream Blk Time (%)		3						
Queuing Penalty (veh)		0						
Storage Bay Dist (ft)	195				110			
Storage Blk Time (%)	6			5				
Queuing Penalty (veh)	25			2				

Intersection: 6: Santa Rosa Avenue & US 101 NB Ramps/Yolanda Ave

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	L	T	R	L	T	R	L	L	T	T	R
Maximum Queue (ft)	127	80	122	19	134	291	150	199	222	348	260	125
Average Queue (ft)	81	35	63	5	90	270	121	121	181	217	149	46
95th Queue (ft)	133	89	114	20	172	330	197	232	255	391	259	123
Link Distance (ft)	603	603	603			276				434	434	
Upstream Blk Time (%)						37				2		
Queuing Penalty (veh)						223				0		
Storage Bay Dist (ft)				110	110		125	200	200			200
Storage Blk Time (%)			2		3	65	1	0	7	7	2	0
Queuing Penalty (veh)			0		14	168	5	1	23	23	2	0

Intersection: 6: Santa Rosa Avenue & US 101 NB Ramps/Yolanda Ave

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	132	148	122	142	134
Average Queue (ft)	78	102	67	94	71
95th Queue (ft)	140	156	124	143	142
Link Distance (ft)			608	608	608
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	200	200			
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 5: Corby Avenue & US 101 SB Ramps

Movement	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	T	T	R	L	LT	T
Maximum Queue (ft)	206	240	202	399	126	123	149	137
Average Queue (ft)	158	194	74	279	82	76	98	93
95th Queue (ft)	257	319	256	498	168	137	163	154
Link Distance (ft)		245	469	469		272	272	272
Upstream Blk Time (%)		16		10				
Queuing Penalty (veh)		0		0				
Storage Bay Dist (ft)	195				110			
Storage Blk Time (%)	1	19		40	0			
Queuing Penalty (veh)	6	47		43	0			

Intersection: 6: Santa Rosa Avenue & US 101 NB Ramps/Yolanda Ave

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	L	T	R	L	T	R	L	L	T	T	R
Maximum Queue (ft)	330	289	366	134	134	292	150	207	224	456	442	224
Average Queue (ft)	238	190	212	46	91	280	141	152	209	381	302	114
95th Queue (ft)	436	370	393	134	166	332	176	256	256	543	499	261
Link Distance (ft)	603	603	603			278				434	434	
Upstream Blk Time (%)						54				24	8	
Queuing Penalty (veh)						426				0	0	
Storage Bay Dist (ft)				110	110		125	200	200			200
Storage Blk Time (%)			41	0	11	62	15	2	20	31	27	0
Queuing Penalty (veh)			17	0	73	276	74	12	96	108	50	0

Intersection: 6: Santa Rosa Avenue & US 101 NB Ramps/Yolanda Ave

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	158	222	344	357	189
Average Queue (ft)	95	144	230	242	111
95th Queue (ft)	170	247	378	378	212
Link Distance (ft)			608	608	608
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	200	200			
Storage Blk Time (%)	0	0	6		
Queuing Penalty (veh)	0	2	20		

Intersection: 5: Corby Avenue & US 101 SB Ramps

Movement	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	R	T	T	R	L	L	T
Maximum Queue (ft)	215	236	108	66	125	40	105	255	126
Average Queue (ft)	185	141	55	38	86	24	98	173	76
95th Queue (ft)	249	309	117	77	135	53	123	280	147
Link Distance (ft)		238	238	470	470			262	262
Upstream Blk Time (%)	0	5	0					1	0
Queuing Penalty (veh)	0	0	0					5	0
Storage Bay Dist (ft)	195					120	80		
Storage Blk Time (%)	11	0			2		8	33	
Queuing Penalty (veh)	33	2			1		29	119	

Intersection: 6: Santa Rosa Avenue & US 101 NB Ramps/Yolanda Ave

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	L	T	R	L	T	R	L	L	T	T	R
Maximum Queue (ft)	187	139	118	61	134	292	114	212	225	460	420	187
Average Queue (ft)	125	77	74	17	104	230	66	194	218	373	281	92
95th Queue (ft)	197	148	131	60	169	334	122	238	243	534	478	210
Link Distance (ft)	603	603	603			282	282			434	434	
Upstream Blk Time (%)						7				21	3	
Queuing Penalty (veh)						25				0	0	
Storage Bay Dist (ft)				110	110			200	200			200
Storage Blk Time (%)			5	0	11	37		9	37	10	5	0
Queuing Penalty (veh)			1	0	41	56		35	147	42	9	0

Intersection: 6: Santa Rosa Avenue & US 101 NB Ramps/Yolanda Ave

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	179	182	178	190	162
Average Queue (ft)	115	127	120	144	92
95th Queue (ft)	185	191	187	202	167
Link Distance (ft)			608	608	608
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	200	200			
Storage Blk Time (%)	0	1	0		
Queuing Penalty (veh)	0	2	0		

Intersection: 5: Corby Avenue & US 101 SB Ramps

Movement	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	R	T	T	R	L	L	T
Maximum Queue (ft)	160	110	74	175	276	128	89	105	155
Average Queue (ft)	111	68	45	85	183	85	44	67	102
95th Queue (ft)	181	121	83	198	316	171	95	108	170
Link Distance (ft)		238	238	470	470			262	262
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	195					120	80		
Storage Blk Time (%)	0				25	0	0	5	
Queuing Penalty (veh)	1				29	0	1	8	

Intersection: 6: Santa Rosa Avenue & US 101 NB Ramps/Yolanda Ave

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	L	T	R	L	T	R	L	L	T	T	R
Maximum Queue (ft)	309	265	174	107	134	294	205	196	225	463	449	225
Average Queue (ft)	228	180	93	34	122	245	120	145	218	433	403	206
95th Queue (ft)	329	276	170	102	169	341	217	226	249	506	521	280
Link Distance (ft)	603	603	603			286	286			434	434	
Upstream Blk Time (%)						13	0			34	14	
Queuing Penalty (veh)						53	0			0	0	
Storage Bay Dist (ft)				110	110			200	200			200
Storage Blk Time (%)			9	0	11	46		1	11	45	37	1
Queuing Penalty (veh)			5	0	38	84		8	61	155	127	8

Intersection: 6: Santa Rosa Avenue & US 101 NB Ramps/Yolanda Ave

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	187	223	408	399	171
Average Queue (ft)	129	173	275	281	79
95th Queue (ft)	210	267	460	437	177
Link Distance (ft)			608	608	608
Upstream Blk Time (%)			0		
Queuing Penalty (veh)			0		
Storage Bay Dist (ft)	200	200			
Storage Blk Time (%)	2	5	15		
Queuing Penalty (veh)	9	28	61		

Appendix F

Turn Lane Warrants and AutoTURN Analysis

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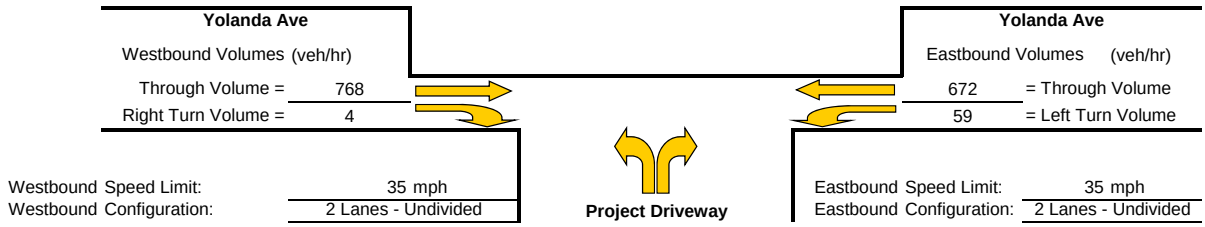
Turn Lane Warrant Analysis - Tee Intersections

Study Intersection: In-N-Out Driveway/Yolanda Avenue
Study Scenario: PM Baseline plus Project

Direction of Analysis Street: East/West

Cross Street Intersects: From the North



Westbound Speed Limit: 35 mph
Westbound Configuration: 2 Lanes - Undivided

Eastbound Speed Limit: 35 mph
Eastbound Configuration: 2 Lanes - Undivided

Westbound Right Turn Lane Warrants

1. Check for right turn volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for turn lane

Advancing Volume Threshold	AV =	1020.1
Advancing Volume	Va =	772
If AV<Va then warrant is met		No

Right Turn Lane Warranted: **NO**

Westbound Right Turn Taper Warrants
(evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

NOT WARRANTED - Less than 20 vehicles

2. Check advance volume threshold criteria for taper

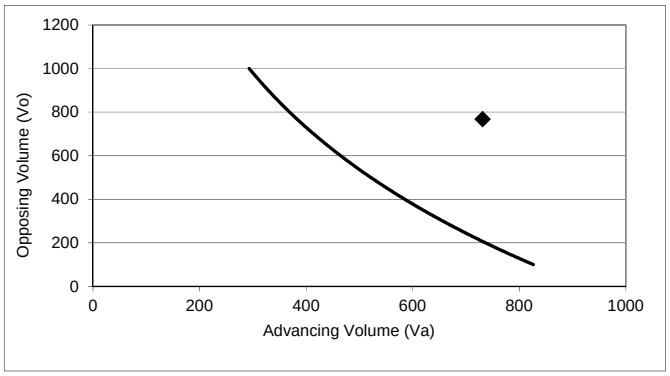
Advancing Volume Threshold	AV =	-
Advancing Volume	Va =	772
If AV<Va then warrant is met		-

Right Turn Taper Warranted: **NO**

Eastbound Left Turn Lane Warrants

Percentage Left Turns	%lt	8.1 %
Advancing Volume Threshold	AV	383 veh/hr

If AV<Va then warrant is met



◆ Study Intersection

Two lane roadway warrant threshold for: 35 mph

Turn lane warranted if point falls to right of warrant threshold line

Left Turn Lane Warranted: **YES**

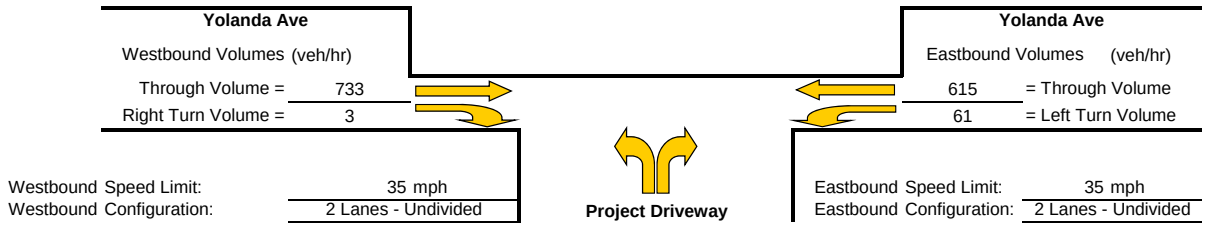
Methodology based on Washington State Transportation Center Research Report *Method For Prioritizing Intersection Improvements* , January 1997.
The right turn lane and taper analysis is based on work conducted by Cottrell in 1981.
The left turn lane analysis is based on work conducted by M.D. Harmelink in 1967, and modified by Kikuchi and Chakroborty in 1991.

Turn Lane Warrant Analysis - Tee Intersections

Study Intersection: Residential Western Driveway/Yolanda Avenue
Study Scenario: PM Baseline plus Project

Direction of Analysis Street: East/West

Cross Street Intersects: From the North



Westbound Speed Limit: 35 mph
Westbound Configuration: 2 Lanes - Undivided

Eastbound Speed Limit: 35 mph
Eastbound Configuration: 2 Lanes - Undivided

Westbound Right Turn Lane Warrants

1. Check for right turn volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for turn lane

Advancing Volume Threshold	AV =	1027.6
Advancing Volume	Va =	736
If AV<Va then warrant is met		No

Right Turn Lane Warranted: **NO**

Westbound Right Turn Taper Warrants
(evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

NOT WARRANTED - Less than 20 vehicles

2. Check advance volume threshold criteria for taper

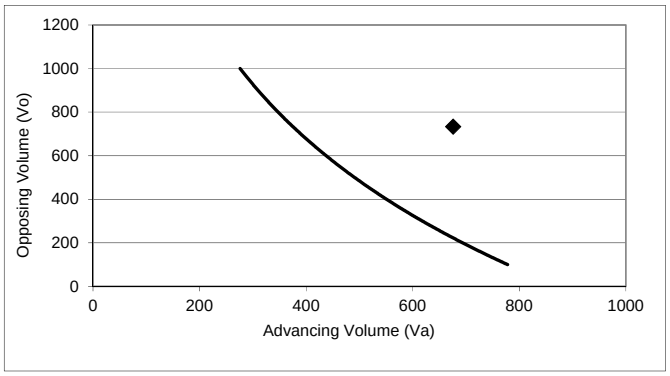
Advancing Volume Threshold	AV =	-
Advancing Volume	Va =	736
If AV<Va then warrant is met		-

Right Turn Taper Warranted: **NO**

Eastbound Left Turn Lane Warrants

Percentage Left Turns	%lt	9.0 %
Advancing Volume Threshold	AV	376 veh/hr

If AV<Va then warrant is met



◆ Study Intersection

Two lane roadway warrant threshold for: 35 mph

Turn lane warranted if point falls to right of warrant threshold line

Left Turn Lane Warranted: **YES**

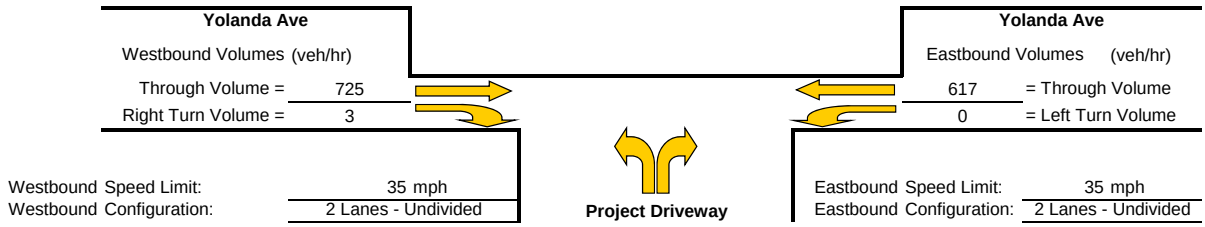
Methodology based on Washington State Transportation Center Research Report *Method For Prioritizing Intersection Improvements* , January 1997.
The right turn lane and taper analysis is based on work conducted by Cottrell in 1981.
The left turn lane analysis is based on work conducted by M.D. Harmelink in 1967, and modified by Kikuchi and Chakroborty in 1991.

Turn Lane Warrant Analysis - Tee Intersections

Study Intersection: Residential Eastern Driveway/Yolanda Avenue
Study Scenario: PM Baseline plus Project

Direction of Analysis Street: East/West

Cross Street Intersects: From the North



Westbound Speed Limit: 35 mph
Westbound Configuration: 2 Lanes - Undivided

Eastbound Speed Limit: 35 mph
Eastbound Configuration: 2 Lanes - Undivided

Westbound Right Turn Lane Warrants

1. Check for right turn volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for turn lane

Advancing Volume Threshold	AV =	1027.6
Advancing Volume	Va =	728
If AV<Va then warrant is met		No

Right Turn Lane Warranted: **NO**

Westbound Right Turn Taper Warrants
(evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

NOT WARRANTED - Less than 20 vehicles

2. Check advance volume threshold criteria for taper

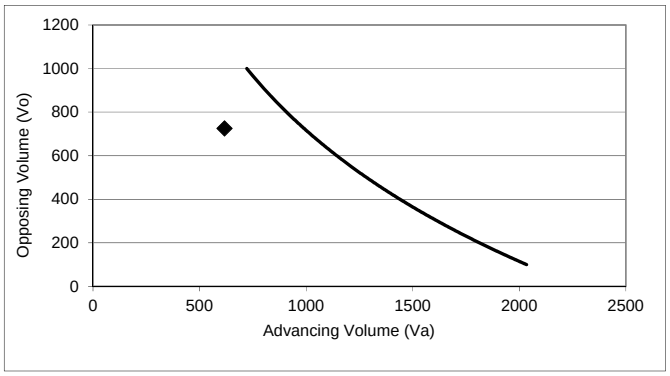
Advancing Volume Threshold	AV =	-
Advancing Volume	Va =	728
If AV<Va then warrant is met		-

Right Turn Taper Warranted: **NO**

Eastbound Left Turn Lane Warrants

Percentage Left Turns	%lt	0.0 %
Advancing Volume Threshold	AV	991 veh/hr

If AV<Va then warrant is met



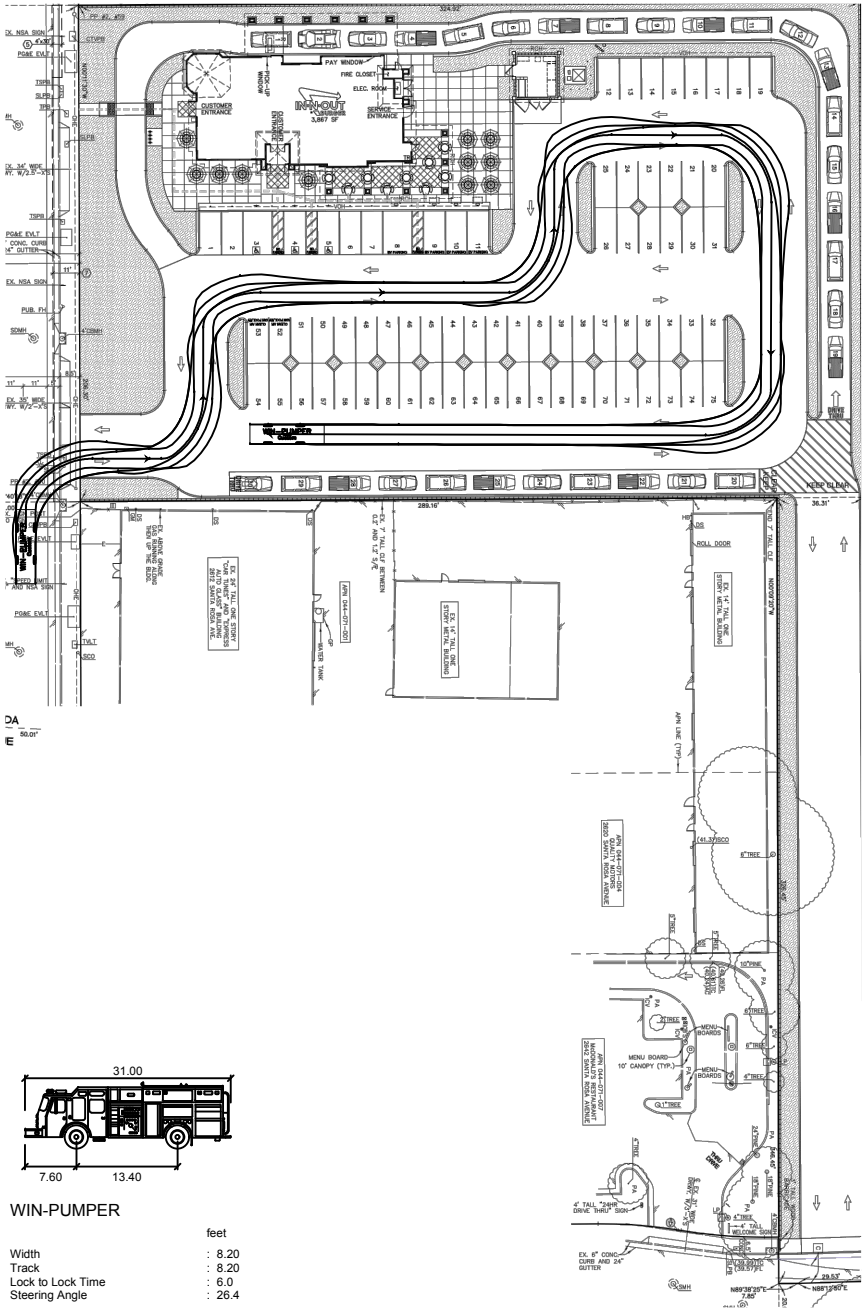
◆ Study Intersection

Two lane roadway warrant threshold for: 35 mph

Turn lane warranted if point falls to right of warrant threshold line

Left Turn Lane Warranted: **NO**

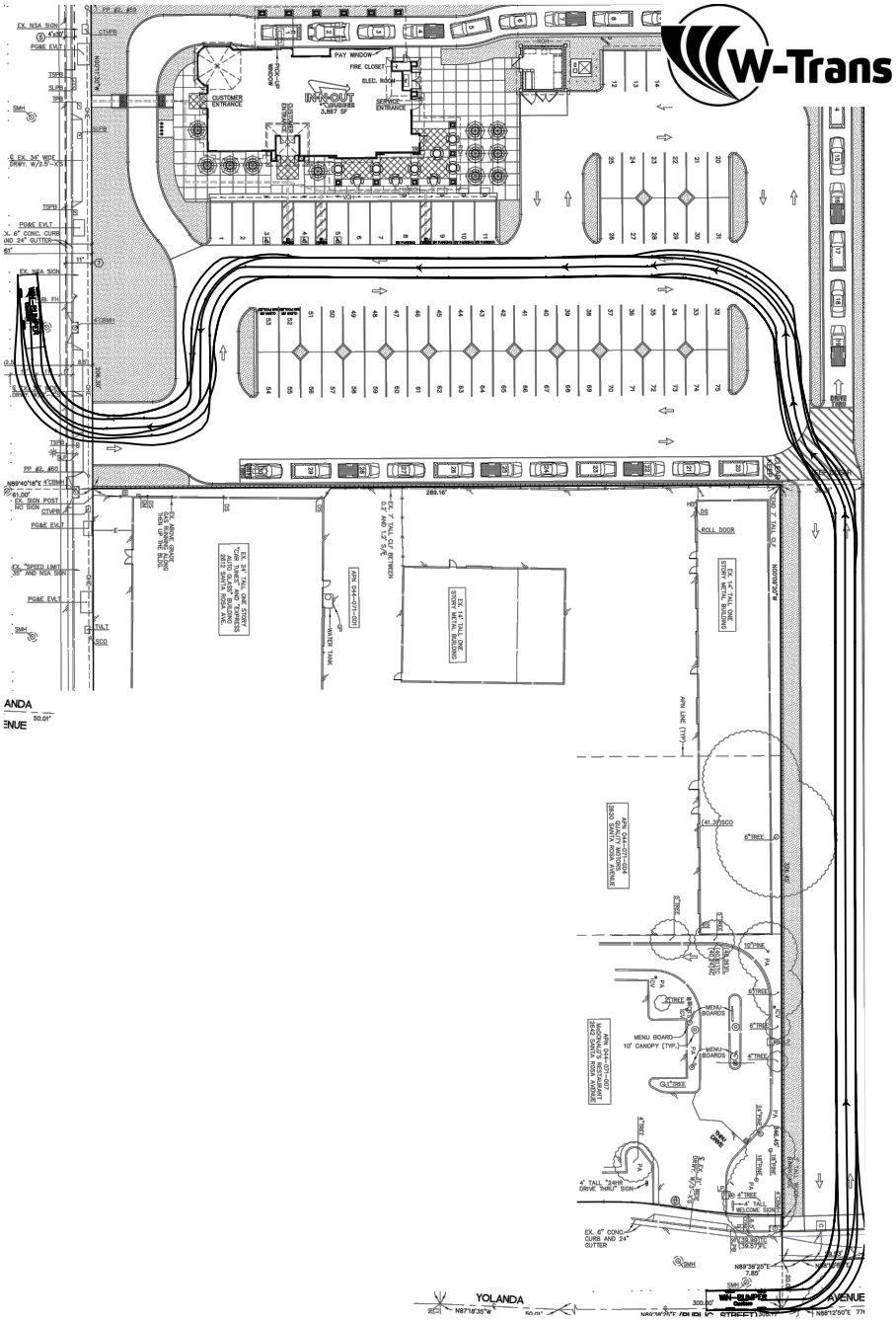
Methodology based on Washington State Transportation Center Research Report *Method For Prioritizing Intersection Improvements* , January 1997.
The right turn lane and taper analysis is based on work conducted by Cottrell in 1981.
The left turn lane analysis is based on work conducted by M.D. Harmelink in 1967, and modified by Kikuchi and Chakroborty in 1991.



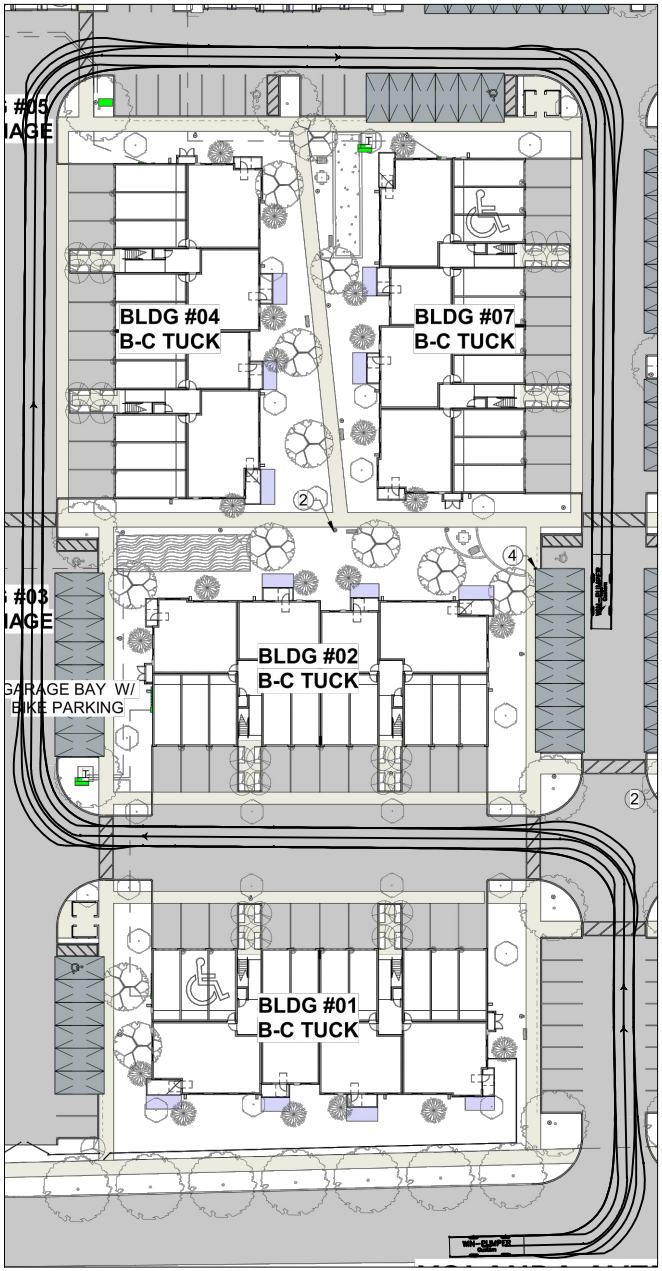
WIN-PUMPER

	feet
Width	: 8.20
Track	: 8.20
Lock to Lock Time	: 6.0
Steering Angle	: 26.4

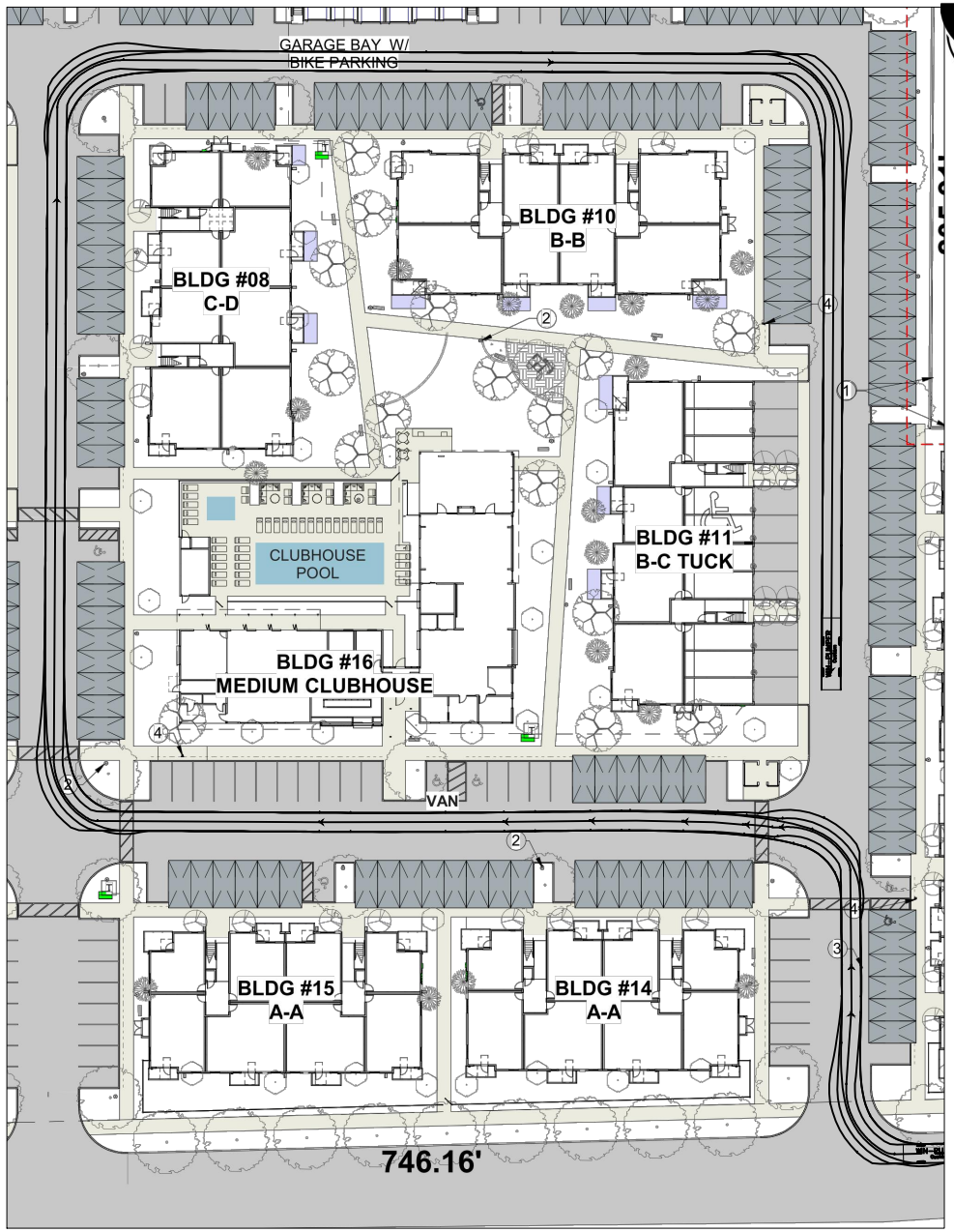
Inbound from Santa Rosa Avenue



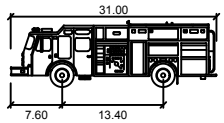
Inbound from Yolanda Avenue



Inbound from Western Driveway



Inbound from Eastern Driveway



WIN-PUMPER

	feet
Width	: 8.20
Track	: 8.20
Lock to Lock Time	: 6.0
Steering Angle	: 26.4

Yolanda Apartments TIS

Residential Fire Truck Access

SRO476

October 2018

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Appendix G

Drive Thru Queuing Calculations

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Drive Through Queuing Evaluation Worksheet

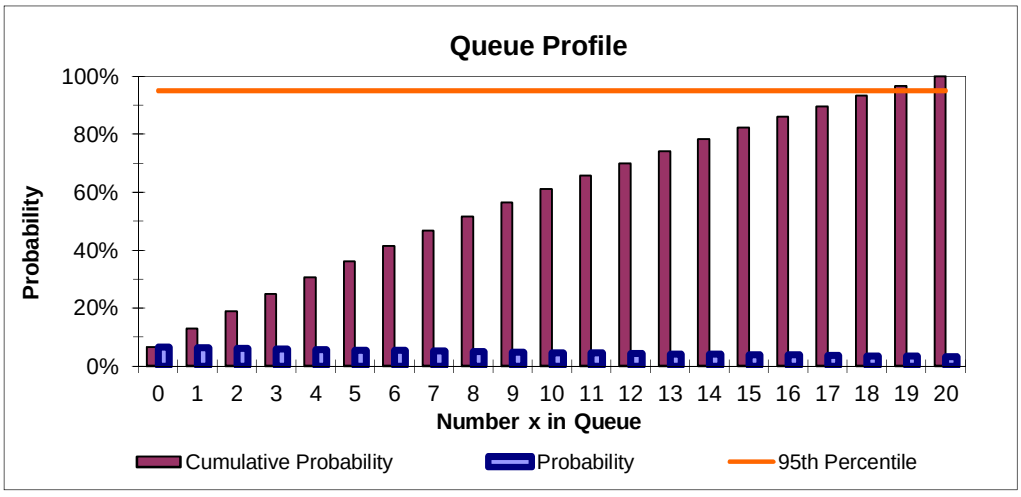
Project: Yolanda In-N-Out Burger
Project No: SRO476

By: KR
Date: 11/2/2018

Arrival Rate (veh/hr):	58	No. of Service Points:	1
Service Rate (veh/hr):	60	Queuing Capacity (veh):	19

Probability the System is Empty	7%	
Probability the System is Full	3%	
Probability of 1 in System	6%	
Probability of 2 in System	6%	
Probability of 3 in System	6%	
Probability of 4 in System	6%	
Probability of 5 in System	6%	
Probability of 6 in System	5%	
Probability of 7 in System	5%	
Probability of 8 in System	5%	
Probability of 9 in System	5%	
Probability of 10 in System	5%	
Probability of 11 in System	5%	
Probability of 12 in System	4%	
Probability of 13 in System	4%	
Probability of 14 in System	4%	
Probability of 15 in System	4%	
Probability of 16 in System	4%	
Probability of 17 in System	4%	
Probability of 18 in System	4%	
Probability of 19 in System	3%	95%-Tile Queue
Probability of 20 in System	3%	95%-Tile Queue

Probability That Customer Waits	93%	
Average Time Customer Waits	9.4	minutes
Average Time Customer Waits To Get To Service Point	8.4	minutes
Probability That a Customer Elects Not to Enter the Queue	3%	
Average In System	8.8	vehicles
Average Total Length of Vehicles in System	219	feet
95th Percentile in System	21	vehicles
95th Percentile Total Length of Vehicles in System	525	feet



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Appendix H

In-N-Out Project Description and Queuing Management Plan

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13502 Hamburger Lane
Baldwin Park, Ca 91706-5885
626-813-8200

The Best Enterprise
Is A Free Enterprise™

Project Description
Proposed In-N-Out Burgers Restaurant
2532 Santa Rosa Avenue

In 1948, Harry and Esther Snyder opened the first In-N-Out Burger with its' innovative 2-way ordering speaker and drive-through. The restaurant served the freshest burgers, coolest shakes and the hottest fries in a friendly, sparkling clean atmosphere. Times have not changed at In-N-Out; the menu is still the same basic menu our guests have enjoyed since 1948. And, we've been serving everything up the same exact way - hot, made to order food, using only the highest quality fresh ingredients.

In-N-Out Burgers proposes to develop a new In-N-Out Burger restaurant with a drive-through at 2532 Santa Rosa Avenue, Santa Rosa, CA.

The proposed In-N-out restaurant will be 3,867 square feet with indoor seating for 77 guests, and outdoor seating for 40 guests. The site will be well landscaped and will include an approx. 300 square foot covered trash building, a drive-through with dedicated onsite queuing for 28 cars, onsite parking for 76 guest cars, excellent vehicle circulation onsite with no "dead-end" parking aisles, and access to both Santa Rosa Avenue and Yolanda Avenues.

The proposed building is single-story, Spanish-Mediterranean in style with exterior stucco and terra-cotta tiled hip-roofed towers. The maximum height of the building is 28 feet tall.

Construction for the restaurant will be done in a single phase and take approximately 6 months, with a typical progression of construction activities. These activities, some of which would run concurrently, include site preparation and limited grading of about 4 to 6 weeks, building construction of about 4 months, paving and striping of about 3 weeks, and landscaping of about 2 weeks.

The restaurant will operate 7 days a week, from 10:00 AM to 1:00 AM Sunday through Thursday, and from 10:00 AM to 1:30 AM on Friday and Saturday. The restaurant, drive-thru, and parking lot, as with all In-N-Out Burgers restaurants, will be well-lit and meticulously maintained. The restaurant will be staffed by approximately 10 to 12 Associates per shift, with 3 shifts per day.

13502 Hamburger Lane
Baldwin Park, Ca 91706-5885
626-813-8200

IN-N-OUT BURGER

The Best Enterprise
Is A Free Enterprise™

In-N-Out cooks all of its burgers and fries to order – nothing is pre-cooked and there are no cooked food holding bins. This restaurant will be equipped with three burger grills. Two grills will operate at all times, and activation of the third grill will be done in response to high dine-in or, more typically, high drive-through demand as activating the third grill significantly increases the speed at which drive-through orders are delivered to customer vehicles. In addition, standard store operating procedure requires that as soon as the drive-through queue reaches the 8th car (where the menu board/order speaker is located) In-N-Out Associates are deployed outside to take orders using hand-held ordering tablets. The use of these tablets puts orders into the kitchen faster than ordering at the menu board, and, when combined with increased production from the third grill, the result is extremely fast and efficient food production with the shortest possible food wait times, and therefore the shortest possible drive-through vehicle queues.

Awareness of the queue reaching the 8th car is enhanced with outdoor cameras and indoor monitors. There will be between 4 and 6 outdoor cameras on this site, with 3 or 4 of them specifically viewing the drive-through lane. These cameras display on multiple monitors located inside the restaurant including at the manager's office, above the grills, and at both the pay and pickup windows.

There is no delivery dock or designated delivery parking bay required on the premises as deliveries are made only by In-N-Out owned and operated vehicles, after the restaurant is closed to the public, between the hours of 2 AM and 9 AM.

No alcoholic beverages will be served.