



# Traffic Impact Study for the Memorial Hospital MOB Project



## Final Report

Prepared for the City of Santa Rosa

Submitted by  
**W-Trans**

September 8, 2017



**TRAFFIC ENGINEERING  
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# Executive Summary

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The proposed Memorial Hospital medical office building project would result in construction of 92,000 square feet of medical office space, with the potential to include 2,500 square feet for a credit union, and 1,500 square feet for a café. The anticipated trip generation for the project includes up to 3,324 daily trips, with 276 trips during the a.m. peak hour and 336 trips during the p.m. peak hour.

The project would have two access points; one driveway on Montgomery Drive and one on Sotoyome Street. It was assumed the southbound left-turn restriction on Sotoyome Street at Sonoma Avenue would be removed upon the development of the project as discussions with City staff indicate that this restriction may no longer be needed. The southbound approach would remain one lane.

The study area includes six intersections near the project site. Analysis indicates that these intersections are operating acceptably under Existing conditions and would be expected to continue doing so under Existing plus Project volumes. Under anticipated Future volumes the study intersections are expected to continue operating acceptably. With the project-added volumes, the study intersections are expected to operate at the same levels of service as without the project. A traffic signal is warranted at the intersection of Sonoma Avenue/Sotoyome Street.

Transit facilities in the vicinity are adequate. Pedestrian facilities will be adequate with the construction of RRFBs at the proposed mid-block crossing on Montgomery Drive which will replace two existing mid-block crosswalks between Sotoyome Street and Doyle Park Drive. Bicycle facilities will be adequate with the addition of short- and long-term bicycle parking and two showers on-site. The proposed parking exceeds City of Santa Rosa minimum requirements and is expected to be adequate to meet the demand from this project.

Sight distance at the project driveways is generally adequate, though 35 feet of red curb should be installed on either side of the driveway on Sotoyome Street to increase sight lines for exiting vehicles. Any new vegetation should be planted so that it is low-lying and any trees maintained so they are at least seven feet above the ground.

# Introduction

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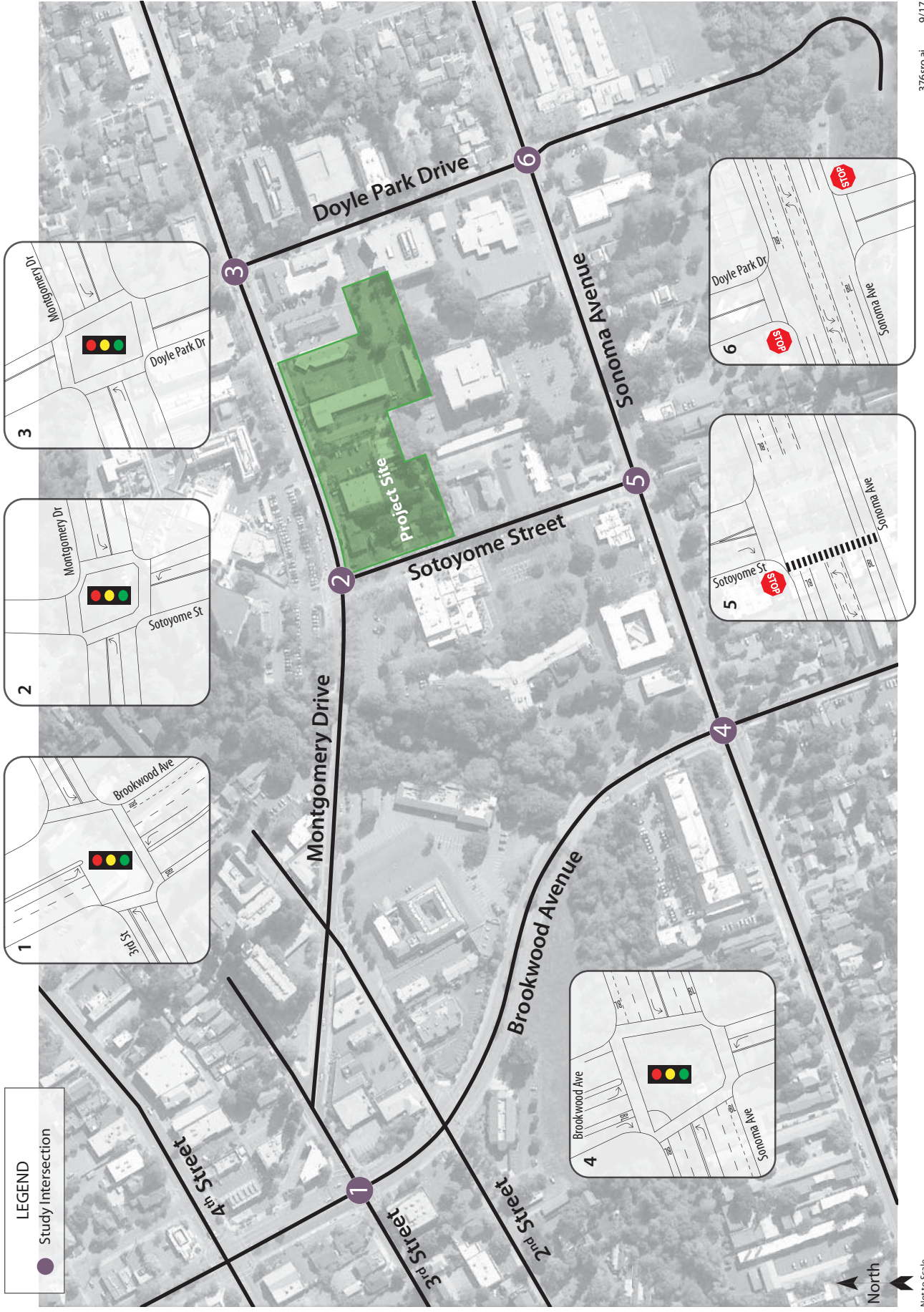
This report presents an analysis of the potential traffic impacts that would be associated with development of a proposed medical office building to be located on the east side of Sotoyome Street between Montgomery Drive and Sonoma Avenue in the City of Santa Rosa. The traffic study was completed in accordance with the criteria established by the City of Santa Rosa, and is consistent with standard traffic engineering techniques.

## Prelude

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

## Project Profile

The project site is bounded by Sotoyome Street to the west, Montgomery Drive to the north, Doyle Park Drive to the east, and Sonoma Avenue to the south, as shown in Figure 1. Memorial Hospital is proposing to develop a 92,000 square-foot medical office building, potentially including with a 2,500 square-foot credit union and 1,500 square-foot café. Access would be provided on via driveways on Sotoyome Street and Montgomery Drive.



Traffic Impact Study for the Memorial Hospital MOB Project  
**Figure 1 – Study Area and Lane Configurations**



# Transportation Setting

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## Operational Analysis

### Study Area and Periods

The study area consists of the following intersections:

1. Brookwood Avenue/3<sup>rd</sup> Street
2. Montgomery Drive/Sotoyome Street
3. Montgomery Drive/Doyle Park Drive
4. Sonoma Avenue/Brookwood Avenue
5. Sonoma Avenue/ Sotoyome Street
6. Sonoma Avenue/Doyle Park Drive

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

**Brookwood Avenue/3<sup>rd</sup> Street** is a signalized intersection with protective left-turn phasing on all four approaches and marked crosswalks across the east, west, and south legs.

**Montgomery Drive/Sotoyome Street** is a signalized intersection with an access point to Memorial Hospital as the north leg. There is permissive left-turn phasing on all four approaches and there are marked crosswalks across all four legs.

**Montgomery Drive/Doyle Park Drive** is a four-legged signalized intersection with permissive left-turn phasing on all four approaches and marked crosswalks across all four legs.

**Sonoma Avenue/Brookwood Avenue** is a signalized intersection with protective left-turn phasing on the northbound and southbound Brookwood Avenue approaches, a right-turn overlap on the southbound approach, and protected-permitted left-turn phasing on the eastbound-westbound Sonoma Avenue approaches. There are marked crosswalks on all four legs of the intersection.

**Sonoma Avenue/Sotoyome Street** is an unsignalized tee-intersection. The stop-controlled southbound approach is currently restricted to right turns only. There are marked crosswalks across the west and north legs of the intersection.

**Sonoma Avenue/Doyle Park Drive** is an off-set, four-legged unsignalized intersection with stop controls on the northbound and southbound Doyle Park Drive approaches. There are marked crosswalks across the north and south legs of the intersection.

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

## Collision History

The collision histories for the study intersections were 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 May 1, 2011 through April 30, 2016.

As presented in Table 1, the calculated collision rates for the study intersections were compared to average collision rates for similar facilities statewide, as indicated in *2012 Collision Data on California State Highways*, California Department of Transportation (Caltrans).

**Table 1 – Collision Rates at the Study Intersections**

| <b>Study Intersection</b>           | <b>Number of Collisions (2010-2015)</b> | <b>Calculated Collision Rate (c/mve)</b> | <b>Statewide Average Collision Rate (c/mve)</b> |
|-------------------------------------|-----------------------------------------|------------------------------------------|-------------------------------------------------|
| 1. Brookwood Ave/3 <sup>rd</sup> St | 10                                      | <b>0.39</b>                              | 0.27                                            |
| 2. Montgomery Dr/Sotoyome St        | 4                                       | 0.25                                     | 0.27                                            |
| 3. Montgomery Dr/Doyle Park Dr      | 2                                       | 0.14                                     | 0.27                                            |
| 4. Sonoma Ave/Brookwood Ave         | 21                                      | <b>0.49</b>                              | 0.27                                            |
| 5. Sonoma Ave/Sotoyome St           | 3                                       | 0.11                                     | 0.18                                            |
| 6. Sonoma Ave/Doyle Park Dr         | 0                                       | 0.00                                     | 0.15                                            |

Note: c/mve = collisions per million vehicles entering

At Brookwood Avenue/3<sup>rd</sup> Street, there were ten reported collisions over the five year period, resulting in a collision rate of 0.39 collisions per million vehicle miles (c/mvm). The majority of the collisions (seven of ten) were broadside crashes with a primary collision factor of “traffic signals and signs.” The City may want to consider adding a red-clearance interval, or increasing the time if one exists, to ensure that conflicting approaches are cleared.

The intersection of Sonoma Avenue/Brookwood Avenue had 21 reported collisions over the five-year study period for a calculated collision rate of 0.49 c/mvm, which is higher than the statewide average of 0.27 c/mvm for similar intersections. Eight collisions were between a vehicle turning left and an oncoming vehicle proceeding straight in the east-west direction, though no more than three such collisions occurred in any 12-month period and only five occurred in the last three years of the study period. Sonoma Avenue at Brookwood Avenue has protected-permitted left-turn phasing in the east-west directions on Sonoma Avenue. The City should monitor crashes at this location, and may want to consider implementing protected-only phasing on Sonoma Avenue should the incidence of such collisions increase. Of the six reported collisions between a northbound or southbound vehicle with an eastbound or westbound vehicle, four were due to “traffic signals and signs.” Similar to indicated above for Brookwood Avenue/3<sup>rd</sup> Street, programming a red clearance interval on all approaches, or increasing the interval if one already exists, may reduce crashes. The collision rate calculations are provided in Appendix A.

## 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 in the vicinity of the proposed project site.

- **Brookwood Avenue** – Intermittent sidewalk coverage is provided on Brookwood Avenue with a significant gap on the west side of the street between 2<sup>nd</sup> Street and Sonoma Avenue. Sidewalks are provided along developed property frontages. There are curb ramps and crosswalks at each of the side street approaches along Brookwood Avenue between 3<sup>rd</sup> Street and Sonoma Avenue.
- **Montgomery Drive** – Continuous sidewalks are provided on both sides of Montgomery Drive between 3<sup>rd</sup> Street and Hahman Drive. There are curb ramps and crosswalks at each of the side street approaches along Montgomery Drive between 3<sup>rd</sup> Street and Talbot Avenue.
- **Sonoma Avenue** – Montgomery Drive between 3<sup>rd</sup> Street and Rosedale Avenue has continuous sidewalks on both sides.
- **Doyle Park Drive** – Continuous sidewalks are provided on both sides of Doyle Park Drive between Montgomery Drive and Sonoma Avenue.
- **Sotoyome Street** – On Sotoyome Street, continuous sidewalks are provided on both sides between Montgomery Drive and Sonoma Avenue.

## Bicycle Facilities

The *Highway Design Manual*, Caltrans, 2012, classifies bikeways into three categories:

- **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.

Guidance for Class IV Bikeways is provided in *Design Information Bulletin Number 89: Class IV Bikeway Guidance (Separated Bikeways/Cycle Tracks)*, Caltrans, 2015.

- **Class IV Bikeway** – also known as a separated bikeway, a Class IV Bikeway is for the exclusive use of bicycles and includes a separation between the bikeway and the motor vehicle traffic lane. The separation may include, but is not limited to, grade separation, flexible posts, inflexible physical barriers, or on-street parking.

In the project area, Class II bike lanes exist on Brookwood Avenue between 3<sup>rd</sup> Street and Sonoma Avenue and on Sonoma Avenue between Santa Rosa Avenue and Hahman Drive. Bicyclists ride in the roadway and/or on sidewalks along all other streets within the project study area. Table 2 summarizes the existing and planned bicycle facilities in the project vicinity, as contained in the *City of Santa Rosa Bicycle and Pedestrian Transportation Plan*, 2010.

**Table 2 – Bicycle Facility Summary**

| <b>Status<br/>Facility</b> | <b>Class</b> | <b>Length<br/>(miles)</b> | <b>Begin Point</b>     | <b>End Point</b>       |
|----------------------------|--------------|---------------------------|------------------------|------------------------|
| <b>Existing</b>            |              |                           |                        |                        |
| Brookwood Avenue           | II           | 0.27                      | 3 <sup>rd</sup> Street | Sonoma Avenue          |
| Sonoma Avenue              | II           | 1.56                      | Santa Rosa Avenue      | Hahman Drive           |
| Montgomery Drive           | II           | 0.16                      | Talbot Avenue          | Alderbrook Drive       |
| Brookwood Avenue           | III          | 0.48                      | Sonoma Avenue          | Maple Avenue           |
| <b>Planned</b>             |              |                           |                        |                        |
| Santa Rosa Creek           | I            | 0.90                      | Santa Rosa Avenue      | Memorial Hospital      |
| Montgomery Drive           | II           | 0.47                      | 3 <sup>rd</sup> Street | Talbot Avenue          |
| Montgomery Drive           | II           | 0.46                      | Alderbrook Drive       | Hahman Drive           |
| Brookwood Avenue           | II           | 0.20                      | College Avenue         | 3 <sup>rd</sup> Street |
| Brookwood Avenue           | II           | 0.48                      | Sonoma Avenue          | Maple Avenue           |
| Doyle Park Drive           | III          | 0.44                      | Leonard Ave            | Doyle Community Park   |

Notes: \* All or portions of these bikeways are located within the City of Santa Rosa

Source: *City of Santa Rosa Bicycle and Pedestrian Transportation Plan, 2010*

## Transit Facilities

### ***Santa Rosa CityBus***

The Santa Rosa CityBus provides fixed route bus service in the City of Santa Rosa. Santa Rosa CityBus Route 4/4A provides service between downtown Santa Rosa and Rincon Valley, Mission Boulevard, and Calistoga Road. The route stops on Sonoma Avenue at Sotoyome Street and Doyle Park Drive and operates Monday through Friday with 30-minute headways between 6:00 a.m. and 8:00 p.m. On Saturdays, service is provided from 6:00 a.m. to 8:00 p.m. with one-hour headways, and Sundays with one-hour headways between 10:00 a.m. and 5:00 p.m.

Two bicycles can be carried on most Santa Rosa CityBus buses. Bike rack space is on a first come, first served basis. Additional bicycles are allowed on Santa Rosa CityBus 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. Santa Rosa Paratransit is designed to serve the needs of individuals with disabilities within the City of Santa Rosa and the greater Santa Rosa area.

### ***Sonoma County Transit***

Sonoma County Transit (SCT) provides fixed route bus service in the City of Santa Rosa and surrounding communities. The routes operate between the City of Santa Rosa and the City of Sonoma, with stops in both directions at Santa Rosa Memorial Hospital. Route 30 has approximately one- to two-hour headways between 5:00 a.m. and 9:00 p.m. on Monday through Friday and runs four times on the weekends between 7:30 a.m. and 7:00 p.m. Route 34 offers weekday service with one morning trip from Santa Rosa through the Sonoma Valley to the City of Sonoma and one evening trip from Sonoma to Santa Rosa.

# 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 methodologies published in the *Highway Capacity Manual* (HCM), Transportation Research Board, 2000. 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 Levels of Service for the intersections with side-street stop controls, or those which are unsignalized and have one or two approaches stop controlled, were analyzed using the “Two-Way Stop-Controlled” intersection capacity method from the HCM. This methodology determines a level of service for each minor turning movement by estimating the level of average delay in seconds per vehicle. Results are presented for individual movements together with the weighted overall average delay for the intersection.

The study intersections that are currently controlled by a traffic signal were evaluated using the signalized methodology from the HCM. This methodology is based on factors including traffic volumes, green time for each movement, phasing, whether or not the signals are coordinated, truck traffic, and pedestrian activity. Average stopped delay per vehicle in seconds is used as the basis for evaluation in this LOS methodology. For purposes of this study, delays were calculated using optimized signal timing.

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

**Table 3 – Intersection Level of Service Criteria**

| LOS | Two-Way Stop-Controlled                                                                                                                                             | Signalized                                                                                                                    |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| A   | Delay of 0 to 10 seconds. Gaps in traffic are readily available for drivers exiting the minor street.                                                               | Delay of 0 to 10 seconds. Most vehicles arrive during the green phase, so do not stop at all.                                 |
| B   | Delay of 10 to 15 seconds. Gaps in traffic are somewhat less readily available than with LOS A, but no queuing occurs on the minor street.                          | Delay of 10 to 20 seconds. More vehicles stop than with LOS A, but many drivers still do not have to stop.                    |
| C   | Delay of 15 to 25 seconds. Acceptable gaps in traffic are less frequent, and drivers may approach while another vehicle is already waiting to exit the side street. | Delay of 20 to 35 seconds. The number of vehicles stopping is significant, although many still pass through without stopping. |
| D   | Delay of 25 to 35 seconds. There are fewer acceptable gaps in traffic, and drivers may enter a queue of one or two vehicles on the side street.                     | Delay of 35 to 55 seconds. The influence of congestion is noticeable, and most vehicles have to stop.                         |
| E   | Delay of 35 to 50 seconds. Few acceptable gaps in traffic are available, and longer queues may form on the side street.                                             | Delay of 55 to 80 seconds. Most, if not all, vehicles must stop and drivers consider the delay excessive.                     |
| F   | Delay of more than 50 seconds. Drivers may wait for long periods before there is an acceptable gap in traffic for exiting the side streets, creating long queues.   | 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, 2000

## Traffic Operation Standards

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

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

## 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 when local schools were in session on Tuesday, November 3, 2015.

### Intersection Levels of Service

Under existing conditions, all study intersections are operating acceptably at LOS C or better during both the a.m. and p.m. peak periods. A summary of the intersection level of service calculations is contained in Table 4. Existing traffic volumes are shown in Figure 2, and copies of the Level of Service calculations are provided in Appendix B.

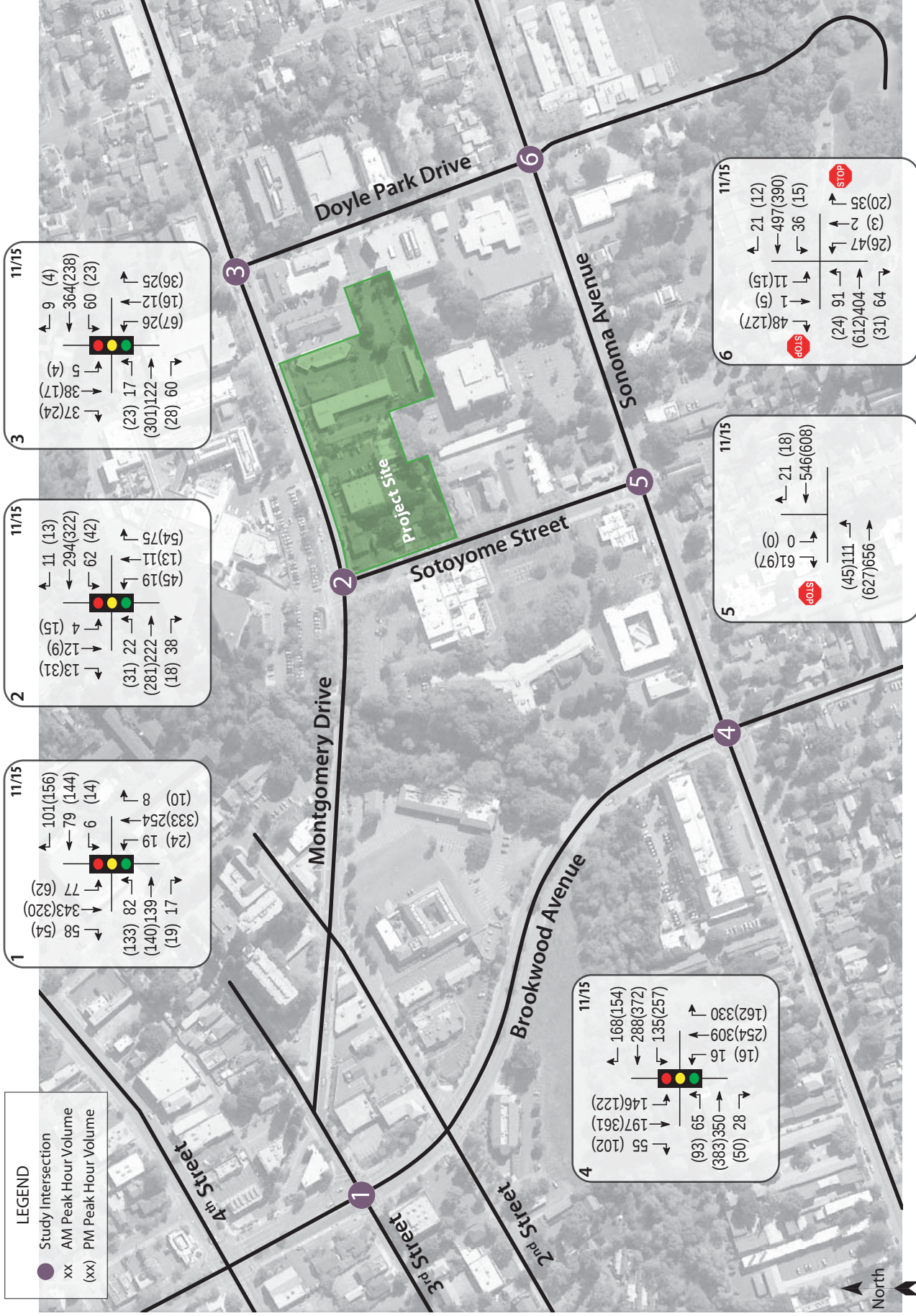
**Table 4 – Existing Peak Hour Intersection Levels of Service**

| Study Intersection<br><i>Approach</i>      | AM Peak     |          | PM Peak     |          |
|--------------------------------------------|-------------|----------|-------------|----------|
|                                            | Delay       | LOS      | Delay       | LOS      |
| 1. Brookwood Ave/3 <sup>rd</sup> St        | 15.8        | B        | 18.5        | B        |
| 2. Montgomery Dr/Sotoyome St               | 5.8         | A        | 6.0         | A        |
| 3. Montgomery Dr/Doyle Park Dr             | 3.7         | A        | 4.7         | A        |
| 4. Sonoma Ave/Brookwood Ave                | 34.3        | C        | 27.2        | C        |
| 5. Sonoma Ave/Sotoyome St                  | 1.3         | A        | 1.4         | A        |
| <i>Southbound (Sotoyome St) Approach</i>   | <i>13.3</i> | <i>B</i> | <i>15.7</i> | <i>C</i> |
| 6. Sonoma Ave/Doyle Park Dr                | 2.8         | A        | 2.5         | A        |
| <i>Northbound (Doyle Park Dr) Approach</i> | <i>18.8</i> | <i>C</i> | <i>16.9</i> | <i>C</i> |
| <i>Southbound (Doyle Park Dr) Approach</i> | <i>14.3</i> | <i>B</i> | <i>14.0</i> | <i>B</i> |

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

## Future Conditions

Segment volumes for the horizon year of 2040 were obtained from the SCTA's gravity demand model and translated to turning movement volumes at each of the study intersections using the "Furness" method and factoring. The Furness method is an iterative process that employs existing turn movement data, existing link volumes, and future link volumes to project likely future turning movement volumes at intersections.



Traffic Impact Study for the Memorial Hospital MOB Project  
**Figure 2 – Existing Traffic Volumes**

Under the anticipated Future volumes, the study intersections are expected to operate acceptably overall at LOS D or better.

Future operating conditions are summarized in Table 5, and Future volumes are shown in Figure 3.

**Table 5 – Future Peak Hour Intersection Levels of Service**

| Study Intersection<br>Approach             | AM Peak     |          | PM Peak     |          |
|--------------------------------------------|-------------|----------|-------------|----------|
|                                            | Delay       | LOS      | Delay       | LOS      |
| 1. Brookwood Ave/3 <sup>rd</sup> St        | 18.8        | B        | 20.8        | C        |
| 2. Montgomery Dr/Sotoyome St               | 5.8         | A        | 6.0         | A        |
| 3. Montgomery Dr/Doyle Park Dr             | 4.4         | A        | 4.3         | A        |
| 4. Sonoma Ave/Brookwood Ave                | 37.8        | D        | 28.0        | C        |
| 5. Sonoma Ave/Sotoyome St                  | 1.6         | A        | 1.7         | A        |
| <i>Southbound (Sotoyome St) Approach</i>   | <i>14.5</i> | <i>B</i> | <i>16.7</i> | <i>C</i> |
| 6. Sonoma Ave/Doyle Park Dr                | 3.2         | A        | 2.8         | A        |
| <i>Northbound (Doyle Park Dr) Approach</i> | <i>21.2</i> | <i>C</i> | <i>17.3</i> | <i>C</i> |
| <i>Southbound (Doyle Park Dr) Approach</i> | <i>14.7</i> | <i>C</i> | <i>14.5</i> | <i>B</i> |

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

## Project Description

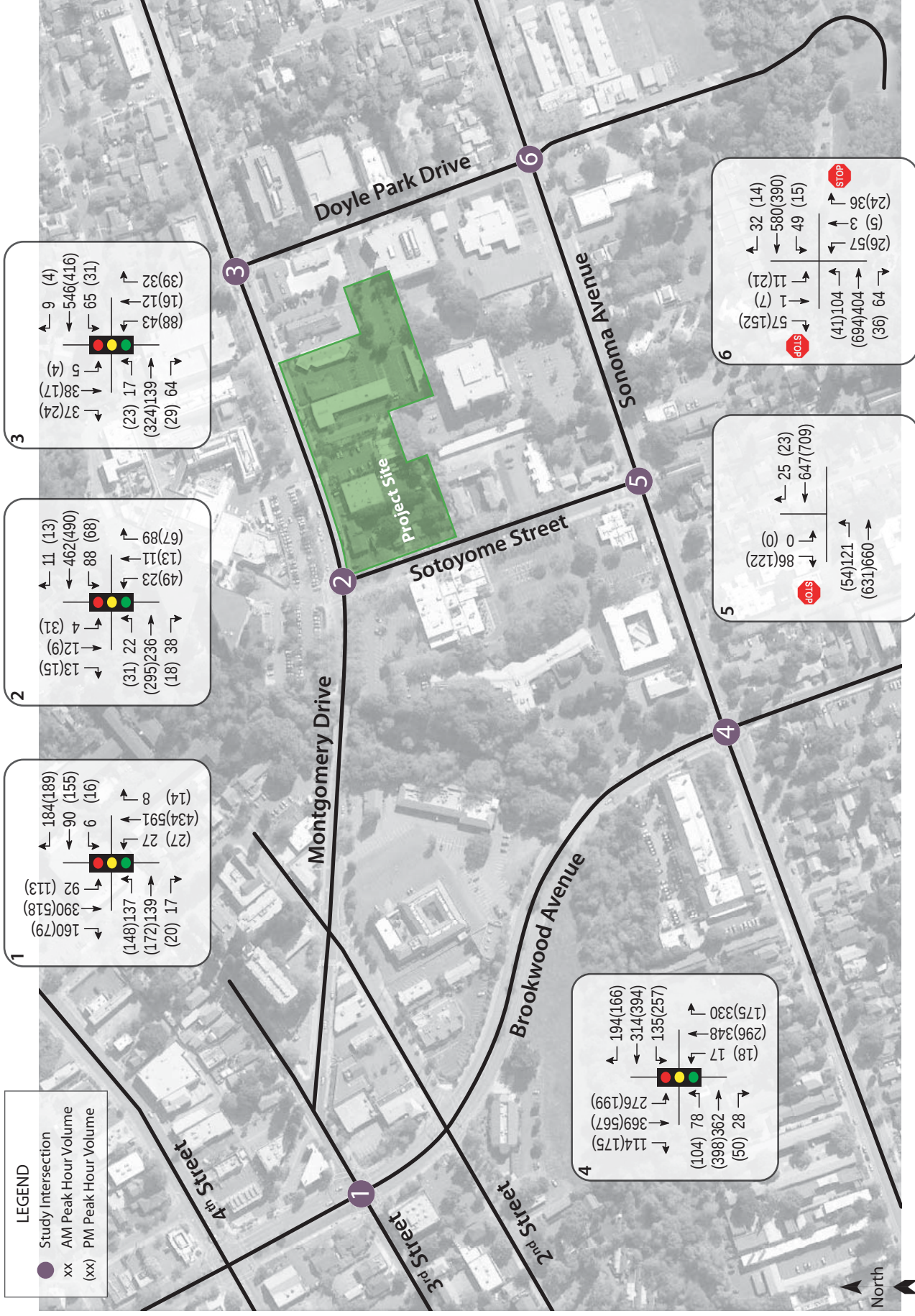
The project consists of development of a 92,000 square-foot medical office building which could include a 2,500 square-foot credit union and a 1,500 square-foot café. The site is bounded by Sotoyome Street to the west, Montgomery Drive to the north, Doyle Park Drive to the east, and Sonoma Avenue to the south. Access would be provided via one driveway each on Sotoyome Street and Montgomery Drive. The proposed project site plan is shown in Figure 4.

## Trip Generation

In order to provide the most conservative assessment, the potential ancillary uses of a credit union and café were broken out and trips estimated for them separately. 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*, 9<sup>th</sup> Edition, 2012 for “Medical Office Building” (ITE LU #720), “Walk-In Bank” (ITE LU #911), and “Coffee/Donut Shop without Drive-Thru” (ITE LU #936). The tenants of the existing buildings are expected to be relocated to adjacent buildings, so no existing trip credits were applied.

## Pass-by Trips

Some portion of traffic associated with the proposed credit union and café is 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 system and choose to make an interim stop, and are referred to as “pass-by.” The percentage of these pass-by trips was developed based on information provided in the *Trip Generation Manual*. This reference includes pass-by data collected at numerous locations for many land uses, such as fast food restaurant, gas station and retail uses. For this analysis, pass-by rates for fast food restaurant and high-





turnover sit-down restaurant were averaged and applied to the café and walk-in bank. At the proposed project, pass-by trips would in essence be “captured” from traffic on the roadway network.

## Internal Capture Trips

The *Trip Generation Manual* also includes data and methodologies that can be applied to determine the proportion of internal trips that may occur within a development area that includes a variety of land uses. Internal trips occur at mixed-use developments, and in the case of the proposed project would consist of employees and visitors to the medical office building patronizing the adjacent café and credit union. The majority of these trips would be made by walking, and the few that would be made by automobile would only travel on-site, so would not affect the adjacent street network. These rates were applied as a deduction to the overall trips generated by the project after deducting pass-by trips.

## Total Project Trip Generation

The expected trip generation potential for the proposed project is indicated in Table 6, with deductions taken for pass-by and internal capture. After deductions are taken into account, the project would be expected to generate 276 new trips during the morning peak hour and 336 during the evening peak hour; these new trips represent the increase in traffic associated with the project compared to existing volumes.

**Table 6 – Trip Generation Summary**

| Land Use                          | Units   | AM Peak Hour           |       |     |     | PM Peak Hour |       |     |     |
|-----------------------------------|---------|------------------------|-------|-----|-----|--------------|-------|-----|-----|
|                                   |         | Rate                   | Trips | In  | Out | Rate         | Trips | In  | Out |
| Proposed                          |         |                        |       |     |     |              |       |     |     |
| Medical Office Building           | 88 ksf  | 2.39                   | 210   | 166 | 44  | 3.57         | 314   | 88  | 226 |
| Credit Union                      | 2.5 ksf | No a.m. rates (closed) |       |     |     | 12.13        | 30    | 13  | 17  |
| Café                              | 1.5 ksf | 108.38                 | 163   | 83  | 80  | 40.75        | 61    | 50  | 11  |
| Pass-By for Credit Union and Café |         | -47%                   | -77   | -39 | -38 | -47%         | -43   | -21 | -22 |
| Net New after Pass-By             |         |                        | 296   | 210 | 86  |              | 362   | 111 | 251 |
| Internal Capture                  |         | -7%                    | -20   | -14 | -6  | -7%          | -26   | -8  | -18 |
| Total New Trips                   |         |                        | 276   | 196 | 80  |              | 336   | 103 | 233 |

Note: ksf = 1,000 square feet

On a daily basis, the 92,000 square foot medical office building has an estimated trip generation of 3,324 trips based on the daily rate of 36.13 trips per thousand square feet of floor space. It is noted that the site is currently occupied by numerous small buildings with a total of 37,137 square feet of floor space used for medical offices. While the elimination of this space was not deducted from the project trip generation to provide a more conservative analysis, the net new trip generation associated with the proposed increase of 54,682 square feet is 1,982 daily trips. Further, this project would provide additional medical services in an area where substantial interaction between uses is possible, thereby resulting in the likelihood that some of the trips would be captured from other nearby facilities rather than being a new, primary trip. The estimate of 1,982 new daily trips may therefore still be conservative as it overstates the trip generation due to there being no specific data that would allow the extent of internal capture to be estimated.

## Trip Distribution

The pattern used to allocate new project trips to the street network was based on turning movement data collected at the study intersections. The applied distribution assumptions and resulting trips are shown in Table 7.

**Table 7 – Trip Distribution Assumptions**

| Route                          | Percent     | AM Trips   | PM Trips   |
|--------------------------------|-------------|------------|------------|
| 1. Brookwood Ave to/from North | 6%          | 17         | 20         |
| 2. Brookwood Ave to/from South | 14%         | 39         | 47         |
| 3. Doyle Park Dr to/from North | 2%          | 5          | 7          |
| 4. Doyle Park Dr to/from South | 2%          | 5          | 7          |
| 5. Montgomery Dr to/from East  | 15%         | 41         | 50         |
| 6. Montgomery Dr to/from West  | 9%          | 25         | 30         |
| 7. Sonoma Ave to/from East     | 30%         | 83         | 101        |
| 8. Sonoma Ave to/from West     | 22%         | 61         | 74         |
| <b>TOTAL</b>                   | <b>100%</b> | <b>276</b> | <b>336</b> |

## Intersection Operation

### Existing plus Project Conditions

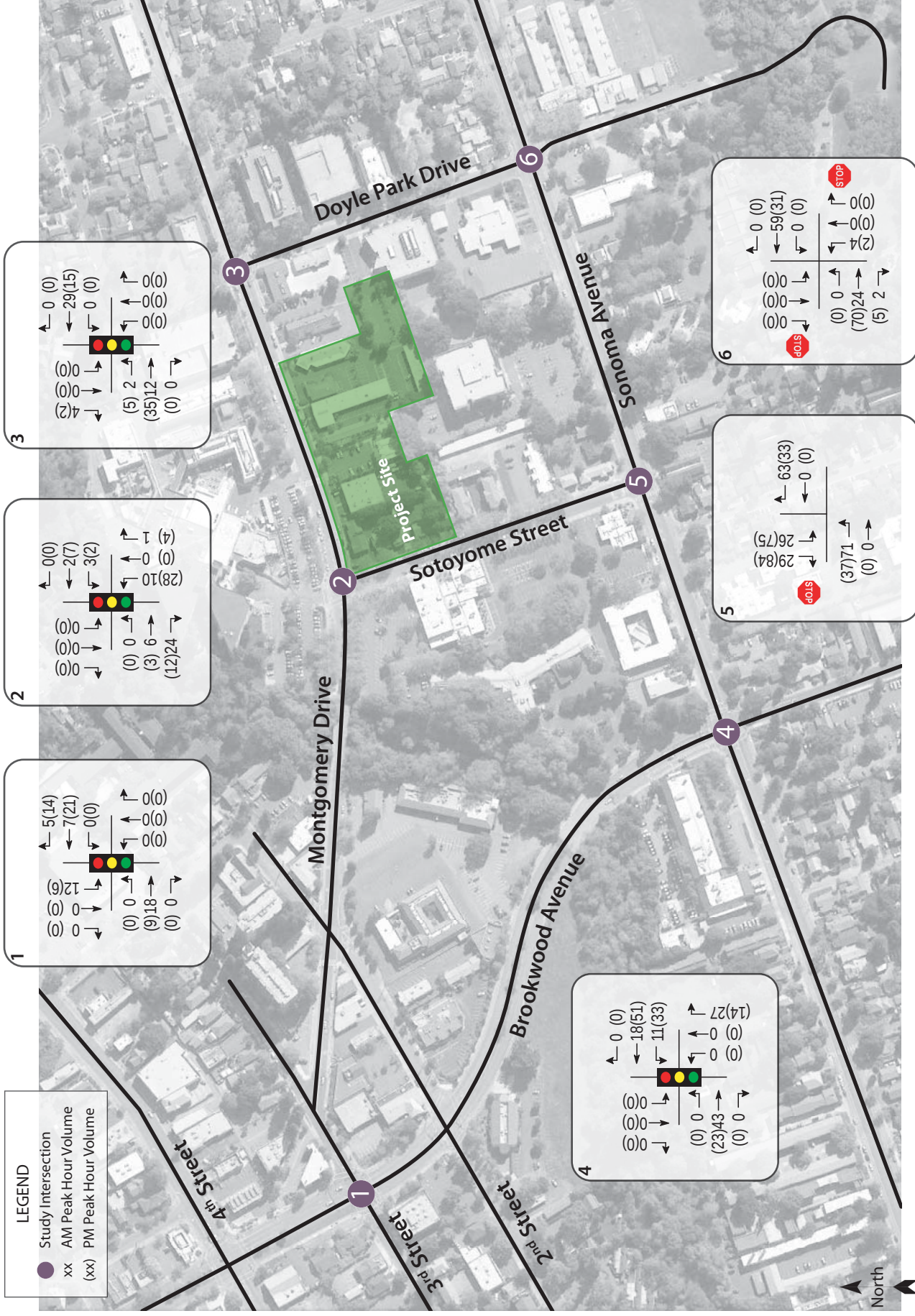
Upon the addition of project-related traffic to the Existing volumes, the study intersections are expected to operate acceptably at the same levels of service as without the project. With the Sonoma Avenue road diet and installation of the two-way left-turn lane on Sonoma Avenue through the intersection of Sonoma Avenue/Sotoyome Street back in 2012, the southbound left-turn restriction is no longer warranted. It was assumed the turn restriction at Sonoma Avenue/Sotoyome Street would be removed as part of the project. The southbound approach would remain stop-controlled, with a single, shared lane for both left and right turns. These results are summarized in Table 8. Project traffic volumes are shown in Figure 5.

**Table 8 – Existing and Existing plus Project Peak Hour Intersection Levels of Service**

| Study Intersection<br>Approach             | Existing Conditions |          |             |          | Existing plus Project |          |             |          |
|--------------------------------------------|---------------------|----------|-------------|----------|-----------------------|----------|-------------|----------|
|                                            | AM Peak             |          | PM Peak     |          | AM Peak               |          | PM Peak     |          |
|                                            | Delay               | LOS      | Delay       | LOS      | Delay                 | LOS      | Delay       | LOS      |
| 1. Brookwood Ave/3 <sup>rd</sup> St        | 15.8                | B        | 18.5        | B        | 16.0                  | B        | 19.2        | B        |
| 2. Montgomery Dr/Sotoyome St               | 5.8                 | A        | 6.0         | A        | 5.8                   | A        | 6.2         | A        |
| 3. Montgomery Dr/Doyle Park Dr             | 3.7                 | A        | 4.7         | A        | 3.8                   | A        | 4.9         | A        |
| 4. Sonoma Ave/Brookwood Ave                | 34.3                | C        | 27.2        | C        | 38.8                  | D        | 29.5        | C        |
| 5. Sonoma Ave/Sotoyome St                  | 1.3                 | A        | 1.4         | A        | 2.6                   | A        | 6.8         | A        |
| <i>Southbound (Sotoyome St) Approach</i>   | <i>13.3</i>         | <i>B</i> | <i>15.7</i> | <i>C</i> | <i>19.4</i>           | <i>C</i> | <i>40.0</i> | <i>E</i> |
| 6. Sonoma Ave/Doyle Park Dr                | 2.8                 | A        | 2.5         | A        | 2.9                   | A        | 2.5         | A        |
| <i>Northbound (Doyle Park Dr) Approach</i> | <i>18.8</i>         | <i>C</i> | <i>16.9</i> | <i>C</i> | <i>21.3</i>           | <i>C</i> | <i>18.4</i> | <i>C</i> |
| <i>Southbound (Doyle Park Dr) Approach</i> | <i>14.3</i>         | <i>B</i> | <i>14.0</i> | <i>B</i> | <i>15.2</i>           | <i>C</i> | <i>14.7</i> | <i>C</i> |

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

**Finding** – The study intersections are expected to continue operating acceptably at the same levels of service upon the addition of project-generated traffic.



Traffic Impact Study for the Memorial Hospital MOB Project  
**Figure 5 – Project Traffic Volumes**

**Recommendation** – The existing turn restrictions at Sonoma Avenue/Sotoyome Street should be eliminated as part of the project.

## Future plus Project Conditions

When the project is built, it is planned that the intersection of Sonoma Avenue/Sotoyome Street will be modified with southbound left-turns, which are currently prohibited, allowed. Upon the addition of project-generated traffic to the anticipated Future volumes, the study intersections are expected to operate acceptably at the same levels of service as without the project. The Future plus Project operating conditions are summarized in Table 9.

**Table 9 – Future and Future plus Project Peak Hour Levels of Service**

| Study Intersection<br><i>Approach</i>      | Future Conditions |          |             |          | Future plus Project |          |             |          |
|--------------------------------------------|-------------------|----------|-------------|----------|---------------------|----------|-------------|----------|
|                                            | AM Peak           |          | PM Peak     |          | AM Peak             |          | PM Peak     |          |
|                                            | Delay             | LOS      | Delay       | LOS      | Delay               | LOS      | Delay       | LOS      |
| 1. Brookwood Ave/3 <sup>rd</sup> St        | 18.8              | B        | 20.8        | C        | 19.2                | B        | 22.7        | C        |
| 2. Montgomery Dr/Sotoyome St               | 5.8               | A        | 6.0         | A        | 5.8                 | A        | 6.3         | A        |
| 3. Montgomery Dr/Doyle Park Dr             | 4.4               | A        | 4.3         | A        | 4.1                 | A        | 4.3         | A        |
| 4. Sonoma Ave/Brookwood Ave                | 37.8              | D        | 28.0        | C        | 40.9                | D        | 30.1        | C        |
| 5. Sonoma Ave/Sotoyome St                  | 1.6               | A        | 1.7         | A        | 2.8                 | A        | 6.4         | A        |
| <i>Southbound (Sotoyome St) Approach</i>   | <i>14.5</i>       | <i>B</i> | <i>16.7</i> | <i>C</i> | <i>20.3</i>         | <i>C</i> | <i>37.3</i> | <i>E</i> |
| 6. Sonoma Ave/Doyle Park Dr                | 3.2               | A        | 2.8         | A        | 3.3                 | A        | 2.8         | A        |
| <i>Northbound (Doyle Park Dr) Approach</i> | <i>21.2</i>       | <i>C</i> | <i>17.3</i> | <i>C</i> | <i>24.4</i>         | <i>C</i> | <i>18.8</i> | <i>C</i> |
| <i>Southbound (Doyle Park Dr) Approach</i> | <i>14.7</i>       | <i>C</i> | <i>14.5</i> | <i>B</i> | <i>15.5</i>         | <i>C</i> | <i>15.4</i> | <i>C</i> |

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

**Finding** – The study intersections will continue operating acceptably with project traffic added, at the same Levels of Service as without the project.

# Alternative Modes

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## Pedestrian Facilities

Given the proximity of the downtown area and commercial, retail, and residential land uses surrounding the project site, it is reasonable to assume that some project trips will occur by foot, bicycle, or public transit to reach the project site. The two existing midblock crossings on Montgomery Drive between Sotoyome Street and Doyle Park Drive will be consolidated into one crossing on the west side of the proposed driveway. This is an appropriate modification to the pedestrian facilities in the area as it decreases the number of locations for potential pedestrian-vehicle conflicts on that section of Montgomery Drive. Analysis was completed to determine if the crosswalk should be enhanced. Based on a major road volume of 679 vehicles on Montgomery Drive between Sotoyome Street and Doyle Park Drive during the peak hour and 61 pedestrians crossing Montgomery Drive during the p.m. peak hour, an active or enhanced crossing is warranted, as shown in Appendix C. The applicant should install a crossing with Rapid Rectangular Flashing Beacons (RRFBs).

**Project Site** – Sidewalks exist along all of the project frontages. A multi-use path paralleling the Santa Rosa Creek Trail is proposed within the project site.

**Finding** – Upon the installation of a crosswalk with RRFBs at the new crossing location on Montgomery Drive between Sotoyome Street and Doyle Park Drive, pedestrian facilities serving the project site will be adequate.

## Bicycle Facilities

Existing bicycle facilities, including bike lanes on Brookwood Avenue, Montgomery Drive, and Sonoma Avenue, together with shared use of minor streets provide adequate access for bicyclists.

## Bicycle Storage

The Santa Rosa City Code stipulates that a minimum bicycle requirement for a Medical service land use is one space per 6,000 square feet. At that rate, 15 bicycle parking spaces should be provided on-site; 25 percent of the spaces should be provided in facilities adequate for long-term use. Additionally, one shower for each gender is required for office uses between 50,000 square-feet and 149,999 square-feet.

The project description indicates there will be long- and short-term bicycle parking and shower facilities provided in accordance with the Santa Rosa City Code requirements.

**Finding** – Upon the addition of 15 bicycle parking spaces and two showers, bicycle facilities serving the project site will be adequate.

## Transit

Existing transit routes are adequate to accommodate project-generated transit trips. Existing stops are within acceptable walking distance of the site. In addition to the existing stops, a bus stop area with a shelter is proposed in front of the project.

**Finding** – Existing and proposed transit facilities serving the project site are adequate.

# Access and Circulation

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## Site Access

Access would be provided via driveways on Sotoyome Street and Montgomery Drive.

## Sight Distance

At driveways, a substantially clear line of sight should be maintained between the driver of a vehicle waiting at the crossroad and the driver of an approaching vehicle. Adequate time must 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 distance should be measured from a 3.5-foot height at the location of the driver on the minor road to a 4.25-foot object height in the center of the approaching lane of the major road. Set-back for the driver on the crossroad shall be a minimum of 15 feet, measured from the edge of the traveled way.

Sight distances along Sotoyome Street and Montgomery Drive at the proposed driveways were evaluated based on criteria contained in the *Highway Design Manual* published by Caltrans. The recommended sight distance at driveways is based on stopping sight distance and the approach travel speeds. Additionally, the stopping sight distance needed for a following driver to stop if there is a vehicle waiting to turn into a driveway is evaluated based on stopping sight distance criterion and the approach speed on the major street. The minimum stopping sight distance for the project driveways on Sotoyome Street and Montgomery Drive is 200 feet based on the posted 25-mph speed limits.

From a review of the proposed site plan as well as site observations, sight distance for vehicles exiting the project site on Montgomery Drive is adequate in both directions as the driveway is on the outside of a curve. Sight distance along Sotoyome Street is limited due to on-street parking along the project frontage. However, once a vehicle creeps out from the project driveway to make a left turn, and while still clear of the travel lane, sight distance is clear to at least 300 feet in each direction, or to the adjacent intersection.

In order to maintain adequate sight lines for vehicles leaving the site, it is recommended that landscaping at both driveways be limited to low-lying vegetation no greater than three feet in height. In addition, signs and monuments planned along the project's frontages should be placed in a manner that does not obstruct sight distance at the project driveways. Finally, parking should be prohibited through installation of red curbing for a distance of 35 feet on either side of the project driveway on Sotoyome Street.

At the project driveways, the required 200 feet of sight distance would be provided and would therefore be adequate.

## Traffic Signal Warrants

Although the intersection of Sonoma Avenue/Sotoyome Street is expected to operate acceptably overall under all scenarios evaluated, because the project would substantially increase delay on the stop-controlled approach, a signal warrant analysis was performed to determine potential need for a traffic signal to offset project impacts.

Chapter 4C of the *California Manual on Uniform Traffic Control Devices* (CA-MUTCD) provides guidance on when a traffic signal should be considered. There are nine different warrants, or criteria, presented, as follows:

- Warrant 1, Eight-Hour Vehicular Volume
- Warrant 2, Four-Hour Vehicular Volume
- Warrant 3, Peak Hour Volume

- Warrant 4, Pedestrian Volume
- Warrant 5, School Crossing
- Warrant 6, Coordinated Signal System
- Warrant 7, Crash Experience
- Warrant 8, Roadway Network
- Warrant 9, Intersection Near a Grade Crossing

For the purposes of this study, Warrant 3, the Peak Hour volume warrant, which determines the need for traffic control based on the highest volume hour of the day, was used as an initial indication of traffic control needs. The use of this signal warrant is common practice for planning studies. Other warrants, which are more generally applicable to existing traffic issues, require collection of traffic volumes for the highest four or eight hours of the day, review of the collision history, and evaluation of the system surrounding the location. It is noted that review of the collision data indicates that there are no safety issues that would warrant signalization.

**Warrant 3** assesses potential need for a traffic control signal if the criteria in either of the following two categories are met:

- A. If all three of the following conditions exist for the same one hour (any four consecutive 15-minute periods) of an average day:
  1. The total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equals or exceeds: four vehicle-hours for a one-lane approach; or five vehicle-hours for a two-lane approach, and
  2. The volume on the same minor-street approach (one direction only) equals or exceeds 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes, and
  3. The total entering volume serviced during the hour equals or exceeds 650 vehicles per hour for intersections with three approaches or 800 vehicles per hour for intersections with four or more approaches.
- B. The plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher-volume minor-street approach (one direction only) for one hour (any four consecutive 15-minute periods) of an average day falls above the applicable curve in Figure 4C-3 for the existing combination of approach lanes.

Under traffic volumes that are anticipated during both the a.m. and p.m. peak hours with project trips added to existing conditions, a signal is warranted at the intersection of Sonoma Avenue/Sotoyome Street. The applicant should consider installing a traffic signal to reduce impacts on local traffic. Traffic signal warrants are included in Appendix D.

# Parking

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The project was analyzed to determine whether the proposed parking supply would be sufficient for the anticipated parking demand. The project site as proposed would provide a total of 619 standard parking spaces for the medical office building, café, and credit union.

Jurisdiction parking supply requirements are based on the Santa Rosa City Code, Chapter 20-36; Parking and Loading Standards. The parking supply as proposed substantially exceeds the parking required per the City's code for all uses at the site as shown in Table 10.

| Table 10 – Parking Analysis Summary |                          |                                          |                 |
|-------------------------------------|--------------------------|------------------------------------------|-----------------|
| Land Use                            | Units                    | City Requirements                        |                 |
|                                     |                          | Rate                                     | Spaces Required |
| Medical Office Building             | 88 ksf                   | 1 space per 200 sf                       | 440             |
| Credit Union                        | 2.5 ksf<br>(incl. 1 ATM) | 1 space per 250 sf +<br>2 spaces per ATM | 12              |
| Café                                | 1.5 ksf                  | 1 space per 75 sf                        | 20              |
| <b>Total</b>                        |                          |                                          | <b>472</b>      |

Notes: ksf = 1,000 square feet; sf = square feet

**Finding** – The proposed parking supply for the project is adequate to meet the City's code.

# Conclusions and Recommendations

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## Conclusions

- The proposed 92,000 square-foot medical office building, potentially including a 2,500 square-foot credit union and 1,500 square-foot café, is expected to generate an average of 276 new trips during the morning peak hour and 336 during the evening peak hour. It has an anticipated daily trip generation of 3,324 without consideration of potential to capture trips associated with other nearby medical services and offices.
- The intersections of Brookwood Avenue/3<sup>rd</sup> Street and Sonoma Avenue/Brookwood Avenue experienced collision rates higher than the statewide averages during the five-year period reviewed.
- All of the study intersections are currently operating acceptably, and they are expected to continue doing so under projected future volumes.
- Upon adding project trips to existing volumes and assuming full outbound access at Sonoma Avenue/Sotoyome Street, all of the study intersections are expected to operate acceptably.
- With project trips added to Future volumes, all of the study intersections will continue operating acceptably at the same levels of service.
- Upon the addition of RRFBs to the proposed mid-block crossing on Montgomery Drive, which would replace two existing mid-block crosswalks on the same block, pedestrian facilities serving the project site will be adequate.
- Generally, bicycle facilities serving the project site are adequate so long as 15 bicycle parking spaces and two showers are provided.
- Existing and proposed transit facilities serving the project site are adequate.
- Sight distance along Montgomery Drive at the project driveway is adequate. With the addition of red curb on either side of the Sotoyome Street driveway, access to the site is expected to function acceptably.
- A traffic signal is warranted at the intersection of Sonoma Avenue/Sotoyome Street.
- The proposed parking supply substantially exceeds the minimum required under the City's code.

## Recommendations

- The City should consider adding or increasing red-clearance intervals at the intersections of Brookwood Avenue/3<sup>rd</sup> Street and Sonoma Avenue/Brookwood Avenue. Additionally, the City should monitor the protected/permitted operation at Sonoma Avenue/Brookwood Avenue and consider converting Sonoma Avenue to protected lefts only should the incidence of correctible collisions increase.
- An enhanced crossing with RRFBs should be installed at the proposed mid-block crossing on Montgomery Drive.
- One shower for each gender should be provided on-site.
- Bicycle parking to adequately meet City requirements should be provided.

- Landscaping should be maintained such that foliage stays above seven feet and below three feet from the ground within the sight lines at the driveways. Signs or monuments to be installed along the project frontage should be placed so that sight distance is not obstructed at the project driveways. Further, red paint should be applied to the curbs for 35 feet on either side of the project driveway on Sotoyome Street to improve sight lines.
- The applicant should consider including installation of a traffic signal at the intersection of Sonoma Avenue/ Sotoyome Street as part of the project proposal.

# Study Participants and References

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## Study Participants

|                             |                              |
|-----------------------------|------------------------------|
| Principal in Charge         | Dalene J. Whitlock, PE, PTOE |
| Assistant Engineer          | Lauren Davini, PE            |
| Graphics/Editing/Formatting | Angela McCoy                 |

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SRO376



# Appendix A

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## Collision Rate Calculations



### Intersection Collision Rate Calculations

#### Santa Rosa Memorial Hospital MOB Project

**Intersection # 1:** Brookwood Avenue & 3rd Street

**Date of Count:** Wednesday, October 14, 2009

**Number of Collisions:** 10

**Number of Injuries:** 5

**Number of Fatalities:** 0

**ADT:** 14100

**Start Date:** May 1, 2011

**End Date:** April 30, 2016

**Number of Years:** 5

**Intersection Type:** Four-Legged

**Control Type:** Signals

**Area:** Urban

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

$$\text{collision rate} = \frac{10}{14,100} \times \frac{1,000,000}{365 \times 5}$$

|                    | Collision Rate | Fatality Rate | Injury Rate |
|--------------------|----------------|---------------|-------------|
| Study Intersection | 0.39 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

\* 2012 Collision Data on California State Highways, Caltrans

**Intersection # 2:** Montgomery Drive & Sotoyome Street

**Date of Count:** Tuesday, November 03, 2015

**Number of Collisions:** 4

**Number of Injuries:** 3

**Number of Fatalities:** 0

**ADT:** 8700

**Start Date:** May 1, 2011

**End Date:** April 30, 2016

**Number of Years:** 5

**Intersection Type:** Four-Legged

**Control Type:** Signals

**Area:** Urban

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

$$\text{collision rate} = \frac{4}{8,700} \times \frac{1,000,000}{365 \times 5}$$

|                    | Collision Rate | Fatality Rate | Injury Rate |
|--------------------|----------------|---------------|-------------|
| Study Intersection | 0.25 c/mve     | 0.0%          | 75.0%       |
| 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

\* 2012 Collision Data on California State Highways, Caltrans

### Intersection Collision Rate Calculations

#### Santa Rosa Memorial Hospital MOB Project

**Intersection # 3:** Montgomery Drive & Doyle Park Drive

**Date of Count:** Tuesday, November 03, 2015

**Number of Collisions:** 2

**Number of Injuries:** 2

**Number of Fatalities:** 0

**ADT:** 7800

**Start Date:** May 1, 2011

**End Date:** April 30, 2016

**Number of Years:** 5

**Intersection Type:** Four-Legged

**Control Type:** Signals

**Area:** Urban

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

$$\text{collision rate} = \frac{2}{7,800} \times \frac{1,000,000}{365 \times 5}$$

|                    | Collision Rate | Fatality Rate | Injury Rate |
|--------------------|----------------|---------------|-------------|
| Study Intersection | 0.14 c/mve     | 0.0%          | 100.0%      |
| 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

\* 2012 Collision Data on California State Highways, Caltrans

**Intersection # 4:** Sonoma Avenue & Brookwood Avenue

**Date of Count:** Tuesday, November 03, 2015

**Number of Collisions:** 21

**Number of Injuries:** 17

**Number of Fatalities:** 0

**ADT:** 23300

**Start Date:** May 1, 2011

**End Date:** April 30, 2016

**Number of Years:** 5

**Intersection Type:** Four-Legged

**Control Type:** Signals

**Area:** Urban

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

$$\text{collision rate} = \frac{21}{23,300} \times \frac{1,000,000}{365 \times 5}$$

|                    | Collision Rate | Fatality Rate | Injury Rate |
|--------------------|----------------|---------------|-------------|
| Study Intersection | 0.49 c/mve     | 0.0%          | 81.0%       |
| 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

\* 2012 Collision Data on California State Highways, Caltrans

### Intersection Collision Rate Calculations

#### Santa Rosa Memorial Hospital MOB Project

**Intersection # 5:** Sonoma Avenue & Sotoyome Street

**Date of Count:** Tuesday, November 03, 2015

**Number of Collisions:** 3

**Number of Injuries:** 2

**Number of Fatalities:** 0

**ADT:** 14300

**Start Date:** May 1, 2011

**End Date:** April 30, 2016

**Number of Years:** 5

**Intersection Type:** Tee

**Control Type:** Stop & Yield Controls

**Area:** Urban

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

$$\text{collision rate} = \frac{3}{14,300} \times \frac{1,000,000}{365 \times 5}$$

|                    | Collision Rate | Fatality Rate | Injury Rate |
|--------------------|----------------|---------------|-------------|
| Study Intersection | 0.11 c/mve     | 0.0%          | 66.7%       |
| Statewide Average* | 0.18 c/mve     | 0.7%          | 36.4%       |

ADT = average daily total vehicles entering intersection

c/mve = collisions per million vehicles entering intersection

\* 2012 Collision Data on California State Highways, Caltrans

**Intersection # 6:** Sonoma Avenue & Doyle Park Drive

**Date of Count:** Tuesday, November 03, 2015

**Number of Collisions:** 0

**Number of Injuries:** 0

**Number of Fatalities:** 0

**ADT:** 12800

**Start Date:** May 1, 2011

**End Date:** April 30, 2016

**Number of Years:** 5

**Intersection Type:** Offset

**Control Type:** Stop & Yield Controls

**Area:** Urban

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

$$\text{collision rate} = \frac{0}{12,800} \times \frac{1,000,000}{365 \times 5}$$

|                    | Collision Rate | Fatality Rate | Injury Rate |
|--------------------|----------------|---------------|-------------|
| Study Intersection | 0.00 c/mve     | 0.0%          | 0.0%        |
| Statewide Average* | 0.15 c/mve     | 1.0%          | 41.9%       |

ADT = average daily total vehicles entering intersection

c/mve = collisions per million vehicles entering intersection

\* 2012 Collision Data on California State Highways, Caltrans



# Appendix B

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## Intersection Level of Service Calculations



# HCM Signalized Intersection Capacity Analysis

1: Brookwood Avenue & 3rd Street

12/14/2016

| Movement                          | EBL   | EBT  | EBR  | WBL   | WBT  | WBR  | NBL  | NBT  | NBR   | SBL   | SBT  | SBR  |
|-----------------------------------|-------|------|------|-------|------|------|------|------|-------|-------|------|------|
| Lane Configurations               | EBL   | EBT  | EBR  | WBL   | WBT  | WBR  | NBL  | NBT  | NBR   | SBL   | SBT  | SBR  |
| Traffic Volume (vph)              | 82    | 139  | 17   | 6     | 79   | 101  | 19   | 254  | 8     | 77    | 343  | 58   |
| Future Volume (vph)               | 82    | 139  | 17   | 6     | 79   | 101  | 19   | 254  | 8     | 77    | 343  | 58   |
| Ideal Flow (vphpl)                | 1900  | 1900 | 1900 | 1900  | 1900 | 1900 | 1900 | 1900 | 1900  | 1900  | 1900 | 1900 |
| Total Lost time (s)               | 3.0   | 3.0  | 3.0  | 3.0   | 3.0  | 3.0  | 3.0  | 3.0  | 3.0   | 3.0   | 3.0  | 3.2  |
| Lane Util. Factor                 | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 0.95 | 1.00  | 1.00  | 0.95 | 1.00 |
| Flpb. ped/bikes                   | 1.00  | 1.00 | 1.00 | 1.00  | 0.98 | 1.00 | 0.98 | 1.00 | 1.00  | 1.00  | 1.00 | 1.00 |
| Frt                               | 1.00  | 0.98 | 1.00 | 0.92  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  | 0.98 | 1.00 |
| Flt Protected                     | 0.95  | 1.00 | 0.95 | 1.00  | 0.95 | 1.00 | 0.95 | 1.00 | 0.95  | 1.00  | 0.95 | 1.00 |
| Satd. Flow (prot)                 | 1770  | 1828 | 1754 | 1676  | 1743 | 3518 | 1770 | 3438 |       |       |      |      |
| Flt Permitted                     | 0.95  | 1.00 | 0.95 | 1.00  | 0.95 | 1.00 | 0.95 | 1.00 | 0.95  | 1.00  | 0.95 | 1.00 |
| Satd. Flow (perm)                 | 1770  | 1828 | 1754 | 1676  | 1743 | 3518 | 1770 | 3438 |       |       |      |      |
| Peak-hour factor, PHF             | 0.92  | 0.92 | 0.92 | 0.92  | 0.92 | 0.92 | 0.92 | 0.92 | 0.92  | 0.92  | 0.92 | 0.92 |
| Adj. Flow (vph)                   | 89    | 151  | 18   | 7     | 86   | 110  | 21   | 276  | 9     | 84    | 373  | 63   |
| RTOR Reduction (vph)              | 0     | 4    | 0    | 0     | 54   | 0    | 0    | 3    | 0     | 0     | 15   | 0    |
| Lane Group Flow (vph)             | 89    | 165  | 0    | 7     | 142  | 0    | 21   | 282  | 0     | 84    | 421  | 0    |
| Confl. Peds. (#/hr)               | 20    | 20   | 20   | 20    | 20   | 20   | 20   | 20   | 20    | 20    | 20   | 20   |
| Turn Type                         | Prot  | NA   | NA   | Prot  | NA   | NA   | Prot | NA   | Prot  | NA    | Prot | NA   |
| Permitted Phases                  | 5     | 2    |      | 1     | 6    |      | 3    | 8    |       | 7     | 4    |      |
| Actuated Green, G (s)             | 4.9   | 19.2 | 0.9  | 15.2  | 0.9  | 13.1 | 0.9  | 13.1 | 4.5   | 17.1  |      |      |
| Effective Green, g (s)            | 4.9   | 19.2 | 0.9  | 15.2  | 0.9  | 13.1 | 0.9  | 13.1 | 4.5   | 17.1  |      |      |
| Actuated g/C Ratio                | 0.10  | 0.38 | 0.02 | 0.30  | 0.02 | 0.26 | 0.02 | 0.26 | 0.09  | 0.34  |      |      |
| Clearance Time (s)                | 3.0   | 3.0  | 3.0  | 3.0   | 3.0  | 3.0  | 3.0  | 3.0  | 3.0   | 3.0   | 3.2  |      |
| Vehicle Extension (s)             | 3.0   | 3.0  | 3.0  | 3.0   | 3.0  | 3.0  | 3.0  | 3.0  | 3.0   | 3.0   | 3.0  |      |
| Lane Grp Cap (vph)                | 172   | 697  | 31   | 506   | 31   | 916  | 31   | 916  | 158   | 1168  |      |      |
| v/s Ratio Prot                    | c0.05 | 0.09 | 0.00 | c0.08 | 0.01 | 0.08 | 0.01 | 0.08 | c0.05 | c0.12 |      |      |
| v/s Ratio Perm                    |       |      |      |       |      |      |      |      |       |       |      |      |
| v/c Ratio                         | 0.52  | 0.24 | 0.23 | 0.28  | 0.68 | 0.31 | 0.68 | 0.31 | 0.53  | 0.36  |      |      |
| Uniform Delay, d1                 | 21.6  | 10.6 | 24.4 | 13.4  | 24.6 | 15.0 | 21.9 | 12.5 |       |       |      |      |
| Progression Factor                | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  |      |      |
| Incremental Delay, d2             | 2.6   | 0.2  | 3.7  | 0.3   | 45.6 | 0.2  | 3.4  | 0.2  |       |       |      |      |
| Delay (s)                         | 24.2  | 10.7 | 28.0 | 13.7  | 70.2 | 15.1 | 25.3 | 12.7 |       |       |      |      |
| Level of Service                  | C     | B    | C    | B     | E    | B    | C    | B    |       |       |      |      |
| Approach Delay (s)                | 15.4  |      |      | 14.2  |      | 18.9 |      |      | 14.7  |       |      |      |
| Approach LOS                      | B     |      |      | B     |      | B    |      |      | B     |       |      |      |
| Intersection Summary              |       |      |      |       |      |      |      |      |       |       |      |      |
| HCM 2000 Control Delay            | 15.8  |      |      |       |      |      |      |      |       |       |      |      |
| HCM 2000 Volume to Capacity ratio | 0.40  |      |      |       |      |      |      |      |       |       |      |      |
| Actuated Cycle Length (s)         | 50.3  |      |      |       |      |      |      |      |       |       |      |      |
| Intersection Capacity Utilization | 54.5% |      |      |       |      |      |      |      |       |       |      |      |
| Analysis Period (min)             | 15    |      |      |       |      |      |      |      |       |       |      |      |
| c Critical Lane Group             |       |      |      |       |      |      |      |      |       |       |      |      |

Traffic Study for the Santa Rosa Memorial Hospital  
AM Existing

Synchro 8 Report

# HCM Signalized Intersection Capacity Analysis

1: Brookwood Avenue & 3rd Street

12/14/2016

| Movement                          | EBL   | EBT  | EBR  | WBL   | WBT  | WBR  | NBL  | NBT  | NBR   | SBL   | SBT  | SBR  |
|-----------------------------------|-------|------|------|-------|------|------|------|------|-------|-------|------|------|
| Lane Configurations               | EBL   | EBT  | EBR  | WBL   | WBT  | WBR  | NBL  | NBT  | NBR   | SBL   | SBT  | SBR  |
| Traffic Volume (vph)              | 133   | 140  | 19   | 14    | 144  | 156  | 24   | 333  | 10    | 62    | 320  | 54   |
| Future Volume (vph)               | 133   | 140  | 19   | 14    | 144  | 156  | 24   | 333  | 10    | 62    | 320  | 54   |
| Ideal Flow (vphpl)                | 1900  | 1900 | 1900 | 1900  | 1900 | 1900 | 1900 | 1900 | 1900  | 1900  | 1900 | 1900 |
| Total Lost time (s)               | 3.0   | 3.0  | 3.0  | 3.0   | 3.0  | 3.0  | 3.0  | 3.0  | 3.0   | 3.0   | 3.0  | 3.2  |
| Lane Util. Factor                 | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 0.95 | 1.00  | 1.00  | 0.95 | 1.00 |
| Flpb. ped/bikes                   | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  | 1.00 | 1.00 |
| Frt                               | 1.00  | 0.98 | 1.00 | 0.92  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  | 0.98 | 1.00 |
| Flt Protected                     | 0.95  | 1.00 | 0.95 | 1.00  | 0.95 | 1.00 | 0.95 | 1.00 | 0.95  | 1.00  | 0.95 | 1.00 |
| Satd. Flow (prot)                 | 1770  | 1823 | 1770 | 1691  | 1770 | 1691 | 1770 | 3519 | 1770  | 3436  |      |      |
| Flt Permitted                     | 0.95  | 1.00 | 0.95 | 1.00  | 0.95 | 1.00 | 0.95 | 1.00 | 0.95  | 1.00  | 0.95 | 1.00 |
| Satd. Flow (perm)                 | 1770  | 1823 | 1770 | 1691  | 1770 | 1691 | 1770 | 3519 | 1770  | 3436  |      |      |
| Peak-hour factor, PHF             | 0.92  | 0.92 | 0.92 | 0.92  | 0.92 | 0.92 | 0.92 | 0.92 | 0.92  | 0.92  | 0.92 | 0.92 |
| Adj. Flow (vph)                   | 145   | 152  | 21   | 15    | 157  | 170  | 26   | 362  | 11    | 67    | 348  | 59   |
| RTOR Reduction (vph)              | 0     | 4    | 0    | 0     | 42   | 0    | 0    | 2    | 0     | 0     | 16   | 0    |
| Lane Group Flow (vph)             | 145   | 169  | 0    | 15    | 285  | 0    | 26   | 371  | 0     | 67    | 391  | 0    |
| Confl. Peds. (#/hr)               | 20    | 20   | 20   | 20    | 20   | 20   | 20   | 20   | 20    | 20    | 20   | 20   |
| Turn Type                         | Prot  | NA   | NA   | Prot  | NA   | NA   | Prot | NA   | Prot  | NA    | Prot | NA   |
| Permitted Phases                  | 5     | 2    |      | 1     | 6    |      | 3    | 8    |       | 7     | 4    |      |
| Actuated Green, G (s)             | 7.9   | 25.6 | 1.0  | 18.7  | 2.5  | 13.9 | 2.5  | 13.9 | 4.5   | 16.3  |      |      |
| Effective Green, g (s)            | 7.9   | 25.6 | 1.0  | 18.7  | 2.5  | 13.9 | 2.5  | 13.9 | 4.5   | 16.3  |      |      |
| Actuated g/C Ratio                | 0.14  | 0.44 | 0.02 | 0.32  | 0.04 | 0.24 | 0.04 | 0.24 | 0.08  | 0.28  |      |      |
| Clearance Time (s)                | 3.0   | 3.0  | 3.0  | 3.0   | 3.0  | 3.0  | 3.0  | 3.0  | 3.0   | 3.0   | 3.2  |      |
| Vehicle Extension (s)             | 3.0   | 3.0  | 3.0  | 3.0   | 3.0  | 3.0  | 3.0  | 3.0  | 3.0   | 3.0   | 3.0  |      |
| Lane Grp Cap (vph)                | 242   | 810  | 30   | 548   | 76   | 849  | 76   | 849  | 138   | 972   |      |      |
| v/s Ratio Prot                    | c0.08 | 0.09 | 0.01 | c0.17 | 0.01 | 0.11 | 0.01 | 0.11 | c0.04 | c0.11 |      |      |
| v/s Ratio Perm                    |       |      |      |       |      |      |      |      |       |       |      |      |
| v/c Ratio                         | 0.60  | 0.21 | 0.50 | 0.52  | 0.34 | 0.44 | 0.34 | 0.44 | 0.49  | 0.40  |      |      |
| Uniform Delay, d1                 | 23.4  | 9.8  | 28.1 | 15.8  | 26.8 | 18.5 | 25.4 | 16.7 |       |       |      |      |
| Progression Factor                | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  |      |      |
| Incremental Delay, d2             | 4.0   | 0.1  | 12.5 | 0.9   | 2.7  | 0.4  | 2.7  | 0.4  | 2.7   | 0.3   |      |      |
| Delay (s)                         | 27.3  | 9.9  | 40.6 | 16.7  | 29.4 | 18.9 | 28.1 | 17.0 |       |       |      |      |
| Level of Service                  | C     | A    | D    | B     | C    | B    | C    | B    |       |       |      |      |
| Approach Delay (s)                | 17.9  |      |      | 17.7  |      | 19.6 |      |      | 18.6  |       |      |      |
| Approach LOS                      | B     |      |      | B     |      | B    |      |      | B     |       |      |      |
| Intersection Summary              |       |      |      |       |      |      |      |      |       |       |      |      |
| HCM 2000 Control Delay            | 18.5  |      |      |       |      |      |      |      |       |       |      |      |
| HCM 2000 Volume to Capacity ratio | 0.50  |      |      |       |      |      |      |      |       |       |      |      |
| Actuated Cycle Length (s)         | 57.6  |      |      |       |      |      |      |      |       |       |      |      |
| Intersection Capacity Utilization | 59.1% |      |      |       |      |      |      |      |       |       |      |      |
| Analysis Period (min)             | 15    |      |      |       |      |      |      |      |       |       |      |      |
| c Critical Lane Group             |       |      |      |       |      |      |      |      |       |       |      |      |

Traffic Study for the Santa Rosa Memorial Hospital  
PM Existing

Synchro 8 Report

HCM Signalized Intersection Capacity Analysis  
2. Sotoyome Street & Montgomery Drive

12/14/2016

| Movement                          | EBL   | EBT  | EBR  | WBL  | WBT  | WBR  | NBL   | NBT  | NBR  | SBL  | SBT  | SBR  |
|-----------------------------------|-------|------|------|------|------|------|-------|------|------|------|------|------|
| Lane Configurations               | ↰     | ↱    | ↱    | ↰    | ↰    | ↰    | ↰     | ↰    | ↰    | ↰    | ↰    | ↰    |
| Traffic Volume (vph)              | 22    | 222  | 38   | 62   | 294  | 11   | 19    | 11   | 75   | 4    | 12   | 13   |
| Future Volume (vph)               | 22    | 222  | 38   | 62   | 294  | 11   | 19    | 11   | 75   | 4    | 12   | 13   |
| Ideal Flow (vphpl)                | 1900  | 1900 | 1900 | 1900 | 1900 | 1900 | 1900  | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s)               | 3.2   | 3.2  | 3.2  | 3.2  | 3.2  | 3.2  | 3.0   | 3.0  | 3.0  | 3.0  | 3.0  | 3.0  |
| Lane Util. 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 |
| Flpb. ped/bikes                   | 1.00  | 0.99 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  | 0.96 | 1.00 | 0.96 | 0.95 | 0.95 |
| Flpb. ped/bikes                   | 0.99  | 1.00 | 0.99 | 1.00 | 0.99 | 1.00 | 0.95  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt                               | 1.00  | 0.98 | 1.00 | 0.99 | 1.00 | 0.99 | 1.00  | 0.85 | 1.00 | 0.85 | 0.94 | 0.94 |
| Flt Protected                     | 0.95  | 1.00 | 0.95 | 1.00 | 0.95 | 1.00 | 0.97  | 1.00 | 0.97 | 1.00 | 0.99 | 0.99 |
| Satd. Flow (prot)                 | 1744  | 1812 | 1749 | 1850 | 1749 | 1850 | 1712  | 1517 | 1517 | 1650 | 1650 | 1650 |
| Flt Permitted                     | 0.54  | 1.00 | 0.58 | 1.00 | 0.58 | 1.00 | 0.89  | 1.00 | 0.89 | 1.00 | 0.98 | 0.98 |
| Satd. Flow (perm)                 | 998   | 1812 | 1077 | 1850 | 1077 | 1850 | 1564  | 1517 | 1517 | 1629 | 1629 | 1629 |
| Peak-hour factor, PHF             | 0.93  | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93  | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph)                   | 24    | 239  | 41   | 67   | 316  | 12   | 20    | 12   | 81   | 4    | 13   | 14   |
| RTOR Reduction (vph)              | 0     | 12   | 0    | 0    | 3    | 0    | 0     | 0    | 58   | 0    | 10   | 0    |
| Lane Group Flow (vph)             | 24    | 268  | 0    | 67   | 325  | 0    | 0     | 32   | 23   | 0    | 21   | 0    |
| Confl. Peds. (#/hr)               | 24    | 24   | 18   | 18   | 24   | 24   | 109   | 28   | 28   | 28   | 109  | 109  |
| Turn Type                         | Perm  | NA   | NA   | Perm | NA   | Perm | NA    | Perm | NA   | Perm | NA   | NA   |
| Protected Phases                  | 2     | 2    | 2    | 2    | 2    | 2    | 4     | 4    | 4    | 4    | 4    | 4    |
| Permitted Phases                  | 2     | 2    | 2    | 2    | 2    | 2    | 4     | 4    | 4    | 4    | 4    | 4    |
| Actuated Green, G (s)             | 23.8  | 23.8 | 23.8 | 23.8 | 23.8 | 23.8 | 11.8  | 11.8 | 11.8 | 11.8 | 11.8 | 11.8 |
| Effective Green, g (s)            | 23.8  | 23.8 | 23.8 | 23.8 | 23.8 | 23.8 | 11.8  | 11.8 | 11.8 | 11.8 | 11.8 | 11.8 |
| Actuated g/C Ratio                | 0.57  | 0.57 | 0.57 | 0.57 | 0.57 | 0.57 | 0.28  | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 |
| Clearance Time (s)                | 3.2   | 3.2  | 3.2  | 3.2  | 3.2  | 3.2  | 3.0   | 3.0  | 3.0  | 3.0  | 3.0  | 3.0  |
| Vehicle Extension (s)             | 3.0   | 3.0  | 3.0  | 3.0  | 3.0  | 3.0  | 2.0   | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  |
| Lane Grp Cap (vph)                | 568   | 1031 | 613  | 1053 | 613  | 1053 | 441   | 428  | 428  | 459  | 459  | 459  |
| v/s Ratio Prot                    | 0.02  | 0.15 | 0.06 | 0.18 | 0.06 | 0.18 | c0.02 | 0.02 | 0.02 | 0.01 | 0.01 | 0.01 |
| v/s Ratio Perm                    | 0.04  | 0.26 | 0.11 | 0.31 | 0.11 | 0.31 | 0.07  | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| v/c Ratio                         | 4.0   | 4.5  | 4.1  | 4.7  | 4.1  | 4.7  | 1.10  | 1.09 | 1.09 | 1.09 | 1.09 | 1.09 |
| Uniform Delay, d1                 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Progression 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 |
| Incremental Delay, d2             | 0.0   | 0.1  | 0.1  | 0.2  | 0.1  | 0.2  | 0.0   | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Delay (s)                         | 4.0   | 4.7  | 4.2  | 4.9  | 4.2  | 4.9  | 1.10  | 1.09 | 1.09 | 1.09 | 1.09 | 1.09 |
| Level of Service                  | A     | A    | A    | A    | A    | A    | B     | B    | B    | B    | B    | B    |
| Approach Delay (s)                | 4.6   | 4.6  | 4.6  | 4.8  | 4.6  | 4.8  | 11.0  | 11.0 | 11.0 | 10.9 | 10.9 | 10.9 |
| Approach LOS                      | A     | A    | A    | A    | A    | A    | B     | B    | B    | B    | B    | B    |
| Intersection Summary              |       |      |      |      |      |      |       |      |      |      |      |      |
| HCM 2000 Control Delay            | 5.8   |      |      |      |      |      |       |      |      |      |      |      |
| HCM 2000 Volume to Capacity ratio | 0.23  |      |      |      |      |      |       |      |      |      |      |      |
| Actuated Cycle Length (s)         | 41.8  |      |      |      |      |      |       |      |      |      |      |      |
| Intersection Capacity Utilization | 63.3% |      |      |      |      |      |       |      |      |      |      |      |
| Analysis Period (min)             | 15    |      |      |      |      |      |       |      |      |      |      |      |
| c Critical Lane Group             |       |      |      |      |      |      |       |      |      |      |      |      |

Traffic Study for the Santa Rosa Memorial Hospital  
AM Existing

Synchro 8 Report

HCM Signalized Intersection Capacity Analysis  
2. Sotoyome Street & Montgomery Drive

12/14/2016

| Movement                          | EBL   | EBT  | EBR  | WBL  | WBT  | WBR  | NBL   | NBT  | NBR  | SBL  | SBT  | SBR  |
|-----------------------------------|-------|------|------|------|------|------|-------|------|------|------|------|------|
| Lane Configurations               | ↰     | ↱    | ↱    | ↰    | ↰    | ↰    | ↰     | ↰    | ↰    | ↰    | ↰    | ↰    |
| Traffic Volume (vph)              | 31    | 281  | 18   | 42   | 322  | 13   | 45    | 13   | 54   | 15   | 9    | 31   |
| Future Volume (vph)               | 31    | 281  | 18   | 42   | 322  | 13   | 45    | 13   | 54   | 15   | 9    | 31   |
| Ideal Flow (vphpl)                | 1900  | 1900 | 1900 | 1900 | 1900 | 1900 | 1900  | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s)               | 3.2   | 3.2  | 3.2  | 3.2  | 3.2  | 3.2  | 3.0   | 3.0  | 3.0  | 3.0  | 3.0  | 3.0  |
| Lane Util. 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 |
| Flpb. ped/bikes                   | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  | 0.97 | 1.00 | 0.97 | 0.95 | 0.95 |
| Flpb. ped/bikes                   | 0.98  | 1.00 | 0.98 | 1.00 | 0.98 | 1.00 | 0.95  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt                               | 1.00  | 0.99 | 1.00 | 0.99 | 1.00 | 0.99 | 1.00  | 0.85 | 1.00 | 0.85 | 0.92 | 0.92 |
| Flt Protected                     | 0.95  | 1.00 | 0.95 | 1.00 | 0.95 | 1.00 | 0.96  | 1.00 | 0.96 | 1.00 | 0.99 | 0.99 |
| Satd. Flow (prot)                 | 1736  | 1841 | 1740 | 1848 | 1740 | 1848 | 1705  | 1529 | 1529 | 1608 | 1608 | 1608 |
| Flt Permitted                     | 0.51  | 1.00 | 0.54 | 1.00 | 0.54 | 1.00 | 0.81  | 1.00 | 0.81 | 1.00 | 0.94 | 0.94 |
| Satd. Flow (perm)                 | 934   | 1841 | 995  | 1848 | 995  | 1848 | 1436  | 1529 | 1529 | 1535 | 1535 | 1535 |
| Peak-hour factor, PHF             | 0.91  | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91  | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Adj. Flow (vph)                   | 34    | 309  | 20   | 46   | 354  | 14   | 49    | 14   | 59   | 16   | 10   | 34   |
| RTOR Reduction (vph)              | 0     | 5    | 0    | 0    | 3    | 0    | 0     | 0    | 43   | 0    | 25   | 0    |
| Lane Group Flow (vph)             | 34    | 324  | 0    | 46   | 365  | 0    | 63    | 16   | 0    | 35   | 0    | 0    |
| Confl. Peds. (#/hr)               | 34    | 34   | 28   | 28   | 34   | 34   | 85    | 18   | 18   | 18   | 85   | 85   |
| Turn Type                         | Perm  | NA   | NA   | Perm | NA   | Perm | NA    | Perm | NA   | Perm | NA   | NA   |
| Protected Phases                  | 2     | 2    | 2    | 2    | 2    | 2    | 4     | 4    | 4    | 4    | 4    | 4    |
| Permitted Phases                  | 2     | 2    | 2    | 2    | 2    | 2    | 4     | 4    | 4    | 4    | 4    | 4    |
| Actuated Green, G (s)             | 24.3  | 24.3 | 24.3 | 24.3 | 24.3 | 24.3 | 11.7  | 11.7 | 11.7 | 11.7 | 11.7 | 11.7 |
| Effective Green, g (s)            | 24.3  | 24.3 | 24.3 | 24.3 | 24.3 | 24.3 | 11.7  | 11.7 | 11.7 | 11.7 | 11.7 | 11.7 |
| Actuated g/C Ratio                | 0.58  | 0.58 | 0.58 | 0.58 | 0.58 | 0.58 | 0.28  | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 |
| Clearance Time (s)                | 3.2   | 3.2  | 3.2  | 3.2  | 3.2  | 3.2  | 3.0   | 3.0  | 3.0  | 3.0  | 3.0  | 3.0  |
| Vehicle Extension (s)             | 3.0   | 3.0  | 3.0  | 3.0  | 3.0  | 3.0  | 2.0   | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  |
| Lane Grp Cap (vph)                | 537   | 1060 | 572  | 1064 | 572  | 1064 | 398   | 423  | 423  | 425  | 425  | 425  |
| v/s Ratio Prot                    | 0.04  | 0.18 | 0.05 | 0.18 | 0.05 | 0.18 | c0.04 | 0.01 | 0.01 | 0.02 | 0.02 | 0.02 |
| v/s Ratio Perm                    | 0.06  | 0.31 | 0.08 | 0.34 | 0.08 | 0.34 | 0.16  | 0.04 | 0.04 | 0.08 | 0.08 | 0.08 |
| v/c Ratio                         | 3.9   | 4.6  | 4.0  | 4.7  | 4.0  | 4.7  | 1.15  | 1.11 | 1.11 | 1.13 | 1.13 | 1.13 |
| Uniform Delay, d1                 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Progression 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 |
| Incremental Delay, d2             | 0.0   | 0.2  | 0.1  | 0.2  | 0.1  | 0.2  | 0.1   | 0.1  | 0.1  | 0.0  | 0.0  | 0.0  |
| Delay (s)                         | 4.0   | 4.8  | 4.0  | 4.9  | 4.0  | 4.9  | 1.16  | 1.12 | 1.12 | 1.13 | 1.13 | 1.13 |
| Level of Service                  | A     | A    | A    | A    | A    | A    | B     | B    | B    | B    | B    | B    |
| Approach Delay (s)                | 4.7   | 4.7  | 4.7  | 4.8  | 4.7  | 4.8  | 11.4  | 11.4 | 11.4 | 11.3 | 11.3 | 11.3 |
| Approach LOS                      | A     | A    | A    | A    | A    | A    | B     | B    | B    | B    | B    | B    |
| Intersection Summary              |       |      |      |      |      |      |       |      |      |      |      |      |
| HCM 2000 Control Delay            | 6.0   |      |      |      |      |      |       |      |      |      |      |      |
| HCM 2000 Volume to Capacity ratio | 0.28  |      |      |      |      |      |       |      |      |      |      |      |
| Actuated Cycle Length (s)         | 42.2  |      |      |      |      |      |       |      |      |      |      |      |
| Intersection Capacity Utilization | 61.6% |      |      |      |      |      |       |      |      |      |      |      |
| Analysis Period (min)             | 15    |      |      |      |      |      |       |      |      |      |      |      |
| c Critical Lane Group             |       |      |      |      |      |      |       |      |      |      |      |      |

Traffic Study for the Santa Rosa Memorial Hospital  
PM Existing

Synchro 8 Report

HCM Signalized Intersection Capacity Analysis  
3: Doyle Park Drive & Montgomery Drive

12/14/2016

| Movement                          | EBL   | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|-----------------------------------|-------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations               | 17    | 122  | 60   | 60   | 364  | 9    | 26   | 12   | 25   | 5    | 38   | 37   |
| Traffic Volume (vph)              | 17    | 122  | 60   | 60   | 364  | 9    | 26   | 12   | 25   | 5    | 38   | 37   |
| Future Volume (vph)               | 1900  | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Ideal Flow (vphpl)                | 3.3   | 3.3  | 3.3  | 3.3  | 3.3  | 3.3  | 3.1  | 3.1  | 3.1  | 3.1  | 3.1  | 3.1  |
| Total Lost time (s)               |       |      |      |      |      |      |      |      |      |      |      |      |
| Lane Util. 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 |
| Flpb. ped/bikes                   | 1.00  | 0.99 | 1.00 | 1.00 | 1.00 | 1.00 | 0.99 | 0.99 | 1.00 | 1.00 | 0.98 | 0.98 |
| Flpb. ped/bikes                   | 0.99  | 1.00 | 0.99 | 1.00 | 0.99 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 1.00 | 0.94 |
| Frt                               | 1.00  | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 0.98 | 0.98 | 1.00 | 1.00 | 0.97 | 0.97 |
| Flt Protected                     | 0.95  | 1.00 | 0.95 | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Satd. Flow (prot)                 | 1745  | 1754 | 1756 | 1854 | 1700 | 1714 |      |      |      |      |      |      |
| Flt Permitted                     | 0.62  | 1.00 | 0.63 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.97 | 0.97 |
| Satd. Flow (perm)                 | 1130  | 1754 | 1171 | 1854 | 1735 | 1672 |      |      |      |      |      |      |
| Peak-hour factor, PHF             | 0.92  | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph)                   | 18    | 133  | 65   | 65   | 396  | 10   | 28   | 13   | 27   | 5    | 41   | 40   |
| RTOR Reduction (vph)              | 0     | 37   | 0    | 0    | 2    | 0    | 0    | 23   | 0    | 0    | 34   | 0    |
| Lane Group Flow (vph)             | 18    | 161  | 0    | 65   | 404  | 0    | 0    | 45   | 0    | 0    | 52   | 0    |
| Confl. Peds. (#/hr)               | 35    | 16   | 16   | 35   | 25   | 17   | 17   | 17   | 17   | 17   | 25   | 25   |
| Turn Type                         | Perm  | NA   | NA   | Perm | NA   | Perm | NA   | Perm | NA   | Perm | NA   | NA   |
| Protected Phases                  | 2     | 2    | 2    | 6    | 6    | 8    | 8    | 8    | 8    | 4    | 4    | 4    |
| Permitted Phases                  | 2     | 6.5  | 6.5  | 6.5  | 6.5  | 2.4  | 2.4  | 2.4  | 2.4  | 2.4  | 2.4  | 2.4  |
| Actuated Green, G (s)             | 6.5   | 6.5  | 6.5  | 6.5  | 6.5  | 2.4  | 2.4  | 2.4  | 2.4  | 2.4  | 2.4  | 2.4  |
| Effective Green, g (s)            | 6.5   | 6.5  | 6.5  | 6.5  | 6.5  | 2.4  | 2.4  | 2.4  | 2.4  | 2.4  | 2.4  | 2.4  |
| Actuated g/C Ratio                | 0.42  | 0.42 | 0.42 | 0.42 | 0.42 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 |
| Clearance Time (s)                | 3.3   | 3.3  | 3.3  | 3.3  | 3.3  | 3.1  | 3.1  | 3.1  | 3.1  | 3.1  | 3.1  | 3.1  |
| Vehicle Extension (s)             | 2.0   | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  |
| Lane Grp Cap (vph)                | 480   | 745  | 497  | 787  | 272  | 262  |      |      |      |      |      |      |
| v/s Ratio Prot                    | 0.09  | 0.09 | 0.06 | 0.06 | 0.03 | 0.03 |      |      |      |      |      |      |
| v/s Ratio Perm                    | 0.04  | 0.22 | 0.13 | 0.51 | 0.17 | 0.20 |      |      |      |      |      |      |
| v/c Ratio                         | 2.6   | 2.8  | 2.7  | 3.2  | 5.6  | 5.6  |      |      |      |      |      |      |
| Uniform Delay, d1                 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |      |      |      |      |      |      |
| Progression Factor                | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |      |      |      |      |      |      |
| Incremental Delay, d2             | 0.0   | 0.1  | 0.0  | 0.2  | 0.1  | 0.1  |      |      |      |      |      |      |
| Delay (s)                         | 2.6   | 2.8  | 2.7  | 3.5  | 5.7  | 5.8  |      |      |      |      |      |      |
| Level of Service                  | A     | A    | A    | A    | A    | A    |      |      |      |      |      |      |
| Approach Delay (s)                | 2.8   | 3.4  | 3.4  | 5.7  | 5.8  | 5.8  |      |      |      |      |      |      |
| Approach LOS                      | A     | A    | A    | A    | A    | A    |      |      |      |      |      |      |
| Intersection Summary              |       |      |      |      |      |      |      |      |      |      |      |      |
| HCM 2000 Control Delay            | 3.7   |      |      |      |      |      |      |      |      |      |      |      |
| HCM 2000 Volume to Capacity ratio | 0.43  |      |      |      |      |      |      |      |      |      |      |      |
| Actuated Cycle Length (s)         | 15.3  |      |      |      |      |      |      |      |      |      |      |      |
| Intersection Capacity Utilization | 44.7% |      |      |      |      |      |      |      |      |      |      |      |
| Analysis Period (min)             | 15    |      |      |      |      |      |      |      |      |      |      |      |
| c Critical Lane Group             |       |      |      |      |      |      |      |      |      |      |      |      |

Traffic Study for the Santa Rosa Memorial Hospital  
AM Existing

Synchro 8 Report

HCM Signalized Intersection Capacity Analysis  
3: Doyle Park Drive & Montgomery Drive

12/14/2016

| Movement                          | EBL   | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|-----------------------------------|-------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations               | 23    | 301  | 28   | 23   | 238  | 4    | 67   | 16   | 36   | 4    | 17   | 24   |
| Traffic Volume (vph)              | 23    | 301  | 28   | 23   | 238  | 4    | 67   | 16   | 36   | 4    | 17   | 24   |
| Future Volume (vph)               | 1900  | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Ideal Flow (vphpl)                | 3.3   | 3.3  | 3.3  | 3.3  | 3.3  | 3.3  | 3.1  | 3.1  | 3.1  | 3.1  | 3.1  | 3.1  |
| Total Lost time (s)               |       |      |      |      |      |      |      |      |      |      |      |      |
| Lane Util. 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 |
| Flpb. ped/bikes                   | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.99 | 0.99 | 1.00 | 1.00 | 0.97 | 0.97 |
| Flpb. ped/bikes                   | 0.98  | 1.00 | 0.99 | 1.00 | 0.99 | 1.00 | 0.98 | 0.98 | 1.00 | 1.00 | 0.93 | 0.93 |
| Frt                               | 1.00  | 0.99 | 1.00 | 1.00 | 0.95 | 1.00 | 0.97 | 0.97 | 1.00 | 1.00 | 0.97 | 0.97 |
| Flt Protected                     | 0.95  | 1.00 | 0.95 | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Satd. Flow (prot)                 | 1729  | 1834 | 1751 | 1857 | 1687 | 1668 |      |      |      |      |      |      |
| Flt Permitted                     | 0.78  | 1.00 | 0.78 | 1.00 | 0.80 | 0.80 | 0.96 | 0.96 | 1.00 | 1.00 | 0.96 | 0.96 |
| Satd. Flow (perm)                 | 1427  | 1834 | 1446 | 1857 | 1384 | 1612 |      |      |      |      |      |      |
| Peak-hour factor, PHF             | 0.92  | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph)                   | 25    | 327  | 30   | 25   | 259  | 4    | 73   | 17   | 39   | 4    | 18   | 26   |
| RTOR Reduction (vph)              | 0     | 9    | 0    | 0    | 1    | 0    | 0    | 29   | 0    | 0    | 19   | 0    |
| Lane Group Flow (vph)             | 25    | 348  | 0    | 25   | 262  | 0    | 100  | 0    | 100  | 0    | 29   | 0    |
| Confl. Peds. (#/hr)               | 47    | 26   | 26   | 47   | 64   | 38   | 38   | 64   | 38   | 38   | 64   | 64   |
| Turn Type                         | Perm  | NA   | NA   | Perm | NA   | Perm | NA   | Perm | NA   | Perm | NA   | NA   |
| Protected Phases                  | 2     | 2    | 2    | 6    | 6    | 8    | 8    | 8    | 8    | 4    | 4    | 4    |
| Permitted Phases                  | 2     | 5.1  | 5.1  | 5.1  | 5.1  | 4.1  | 4.1  | 4.1  | 4.1  | 4.1  | 4.1  | 4.1  |
| Actuated Green, G (s)             | 5.1   | 5.1  | 5.1  | 5.1  | 5.1  | 4.1  | 4.1  | 4.1  | 4.1  | 4.1  | 4.1  | 4.1  |
| Effective Green, g (s)            | 5.1   | 5.1  | 5.1  | 5.1  | 5.1  | 4.1  | 4.1  | 4.1  | 4.1  | 4.1  | 4.1  | 4.1  |
| Actuated g/C Ratio                | 0.33  | 0.33 | 0.33 | 0.33 | 0.33 | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 |
| Clearance Time (s)                | 3.3   | 3.3  | 3.3  | 3.3  | 3.3  | 3.1  | 3.1  | 3.1  | 3.1  | 3.1  | 3.1  | 3.1  |
| Vehicle Extension (s)             | 2.0   | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  |
| Lane Grp Cap (vph)                | 466   | 599  | 472  | 607  | 363  | 423  |      |      |      |      |      |      |
| v/s Ratio Prot                    | 0.02  | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |      |      |      |      |      |      |
| v/s Ratio Perm                    | 0.05  | 0.58 | 0.05 | 0.43 | 0.28 | 0.07 |      |      |      |      |      |      |
| v/c Ratio                         | 3.6   | 4.4  | 3.6  | 4.1  | 4.6  | 4.3  |      |      |      |      |      |      |
| Uniform Delay, d1                 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |      |      |      |      |      |      |
| Progression Factor                | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |      |      |      |      |      |      |
| Incremental Delay, d2             | 0.0   | 0.9  | 0.0  | 0.2  | 0.2  | 0.0  |      |      |      |      |      |      |
| Delay (s)                         | 3.6   | 5.3  | 3.6  | 4.3  | 4.7  | 4.3  |      |      |      |      |      |      |
| Level of Service                  | A     | A    | A    | A    | A    | A    |      |      |      |      |      |      |
| Approach Delay (s)                | 5.2   | 4.2  | 4.2  | 4.7  | 4.3  | 4.3  |      |      |      |      |      |      |
| Approach LOS                      | A     | A    | A    | A    | A    | A    |      |      |      |      |      |      |
| Intersection Summary              |       |      |      |      |      |      |      |      |      |      |      |      |
| HCM 2000 Control Delay            | 4.7   |      |      |      |      |      |      |      |      |      |      |      |
| HCM 2000 Volume to Capacity ratio | 0.44  |      |      |      |      |      |      |      |      |      |      |      |
| Actuated Cycle Length (s)         | 15.6  |      |      |      |      |      |      |      |      |      |      |      |
| Intersection Capacity Utilization | 40.2% |      |      |      |      |      |      |      |      |      |      |      |
| Analysis Period (min)             | 15    |      |      |      |      |      |      |      |      |      |      |      |
| c Critical Lane Group             |       |      |      |      |      |      |      |      |      |      |      |      |

Traffic Study for the Santa Rosa Memorial Hospital  
PM Existing

Synchro 8 Report

HCM Signalized Intersection Capacity Analysis  
4: Brookwood Avenue & Sonoma Avenue

12/14/2016

| Movement                          | EBL   | EBT  | EBR   | WBL   | WBT  | WBR   | NBL  | NBT   | NBR   | SBL  | SBT   | SBR  |
|-----------------------------------|-------|------|-------|-------|------|-------|------|-------|-------|------|-------|------|
| Lane Configurations               | EB    | EB   | EB    | EB    | EB   | EB    | EB   | EB    | EB    | EB   | EB    | EB   |
| Traffic Volume (vph)              | 65    | 350  | 28    | 135   | 288  | 168   | 16   | 309   | 330   | 146  | 197   | 55   |
| Future Volume (vph)               | 65    | 350  | 28    | 135   | 288  | 168   | 16   | 309   | 330   | 146  | 197   | 55   |
| Ideal Flow (vphpl)                | 1900  | 1900 | 1900  | 1900  | 1900 | 1900  | 1900 | 1900  | 1900  | 1900 | 1900  | 1900 |
| Total Lost time (s)               | 3.0   | 3.6  | 3.0   | 3.6   | 3.0  | 3.6   | 3.0  | 3.2   | 3.0   | 3.6  | 3.0   | 3.0  |
| Lane Util. Factor                 | 1.00  | 0.95 | 1.00  | 0.95  | 1.00 | 0.95  | 1.00 | 0.98  | 1.00  | 0.95 | 1.00  | 0.98 |
| Frpb, ped/bikes                   | 1.00  | 1.00 | 1.00  | 1.00  | 1.00 | 1.00  | 1.00 | 1.00  | 1.00  | 1.00 | 1.00  | 1.00 |
| Flpb, ped/bikes                   | 1.00  | 1.00 | 1.00  | 1.00  | 1.00 | 1.00  | 1.00 | 1.00  | 1.00  | 1.00 | 1.00  | 1.00 |
| Fr                                | 1.00  | 0.99 | 1.00  | 0.94  | 1.00 | 0.94  | 1.00 | 0.92  | 1.00  | 0.95 | 1.00  | 0.95 |
| Flt Protected                     | 0.95  | 1.00 | 0.95  | 1.00  | 0.95 | 1.00  | 0.95 | 1.00  | 0.95  | 1.00 | 0.95  | 1.00 |
| Satd. Flow (prot)                 | 1766  | 3484 | 1764  | 3311  | 1764 | 3311  | 1770 | 1679  | 1770  | 1863 | 1544  | 1544 |
| Flt Permitted                     | 0.33  | 1.00 | 0.24  | 1.00  | 0.24 | 1.00  | 0.95 | 1.00  | 0.95  | 1.00 | 1.00  | 1.00 |
| Satd. Flow (perm)                 | 614   | 3484 | 446   | 3311  | 446  | 3311  | 1770 | 1679  | 1770  | 1863 | 1544  | 1544 |
| Peak-hour factor, PHF             | 0.90  | 0.90 | 0.90  | 0.90  | 0.90 | 0.90  | 0.90 | 0.90  | 0.90  | 0.90 | 0.90  | 0.90 |
| Adj. Flow (vph)                   | 72    | 389  | 31    | 150   | 320  | 187   | 18   | 343   | 367   | 162  | 219   | 61   |
| RTOR Reduction (vph)              | 0     | 5    | 0     | 0     | 70   | 0     | 0    | 27    | 0     | 0    | 0     | 24   |
| Lane Group Flow (vph)             | 72    | 415  | 0     | 150   | 437  | 0     | 18   | 683   | 0     | 162  | 219   | 37   |
| Confl. Peds. (#/hr)               | 15    | 15   | 15    | 15    | 15   | 15    | 15   | 15    | 15    | 15   | 15    | 15   |
| Turn Type                         | pm+pt | NA   | NA    | pm+pt | NA   | NA    | Prot | NA    | Prot  | NA   | pm+ov | NA   |
| Protected Phases                  | 5     | 2    | 2     | 1     | 6    | 6     | 3    | 8     | 7     | 4    | 4     | 5    |
| Permitted Phases                  | 2     | 6    | 6     | 6     | 6    | 6     | 6    | 6     | 6     | 6    | 6     | 6    |
| Actuated Green, G (s)             | 22.9  | 16.7 | 30.3  | 21.1  | 22.9 | 21.1  | 2.9  | 42.1  | 12.7  | 51.5 | 57.7  | 57.7 |
| Effective Green, g (s)            | 22.9  | 16.7 | 30.3  | 21.1  | 22.9 | 21.1  | 2.9  | 42.1  | 12.7  | 51.5 | 57.7  | 57.7 |
| Actuated g/C Ratio                | 0.24  | 0.18 | 0.32  | 0.22  | 0.32 | 0.22  | 0.03 | 0.44  | 0.13  | 0.54 | 0.61  | 0.61 |
| Clearance Time (s)                | 3.0   | 3.6  | 3.0   | 3.6   | 3.0  | 3.6   | 3.0  | 3.2   | 3.0   | 3.6  | 3.0   | 3.0  |
| Vehicle Extension (s)             | 2.0   | 2.0  | 2.0   | 2.0   | 2.0  | 2.0   | 2.0  | 2.0   | 2.0   | 2.0  | 2.0   | 2.0  |
| Lane Grp Cap (vph)                | 223   | 613  | 289   | 736   | 54   | 744   | 54   | 744   | 236   | 1011 | 938   | 938  |
| v/s Ratio Prot                    | 0.02  | 0.12 | c0.06 | c0.13 | 0.01 | c0.41 | 0.01 | c0.41 | c0.09 | 0.12 | 0.00  | 0.00 |
| v/s Ratio Perm                    | 0.06  | 0.32 | 0.52  | 0.59  | 0.33 | 0.92  | 0.33 | 0.92  | 0.69  | 0.22 | 0.04  | 0.04 |
| Uniform Delay, d1                 | 28.6  | 36.6 | 24.7  | 33.1  | 45.1 | 24.8  | 45.1 | 24.8  | 39.2  | 11.2 | 7.5   | 7.5  |
| Progression 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 |
| Incremental Delay, d2             | 0.3   | 2.3  | 0.7   | 0.9   | 1.3  | 16.1  | 1.3  | 16.1  | 6.5   | 0.1  | 0.0   | 0.0  |
| Delay (s)                         | 28.9  | 38.9 | 25.4  | 33.9  | 46.4 | 40.9  | 46.4 | 40.9  | 45.7  | 11.4 | 7.5   | 7.5  |
| Level of Service                  | C     | D    | C     | C     | D    | D     | D    | D     | D     | B    | B     | A    |
| Approach Delay (s)                | 37.5  | 37.5 | 32.0  | 32.0  | 32.0 | 32.0  | 41.0 | 41.0  | 23.4  | 23.4 | C     | C    |
| Approach LOS                      | D     | D    | C     | C     | C    | C     | D    | D     | D     | D    | C     | C    |
| Intersection Summary              |       |      |       |       |      |       |      |       |       |      |       |      |
| HCM 2000 Control Delay            | 34.3  |      |       |       |      |       |      |       |       |      |       |      |
| HCM 2000 Volume to Capacity ratio | 0.79  |      |       |       |      |       |      |       |       |      |       |      |
| Actuated Cycle Length (s)         | 94.9  |      |       |       |      |       |      |       |       |      |       |      |
| Intersection Capacity Utilization | 82.4% |      |       |       |      |       |      |       |       |      |       |      |
| Analysis Period (min)             | 15    |      |       |       |      |       |      |       |       |      |       |      |
| c Critical Lane Group             |       |      |       |       |      |       |      |       |       |      |       |      |

HCM Signalized Intersection Capacity Analysis  
4: Brookwood Avenue & Sonoma Avenue

12/14/2016

| Movement                          | EBL   | EBT  | EBR   | WBL   | WBT  | WBR   | NBL  | NBT   | NBR   | SBL  | SBT   | SBR  |
|-----------------------------------|-------|------|-------|-------|------|-------|------|-------|-------|------|-------|------|
| Lane Configurations               | EB    | EB   | EB    | EB    | EB   | EB    | EB   | EB    | EB    | EB   | EB    | EB   |
| Traffic Volume (vph)              | 93    | 383  | 50    | 257   | 372  | 154   | 16   | 254   | 162   | 122  | 361   | 102  |
| Future Volume (vph)               | 93    | 383  | 50    | 257   | 372  | 154   | 16   | 254   | 162   | 122  | 361   | 102  |
| Ideal Flow (vphpl)                | 1900  | 1900 | 1900  | 1900  | 1900 | 1900  | 1900 | 1900  | 1900  | 1900 | 1900  | 1900 |
| Total Lost time (s)               | 3.0   | 3.6  | 3.0   | 3.6   | 3.0  | 3.6   | 3.0  | 3.2   | 3.0   | 3.6  | 3.0   | 3.0  |
| Lane Util. Factor                 | 1.00  | 0.95 | 1.00  | 0.95  | 1.00 | 0.95  | 1.00 | 0.98  | 1.00  | 0.95 | 1.00  | 0.98 |
| Frpb, ped/bikes                   | 1.00  | 1.00 | 1.00  | 1.00  | 1.00 | 1.00  | 1.00 | 1.00  | 1.00  | 1.00 | 1.00  | 1.00 |
| Flpb, ped/bikes                   | 1.00  | 1.00 | 1.00  | 1.00  | 1.00 | 1.00  | 1.00 | 1.00  | 1.00  | 1.00 | 1.00  | 1.00 |
| Fr                                | 1.00  | 0.98 | 1.00  | 0.96  | 1.00 | 0.96  | 1.00 | 0.94  | 1.00  | 0.95 | 1.00  | 0.95 |
| Flt Protected                     | 0.95  | 1.00 | 0.95  | 1.00  | 0.95 | 1.00  | 0.95 | 1.00  | 0.95  | 1.00 | 0.95  | 1.00 |
| Satd. Flow (prot)                 | 1767  | 3455 | 1765  | 3359  | 1765 | 3359  | 1770 | 1725  | 1770  | 1863 | 1550  | 1550 |
| Flt Permitted                     | 0.32  | 1.00 | 0.23  | 1.00  | 0.23 | 1.00  | 0.95 | 1.00  | 0.95  | 1.00 | 1.00  | 1.00 |
| Satd. Flow (perm)                 | 587   | 3455 | 423   | 3359  | 423  | 3359  | 1770 | 1725  | 1770  | 1863 | 1550  | 1550 |
| Peak-hour factor, PHF             | 0.89  | 0.89 | 0.89  | 0.89  | 0.89 | 0.89  | 0.89 | 0.89  | 0.89  | 0.89 | 0.89  | 0.89 |
| Adj. Flow (vph)                   | 104   | 430  | 56    | 289   | 418  | 173   | 18   | 285   | 182   | 137  | 406   | 115  |
| RTOR Reduction (vph)              | 0     | 9    | 0     | 0     | 35   | 0     | 0    | 19    | 0     | 0    | 0     | 51   |
| Lane Group Flow (vph)             | 104   | 477  | 0     | 289   | 556  | 0     | 18   | 448   | 0     | 137  | 406   | 64   |
| Confl. Peds. (#/hr)               | 15    | 15   | 15    | 15    | 15   | 15    | 15   | 15    | 15    | 15   | 15    | 15   |
| Turn Type                         | pm+pt | NA   | NA    | pm+pt | NA   | NA    | Prot | NA    | Prot  | NA   | pm+ov | NA   |
| Protected Phases                  | 5     | 2    | 2     | 1     | 6    | 6     | 3    | 8     | 7     | 4    | 4     | 5    |
| Permitted Phases                  | 2     | 6    | 6     | 6     | 6    | 6     | 6    | 6     | 6     | 6    | 6     | 6    |
| Actuated Green, G (s)             | 26.5  | 17.6 | 34.5  | 22.6  | 22.6 | 22.6  | 2.6  | 29.9  | 11.8  | 38.7 | 47.6  | 47.6 |
| Effective Green, g (s)            | 26.5  | 17.6 | 34.5  | 22.6  | 22.6 | 22.6  | 2.6  | 29.9  | 11.8  | 38.7 | 47.6  | 47.6 |
| Actuated g/C Ratio                | 0.31  | 0.20 | 0.40  | 0.26  | 0.26 | 0.26  | 0.03 | 0.35  | 0.14  | 0.45 | 0.55  | 0.55 |
| Clearance Time (s)                | 3.0   | 3.6  | 3.0   | 3.6   | 3.0  | 3.6   | 3.0  | 3.2   | 3.0   | 3.6  | 3.0   | 3.0  |
| Vehicle Extension (s)             | 2.0   | 2.0  | 2.0   | 2.0   | 2.0  | 2.0   | 2.0  | 2.0   | 2.0   | 2.0  | 2.0   | 2.0  |
| Lane Grp Cap (vph)                | 302   | 707  | 386   | 882   | 386  | 882   | 53   | 599   | 242   | 838  | 857   | 857  |
| v/s Ratio Prot                    | 0.04  | 0.14 | c0.12 | 0.17  | 0.01 | c0.26 | 0.01 | c0.26 | c0.08 | 0.22 | 0.01  | 0.01 |
| v/s Ratio Perm                    | 0.07  | 0.34 | 0.68  | 0.75  | 0.63 | 0.75  | 0.34 | 0.75  | 0.57  | 0.48 | 0.07  | 0.07 |
| Uniform Delay, d1                 | 22.0  | 31.6 | 19.4  | 28.0  | 40.9 | 24.7  | 40.9 | 24.7  | 34.7  | 16.6 | 8.9   | 8.9  |
| Progression 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 |
| Incremental Delay, d2             | 0.3   | 2.0  | 6.8   | 1.0   | 1.4  | 5.1   | 1.4  | 5.1   | 1.8   | 0.4  | 0.0   | 0.0  |
| Delay (s)                         | 22.3  | 33.6 | 26.2  | 29.0  | 42.2 | 29.8  | 42.2 | 29.8  | 36.5  | 17.1 | 9.0   | 9.0  |
| Level of Service                  | C     | C    | C     | C     | C    | C     | D    | C     | D     | B    | B     | A    |
| Approach Delay (s)                | 31.6  | 31.6 | 28.1  | 28.1  | 28.1 | 30.3  | 30.3 | 30.3  | 19.7  | 19.7 | B     | B    |
| Approach LOS                      | C     | C    | C     | C     | C    | C     | C    | C     | C     | C    | B     | B    |
| Intersection Summary              |       |      |       |       |      |       |      |       |       |      |       |      |
| HCM 2000 Control Delay            | 27.2  |      |       |       |      |       |      |       |       |      |       |      |
| HCM 2000 Volume to Capacity ratio | 0.75  |      |       |       |      |       |      |       |       |      |       |      |
| Actuated Cycle Length (s)         | 86.0  |      |       |       |      |       |      |       |       |      |       |      |
| Intersection Capacity Utilization | 71.4% |      |       |       |      |       |      |       |       |      |       |      |
| Analysis Period (min)             | 15    |      |       |       |      |       |      |       |       |      |       |      |
| c Critical Lane Group             |       |      |       |       |      |       |      |       |       |      |       |      |

# HCM Unsignalized Intersection Capacity Analysis 5: Sonoma Avenue & Sotoyome Street

12/14/2016



| Movement                          | EBL  | EBT  | WBT   | SBR                  |
|-----------------------------------|------|------|-------|----------------------|
| Lane Configurations               | EBL  | EBT  | WBT   | SBR                  |
| Traffic Volume (veh/h)            | 111  | 656  | 546   | 21                   |
| Future Volume (Veh/h)             | 111  | 656  | 546   | 21                   |
| Sign Control                      | Free | Free | Free  | Stop                 |
| Grade                             | 0%   | 0%   | 0%    | 0%                   |
| Peak Hour Factor                  | 0.93 | 0.93 | 0.93  | 0.93                 |
| Hourly flow rate (vph)            | 119  | 705  | 587   | 23                   |
| Pedestrians                       |      |      |       |                      |
| Lane Width (ft)                   |      |      |       |                      |
| Walking Speed (ft/s)              |      |      |       |                      |
| Percent Blockage                  |      |      |       |                      |
| Right turn flare (veh)            |      |      |       |                      |
| Median type                       |      |      |       |                      |
| Median storage (veh)              |      |      |       |                      |
| Upstream signal (ft)              |      |      |       |                      |
| pX platoon unblocked              |      |      |       |                      |
| VC, conflicting volume            |      |      |       |                      |
| VC1, stage 1 conf vol             |      |      |       |                      |
| VC2, stage 2 conf vol             |      |      |       |                      |
| VCu, unblocked vol                |      |      |       |                      |
| IC, single (s)                    |      |      |       |                      |
| IC, 2 stage (s)                   |      |      |       |                      |
| p0 queue free %                   |      |      |       |                      |
| IF (s)                            |      |      |       |                      |
| CM capacity (veh/h)               |      |      |       |                      |
| Direction, Lane #                 | EB 1 | EB 2 | WB 1  | SB 1                 |
| Volume Total                      | 119  | 705  | 610   | 66                   |
| Volume Left                       | 119  | 0    | 0     | 0                    |
| Volume Right                      | 0    | 0    | 23    | 66                   |
| cSH                               | 969  | 1700 | 1700  | 502                  |
| Volume to Capacity                | 0.12 | 0.41 | 0.36  | 0.13                 |
| Queue Length 95th (ft)            | 10   | 0    | 0     | 11                   |
| Control Delay (s)                 | 9.2  | 0.0  | 0.0   | 13.3                 |
| Lane LOS                          | A    | A    | B     | B                    |
| Approach Delay (s)                | 1.3  | 0.0  | 13.3  |                      |
| Approach LOS                      |      |      | B     |                      |
| Intersection Summary              |      |      |       |                      |
| Average Delay                     |      |      | 1.3   |                      |
| Intersection Capacity Utilization |      |      | 42.5% |                      |
| Analysis Period (min)             |      |      | 15    |                      |
|                                   |      |      |       | ICU Level of Service |
|                                   |      |      |       | A                    |

Traffic Study for the Santa Rosa Memorial Hospital  
AM Existing

Synchro 8 Report

# HCM Unsignalized Intersection Capacity Analysis 5: Sonoma Avenue & Sotoyome Street

12/14/2016



| Movement                          | EBL  | EBT  | WBT   | SBR                  |
|-----------------------------------|------|------|-------|----------------------|
| Lane Configurations               | EBL  | EBT  | WBT   | SBR                  |
| Traffic Volume (veh/h)            | 45   | 627  | 608   | 18                   |
| Future Volume (Veh/h)             | 45   | 627  | 608   | 18                   |
| Sign Control                      | Free | Free | Free  | Stop                 |
| Grade                             | 0%   | 0%   | 0%    | 0%                   |
| Peak Hour Factor                  | 0.89 | 0.89 | 0.89  | 0.89                 |
| Hourly flow rate (vph)            | 51   | 704  | 683   | 20                   |
| Pedestrians                       |      |      |       |                      |
| Lane Width (ft)                   |      |      |       |                      |
| Walking Speed (ft/s)              |      |      |       |                      |
| Percent Blockage                  |      |      |       |                      |
| Right turn flare (veh)            |      |      |       |                      |
| Median type                       |      |      |       |                      |
| Median storage (veh)              |      |      |       |                      |
| Upstream signal (ft)              |      |      |       |                      |
| pX platoon unblocked              |      |      |       |                      |
| VC, conflicting volume            |      |      |       |                      |
| VC1, stage 1 conf vol             |      |      |       |                      |
| VC2, stage 2 conf vol             |      |      |       |                      |
| VCu, unblocked vol                |      |      |       |                      |
| IC, single (s)                    |      |      |       |                      |
| IC, 2 stage (s)                   |      |      |       |                      |
| p0 queue free %                   |      |      |       |                      |
| IF (s)                            |      |      |       |                      |
| CM capacity (veh/h)               |      |      |       |                      |
| Direction, Lane #                 | EB 1 | EB 2 | WB 1  | SB 1                 |
| Volume Total                      | 51   | 704  | 703   | 109                  |
| Volume Left                       | 51   | 0    | 0     | 0                    |
| Volume Right                      | 0    | 0    | 20    | 109                  |
| cSH                               | 895  | 1700 | 1700  | 443                  |
| Volume to Capacity                | 0.06 | 0.41 | 0.41  | 0.25                 |
| Queue Length 95th (ft)            | 5    | 0    | 0     | 24                   |
| Control Delay (s)                 | 9.3  | 0.0  | 0.0   | 15.7                 |
| Lane LOS                          | A    | A    | C     | C                    |
| Approach Delay (s)                | 0.6  | 0.0  | 15.7  |                      |
| Approach LOS                      |      |      | C     |                      |
| Intersection Summary              |      |      |       |                      |
| Average Delay                     |      |      | 1.4   |                      |
| Intersection Capacity Utilization |      |      | 45.8% |                      |
| Analysis Period (min)             |      |      | 15    |                      |
|                                   |      |      |       | ICU Level of Service |
|                                   |      |      |       | A                    |

Traffic Study for the Santa Rosa Memorial Hospital  
PM Existing

Synchro 8 Report

# HCM Unsignalized Intersection Capacity Analysis 6: Doyle Park Drive & Sonoma Avenue

12/14/2016

| Movement                          | EBL                                                                                 | EBT                                                                                 | EBR  | WBL                                                                                 | WBT                                                                                 | WBR  | NBL                  | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR  |
|-----------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------|----------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------|
| Lane Configurations               |  |  |      |  |  |      |                      |  |  |  |  |      |
| Traffic Volume (veh/h)            | 91                                                                                  | 404                                                                                 | 64   | 36                                                                                  | 497                                                                                 | 21   | 47                   | 2                                                                                   | 35                                                                                  | 11                                                                                  | 1                                                                                   | 48   |
| Future Volume (Veh/h)             | 91                                                                                  | 404                                                                                 | 64   | 36                                                                                  | 497                                                                                 | 21   | 47                   | 2                                                                                   | 35                                                                                  | 11                                                                                  | 1                                                                                   | 48   |
| Sign Control                      | Free                                                                                | Free                                                                                |      | Free                                                                                | Free                                                                                |      | Stop                 | Stop                                                                                | Stop                                                                                | Stop                                                                                | Stop                                                                                |      |
| Grade                             | 0%                                                                                  |                                                                                     |      |                                                                                     | 0%                                                                                  |      |                      | 0%                                                                                  |                                                                                     |                                                                                     | 0%                                                                                  |      |
| Peak Hour Factor                  | 0.91                                                                                | 0.91                                                                                | 0.91 | 0.91                                                                                | 0.91                                                                                | 0.91 | 0.91                 | 0.91                                                                                | 0.91                                                                                | 0.91                                                                                | 0.91                                                                                | 0.91 |
| Hourly flow rate (vph)            | 100                                                                                 | 444                                                                                 | 70   | 40                                                                                  | 546                                                                                 | 23   | 52                   | 2                                                                                   | 38                                                                                  | 12                                                                                  | 1                                                                                   | 53   |
| Pedestrians                       |                                                                                     |                                                                                     |      |                                                                                     |                                                                                     |      |                      |                                                                                     |                                                                                     |                                                                                     |                                                                                     |      |
| Lane Width (ft)                   |                                                                                     |                                                                                     |      |                                                                                     |                                                                                     |      |                      |                                                                                     |                                                                                     |                                                                                     |                                                                                     |      |
| Walking Speed (ft/s)              |                                                                                     |                                                                                     |      |                                                                                     |                                                                                     |      |                      |                                                                                     |                                                                                     |                                                                                     |                                                                                     |      |
| Percent Blockage                  |                                                                                     |                                                                                     |      |                                                                                     |                                                                                     |      |                      |                                                                                     |                                                                                     |                                                                                     |                                                                                     |      |
| Right turn flare (veh)            |                                                                                     |                                                                                     |      |                                                                                     |                                                                                     |      |                      |                                                                                     | 1                                                                                   |                                                                                     |                                                                                     |      |
| Median type                       |                                                                                     | TWLT                                                                                |      |                                                                                     | TWLT                                                                                |      |                      |                                                                                     |                                                                                     |                                                                                     |                                                                                     |      |
| Median storage (veh)              | 2                                                                                   |                                                                                     |      |                                                                                     | 2                                                                                   |      |                      |                                                                                     |                                                                                     |                                                                                     |                                                                                     |      |
| Upstream signal (ft)              |                                                                                     |                                                                                     |      |                                                                                     |                                                                                     |      |                      |                                                                                     |                                                                                     |                                                                                     |                                                                                     |      |
| pX platoon unblocked              |                                                                                     |                                                                                     |      |                                                                                     |                                                                                     |      |                      |                                                                                     |                                                                                     |                                                                                     |                                                                                     |      |
| VC, conflicting volume            | 569                                                                                 |                                                                                     | 514  |                                                                                     |                                                                                     |      | 1358                 | 1328                                                                                | 479                                                                                 | 1302                                                                                | 1352                                                                                | 558  |
| VC1, stage 1 conf vol             |                                                                                     |                                                                                     |      |                                                                                     |                                                                                     |      | 679                  | 679                                                                                 |                                                                                     | 638                                                                                 | 638                                                                                 |      |
| VC2, stage 2 conf vol             |                                                                                     |                                                                                     |      |                                                                                     |                                                                                     |      | 680                  | 649                                                                                 |                                                                                     | 664                                                                                 | 714                                                                                 |      |
| VCu, unblocked vol                | 569                                                                                 |                                                                                     | 514  |                                                                                     |                                                                                     |      | 1358                 | 1328                                                                                | 479                                                                                 | 1302                                                                                | 1352                                                                                | 558  |
| IC, single (s)                    | 4.1                                                                                 |                                                                                     | 4.1  |                                                                                     |                                                                                     |      | 7.1                  | 6.5                                                                                 | 6.2                                                                                 | 7.1                                                                                 | 6.5                                                                                 | 6.2  |
| IC, 2 stage (s)                   |                                                                                     |                                                                                     |      |                                                                                     |                                                                                     |      | 6.1                  | 5.5                                                                                 |                                                                                     | 6.1                                                                                 | 5.5                                                                                 |      |
| p0 queue free %                   | 2.2                                                                                 |                                                                                     | 2.2  |                                                                                     |                                                                                     |      | 3.5                  | 4.0                                                                                 | 3.3                                                                                 | 3.5                                                                                 | 4.0                                                                                 | 3.3  |
| p0 queue free %                   | 90                                                                                  |                                                                                     | 96   |                                                                                     |                                                                                     |      | 78                   | 99                                                                                  | 94                                                                                  | 96                                                                                  | 100                                                                                 | 90   |
| CM capacity (veh/h)               | 1003                                                                                |                                                                                     | 1052 |                                                                                     |                                                                                     |      | 242                  | 286                                                                                 | 587                                                                                 | 283                                                                                 | 296                                                                                 | 530  |
| Direction, Lane #                 | EB 1                                                                                | EB 2                                                                                | WB 1 | WB 2                                                                                | NB 1                                                                                | SB 1 |                      |                                                                                     |                                                                                     |                                                                                     |                                                                                     |      |
| Volume Total                      | 100                                                                                 | 514                                                                                 | 40   | 569                                                                                 | 92                                                                                  | 66   |                      |                                                                                     |                                                                                     |                                                                                     |                                                                                     |      |
| Volume Left                       | 100                                                                                 | 0                                                                                   | 40   | 0                                                                                   | 52                                                                                  | 12   |                      |                                                                                     |                                                                                     |                                                                                     |                                                                                     |      |
| Volume Right                      | 0                                                                                   | 70                                                                                  | 0    | 23                                                                                  | 38                                                                                  | 53   |                      |                                                                                     |                                                                                     |                                                                                     |                                                                                     |      |
| cSH                               | 1003                                                                                | 1700                                                                                | 1052 | 1700                                                                                | 415                                                                                 | 453  |                      |                                                                                     |                                                                                     |                                                                                     |                                                                                     |      |
| Volume to Capacity                | 0.10                                                                                | 0.30                                                                                | 0.04 | 0.33                                                                                | 0.22                                                                                | 0.15 |                      |                                                                                     |                                                                                     |                                                                                     |                                                                                     |      |
| Queue Length 95th (ft)            | 8                                                                                   | 0                                                                                   | 3    | 0                                                                                   | 21                                                                                  | 13   |                      |                                                                                     |                                                                                     |                                                                                     |                                                                                     |      |
| Control Delay (s)                 | 9.0                                                                                 | 0.0                                                                                 | 8.6  | 0.0                                                                                 | 18.8                                                                                | 14.3 |                      |                                                                                     |                                                                                     |                                                                                     |                                                                                     |      |
| Lane LOS                          | A                                                                                   | A                                                                                   | A    | A                                                                                   | C                                                                                   | B    |                      |                                                                                     |                                                                                     |                                                                                     |                                                                                     |      |
| Approach Delay (s)                | 1.5                                                                                 |                                                                                     | 0.6  |                                                                                     | 18.8                                                                                | 14.3 |                      |                                                                                     |                                                                                     |                                                                                     |                                                                                     |      |
| Approach LOS                      |                                                                                     |                                                                                     | C    |                                                                                     | B                                                                                   |      |                      |                                                                                     |                                                                                     |                                                                                     |                                                                                     |      |
| Intersection Summary              |                                                                                     |                                                                                     |      |                                                                                     |                                                                                     |      |                      |                                                                                     |                                                                                     |                                                                                     |                                                                                     |      |
| Average Delay                     | 2.8                                                                                 |                                                                                     |      |                                                                                     |                                                                                     |      | ICU Level of Service |                                                                                     |                                                                                     |                                                                                     |                                                                                     |      |
| Intersection Capacity Utilization | 52.8%                                                                               |                                                                                     |      |                                                                                     |                                                                                     |      | A                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |      |
| Analysis Period (min)             | 15                                                                                  |                                                                                     |      |                                                                                     |                                                                                     |      |                      |                                                                                     |                                                                                     |                                                                                     |                                                                                     |      |

# HCM Unsignalized Intersection Capacity Analysis 6: Doyle Park Drive & Sonoma Avenue

12/14/2016

| Movement                          | EBL                                                                               | EBT                                                                               | EBR  | WBL                                                                               | WBT                                                                               | WBR  | NBL                  | NBT  | NBR                                                                               | SBL                                                                               | SBT                                                                               | SBR                                                                               |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|----------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Lane Configurations               |  |  |      |  |  |      |                      |      |  |  |  |  |
| Traffic Volume (veh/h)            | 24                                                                                | 612                                                                               | 31   | 15                                                                                | 390                                                                               | 12   | 26                   | 3    | 20                                                                                | 15                                                                                | 5                                                                                 | 127                                                                               |
| Future Volume (veh/h)             | 24                                                                                | 612                                                                               | 31   | 15                                                                                | 390                                                                               | 12   | 26                   | 3    | 20                                                                                | 15                                                                                | 5                                                                                 | 127                                                                               |
| Sign Control                      | Free                                                                              |                                                                                   |      |                                                                                   |                                                                                   |      |                      |      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Grade                             | 0%                                                                                |                                                                                   |      |                                                                                   |                                                                                   |      |                      |      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Peak Hour Factor                  | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                 | 0.92 | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              |
| Hourly flow rate (vph)            | 26                                                                                | 665                                                                               | 34   | 16                                                                                | 424                                                                               | 13   | 28                   | 3    | 22                                                                                | 16                                                                                | 5                                                                                 | 138                                                                               |
| Pedestrians                       |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |                      |      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Lane Width (ft)                   |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |                      |      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Walking Speed (ft/s)              |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |                      |      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Percent Blockage                  |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |                      |      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Right turn flare (veh)            | 1                                                                                 |                                                                                   |      |                                                                                   |                                                                                   |      |                      |      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Median type                       | TWLTL                                                                             |                                                                                   |      |                                                                                   |                                                                                   |      |                      |      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Median storage (veh)              | 2                                                                                 |                                                                                   |      |                                                                                   |                                                                                   |      |                      |      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Upstream signal (ft)              |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |                      |      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| pX, platoon unblocked             |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |                      |      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| vc, conflicting volume            | 437                                                                               |                                                                                   | 699  |                                                                                   |                                                                                   |      | 1330                 | 1203 | 682                                                                               | 1192                                                                              | 1214                                                                              | 430                                                                               |
| vc1, stage 1 conf vol             |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      | 734                  | 734  |                                                                                   | 462                                                                               | 462                                                                               |                                                                                   |
| vc2, stage 2 conf vol             |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      | 596                  | 469  |                                                                                   | 730                                                                               | 751                                                                               |                                                                                   |
| vcU, unblocked vol                | 437                                                                               |                                                                                   | 699  |                                                                                   |                                                                                   |      | 1330                 | 1203 | 682                                                                               | 1192                                                                              | 1214                                                                              | 430                                                                               |
| IC, single (s)                    | 4.1                                                                               |                                                                                   | 4.1  |                                                                                   |                                                                                   |      | 7.1                  | 6.5  | 6.2                                                                               | 7.1                                                                               | 6.5                                                                               | 6.2                                                                               |
| IC, 2 stage (s)                   |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      | 6.1                  | 5.5  |                                                                                   | 6.1                                                                               | 5.5                                                                               |                                                                                   |
| p0 queue free %                   | 2.2                                                                               |                                                                                   | 2.2  |                                                                                   |                                                                                   |      | 3.5                  | 4.0  | 3.3                                                                               | 3.5                                                                               | 4.0                                                                               | 3.3                                                                               |
| p0 queue free %                   | 98                                                                                |                                                                                   | 98   |                                                                                   |                                                                                   |      | 90                   | 99   | 95                                                                                | 95                                                                                | 99                                                                                | 78                                                                                |
| cm capacity (veh/h)               | 1123                                                                              |                                                                                   | 898  |                                                                                   |                                                                                   |      | 273                  | 355  | 450                                                                               | 326                                                                               | 346                                                                               | 625                                                                               |
| Direction, Lane #                 | EB 1                                                                              | EB 2                                                                              | WB 1 | WB 2                                                                              | NB 1                                                                              | SB 1 |                      |      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Volume Total                      | 26                                                                                | 699                                                                               | 16   | 437                                                                               | 53                                                                                | 159  |                      |      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Volume Left                       | 26                                                                                | 0                                                                                 | 16   | 0                                                                                 | 28                                                                                | 16   |                      |      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Volume Right                      | 0                                                                                 | 34                                                                                | 0    | 13                                                                                | 22                                                                                | 138  |                      |      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| cSH                               | 1123                                                                              | 1700                                                                              | 898  | 1700                                                                              | 480                                                                               | 559  |                      |      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Volume to Capacity                | 0.02                                                                              | 0.41                                                                              | 0.02 | 0.26                                                                              | 0.11                                                                              | 0.28 |                      |      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Queue Length 95th (ft)            | 2                                                                                 | 0                                                                                 | 1    | 0                                                                                 | 9                                                                                 | 29   |                      |      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Control Delay (s)                 | 8.3                                                                               | 0.0                                                                               | 9.1  | 0.0                                                                               | 16.9                                                                              | 14.0 |                      |      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Lane LOS                          | A                                                                                 | A                                                                                 | A    | A                                                                                 | C                                                                                 | B    |                      |      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Approach Delay (s)                | 0.3                                                                               |                                                                                   | 0.3  |                                                                                   | 16.9                                                                              | 14.0 |                      |      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Approach LOS                      |                                                                                   |                                                                                   | C    |                                                                                   | B                                                                                 |      |                      |      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Intersection Summary              |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |      |                      |      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Average Delay                     | 2.5                                                                               |                                                                                   |      |                                                                                   |                                                                                   |      | ICU Level of Service |      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Intersection Capacity Utilization | 56.4%                                                                             |                                                                                   |      |                                                                                   |                                                                                   |      | B                    |      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Analysis Period (min)             | 15                                                                                |                                                                                   |      |                                                                                   |                                                                                   |      |                      |      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |

# HCM Signalized Intersection Capacity Analysis

1: Brookwood Avenue & 3rd Street

09/07/2017

| Movement                          | EBL                                                                                 | EBT                                                                                 | EBR                                                                                 | WBL                                                                                 | WBT                                                                                 | WBR                                                                                 | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
|-----------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Lane Configurations               |  |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph)              | 137                                                                                 | 139                                                                                 | 17                                                                                  | 6                                                                                   | 90                                                                                  | 184                                                                                 | 27                                                                                  | 591                                                                                 | 8                                                                                   | 92                                                                                  | 390                                                                                 | 160                                                                                 |
| Future Volume (vph)               | 137                                                                                 | 139                                                                                 | 17                                                                                  | 6                                                                                   | 90                                                                                  | 184                                                                                 | 27                                                                                  | 591                                                                                 | 8                                                                                   | 92                                                                                  | 390                                                                                 | 160                                                                                 |
| Ideal Flow (vphpl)                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               | 3.0                                                                                 | 3.0                                                                                 |                                                                                     | 3.0                                                                                 | 3.0                                                                                 |                                                                                     | 3.0                                                                                 | 3.6                                                                                 |                                                                                     | 3.0                                                                                 | 3.2                                                                                 |                                                                                     |
| Lane Util. Factor                 | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                | 0.95                                                                                |                                                                                     | 1.00                                                                                | 0.95                                                                                |                                                                                     |
| Flpb. ped/bikes                   | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Flpb. ped/bikes                   | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Flt                               | 1.00                                                                                | 0.98                                                                                |                                                                                     | 1.00                                                                                | 0.90                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                | 0.96                                                                                |                                                                                     |
| Flt Protected                     | 0.95                                                                                | 1.00                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (prot)                 | 1770                                                                                | 1827                                                                                |                                                                                     | 1770                                                                                | 1637                                                                                |                                                                                     | 1770                                                                                | 3530                                                                                |                                                                                     | 1770                                                                                | 3330                                                                                |                                                                                     |
| Flt Permitted                     | 0.95                                                                                | 1.00                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                |                                                                                     |
| Satd. Flow (perm)                 | 1770                                                                                | 1827                                                                                |                                                                                     | 1770                                                                                | 1637                                                                                |                                                                                     | 1770                                                                                | 3530                                                                                |                                                                                     | 1770                                                                                | 3330                                                                                |                                                                                     |
| Peak-hour factor, PHF             | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Adj. Flow (vph)                   | 137                                                                                 | 139                                                                                 | 17                                                                                  | 6                                                                                   | 90                                                                                  | 184                                                                                 | 27                                                                                  | 591                                                                                 | 8                                                                                   | 92                                                                                  | 390                                                                                 | 160                                                                                 |
| RTOR Reduction (vph)              | 0                                                                                   | 4                                                                                   | 0                                                                                   | 0                                                                                   | 92                                                                                  | 0                                                                                   | 0                                                                                   | 1                                                                                   | 0                                                                                   | 0                                                                                   | 47                                                                                  | 0                                                                                   |
| Lane Group Flow (vph)             | 137                                                                                 | 152                                                                                 | 0                                                                                   | 6                                                                                   | 182                                                                                 | 0                                                                                   | 27                                                                                  | 598                                                                                 | 0                                                                                   | 92                                                                                  | 503                                                                                 | 0                                                                                   |
| Confl. Peds. (#/hr)               | 20                                                                                  | 20                                                                                  | 20                                                                                  | 20                                                                                  | 20                                                                                  | 20                                                                                  | 20                                                                                  | 20                                                                                  | 20                                                                                  | 20                                                                                  | 20                                                                                  | 20                                                                                  |
| Turn Type                         | Prot                                                                                | NA                                                                                  | NA                                                                                  | Prot                                                                                | NA                                                                                  | NA                                                                                  | Prot                                                                                | NA                                                                                  | Prot                                                                                | NA                                                                                  | Prot                                                                                | NA                                                                                  |
| Protected Phases                  | 5                                                                                   | 2                                                                                   |                                                                                     | 1                                                                                   | 6                                                                                   |                                                                                     | 3                                                                                   | 8                                                                                   |                                                                                     | 7                                                                                   | 4                                                                                   |                                                                                     |
| Permitted Phases                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     | 6                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Green, G (s)             | 7.6                                                                                 | 22.7                                                                                |                                                                                     | 1.1                                                                                 | 16.2                                                                                |                                                                                     | 2.6                                                                                 | 18.1                                                                                |                                                                                     | 6.8                                                                                 | 22.7                                                                                |                                                                                     |
| Effective Green, g (s)            | 7.6                                                                                 | 22.7                                                                                |                                                                                     | 1.1                                                                                 | 16.2                                                                                |                                                                                     | 2.6                                                                                 | 18.1                                                                                |                                                                                     | 6.8                                                                                 | 22.7                                                                                |                                                                                     |
| Actuated g/C Ratio                | 0.12                                                                                | 0.37                                                                                |                                                                                     | 0.02                                                                                | 0.26                                                                                |                                                                                     | 0.04                                                                                | 0.30                                                                                |                                                                                     | 0.11                                                                                | 0.37                                                                                |                                                                                     |
| Clearance Time (s)                | 3.0                                                                                 | 3.0                                                                                 |                                                                                     | 3.0                                                                                 | 3.0                                                                                 |                                                                                     | 3.0                                                                                 | 3.6                                                                                 |                                                                                     | 3.0                                                                                 | 3.2                                                                                 |                                                                                     |
| Vehicle Extension (s)             | 3.0                                                                                 | 3.0                                                                                 |                                                                                     | 3.0                                                                                 | 3.0                                                                                 |                                                                                     | 3.0                                                                                 | 3.0                                                                                 |                                                                                     | 3.0                                                                                 | 3.0                                                                                 |                                                                                     |
| Lane Grp Cap (vph)                | 219                                                                                 | 676                                                                                 |                                                                                     | 31                                                                                  | 432                                                                                 |                                                                                     | 75                                                                                  | 1042                                                                                |                                                                                     | 196                                                                                 | 1233                                                                                |                                                                                     |
| v/s Ratio Prot                    | c0.08                                                                               | 0.08                                                                                |                                                                                     | 0.00                                                                                | c0.11                                                                               |                                                                                     | 0.02                                                                                | c0.17                                                                               |                                                                                     | c0.05                                                                               | 0.15                                                                                |                                                                                     |
| v/s Ratio Perm                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| v/c Ratio                         | 0.63                                                                                | 0.22                                                                                |                                                                                     | 0.19                                                                                | 0.42                                                                                |                                                                                     | 0.36                                                                                | 0.57                                                                                |                                                                                     | 0.47                                                                                | 0.41                                                                                |                                                                                     |
| Uniform Delay, d1                 | 25.5                                                                                | 13.3                                                                                |                                                                                     | 29.7                                                                                | 18.7                                                                                |                                                                                     | 28.5                                                                                | 18.3                                                                                |                                                                                     | 25.6                                                                                | 14.3                                                                                |                                                                                     |
| Progression Factor                | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |
| Incremental Delay, d2             | 5.5                                                                                 | 0.2                                                                                 |                                                                                     | 3.0                                                                                 | 0.7                                                                                 |                                                                                     | 2.9                                                                                 | 0.8                                                                                 |                                                                                     | 1.8                                                                                 | 0.2                                                                                 |                                                                                     |
| Delay (s)                         | 31.0                                                                                | 13.4                                                                                |                                                                                     | 32.7                                                                                | 19.3                                                                                |                                                                                     | 31.5                                                                                | 19.1                                                                                |                                                                                     | 27.3                                                                                | 14.5                                                                                |                                                                                     |
| Level of Service                  | C                                                                                   | B                                                                                   |                                                                                     | C                                                                                   | B                                                                                   |                                                                                     | C                                                                                   | B                                                                                   |                                                                                     | C                                                                                   | B                                                                                   |                                                                                     |
| Approach Delay (s)                |                                                                                     | 21.6                                                                                |                                                                                     |                                                                                     | 19.6                                                                                |                                                                                     |                                                                                     | 19.6                                                                                |                                                                                     |                                                                                     | 16.4                                                                                |                                                                                     |
| Approach LOS                      |                                                                                     | C                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Intersection Summary              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Control Delay            | 18.8                                                                                |                                                                                     |                                                                                     |                                                                                     | HCM 2000 Level of Service                                                           |                                                                                     |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Volume to Capacity ratio | 0.52                                                                                |                                                                                     |                                                                                     |                                                                                     | Sum of lost time (s)                                                                |                                                                                     |                                                                                     |                                                                                     | 12.6                                                                                |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         | 61.3                                                                                |                                                                                     |                                                                                     |                                                                                     | ICU Level of Service                                                                |                                                                                     |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Capacity Utilization | 62.1%                                                                               |                                                                                     |                                                                                     |                                                                                     | Analysis Period (min)                                                               |                                                                                     |                                                                                     |                                                                                     | 15                                                                                  |                                                                                     |                                                                                     |                                                                                     |
| Critical Lane Group               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

Traffic Study for the Santa Rosa Memorial Hospital  
AM Future

Synchro 8 Report

# HCM Signalized Intersection Capacity Analysis

1: Brookwood Avenue & 3rd Street

09/07/2017

| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                               | SBT                                                                               | SBR                                                                               |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Lane Configurations               |  |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph)              | 148                                                                               | 172                                                                               | 20                                                                                | 16                                                                                | 155                                                                               | 189                                                                               | 27                                                                                | 434                                                                               | 14                                                                                | 113                                                                               | 518                                                                               | 79                                                                                |
| Future Volume (vph)               | 148                                                                               | 172                                                                               | 20                                                                                | 16                                                                                | 155                                                                               | 189                                                                               | 27                                                                                | 434                                                                               | 14                                                                                | 113                                                                               | 518                                                                               | 79                                                                                |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              |
| Total Lost time (s)               | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                               | 3.6                                                                               |                                                                                   | 3.0                                                                               | 3.2                                                                               |                                                                                   |
| Lane Util. Factor                 | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 0.95                                                                              |                                                                                   | 1.00                                                                              | 0.95                                                                              |                                                                                   |
| Flpb. ped/bikes                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   |
| Flpb. ped/bikes                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   |
| Flt                               | 1.00                                                                              | 0.98                                                                              |                                                                                   | 1.00                                                                              | 0.92                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 0.98                                                                              |                                                                                   |
| Flt Protected                     | 0.95                                                                              | 1.00                                                                              |                                                                                   | 0.95                                                                              | 1.00                                                                              |                                                                                   | 0.95                                                                              | 1.00                                                                              |                                                                                   | 0.95                                                                              | 1.00                                                                              |                                                                                   |
| Satd. Flow (prot)                 | 1770                                                                              | 1829                                                                              |                                                                                   | 1770                                                                              | 1680                                                                              |                                                                                   | 1770                                                                              | 3517                                                                              |                                                                                   | 1770                                                                              | 3443                                                                              |                                                                                   |
| Flt Permitted                     | 0.95                                                                              | 1.00                                                                              |                                                                                   | 0.95                                                                              | 1.00                                                                              |                                                                                   | 0.95                                                                              | 1.00                                                                              |                                                                                   | 0.95                                                                              | 1.00                                                                              |                                                                                   |
| Satd. Flow (perm)                 | 1770                                                                              | 1829                                                                              |                                                                                   | 1770                                                                              | 1680                                                                              |                                                                                   | 1770                                                                              | 3517                                                                              |                                                                                   | 1770                                                                              | 3443                                                                              |                                                                                   |
| Peak-hour factor, PHF             | 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. Flow (vph)                   | 148                                                                               | 172                                                                               | 20                                                                                | 16                                                                                | 155                                                                               | 189                                                                               | 27                                                                                | 434                                                                               | 14                                                                                | 113                                                                               | 518                                                                               | 79                                                                                |
| RTOR Reduction (vph)              | 0                                                                                 | 4                                                                                 | 0                                                                                 | 0                                                                                 | 49                                                                                | 0                                                                                 | 0                                                                                 | 2                                                                                 | 0                                                                                 | 0                                                                                 | 13                                                                                | 0                                                                                 |
| Lane Group Flow (vph)             | 148                                                                               | 188                                                                               | 0                                                                                 | 16                                                                                | 295                                                                               | 0                                                                                 | 27                                                                                | 446                                                                               | 0                                                                                 | 113                                                                               | 584                                                                               | 0                                                                                 |
| Confl. Peds. (#/hr)               | 20                                                                                | 20                                                                                | 20                                                                                | 20                                                                                | 20                                                                                | 20                                                                                | 20                                                                                | 20                                                                                | 20                                                                                | 20                                                                                | 20                                                                                | 20                                                                                |
| Turn Type                         | Prot                                                                              | NA                                                                                | Prot                                                                              | Prot                                                                              | NA                                                                                | Prot                                                                              | Prot                                                                              | NA                                                                                | Prot                                                                              | Prot                                                                              | NA                                                                                | NA                                                                                |
| Protected Phases                  | 5                                                                                 | 2                                                                                 |                                                                                   | 1                                                                                 | 6                                                                                 |                                                                                   | 3                                                                                 | 8                                                                                 |                                                                                   | 7                                                                                 | 4                                                                                 |                                                                                   |
| Permitted Phases                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 6                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Actuated Green, G (s)             | 7.7                                                                               | 26.2                                                                              |                                                                                   | 1.1                                                                               | 19.6                                                                              |                                                                                   | 2.6                                                                               | 16.6                                                                              |                                                                                   | 7.6                                                                               | 22.0                                                                              |                                                                                   |
| Effective Green, g (s)            | 7.7                                                                               | 26.2                                                                              |                                                                                   | 1.1                                                                               | 19.6                                                                              |                                                                                   | 2.6                                                                               | 16.6                                                                              |                                                                                   | 7.6                                                                               | 22.0                                                                              |                                                                                   |
| Actuated g/C Ratio                | 0.12                                                                              | 0.41                                                                              |                                                                                   | 0.02                                                                              | 0.31                                                                              |                                                                                   | 0.04                                                                              | 0.26                                                                              |                                                                                   | 0.12                                                                              | 0.34                                                                              |                                                                                   |
| Clearance Time (s)                | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                               | 3.6                                                                               |                                                                                   | 3.0                                                                               | 3.2                                                                               |                                                                                   |
| Vehicle Extension (s)             | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               |                                                                                   |
| Lane Grp Cap (vph)                | 212                                                                               | 747                                                                               |                                                                                   | 30                                                                                | 513                                                                               |                                                                                   | 71                                                                                | 910                                                                               |                                                                                   | 209                                                                               | 1181                                                                              |                                                                                   |
| v/s Ratio Prot                    | c0.08                                                                             | 0.10                                                                              |                                                                                   | 0.01                                                                              | c0.18                                                                             |                                                                                   | 0.02                                                                              | 0.13                                                                              |                                                                                   | c0.06                                                                             | c0.17                                                                             |                                                                                   |
| v/s Ratio Perm                    |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| v/c Ratio                         | 0.70                                                                              | 0.25                                                                              |                                                                                   | 0.53                                                                              | 0.58                                                                              |                                                                                   | 0.38                                                                              | 0.49                                                                              |                                                                                   | 0.54                                                                              | 0.49                                                                              |                                                                                   |
| Uniform Delay, d1                 | 27.1                                                                              | 12.5                                                                              |                                                                                   | 31.2                                                                              | 18.7                                                                              |                                                                                   | 30.0                                                                              | 20.2                                                                              |                                                                                   | 26.6                                                                              | 16.7                                                                              |                                                                                   |
| Progression Factor                | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   |
| Incremental Delay, d2             | 9.6                                                                               | 0.2                                                                               |                                                                                   | 17.0                                                                              | 1.6                                                                               |                                                                                   | 3.4                                                                               | 0.4                                                                               |                                                                                   | 2.8                                                                               | 0.3                                                                               |                                                                                   |
| Delay (s)                         | 36.7                                                                              | 12.7                                                                              |                                                                                   | 48.2                                                                              | 20.3                                                                              |                                                                                   | 33.3                                                                              | 20.6                                                                              |                                                                                   | 29.4                                                                              | 17.0                                                                              |                                                                                   |
| Level of Service                  | D                                                                                 | B                                                                                 |                                                                                   | D                                                                                 | C                                                                                 |                                                                                   | C                                                                                 | C                                                                                 |                                                                                   | C                                                                                 | B                                                                                 |                                                                                   |
| Approach Delay (s)                |                                                                                   | 23.1                                                                              |                                                                                   |                                                                                   | 21.6                                                                              |                                                                                   |                                                                                   | 21.3                                                                              |                                                                                   |                                                                                   | 19.0                                                                              |                                                                                   |
| Approach LOS                      |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |
| Intersection Summary              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| HCM 2000 Control Delay            | 20.8                                                                              |                                                                                   |                                                                                   |                                                                                   | HCM 2000 Level of Service                                                         |                                                                                   |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| HCM 2000 Volume to Capacity ratio | 0.59                                                                              |                                                                                   |                                                                                   |                                                                                   | Sum of lost time (s)                                                              |                                                                                   |                                                                                   |                                                                                   | 12.6                                                                              |                                                                                   |                                                                                   |                                                                                   |
| Actuated Cycle Length (s)         | 64.1                                                                              |                                                                                   |                                                                                   |                                                                                   | ICU Level of Service                                                              |                                                                                   |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |
| Intersection Capacity Utilization | 66.2%                                                                             |                                                                                   |                                                                                   |                                                                                   | Analysis Period (min)                                                             |                                                                                   |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |
| Analysis Period (min)             | 15                                                                                |                                                                                   |                                                                                   |                                                                                   | Critical Lane Group                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |

Traffic Study for the Santa Rosa Memorial Hospital  
PM Future

Synchro 8 Report

HCM Signalized Intersection Capacity Analysis  
2. Sotoyome Street & Montgomery Drive

09/07/2017

| Movement                          | EBL                                                                                 | EBT                                                                                 | EBR                                                                                 | WBL                                                                                 | WBT                                                                                 | WBR                                                                                 | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
|-----------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Lane Configurations               |  |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph)              | 22                                                                                  | 236                                                                                 | 38                                                                                  | 88                                                                                  | 462                                                                                 | 11                                                                                  | 23                                                                                  | 11                                                                                  | 89                                                                                  | 4                                                                                   | 12                                                                                  | 13                                                                                  |
| Future Volume (vph)               | 22                                                                                  | 236                                                                                 | 38                                                                                  | 88                                                                                  | 462                                                                                 | 11                                                                                  | 23                                                                                  | 11                                                                                  | 89                                                                                  | 4                                                                                   | 12                                                                                  | 13                                                                                  |
| Ideal Flow (vphpl)                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               | 3.2                                                                                 | 3.2                                                                                 |                                                                                     | 3.2                                                                                 | 3.2                                                                                 |                                                                                     |                                                                                     | 3.0                                                                                 | 3.0                                                                                 |                                                                                     | 3.0                                                                                 |                                                                                     |
| Lane Util. Factor                 | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |                                                                                     |
| Frbp. ped/bikes                   | 1.00                                                                                | 0.99                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |                                                                                     | 1.00                                                                                | 0.96                                                                                |                                                                                     | 1.00                                                                                | 0.95                                                                                |
| Flbb. ped/bikes                   | 0.99                                                                                | 1.00                                                                                |                                                                                     | 0.99                                                                                | 1.00                                                                                |                                                                                     |                                                                                     | 0.94                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |
| Frt                               | 1.00                                                                                | 0.98                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |                                                                                     | 1.00                                                                                | 0.85                                                                                |                                                                                     | 0.94                                                                                |                                                                                     |
| Flt Protected                     | 0.95                                                                                | 1.00                                                                                |                                                                                     | 0.95                                                                                | 1.00                                                                                |                                                                                     |                                                                                     | 0.97                                                                                | 1.00                                                                                |                                                                                     | 0.99                                                                                |                                                                                     |
| Satd. Flow (prot)                 | 1748                                                                                | 1814                                                                                |                                                                                     | 1747                                                                                | 1854                                                                                |                                                                                     |                                                                                     | 1688                                                                                | 1513                                                                                |                                                                                     | 1643                                                                                |                                                                                     |
| Flt Permitted                     | 0.44                                                                                | 1.00                                                                                |                                                                                     | 0.59                                                                                | 1.00                                                                                |                                                                                     |                                                                                     | 0.87                                                                                | 1.00                                                                                |                                                                                     | 0.98                                                                                |                                                                                     |
| Satd. Flow (perm)                 | 808                                                                                 | 1814                                                                                |                                                                                     | 1086                                                                                | 1854                                                                                |                                                                                     |                                                                                     | 1517                                                                                | 1513                                                                                |                                                                                     | 1619                                                                                |                                                                                     |
| Peak-hour factor, PHF             | 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. Flow (vph)                   | 22                                                                                  | 236                                                                                 | 38                                                                                  | 88                                                                                  | 462                                                                                 | 11                                                                                  | 23                                                                                  | 11                                                                                  | 89                                                                                  | 4                                                                                   | 12                                                                                  | 13                                                                                  |
| RTOR Reduction (vph)              | 0                                                                                   | 10                                                                                  | 0                                                                                   | 0                                                                                   | 2                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 67                                                                                  | 0                                                                                   | 10                                                                                  | 0                                                                                   |
| Lane Group Flow (vph)             | 22                                                                                  | 264                                                                                 | 0                                                                                   | 88                                                                                  | 471                                                                                 | 0                                                                                   | 0                                                                                   | 34                                                                                  | 22                                                                                  | 0                                                                                   | 19                                                                                  | 0                                                                                   |
| Confl. Peds. (#/hr)               | 24                                                                                  | 18                                                                                  | 18                                                                                  | 24                                                                                  | 109                                                                                 | 24                                                                                  | 109                                                                                 | 28                                                                                  | 28                                                                                  | 28                                                                                  | 109                                                                                 | 109                                                                                 |
| Turn Type                         | Perm                                                                                | NA                                                                                  | NA                                                                                  | Perm                                                                                | NA                                                                                  | NA                                                                                  | Perm                                                                                | NA                                                                                  | Perm                                                                                | Perm                                                                                | NA                                                                                  | NA                                                                                  |
| Protected Phases                  | 2                                                                                   | 2                                                                                   |                                                                                     | 2                                                                                   | 2                                                                                   |                                                                                     | 4                                                                                   | 4                                                                                   | 4                                                                                   | 4                                                                                   | 4                                                                                   | 4                                                                                   |
| Permitted Phases                  | 2                                                                                   | 2                                                                                   |                                                                                     | 2                                                                                   | 2                                                                                   |                                                                                     | 4                                                                                   | 4                                                                                   | 4                                                                                   | 4                                                                                   | 4                                                                                   | 4                                                                                   |
| Actuated Green, G (s)             | 28.8                                                                                | 28.8                                                                                |                                                                                     | 28.8                                                                                | 28.8                                                                                |                                                                                     | 11.5                                                                                | 11.5                                                                                | 11.5                                                                                | 11.5                                                                                | 11.5                                                                                | 11.5                                                                                |
| Effective Green, g (s)            | 28.8                                                                                | 28.8                                                                                |                                                                                     | 28.8                                                                                | 28.8                                                                                |                                                                                     | 11.5                                                                                | 11.5                                                                                | 11.5                                                                                | 11.5                                                                                | 11.5                                                                                | 11.5                                                                                |
| Actuated g/C Ratio                | 0.62                                                                                | 0.62                                                                                |                                                                                     | 0.62                                                                                | 0.62                                                                                |                                                                                     | 0.25                                                                                | 0.25                                                                                | 0.25                                                                                | 0.25                                                                                | 0.25                                                                                | 0.25                                                                                |
| Clearance Time (s)                | 3.2                                                                                 | 3.2                                                                                 |                                                                                     | 3.2                                                                                 | 3.2                                                                                 |                                                                                     | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 |
| Vehicle Extension (s)             | 3.0                                                                                 | 3.0                                                                                 |                                                                                     | 3.0                                                                                 | 3.0                                                                                 |                                                                                     | 2.0                                                                                 | 2.0                                                                                 | 2.0                                                                                 | 2.0                                                                                 | 2.0                                                                                 | 2.0                                                                                 |
| Lane Grp Cap (vph)                | 500                                                                                 | 1123                                                                                |                                                                                     | 672                                                                                 | 1148                                                                                |                                                                                     | 375                                                                                 | 375                                                                                 | 374                                                                                 | 400                                                                                 | 400                                                                                 | 400                                                                                 |
| v/s Ratio Prot                    | 0.15                                                                                |                                                                                     |                                                                                     | c0.25                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| v/s Ratio Perm                    | 0.03                                                                                |                                                                                     |                                                                                     | 0.08                                                                                |                                                                                     |                                                                                     | c0.02                                                                               | 0.01                                                                                |                                                                                     |                                                                                     | 0.01                                                                                |                                                                                     |
| v/c Ratio                         | 0.04                                                                                | 0.23                                                                                |                                                                                     | 0.13                                                                                | 0.41                                                                                |                                                                                     | 0.09                                                                                | 0.06                                                                                |                                                                                     |                                                                                     | 0.05                                                                                |                                                                                     |
| Uniform Delay, d1                 | 3.5                                                                                 | 3.9                                                                                 |                                                                                     | 3.7                                                                                 | 4.5                                                                                 |                                                                                     | 13.5                                                                                | 13.4                                                                                |                                                                                     |                                                                                     | 13.3                                                                                |                                                                                     |
| Progression Factor                | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |                                                                                     | 1.00                                                                                | 1.00                                                                                |
| Incremental Delay, d2             | 0.0                                                                                 | 0.1                                                                                 |                                                                                     | 0.1                                                                                 | 0.2                                                                                 |                                                                                     | 0.0                                                                                 | 0.0                                                                                 |                                                                                     |                                                                                     | 0.0                                                                                 | 0.0                                                                                 |
| Delay (s)                         | 3.5                                                                                 | 4.1                                                                                 |                                                                                     | 3.8                                                                                 | 4.8                                                                                 |                                                                                     | 13.5                                                                                | 13.4                                                                                |                                                                                     |                                                                                     | 13.3                                                                                |                                                                                     |
| Level of Service                  | A                                                                                   | A                                                                                   |                                                                                     | A                                                                                   | A                                                                                   |                                                                                     | B                                                                                   | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Approach Delay (s)                | 4.0                                                                                 |                                                                                     |                                                                                     | 4.6                                                                                 |                                                                                     |                                                                                     | 13.4                                                                                |                                                                                     |                                                                                     |                                                                                     | 13.3                                                                                |                                                                                     |
| Approach LOS                      | A                                                                                   |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Intersection Summary              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Control Delay            | 5.8                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     | HCM 2000 Level of Service                                                           |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Volume to Capacity ratio | 0.32                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         | 46.5                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     | Sum of lost time (s)                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Capacity Utilization | 64.7%                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     | C                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Analysis Period (min)             | 15                                                                                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     | ICU Level of Service                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Critical Lane Group               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

HCM Signalized Intersection Capacity Analysis  
2. Sotoyome Street & Montgomery Drive

09/07/2017

| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                               | SBT                                                                               | SBR                                                                               |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Lane Configurations               |  |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph)              | 31                                                                                | 295                                                                               | 18                                                                                | 68                                                                                | 490                                                                               | 13                                                                                | 49                                                                                | 13                                                                                | 67                                                                                | 31                                                                                | 9                                                                                 | 15                                                                                |
| Future Volume (vph)               | 31                                                                                | 295                                                                               | 18                                                                                | 68                                                                                | 490                                                                               | 13                                                                                | 49                                                                                | 13                                                                                | 67                                                                                | 31                                                                                | 9                                                                                 | 15                                                                                |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              |
| Total Lost time (s)               | 3.2                                                                               | 3.2                                                                               |                                                                                   | 3.2                                                                               | 3.2                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               |                                                                                   |
| Lane Util. Factor                 | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   |
| Frbp. ped/bikes                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 0.96                                                                              |                                                                                   | 1.00                                                                              | 0.97                                                                              |                                                                                   |
| Flbb. ped/bikes                   | 0.98                                                                              | 1.00                                                                              |                                                                                   | 0.98                                                                              | 1.00                                                                              |                                                                                   | 0.94                                                                              | 1.00                                                                              |                                                                                   | 0.99                                                                              | 1.00                                                                              |                                                                                   |
| Frt                               | 1.00                                                                              | 0.99                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 0.85                                                                              |                                                                                   | 1.00                                                                              | 0.96                                                                              |                                                                                   |
| Flt Protected                     | 0.95                                                                              | 1.00                                                                              |                                                                                   | 0.95                                                                              | 1.00                                                                              |                                                                                   | 0.96                                                                              | 1.00                                                                              |                                                                                   | 0.97                                                                              | 1.00                                                                              |                                                                                   |
| Satd. Flow (prot)                 | 1740                                                                              | 1841                                                                              |                                                                                   | 1736                                                                              | 1853                                                                              |                                                                                   | 1691                                                                              | 1526                                                                              |                                                                                   | 1685                                                                              | 1685                                                                              |                                                                                   |
| Flt Permitted                     | 0.42                                                                              | 1.00                                                                              |                                                                                   | 0.56                                                                              | 1.00                                                                              |                                                                                   | 0.80                                                                              | 1.00                                                                              |                                                                                   | 0.86                                                                              | 1.00                                                                              |                                                                                   |
| Satd. Flow (perm)                 | 768                                                                               | 1841                                                                              |                                                                                   | 1023                                                                              | 1853                                                                              |                                                                                   | 1412                                                                              | 1526                                                                              |                                                                                   | 1498                                                                              | 1498                                                                              |                                                                                   |
| Peak-hour factor, PHF             | 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. Flow (vph)                   | 31                                                                                | 295                                                                               | 18                                                                                | 68                                                                                | 490                                                                               | 13                                                                                | 49                                                                                | 13                                                                                | 67                                                                                | 31                                                                                | 9                                                                                 | 15                                                                                |
| RTOR Reduction (vph)              | 0                                                                                 | 4                                                                                 | 0                                                                                 | 0                                                                                 | 2                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 51                                                                                | 0                                                                                 | 11                                                                                | 0                                                                                 |
| Lane Group Flow (vph)             | 31                                                                                | 309                                                                               | 0                                                                                 | 68                                                                                | 501                                                                               | 0                                                                                 | 0                                                                                 | 62                                                                                | 16                                                                                | 0                                                                                 | 44                                                                                | 0                                                                                 |
| Confl. Peds. (#/hr)               | 34                                                                                | 28                                                                                | 28                                                                                | 34                                                                                | 85                                                                                | 34                                                                                | 85                                                                                | 18                                                                                | 18                                                                                | 18                                                                                | 85                                                                                | 85                                                                                |
| Turn Type                         | Perm                                                                              | NA                                                                                | NA                                                                                | Perm                                                                              | NA                                                                                | Perm                                                                              | NA                                                                                | Perm                                                                              | NA                                                                                | Perm                                                                              | NA                                                                                | NA                                                                                |
| Protected Phases                  | 2                                                                                 | 2                                                                                 |                                                                                   | 2                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 4                                                                                 | 4                                                                                 | 4                                                                                 | 4                                                                                 |                                                                                   |
| Permitted Phases                  | 2                                                                                 | 2                                                                                 |                                                                                   | 2                                                                                 | 2                                                                                 |                                                                                   | 4                                                                                 | 4                                                                                 | 4                                                                                 | 4                                                                                 | 4                                                                                 |                                                                                   |
| Actuated Green, G (s)             | 29.5                                                                              | 29.5                                                                              |                                                                                   | 29.5                                                                              | 29.5                                                                              |                                                                                   | 11.5                                                                              | 11.5                                                                              | 11.5                                                                              | 11.5                                                                              | 11.5                                                                              |                                                                                   |
| Effective Green, g (s)            | 29.5                                                                              | 29.5                                                                              |                                                                                   | 29.5                                                                              | 29.5                                                                              |                                                                                   | 11.5                                                                              | 11.5                                                                              | 11.5                                                                              | 11.5                                                                              | 11.5                                                                              |                                                                                   |
| Actuated g/C Ratio                | 0.62                                                                              | 0.62                                                                              |                                                                                   | 0.62                                                                              | 0.62                                                                              |                                                                                   | 0.24                                                                              | 0.24                                                                              | 0.24                                                                              | 0.24                                                                              | 0.24                                                                              |                                                                                   |
| Clearance Time (s)                | 3.2                                                                               | 3.2                                                                               |                                                                                   | 3.2                                                                               | 3.2                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               |                                                                                   |
| Vehicle Extension (s)             | 3.0                                                                               | 3.0                                                                               |                                                                                   | 3.0                                                                               | 3.0                                                                               |                                                                                   | 2.0                                                                               | 2.0                                                                               | 2.0                                                                               | 2.0                                                                               | 2.0                                                                               |                                                                                   |
| Lane Grp Cap (vph)                | 480                                                                               | 1150                                                                              |                                                                                   | 639                                                                               | 1158                                                                              |                                                                                   | 344                                                                               | 371                                                                               | 364                                                                               | 364                                                                               | 364                                                                               |                                                                                   |
| v/s Ratio Prot                    | 0.17                                                                              |                                                                                   |                                                                                   | 0.27                                                                              |                                                                                   |                                                                                   | 0.04                                                                              | 0.01                                                                              |                                                                                   | 0.03                                                                              |                                                                                   |                                                                                   |
| v/s Ratio Perm                    | 0.04                                                                              |                                                                                   |                                                                                   | 0.07                                                                              |                                                                                   |                                                                                   | 0.04                                                                              | 0.01                                                                              |                                                                                   | 0.03                                                                              |                                                                                   |                                                                                   |
| v/c Ratio                         | 0.06                                                                              | 0.27                                                                              |                                                                                   | 0.11                                                                              | 0.43                                                                              |                                                                                   | 0.18                                                                              | 0.04                                                                              |                                                                                   | 0.12                                                                              |                                                                                   |                                                                                   |
| Uniform Delay, d1                 | 3.5                                                                               | 4.0                                                                               |                                                                                   | 3.6                                                                               | 4.5                                                                               |                                                                                   | 14.1                                                                              | 13.6                                                                              |                                                                                   | 13.9                                                                              |                                                                                   |                                                                                   |
| Progression Factor                | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              | 1.00                                                                              |                                                                                   | 1.00                                                                              |                                                                                   |                                                                                   |
| Incremental Delay, d2             | 0.1                                                                               | 0.1                                                                               |                                                                                   | 0.1                                                                               | 0.3                                                                               |                                                                                   | 0.1                                                                               | 0.0                                                                               |                                                                                   | 0.1                                                                               |                                                                                   |                                                                                   |
| Delay (s)                         | 3.5                                                                               | 4.1                                                                               |                                                                                   | 3.6                                                                               | 4.8                                                                               |                                                                                   | 14.2                                                                              | 13.7                                                                              |                                                                                   | 14.0                                                                              |                                                                                   |                                                                                   |
| Level of Service                  | A                                                                                 | A                                                                                 |                                                                                   | A                                                                                 | A                                                                                 |                                                                                   | B                                                                                 | B                                                                                 |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |
| Approach Delay (s)                | 4.1                                                                               | 4.1                                                                               |                                                                                   | 4.7                                                                               |                                                                                   |                                                                                   | 13.9                                                                              |                                                                                   |                                                                                   | 14.0                                                                              |                                                                                   |                                                                                   |
| Approach LOS                      | A                                                                                 | A                                                                                 |                                                                                   | A                                                                                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |
| Intersection Summary              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| HCM 2000 Control Delay            | 6.0                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | HCM 2000 Level of Service                                                         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| HCM 2000 Volume to Capacity ratio | 0.36                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Actuated Cycle Length (s)         | 47.2                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | Sum of lost time (s)                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Intersection Capacity Utilization | 66.0%                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Analysis Period (min)             | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | ICU Level of Service                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Critical Lane Group               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |

### HCM Signalized Intersection Capacity Analysis 3: Doyle Park Drive & Montgomery Drive

09/07/2017

| Movement               | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations    | 1    | 1    | 1    | 1    | 1    | 1    | 1    | 1    | 1    | 1    | 1    | 1    |
| Traffic Volume (vph)   | 17   | 139  | 64   | 65   | 546  | 9    | 43   | 12   | 32   | 5    | 38   | 37   |
| Future Volume (vph)    | 17   | 139  | 64   | 65   | 546  | 9    | 43   | 12   | 32   | 5    | 38   | 37   |
| Ideal Flow (vphpl)     | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s)    | 3.3  | 3.3  | 3.3  | 3.3  | 3.3  | 3.3  | 3.1  | 3.1  | 3.1  | 3.1  | 3.1  | 3.1  |
| Lane Util. 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 |
| Flpb. ped/bikes        | 1.00 | 0.99 | 1.00 | 1.00 | 1.00 | 1.00 | 0.99 | 0.99 | 0.99 | 1.00 | 0.98 | 1.00 |
| Flpb. ped/bikes        | 0.99 | 1.00 | 0.99 | 1.00 | 0.99 | 1.00 | 0.99 | 0.99 | 0.99 | 1.00 | 0.94 | 1.00 |
| Flt Protected          | 0.95 | 1.00 | 0.95 | 1.00 | 0.95 | 1.00 | 0.98 | 0.98 | 0.98 | 1.00 | 0.94 | 1.00 |
| Satd. Flow (prot)      | 1745 | 1756 | 1752 | 1857 | 1752 | 1857 | 1695 | 1695 | 1695 | 1711 | 1711 | 1711 |
| Flt Permitted          | 0.41 | 1.00 | 0.63 | 1.00 | 0.63 | 1.00 | 0.81 | 0.81 | 0.81 | 0.97 | 0.97 | 0.97 |
| Satd. Flow (perm)      | 750  | 1756 | 1163 | 1857 | 1163 | 1857 | 1403 | 1403 | 1403 | 1667 | 1667 | 1667 |
| Peak-hour factor, PHF  | 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. Flow (vph)        | 17   | 139  | 64   | 65   | 546  | 9    | 43   | 12   | 32   | 5    | 38   | 37   |
| RTOR Reduction (vph)   | 0    | 32   | 0    | 0    | 1    | 0    | 0    | 26   | 0    | 0    | 30   | 0    |
| Lane Group Flow (vph)  | 17   | 171  | 0    | 65   | 554  | 0    | 0    | 61   | 0    | 0    | 50   | 0    |
| Confl. Peds. (#/hr)    | 35   | 16   | 16   | 35   | 25   | 17   | 17   | 17   | 17   | 17   | 25   | 25   |
| Turn Type              | Perm | NA   | NA   | Perm | NA   | Perm | NA   | NA   | Perm | NA   | NA   | NA   |
| Protected Phases       | 2    | 2    | 2    | 6    | 6    | 6    | 8    | 8    | 8    | 4    | 4    | 4    |
| Permitted Phases       | 2    | 2    | 2    | 6    | 6    | 6    | 8    | 8    | 8    | 4    | 4    | 4    |
| Actuated Green, G (s)  | 9.8  | 9.8  | 9.8  | 9.8  | 9.8  | 9.8  | 3.7  | 3.7  | 3.7  | 3.7  | 3.7  | 3.7  |
| Effective Green, g (s) | 9.8  | 9.8  | 9.8  | 9.8  | 9.8  | 9.8  | 3.7  | 3.7  | 3.7  | 3.7  | 3.7  | 3.7  |
| Actuated g/C Ratio     | 0.49 | 0.49 | 0.49 | 0.49 | 0.49 | 0.49 | 0.19 | 0.19 | 0.19 | 0.19 | 0.19 | 0.19 |
| Clearance Time (s)     | 3.3  | 3.3  | 3.3  | 3.3  | 3.3  | 3.3  | 3.1  | 3.1  | 3.1  | 3.1  | 3.1  | 3.1  |
| Vehicle Extension (s)  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  |
| Lane Grp Cap (vph)     | 369  | 864  | 572  | 914  | 572  | 914  | 260  | 260  | 260  | 309  | 309  | 309  |
| v/s Ratio Prot         | 0.02 | 0.10 | 0.06 | 0.30 | 0.06 | 0.30 | 0.04 | 0.04 | 0.04 | 0.03 | 0.03 | 0.03 |
| v/s Ratio Perm         | 0.05 | 0.20 | 0.11 | 0.61 | 0.11 | 0.61 | 0.23 | 0.23 | 0.23 | 0.16 | 0.16 | 0.16 |
| Uniform Delay, d1      | 2.6  | 2.8  | 2.7  | 3.7  | 2.7  | 3.7  | 6.9  | 6.9  | 6.9  | 6.8  | 6.8  | 6.8  |
| Progression 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 |
| Incremental Delay, d2  | 0.0  | 0.0  | 0.0  | 0.8  | 0.0  | 0.8  | 0.2  | 0.2  | 0.2  | 0.1  | 0.1  | 0.1  |
| Delay (s)              | 2.6  | 2.9  | 2.7  | 4.4  | 2.7  | 4.4  | 7.1  | 7.1  | 7.1  | 6.9  | 6.9  | 6.9  |
| Level of Service       | A    | A    | A    | A    | A    | A    | A    | A    | A    | A    | A    | A    |
| Approach Delay (s)     | 2.9  | 2.9  | 2.9  | 4.3  | 2.9  | 4.3  | 7.1  | 7.1  | 7.1  | 6.9  | 6.9  | 6.9  |
| Approach LOS           | A    | A    | A    | A    | A    | A    | A    | A    | A    | A    | A    | A    |

|                                   |       |                           |     |
|-----------------------------------|-------|---------------------------|-----|
| Intersection Summary              |       |                           |     |
| HCM 2000 Control Delay            | 4.4   | HCM 2000 Level of Service | A   |
| HCM 2000 Volume to Capacity ratio | 0.50  |                           |     |
| Actuated Cycle Length (s)         | 19.9  | Sum of lost time (s)      | 6.4 |
| Intersection Capacity Utilization | 55.0% | ICU Level of Service      | B   |
| Analysis Period (min)             | 15    |                           |     |
| c Critical Lane Group             |       |                           |     |

Traffic Study for the Santa Rosa Memorial Hospital  
AM Future

Synchro 8 Report

### HCM Signalized Intersection Capacity Analysis 3: Doyle Park Drive & Montgomery Drive

09/07/2017

| Movement               | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations    | 1    | 1    | 1    | 1    | 1    | 1    | 1    | 1    | 1    | 1    | 1    | 1    |
| Traffic Volume (vph)   | 23   | 324  | 29   | 31   | 416  | 4    | 88   | 16   | 39   | 4    | 17   | 24   |
| Future Volume (vph)    | 23   | 324  | 29   | 31   | 416  | 4    | 88   | 16   | 39   | 4    | 17   | 24   |
| Ideal Flow (vphpl)     | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s)    | 3.3  | 3.3  | 3.3  | 3.3  | 3.3  | 3.3  | 3.1  | 3.1  | 3.1  | 3.1  | 3.1  | 3.1  |
| Lane Util. 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 |
| Flpb. ped/bikes        | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.99 | 0.99 | 0.99 | 1.00 | 0.97 | 1.00 |
| Flpb. ped/bikes        | 0.98 | 1.00 | 0.99 | 1.00 | 0.99 | 1.00 | 0.98 | 0.98 | 0.98 | 1.00 | 0.93 | 1.00 |
| Flt Protected          | 0.95 | 1.00 | 0.95 | 1.00 | 0.95 | 1.00 | 0.97 | 0.97 | 0.97 | 1.00 | 0.93 | 1.00 |
| Satd. Flow (prot)      | 1729 | 1834 | 1747 | 1859 | 1747 | 1859 | 1679 | 1679 | 1679 | 1663 | 1663 | 1663 |
| Flt Permitted          | 0.52 | 1.00 | 0.55 | 1.00 | 0.55 | 1.00 | 0.79 | 0.79 | 0.79 | 0.96 | 0.96 | 0.96 |
| Satd. Flow (perm)      | 941  | 1834 | 1011 | 1859 | 1011 | 1859 | 1360 | 1360 | 1360 | 1602 | 1602 | 1602 |
| Peak-hour factor, PHF  | 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. Flow (vph)        | 23   | 324  | 29   | 31   | 416  | 4    | 88   | 16   | 39   | 4    | 17   | 24   |
| RTOR Reduction (vph)   | 0    | 7    | 0    | 0    | 1    | 0    | 0    | 30   | 0    | 0    | 19   | 0    |
| Lane Group Flow (vph)  | 23   | 346  | 0    | 31   | 419  | 0    | 113  | 0    | 0    | 0    | 26   | 0    |
| Confl. Peds. (#/hr)    | 47   | 26   | 26   | 47   | 64   | 47   | 38   | 38   | 38   | 64   | 64   | 64   |
| Turn Type              | Perm | NA   | NA   | Perm | NA   | Perm | NA   | NA   | Perm | NA   | NA   | NA   |
| Protected Phases       | 2    | 2    | 2    | 6    | 6    | 6    | 8    | 8    | 8    | 4    | 4    | 4    |
| Permitted Phases       | 2    | 2    | 2    | 6    | 6    | 6    | 8    | 8    | 8    | 4    | 4    | 4    |
| Actuated Green, G (s)  | 8.6  | 8.6  | 8.6  | 8.6  | 8.6  | 8.6  | 4.2  | 4.2  | 4.2  | 4.2  | 4.2  | 4.2  |
| Effective Green, g (s) | 8.6  | 8.6  | 8.6  | 8.6  | 8.6  | 8.6  | 4.2  | 4.2  | 4.2  | 4.2  | 4.2  | 4.2  |
| Actuated g/C Ratio     | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 |
| Clearance Time (s)     | 3.3  | 3.3  | 3.3  | 3.3  | 3.3  | 3.3  | 3.1  | 3.1  | 3.1  | 3.1  | 3.1  | 3.1  |
| Vehicle Extension (s)  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  | 2.0  |
| Lane Grp Cap (vph)     | 421  | 821  | 452  | 832  | 452  | 832  | 297  | 297  | 297  | 350  | 350  | 350  |
| v/s Ratio Prot         | 0.02 | 0.19 | 0.03 | 0.23 | 0.03 | 0.23 | 0.08 | 0.08 | 0.08 | 0.02 | 0.02 | 0.02 |
| v/s Ratio Perm         | 0.05 | 0.42 | 0.07 | 0.50 | 0.07 | 0.50 | 0.38 | 0.38 | 0.38 | 0.07 | 0.07 | 0.07 |
| Uniform Delay, d1      | 3.0  | 3.6  | 3.0  | 3.8  | 3.0  | 3.8  | 6.4  | 6.4  | 6.4  | 6.0  | 6.0  | 6.0  |
| Progression 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 |
| Incremental Delay, d2  | 0.0  | 0.1  | 0.0  | 0.2  | 0.0  | 0.2  | 0.3  | 0.3  | 0.3  | 0.0  | 0.0  | 0.0  |
| Delay (s)              | 3.0  | 3.7  | 3.0  | 4.0  | 3.0  | 4.0  | 6.7  | 6.7  | 6.7  | 6.0  | 6.0  | 6.0  |
| Level of Service       | A    | A    | A    | A    | A    | A    | A    | A    | A    | A    | A    | A    |
| Approach Delay (s)     | 3.7  | 3.7  | 3.7  | 3.9  | 3.7  | 3.9  | 6.7  | 6.7  | 6.7  | 6.0  | 6.0  | 6.0  |
| Approach LOS           | A    | A    | A    | A    | A    | A    | A    | A    | A    | A    | A    | A    |

|                                   |       |                           |  |
|-----------------------------------|-------|---------------------------|--|
| Intersection Summary              |       |                           |  |
| HCM 2000 Control Delay            | 4.3   | HCM 2000 Level of Service |  |
| HCM 2000 Volume to Capacity ratio | 0.46  | A                         |  |
| Actuated Cycle Length (s)         | 19.2  | Sum of lost time (s)      |  |
| Intersection Capacity Utilization | 48.1% | A                         |  |
| Analysis Period (min)             | 15    | ICU Level of Service      |  |
| c Critical Lane Group             |       |                           |  |

Traffic Study for the Santa Rosa Memorial Hospital  
PM Future

Synchro 8 Report

HCM Signalized Intersection Capacity Analysis  
4: Brookwood Avenue & Sonoma Avenue

09/07/2017

| Movement               | EBL   | EBT  | EBR  | WBL   | WBT   | WBR  | NBL  | NBT   | NBR  | SBL   | SBT  | SBR   |
|------------------------|-------|------|------|-------|-------|------|------|-------|------|-------|------|-------|
| Lane Configurations    | ↰     | ↱    | ↱    | ↰     | ↰     | ↰    | ↰    | ↱     | ↱    | ↱     | ↱    | ↱     |
| Traffic Volume (vph)   | 78    | 362  | 28   | 135   | 314   | 194  | 17   | 348   | 330  | 276   | 369  | 114   |
| Future Volume (vph)    | 78    | 362  | 28   | 135   | 314   | 194  | 17   | 348   | 330  | 276   | 369  | 114   |
| Ideal Flow (vphpl)     | 1900  | 1900 | 1900 | 1900  | 1900  | 1900 | 1900 | 1900  | 1900 | 1900  | 1900 | 1900  |
| Total Lost time (s)    | 3.0   | 3.6  |      | 3.0   | 3.6   |      | 3.0  | 3.2   |      | 3.0   | 3.6  | 3.0   |
| Lane Util. Factor      | 1.00  | 0.95 | 1.00 | 1.00  | 0.99  | 1.00 | 1.00 | 0.98  | 1.00 | 1.00  | 0.98 | 1.00  |
| Flpb. ped/bikes        | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00  | 1.00 | 1.00  |
| Flt                    | 1.00  | 0.99 | 1.00 | 1.00  | 0.94  | 1.00 | 1.00 | 0.93  | 1.00 | 1.00  | 1.00 | 0.85  |
| Flt Protected          | 0.95  | 1.00 | 0.95 | 1.00  | 0.95  | 1.00 | 0.95 | 1.00  | 0.95 | 1.00  | 1.00 | 1.00  |
| Satd. Flow (prot)      | 1767  | 3486 |      | 1762  | 3303  |      | 1770 | 1690  | 1770 | 1863  | 1545 |       |
| Flt Permitted          | 0.25  | 1.00 | 0.27 | 1.00  | 0.95  | 1.00 | 0.95 | 1.00  | 0.95 | 1.00  | 1.00 | 1.00  |
| Satd. Flow (perm)      | 471   | 3486 |      | 499   | 3303  |      | 1770 | 1690  | 1770 | 1863  | 1545 |       |
| Peak-hour factor, PHF  | 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. Flow (vph)        | 78    | 362  | 28   | 135   | 314   | 194  | 17   | 348   | 330  | 276   | 369  | 114   |
| RTOR Reduction (vph)   | 0     | 5    | 0    | 0     | 83    | 0    | 0    | 25    | 0    | 0     | 0    | 40    |
| Lane Group Flow (vph)  | 78    | 385  | 0    | 135   | 425   | 0    | 17   | 653   | 0    | 276   | 369  | 74    |
| Confl. Peds. (#/hr)    | 15    | 15   | 15   | 15    | 15    | 15   | 15   | 15    | 15   | 15    | 15   | 15    |
| Turn Type              | pm+pt | NA   | NA   | pm+pt | NA    | NA   | Prot | NA    | Prot | NA    | NA   | pm+ov |
| Protected Phases       | 5     | 2    |      | 1     | 6     |      | 3    | 8     |      | 7     | 4    | 5     |
| Permitted Phases       | 2     |      |      | 6     |       |      |      |       |      |       |      | 4     |
| Actuated Green, G (s)  | 23.9  | 15.8 |      | 27.7  | 17.7  |      | 3.0  | 41.9  |      | 15.1  | 53.6 | 61.7  |
| Effective Green, g (s) | 23.9  | 15.8 |      | 27.7  | 17.7  |      | 3.0  | 41.9  |      | 15.1  | 53.6 | 61.7  |
| Actuated g/C Ratio     | 0.25  | 0.17 |      | 0.29  | 0.19  |      | 0.03 | 0.44  |      | 0.16  | 0.56 | 0.65  |
| Clearance Time (s)     | 3.0   | 3.6  |      | 3.0   | 3.6   |      | 3.0  | 3.2   |      | 3.0   | 3.6  | 3.0   |
| Vehicle Extension (s)  | 2.0   | 2.0  |      | 2.0   | 2.0   |      | 2.0  | 2.0   |      | 2.0   | 2.0  | 2.0   |
| Lane Grp Cap (vph)     | 227   | 576  |      | 276   | 611   |      | 55   | 740   |      | 279   | 1044 | 997   |
| v/s Ratio Prot         | 0.03  | 0.11 |      | c0.05 | c0.13 |      | 0.01 | c0.39 |      | c0.16 | 0.20 | 0.01  |
| v/s Ratio Perm         | 0.06  |      |      | 0.09  |       |      |      |       |      | 0.99  | 0.35 | 0.07  |
| v/c Ratio              | 0.34  | 0.67 |      | 0.49  | 0.70  |      | 0.31 | 0.88  |      | 0.40  | 1.15 | 0.63  |
| Uniform Delay, d1      | 28.5  | 37.4 |      | 26.6  | 36.4  |      | 45.3 | 24.6  |      | 40.2  | 11.5 | 6.3   |
| Progression Factor     | 1.00  | 1.00 |      | 1.00  | 1.00  |      | 1.00 | 1.00  |      | 1.00  | 1.00 | 1.00  |
| Incremental Delay, d2  | 0.3   | 2.3  |      | 0.5   | 2.8   |      | 1.2  | 12.1  |      | 50.3  | 0.2  | 0.0   |
| Delay (s)              | 28.8  | 39.7 |      | 27.1  | 39.2  |      | 46.5 | 36.7  |      | 90.4  | 11.7 | 6.3   |
| Level of Service       | C     | D    |      | C     | D     |      | D    | D     |      | F     | B    | A     |
| Approach Delay (s)     |       | 37.9 |      |       | 36.7  |      |      | 36.9  |      |       | 39.5 |       |
| Approach LOS           |       | D    |      |       | D     |      |      | D     |      |       | D    |       |

| Intersection Summary              |  |       |  | HCM 2000 Level of Service |  |  |  |
|-----------------------------------|--|-------|--|---------------------------|--|--|--|
| HCM 2000 Control Delay            |  | 37.8  |  | D                         |  |  |  |
| HCM 2000 Volume to Capacity ratio |  | 0.84  |  | 13.2                      |  |  |  |
| Actuated Cycle Length (s)         |  | 95.6  |  | F                         |  |  |  |
| Intersection Capacity Utilization |  | 92.6% |  | 15                        |  |  |  |
| Analysis Period (min)             |  |       |  |                           |  |  |  |
| c Critical Lane Group             |  |       |  |                           |  |  |  |

HCM Signalized Intersection Capacity Analysis  
4: Brookwood Avenue & Sonoma Avenue

09/07/2017

| Movement               | EBL   | EBT  | EBR  | WBL   | WBT  | WBR  | NBL  | NBT   | NBR  | SBL   | SBT  | SBR   |
|------------------------|-------|------|------|-------|------|------|------|-------|------|-------|------|-------|
| Lane Configurations    | ↰     | ↱    | ↱    | ↰     | ↰    | ↰    | ↰    | ↱     | ↱    | ↱     | ↱    | ↱     |
| Traffic Volume (vph)   | 104   | 398  | 50   | 257   | 394  | 166  | 18   | 296   | 175  | 199   | 567  | 175   |
| Future Volume (vph)    | 104   | 398  | 50   | 257   | 394  | 166  | 18   | 296   | 175  | 199   | 567  | 175   |
| Ideal Flow (vphpl)     | 1900  | 1900 | 1900 | 1900  | 1900 | 1900 | 1900 | 1900  | 1900 | 1900  | 1900 | 1900  |
| Total Lost time (s)    | 3.0   | 3.6  |      | 3.0   | 3.6  |      | 3.0  | 3.2   |      | 3.0   | 3.6  | 3.0   |
| Lane Util. Factor      | 1.00  | 0.95 | 1.00 | 1.00  | 0.95 | 1.00 | 1.00 | 0.98  | 1.00 | 1.00  | 0.98 | 1.00  |
| Flpb. ped/bikes        | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00  | 1.00 | 1.00  |
| Flt                    | 1.00  | 0.98 | 1.00 | 1.00  | 0.96 | 1.00 | 1.00 | 0.94  | 1.00 | 1.00  | 0.85 | 1.00  |
| Flt Protected          | 0.95  | 1.00 | 0.95 | 1.00  | 0.95 | 1.00 | 0.95 | 1.00  | 0.95 | 1.00  | 1.00 | 1.00  |
| Satd. Flow (prot)      | 1767  | 3457 |      | 1764  | 3356 |      | 1770 | 1731  | 1770 | 1863  | 1549 |       |
| Flt Permitted          | 0.30  | 1.00 | 0.24 | 1.00  | 0.95 | 1.00 | 0.95 | 1.00  | 0.95 | 1.00  | 1.00 | 1.00  |
| Satd. Flow (perm)      | 500   | 3457 |      | 444   | 3356 |      | 1770 | 1731  | 1770 | 1863  | 1549 |       |
| Peak-hour factor, PHF  | 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. Flow (vph)        | 104   | 398  | 50   | 257   | 394  | 166  | 18   | 296   | 175  | 199   | 567  | 175   |
| RTOR Reduction (vph)   | 0     | 8    | 0    | 0     | 37   | 0    | 0    | 18    | 0    | 0     | 0    | 73    |
| Lane Group Flow (vph)  | 104   | 440  | 0    | 257   | 523  | 0    | 18   | 453   | 0    | 199   | 567  | 102   |
| Confl. Peds. (#/hr)    | 15    | 15   | 15   | 15    | 15   | 15   | 15   | 15    | 15   | 15    | 15   | 15    |
| Turn Type              | pm+pt | NA   | NA   | pm+pt | NA   | NA   | Prot | NA    | Prot | NA    | NA   | pm+ov |
| Protected Phases       | 5     | 2    |      | 1     | 6    |      | 3    | 8     |      | 7     | 4    | 5     |
| Permitted Phases       | 2     |      |      | 6     |      |      |      |       |      |       |      | 4     |
| Actuated Green, G (s)  | 26.0  | 17.0 |      | 33.3  | 21.3 |      | 2.7  | 30.9  |      | 15.3  | 43.1 | 52.1  |
| Effective Green, g (s) | 26.0  | 17.0 |      | 33.3  | 21.3 |      | 2.7  | 30.9  |      | 15.3  | 43.1 | 52.1  |
| Actuated g/C Ratio     | 0.29  | 0.19 |      | 0.37  | 0.24 |      | 0.03 | 0.35  |      | 0.17  | 0.48 | 0.58  |
| Clearance Time (s)     | 3.0   | 3.6  |      | 3.0   | 3.6  |      | 3.0  | 3.2   |      | 3.0   | 3.6  | 3.0   |
| Vehicle Extension (s)  | 2.0   | 2.0  |      | 2.0   | 2.0  |      | 2.0  | 2.0   |      | 2.0   | 2.0  | 2.0   |
| Lane Grp Cap (vph)     | 284   | 658  |      | 362   | 800  |      | 53   | 598   |      | 303   | 899  | 903   |
| v/s Ratio Prot         | 0.04  | 0.13 |      | c0.11 | 0.16 |      | 0.01 | c0.26 |      | c0.11 | 0.30 | 0.01  |
| v/s Ratio Perm         | 0.07  |      |      | c0.16 |      |      |      |       |      | 0.66  | 0.63 | 0.11  |
| v/c Ratio              | 0.37  | 0.67 |      | 0.71  | 0.65 |      | 0.34 | 0.76  |      | 0.34  | 1.15 | 0.83  |
| Uniform Delay, d1      | 24.0  | 33.5 |      | 21.4  | 30.7 |      | 42.4 | 25.9  |      | 34.5  | 17.2 | 8.3   |
| Progression Factor     | 1.00  | 1.00 |      | 1.00  | 1.00 |      | 1.00 | 1.00  |      | 1.00  | 1.00 | 1.00  |
| Incremental Delay, d2  | 0.3   | 2.0  |      | 5.2   | 1.5  |      | 1.4  | 5.5   |      | 3.9   | 1.5  | 0.0   |
| Delay (s)              | 24.3  | 35.5 |      | 26.5  | 32.1 |      | 43.8 | 31.4  |      | 38.4  | 18.6 | 8.3   |
| Level of Service       | C     | D    |      | C     | C    |      | D    | D     |      | D     | B    | A     |
| Approach Delay (s)     |       | 33.4 |      |       | 30.4 |      |      | 31.8  |      |       | 20.9 |       |
| Approach LOS           |       | C    |      |       | C    |      |      | C     |      |       | C    |       |

| Intersection Summary              |  |       |  | HCM 2000 Level of Service |  |  |  |
|-----------------------------------|--|-------|--|---------------------------|--|--|--|
| HCM 2000 Control Delay            |  | 28.0  |  | C                         |  |  |  |
| HCM 2000 Volume to Capacity ratio |  | 0.75  |  | 13.2                      |  |  |  |
| Actuated Cycle Length (s)         |  | 89.3  |  | D                         |  |  |  |
| Intersection Capacity Utilization |  | 78.7% |  | 15                        |  |  |  |
| Analysis Period (min)             |  |       |  |                           |  |  |  |
| c Critical Lane Group             |  |       |  |                           |  |  |  |

# HCM Unsignalized Intersection Capacity Analysis

5: Sonoma Avenue & Sotoyome Street

09/07/2017



| Movement               | EBL  | EBT  | WBT  | SBR  |
|------------------------|------|------|------|------|
| Lane Configurations    | EBL  | EBT  | WBT  | SBR  |
| Traffic Volume (veh/h) | 121  | 660  | 647  | 25   |
| Future Volume (Veh/h)  | 121  | 660  | 647  | 25   |
| Sign Control           | Free | Free | Free | Stop |
| Grade                  | 0%   | 0%   | 0%   | 0%   |
| Peak Hour Factor       | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 121  | 660  | 647  | 25   |
| Pedestrians            |      |      |      |      |
| Lane Width (ft)        |      |      |      |      |
| Walking Speed (ft/s)   |      |      |      |      |
| Percent Blockage       |      |      |      |      |
| Right turn flare (veh) |      |      |      |      |
| Median type            |      |      |      |      |
| Median storage (veh)   |      | 2    | 2    |      |
| Upstream signal (ft)   |      | 595  |      |      |
| pX platoon unblocked   |      |      |      | 0.88 |
| VC, conflicting volume | 672  |      |      | 1562 |
| VC1, stage 1 conf vol  |      |      |      | 660  |
| VC2, stage 2 conf vol  |      |      |      | 902  |
| VCu, unblocked vol     | 672  |      |      | 1570 |
| IC, single (s)         | 4.1  |      |      | 6.4  |
| IC, 2 stage (s)        |      |      |      | 5.4  |
| IF (s)                 | 2.2  |      |      | 3.5  |
| p0 queue free %        | 87   |      |      | 100  |
| CM capacity (veh/h)    | 919  |      |      | 284  |

| Direction, Lane #                 | EB 1 | EB 2 | WB 1  | SB 1 |
|-----------------------------------|------|------|-------|------|
| Volume Total                      | 121  | 660  | 672   | 86   |
| Volume Left                       | 121  | 0    | 0     | 0    |
| Volume Right                      | 0    | 0    | 25    | 86   |
| cSH                               | 919  | 1700 | 1700  | 463  |
| Volume to Capacity                | 0.13 | 0.39 | 0.40  | 0.19 |
| Queue Length 95th (ft)            | 11   | 0    | 0     | 17   |
| Control Delay (s)                 | 9.5  | 0.0  | 0.0   | 14.5 |
| Lane LOS                          | A    |      | B     | B    |
| Approach Delay (s)                | 1.5  |      | 0.0   | 14.5 |
| Approach LOS                      |      |      | B     |      |
| Intersection Summary              |      |      |       |      |
| Average Delay                     |      |      | 1.6   |      |
| Intersection Capacity Utilization |      |      | 48.9% | A    |
| Analysis Period (min)             |      |      | 15    |      |

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# HCM Unsignalized Intersection Capacity Analysis

5: Sonoma Avenue & Sotoyome Street

09/07/2017



| Movement               | EBL  | EBT  | WBT  | SBR  |
|------------------------|------|------|------|------|
| Lane Configurations    | EBL  | EBT  | WBT  | SBR  |
| Traffic Volume (veh/h) | 54   | 631  | 709  | 23   |
| Future Volume (Veh/h)  | 54   | 631  | 709  | 23   |
| Sign Control           | Free | Free | Free | Stop |
| Grade                  | 0%   | 0%   | 0%   | 0%   |
| Peak Hour Factor       | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph) | 54   | 631  | 709  | 23   |
| Pedestrians            |      |      |      |      |
| Lane Width (ft)        |      |      |      |      |
| Walking Speed (ft/s)   |      |      |      |      |
| Percent Blockage       |      |      |      |      |
| Right turn flare (veh) |      |      |      |      |
| Median type            |      |      |      |      |
| Median storage (veh)   |      | 2    | 2    |      |
| Upstream signal (ft)   |      | 595  |      |      |
| pX platoon unblocked   |      |      |      | 0.85 |
| VC, conflicting volume | 732  |      |      | 1480 |
| VC1, stage 1 conf vol  |      |      |      | 720  |
| VC2, stage 2 conf vol  |      |      |      | 739  |
| VCu, unblocked vol     | 732  |      |      | 1453 |
| IC, single (s)         | 4.1  |      |      | 6.4  |
| IC, 2 stage (s)        |      |      |      | 5.4  |
| IF (s)                 | 2.2  |      |      | 3.5  |
| p0 queue free %        | 94   |      |      | 100  |
| CM capacity (veh/h)    | 873  |      |      | 334  |

| Direction, Lane #                 | EB 1 | EB 2 | WB 1  | SB 1 |
|-----------------------------------|------|------|-------|------|
| Volume Total                      | 54   | 631  | 732   | 122  |
| Volume Left                       | 54   | 0    | 0     | 0    |
| Volume Right                      | 0    | 0    | 23    | 122  |
| cSH                               | 873  | 1700 | 1700  | 428  |
| Volume to Capacity                | 0.06 | 0.37 | 0.43  | 0.29 |
| Queue Length 95th (ft)            | 5    | 0    | 0     | 29   |
| Control Delay (s)                 | 9.4  | 0.0  | 0.0   | 16.7 |
| Lane LOS                          | A    |      | C     | C    |
| Approach Delay (s)                | 0.7  |      | 0.0   | 16.7 |
| Approach LOS                      |      |      | C     |      |
| Intersection Summary              |      |      |       |      |
| Average Delay                     |      |      | 1.7   |      |
| Intersection Capacity Utilization |      |      | 52.9% | A    |
| Analysis Period (min)             |      |      | 15    |      |

Traffic Study for the Santa Rosa Memorial Hospital  
PM Future

Synchro 8 Report

# HCM Unsignalized Intersection Capacity Analysis

6: Doyle Park Drive & Sonoma Avenue

09/07/2017

| Movement                          | EBL  | EBT  | EBR   | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|-----------------------------------|------|------|-------|------|------|------|------|------|------|------|------|------|
| Lane Configurations               | EBL  | EBT  | EBR   | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
| Traffic Volume (veh/h)            | 104  | 404  | 64    | 49   | 580  | 32   | 57   | 3    | 36   | 11   | 1    | 57   |
| Future Volume (Veh/h)             | 104  | 404  | 64    | 49   | 580  | 32   | 57   | 3    | 36   | 11   | 1    | 57   |
| Sign Control                      | Free | Free | Free  | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop |
| Grade                             | 0%   | 0%   | 0%    | 0%   | 0%   | 0%   | 0%   | 0%   | 0%   | 0%   | 0%   | 0%   |
| Peak Hour Factor                  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph)            | 104  | 404  | 64    | 49   | 580  | 32   | 57   | 3    | 36   | 11   | 1    | 57   |
| Pedestrians                       |      |      |       |      |      |      |      |      |      |      |      |      |
| Lane Width (ft)                   |      |      |       |      |      |      |      |      |      |      |      |      |
| Walking Speed (ft/s)              |      |      |       |      |      |      |      |      |      |      |      |      |
| Percent Blockage                  |      |      |       |      |      |      |      |      |      |      |      |      |
| Right turn flare (veh)            |      |      |       |      |      |      |      |      | 1    |      |      |      |
| Median type                       |      |      |       |      |      |      |      |      |      |      |      |      |
| Median storage (veh)              |      |      |       |      |      |      |      |      |      |      |      |      |
| Upstream signal (ft)              |      |      |       |      |      |      |      |      |      |      |      |      |
| pX platoon unblocked              |      |      |       |      |      |      |      |      |      |      |      |      |
| VC, conflicting volume            | 612  |      |       | 468  |      |      | 1380 | 1354 | 436  | 1326 | 1370 | 596  |
| VC1, stage 1 conf vol             |      |      |       |      |      |      | 644  | 644  |      | 694  |      | 694  |
| VC2, stage 2 conf vol             |      |      |       |      |      |      | 736  | 710  |      | 632  |      | 676  |
| VCu, unblocked vol                | 612  |      |       | 468  |      |      | 1380 | 1354 | 436  | 1326 | 1370 | 596  |
| IC, single (s)                    | 4.1  |      |       | 4.1  |      |      | 7.1  | 6.5  | 6.2  | 7.1  | 6.5  | 6.2  |
| IC, 2 stage (s)                   |      |      |       |      |      |      | 6.1  | 5.5  |      | 6.1  | 5.5  |      |
| IF (s)                            | 2.2  |      |       | 2.2  |      |      | 3.5  | 4.0  | 3.3  | 3.5  | 4.0  | 3.3  |
| p0 queue free %                   | 89   |      |       | 96   |      |      | 74   | 99   | 94   | 96   | 100  | 89   |
| CM capacity (veh/h)               | 967  |      |       | 1094 |      |      | 219  | 270  | 620  | 278  | 290  | 504  |
| Direction, Lane #                 | EB 1 | EB 2 | WB 1  | WB 2 | NB 1 | SB 1 |      |      |      |      |      |      |
| Volume Total                      | 104  | 468  | 49    | 612  | 96   | 69   |      |      |      |      |      |      |
| Volume Left                       | 104  | 0    | 49    | 0    | 57   | 11   |      |      |      |      |      |      |
| Volume Right                      | 0    | 64   | 0     | 32   | 36   | 57   |      |      |      |      |      |      |
| cSH                               | 967  | 1700 | 1094  | 1700 | 354  | 442  |      |      |      |      |      |      |
| Volume to Capacity                | 0.11 | 0.28 | 0.04  | 0.36 | 0.27 | 0.16 |      |      |      |      |      |      |
| Queue Length 95th (ft)            | 9    | 0    | 4     | 0    | 27   | 14   |      |      |      |      |      |      |
| Control Delay (s)                 | 9.2  | 0.0  | 8.4   | 0.0  | 21.2 | 14.7 |      |      |      |      |      |      |
| Lane LOS                          | A    | A    | A     | A    | C    | B    |      |      |      |      |      |      |
| Approach Delay (s)                | 1.7  |      | 0.6   |      | 21.2 | 14.7 |      |      |      |      |      |      |
| Approach LOS                      |      |      |       |      | C    | B    |      |      |      |      |      |      |
| Intersection Summary              |      |      |       |      |      |      |      |      |      |      |      |      |
| Average Delay                     |      |      | 3.2   |      |      |      |      |      |      |      |      |      |
| Intersection Capacity Utilization |      |      | 59.1% |      |      |      |      |      |      |      |      |      |
| Analysis Period (min)             |      |      | 15    |      |      |      |      |      |      |      |      |      |

Traffic Study for the Santa Rosa Memorial Hospital  
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Synchro 8 Report

# HCM Unsignalized Intersection Capacity Analysis

6: Doyle Park Drive & Sonoma Avenue

09/07/2017

| Movement                          | EBL  | EBT  | EBR   | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|-----------------------------------|------|------|-------|------|------|------|------|------|------|------|------|------|
| Lane Configurations               | EBL  | EBT  | EBR   | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
| Traffic Volume (veh/h)            | 41   | 694  | 36    | 15   | 390  | 14   | 26   | 5    | 24   | 21   | 7    | 152  |
| Future Volume (Veh/h)             | 41   | 694  | 36    | 15   | 390  | 14   | 26   | 5    | 24   | 21   | 7    | 152  |
| Sign Control                      | Free | Free | Free  | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop |
| Grade                             | 0%   | 0%   | 0%    | 0%   | 0%   | 0%   | 0%   | 0%   | 0%   | 0%   | 0%   | 0%   |
| Peak Hour Factor                  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Hourly flow rate (vph)            | 41   | 694  | 36    | 15   | 390  | 14   | 26   | 5    | 24   | 21   | 7    | 152  |
| Pedestrians                       |      |      |       |      |      |      |      |      |      |      |      |      |
| Lane Width (ft)                   |      |      |       |      |      |      |      |      |      |      |      |      |
| Walking Speed (ft/s)              |      |      |       |      |      |      |      |      |      |      |      |      |
| Percent Blockage                  |      |      |       |      |      |      |      |      |      |      |      |      |
| Right turn flare (veh)            |      |      |       |      |      |      |      |      | 1    |      |      |      |
| Median type                       |      |      |       |      |      |      |      |      |      |      |      |      |
| Median storage (veh)              |      |      |       |      |      |      |      |      |      |      |      |      |
| Upstream signal (ft)              |      |      |       |      |      |      |      |      |      |      |      |      |
| pX platoon unblocked              |      |      |       |      |      |      |      |      |      |      |      |      |
| VC, conflicting volume            | 404  |      |       | 730  |      |      | 1370 | 1228 | 712  | 1218 | 1239 | 397  |
| VC1, stage 1 conf vol             |      |      |       |      |      |      | 794  | 794  |      | 427  |      | 427  |
| VC2, stage 2 conf vol             |      |      |       |      |      |      | 576  | 434  |      | 790  |      | 812  |
| VCu, unblocked vol                | 404  |      |       | 730  |      |      | 1370 | 1228 | 712  | 1218 | 1239 | 397  |
| IC, single (s)                    | 4.1  |      |       | 4.1  |      |      | 7.1  | 6.5  | 6.2  | 7.1  | 6.5  | 6.2  |
| IC, 2 stage (s)                   |      |      |       |      |      |      | 6.1  | 5.5  |      | 6.1  | 5.5  |      |
| IF (s)                            | 2.2  |      |       | 2.2  |      |      | 3.5  | 4.0  | 3.3  | 3.5  | 4.0  | 3.3  |
| p0 queue free %                   | 96   |      |       | 98   |      |      | 90   | 99   | 94   | 93   | 98   | 77   |
| CM capacity (veh/h)               | 1155 |      |       | 874  |      |      | 256  | 338  | 432  | 302  | 329  | 652  |
| Direction, Lane #                 | EB 1 | EB 2 | WB 1  | WB 2 | NB 1 | SB 1 |      |      |      |      |      |      |
| Volume Total                      | 41   | 730  | 15    | 404  | 55   | 180  |      |      |      |      |      |      |
| Volume Left                       | 41   | 0    | 15    | 0    | 26   | 21   |      |      |      |      |      |      |
| Volume Right                      | 0    | 36   | 0     | 14   | 24   | 152  |      |      |      |      |      |      |
| cSH                               | 1155 | 1700 | 874   | 1700 | 478  | 556  |      |      |      |      |      |      |
| Volume to Capacity                | 0.04 | 0.43 | 0.02  | 0.24 | 0.12 | 0.32 |      |      |      |      |      |      |
| Queue Length 95th (ft)            | 3    | 0    | 1     | 0    | 10   | 35   |      |      |      |      |      |      |
| Control Delay (s)                 | 8.2  | 0.0  | 9.2   | 0.0  | 17.3 | 14.5 |      |      |      |      |      |      |
| Lane LOS                          | A    | A    | A     | A    | C    | B    |      |      |      |      |      |      |
| Approach Delay (s)                | 0.4  |      | 0.3   |      | 17.3 | 14.5 |      |      |      |      |      |      |
| Approach LOS                      |      |      |       |      | C    | B    |      |      |      |      |      |      |
| Intersection Summary              |      |      |       |      |      |      |      |      |      |      |      |      |
| Average Delay                     |      |      | 2.8   |      |      |      |      |      |      |      |      |      |
| Intersection Capacity Utilization |      |      | 63.0% |      |      |      |      |      |      |      |      |      |
| Analysis Period (min)             |      |      | 15    |      |      |      |      |      |      |      |      |      |

Traffic Study for the Santa Rosa Memorial Hospital  
PM Future

Synchro 8 Report

# HCM Signalized Intersection Capacity Analysis

1: Brookwood Avenue & 3rd Street

1/4/2017

| Movement                          | EBL                                                                                 | EBT                                                                                 | EBR                                                                                 | WBL                                                                                 | WBT                                                                                 | WBR                                                                                 | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |      |
|-----------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------|
| Lane Configurations               |  |  |  |  |  |  |  |  |  |  |  |  |      |
| Traffic Volume (vph)              | 82                                                                                  | 157                                                                                 | 17                                                                                  | 6                                                                                   | 86                                                                                  | 106                                                                                 | 19                                                                                  | 254                                                                                 | 8                                                                                   | 89                                                                                  | 343                                                                                 | 58                                                                                  |      |
| Future Volume (vph)               | 82                                                                                  | 157                                                                                 | 17                                                                                  | 6                                                                                   | 86                                                                                  | 106                                                                                 | 19                                                                                  | 254                                                                                 | 8                                                                                   | 89                                                                                  | 343                                                                                 | 58                                                                                  |      |
| Ideal Flow (vphpl)                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |      |
| Total Lost time (s)               | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.6                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.2                                                                                 |                                                                                     |      |
| Lane Util. Factor                 | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                | 0.95                                                                                |      |
| Flpb. ped/bikes                   | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 0.99                                                                                |      |
| Flt                               | 1.00                                                                                | 0.99                                                                                | 1.00                                                                                | 1.00                                                                                | 0.92                                                                                | 1.00                                                                                | 0.92                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 0.98                                                                                |                                                                                     |      |
| Flt Protected                     | 0.95                                                                                | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                |      |
| Satd. Flow (prot)                 | 1770                                                                                | 1832                                                                                | 1770                                                                                | 1677                                                                                | 1770                                                                                | 1677                                                                                | 1770                                                                                | 3517                                                                                | 1770                                                                                | 3437                                                                                |                                                                                     |                                                                                     |      |
| Flt Permitted                     | 0.95                                                                                | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                |      |
| Satd. Flow (perm)                 | 1770                                                                                | 1832                                                                                | 1770                                                                                | 1677                                                                                | 1770                                                                                | 1677                                                                                | 1770                                                                                | 3517                                                                                | 1770                                                                                | 3437                                                                                |                                                                                     |                                                                                     |      |
| Peak-hour factor, PHF             | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                | 0.92                                                                                |      |
| Adj. Flow (vph)                   | 89                                                                                  | 171                                                                                 | 18                                                                                  | 7                                                                                   | 93                                                                                  | 115                                                                                 | 21                                                                                  | 276                                                                                 | 9                                                                                   | 97                                                                                  | 373                                                                                 | 63                                                                                  |      |
| RTOR Reduction (vph)              | 0                                                                                   | 4                                                                                   | 0                                                                                   | 0                                                                                   | 54                                                                                  | 0                                                                                   | 0                                                                                   | 3                                                                                   | 0                                                                                   | 0                                                                                   | 14                                                                                  | 0                                                                                   |      |
| Lane Group Flow (vph)             | 89                                                                                  | 185                                                                                 | 0                                                                                   | 7                                                                                   | 154                                                                                 | 0                                                                                   | 21                                                                                  | 282                                                                                 | 0                                                                                   | 97                                                                                  | 422                                                                                 | 0                                                                                   |      |
| Confl. Peds. (#/hr)               | 20                                                                                  | 20                                                                                  | 20                                                                                  | 20                                                                                  | 20                                                                                  | 20                                                                                  | 20                                                                                  | 20                                                                                  | 20                                                                                  | 20                                                                                  | 20                                                                                  | 20                                                                                  |      |
| Turn Type                         | Prot                                                                                | NA                                                                                  | Prot                                                                                | NA                                                                                  | NA                                                                                  | NA                                                                                  | Prot                                                                                | NA                                                                                  | Prot                                                                                | NA                                                                                  | Prot                                                                                | NA                                                                                  |      |
| Protected Phases                  | 5                                                                                   | 2                                                                                   |                                                                                     | 1                                                                                   | 6                                                                                   |                                                                                     | 3                                                                                   | 8                                                                                   |                                                                                     | 7                                                                                   | 4                                                                                   |                                                                                     |      |
| Permitted Phases                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     | 6                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |      |
| Actuated Green, G (s)             | 5.1                                                                                 | 19.0                                                                                |                                                                                     | 1.0                                                                                 | 14.9                                                                                |                                                                                     | 1.0                                                                                 | 13.6                                                                                |                                                                                     | 6.9                                                                                 | 19.9                                                                                |                                                                                     |      |
| Effective Green, g (s)            | 5.1                                                                                 | 19.0                                                                                |                                                                                     | 1.0                                                                                 | 14.9                                                                                |                                                                                     | 1.0                                                                                 | 13.6                                                                                |                                                                                     | 6.9                                                                                 | 19.9                                                                                |                                                                                     |      |
| Actuated g/C Ratio                | 0.10                                                                                | 0.36                                                                                |                                                                                     | 0.02                                                                                | 0.28                                                                                |                                                                                     | 0.02                                                                                | 0.26                                                                                |                                                                                     | 0.13                                                                                | 0.37                                                                                |                                                                                     |      |
| Clearance Time (s)                | 3.0                                                                                 | 3.0                                                                                 |                                                                                     | 3.0                                                                                 | 3.0                                                                                 |                                                                                     | 3.0                                                                                 | 3.6                                                                                 |                                                                                     | 3.0                                                                                 | 3.2                                                                                 |                                                                                     |      |
| Vehicle Extension (s)             | 3.0                                                                                 | 3.0                                                                                 |                                                                                     | 3.0                                                                                 | 3.0                                                                                 |                                                                                     | 3.0                                                                                 | 3.0                                                                                 |                                                                                     | 3.0                                                                                 | 3.0                                                                                 |                                                                                     |      |
| Lane Grp Cap (vph)                | 170                                                                                 | 655                                                                                 |                                                                                     | 33                                                                                  | 470                                                                                 |                                                                                     | 33                                                                                  | 900                                                                                 |                                                                                     | 230                                                                                 | 1288                                                                                |                                                                                     |      |
| v/s Ratio Prot                    | c0.05                                                                               | c0.10                                                                               |                                                                                     | 0.00                                                                                | 0.09                                                                                |                                                                                     | 0.01                                                                                | 0.08                                                                                |                                                                                     | c0.05                                                                               | c0.12                                                                               |                                                                                     |      |
| v/s Ratio Perm                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |      |
| v/c Ratio                         | 0.52                                                                                | 0.28                                                                                |                                                                                     | 0.21                                                                                | 0.33                                                                                |                                                                                     | 0.64                                                                                | 0.31                                                                                |                                                                                     | 0.42                                                                                | 0.33                                                                                |                                                                                     |      |
| Uniform Delay, d1                 | 22.8                                                                                | 12.2                                                                                |                                                                                     | 25.7                                                                                | 15.1                                                                                |                                                                                     | 25.9                                                                                | 16.0                                                                                |                                                                                     | 21.3                                                                                | 11.8                                                                                |                                                                                     |      |
| Progression Factor                | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                | 1.00                                                                                |                                                                                     |      |
| Incremental Delay, d2             | 2.9                                                                                 | 0.2                                                                                 |                                                                                     | 3.2                                                                                 | 0.4                                                                                 |                                                                                     | 33.9                                                                                | 0.2                                                                                 |                                                                                     | 1.2                                                                                 | 0.1                                                                                 |                                                                                     |      |
| Delay (s)                         | 25.7                                                                                | 12.4                                                                                |                                                                                     | 28.9                                                                                | 15.5                                                                                |                                                                                     | 59.7                                                                                | 16.2                                                                                |                                                                                     | 22.5                                                                                | 12.0                                                                                |                                                                                     |      |
| Level of Service                  | C                                                                                   | B                                                                                   |                                                                                     | C                                                                                   | B                                                                                   |                                                                                     | E                                                                                   | B                                                                                   |                                                                                     | C                                                                                   | B                                                                                   |                                                                                     |      |
| Approach Delay (s)                | 16.7                                                                                |                                                                                     |                                                                                     | 16.0                                                                                |                                                                                     |                                                                                     | 19.2                                                                                |                                                                                     |                                                                                     | 13.9                                                                                |                                                                                     |                                                                                     |      |
| Approach LOS                      | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |                                                                                     |      |
| Intersection Summary              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |      |
| HCM 2000 Control Delay            | 16.0                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     | HCM 2000 Level of Service                                                           |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     | B    |
| HCM 2000 Volume to Capacity ratio | 0.39                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |      |
| Actuated Cycle Length (s)         | 53.1                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     | Sum of lost time (s)                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     | 12.6 |
| Intersection Capacity Utilization | 54.9%                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     | ICU Level of Service                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     | A    |
| Analysis Period (min)             | 15                                                                                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |      |
| Critical Lane Group               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |      |

Traffic Study for the Santa Rosa Memorial Hospital  
AM Existing plus Project

Synchro 8 Report

# HCM Signalized Intersection Capacity Analysis

1: Brookwood Avenue & 3rd Street

12/14/2016

| Movement                          | EBL   | EBT  | EBR  | WBL  | WBT   | WBR  | NBL                       | NBT  | NBR  | SBL   | SBT   | SBR  |
|-----------------------------------|-------|------|------|------|-------|------|---------------------------|------|------|-------|-------|------|
| Lane Configurations               | ↰     | ↱    | ↲    | ↰    | ↱     | ↲    | ↰                         | ↱    | ↲    | ↰     | ↱     | ↲    |
| Traffic Volume (vph)              | 133   | 149  | 19   | 14   | 165   | 170  | 24                        | 333  | 10   | 68    | 320   | 54   |
| Future Volume (vph)               | 133   | 149  | 19   | 14   | 165   | 170  | 24                        | 333  | 10   | 68    | 320   | 54   |
| Ideal Flow (vphpl)                | 1900  | 1900 | 1900 | 1900 | 1900  | 1900 | 1900                      | 1900 | 1900 | 1900  | 1900  | 1900 |
| Total Lost time (s)               | 3.0   | 3.0  | 3.0  | 3.0  | 3.0   | 3.0  | 3.0                       | 3.6  | 3.0  | 3.0   | 3.2   |      |
| Lane Util. Factor                 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00                      | 0.95 | 1.00 | 0.95  | 1.00  | 0.95 |
| Flpb. ped/bikes                   | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00                      | 1.00 | 1.00 | 1.00  | 1.00  | 1.00 |
| Flt                               | 1.00  | 0.98 | 1.00 | 1.00 | 0.92  | 1.00 | 1.00                      | 1.00 | 1.00 | 1.00  | 0.98  |      |
| Flt Protected                     | 0.95  | 1.00 | 0.95 | 1.00 | 0.95  | 1.00 | 0.95                      | 1.00 | 0.95 | 1.00  | 0.95  | 1.00 |
| Satd. Flow (prot)                 | 1770  | 1825 | 1770 | 1695 | 1770  | 1695 | 1770                      | 3519 | 1770 | 3435  |       |      |
| Flt Permitted                     | 0.95  | 1.00 | 0.95 | 1.00 | 0.95  | 1.00 | 0.95                      | 1.00 | 0.95 | 1.00  | 0.95  | 1.00 |
| Satd. Flow (perm)                 | 1770  | 1825 | 1770 | 1695 | 1770  | 1695 | 1770                      | 3519 | 1770 | 3435  |       |      |
| Peak-hour factor, PHF             | 0.92  | 0.92 | 0.92 | 0.92 | 0.92  | 0.92 | 0.92                      | 0.92 | 0.92 | 0.92  | 0.92  | 0.92 |
| Adj. Flow (vph)                   | 145   | 162  | 21   | 15   | 179   | 185  | 26                        | 362  | 11   | 74    | 348   | 59   |
| RTOR Reduction (vph)              | 0     | 4    | 0    | 0    | 39    | 0    | 0                         | 2    | 0    | 0     | 16    | 0    |
| Lane Group Flow (vph)             | 145   | 179  | 0    | 15   | 325   | 0    | 26                        | 371  | 0    | 74    | 391   | 0    |
| Confl. Peds. (#/hr)               | 20    | 20   | 20   | 20   | 20    | 20   | 20                        | 20   | 20   | 20    | 20    | 20   |
| Turn Type                         | Prot  | NA   | NA   | Prot | NA    | NA   | Prot                      | NA   | Prot | NA    | Prot  | NA   |
| Protected Phases                  | 5     | 2    |      | 1    | 6     |      | 3                         | 8    |      | 7     | 4     |      |
| Permitted Phases                  |       |      |      |      |       | 6    |                           |      |      |       |       |      |
| Actuated Green, G (s)             | 7.9   | 26.8 |      | 1.1  | 20.0  |      | 2.5                       | 14.2 |      | 4.7   | 16.8  |      |
| Effective Green, g (s)            | 7.9   | 26.8 |      | 1.1  | 20.0  |      | 2.5                       | 14.2 |      | 4.7   | 16.8  |      |
| Actuated g/C Ratio                | 0.13  | 0.45 |      | 0.02 | 0.34  |      | 0.04                      | 0.24 |      | 0.08  | 0.28  |      |
| Clearance Time (s)                | 3.0   | 3.0  |      | 3.0  | 3.0   |      | 3.0                       | 3.6  |      | 3.0   | 3.2   |      |
| Vehicle Extension (s)             | 3.0   | 3.0  |      | 3.0  | 3.0   |      | 3.0                       | 3.0  |      | 3.0   | 3.0   |      |
| Lane Grp Cap (vph)                | 235   | 823  |      | 32   | 570   |      | 74                        | 841  |      | 140   | 971   |      |
| v/s Ratio Prot                    | c0.08 | 0.10 |      | 0.01 | c0.19 |      | 0.01                      | 0.11 |      | c0.04 | c0.11 |      |
| v/s Ratio Perm                    |       |      |      |      |       |      |                           |      |      |       |       |      |
| v/c Ratio                         | 0.62  | 0.22 |      | 0.47 | 0.57  |      | 0.35                      | 0.44 |      | 0.53  | 0.40  |      |
| Uniform Delay, d1                 | 24.3  | 9.9  |      | 28.9 | 16.2  |      | 27.7                      | 19.2 |      | 26.3  | 17.2  |      |
| Progression Factor                | 1.00  | 1.00 |      | 1.00 | 1.00  |      | 1.00                      | 1.00 |      | 1.00  | 1.00  |      |
| Incremental Delay, d2             | 4.8   | 0.1  |      | 10.5 | 1.3   |      | 2.9                       | 0.4  |      | 3.6   | 0.3   |      |
| Delay (s)                         | 29.1  | 10.1 |      | 39.3 | 17.5  |      | 30.5                      | 19.6 |      | 29.9  | 17.5  |      |
| Level of Service                  | C     | B    |      | D    | B     |      | C                         | B    |      | C     | B     |      |
| Approach Delay (s)                | 18.5  |      |      | 18.3 |       |      | 20.3                      |      |      | 19.4  |       |      |
| Approach LOS                      | B     |      |      | B    |       |      | C                         |      |      | B     |       |      |
| Intersection Summary              |       |      |      |      |       |      |                           |      |      |       |       |      |
| HCM 2000 Control Delay            | 19.2  |      |      |      |       |      | HCM 2000 Level of Service |      |      |       |       |      |
| HCM 2000 Volume to Capacity ratio | 0.53  |      |      |      |       |      | B                         |      |      |       |       |      |
| Actuated Cycle Length (s)         | 59.4  |      |      |      |       |      | Sum of lost time (s)      |      |      |       |       |      |
| Intersection Capacity Utilization | 61.0% |      |      |      |       |      | ICU Level of Service      |      |      |       |       |      |
| Analysis Period (min)             | 15    |      |      |      |       |      | B                         |      |      |       |       |      |
| Critical Lane Group               |       |      |      |      |       |      |                           |      |      |       |       |      |

Traffic Study for the Santa Rosa Memorial Hospital  
PM Existing plus Project

Synchro 8 Report

HCM Signalized Intersection Capacity Analysis  
2. Sotoyome Street & Montgomery Drive

1/4/2017

| Movement                          | EBL                                                                                 | EBT                                                                                 | EBR  | WBL                                                                                 | WBT                                                                                 | WBR  | NBL   | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
|-----------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------|-------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Lane Configurations               |  |  |      |  |  |      |       |  |  |  |  |  |
| Traffic Volume (vph)              | 22                                                                                  | 228                                                                                 | 62   | 65                                                                                  | 296                                                                                 | 11   | 29    | 11                                                                                  | 76                                                                                  | 4                                                                                   | 12                                                                                  | 13                                                                                  |
| Future Volume (vph)               | 22                                                                                  | 228                                                                                 | 62   | 65                                                                                  | 296                                                                                 | 11   | 29    | 11                                                                                  | 76                                                                                  | 4                                                                                   | 12                                                                                  | 13                                                                                  |
| Ideal Flow (vphpl)                | 1900                                                                                | 1900                                                                                | 1900 | 1900                                                                                | 1900                                                                                | 1900 | 1900  | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               | 3.2                                                                                 | 3.2                                                                                 |      | 3.2                                                                                 | 3.2                                                                                 |      |       | 3.0                                                                                 | 3.0                                                                                 |                                                                                     | 3.0                                                                                 |                                                                                     |
| Lane Util. Factor                 | 1.00                                                                                | 1.00                                                                                |      | 1.00                                                                                | 1.00                                                                                |      |       | 1.00                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |                                                                                     |
| Flpb. ped/bikes                   | 1.00                                                                                | 0.99                                                                                |      | 1.00                                                                                | 1.00                                                                                |      |       | 1.00                                                                                | 0.96                                                                                |                                                                                     | 1.00                                                                                |                                                                                     |
| Flpb. ped/bikes                   | 0.99                                                                                | 1.00                                                                                |      | 0.99                                                                                | 1.00                                                                                |      |       | 0.94                                                                                | 1.00                                                                                |                                                                                     | 1.00                                                                                |                                                                                     |
| Frt                               | 1.00                                                                                | 0.97                                                                                |      | 1.00                                                                                | 0.99                                                                                |      |       | 1.00                                                                                | 0.85                                                                                |                                                                                     | 0.94                                                                                |                                                                                     |
| Flt Protected                     | 0.95                                                                                | 1.00                                                                                |      | 0.95                                                                                | 1.00                                                                                |      |       | 0.97                                                                                | 1.00                                                                                |                                                                                     | 0.99                                                                                |                                                                                     |
| Satd. Flow (prot)                 | 1745                                                                                | 1789                                                                                |      | 1750                                                                                | 1850                                                                                |      |       | 1689                                                                                | 1517                                                                                |                                                                                     | 1651                                                                                |                                                                                     |
| Flt Permitted                     | 0.54                                                                                | 1.00                                                                                |      | 0.56                                                                                | 1.00                                                                                |      |       | 0.86                                                                                | 1.00                                                                                |                                                                                     | 0.98                                                                                |                                                                                     |
| Satd. Flow (perm)                 | 994                                                                                 | 1789                                                                                |      | 1026                                                                                | 1850                                                                                |      |       | 1498                                                                                | 1517                                                                                |                                                                                     | 1628                                                                                |                                                                                     |
| Peak-hour factor, PHF             | 0.93                                                                                | 0.93                                                                                | 0.93 | 0.93                                                                                | 0.93                                                                                | 0.93 | 0.93  | 0.93                                                                                | 0.93                                                                                | 0.93                                                                                | 0.93                                                                                | 0.93                                                                                |
| Adj. Flow (vph)                   | 24                                                                                  | 245                                                                                 | 67   | 70                                                                                  | 318                                                                                 | 12   | 31    | 12                                                                                  | 82                                                                                  | 4                                                                                   | 13                                                                                  | 14                                                                                  |
| RTOR Reduction (vph)              | 0                                                                                   | 20                                                                                  | 0    | 0                                                                                   | 3                                                                                   | 0    | 0     | 0                                                                                   | 59                                                                                  | 0                                                                                   | 10                                                                                  | 0                                                                                   |
| Lane Group Flow (vph)             | 24                                                                                  | 292                                                                                 | 0    | 70                                                                                  | 327                                                                                 | 0    | 0     | 43                                                                                  | 23                                                                                  | 0                                                                                   | 21                                                                                  | 0                                                                                   |
| Confl. Peds. (#/hr)               | 24                                                                                  | 18                                                                                  | 18   | 24                                                                                  | 109                                                                                 | 24   | 109   | 28                                                                                  | 28                                                                                  | 28                                                                                  | 109                                                                                 | 109                                                                                 |
| Turn Type                         | Perm                                                                                | NA                                                                                  | Perm | NA                                                                                  | NA                                                                                  | Perm | NA    | Perm                                                                                | NA                                                                                  | Perm                                                                                | NA                                                                                  | NA                                                                                  |
| Protected Phases                  | 2                                                                                   | 2                                                                                   |      | 2                                                                                   | 2                                                                                   |      | 4     | 4                                                                                   | 4                                                                                   | 4                                                                                   | 4                                                                                   | 4                                                                                   |
| Permitted Phases                  | 2                                                                                   | 2                                                                                   |      | 2                                                                                   | 2                                                                                   |      | 4     | 4                                                                                   | 4                                                                                   | 4                                                                                   | 4                                                                                   | 4                                                                                   |
| Actuated Green, G (s)             | 23.7                                                                                | 23.7                                                                                |      | 23.7                                                                                | 23.7                                                                                |      | 11.8  | 11.8                                                                                | 11.8                                                                                | 11.8                                                                                | 11.8                                                                                | 11.8                                                                                |
| Effective Green, g (s)            | 23.7                                                                                | 23.7                                                                                |      | 23.7                                                                                | 23.7                                                                                |      | 11.8  | 11.8                                                                                | 11.8                                                                                | 11.8                                                                                | 11.8                                                                                | 11.8                                                                                |
| Actuated g/C Ratio                | 0.57                                                                                | 0.57                                                                                |      | 0.57                                                                                | 0.57                                                                                |      | 0.28  | 0.28                                                                                | 0.28                                                                                | 0.28                                                                                | 0.28                                                                                | 0.28                                                                                |
| Clearance Time (s)                | 3.2                                                                                 | 3.2                                                                                 |      | 3.2                                                                                 | 3.2                                                                                 |      | 3.0   | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 |
| Vehicle Extension (s)             | 3.0                                                                                 | 3.0                                                                                 |      | 3.0                                                                                 | 3.0                                                                                 |      | 2.0   | 2.0                                                                                 | 2.0                                                                                 | 2.0                                                                                 | 2.0                                                                                 | 2.0                                                                                 |
| Lane Grp Cap (vph)                | 564                                                                                 | 1016                                                                                |      | 583                                                                                 | 1051                                                                                |      | 423   | 429                                                                                 | 460                                                                                 | 460                                                                                 | 460                                                                                 | 460                                                                                 |
| v/s Ratio Prot                    | 0.16                                                                                |                                                                                     |      | c0.18                                                                               |                                                                                     |      |       |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| v/s Ratio Perm                    | 0.02                                                                                |                                                                                     |      | 0.07                                                                                |                                                                                     |      | c0.03 | 0.02                                                                                |                                                                                     |                                                                                     | 0.01                                                                                |                                                                                     |
| v/s Ratio                         | 0.04                                                                                | 0.29                                                                                |      | 0.12                                                                                | 0.31                                                                                |      | 0.10  | 0.05                                                                                |                                                                                     |                                                                                     | 0.05                                                                                |                                                                                     |
| Uniform Delay, d1                 | 4.0                                                                                 | 4.6                                                                                 |      | 4.2                                                                                 | 4.7                                                                                 |      | 11.0  | 10.9                                                                                |                                                                                     |                                                                                     | 10.9                                                                                |                                                                                     |
| Progression Factor                | 1.00                                                                                | 1.00                                                                                |      | 1.00                                                                                | 1.00                                                                                |      | 1.00  | 1.00                                                                                |                                                                                     |                                                                                     | 1.00                                                                                |                                                                                     |
| Incremental Delay, d2             | 0.0                                                                                 | 0.2                                                                                 |      | 0.1                                                                                 | 0.2                                                                                 |      | 0.0   | 0.0                                                                                 |                                                                                     |                                                                                     | 0.0                                                                                 |                                                                                     |
| Delay (s)                         | 4.0                                                                                 | 4.8                                                                                 |      | 4.3                                                                                 | 4.9                                                                                 |      | 11.1  | 10.9                                                                                |                                                                                     |                                                                                     | 10.9                                                                                |                                                                                     |
| Level of Service                  | A                                                                                   | A                                                                                   |      | A                                                                                   | A                                                                                   |      | B     | B                                                                                   |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Approach Delay (s)                | 4.7                                                                                 |                                                                                     |      | 4.8                                                                                 |                                                                                     |      | 11.0  |                                                                                     |                                                                                     |                                                                                     | 10.9                                                                                |                                                                                     |
| Approach LOS                      | A                                                                                   |                                                                                     |      | A                                                                                   |                                                                                     |      | B     |                                                                                     |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |
| Intersection Summary              |                                                                                     |                                                                                     |      |                                                                                     |                                                                                     |      |       |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Control Delay            | 5.8                                                                                 |                                                                                     |      |                                                                                     | HCM 2000 Level of Service                                                           |      |       |                                                                                     | A                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Volume to Capacity ratio | 0.24                                                                                |                                                                                     |      |                                                                                     | Sum of lost time (s)                                                                |      |       |                                                                                     | 6.2                                                                                 |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         | 41.7                                                                                |                                                                                     |      |                                                                                     | ICU Level of Service                                                                |      |       |                                                                                     | C                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Intersection Capacity Utilization | 64.4%                                                                               |                                                                                     |      |                                                                                     | Analysis Period (min)                                                               |      |       |                                                                                     | 15                                                                                  |                                                                                     |                                                                                     |                                                                                     |
| Critical Lane Group               |                                                                                     |                                                                                     |      |                                                                                     |                                                                                     |      |       |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

HCM Signalized Intersection Capacity Analysis  
2. Sotoyome Street & Montgomery Drive

12/14/2016

| Movement                          | EBL   | EBT  | EBR  | WBL  | WBT                       | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|-----------------------------------|-------|------|------|------|---------------------------|------|------|------|------|------|------|------|
| Lane Configurations               | ↰     | ↡    | ↠    | ↰    | ↡                         | ↠    | ↰    | ↡    | ↠    | ↰    | ↡    | ↠    |
| Traffic Volume (vph)              | 31    | 284  | 30   | 44   | 329                       | 13   | 73   | 13   | 58   | 15   | 9    | 31   |
| Future Volume (vph)               | 31    | 284  | 30   | 44   | 329                       | 13   | 73   | 13   | 58   | 15   | 9    | 31   |
| Ideal Flow (vphpl)                | 1900  | 1900 | 1900 | 1900 | 1900                      | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s)               | 3.2   | 3.2  |      | 3.2  | 3.2                       |      | 3.0  | 3.0  | 3.0  |      | 3.0  |      |
| Lane Util. Factor                 | 1.00  | 1.00 |      | 1.00 | 1.00                      |      | 1.00 | 1.00 | 1.00 |      | 1.00 |      |
| Flpb. ped/bikes                   | 0.98  | 1.00 |      | 0.98 | 1.00                      |      | 0.95 | 1.00 | 1.00 |      | 0.95 |      |
| Frt                               | 1.00  | 0.99 |      | 1.00 | 0.99                      |      | 1.00 | 0.85 | 1.00 |      | 0.92 |      |
| Flt Protected                     | 0.95  | 1.00 |      | 0.95 | 1.00                      |      | 0.96 | 1.00 | 0.99 |      | 1.00 |      |
| Satd. Flow (prot)                 | 1737  | 1828 |      | 1742 | 1849                      |      | 1692 | 1530 | 1609 |      | 1609 |      |
| Flt Permitted                     | 0.50  | 1.00 |      | 0.53 | 1.00                      |      | 0.77 | 1.00 | 0.94 |      | 0.94 |      |
| Satd. Flow (perm)                 | 920   | 1828 |      | 970  | 1849                      |      | 1357 | 1530 | 1529 |      | 1529 |      |
| Peak-hour factor, PHF             | 0.91  | 0.91 |      | 0.91 | 0.91                      |      | 0.91 | 0.91 | 0.91 |      | 0.91 |      |
| Adj. Flow (vph)                   | 34    | 312  |      | 33   | 48                        |      | 80   | 14   | 64   |      | 16   |      |
| RTOR Reduction (vph)              | 0     | 8    |      | 0    | 3                         |      | 0    | 0    | 46   |      | 0    |      |
| Lane Group Flow (vph)             | 34    | 337  |      | 0    | 48                        |      | 373  | 0    | 94   |      | 18   |      |
| Confl. Peds. (#/hr)               | 34    | 28   |      | 28   | 34                        |      | 85   | 34   | 18   |      | 18   |      |
| Turn Type                         | Perm  | NA   |      | Perm | NA                        |      | Perm | NA   | Perm |      | Perm | NA   |
| Protected Phases                  | 2     | 2    |      | 2    | 2                         |      | 4    | 4    | 4    |      | 4    |      |
| Permitted Phases                  | 2     | 2    |      | 2    | 2                         |      | 4    | 4    | 4    |      | 4    |      |
| Actuated Green, G (s)             | 23.3  | 23.3 |      | 23.3 | 23.3                      |      | 11.7 | 11.7 | 11.7 |      | 11.7 |      |
| Effective Green, g (s)            | 23.3  | 23.3 |      | 23.3 | 23.3                      |      | 11.7 | 11.7 | 11.7 |      | 11.7 |      |
| Actuated g/C Ratio                | 0.57  | 0.57 |      | 0.57 | 0.57                      |      | 0.28 | 0.28 | 0.28 |      | 0.28 |      |
| Clearance Time (s)                | 3.2   | 3.2  |      | 3.2  | 3.2                       |      | 3.0  | 3.0  | 3.0  |      | 3.0  |      |
| Vehicle Extension (s)             | 3.0   | 3.0  |      | 3.0  | 3.0                       |      | 2.0  | 2.0  | 2.0  |      | 2.0  |      |
| Lane Grp Cap (vph)                | 520   | 1033 |      | 548  | 1045                      |      | 385  | 434  | 434  |      | 434  |      |
| v/s Ratio Prot                    | 0.04  | 0.18 |      | 0.05 | 0.20                      |      | 0.07 | 0.01 | 0.01 |      | 0.02 |      |
| v/s Ratio Perm                    | 0.07  | 0.33 |      | 0.09 | 0.36                      |      | 0.24 | 0.04 | 0.04 |      | 0.08 |      |
| Uniform Delay, d1                 | 4.0   | 4.8  |      | 4.1  | 4.9                       |      | 11.3 | 10.7 | 10.8 |      | 10.8 |      |
| Progression Factor                | 1.00  | 1.00 |      | 1.00 | 1.00                      |      | 1.00 | 1.00 | 1.00 |      | 1.00 |      |
| Incremental Delay, d2             | 0.1   | 0.2  |      | 0.1  | 0.2                       |      | 0.1  | 0.1  | 0.0  |      | 0.0  |      |
| Delay (s)                         | 4.1   | 5.0  |      | 4.2  | 5.1                       |      | 11.5 | 10.7 | 10.8 |      | 10.8 |      |
| Level of Service                  | A     | A    |      | A    | A                         |      | B    | B    | B    |      | B    |      |
| Approach Delay (s)                | 4.9   | 4.9  |      | 5.0  | 5.0                       |      | 11.2 | 11.2 | 10.8 |      | 10.8 |      |
| Approach LOS                      | A     | A    |      | A    | A                         |      | B    | B    | B    |      | B    |      |
| Intersection Summary              |       |      |      |      |                           |      |      |      |      |      |      |      |
| HCM 2000 Control Delay            | 6.2   |      |      |      | HCM 2000 Level of Service |      |      |      | A    |      |      |      |
| HCM 2000 Volume to Capacity ratio | 0.32  |      |      |      | Sum of lost time (s)      |      |      |      | 6.2  |      |      |      |
| Actuated Cycle Length (s)         | 41.2  |      |      |      | ICU Level of Service      |      |      |      | B    |      |      |      |
| Intersection Capacity Utilization | 62.0% |      |      |      | Analysis Period (min)     |      |      |      | 15   |      |      |      |
| Analysis Period (min)             | 15    |      |      |      | Critical Lane Group       |      |      |      |      |      |      |      |

HCM Signalized Intersection Capacity Analysis  
3: Doyle Park Drive & Montgomery Drive

1/4/2017

| Movement                          | EBL                                                                                 | EBT                                                                                 | EBR   | WBL                                                                                 | WBT                                                                                 | WBR  | NBL  | NBT                                                                                 | NBR                                                                                 | SBL  | SBT                                                                                 | SBR                                                                                 |
|-----------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Lane Configurations               |  |  |       |  |  |      |      |  |  |      |  |  |
| Traffic Volume (vph)              | 19                                                                                  | 134                                                                                 | 60    | 60                                                                                  | 393                                                                                 | 9    | 26   | 12                                                                                  | 25                                                                                  | 5    | 38                                                                                  | 41                                                                                  |
| Future Volume (vph)               | 19                                                                                  | 134                                                                                 | 60    | 60                                                                                  | 393                                                                                 | 9    | 26   | 12                                                                                  | 25                                                                                  | 5    | 38                                                                                  | 41                                                                                  |
| Ideal Flow (vphpl)                | 1900                                                                                | 1900                                                                                | 1900  | 1900                                                                                | 1900                                                                                | 1900 | 1900 | 1900                                                                                | 1900                                                                                | 1900 | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               | 3.3                                                                                 | 3.3                                                                                 |       | 3.3                                                                                 | 3.3                                                                                 |      |      | 3.1                                                                                 |                                                                                     |      | 3.1                                                                                 |                                                                                     |
| Lane Util. Factor                 | 1.00                                                                                | 1.00                                                                                |       | 1.00                                                                                | 1.00                                                                                |      |      | 1.00                                                                                |                                                                                     |      | 1.00                                                                                |                                                                                     |
| Flpb. ped/bikes                   | 1.00                                                                                | 0.99                                                                                |       | 1.00                                                                                | 1.00                                                                                |      |      | 1.00                                                                                |                                                                                     |      | 1.00                                                                                |                                                                                     |
| Flpb. ped/bikes                   | 0.99                                                                                | 1.00                                                                                |       | 0.99                                                                                | 1.00                                                                                |      |      | 1.00                                                                                |                                                                                     |      | 1.00                                                                                |                                                                                     |
| Flt                               | 1.00                                                                                | 0.95                                                                                |       | 1.00                                                                                | 1.00                                                                                |      |      | 0.95                                                                                |                                                                                     |      | 0.93                                                                                |                                                                                     |
| Flt Protected                     | 0.95                                                                                | 1.00                                                                                |       | 0.95                                                                                | 1.00                                                                                |      |      | 0.98                                                                                |                                                                                     |      | 1.00                                                                                |                                                                                     |
| Satd. Flow (prot)                 | 1746                                                                                | 1760                                                                                |       | 1756                                                                                | 1854                                                                                |      |      | 1700                                                                                |                                                                                     |      | 1705                                                                                |                                                                                     |
| Flt Permitted                     | 0.61                                                                                | 1.00                                                                                |       | 0.63                                                                                | 1.00                                                                                |      |      | 1.00                                                                                |                                                                                     |      | 0.97                                                                                |                                                                                     |
| Satd. Flow (perm)                 | 1114                                                                                | 1760                                                                                |       | 1157                                                                                | 1854                                                                                |      |      | 1735                                                                                |                                                                                     |      | 1666                                                                                |                                                                                     |
| Peak-hour factor, PHF             | 0.92                                                                                | 0.92                                                                                | 0.92  | 0.92                                                                                | 0.92                                                                                | 0.92 | 0.92 | 0.92                                                                                | 0.92                                                                                | 0.92 | 0.92                                                                                | 0.92                                                                                |
| Adj. Flow (vph)                   | 21                                                                                  | 146                                                                                 | 65    | 65                                                                                  | 427                                                                                 | 10   | 28   | 13                                                                                  | 27                                                                                  | 5    | 41                                                                                  | 45                                                                                  |
| RTOR Reduction (vph)              | 0                                                                                   | 35                                                                                  | 0     | 0                                                                                   | 2                                                                                   | 0    | 0    | 23                                                                                  | 0                                                                                   | 0    | 38                                                                                  | 0                                                                                   |
| Lane Group Flow (vph)             | 21                                                                                  | 176                                                                                 | 0     | 65                                                                                  | 435                                                                                 | 0    | 0    | 45                                                                                  | 0                                                                                   | 0    | 53                                                                                  | 0                                                                                   |
| Confl. Peds. (#/hr)               | 35                                                                                  |                                                                                     | 16    | 16                                                                                  |                                                                                     | 35   | 25   |                                                                                     | 17                                                                                  | 17   |                                                                                     | 25                                                                                  |
| Turn Type                         | Perm                                                                                | NA                                                                                  | Perm  | Perm                                                                                | NA                                                                                  | Perm | Perm | NA                                                                                  | Perm                                                                                | NA   | Perm                                                                                | NA                                                                                  |
| Protected Phases                  | 2                                                                                   | 2                                                                                   |       | 6                                                                                   | 6                                                                                   |      | 8    | 8                                                                                   |                                                                                     | 4    |                                                                                     | 4                                                                                   |
| Permitted Phases                  | 2                                                                                   |                                                                                     |       | 6                                                                                   | 6                                                                                   | 6    | 8    |                                                                                     |                                                                                     |      |                                                                                     |                                                                                     |
| Actuated Green, G (s)             | 6.6                                                                                 | 6.6                                                                                 |       | 6.6                                                                                 | 6.6                                                                                 | 6.6  | 2.4  | 2.4                                                                                 |                                                                                     |      | 2.4                                                                                 |                                                                                     |
| Effective Green, g (s)            | 6.6                                                                                 | 6.6                                                                                 |       | 6.6                                                                                 | 6.6                                                                                 | 6.6  | 2.4  | 2.4                                                                                 |                                                                                     |      | 2.4                                                                                 |                                                                                     |
| Actuated g/C Ratio                | 0.43                                                                                | 0.43                                                                                |       | 0.43                                                                                | 0.43                                                                                | 0.43 | 0.16 | 0.16                                                                                |                                                                                     |      | 0.16                                                                                |                                                                                     |
| Clearance Time (s)                | 3.3                                                                                 | 3.3                                                                                 |       | 3.3                                                                                 | 3.3                                                                                 | 3.3  | 3.1  | 3.1                                                                                 |                                                                                     |      | 3.1                                                                                 |                                                                                     |
| Vehicle Extension (s)             | 2.0                                                                                 | 2.0                                                                                 | 2.0   | 2.0                                                                                 | 2.0                                                                                 | 2.0  | 2.0  | 2.0                                                                                 | 2.0                                                                                 | 2.0  | 2.0                                                                                 | 2.0                                                                                 |
| Lane Grp Cap (vph)                | 477                                                                                 | 754                                                                                 |       | 495                                                                                 | 794                                                                                 |      | 270  | 270                                                                                 |                                                                                     |      | 259                                                                                 |                                                                                     |
| v/s Ratio Prot                    | 0.02                                                                                | 0.10                                                                                |       | 0.06                                                                                | 0.06                                                                                | 0.23 |      | 0.03                                                                                |                                                                                     |      | 0.03                                                                                |                                                                                     |
| v/s Ratio Perm                    | 0.04                                                                                | 0.23                                                                                |       | 0.13                                                                                | 0.55                                                                                |      | 0.17 | 0.17                                                                                |                                                                                     |      | 0.20                                                                                |                                                                                     |
| Uniform Delay, d1                 | 2.6                                                                                 | 2.8                                                                                 |       | 2.7                                                                                 | 3.3                                                                                 |      | 5.6  | 5.6                                                                                 |                                                                                     |      | 5.7                                                                                 |                                                                                     |
| Progression Factor                | 1.00                                                                                | 1.00                                                                                |       | 1.00                                                                                | 1.00                                                                                | 1.00 | 1.00 | 1.00                                                                                |                                                                                     |      | 1.00                                                                                |                                                                                     |
| Incremental Delay, d2             | 0.0                                                                                 | 0.1                                                                                 |       | 0.0                                                                                 | 0.4                                                                                 |      | 0.1  | 0.1                                                                                 |                                                                                     |      | 0.1                                                                                 |                                                                                     |
| Delay (s)                         | 2.6                                                                                 | 2.9                                                                                 |       | 2.7                                                                                 | 3.7                                                                                 |      | 5.7  | 5.7                                                                                 |                                                                                     |      | 5.8                                                                                 |                                                                                     |
| Level of Service                  | A                                                                                   | A                                                                                   |       | A                                                                                   | A                                                                                   | A    | A    | A                                                                                   |                                                                                     |      | A                                                                                   |                                                                                     |
| Approach Delay (s)                | 2.8                                                                                 |                                                                                     |       | 3.6                                                                                 |                                                                                     |      | 5.7  | 5.7                                                                                 |                                                                                     |      | 5.8                                                                                 |                                                                                     |
| Approach LOS                      | A                                                                                   |                                                                                     |       | A                                                                                   |                                                                                     |      | A    | A                                                                                   |                                                                                     |      | A                                                                                   |                                                                                     |
| Intersection Summary              |                                                                                     |                                                                                     |       |                                                                                     |                                                                                     |      |      |                                                                                     |                                                                                     |      |                                                                                     |                                                                                     |
| HCM 2000 Control Delay            | 3.8                                                                                 |                                                                                     | 3.8   |                                                                                     | HCM 2000 Level of Service                                                           |      | A    |                                                                                     | A                                                                                   |      |                                                                                     |                                                                                     |
| HCM 2000 Volume to Capacity ratio | 0.46                                                                                |                                                                                     | 0.46  |                                                                                     | Sum of lost time (s)                                                                |      | 6.4  |                                                                                     | 6.4                                                                                 |      |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         | 15.4                                                                                |                                                                                     | 15.4  |                                                                                     | ICU Level of Service                                                                |      | A    |                                                                                     | A                                                                                   |      |                                                                                     |                                                                                     |
| Intersection Capacity Utilization | 46.2%                                                                               |                                                                                     | 46.2% |                                                                                     | Analysis Period (min)                                                               |      | 15   |                                                                                     | 15                                                                                  |      |                                                                                     |                                                                                     |
| Analysis Period (min)             | 15                                                                                  |                                                                                     | 15    |                                                                                     | Critical Lane Group                                                                 |      |      |                                                                                     |                                                                                     |      |                                                                                     |                                                                                     |

Traffic Study for the Santa Rosa Memorial Hospital  
AM Existing plus Project

Synchro 8 Report

HCM Signalized Intersection Capacity Analysis  
3: Doyle Park Drive & Montgomery Drive

12/14/2016

| Movement                          | EBL   | EBT  | EBR   | WBL  | WBT                       | WBR  | NBL                 | NBT  | NBR                 | SBL  | SBT  | SBR  |
|-----------------------------------|-------|------|-------|------|---------------------------|------|---------------------|------|---------------------|------|------|------|
| Lane Configurations               | ↖     | ↗    |       | ↖    | ↗                         |      |                     | ↖    | ↗                   | ↖    | ↗    |      |
| Traffic Volume (vph)              | 28    | 336  | 28    | 23   | 253                       | 4    | 67                  | 16   | 36                  | 4    | 17   | 26   |
| Future Volume (vph)               | 28    | 336  | 28    | 23   | 253                       | 4    | 67                  | 16   | 36                  | 4    | 17   | 26   |
| Ideal Flow (vphpl)                | 1900  | 1900 | 1900  | 1900 | 1900                      | 1900 | 1900                | 1900 | 1900                | 1900 | 1900 | 1900 |
| Total Lost time (s)               | 3.3   | 3.3  |       | 3.3  | 3.3                       |      |                     | 3.1  |                     |      | 3.1  |      |
| Lane Util. Factor                 | 1.00  | 1.00 |       | 1.00 | 1.00                      |      |                     | 1.00 |                     |      | 1.00 |      |
| Flpb. ped/bikes                   | 1.00  | 1.00 |       | 1.00 | 1.00                      |      |                     | 0.99 |                     |      | 0.97 |      |
| Flpb. ped/bikes                   | 0.98  | 1.00 |       | 0.99 | 1.00                      |      |                     | 0.98 |                     |      | 1.00 |      |
| Flt                               | 1.00  | 0.99 |       | 1.00 | 1.00                      |      |                     | 0.96 |                     |      | 0.92 |      |
| Flt Protected                     | 0.95  | 1.00 |       | 0.95 | 1.00                      |      |                     | 0.97 |                     |      | 1.00 |      |
| Satd. Flow (prot)                 | 1729  | 1836 |       | 1752 | 1857                      |      |                     | 1686 |                     |      | 1662 |      |
| Flt Permitted                     | 0.74  | 1.00 |       | 0.74 | 1.00                      |      |                     | 0.80 |                     |      | 0.96 |      |
| Satd. Flow (perm)                 | 1348  | 1836 |       | 1366 | 1857                      |      |                     | 1381 |                     |      | 1607 |      |
| Peak-hour factor, PHF             | 0.92  | 0.92 | 0.92  | 0.92 | 0.92                      | 0.92 | 0.92                | 0.92 | 0.92                | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph)                   | 30    | 365  | 30    | 25   | 275                       | 4    | 73                  | 17   | 39                  | 4    | 18   | 28   |
| RTOR Reduction (vph)              | 0     | 7    | 0     | 0    | 1                         | 0    | 0                   | 29   | 0                   | 0    | 21   | 0    |
| Lane Group Flow (vph)             | 30    | 388  | 0     | 25   | 278                       | 0    | 0                   | 100  | 0                   | 0    | 29   | 0    |
| Confl. Peds. (#/hr)               | 47    |      | 26    | 26   |                           | 47   | 64                  |      | 38                  | 38   |      | 64   |
| Turn Type                         | Perm  | NA   | NA    | Perm | NA                        | Perm | Perm                | NA   | NA                  | Perm | NA   | NA   |
| Protected Phases                  | 2     | 2    |       | 6    | 6                         |      | 8                   |      | 8                   |      | 4    |      |
| Permitted Phases                  | 2     |      |       | 6    |                           |      | 8                   |      |                     | 4    |      |      |
| Actuated Green, G (s)             | 5.4   | 5.4  |       | 5.4  | 5.4                       |      | 4.0                 |      | 4.0                 |      | 4.0  |      |
| Effective Green, g (s)            | 5.4   | 5.4  |       | 5.4  | 5.4                       |      | 4.0                 |      | 4.0                 |      | 4.0  |      |
| Actuated g/C Ratio                | 0.34  | 0.34 |       | 0.34 | 0.34                      |      | 0.25                |      | 0.25                |      | 0.25 |      |
| Clearance Time (s)                | 3.3   | 3.3  |       | 3.3  | 3.3                       |      | 3.1                 |      | 3.1                 |      | 3.1  |      |
| Vehicle Extension (s)             | 2.0   | 2.0  |       | 2.0  | 2.0                       |      | 2.0                 |      | 2.0                 |      | 2.0  |      |
| Lane Grp Cap (vph)                | 460   | 627  |       | 466  | 634                       |      | 349                 |      |                     |      | 406  |      |
| v/s Ratio Prot                    | c0.21 |      |       | 0.02 | 0.15                      |      |                     |      |                     |      | 0.02 |      |
| v/s Ratio Perm                    | 0.02  |      |       | 0.02 |                           |      | c0.07               |      |                     |      | 0.02 |      |
| v/c Ratio                         | 0.07  | 0.62 |       | 0.05 | 0.44                      |      | 0.29                |      | 0.29                |      | 0.07 |      |
| Uniform Delay, d1                 | 3.5   | 4.3  |       | 3.5  | 4.0                       |      | 4.8                 |      | 4.8                 |      | 4.5  |      |
| Progression Factor                | 1.00  | 1.00 |       | 1.00 | 1.00                      |      | 1.00                |      | 1.00                |      | 1.00 |      |
| Incremental Delay, d2             | 0.0   | 1.3  |       | 0.0  | 0.2                       |      | 0.2                 |      | 0.2                 |      | 0.0  |      |
| Delay (s)                         | 3.5   | 5.6  |       | 3.5  | 4.2                       |      | 4.9                 |      | 4.9                 |      | 4.5  |      |
| Level of Service                  | A     | A    |       | A    | A                         |      | A                   |      | A                   |      | A    |      |
| Approach Delay (s)                | 5.5   |      |       | 4.1  |                           |      | 4.9                 |      | 4.9                 |      | 4.5  |      |
| Approach LOS                      | A     |      |       | A    |                           |      | A                   |      | A                   |      | A    |      |
| Intersection Summary              |       |      |       |      |                           |      |                     |      |                     |      |      |      |
| HCM 2000 Control Delay            | 4.9   |      | 4.9   |      | HCM 2000 Level of Service |      | A                   |      | A                   |      |      |      |
| HCM 2000 Volume to Capacity ratio | 0.48  |      | 0.48  |      | Sum of lost time (s)      |      | 6.4                 |      | 6.4                 |      |      |      |
| Actuated Cycle Length (s)         | 15.8  |      | 15.8  |      | ICU Level of Service      |      | A                   |      | A                   |      |      |      |
| Intersection Capacity Utilization | 44.3% |      | 44.3% |      | Analysis Period (min)     |      | 15                  |      | 15                  |      |      |      |
| Analysis Period (min)             | 15    |      | 15    |      | Critical Lane Group       |      | Critical Lane Group |      | Critical Lane Group |      |      |      |

Traffic Study for the Santa Rosa Memorial Hospital  
PM Existing plus Project

Synchro 8 Report

HCM Signalized Intersection Capacity Analysis  
4: Brookwood Avenue & Sonoma Avenue

1/4/2017

| Movement               | EBL   | EBT   | EBR   | WBL   | WBT  | WBR  | NBL  | NBT   | NBR   | SBL  | SBT  | SBR   |
|------------------------|-------|-------|-------|-------|------|------|------|-------|-------|------|------|-------|
| Lane Configurations    | EBL   | EBT   | EBR   | WBL   | WBT  | WBR  | NBL  | NBT   | NBR   | SBL  | SBT  | SBR   |
| Traffic Volume (vph)   | 65    | 393   | 28    | 146   | 306  | 168  | 16   | 309   | 357   | 146  | 197  | 55    |
| Future Volume (vph)    | 65    | 393   | 28    | 146   | 306  | 168  | 16   | 309   | 357   | 146  | 197  | 55    |
| Ideal Flow (vphpl)     | 1900  | 1900  | 1900  | 1900  | 1900 | 1900 | 1900 | 1900  | 1900  | 1900 | 1900 | 1900  |
| Total Lost time (s)    | 3.0   | 3.6   | 3.0   | 3.6   | 3.0  | 3.6  | 3.0  | 3.2   | 3.0   | 3.6  | 3.0  | 3.0   |
| Lane Util. Factor      | 1.00  | 0.95  | 1.00  | 0.95  | 1.00 | 0.95 | 1.00 | 0.98  | 1.00  | 0.95 | 1.00 | 0.98  |
| Flph. ped/bikes        | 1.00  | 1.00  | 1.00  | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  | 1.00 | 1.00 | 1.00  |
| Flt                    | 1.00  | 0.99  | 1.00  | 0.95  | 1.00 | 0.95 | 1.00 | 0.92  | 1.00  | 0.95 | 1.00 | 0.95  |
| Flt Protected          | 0.95  | 1.00  | 0.95  | 1.00  | 0.95 | 1.00 | 0.95 | 1.00  | 0.95  | 1.00 | 0.95 | 1.00  |
| Satd. Flow (prot)      | 1766  | 3490  | 1765  | 3319  | 1765 | 3319 | 1770 | 1672  | 1770  | 1863 | 1544 | 1544  |
| Flt Permitted          | 0.33  | 1.00  | 0.21  | 1.00  | 0.21 | 1.00 | 0.95 | 1.00  | 0.95  | 1.00 | 1.00 | 1.00  |
| Satd. Flow (perm)      | 607   | 3490  | 385   | 3319  | 385  | 3319 | 1770 | 1672  | 1770  | 1863 | 1544 | 1544  |
| Peak-hour factor, PHF  | 0.90  | 0.90  | 0.90  | 0.90  | 0.90 | 0.90 | 0.90 | 0.90  | 0.90  | 0.90 | 0.90 | 0.90  |
| Adj. Flow (vph)        | 72    | 437   | 31    | 162   | 340  | 187  | 18   | 343   | 397   | 162  | 219  | 61    |
| RTOR Reduction (vph)   | 0     | 5     | 0     | 0     | 61   | 0    | 0    | 30    | 0     | 0    | 0    | 24    |
| Lane Group Flow (vph)  | 72    | 463   | 0     | 162   | 466  | 0    | 18   | 710   | 0     | 162  | 219  | 37    |
| Confl. Peds. (#/hr)    | 15    | 15    | 15    | 15    | 15   | 15   | 15   | 15    | 15    | 15   | 15   | 15    |
| Turn Type              | pm+pt | NA    | NA    | pm+pt | NA   | NA   | Prot | NA    | Prot  | NA   | NA   | pm+ov |
| Protected Phases       | 5     | 2     | 2     | 6     | 6    | 6    | 3    | 8     | 7     | 4    | 4    | 5     |
| Permitted Phases       | 2     | 2     | 2     | 6     | 6    | 6    | 3    | 8     | 7     | 4    | 4    | 5     |
| Actuated Green, G (s)  | 24.0  | 17.8  | 31.8  | 22.6  | 22.6 | 22.6 | 2.9  | 42.1  | 12.8  | 51.6 | 57.8 | 4     |
| Effective Green, g (s) | 24.0  | 17.8  | 31.8  | 22.6  | 22.6 | 22.6 | 2.9  | 42.1  | 12.8  | 51.6 | 57.8 | 4     |
| Actuated g/C Ratio     | 0.25  | 0.18  | 0.33  | 0.23  | 0.23 | 0.23 | 0.03 | 0.44  | 0.13  | 0.53 | 0.60 | 0.60  |
| Clearance Time (s)     | 3.0   | 3.6   | 3.0   | 3.6   | 3.0  | 3.6  | 3.0  | 3.2   | 3.0   | 3.6  | 3.0  | 3.0   |
| Vehicle Extension (s)  | 2.0   | 2.0   | 2.0   | 2.0   | 2.0  | 2.0  | 2.0  | 2.0   | 2.0   | 2.0  | 2.0  | 2.0   |
| Lane Grp Cap (vph)     | 225   | 643   | 284   | 777   | 284  | 777  | 53   | 729   | 234   | 996  | 924  | 924   |
| v/s Ratio Prot         | 0.02  | c0.13 | c0.06 | 0.14  | 0.14 | 0.14 | 0.01 | c0.42 | c0.09 | 0.12 | 0.00 | 0.00  |
| v/s Ratio Perm         | 0.06  | 0.32  | 0.12  | 0.57  | 0.60 | 0.60 | 0.34 | 0.97  | 0.69  | 0.22 | 0.02 | 0.02  |
| Uniform Delay, d1      | 28.5  | 37.0  | 24.8  | 32.9  | 32.9 | 32.9 | 45.9 | 26.7  | 40.0  | 11.8 | 7.9  | 0.04  |
| Progression 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  |
| Incremental Delay, d2  | 0.3   | 3.4   | 1.7   | 0.8   | 0.8  | 0.8  | 1.4  | 26.8  | 7.0   | 0.1  | 0.0  | 0.0   |
| Delay (s)              | 28.8  | 40.4  | 26.5  | 33.8  | 33.8 | 33.8 | 47.3 | 53.5  | 46.9  | 11.9 | 8.0  | 8.0   |
| Level of Service       | C     | D     | C     | C     | C    | C    | D    | D     | D     | B    | A    | A     |
| Approach Delay (s)     | 38.8  | 38.8  | 38.8  | 32.0  | 32.0 | 32.0 | 53.3 | 53.3  | 53.3  | 24.2 | 24.2 | 24.2  |
| Approach LOS           | D     | D     | D     | C     | C    | C    | D    | D     | D     | C    | C    | C     |

|                                   |       |                           |  |
|-----------------------------------|-------|---------------------------|--|
| Intersection Summary              |       |                           |  |
| HCM 2000 Control Delay            | 38.8  | HCM 2000 Level of Service |  |
| HCM 2000 Volume to Capacity ratio | 0.83  | D                         |  |
| Actuated Cycle Length (s)         | 96.5  | Sum of lost time (s)      |  |
| Intersection Capacity Utilization | 84.4% | 13.2                      |  |
| Analysis Period (min)             | 15    | E                         |  |
| c Critical Lane Group             |       |                           |  |

Traffic Study for the Santa Rosa Memorial Hospital  
AM Existing plus Project

Synchro 8 Report

HCM Signalized Intersection Capacity Analysis  
4: Brookwood Avenue & Sonoma Avenue

12/14/2016

| Movement               | EBL   | EBT  | EBR   | WBL   | WBT  | WBR  | NBL  | NBT   | NBR   | SBL  | SBT  | SBR   |
|------------------------|-------|------|-------|-------|------|------|------|-------|-------|------|------|-------|
| Lane Configurations    | EBL   | EBT  | EBR   | WBL   | WBT  | WBR  | NBL  | NBT   | NBR   | SBL  | SBT  | SBR   |
| Traffic Volume (vph)   | 93    | 406  | 50    | 290   | 423  | 154  | 16   | 254   | 176   | 122  | 361  | 102   |
| Future Volume (vph)    | 93    | 406  | 50    | 290   | 423  | 154  | 16   | 254   | 176   | 122  | 361  | 102   |
| Ideal Flow (vphpl)     | 1900  | 1900 | 1900  | 1900  | 1900 | 1900 | 1900 | 1900  | 1900  | 1900 | 1900 | 1900  |
| Total Lost time (s)    | 3.0   | 3.6  | 3.0   | 3.6   | 3.0  | 3.6  | 3.0  | 3.2   | 3.0   | 3.6  | 3.0  | 3.0   |
| Lane Util. Factor      | 1.00  | 0.95 | 1.00  | 0.95  | 1.00 | 0.95 | 1.00 | 0.98  | 1.00  | 0.95 | 1.00 | 0.98  |
| Flph. ped/bikes        | 1.00  | 1.00 | 1.00  | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  | 1.00 | 1.00 | 1.00  |
| Flt                    | 1.00  | 0.98 | 1.00  | 0.96  | 1.00 | 0.96 | 1.00 | 0.94  | 1.00  | 0.95 | 1.00 | 0.95  |
| Flt Protected          | 0.95  | 1.00 | 0.95  | 1.00  | 0.95 | 1.00 | 0.95 | 1.00  | 0.95  | 1.00 | 0.95 | 1.00  |
| Satd. Flow (prot)      | 1767  | 3459 | 1766  | 3374  | 1766 | 3374 | 1770 | 1718  | 1770  | 1863 | 1549 | 1549  |
| Flt Permitted          | 0.29  | 1.00 | 0.21  | 1.00  | 0.21 | 1.00 | 0.95 | 1.00  | 0.95  | 1.00 | 1.00 | 1.00  |
| Satd. Flow (perm)      | 541   | 3459 | 387   | 3374  | 387  | 3374 | 1770 | 1718  | 1770  | 1863 | 1549 | 1549  |
| Peak-hour factor, PHF  | 0.89  | 0.89 | 0.89  | 0.89  | 0.89 | 0.89 | 0.89 | 0.89  | 0.89  | 0.89 | 0.89 | 0.89  |
| Adj. Flow (vph)        | 104   | 456  | 56    | 326   | 475  | 173  | 18   | 285   | 198   | 137  | 406  | 115   |
| RTOR Reduction (vph)   | 0     | 8    | 0     | 0     | 29   | 0    | 0    | 21    | 0     | 0    | 0    | 52    |
| Lane Group Flow (vph)  | 104   | 504  | 0     | 326   | 619  | 0    | 18   | 462   | 0     | 137  | 406  | 63    |
| Confl. Peds. (#/hr)    | 15    | 15   | 15    | 15    | 15   | 15   | 15   | 15    | 15    | 15   | 15   | 15    |
| Turn Type              | pm+pt | NA   | NA    | pm+pt | NA   | NA   | Prot | NA    | Prot  | NA   | NA   | pm+ov |
| Protected Phases       | 5     | 2    | 2     | 6     | 6    | 6    | 3    | 8     | 7     | 4    | 4    | 5     |
| Permitted Phases       | 2     | 2    | 2     | 6     | 6    | 6    | 3    | 8     | 7     | 4    | 4    | 5     |
| Actuated Green, G (s)  | 27.6  | 18.7 | 36.9  | 25.0  | 25.0 | 25.0 | 2.7  | 31.4  | 11.9  | 40.2 | 49.1 | 49.1  |
| Effective Green, g (s) | 27.6  | 18.7 | 36.9  | 25.0  | 25.0 | 25.0 | 2.7  | 31.4  | 11.9  | 40.2 | 49.1 | 49.1  |
| Actuated g/C Ratio     | 0.31  | 0.21 | 0.41  | 0.28  | 0.28 | 0.28 | 0.03 | 0.35  | 0.13  | 0.45 | 0.55 | 0.55  |
| Clearance Time (s)     | 3.0   | 3.6  | 3.0   | 3.6   | 3.0  | 3.6  | 3.0  | 3.2   | 3.0   | 3.6  | 3.0  | 3.0   |
| Vehicle Extension (s)  | 2.0   | 2.0  | 2.0   | 2.0   | 2.0  | 2.0  | 2.0  | 2.0   | 2.0   | 2.0  | 2.0  | 2.0   |
| Lane Grp Cap (vph)     | 287   | 718  | 391   | 937   | 391  | 937  | 53   | 599   | 234   | 832  | 845  | 845   |
| v/s Ratio Prot         | 0.04  | 0.15 | c0.14 | 0.18  | 0.18 | 0.18 | 0.01 | c0.27 | c0.08 | 0.22 | 0.01 | 0.01  |
| v/s Ratio Perm         | 0.08  | 0.36 | 0.12  | 0.83  | 0.83 | 0.83 | 0.34 | 0.77  | 0.59  | 0.49 | 0.07 | 0.07  |
| Uniform Delay, d1      | 23.2  | 33.1 | 20.5  | 28.7  | 28.7 | 28.7 | 42.8 | 26.1  | 36.7  | 17.6 | 9.7  | 9.7   |
| Progression 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  |
| Incremental Delay, d2  | 0.3   | 2.6  | 1.3   | 1.4   | 1.4  | 1.4  | 1.4  | 6.1   | 2.4   | 0.5  | 0.0  | 0.0   |
| Delay (s)              | 23.5  | 35.6 | 21.8  | 30.1  | 30.1 | 30.1 | 44.2 | 32.2  | 39.1  | 18.1 | 9.7  | 9.7   |
| Level of Service       | C     | D    | C     | C     | C    | C    | D    | D     | D     | B    | A    | A     |
| Approach Delay (s)     | 33.6  | 33.6 | 33.6  | 31.4  | 31.4 | 31.4 | 32.6 | 32.6  | 32.6  | 21.0 | 21.0 | 21.0  |
| Approach LOS           | C     | C    | C     | C     | C    | C    | C    | C     | C     | C    | C    | C     |

|                                   |       |                           |  |      |
|-----------------------------------|-------|---------------------------|--|------|
| Intersection Summary              |       |                           |  |      |
| HCM 2000 Control Delay            | 29.6  | HCM 2000 Level of Service |  | C    |
| HCM 2000 Volume to Capacity ratio | 0.80  |                           |  |      |
| Actuated Cycle Length (s)         | 90.0  | Sum of lost time (s)      |  | 13.2 |
| Intersection Capacity Utilization | 74.3% | ICU Level of Service      |  | D    |
| Analysis Period (min)             | 15    |                           |  |      |
| c Critical Lane Group             |       |                           |  |      |

Traffic Study for the Santa Rosa Memorial Hospital  
PM Existing plus Project

Synchro 8 Report

# HCM Unsignalized Intersection Capacity Analysis

5: Sonoma Avenue & Sotoyome Street

1/4/2017



| Movement                          | EBL  | EBT  | WBT   | SBR                  |
|-----------------------------------|------|------|-------|----------------------|
| Lane Configurations               | W    | W    | W     | W                    |
| Traffic Volume (veh/h)            | 182  | 656  | 546   | 84                   |
| Future Volume (Veh/h)             | 182  | 656  | 546   | 84                   |
| Sign Control                      | Free | Free | Free  | Stop                 |
| Grade                             | 0%   | 0%   | 0%    | 0%                   |
| Peak Hour Factor                  | 0.93 | 0.93 | 0.93  | 0.93                 |
| Hourly flow rate (vph)            | 196  | 705  | 587   | 90                   |
| Pedestrians                       |      |      |       |                      |
| Lane Width (ft)                   |      |      |       |                      |
| Walking Speed (ft/s)              |      |      |       |                      |
| Percent Blockage                  |      |      |       |                      |
| Right turn flare (veh)            |      |      |       |                      |
| Median type                       |      |      |       |                      |
| Median storage (veh)              |      |      |       |                      |
| Upstream signal (ft)              |      |      |       |                      |
| pX platoon unblocked              |      |      |       |                      |
| VC, conflicting volume            |      |      |       |                      |
| VC1, stage 1 conf vol             |      |      |       |                      |
| VC2, stage 2 conf vol             |      |      |       |                      |
| VCu, unblocked vol                |      |      |       |                      |
| IC, single (s)                    |      |      |       |                      |
| IC, 2 stage (s)                   |      |      |       |                      |
| p0 queue free %                   |      |      |       |                      |
| ICF (s)                           |      |      |       |                      |
| CM capacity (veh/h)               |      |      |       |                      |
| Direction, Lane #                 | EB 1 | EB 2 | WB 1  | SB 1                 |
| Volume Total                      | 196  | 705  | 677   | 125                  |
| Volume Left                       | 196  | 0    | 0     | 28                   |
| Volume Right                      | 0    | 0    | 90    | 97                   |
| cSH                               | 915  | 1700 | 1700  | 374                  |
| Volume to Capacity                | 0.21 | 0.41 | 0.40  | 0.33                 |
| Queue Length 95th (ft)            | 20   | 0    | 0     | 36                   |
| Control Delay (s)                 | 10.0 | 0.0  | 0.0   | 19.4                 |
| Lane LOS                          | B    | B    | C     | C                    |
| Approach Delay (s)                | 2.2  | 0.0  | 0.0   | 19.4                 |
| Approach LOS                      |      |      |       | C                    |
| Intersection Summary              |      |      |       |                      |
| Average Delay                     |      |      | 2.6   |                      |
| Intersection Capacity Utilization |      |      | 60.9% |                      |
| Analysis Period (min)             |      |      | 15    |                      |
|                                   |      |      |       | B                    |
|                                   |      |      |       | ICU Level of Service |

Traffic Study for the Santa Rosa Memorial Hospital  
AM Existing plus Project

Synchro 8 Report

# HCM Unsignalized Intersection Capacity Analysis

5: Sonoma Avenue & Sotoyome Street

12/14/2016



| Movement                          | EBL  | EBT  | WBT   | SBR                  |
|-----------------------------------|------|------|-------|----------------------|
| Lane Configurations               | W    | W    | W     | W                    |
| Traffic Volume (veh/h)            | 82   | 627  | 608   | 51                   |
| Future Volume (Veh/h)             | 82   | 627  | 608   | 51                   |
| Sign Control                      | Free | Free | Free  | Stop                 |
| Grade                             | 0%   | 0%   | 0%    | 0%                   |
| Peak Hour Factor                  | 0.89 | 0.89 | 0.89  | 0.89                 |
| Hourly flow rate (vph)            | 92   | 704  | 663   | 57                   |
| Pedestrians                       |      |      |       |                      |
| Lane Width (ft)                   |      |      |       |                      |
| Walking Speed (ft/s)              |      |      |       |                      |
| Percent Blockage                  |      |      |       |                      |
| Right turn flare (veh)            |      |      |       |                      |
| Median type                       |      |      |       |                      |
| Median storage (veh)              |      |      |       |                      |
| Upstream signal (ft)              |      |      |       |                      |
| pX platoon unblocked              |      |      |       |                      |
| VC, conflicting volume            |      |      |       |                      |
| VC1, stage 1 conf vol             |      |      |       |                      |
| VC2, stage 2 conf vol             |      |      |       |                      |
| VCu, unblocked vol                |      |      |       |                      |
| IC, single (s)                    |      |      |       |                      |
| IC, 2 stage (s)                   |      |      |       |                      |
| p0 queue free %                   |      |      |       |                      |
| ICF (s)                           |      |      |       |                      |
| CM capacity (veh/h)               |      |      |       |                      |
| Direction, Lane #                 | EB 1 | EB 2 | WB 1  | SB 1                 |
| Volume Total                      | 92   | 704  | 740   | 287                  |
| Volume Left                       | 92   | 0    | 0     | 84                   |
| Volume Right                      | 0    | 0    | 57    | 203                  |
| cSH                               | 867  | 1700 | 1700  | 375                  |
| Volume to Capacity                | 0.11 | 0.41 | 0.44  | 0.77                 |
| Queue Length 95th (ft)            | 9    | 0    | 0     | 156                  |
| Control Delay (s)                 | 9.6  | 0.0  | 0.0   | 40.0                 |
| Lane LOS                          | A    | A    | E     | E                    |
| Approach Delay (s)                | 1.1  | 0.0  | 0.0   | 40.0                 |
| Approach LOS                      |      |      |       | E                    |
| Intersection Summary              |      |      |       |                      |
| Average Delay                     |      |      | 6.8   |                      |
| Intersection Capacity Utilization |      |      | 64.9% |                      |
| Analysis Period (min)             |      |      | 15    |                      |
|                                   |      |      |       | C                    |
|                                   |      |      |       | ICU Level of Service |

Traffic Study for the Santa Rosa Memorial Hospital  
PM Existing plus Project

Synchro 8 Report

HCM Unsignalized Intersection Capacity Analysis  
6: Doyle Park Drive & Sonoma Avenue

1/4/2017

| Movement                          | EBL                                                                                 | EBT                                                                                 | EBR                                                                                 | WBL                                                                                 | WBT                                                                                 | WBR                                                                                 | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |  |  |  |  |  |  |  |  |  |
|-----------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|--|--|--|--|--|--|
| Lane Configurations               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)            | 91                                                                                  | 428                                                                                 | 66                                                                                  | 36                                                                                  | 556                                                                                 | 21                                                                                  | 51                                                                                  | 2                                                                                   | 35                                                                                  | 11                                                                                  | 1                                                                                   | 48                                                                                  |  |  |  |  |  |  |  |  |  |
| Future Volume (Veh/h)             | 91                                                                                  | 428                                                                                 | 66                                                                                  | 36                                                                                  | 556                                                                                 | 21                                                                                  | 51                                                                                  | 2                                                                                   | 35                                                                                  | 11                                                                                  | 1                                                                                   | 48                                                                                  |  |  |  |  |  |  |  |  |  |
| Sign Control                      | Free                                                                                |                                                                                     |                                                                                     | Free                                                                                |                                                                                     |                                                                                     | Stop                                                                                |                                                                                     |                                                                                     | Stop                                                                                |                                                                                     |                                                                                     |  |  |  |  |  |  |  |  |  |
| Grade                             | 0%                                                                                  |                                                                                     |                                                                                     | 0%                                                                                  |                                                                                     |                                                                                     | 0%                                                                                  |                                                                                     |                                                                                     | 0%                                                                                  |                                                                                     |                                                                                     |  |  |  |  |  |  |  |  |  |
| Peak Hour Factor                  | 0.91                                                                                | 0.91                                                                                | 0.91                                                                                | 0.91                                                                                | 0.91                                                                                | 0.91                                                                                | 0.91                                                                                | 0.91                                                                                | 0.91                                                                                | 0.91                                                                                | 0.91                                                                                | 0.91                                                                                |  |  |  |  |  |  |  |  |  |
| Hourly flow rate (vph)            | 100                                                                                 | 470                                                                                 | 73                                                                                  | 40                                                                                  | 611                                                                                 | 23                                                                                  | 56                                                                                  | 2                                                                                   | 38                                                                                  | 12                                                                                  | 1                                                                                   | 53                                                                                  |  |  |  |  |  |  |  |  |  |
| Pedestrians                       |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |  |  |
| Lane Width (ft)                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |  |  |
| Walking Speed (ft/s)              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |  |  |
| Percent Blockage                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |  |  |
| Right turn flare (veh)            |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |  |  |
| Median type                       | TWLTL                                                                               |                                                                                     |                                                                                     | TWLTL                                                                               |                                                                                     |                                                                                     | TWLTL                                                                               |                                                                                     |                                                                                     | 1                                                                                   |                                                                                     |                                                                                     |  |  |  |  |  |  |  |  |  |
| Median storage (veh)              | 2                                                                                   |                                                                                     |                                                                                     | 2                                                                                   |                                                                                     |                                                                                     | 2                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |  |  |
| Upstream signal (ft)              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |  |  |
| pX-platoon unblocked              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |  |  |
| VC, conflicting volume            | 634                                                                                 |                                                                                     |                                                                                     | 543                                                                                 |                                                                                     |                                                                                     | 1451                                                                                | 1420                                                                                | 506                                                                                 | 1392                                                                                | 1446                                                                                | 622                                                                                 |  |  |  |  |  |  |  |  |  |
| VC1, stage 1 conf vol             |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     | 706                                                                                 | 706                                                                                 |                                                                                     | 702                                                                                 | 702                                                                                 |                                                                                     |  |  |  |  |  |  |  |  |  |
| VC2, stage 2 conf vol             |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     | 744                                                                                 | 714                                                                                 |                                                                                     | 690                                                                                 | 743                                                                                 |                                                                                     |  |  |  |  |  |  |  |  |  |
| VCu, unblocked vol                | 634                                                                                 |                                                                                     |                                                                                     | 543                                                                                 |                                                                                     |                                                                                     | 1451                                                                                | 1420                                                                                | 506                                                                                 | 1392                                                                                | 1446                                                                                | 622                                                                                 |  |  |  |  |  |  |  |  |  |
| IC, single (s)                    | 4.1                                                                                 |                                                                                     |                                                                                     | 4.1                                                                                 |                                                                                     |                                                                                     | 7.1                                                                                 | 6.5                                                                                 | 6.2                                                                                 | 7.1                                                                                 | 6.5                                                                                 | 6.2                                                                                 |  |  |  |  |  |  |  |  |  |
| IC, 2 stage (s)                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     | 6.1                                                                                 | 5.5                                                                                 |                                                                                     | 6.1                                                                                 | 5.5                                                                                 |                                                                                     |  |  |  |  |  |  |  |  |  |
| IF (s)                            | 2.2                                                                                 |                                                                                     |                                                                                     | 2.2                                                                                 |                                                                                     |                                                                                     | 3.5                                                                                 | 4.0                                                                                 | 3.3                                                                                 | 3.5                                                                                 | 4.0                                                                                 | 3.3                                                                                 |  |  |  |  |  |  |  |  |  |
| p0 queue free %                   | 89                                                                                  |                                                                                     |                                                                                     | 96                                                                                  |                                                                                     |                                                                                     | 74                                                                                  | 99                                                                                  | 93                                                                                  | 95                                                                                  | 100                                                                                 | 89                                                                                  |  |  |  |  |  |  |  |  |  |
| cM capacity (veh/h)               | 949                                                                                 |                                                                                     |                                                                                     | 1026                                                                                |                                                                                     |                                                                                     | 216                                                                                 | 264                                                                                 | 566                                                                                 | 264                                                                                 | 278                                                                                 | 486                                                                                 |  |  |  |  |  |  |  |  |  |
| Direction, Lane #                 | EB 1                                                                                | EB 2                                                                                | WB 1                                                                                | WB 2                                                                                | NB 1                                                                                | SB 1                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |  |  |
| Volume Total                      | 100                                                                                 | 543                                                                                 | 40                                                                                  | 634                                                                                 | 96                                                                                  | 66                                                                                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |  |  |
| Volume Left                       | 100                                                                                 | 0                                                                                   | 40                                                                                  | 0                                                                                   | 56                                                                                  | 12                                                                                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |  |  |
| Volume Right                      | 0                                                                                   | 73                                                                                  | 0                                                                                   | 23                                                                                  | 38                                                                                  | 53                                                                                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |  |  |
| cSH                               | 949                                                                                 | 1700                                                                                | 1026                                                                                | 1700                                                                                | 360                                                                                 | 418                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |  |  |
| Volume to Capacity                | 0.11                                                                                | 0.32                                                                                | 0.04                                                                                | 0.37                                                                                | 0.27                                                                                | 0.16                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |  |  |
| Queue Length 95th (ft)            | 9                                                                                   | 0                                                                                   | 3                                                                                   | 0                                                                                   | 26                                                                                  | 14                                                                                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |  |  |
| Control Delay (s)                 | 9.2                                                                                 | 0.0                                                                                 | 8.7                                                                                 | 0.0                                                                                 | 21.3                                                                                | 15.2                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |  |  |
| Lane LOS                          | A                                                                                   | A                                                                                   | A                                                                                   | A                                                                                   | C                                                                                   | C                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |  |  |
| Approach Delay (s)                | 1.4                                                                                 |                                                                                     | 0.5                                                                                 |                                                                                     | 21.3                                                                                | 15.2                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |  |  |
| Approach LOS                      |                                                                                     |                                                                                     | C                                                                                   |                                                                                     | C                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |  |  |
| Intersection Summary              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |  |  |
| Average Delay                     |                                                                                     |                                                                                     |                                                                                     | 2.9                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |                                                                                     |  |  |  |  |  |  |  |  |  |
| Intersection Capacity Utilization |                                                                                     |                                                                                     |                                                                                     | 55.9%                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |  |  |
| Analysis Period (min)             |                                                                                     |                                                                                     |                                                                                     | 15                                                                                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |  |  |  |  |  |  |  |  |

HCM Unsignalized Intersection Capacity Analysis  
6: Doyle Park Drive & Sonoma Avenue

12/14/2016

| Movement                          | EBL                                                                               | EBT                                                                               | EBR  | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                               | SBT                                                                               | SBR                                                                               |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Lane Configurations               |  |  |      |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)            | 24                                                                                | 682                                                                               | 36   | 15                                                                                | 421                                                                               | 12                                                                                | 28                                                                                | 3                                                                                 | 20                                                                                | 15                                                                                | 5                                                                                 | 127                                                                               |
| Future Volume (Veh/h)             | 24                                                                                | 682                                                                               | 36   | 15                                                                                | 421                                                                               | 12                                                                                | 28                                                                                | 3                                                                                 | 20                                                                                | 15                                                                                | 5                                                                                 | 127                                                                               |
| Sign Control                      | Free                                                                              |                                                                                   |      | Free                                                                              |                                                                                   |                                                                                   | Stop                                                                              |                                                                                   |                                                                                   | Stop                                                                              |                                                                                   |                                                                                   |
| Grade                             | 0%                                                                                |                                                                                   |      | 0%                                                                                |                                                                                   |                                                                                   | 0%                                                                                |                                                                                   |                                                                                   | 0%                                                                                |                                                                                   |                                                                                   |
| Peak Hour Factor                  | 0.92                                                                              | 0.92                                                                              | 0.92 | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              | 0.92                                                                              |
| Hourly flow rate (vph)            | 26                                                                                | 741                                                                               | 39   | 16                                                                                | 458                                                                               | 13                                                                                | 30                                                                                | 3                                                                                 | 22                                                                                | 16                                                                                | 5                                                                                 | 138                                                                               |
| Pedestrians                       |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Lane Width (ft)                   |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Walking Speed (ft/s)              |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Percent Blockage                  |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Right turn flare (veh)            | TWLTL                                                                             |                                                                                   |      | TWLTL                                                                             |                                                                                   |                                                                                   | TWLTL                                                                             |                                                                                   |                                                                                   | 1                                                                                 |                                                                                   |                                                                                   |
| Median type                       | 2                                                                                 |                                                                                   |      | 2                                                                                 |                                                                                   |                                                                                   | 2                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Median storage (veh)              | 2                                                                                 |                                                                                   |      | 2                                                                                 |                                                                                   |                                                                                   | 2                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Upstream signal (ft)              | 2                                                                                 |                                                                                   |      | 2                                                                                 |                                                                                   |                                                                                   | 2                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| pX, platoon unblocked             | 2                                                                                 |                                                                                   |      | 2                                                                                 |                                                                                   |                                                                                   | 2                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| VC, conflicting volume            | 471                                                                               |                                                                                   |      | 780                                                                               |                                                                                   |                                                                                   | 1443                                                                              | 1316                                                                              | 760                                                                               | 1302                                                                              | 1328                                                                              | 464                                                                               |
| VC1, stage 1 conf vol             |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   | 812                                                                               | 812                                                                               |                                                                                   | 496                                                                               | 496                                                                               |                                                                                   |
| VC2, stage 2 conf vol             |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   | 630                                                                               | 503                                                                               |                                                                                   | 806                                                                               | 832                                                                               |                                                                                   |
| VCu, unblocked vol                | 471                                                                               |                                                                                   |      | 780                                                                               |                                                                                   |                                                                                   | 1443                                                                              | 1316                                                                              | 760                                                                               | 1302                                                                              | 1328                                                                              | 464                                                                               |
| IC, single (s)                    | 4.1                                                                               |                                                                                   |      | 4.1                                                                               |                                                                                   |                                                                                   | 7.1                                                                               | 6.5                                                                               | 6.2                                                                               | 7.1                                                                               | 6.5                                                                               | 6.2                                                                               |
| IC, 2 stage (s)                   |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   | 6.1                                                                               | 5.5                                                                               |                                                                                   | 6.1                                                                               | 5.5                                                                               |                                                                                   |
| IF (s)                            | 2.2                                                                               |                                                                                   |      | 2.2                                                                               |                                                                                   |                                                                                   | 3.5                                                                               | 4.0                                                                               | 3.3                                                                               | 3.5                                                                               | 4.0                                                                               | 3.3                                                                               |
| p0 queue free %                   | 98                                                                                |                                                                                   |      | 98                                                                                |                                                                                   |                                                                                   | 88                                                                                | 99                                                                                | 95                                                                                | 95                                                                                | 98                                                                                | 77                                                                                |
| CM capacity (veh/h)               | 1091                                                                              |                                                                                   |      | 837                                                                               |                                                                                   |                                                                                   | 249                                                                               | 327                                                                               | 406                                                                               | 293                                                                               | 317                                                                               | 598                                                                               |
| Direction, Lane #                 | EB 1                                                                              | EB 2                                                                              | WB 1 | WB 2                                                                              | NB 1                                                                              | SB 1                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Volume Total                      | 26                                                                                | 780                                                                               | 16   | 471                                                                               | 55                                                                                | 159                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Volume Left                       | 26                                                                                | 0                                                                                 | 16   | 0                                                                                 | 30                                                                                | 16                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Volume Right                      | 0                                                                                 | 39                                                                                | 0    | 13                                                                                | 22                                                                                | 138                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| cSH                               | 1091                                                                              | 1700                                                                              | 837  | 1700                                                                              | 427                                                                               | 528                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Volume to Capacity                | 0.02                                                                              | 0.46                                                                              | 0.02 | 0.28                                                                              | 0.13                                                                              | 0.30                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Queue Length 95th (ft)            | 2                                                                                 | 0                                                                                 | 1    | 0                                                                                 | 11                                                                                | 31                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Control Delay (s)                 | 8.4                                                                               | 0.0                                                                               | 9.4  | 0.0                                                                               | 18.4                                                                              | 14.7                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Lane LOS                          | A                                                                                 | A                                                                                 | A    | A                                                                                 | C                                                                                 | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Approach Delay (s)                | 0.3                                                                               |                                                                                   | 0.3  |                                                                                   | 18.4                                                                              | 14.7                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Approach LOS                      |                                                                                   |                                                                                   | C    |                                                                                   | C                                                                                 | B                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Intersection Summary              |                                                                                   |                                                                                   |      |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Average Delay                     |                                                                                   |                                                                                   |      | 2.5                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | B                                                                                 |                                                                                   |                                                                                   |
| Intersection Capacity Utilization |                                                                                   |                                                                                   |      | 60.3%                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Analysis Period (min)             |                                                                                   |                                                                                   |      | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |

# HCM Signalized Intersection Capacity Analysis

1: Brookwood Avenue & 3rd Street

09/07/2017

| Movement               | EBL   | EBT  | EBR  | WBL  | WBT   | WBR  | NBL  | NBT   | NBR  | SBL   | SBT  | SBR  |
|------------------------|-------|------|------|------|-------|------|------|-------|------|-------|------|------|
| Lane Configurations    | EBL   | EBT  | EBR  | WBL  | WBT   | WBR  | NBL  | NBT   | NBR  | SBL   | SBT  | SBR  |
| Traffic Volume (vph)   | 137   | 157  | 17   | 6    | 97    | 189  | 27   | 591   | 8    | 104   | 390  | 160  |
| Future Volume (vph)    | 137   | 157  | 17   | 6    | 97    | 189  | 27   | 591   | 8    | 104   | 390  | 160  |
| Ideal Flow (vphpl)     | 1900  | 1900 | 1900 | 1900 | 1900  | 1900 | 1900 | 1900  | 1900 | 1900  | 1900 | 1900 |
| Total Lost time (s)    | 3.0   | 3.0  | 3.0  | 3.0  | 3.0   | 3.0  | 3.0  | 3.0   | 3.0  | 3.0   | 3.0  | 3.2  |
| Lane Util. Factor      | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00  | 1.00 | 0.95 |
| Flpb. ped/bikes        | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00  | 1.00 | 0.98 |
| Frt                    | 1.00  | 0.99 | 1.00 | 1.00 | 0.90  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00  | 1.00 | 0.96 |
| Flt Protected          | 0.95  | 1.00 | 0.95 | 1.00 | 0.95  | 1.00 | 0.95 | 1.00  | 0.95 | 1.00  | 0.95 | 1.00 |
| Satd. Flow (prot)      | 1770  | 1831 | 1770 | 1640 | 1770  | 1640 | 1770 | 3530  | 1770 | 3330  | 1770 | 3330 |
| Flt Permitted          | 0.95  | 1.00 | 0.95 | 1.00 | 0.95  | 1.00 | 0.95 | 1.00  | 0.95 | 1.00  | 0.95 | 1.00 |
| Satd. Flow (perm)      | 1770  | 1831 | 1770 | 1640 | 1770  | 1640 | 1770 | 3530  | 1770 | 3330  | 1770 | 3330 |
| Peak-hour factor, PHF  | 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. Flow (vph)        | 137   | 157  | 17   | 6    | 97    | 189  | 27   | 591   | 8    | 104   | 390  | 160  |
| RTOR Reduction (vph)   | 0     | 4    | 0    | 0    | 87    | 0    | 0    | 1     | 0    | 0     | 46   | 0    |
| Lane Group Flow (vph)  | 137   | 170  | 0    | 6    | 199   | 0    | 27   | 598   | 0    | 104   | 504  | 0    |
| Confl. Peds. (#/hr)    | 20    | 20   | 20   | 20   | 20    | 20   | 20   | 20    | 20   | 20    | 20   | 20   |
| Turn Type              | Prot  | NA   | NA   | Prot | NA    | NA   | Prot | NA    | Prot | NA    | Prot | NA   |
| Permitted Phases       | 5     | 2    |      | 1    | 6     |      | 3    | 8     |      | 7     | 4    |      |
| Actuated Green, G (s)  | 7.6   | 23.1 |      | 1.1  | 16.6  |      | 2.6  | 18.3  |      | 7.2   | 23.3 |      |
| Effective Green, g (s) | 7.6   | 23.1 |      | 1.1  | 16.6  |      | 2.6  | 18.3  |      | 7.2   | 23.3 |      |
| Actuated g/C Ratio     | 0.12  | 0.37 |      | 0.02 | 0.27  |      | 0.04 | 0.29  |      | 0.12  | 0.37 |      |
| Clearance Time (s)     | 3.0   | 3.0  |      | 3.0  | 3.0   |      | 3.0  | 3.6   |      | 3.0   | 3.2  |      |
| Vehicle Extension (s)  | 3.0   | 3.0  |      | 3.0  | 3.0   |      | 3.0  | 3.0   |      | 3.0   | 3.0  |      |
| Lane Grp Cap (vph)     | 215   | 678  |      | 31   | 436   |      | 73   | 1036  |      | 204   | 1245 |      |
| v/s Ratio Prot         | c0.08 | 0.09 |      | 0.00 | c0.12 |      | 0.02 | c0.17 |      | c0.06 | 0.15 |      |
| v/s Ratio Perm         |       |      |      |      |       |      |      |       |      |       |      |      |
| v/c Ratio              | 0.64  | 0.25 |      | 0.19 | 0.46  |      | 0.37 | 0.58  |      | 0.51  | 0.40 |      |
| Uniform Delay, d1      | 26.0  | 13.6 |      | 30.2 | 19.1  |      | 29.1 | 18.7  |      | 25.9  | 14.4 |      |
| Progression Factor     | 1.00  | 1.00 |      | 1.00 | 1.00  |      | 1.00 | 1.00  |      | 1.00  | 1.00 |      |
| Incremental Delay, d2  | 6.1   | 0.2  |      | 3.0  | 0.8   |      | 3.1  | 0.8   |      | 2.0   | 0.2  |      |
| Delay (s)              | 32.1  | 13.8 |      | 33.2 | 19.8  |      | 32.2 | 19.5  |      | 27.9  | 14.6 |      |
| Level of Service       | C     | B    |      | C    | B     |      | C    | B     |      | C     | B    |      |
| Approach Delay (s)     | 21.9  |      |      | 20.1 |       |      | 20.0 |       |      | 16.7  |      |      |
| Approach LOS           | C     |      |      | C    |       |      | C    |       |      | B     |      |      |

|                                   |       |  |  |  |  |  |  |  |  |      |  |  |
|-----------------------------------|-------|--|--|--|--|--|--|--|--|------|--|--|
| <b>Intersection Summary</b>       |       |  |  |  |  |  |  |  |  |      |  |  |
| HCM 2000 Control Delay            | 19.2  |  |  |  |  |  |  |  |  |      |  |  |
| HCM 2000 Volume to Capacity ratio | 0.54  |  |  |  |  |  |  |  |  |      |  |  |
| Actuated Cycle Length (s)         | 62.3  |  |  |  |  |  |  |  |  | 12.6 |  |  |
| Intersection Capacity Utilization | 62.8% |  |  |  |  |  |  |  |  | B    |  |  |
| Analysis Period (min)             | 15    |  |  |  |  |  |  |  |  |      |  |  |
| c Critical Lane Group             |       |  |  |  |  |  |  |  |  |      |  |  |

# HCM Signalized Intersection Capacity Analysis

1: Brookwood Avenue & 3rd Street

09/07/2017

| Movement               | EBL   | EBT  | EBR  | WBL  | WBT   | WBR  | NBL  | NBT  | NBR  | SBL   | SBT   | SBR  |
|------------------------|-------|------|------|------|-------|------|------|------|------|-------|-------|------|
| Lane Configurations    | EBL   | EBT  | EBR  | WBL  | WBT   | WBR  | NBL  | NBT  | NBR  | SBL   | SBT   | SBR  |
| Traffic Volume (vph)   | 148   | 181  | 20   | 16   | 176   | 203  | 27   | 434  | 14   | 119   | 518   | 79   |
| Future Volume (vph)    | 148   | 181  | 20   | 16   | 176   | 203  | 27   | 434  | 14   | 119   | 518   | 79   |
| Ideal Flow (vphpl)     | 1900  | 1900 | 1900 | 1900 | 1900  | 1900 | 1900 | 1900 | 1900 | 1900  | 1900  | 1900 |
| Total Lost time (s)    | 3.0   | 3.0  | 3.0  | 3.0  | 3.0   | 3.0  | 3.0  | 3.0  | 3.0  | 3.0   | 3.0   | 3.2  |
| Lane Util. Factor      | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  | 0.95 |
| Flpb. ped/bikes        | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  | 0.99 |
| Frt                    | 1.00  | 0.99 | 1.00 | 1.00 | 0.92  | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  | 1.00  | 0.98 |
| Flt Protected          | 0.95  | 1.00 | 0.95 | 1.00 | 0.95  | 1.00 | 0.95 | 1.00 | 0.95 | 1.00  | 0.95  | 1.00 |
| Satd. Flow (prot)      | 1770  | 1830 | 1770 | 1684 | 1770  | 1684 | 1770 | 3517 | 1770 | 3441  | 1770  | 3441 |
| Flt Permitted          | 0.95  | 1.00 | 0.95 | 1.00 | 0.95  | 1.00 | 0.95 | 1.00 | 0.95 | 1.00  | 0.95  | 1.00 |
| Satd. Flow (perm)      | 1770  | 1830 | 1770 | 1684 | 1770  | 1684 | 1770 | 3517 | 1770 | 3441  | 1770  | 3441 |
| Peak-hour factor, PHF  | 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. Flow (vph)        | 148   | 181  | 20   | 16   | 176   | 203  | 27   | 434  | 14   | 119   | 518   | 79   |
| RTOR Reduction (vph)   | 0     | 3    | 0    | 0    | 46    | 0    | 0    | 2    | 0    | 0     | 14    | 0    |
| Lane Group Flow (vph)  | 148   | 198  | 0    | 16   | 333   | 0    | 27   | 446  | 0    | 119   | 583   | 0    |
| Confl. Peds. (#/hr)    | 20    | 20   | 20   | 20   | 20    | 20   | 20   | 20   | 20   | 20    | 20    | 20   |
| Turn Type              | Prot  | NA   | NA   | Prot | NA    | NA   | Prot | NA   | Prot | NA    | Prot  | NA   |
| Permitted Phases       | 5     | 2    |      | 1    | 6     |      | 3    | 8    |      | 7     | 4     |      |
| Actuated Green, G (s)  | 11.3  | 31.2 |      | 1.2  | 21.1  |      | 2.7  | 16.1 |      | 8.2   | 22.0  |      |
| Effective Green, g (s) | 11.3  | 31.2 |      | 1.2  | 21.1  |      | 2.7  | 16.1 |      | 8.2   | 22.0  |      |
| Actuated g/C Ratio     | 0.16  | 0.45 |      | 0.02 | 0.30  |      | 0.04 | 0.23 |      | 0.12  | 0.32  |      |
| Clearance Time (s)     | 3.0   | 3.0  |      | 3.0  | 3.0   |      | 3.0  | 3.6  |      | 3.0   | 3.2   |      |
| Vehicle Extension (s)  | 3.0   | 3.0  |      | 3.0  | 3.0   |      | 3.0  | 3.0  |      | 3.0   | 3.0   |      |
| Lane Grp Cap (vph)     | 288   | 823  |      | 30   | 512   |      | 68   | 817  |      | 209   | 1092  |      |
| v/s Ratio Prot         | c0.08 | 0.11 |      | 0.01 | c0.20 |      | 0.02 | 0.13 |      | c0.07 | c0.17 |      |
| v/s Ratio Perm         |       |      |      |      |       |      |      |      |      |       |       |      |
| v/c Ratio              | 0.51  | 0.24 |      | 0.53 | 0.65  |      | 0.40 | 0.55 |      | 0.57  | 0.53  |      |
| Uniform Delay, d1      | 26.5  | 11.7 |      | 33.8 | 20.9  |      | 32.5 | 23.4 |      | 28.9  | 19.4  |      |
| Progression Factor     | 1.00  | 1.00 |      | 1.00 | 1.00  |      | 1.00 | 1.00 |      | 1.00  | 1.00  |      |
| Incremental Delay, d2  | 1.5   | 0.2  |      | 17.0 | 3.0   |      | 3.8  | 0.7  |      | 3.5   | 0.5   |      |
| Delay (s)              | 28.0  | 11.9 |      | 50.8 | 23.9  |      | 36.3 | 24.1 |      | 32.4  | 19.9  |      |
| Level of Service       | C     | B    |      | D    | C     |      | D    | C    |      | C     | B     |      |
| Approach Delay (s)     | 18.7  |      |      | 24.9 |       |      | 24.8 |      |      | 22.0  |       |      |
| Approach LOS           | B     |      |      | C    |       |      | C    |      |      | C     |       |      |

|                                   |       |  |  |  |  |  |  |  |  |      |  |  |
|-----------------------------------|-------|--|--|--|--|--|--|--|--|------|--|--|
| <b>Intersection Summary</b>       |       |  |  |  |  |  |  |  |  |      |  |  |
| HCM 2000 Control Delay            | 22.7  |  |  |  |  |  |  |  |  |      |  |  |
| HCM 2000 Volume to Capacity ratio | 0.61  |  |  |  |  |  |  |  |  |      |  |  |
| Actuated Cycle Length (s)         | 69.3  |  |  |  |  |  |  |  |  | 12.6 |  |  |
| Intersection Capacity Utilization | 68.1% |  |  |  |  |  |  |  |  | C    |  |  |
| Analysis Period (min)             | 15    |  |  |  |  |  |  |  |  |      |  |  |
| c Critical Lane Group             |       |  |  |  |  |  |  |  |  |      |  |  |

HCM Signalized Intersection Capacity Analysis  
2. Sotoyome Street & Montgomery Drive

09/07/2017

| Movement                          | EBL                                                                                 | EBT                                                                                 | EBR                                                                                 | WBL                                                                                 | WBT                                                                                 | WBR                                                                                 | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
|-----------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Lane Configurations               |  |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph)              | 22                                                                                  | 242                                                                                 | 62                                                                                  | 91                                                                                  | 464                                                                                 | 11                                                                                  | 33                                                                                  | 11                                                                                  | 90                                                                                  | 4                                                                                   | 12                                                                                  | 13                                                                                  |
| Future Volume (vph)               | 22                                                                                  | 242                                                                                 | 62                                                                                  | 91                                                                                  | 464                                                                                 | 11                                                                                  | 33                                                                                  | 11                                                                                  | 90                                                                                  | 4                                                                                   | 12                                                                                  | 13                                                                                  |
| Ideal Flow (vphpl)                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               | 3.2                                                                                 | 3.2                                                                                 | 3.2                                                                                 | 3.2                                                                                 | 3.2                                                                                 | 3.2                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 |
| Lane Util. 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                                                                                |
| Frbp. ped/bikes                   | 1.00                                                                                | 0.99                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 0.96                                                                                | 1.00                                                                                | 0.96                                                                                | 0.95                                                                                | 0.95                                                                                |
| Flbb. ped/bikes                   | 0.99                                                                                | 1.00                                                                                | 0.99                                                                                | 1.00                                                                                | 1.00                                                                                | 0.99                                                                                | 1.00                                                                                | 0.93                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Frt                               | 1.00                                                                                | 0.97                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 0.85                                                                                | 1.00                                                                                | 0.85                                                                                | 0.94                                                                                | 0.94                                                                                |
| Flt Protected                     | 0.95                                                                                | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                | 0.96                                                                                | 1.00                                                                                | 0.96                                                                                | 1.00                                                                                | 0.99                                                                                | 0.99                                                                                |
| Satd. Flow (prot)                 | 1748                                                                                | 1792                                                                                | 1748                                                                                | 1854                                                                                | 1748                                                                                | 1854                                                                                | 1669                                                                                | 1513                                                                                | 1643                                                                                | 1643                                                                                | 1643                                                                                | 1643                                                                                |
| Flt Permitted                     | 0.44                                                                                | 1.00                                                                                | 0.57                                                                                | 1.00                                                                                | 0.57                                                                                | 1.00                                                                                | 0.84                                                                                | 1.00                                                                                | 0.84                                                                                | 1.00                                                                                | 0.98                                                                                | 0.98                                                                                |
| Satd. Flow (perm)                 | 805                                                                                 | 1792                                                                                | 1043                                                                                | 1854                                                                                | 1043                                                                                | 1854                                                                                | 1460                                                                                | 1513                                                                                | 1460                                                                                | 1513                                                                                | 1617                                                                                | 1617                                                                                |
| Peak-hour factor, PHF             | 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. Flow (vph)                   | 22                                                                                  | 242                                                                                 | 62                                                                                  | 91                                                                                  | 464                                                                                 | 11                                                                                  | 33                                                                                  | 11                                                                                  | 90                                                                                  | 4                                                                                   | 12                                                                                  | 13                                                                                  |
| RTOR Reduction (vph)              | 0                                                                                   | 17                                                                                  | 0                                                                                   | 0                                                                                   | 2                                                                                   | 0                                                                                   | 0                                                                                   | 0                                                                                   | 68                                                                                  | 0                                                                                   | 10                                                                                  | 0                                                                                   |
| Lane Group Flow (vph)             | 22                                                                                  | 287                                                                                 | 0                                                                                   | 91                                                                                  | 473                                                                                 | 0                                                                                   | 0                                                                                   | 44                                                                                  | 22                                                                                  | 0                                                                                   | 19                                                                                  | 0                                                                                   |
| Confl. Peds. (#/hr)               | 24                                                                                  | 18                                                                                  | 18                                                                                  | 24                                                                                  | 109                                                                                 | 24                                                                                  | 109                                                                                 | 28                                                                                  | 28                                                                                  | 28                                                                                  | 109                                                                                 | 109                                                                                 |
| Turn Type                         | Perm                                                                                | NA                                                                                  | NA                                                                                  | Perm                                                                                | NA                                                                                  | Perm                                                                                | NA                                                                                  | Perm                                                                                | NA                                                                                  | Perm                                                                                | NA                                                                                  | NA                                                                                  |
| Protected Phases                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 4                                                                                   | 4                                                                                   | 4                                                                                   | 4                                                                                   | 4                                                                                   | 4                                                                                   |
| Permitted Phases                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 2                                                                                   | 4                                                                                   | 4                                                                                   | 4                                                                                   | 4                                                                                   | 4                                                                                   | 4                                                                                   |
| Actuated Green, G (s)             | 28.8                                                                                | 28.8                                                                                | 28.8                                                                                | 28.8                                                                                | 28.8                                                                                | 28.8                                                                                | 11.5                                                                                | 11.5                                                                                | 11.5                                                                                | 11.5                                                                                | 11.5                                                                                | 11.5                                                                                |
| Effective Green, g (s)            | 28.8                                                                                | 28.8                                                                                | 28.8                                                                                | 28.8                                                                                | 28.8                                                                                | 28.8                                                                                | 11.5                                                                                | 11.5                                                                                | 11.5                                                                                | 11.5                                                                                | 11.5                                                                                | 11.5                                                                                |
| Actuated g/C Ratio                | 0.62                                                                                | 0.62                                                                                | 0.62                                                                                | 0.62                                                                                | 0.62                                                                                | 0.62                                                                                | 0.25                                                                                | 0.25                                                                                | 0.25                                                                                | 0.25                                                                                | 0.25                                                                                | 0.25                                                                                |
| Clearance Time (s)                | 3.2                                                                                 | 3.2                                                                                 | 3.2                                                                                 | 3.2                                                                                 | 3.2                                                                                 | 3.2                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 |
| Vehicle Extension (s)             | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 3.0                                                                                 | 2.0                                                                                 | 2.0                                                                                 | 2.0                                                                                 | 2.0                                                                                 | 2.0                                                                                 | 2.0                                                                                 |
| Lane Grp Cap (vph)                | 498                                                                                 | 1109                                                                                | 645                                                                                 | 1148                                                                                | 645                                                                                 | 1148                                                                                | 361                                                                                 | 374                                                                                 | 361                                                                                 | 374                                                                                 | 399                                                                                 | 399                                                                                 |
| v/s Ratio Prot                    | 0.03                                                                                | 0.16                                                                                | 0.09                                                                                | 0.09                                                                                | 0.16                                                                                | 0.09                                                                                | 0.03                                                                                | 0.01                                                                                | 0.01                                                                                | 0.01                                                                                | 0.01                                                                                | 0.01                                                                                |
| v/s Ratio Perm                    | 0.04                                                                                | 0.26                                                                                | 0.14                                                                                | 0.41                                                                                | 0.14                                                                                | 0.41                                                                                | 0.12                                                                                | 0.06                                                                                | 0.06                                                                                | 0.05                                                                                | 0.05                                                                                | 0.05                                                                                |
| v/c Ratio                         | 3.5                                                                                 | 4.0                                                                                 | 3.7                                                                                 | 4.5                                                                                 | 3.7                                                                                 | 4.5                                                                                 | 13.6                                                                                | 13.4                                                                                | 13.4                                                                                | 13.3                                                                                | 13.3                                                                                | 13.3                                                                                |
| Uniform Delay, d1                 | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Progression Factor                | 0.0                                                                                 | 0.1                                                                                 | 0.1                                                                                 | 0.2                                                                                 | 0.1                                                                                 | 0.2                                                                                 | 0.1                                                                                 | 0.1                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 |
| Incremental Delay, d2             | 3.5                                                                                 | 4.1                                                                                 | 3.8                                                                                 | 4.8                                                                                 | 3.8                                                                                 | 4.8                                                                                 | 13.6                                                                                | 13.4                                                                                | 13.4                                                                                | 13.3                                                                                | 13.3                                                                                | 13.3                                                                                |
| Delay (s)                         | A                                                                                   | A                                                                                   | A                                                                                   | A                                                                                   | A                                                                                   | A                                                                                   | B                                                                                   | B                                                                                   | B                                                                                   | B                                                                                   | B                                                                                   | B                                                                                   |
| Level of Service                  | A                                                                                   | A                                                                                   | A                                                                                   | A                                                                                   | A                                                                                   | A                                                                                   | B                                                                                   | B                                                                                   | B                                                                                   | B                                                                                   | B                                                                                   | B                                                                                   |
| Approach Delay (s)                | 4.1                                                                                 | 4.1                                                                                 | 4.1                                                                                 | 4.6                                                                                 | 4.1                                                                                 | 4.6                                                                                 | 13.5                                                                                | 13.5                                                                                | 13.5                                                                                | 13.3                                                                                | 13.3                                                                                | 13.3                                                                                |
| Approach LOS                      | A                                                                                   | A                                                                                   | A                                                                                   | A                                                                                   | A                                                                                   | A                                                                                   | B                                                                                   | B                                                                                   | B                                                                                   | B                                                                                   | B                                                                                   | B                                                                                   |
| Intersection Summary              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Control Delay            | 5.8                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Volume to Capacity ratio | 0.33                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         | 46.5                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Capacity Utilization | 65.1%                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Analysis Period (min)             | 15                                                                                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| c Critical Lane Group             |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

HCM Signalized Intersection Capacity Analysis  
2. Sotoyome Street & Montgomery Drive

09/07/2017

| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                               | SBT                                                                               | SBR                                                                               |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Lane Configurations               |  |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph)              | 31                                                                                | 298                                                                               | 30                                                                                | 70                                                                                | 497                                                                               | 13                                                                                | 77                                                                                | 13                                                                                | 71                                                                                | 31                                                                                | 9                                                                                 | 15                                                                                |
| Future Volume (vph)               | 31                                                                                | 298                                                                               | 30                                                                                | 70                                                                                | 497                                                                               | 13                                                                                | 77                                                                                | 13                                                                                | 71                                                                                | 31                                                                                | 9                                                                                 | 15                                                                                |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              |
| Total Lost time (s)               | 3.2                                                                               | 3.2                                                                               | 3.2                                                                               | 3.2                                                                               | 3.2                                                                               | 3.2                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               |
| Lane Util. 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                                                                              |
| Frbp. ped/bikes                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.96                                                                              | 1.00                                                                              | 0.96                                                                              | 0.97                                                                              | 0.97                                                                              |
| Flbb. ped/bikes                   | 0.98                                                                              | 1.00                                                                              | 0.98                                                                              | 1.00                                                                              | 0.98                                                                              | 1.00                                                                              | 0.94                                                                              | 1.00                                                                              | 0.94                                                                              | 1.00                                                                              | 0.99                                                                              | 0.99                                                                              |
| Frt                               | 1.00                                                                              | 0.99                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.85                                                                              | 1.00                                                                              | 0.85                                                                              | 0.96                                                                              | 0.96                                                                              |
| Flt Protected                     | 0.95                                                                              | 1.00                                                                              | 0.95                                                                              | 1.00                                                                              | 0.95                                                                              | 1.00                                                                              | 0.96                                                                              | 1.00                                                                              | 0.96                                                                              | 1.00                                                                              | 0.97                                                                              | 0.97                                                                              |
| Satd. Flow (prot)                 | 1741                                                                              | 1829                                                                              | 1737                                                                              | 1853                                                                              | 1737                                                                              | 1853                                                                              | 1679                                                                              | 1527                                                                              | 1687                                                                              | 1687                                                                              | 1687                                                                              | 1687                                                                              |
| Flt Permitted                     | 0.41                                                                              | 1.00                                                                              | 0.55                                                                              | 1.00                                                                              | 0.55                                                                              | 1.00                                                                              | 0.76                                                                              | 1.00                                                                              | 0.76                                                                              | 1.00                                                                              | 0.86                                                                              | 0.86                                                                              |
| Satd. Flow (perm)                 | 756                                                                               | 1829                                                                              | 1002                                                                              | 1853                                                                              | 1002                                                                              | 1853                                                                              | 1339                                                                              | 1527                                                                              | 1339                                                                              | 1527                                                                              | 1484                                                                              | 1484                                                                              |
| Peak-hour factor, PHF             | 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. Flow (vph)                   | 31                                                                                | 298                                                                               | 30                                                                                | 70                                                                                | 497                                                                               | 13                                                                                | 77                                                                                | 13                                                                                | 71                                                                                | 31                                                                                | 9                                                                                 | 15                                                                                |
| RTOR Reduction (vph)              | 0                                                                                 | 7                                                                                 | 0                                                                                 | 0                                                                                 | 2                                                                                 | 0                                                                                 | 0                                                                                 | 0                                                                                 | 53                                                                                | 0                                                                                 | 11                                                                                | 0                                                                                 |
| Lane Group Flow (vph)             | 31                                                                                | 321                                                                               | 0                                                                                 | 70                                                                                | 508                                                                               | 0                                                                                 | 0                                                                                 | 90                                                                                | 18                                                                                | 0                                                                                 | 44                                                                                | 0                                                                                 |
| Confl. Peds. (#/hr)               | 34                                                                                | 28                                                                                | 28                                                                                | 34                                                                                | 85                                                                                | 34                                                                                | 85                                                                                | 18                                                                                | 18                                                                                | 18                                                                                | 85                                                                                | 85                                                                                |
| Turn Type                         | Perm                                                                              | NA                                                                                | NA                                                                                | Perm                                                                              | NA                                                                                | Perm                                                                              | NA                                                                                | Perm                                                                              | NA                                                                                | Perm                                                                              | NA                                                                                | NA                                                                                |
| Protected Phases                  | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 4                                                                                 | 4                                                                                 | 4                                                                                 | 4                                                                                 | 4                                                                                 | 4                                                                                 |
| Permitted Phases                  | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 2                                                                                 | 4                                                                                 | 4                                                                                 | 4                                                                                 | 4                                                                                 | 4                                                                                 | 4                                                                                 |
| Actuated Green, G (s)             | 28.5                                                                              | 28.5                                                                              | 28.5                                                                              | 28.5                                                                              | 28.5                                                                              | 28.5                                                                              | 11.5                                                                              | 11.5                                                                              | 11.5                                                                              | 11.5                                                                              | 11.5                                                                              | 11.5                                                                              |
| Effective Green, g (s)            | 28.5                                                                              | 28.5                                                                              | 28.5                                                                              | 28.5                                                                              | 28.5                                                                              | 28.5                                                                              | 11.5                                                                              | 11.5                                                                              | 11.5                                                                              | 11.5                                                                              | 11.5                                                                              | 11.5                                                                              |
| Actuated g/C Ratio                | 0.62                                                                              | 0.62                                                                              | 0.62                                                                              | 0.62                                                                              | 0.62                                                                              | 0.62                                                                              | 0.25                                                                              | 0.25                                                                              | 0.25                                                                              | 0.25                                                                              | 0.25                                                                              | 0.25                                                                              |
| Clearance Time (s)                | 3.2                                                                               | 3.2                                                                               | 3.2                                                                               | 3.2                                                                               | 3.2                                                                               | 3.2                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               |
| Vehicle Extension (s)             | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 3.0                                                                               | 2.0                                                                               | 2.0                                                                               | 2.0                                                                               | 2.0                                                                               | 2.0                                                                               | 2.0                                                                               |
| Lane Grp Cap (vph)                | 466                                                                               | 1128                                                                              | 618                                                                               | 1143                                                                              | 618                                                                               | 1143                                                                              | 333                                                                               | 380                                                                               | 333                                                                               | 380                                                                               | 369                                                                               | 369                                                                               |
| v/s Ratio Prot                    | 0.04                                                                              | 0.18                                                                              | 0.07                                                                              | 0.07                                                                              | 0.18                                                                              | 0.07                                                                              | 0.07                                                                              | 0.01                                                                              | 0.01                                                                              | 0.03                                                                              | 0.03                                                                              | 0.03                                                                              |
| v/s Ratio Perm                    | 0.07                                                                              | 0.29                                                                              | 0.11                                                                              | 0.44                                                                              | 0.11                                                                              | 0.44                                                                              | 0.27                                                                              | 0.05                                                                              | 0.05                                                                              | 0.12                                                                              | 0.12                                                                              | 0.12                                                                              |
| v/c Ratio                         | 3.5                                                                               | 4.1                                                                               | 3.6                                                                               | 4.7                                                                               | 3.6                                                                               | 4.7                                                                               | 14.0                                                                              | 13.2                                                                              | 13.2                                                                              | 13.4                                                                              | 13.4                                                                              | 13.4                                                                              |
| Uniform Delay, d1                 | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              |
| Progression Factor                | 0.1                                                                               | 0.1                                                                               | 0.1                                                                               | 0.3                                                                               | 0.1                                                                               | 0.3                                                                               | 0.2                                                                               | 0.0                                                                               | 0.0                                                                               | 0.1                                                                               | 0.1                                                                               | 0.1                                                                               |
| Incremental Delay, d2             | 3.6                                                                               | 4.3                                                                               | 3.7                                                                               | 5.0                                                                               | 3.7                                                                               | 5.0                                                                               | 14.1                                                                              | 13.2                                                                              | 13.2                                                                              | 13.5                                                                              | 13.5                                                                              | 13.5                                                                              |
| Delay (s)                         | A                                                                                 | A                                                                                 | A                                                                                 | A                                                                                 | A                                                                                 | A                                                                                 | B                                                                                 | B                                                                                 | B                                                                                 | B                                                                                 | B                                                                                 | B                                                                                 |
| Level of Service                  | A                                                                                 | A                                                                                 | A                                                                                 | A                                                                                 | A                                                                                 | A                                                                                 | B                                                                                 | B                                                                                 | B                                                                                 | B                                                                                 | B                                                                                 | B                                                                                 |
| Approach Delay (s)                | 4.2                                                                               | 4.2                                                                               | 4.2                                                                               | 4.8                                                                               | 4.2                                                                               | 4.8                                                                               | 13.7                                                                              | 13.7                                                                              | 13.7                                                                              | 13.5                                                                              | 13.5                                                                              | 13.5                                                                              |
| Approach LOS                      | A                                                                                 | A                                                                                 | A                                                                                 | A                                                                                 | A                                                                                 | A                                                                                 | B                                                                                 | B                                                                                 | B                                                                                 | B                                                                                 | B                                                                                 | B                                                                                 |
| Intersection Summary              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| HCM 2000 Control Delay            | 6.3                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| HCM 2000 Volume to Capacity ratio | 0.39                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Actuated Cycle Length (s)         | 46.2                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Intersection Capacity Utilization | 66.4%                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Analysis Period (min)             | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| c Critical Lane Group             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |

HCM Signalized Intersection Capacity Analysis  
3: Doyle Park Drive & Montgomery Drive

09/07/2017

| Movement                          | EBL                                                                                 | EBT                                                                                 | EBR                                                                                 | WBL                                                                                 | WBT                                                                                 | WBR                                                                                 | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
|-----------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Lane Configurations               |  |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph)              | 19                                                                                  | 151                                                                                 | 64                                                                                  | 65                                                                                  | 575                                                                                 | 9                                                                                   | 43                                                                                  | 12                                                                                  | 32                                                                                  | 5                                                                                   | 38                                                                                  | 41                                                                                  |
| Future Volume (vph)               | 19                                                                                  | 151                                                                                 | 64                                                                                  | 65                                                                                  | 575                                                                                 | 9                                                                                   | 43                                                                                  | 12                                                                                  | 32                                                                                  | 5                                                                                   | 38                                                                                  | 41                                                                                  |
| Ideal Flow (vphpl)                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                | 1900                                                                                |
| Total Lost time (s)               | 3.3                                                                                 | 3.3                                                                                 | 3.3                                                                                 | 3.3                                                                                 | 3.3                                                                                 | 3.3                                                                                 | 3.1                                                                                 | 3.1                                                                                 | 3.1                                                                                 | 3.1                                                                                 | 3.1                                                                                 | 3.1                                                                                 |
| Lane Util. 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                                                                                |
| Flpb. ped/bikes                   | 1.00                                                                                | 0.99                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 0.99                                                                                | 0.99                                                                                | 0.99                                                                                | 1.00                                                                                | 0.98                                                                                | 0.98                                                                                |
| Flpb. ped/bikes                   | 0.98                                                                                | 1.00                                                                                | 0.99                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 0.99                                                                                | 0.99                                                                                | 0.99                                                                                | 1.00                                                                                | 0.98                                                                                | 0.98                                                                                |
| Flt                               | 1.00                                                                                | 0.96                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 0.95                                                                                | 0.95                                                                                | 0.95                                                                                | 1.00                                                                                | 0.93                                                                                | 0.93                                                                                |
| Flt Protected                     | 0.95                                                                                | 1.00                                                                                | 0.95                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 0.98                                                                                | 0.98                                                                                | 0.98                                                                                | 1.00                                                                                | 0.97                                                                                | 0.97                                                                                |
| Satd. Flow (prot)                 | 1743                                                                                | 1761                                                                                | 1749                                                                                | 1857                                                                                | 1749                                                                                | 1857                                                                                | 1692                                                                                | 1692                                                                                | 1692                                                                                | 1701                                                                                | 1701                                                                                | 1701                                                                                |
| Flt Permitted                     | 0.39                                                                                | 1.00                                                                                | 0.62                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 0.80                                                                                | 0.80                                                                                | 0.80                                                                                | 0.97                                                                                | 0.97                                                                                | 0.97                                                                                |
| Satd. Flow (perm)                 | 716                                                                                 | 1761                                                                                | 1148                                                                                | 1857                                                                                | 1148                                                                                | 1857                                                                                | 1388                                                                                | 1388                                                                                | 1388                                                                                | 1660                                                                                | 1660                                                                                | 1660                                                                                |
| Peak-hour factor, PHF             | 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. Flow (vph)                   | 19                                                                                  | 151                                                                                 | 64                                                                                  | 65                                                                                  | 575                                                                                 | 9                                                                                   | 43                                                                                  | 12                                                                                  | 32                                                                                  | 5                                                                                   | 38                                                                                  | 41                                                                                  |
| RTOR Reduction (vph)              | 0                                                                                   | 25                                                                                  | 0                                                                                   | 0                                                                                   | 1                                                                                   | 0                                                                                   | 0                                                                                   | 27                                                                                  | 0                                                                                   | 0                                                                                   | 34                                                                                  | 0                                                                                   |
| Lane Group Flow (vph)             | 19                                                                                  | 190                                                                                 | 0                                                                                   | 65                                                                                  | 583                                                                                 | 0                                                                                   | 0                                                                                   | 60                                                                                  | 0                                                                                   | 0                                                                                   | 50                                                                                  | 0                                                                                   |
| Confl. Peds. (#/hr)               | 35                                                                                  | 16                                                                                  | 16                                                                                  | 35                                                                                  | 25                                                                                  | 35                                                                                  | 17                                                                                  | 17                                                                                  | 17                                                                                  | 17                                                                                  | 25                                                                                  | 25                                                                                  |
| Turn Type                         | Perm                                                                                | NA                                                                                  | NA                                                                                  | Perm                                                                                | NA                                                                                  | Perm                                                                                | NA                                                                                  | NA                                                                                  | Perm                                                                                | NA                                                                                  | NA                                                                                  | NA                                                                                  |
| Protected Phases                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 6                                                                                   | 6                                                                                   | 6                                                                                   | 8                                                                                   | 8                                                                                   | 8                                                                                   | 4                                                                                   | 4                                                                                   | 4                                                                                   |
| Permitted Phases                  | 2                                                                                   | 2                                                                                   | 2                                                                                   | 6                                                                                   | 6                                                                                   | 6                                                                                   | 8                                                                                   | 8                                                                                   | 8                                                                                   | 4                                                                                   | 4                                                                                   | 4                                                                                   |
| Actuated Green, G (s)             | 13.1                                                                                | 13.1                                                                                | 13.1                                                                                | 13.1                                                                                | 13.1                                                                                | 13.1                                                                                | 3.8                                                                                 | 3.8                                                                                 | 3.8                                                                                 | 3.8                                                                                 | 3.8                                                                                 | 3.8                                                                                 |
| Effective Green, g (s)            | 13.1                                                                                | 13.1                                                                                | 13.1                                                                                | 13.1                                                                                | 13.1                                                                                | 13.1                                                                                | 3.8                                                                                 | 3.8                                                                                 | 3.8                                                                                 | 3.8                                                                                 | 3.8                                                                                 | 3.8                                                                                 |
| Actuated g/C Ratio                | 0.56                                                                                | 0.56                                                                                | 0.56                                                                                | 0.56                                                                                | 0.56                                                                                | 0.56                                                                                | 0.16                                                                                | 0.16                                                                                | 0.16                                                                                | 0.16                                                                                | 0.16                                                                                | 0.16                                                                                |
| Clearance Time (s)                | 3.3                                                                                 | 3.3                                                                                 | 3.3                                                                                 | 3.3                                                                                 | 3.3                                                                                 | 3.3                                                                                 | 3.1                                                                                 | 3.1                                                                                 | 3.1                                                                                 | 3.1                                                                                 | 3.1                                                                                 | 3.1                                                                                 |
| Vehicle Extension (s)             | 2.0                                                                                 | 2.0                                                                                 | 2.0                                                                                 | 2.0                                                                                 | 2.0                                                                                 | 2.0                                                                                 | 2.0                                                                                 | 2.0                                                                                 | 2.0                                                                                 | 2.0                                                                                 | 2.0                                                                                 | 2.0                                                                                 |
| Lane Grp Cap (vph)                | 402                                                                                 | 990                                                                                 | 645                                                                                 | 1044                                                                                | 645                                                                                 | 1044                                                                                | 226                                                                                 | 226                                                                                 | 226                                                                                 | 270                                                                                 | 270                                                                                 | 270                                                                                 |
| v/s Ratio Prot                    | 0.11                                                                                | 0.11                                                                                | 0.11                                                                                | 0.31                                                                                | 0.31                                                                                | 0.31                                                                                | 0.04                                                                                | 0.04                                                                                | 0.04                                                                                | 0.03                                                                                | 0.03                                                                                | 0.03                                                                                |
| v/s Ratio Perm                    | 0.03                                                                                | 0.03                                                                                | 0.03                                                                                | 0.10                                                                                | 0.10                                                                                | 0.10                                                                                | 0.27                                                                                | 0.27                                                                                | 0.27                                                                                | 0.18                                                                                | 0.18                                                                                | 0.18                                                                                |
| v/c Ratio                         | 0.05                                                                                | 0.19                                                                                | 0.19                                                                                | 0.10                                                                                | 0.56                                                                                | 0.10                                                                                | 0.27                                                                                | 0.27                                                                                | 0.27                                                                                | 0.18                                                                                | 0.18                                                                                | 0.18                                                                                |
| Uniform Delay, d1                 | 2.3                                                                                 | 2.5                                                                                 | 2.5                                                                                 | 2.4                                                                                 | 3.3                                                                                 | 2.4                                                                                 | 8.5                                                                                 | 8.5                                                                                 | 8.5                                                                                 | 8.4                                                                                 | 8.4                                                                                 | 8.4                                                                                 |
| Progression 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                                                                                |
| Incremental Delay, d2             | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.0                                                                                 | 0.4                                                                                 | 0.0                                                                                 | 0.2                                                                                 | 0.2                                                                                 | 0.2                                                                                 | 0.1                                                                                 | 0.1                                                                                 | 0.1                                                                                 |
| Delay (s)                         | 2.3                                                                                 | 2.5                                                                                 | 2.5                                                                                 | 2.4                                                                                 | 3.6                                                                                 | 2.4                                                                                 | 8.8                                                                                 | 8.8                                                                                 | 8.8                                                                                 | 8.5                                                                                 | 8.5                                                                                 | 8.5                                                                                 |
| Level of Service                  | A                                                                                   | A                                                                                   | A                                                                                   | A                                                                                   | A                                                                                   | A                                                                                   | A                                                                                   | A                                                                                   | A                                                                                   | A                                                                                   | A                                                                                   | A                                                                                   |
| Approach Delay (s)                | 2.5                                                                                 | 2.5                                                                                 | 2.5                                                                                 | 3.5                                                                                 | 3.5                                                                                 | 3.5                                                                                 | 8.8                                                                                 | 8.8                                                                                 | 8.8                                                                                 | 8.5                                                                                 | 8.5                                                                                 | 8.5                                                                                 |
| Approach LOS                      | A                                                                                   | A                                                                                   | A                                                                                   | A                                                                                   | A                                                                                   | A                                                                                   | A                                                                                   | A                                                                                   | A                                                                                   | A                                                                                   | A                                                                                   | A                                                                                   |
| Intersection Summary              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Control Delay            | 4.1                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     | HCM 2000 Level of Service                                                           |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| HCM 2000 Volume to Capacity ratio | 0.49                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     | A                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Actuated Cycle Length (s)         | 23.3                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     | Sum of lost time (s)                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Capacity Utilization | 56.5%                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Analysis Period (min)             | 15                                                                                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     | 15                                                                                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| c Critical Lane Group             |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

HCM Signalized Intersection Capacity Analysis  
3: Doyle Park Drive & Montgomery Drive

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| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                               | SBT                                                                               | SBR                                                                               |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Lane Configurations               |  |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (vph)              | 28                                                                                | 359                                                                               | 29                                                                                | 31                                                                                | 431                                                                               | 4                                                                                 | 88                                                                                | 16                                                                                | 39                                                                                | 4                                                                                 | 17                                                                                | 26                                                                                |
| Future Volume (vph)               | 28                                                                                | 359                                                                               | 29                                                                                | 31                                                                                | 431                                                                               | 4                                                                                 | 88                                                                                | 16                                                                                | 39                                                                                | 4                                                                                 | 17                                                                                | 26                                                                                |
| Ideal Flow (vphpl)                | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              | 1900                                                                              |
| Total Lost time (s)               | 3.3                                                                               | 3.3                                                                               | 3.3                                                                               | 3.3                                                                               | 3.3                                                                               | 3.3                                                                               | 3.1                                                                               | 3.1                                                                               | 3.1                                                                               | 3.1                                                                               | 3.1                                                                               | 3.1                                                                               |
| Lane Util. 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                                                                              |
| Flpb. ped/bikes                   | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.99                                                                              | 0.99                                                                              | 0.99                                                                              | 1.00                                                                              | 0.97                                                                              | 0.97                                                                              |
| Flpb. ped/bikes                   | 0.98                                                                              | 1.00                                                                              | 0.99                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.99                                                                              | 0.98                                                                              | 0.98                                                                              | 1.00                                                                              | 0.97                                                                              | 0.97                                                                              |
| Flt                               | 1.00                                                                              | 0.99                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.96                                                                              | 0.96                                                                              | 0.96                                                                              | 1.00                                                                              | 0.93                                                                              | 0.93                                                                              |
| Flt Protected                     | 0.95                                                                              | 1.00                                                                              | 0.95                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 0.97                                                                              | 0.97                                                                              | 0.97                                                                              | 1.00                                                                              | 0.97                                                                              | 0.97                                                                              |
| Satd. Flow (prot)                 | 1729                                                                              | 1836                                                                              | 1748                                                                              | 1859                                                                              | 1748                                                                              | 1859                                                                              | 1678                                                                              | 1678                                                                              | 1678                                                                              | 1656                                                                              | 1656                                                                              | 1656                                                                              |
| Flt Permitted                     | 0.51                                                                              | 1.00                                                                              | 0.53                                                                              | 1.00                                                                              | 0.53                                                                              | 1.00                                                                              | 0.78                                                                              | 0.78                                                                              | 0.78                                                                              | 1.00                                                                              | 0.96                                                                              | 0.96                                                                              |
| Satd. Flow (perm)                 | 920                                                                               | 1836                                                                              | 979                                                                               | 1859                                                                              | 979                                                                               | 1859                                                                              | 1357                                                                              | 1357                                                                              | 1357                                                                              | 1597                                                                              | 1597                                                                              | 1597                                                                              |
| Peak-hour factor, PHF             | 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. Flow (vph)                   | 28                                                                                | 359                                                                               | 29                                                                                | 31                                                                                | 431                                                                               | 4                                                                                 | 88                                                                                | 16                                                                                | 39                                                                                | 4                                                                                 | 17                                                                                | 26                                                                                |
| RTOR Reduction (vph)              | 0                                                                                 | 6                                                                                 | 0                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 0                                                                                 | 31                                                                                | 0                                                                                 | 0                                                                                 | 20                                                                                | 0                                                                                 |
| Lane Group Flow (vph)             | 28                                                                                | 382                                                                               | 0                                                                                 | 31                                                                                | 434                                                                               | 0                                                                                 | 112                                                                               | 0                                                                                 | 0                                                                                 | 0                                                                                 | 27                                                                                | 0                                                                                 |
| Confl. Peds. (#/hr)               | 47                                                                                | 26                                                                                | 26                                                                                | 47                                                                                | 64                                                                                | 47                                                                                | 64                                                                                | 38                                                                                | 38                                                                                | 64                                                                                | 64                                                                                | 64                                                                                |
| Turn Type                         | Perm                                                                              | NA                                                                                | NA                                                                                | Perm                                                                              | NA                                                                                | Perm                                                                              | NA                                                                                | NA                                                                                | Perm                                                                              | NA                                                                                | NA                                                                                | NA                                                                                |
| Protected Phases                  | 2                                                                                 | 2                                                                                 | 2                                                                                 | 6                                                                                 | 6                                                                                 | 6                                                                                 | 8                                                                                 | 8                                                                                 | 8                                                                                 | 4                                                                                 | 4                                                                                 | 4                                                                                 |
| Permitted Phases                  | 2                                                                                 | 2                                                                                 | 2                                                                                 | 6                                                                                 | 6                                                                                 | 6                                                                                 | 8                                                                                 | 8                                                                                 | 8                                                                                 | 4                                                                                 | 4                                                                                 | 4                                                                                 |
| Actuated Green, G (s)             | 9.0                                                                               | 9.0                                                                               | 9.0                                                                               | 9.0                                                                               | 9.0                                                                               | 9.0                                                                               | 4.2                                                                               | 4.2                                                                               | 4.2                                                                               | 4.2                                                                               | 4.2                                                                               | 4.2                                                                               |
| Effective Green, g (s)            | 9.0                                                                               | 9.0                                                                               | 9.0                                                                               | 9.0                                                                               | 9.0                                                                               | 9.0                                                                               | 4.2                                                                               | 4.2                                                                               | 4.2                                                                               | 4.2                                                                               | 4.2                                                                               | 4.2                                                                               |
| Actuated g/C Ratio                | 0.46                                                                              | 0.46                                                                              | 0.46                                                                              | 0.46                                                                              | 0.46                                                                              | 0.46                                                                              | 0.21                                                                              | 0.21                                                                              | 0.21                                                                              | 0.21                                                                              | 0.21                                                                              | 0.21                                                                              |
| Clearance Time (s)                | 3.3                                                                               | 3.3                                                                               | 3.3                                                                               | 3.3                                                                               | 3.3                                                                               | 3.3                                                                               | 3.1                                                                               | 3.1                                                                               | 3.1                                                                               | 3.1                                                                               | 3.1                                                                               | 3.1                                                                               |
| Vehicle Extension (s)             | 2.0                                                                               | 2.0                                                                               | 2.0                                                                               | 2.0                                                                               | 2.0                                                                               | 2.0                                                                               | 2.0                                                                               | 2.0                                                                               | 2.0                                                                               | 2.0                                                                               | 2.0                                                                               | 2.0                                                                               |
| Lane Grp Cap (vph)                | 422                                                                               | 843                                                                               | 449                                                                               | 853                                                                               | 449                                                                               | 853                                                                               | 290                                                                               | 290                                                                               | 290                                                                               | 342                                                                               | 342                                                                               | 342                                                                               |
| v/s Ratio Prot                    | 0.21                                                                              | 0.21                                                                              | 0.21                                                                              | 0.23                                                                              | 0.23                                                                              | 0.23                                                                              | 0.08                                                                              | 0.08                                                                              | 0.08                                                                              | 0.02                                                                              | 0.02                                                                              | 0.02                                                                              |
| v/s Ratio Perm                    | 0.03                                                                              | 0.03                                                                              | 0.03                                                                              | 0.07                                                                              | 0.07                                                                              | 0.07                                                                              | 0.39                                                                              | 0.39                                                                              | 0.39                                                                              | 0.08                                                                              | 0.08                                                                              | 0.08                                                                              |
| v/c Ratio                         | 0.07                                                                              | 0.45                                                                              | 0.45                                                                              | 0.07                                                                              | 0.51                                                                              | 0.07                                                                              | 0.39                                                                              | 0.39                                                                              | 0.39                                                                              | 0.08                                                                              | 0.08                                                                              | 0.08                                                                              |
| Uniform Delay, d1                 | 3.0                                                                               | 3.6                                                                               | 3.6                                                                               | 3.0                                                                               | 3.7                                                                               | 3.0                                                                               | 6.6                                                                               | 6.6                                                                               | 6.6                                                                               | 6.2                                                                               | 6.2                                                                               | 6.2                                                                               |
| Progression 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                                                                              |
| Incremental Delay, d2             | 0.0                                                                               | 0.1                                                                               | 0.1                                                                               | 0.0                                                                               | 0.2                                                                               | 0.0                                                                               | 0.3                                                                               | 0.3                                                                               | 0.3                                                                               | 0.0                                                                               | 0.0                                                                               | 0.0                                                                               |
| Delay (s)                         | 3.0                                                                               | 3.8                                                                               | 3.8                                                                               | 3.0                                                                               | 3.9                                                                               | 3.0                                                                               | 6.9                                                                               | 6.9                                                                               | 6.9                                                                               | 6.2                                                                               | 6.2                                                                               | 6.2                                                                               |
| Level of Service                  | A                                                                                 | A                                                                                 | A                                                                                 | A                                                                                 | A                                                                                 | A                                                                                 | A                                                                                 | A                                                                                 | A                                                                                 | A                                                                                 | A                                                                                 | A                                                                                 |
| Approach Delay (s)                | 3.7                                                                               | 3.7                                                                               | 3.7                                                                               | 3.9                                                                               | 3.9                                                                               | 3.9                                                                               | 6.9                                                                               | 6.9                                                                               | 6.9                                                                               | 6.2                                                                               | 6.2                                                                               | 6.2                                                                               |
| Approach LOS                      | A                                                                                 | A                                                                                 | A                                                                                 | A                                                                                 | A                                                                                 | A                                                                                 | A                                                                                 | A                                                                                 | A                                                                                 | A                                                                                 | A                                                                                 | A                                                                                 |
| Intersection Summary              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| HCM 2000 Control Delay            | 4.3                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | HCM 2000 Level of Service                                                         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| HCM 2000 Volume to Capacity ratio | 0.47                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Actuated Cycle Length (s)         | 19.6                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | Sum of lost time (s)                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Intersection Capacity Utilization | 48.1%                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | A                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Analysis Period (min)             | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | ICU Level of Service                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Critical Lane Group               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |

HCM Signalized Intersection Capacity Analysis  
4: Brookwood Avenue & Sonoma Avenue

09/07/2017

| Movement               | EBL   | EBT  | EBR   | WBL   | WBT  | WBR   | NBL  | NBT   | NBR  | SBL  | SBT  | SBR   |
|------------------------|-------|------|-------|-------|------|-------|------|-------|------|------|------|-------|
| Lane Configurations    | ↖     | ↗    | ↘     | ↖     | ↗    | ↘     | ↖    | ↗     | ↘    | ↖    | ↗    | ↘     |
| Traffic Volume (vph)   | 78    | 405  | 28    | 146   | 332  | 194   | 17   | 348   | 357  | 276  | 369  | 114   |
| Future Volume (vph)    | 78    | 405  | 28    | 146   | 332  | 194   | 17   | 348   | 357  | 276  | 369  | 114   |
| Ideal Flow (vphpl)     | 1900  | 1900 | 1900  | 1900  | 1900 | 1900  | 1900 | 1900  | 1900 | 1900 | 1900 | 1900  |
| Total Lost time (s)    | 3.0   | 3.6  | 3.0   | 3.6   | 3.0  | 3.6   | 3.0  | 3.2   | 3.0  | 3.6  | 3.0  | 3.0   |
| Lane Util. Factor      | 1.00  | 0.95 | 1.00  | 0.99  | 1.00 | 0.95  | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 0.98  |
| Frbp. ped/bikes        | 1.00  | 1.00 | 1.00  | 1.00  | 1.00 | 1.00  | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  |
| Frbp. ped/bikes        | 1.00  | 1.00 | 1.00  | 1.00  | 1.00 | 1.00  | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  |
| Frt                    | 1.00  | 0.99 | 1.00  | 0.94  | 1.00 | 0.94  | 1.00 | 0.92  | 1.00 | 1.00 | 1.00 | 0.85  |
| Flt Protected          | 0.95  | 1.00 | 0.95  | 1.00  | 0.95 | 1.00  | 0.95 | 1.00  | 0.95 | 1.00 | 1.00 | 1.00  |
| Satd. Flow (prot)      | 1767  | 3491 | 1764  | 3310  | 1764 | 3310  | 1770 | 1682  | 1770 | 1683 | 1545 | 1545  |
| Flt Permitted          | 0.24  | 1.00 | 0.23  | 1.00  | 0.23 | 1.00  | 0.95 | 1.00  | 0.95 | 1.00 | 1.00 | 1.00  |
| Satd. Flow (perm)      | 446   | 3491 | 422   | 3310  | 422  | 3310  | 1770 | 1682  | 1770 | 1683 | 1545 | 1545  |
| Peak-hour factor, PHF  | 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. Flow (vph)        | 78    | 405  | 28    | 146   | 332  | 194   | 17   | 348   | 357  | 276  | 369  | 114   |
| RTOR Reduction (vph)   | 0     | 4    | 0     | 0     | 72   | 0     | 0    | 27    | 0    | 0    | 0    | 42    |
| Lane Group Flow (vph)  | 78    | 429  | 0     | 146   | 454  | 0     | 17   | 678   | 0    | 276  | 369  | 72    |
| Confl. Peds. (#/hr)    | 15    | 15   | 15    | 15    | 15   | 15    | 15   | 15    | 15   | 15   | 15   | 15    |
| Turn Type              | pm+pt | NA   | NA    | pm+pt | NA   | NA    | Prot | NA    | Prot | NA   | NA   | pm+ov |
| Protected Phases       | 5     | 2    | 2     | 1     | 6    | 6     | 3    | 8     | 8    | 7    | 4    | 5     |
| Permitted Phases       | 2     | 2    | 2     | 6     | 6    | 6     | 6    | 6     | 6    | 7    | 4    | 4     |
| Actuated Green, G (s)  | 24.7  | 16.7 | 29.5  | 19.1  | 29.5 | 19.1  | 3.0  | 41.9  | 15.1 | 53.6 | 61.6 | 61.6  |
| Effective Green, g (s) | 24.7  | 16.7 | 29.5  | 19.1  | 29.5 | 19.1  | 3.0  | 41.9  | 15.1 | 53.6 | 61.6 | 61.6  |
| Actuated g/C Ratio     | 0.25  | 0.17 | 0.30  | 0.20  | 0.30 | 0.20  | 0.03 | 0.43  | 0.16 | 0.55 | 0.64 | 0.64  |
| Clearance Time (s)     | 3.0   | 3.6  | 3.0   | 3.6   | 3.0  | 3.6   | 3.0  | 3.2   | 3.0  | 3.6  | 3.0  | 3.0   |
| Vehicle Extension (s)  | 2.0   | 2.0  | 2.0   | 2.0   | 2.0  | 2.0   | 2.0  | 3.0   | 2.0  | 3.0  | 2.0  | 2.0   |
| Lane Grp Cap (vph)     | 222   | 601  | 272   | 652   | 272  | 652   | 54   | 727   | 275  | 1030 | 982  | 982   |
| v/s Ratio Prot         | 0.03  | 0.12 | c0.06 | c0.14 | 0.01 | c0.40 | 0.01 | c0.40 | 0.16 | 0.20 | 0.01 | 0.01  |
| v/s Ratio Perm         | 0.06  | 0.11 | 0.11  | 0.11  | 0.11 | 0.11  | 0.11 | 0.11  | 0.11 | 0.11 | 0.11 | 0.11  |
| v/c Ratio              | 0.35  | 0.71 | 0.54  | 0.70  | 0.31 | 0.93  | 0.31 | 0.93  | 1.00 | 0.36 | 0.07 | 0.07  |
| Uniform Delay, d1      | 28.5  | 37.8 | 26.2  | 36.2  | 26.2 | 36.2  | 45.9 | 26.2  | 40.9 | 12.1 | 6.7  | 6.7   |
| Progression 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  |
| Incremental Delay, d2  | 0.4   | 3.3  | 1.0   | 2.6   | 1.0  | 2.6   | 1.2  | 18.8  | 55.2 | 0.2  | 0.0  | 0.0   |
| Delay (s)              | 28.9  | 41.2 | 27.2  | 38.8  | 27.2 | 38.8  | 47.2 | 45.0  | 96.1 | 12.3 | 6.8  | 6.8   |
| Level of Service       | C     | D    | C     | D     | C    | D     | D    | D     | F    | B    | A    | A     |
| Approach Delay (s)     | 39.3  | 39.3 | 39.3  | 36.3  | 36.3 | 36.3  | 45.1 | 45.1  | 45.1 | 41.9 | 41.9 | 41.9  |
| Approach LOS           | D     | D    | D     | D     | D    | D     | D    | D     | D    | D    | D    | D     |

| Intersection Summary              |       |                           |      |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay            | 40.9  | HCM 2000 Level of Service | D    |
| HCM 2000 Volume to Capacity ratio | 0.87  |                           |      |
| Actuated Cycle Length (s)         | 96.9  | Sum of lost time (s)      | 13.2 |
| Intersection Capacity Utilization | 94.6% | ICU Level of Service      | F    |
| Analysis Period (min)             | 15    |                           |      |
| c Critical Lane Group             |       |                           |      |

Traffic Study for the Santa Rosa Memorial Hospital  
AM Future + Project

Synchro 8 Report

HCM Signalized Intersection Capacity Analysis  
4: Brookwood Avenue & Sonoma Avenue

09/07/2017

| Movement               | EBL   | EBT  | EBR   | WBL   | WBT  | WBR   | NBL  | NBT   | NBR  | SBL  | SBT  | SBR   |
|------------------------|-------|------|-------|-------|------|-------|------|-------|------|------|------|-------|
| Lane Configurations    | ↖     | ↗    | ↘     | ↖     | ↗    | ↘     | ↖    | ↗     | ↘    | ↖    | ↗    | ↘     |
| Traffic Volume (vph)   | 104   | 421  | 50    | 290   | 445  | 166   | 18   | 296   | 189  | 199  | 567  | 175   |
| Future Volume (vph)    | 104   | 421  | 50    | 290   | 445  | 166   | 18   | 296   | 189  | 199  | 567  | 175   |
| Ideal Flow (vphpl)     | 1900  | 1900 | 1900  | 1900  | 1900 | 1900  | 1900 | 1900  | 1900 | 1900 | 1900 | 1900  |
| Total Lost time (s)    | 3.0   | 3.6  | 3.0   | 3.6   | 3.0  | 3.6   | 3.0  | 3.2   | 3.0  | 3.6  | 3.0  | 3.0   |
| Lane Util. Factor      | 1.00  | 0.95 | 1.00  | 0.95  | 1.00 | 0.95  | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 0.98  |
| Frbp. ped/bikes        | 1.00  | 1.00 | 1.00  | 1.00  | 1.00 | 1.00  | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  |
| Frbp. ped/bikes        | 1.00  | 1.00 | 1.00  | 1.00  | 1.00 | 1.00  | 1.00 | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  |
| Frt                    | 1.00  | 0.98 | 1.00  | 0.96  | 1.00 | 0.96  | 1.00 | 0.94  | 1.00 | 1.00 | 1.00 | 0.85  |
| Flt Protected          | 0.95  | 1.00 | 0.95  | 1.00  | 0.95 | 1.00  | 0.95 | 1.00  | 0.95 | 1.00 | 1.00 | 1.00  |
| Satd. Flow (prot)      | 1767  | 3461 | 1765  | 3371  | 1765 | 3371  | 1770 | 1724  | 1770 | 1683 | 1548 | 1548  |
| Flt Permitted          | 0.27  | 1.00 | 0.22  | 1.00  | 0.22 | 1.00  | 0.95 | 1.00  | 0.95 | 1.00 | 1.00 | 1.00  |
| Satd. Flow (perm)      | 505   | 3461 | 416   | 3371  | 416  | 3371  | 1770 | 1724  | 1770 | 1683 | 1548 | 1548  |
| Peak-hour factor, PHF  | 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. Flow (vph)        | 104   | 421  | 50    | 290   | 445  | 166   | 18   | 296   | 189  | 199  | 567  | 175   |
| RTOR Reduction (vph)   | 0     | 8    | 0     | 0     | 31   | 0     | 0    | 19    | 0    | 0    | 0    | 74    |
| Lane Group Flow (vph)  | 104   | 463  | 0     | 290   | 580  | 0     | 18   | 466   | 0    | 199  | 567  | 101   |
| Confl. Peds. (#/hr)    | 15    | 15   | 15    | 15    | 15   | 15    | 15   | 15    | 15   | 15   | 15   | 15    |
| Turn Type              | pm+pt | NA   | NA    | pm+pt | NA   | NA    | Prot | NA    | Prot | NA   | NA   | pm+ov |
| Protected Phases       | 5     | 2    | 2     | 1     | 6    | 6     | 3    | 8     | 8    | 7    | 4    | 5     |
| Permitted Phases       | 2     | 2    | 2     | 6     | 6    | 6     | 6    | 6     | 6    | 7    | 4    | 4     |
| Actuated Green, G (s)  | 27.3  | 18.2 | 35.4  | 23.3  | 27.3 | 23.3  | 2.7  | 32.5  | 15.3 | 44.7 | 53.8 | 53.8  |
| Effective Green, g (s) | 27.3  | 18.2 | 35.4  | 23.3  | 27.3 | 23.3  | 2.7  | 32.5  | 15.3 | 44.7 | 53.8 | 53.8  |
| Actuated g/C Ratio     | 0.29  | 0.20 | 0.38  | 0.25  | 0.38 | 0.25  | 0.03 | 0.35  | 0.16 | 0.48 | 0.58 | 0.58  |
| Clearance Time (s)     | 3.0   | 3.6  | 3.0   | 3.6   | 3.0  | 3.6   | 3.0  | 3.2   | 3.0  | 3.6  | 3.0  | 3.0   |
| Vehicle Extension (s)  | 2.0   | 2.0  | 2.0   | 2.0   | 2.0  | 2.0   | 2.0  | 3.0   | 2.0  | 3.0  | 2.0  | 2.0   |
| Lane Grp Cap (vph)     | 271   | 677  | 364   | 844   | 364  | 844   | 51   | 602   | 291  | 895  | 895  | 895   |
| v/s Ratio Prot         | 0.04  | 0.13 | c0.12 | 0.17  | 0.01 | c0.27 | 0.01 | c0.11 | 0.30 | 0.01 | 0.01 | 0.01  |
| v/s Ratio Perm         | 0.07  | 0.07 | 0.18  | 0.18  | 0.07 | 0.18  | 0.07 | 0.18  | 0.07 | 0.18 | 0.07 | 0.07  |
| v/c Ratio              | 0.38  | 0.68 | 0.80  | 0.69  | 0.35 | 0.77  | 0.35 | 0.77  | 0.68 | 0.63 | 0.11 | 0.11  |
| Uniform Delay, d1      | 24.9  | 34.7 | 22.4  | 31.6  | 22.4 | 31.6  | 44.3 | 27.0  | 36.6 | 18.0 | 8.8  | 8.8   |
| Progression 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  |
| Incremental Delay, d2  | 0.3   | 2.3  | 10.8  | 1.9   | 1.5  | 6.2   | 1.5  | 6.2   | 5.2  | 1.5  | 0.0  | 0.0   |
| Delay (s)              | 25.2  | 37.0 | 33.1  | 33.4  | 23.9 | 33.4  | 45.8 | 33.1  | 41.8 | 19.5 | 8.9  | 8.9   |
| Level of Service       | C     | D    | C     | C     | C    | C     | D    | C     | D    | B    | A    | A     |
| Approach Delay (s)     | 34.9  | 34.9 | 34.9  | 33.3  | 33.3 | 33.3  | 33.6 | 33.6  | 33.6 | 22.2 | 22.2 | 22.2  |
| Approach LOS           | C     | C    | C     | C     | C    | C     | C    | C     | C    | C    | C    | C     |

| Intersection Summary              |       |                           |      |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay            | 30.1  | HCM 2000 Level of Service | C    |
| HCM 2000 Volume to Capacity ratio | 0.80  |                           |      |
| Actuated Cycle Length (s)         | 93.0  | Sum of lost time (s)      | 13.2 |
| Intersection Capacity Utilization | 81.8% | ICU Level of Service      | D    |
| Analysis Period (min)             | 15    |                           |      |
| c Critical Lane Group             |       |                           |      |

Traffic Study for the Santa Rosa Memorial Hospital  
PM Future + Project

Synchro 8 Report

# HCM Unsignalized Intersection Capacity Analysis

5: Sonoma Avenue & Sotoyome Street

09/07/2017



| Movement                          | EBL        | EBT        | WBT        | WBR        | SBL                  | SBR        |
|-----------------------------------|------------|------------|------------|------------|----------------------|------------|
| Lane Configurations               | LT, TH, RT | LT, TH, RT | LT, TH, RT | LT, TH, RT | LT, TH, RT           | LT, TH, RT |
| Traffic Volume (veh/h)            | 192        | 660        | 647        | 88         | 26                   | 115        |
| Future Volume (Veh/h)             | 192        | 660        | 647        | 88         | 26                   | 115        |
| Sign Control                      | Free       | Free       | Free       | Free       | Stop                 | Stop       |
| Grade                             | 0%         | 0%         | 0%         | 0%         | 0%                   | 0%         |
| Peak Hour Factor                  | 1.00       | 1.00       | 1.00       | 1.00       | 1.00                 | 1.00       |
| Hourly flow rate (vph)            | 192        | 660        | 647        | 88         | 26                   | 115        |
| Pedestrians                       |            |            |            |            |                      |            |
| Lane Width (ft)                   |            |            |            |            |                      |            |
| Walking Speed (ft/s)              |            |            |            |            |                      |            |
| Percent Blockage                  |            |            |            |            |                      |            |
| Right turn flare (veh)            |            |            |            |            |                      |            |
| Median type                       |            | TWLT       | TL         | TWLT       |                      |            |
| Median storage (veh)              |            | 2          |            | 2          |                      |            |
| Upstream signal (ft)              |            | 595        |            |            |                      |            |
| pX platoon unblocked              |            |            |            |            | 0.88                 |            |
| VC, conflicting volume            | 735        |            |            |            | 1735                 | 691        |
| VC1, stage 1 conf vol             |            |            |            |            | 691                  |            |
| VC2, stage 2 conf vol             |            |            |            |            | 1044                 |            |
| VCu, unblocked vol                | 735        |            |            |            | 1768                 | 691        |
| IC, single (s)                    | 4.1        |            |            |            | 6.4                  | 6.2        |
| IC, 2 stage (s)                   |            |            |            |            | 5.4                  |            |
| IF (s)                            | 2.2        |            |            |            | 3.5                  | 3.3        |
| p0 queue free %                   | 78         |            |            |            | 88                   | 74         |
| CM capacity (veh/h)               | 870        |            |            |            | 222                  | 445        |
| Direction, Lane #                 | EB 1       | EB 2       | WB 1       | SB 1       |                      |            |
| Volume Total                      | 192        | 660        | 735        | 141        |                      |            |
| Volume Left                       | 192        | 0          | 0          | 26         |                      |            |
| Volume Right                      | 0          | 0          | 88         | 115        |                      |            |
| cSH                               | 870        | 1700       | 1700       | 375        |                      |            |
| Volume to Capacity                | 0.22       | 0.39       | 0.43       | 0.38       |                      |            |
| Queue Length 95th (ft)            | 21         | 0          | 0          | 43         |                      |            |
| Control Delay (s)                 | 10.3       | 0.0        | 0.0        | 20.3       |                      |            |
| Lane LOS                          | B          |            |            | C          |                      |            |
| Approach Delay (s)                | 2.3        |            | 0.0        | 20.3       |                      |            |
| Approach LOS                      |            |            |            | C          |                      |            |
| Intersection Summary              |            |            |            |            |                      |            |
| Average Delay                     |            |            | 2.8        |            |                      |            |
| Intersection Capacity Utilization |            |            | Err%       |            | ICU Level of Service | H          |
| Analysis Period (min)             |            |            | 15         |            |                      |            |

Traffic Study for the Santa Rosa Memorial Hospital  
AM Future + Project

Synchro 8 Report

# HCM Unsignalized Intersection Capacity Analysis

5: Sonoma Avenue & Sotoyome Street

09/07/2017



| Movement                          | EBL        | EBT        | WBT        | WBR        | SBL                  | SBR        |
|-----------------------------------|------------|------------|------------|------------|----------------------|------------|
| Lane Configurations               | LT, TH, RT | LT, TH, RT | LT, TH, RT | LT, TH, RT | LT, TH, RT           | LT, TH, RT |
| Traffic Volume (veh/h)            | 91         | 631        | 709        | 56         | 75                   | 206        |
| Future Volume (Veh/h)             | 91         | 631        | 709        | 56         | 75                   | 206        |
| Sign Control                      | Free       | Free       | Free       | Free       | Stop                 | Stop       |
| Grade                             | 0%         | 0%         | 0%         | 0%         | 0%                   | 0%         |
| Peak Hour Factor                  | 1.00       | 1.00       | 1.00       | 1.00       | 1.00                 | 1.00       |
| Hourly flow rate (vph)            | 91         | 631        | 709        | 56         | 75                   | 206        |
| Pedestrians                       |            |            |            |            |                      |            |
| Lane Width (ft)                   |            |            |            |            |                      |            |
| Walking Speed (ft/s)              |            |            |            |            |                      |            |
| Percent Blockage                  |            |            |            |            |                      |            |
| Right turn flare (veh)            |            |            |            |            |                      |            |
| Median type                       |            | TWLT       | TL         | TWLT       |                      |            |
| Median storage (veh)              |            | 2          |            | 2          |                      |            |
| Upstream signal (ft)              |            | 595        |            |            |                      |            |
| pX platoon unblocked              |            |            |            |            | 0.85                 |            |
| VC, conflicting volume            | 765        |            |            |            | 1550                 | 737        |
| VC1, stage 1 conf vol             |            |            |            |            | 737                  |            |
| VC2, stage 2 conf vol             |            |            |            |            | 813                  |            |
| VCu, unblocked vol                | 765        |            |            |            | 1559                 | 737        |
| IC, single (s)                    | 4.1        |            |            |            | 6.4                  | 6.2        |
| IC, 2 stage (s)                   |            |            |            |            | 5.4                  |            |
| IF (s)                            | 2.2        |            |            |            | 3.5                  | 3.3        |
| p0 queue free %                   | 89         |            |            |            | 75                   | 51         |
| CM capacity (veh/h)               | 848        |            |            |            | 301                  | 418        |
| Direction, Lane #                 | EB 1       | EB 2       | WB 1       | SB 1       |                      |            |
| Volume Total                      | 91         | 631        | 765        | 281        |                      |            |
| Volume Left                       | 91         | 0          | 0          | 75         |                      |            |
| Volume Right                      | 0          | 0          | 56         | 206        |                      |            |
| cSH                               | 848        | 1700       | 1700       | 379        |                      |            |
| Volume to Capacity                | 0.11       | 0.37       | 0.45       | 0.74       |                      |            |
| Queue Length 95th (ft)            | 9          | 0          | 0          | 146        |                      |            |
| Control Delay (s)                 | 9.8        | 0.0        | 0.0        | 37.3       |                      |            |
| Lane LOS                          | A          |            |            | E          |                      |            |
| Approach Delay (s)                | 1.2        |            | 0.0        | 37.3       |                      |            |
| Approach LOS                      |            |            |            | E          |                      |            |
| Intersection Summary              |            |            |            |            |                      |            |
| Average Delay                     |            |            | 6.4        |            |                      |            |
| Intersection Capacity Utilization |            |            | Err%       |            | ICU Level of Service | H          |
| Analysis Period (min)             |            |            | 15         |            |                      |            |

Traffic Study for the Santa Rosa Memorial Hospital  
PM Future + Project

Synchro 8 Report

# HCM Unsignalized Intersection Capacity Analysis

6: Doyle Park Drive & Sonoma Avenue

09/07/2017

| Movement                          | EBL                                                                                 | EBT                                                                                 | EBR                                                                                 | WBL                                                                                 | WBT                                                                                 | WBR                                                                                 | NBL                                                                                 | NBT                                                                                 | NBR                                                                                 | SBL                                                                                 | SBT                                                                                 | SBR                                                                                 |
|-----------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Lane Configurations               |  |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)            | 104                                                                                 | 428                                                                                 | 66                                                                                  | 49                                                                                  | 639                                                                                 | 32                                                                                  | 61                                                                                  | 3                                                                                   | 36                                                                                  | 11                                                                                  | 1                                                                                   | 57                                                                                  |
| Future Volume (Veh/h)             | 104                                                                                 | 428                                                                                 | 66                                                                                  | 49                                                                                  | 639                                                                                 | 32                                                                                  | 61                                                                                  | 3                                                                                   | 36                                                                                  | 11                                                                                  | 1                                                                                   | 57                                                                                  |
| Sign Control                      | Free                                                                                |                                                                                     |                                                                                     | Free                                                                                |                                                                                     |                                                                                     | Stop                                                                                |                                                                                     |                                                                                     | Stop                                                                                |                                                                                     |                                                                                     |
| Grade                             | 0%                                                                                  |                                                                                     |                                                                                     | 0%                                                                                  |                                                                                     |                                                                                     | 0%                                                                                  |                                                                                     |                                                                                     | 0%                                                                                  |                                                                                     |                                                                                     |
| Peak Hour Factor                  | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                | 1.00                                                                                |
| Hourly flow rate (vph)            | 104                                                                                 | 428                                                                                 | 66                                                                                  | 49                                                                                  | 639                                                                                 | 32                                                                                  | 61                                                                                  | 3                                                                                   | 36                                                                                  | 11                                                                                  | 1                                                                                   | 57                                                                                  |
| Pedestrians                       |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Lane Width (ft)                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Walking Speed (ft/s)              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Percent Blockage                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Right turn flare (veh)            |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Median type                       | TWLTL                                                                               |                                                                                     |                                                                                     | TWLTL                                                                               |                                                                                     |                                                                                     | TWLTL                                                                               |                                                                                     |                                                                                     | 1                                                                                   |                                                                                     |                                                                                     |
| Median storage (veh)              | 2                                                                                   |                                                                                     |                                                                                     | 2                                                                                   |                                                                                     |                                                                                     | 2                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Upstream signal (ft)              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| pX platoon unblocked              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| VC, conflicting volume            | 671                                                                                 |                                                                                     |                                                                                     | 494                                                                                 |                                                                                     |                                                                                     | 1464                                                                                | 1438                                                                                | 461                                                                                 | 1408                                                                                | 1455                                                                                | 655                                                                                 |
| VC1, stage 1 conf vol             |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     | 669                                                                                 | 669                                                                                 |                                                                                     | 753                                                                                 | 753                                                                                 |                                                                                     |
| VC2, stage 2 conf vol             |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     | 794                                                                                 | 769                                                                                 |                                                                                     | 656                                                                                 | 702                                                                                 |                                                                                     |
| VCu, unblocked vol                | 671                                                                                 |                                                                                     |                                                                                     | 494                                                                                 |                                                                                     |                                                                                     | 1464                                                                                | 1438                                                                                | 461                                                                                 | 1408                                                                                | 1455                                                                                | 655                                                                                 |
| IC, single (s)                    | 4.1                                                                                 |                                                                                     |                                                                                     | 4.1                                                                                 |                                                                                     |                                                                                     | 7.1                                                                                 | 6.5                                                                                 | 6.2                                                                                 | 7.1                                                                                 | 6.5                                                                                 | 6.2                                                                                 |
| IC, 2 stage (s)                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     | 6.1                                                                                 | 5.5                                                                                 |                                                                                     | 6.1                                                                                 | 5.5                                                                                 |                                                                                     |
| IF (s)                            | 2.2                                                                                 |                                                                                     |                                                                                     | 2.2                                                                                 |                                                                                     |                                                                                     | 3.5                                                                                 | 4.0                                                                                 | 3.3                                                                                 | 3.5                                                                                 | 4.0                                                                                 | 3.3                                                                                 |
| p0 queue free %                   | 89                                                                                  |                                                                                     |                                                                                     | 95                                                                                  |                                                                                     |                                                                                     | 69                                                                                  | 99                                                                                  | 94                                                                                  | 96                                                                                  | 100                                                                                 | 88                                                                                  |
| CM capacity (veh/h)               | 919                                                                                 |                                                                                     |                                                                                     | 1070                                                                                |                                                                                     |                                                                                     | 195                                                                                 | 249                                                                                 | 600                                                                                 | 260                                                                                 | 274                                                                                 | 466                                                                                 |
| Direction, Lane #                 | EB 1                                                                                | EB 2                                                                                | WB 1                                                                                | WB 2                                                                                | NB 1                                                                                | SB 1                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Volume Total                      | 104                                                                                 | 494                                                                                 | 49                                                                                  | 671                                                                                 | 100                                                                                 | 69                                                                                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Volume Left                       | 104                                                                                 | 0                                                                                   | 49                                                                                  | 0                                                                                   | 61                                                                                  | 11                                                                                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Volume Right                      | 0                                                                                   | 66                                                                                  | 0                                                                                   | 32                                                                                  | 36                                                                                  | 57                                                                                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| cSH                               | 919                                                                                 | 1700                                                                                | 1070                                                                                | 1700                                                                                | 284                                                                                 | 410                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Volume to Capacity                | 0.11                                                                                | 0.29                                                                                | 0.05                                                                                | 0.39                                                                                | 0.35                                                                                | 0.17                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Queue Length 95th (ft)            | 10                                                                                  | 0                                                                                   | 4                                                                                   | 0                                                                                   | 38                                                                                  | 15                                                                                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Control Delay (s)                 | 9.4                                                                                 | 0.0                                                                                 | 8.5                                                                                 | 0.0                                                                                 | 24.4                                                                                | 15.5                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Lane LOS                          | A                                                                                   | A                                                                                   | A                                                                                   | A                                                                                   | C                                                                                   | C                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Approach Delay (s)                | 1.6                                                                                 |                                                                                     | 0.6                                                                                 |                                                                                     | 24.4                                                                                | 15.5                                                                                |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Approach LOS                      |                                                                                     |                                                                                     | C                                                                                   |                                                                                     | C                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Intersection Summary              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Average Delay                     |                                                                                     |                                                                                     |                                                                                     | 3.3                                                                                 |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     | B                                                                                   |                                                                                     |                                                                                     |
| Intersection Capacity Utilization |                                                                                     |                                                                                     |                                                                                     | 62.2%                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Analysis Period (min)             |                                                                                     |                                                                                     |                                                                                     | 15                                                                                  |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

Traffic Study for the Santa Rosa Memorial Hospital  
AM Future + Project

Synchro 8 Report

# HCM Unsignalized Intersection Capacity Analysis

6: Doyle Park Drive & Sonoma Avenue

09/07/2017

| Movement                          | EBL                                                                               | EBT                                                                               | EBR                                                                               | WBL                                                                               | WBT                                                                               | WBR                                                                               | NBL                                                                               | NBT                                                                               | NBR                                                                               | SBL                                                                               | SBT                                                                               | SBR                                                                               |
|-----------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Lane Configurations               |  |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume (veh/h)            | 41                                                                                | 764                                                                               | 41                                                                                | 15                                                                                | 421                                                                               | 14                                                                                | 28                                                                                | 5                                                                                 | 24                                                                                | 21                                                                                | 7                                                                                 | 152                                                                               |
| Future Volume (Veh/h)             | 41                                                                                | 764                                                                               | 41                                                                                | 15                                                                                | 421                                                                               | 14                                                                                | 28                                                                                | 5                                                                                 | 24                                                                                | 21                                                                                | 7                                                                                 | 152                                                                               |
| Sign Control                      | Free                                                                              |                                                                                   |                                                                                   | Free                                                                              |                                                                                   |                                                                                   | Stop                                                                              |                                                                                   |                                                                                   | Stop                                                                              |                                                                                   |                                                                                   |
| Grade                             | 0%                                                                                |                                                                                   |                                                                                   | 0%                                                                                |                                                                                   |                                                                                   | 0%                                                                                |                                                                                   |                                                                                   | 0%                                                                                |                                                                                   |                                                                                   |
| Peak Hour Factor                  | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              | 1.00                                                                              |
| Hourly flow rate (vph)            | 41                                                                                | 764                                                                               | 41                                                                                | 15                                                                                | 421                                                                               | 14                                                                                | 28                                                                                | 5                                                                                 | 24                                                                                | 21                                                                                | 7                                                                                 | 152                                                                               |
| Pedestrians                       |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Lane Width (ft)                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Walking Speed (ft/s)              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Percent Blockage                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Right turn flare (veh)            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Median type                       | TWLTL                                                                             |                                                                                   |                                                                                   | TWLTL                                                                             |                                                                                   |                                                                                   | TWLTL                                                                             |                                                                                   |                                                                                   | 1                                                                                 |                                                                                   |                                                                                   |
| Median storage (veh)              | 2                                                                                 |                                                                                   |                                                                                   | 2                                                                                 |                                                                                   |                                                                                   | 2                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Upstream signal (ft)              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| pX platoon unblocked              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| VC, conflicting volume            | 435                                                                               |                                                                                   |                                                                                   | 805                                                                               |                                                                                   |                                                                                   | 1473                                                                              | 1332                                                                              | 784                                                                               | 1318                                                                              | 1345                                                                              | 428                                                                               |
| VC1, stage 1 conf vol             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 866                                                                               | 866                                                                               |                                                                                   | 458                                                                               | 458                                                                               |                                                                                   |
| VC2, stage 2 conf vol             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 606                                                                               | 465                                                                               |                                                                                   | 860                                                                               | 887                                                                               |                                                                                   |
| VCu, unblocked vol                | 435                                                                               |                                                                                   |                                                                                   | 805                                                                               |                                                                                   |                                                                                   | 1473                                                                              | 1332                                                                              | 784                                                                               | 1318                                                                              | 1345                                                                              | 428                                                                               |
| IC, single (s)                    | 4.1                                                                               |                                                                                   |                                                                                   | 4.1                                                                               |                                                                                   |                                                                                   | 7.1                                                                               | 6.5                                                                               | 6.2                                                                               | 7.1                                                                               | 6.5                                                                               | 6.2                                                                               |
| IC, 2 stage (s)                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 6.1                                                                               | 5.5                                                                               |                                                                                   | 6.1                                                                               | 5.5                                                                               |                                                                                   |
| IF (s)                            | 2.2                                                                               |                                                                                   |                                                                                   | 2.2                                                                               |                                                                                   |                                                                                   | 3.5                                                                               | 4.0                                                                               | 3.3                                                                               | 3.5                                                                               | 4.0                                                                               | 3.3                                                                               |
| p0 queue free %                   | 96                                                                                |                                                                                   |                                                                                   | 98                                                                                |                                                                                   |                                                                                   | 88                                                                                | 98                                                                                | 94                                                                                | 92                                                                                | 98                                                                                | 76                                                                                |
| CM capacity (veh/h)               | 1125                                                                              |                                                                                   |                                                                                   | 819                                                                               |                                                                                   |                                                                                   | 235                                                                               | 312                                                                               | 393                                                                               | 273                                                                               | 302                                                                               | 627                                                                               |
| Direction, Lane #                 | EB 1                                                                              | EB 2                                                                              | WB 1                                                                              | WB 2                                                                              | NB 1                                                                              | SB 1                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Volume Total                      | 41                                                                                | 805                                                                               | 15                                                                                | 435                                                                               | 57                                                                                | 180                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Volume Left                       | 41                                                                                | 0                                                                                 | 15                                                                                | 0                                                                                 | 28                                                                                | 21                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Volume Right                      | 0                                                                                 | 41                                                                                | 0                                                                                 | 14                                                                                | 24                                                                                | 152                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| cSH                               | 1125                                                                              | 1700                                                                              | 819                                                                               | 1700                                                                              | 427                                                                               | 525                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Volume to Capacity                | 0.04                                                                              | 0.47                                                                              | 0.02                                                                              | 0.26                                                                              | 0.13                                                                              | 0.34                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Queue Length 95th (ft)            | 3                                                                                 | 0                                                                                 | 1                                                                                 | 0                                                                                 | 11                                                                                | 38                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Control Delay (s)                 | 8.3                                                                               | 0.0                                                                               | 9.5                                                                               | 0.0                                                                               | 18.8                                                                              | 15.4                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Lane LOS                          | A                                                                                 | A                                                                                 | A                                                                                 | A                                                                                 | C                                                                                 | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Approach Delay (s)                | 0.4                                                                               |                                                                                   | 0.3                                                                               |                                                                                   | 18.8                                                                              | 15.4                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Approach LOS                      |                                                                                   |                                                                                   | C                                                                                 |                                                                                   | C                                                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Intersection Summary              |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Average Delay                     |                                                                                   |                                                                                   |                                                                                   | 2.8                                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | C                                                                                 |                                                                                   |                                                                                   |
| Intersection Capacity Utilization |                                                                                   |                                                                                   |                                                                                   | 66.9%                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
| Analysis Period (min)             |                                                                                   |                                                                                   |                                                                                   | 15                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |

Traffic Study for the Santa Rosa Memorial Hospital  
PM Future + Project

Synchro 8 Report

# Appendix C

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## Pedestrian Crossing Warrant





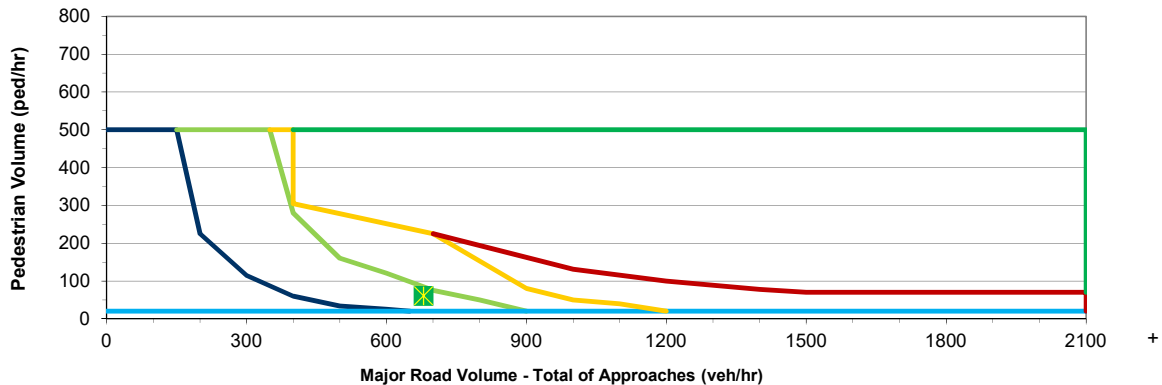
# TCRP Report 112 - NCHRP Report 562 - Pedestrian Crossing Treatment Worksheet

## Worksheet 1: Peak-Hour, 35 MPH or Less

| Analyst and Site Information                                                                                                                                                                                                      |                                                                   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| Analyst: W-Trans                                                                                                                                                                                                                  | Major Street: Montgomery Drive                                    |
| Analysis Date: 12-Jun-17                                                                                                                                                                                                          | Minor Street or Location: Mid-Block Crossing at Memorial Hospital |
| Data Collection Date: 11/3/2015                                                                                                                                                                                                   | Peak Hour: PM                                                     |
| <b>Step 1:</b> Select worksheet (speed reflects posted or statutory speed limit or 85th percentile speed on the major street):                                                                                                    |                                                                   |
| a) Worksheet 1 - 35 mph or less                                                                                                                                                                                                   |                                                                   |
| b) Worksheet 2- exceeds 35 mph, communities with less than 10,000, or where major transit stop exists                                                                                                                             |                                                                   |
| <b>Step 2:</b> Does the crossing meet minimum pedestrian volumes to be considered for a TCD type of treatment?                                                                                                                    |                                                                   |
| 2a Peak-hour pedestrian volume (ped/h), vp                                                                                                                                                                                        | 2a 61                                                             |
| If 2a ≥ 20 ped/h, then go to Step 3.<br>If 2a < 20 ped/h, then consider median refuge islands, curb extensions, traffic calming, etc. as feasible.                                                                                |                                                                   |
| <b>Step 3:</b> Does the crossing meet the pedestrian volume warrant for a traffic signal?                                                                                                                                         |                                                                   |
| 3a Major road volume, total of both approaches during peak hour (veh/h), V maj-s                                                                                                                                                  | 3a 679                                                            |
| 3b Minimum signal warrant volume for peak hour (use 3a for Vmaj-s), SC                                                                                                                                                            | 3b 437.33                                                         |
| $SC = 0.00021 V_{maj-s}^2 - 0.74072 V_{maj-s} + 734.125 / 0.75$ OR<br>$[(0.00021 3a^2 - 0.74072 3a + 734.125) / 0.75]$                                                                                                            |                                                                   |
| 3c If 3b < 133, then enter 133. If 3b ≥ 133, then enter 3b.                                                                                                                                                                       | 3c 437.3263067                                                    |
| 3d If 15th percentile crossing speed of pedestrians is less than 3.5 ft/s (1.1 m/s), then reduce 3c by up to 50 percent; otherwise enter 3c.                                                                                      | 3d 437.3263067                                                    |
| If 2a ≥ 3d, then the warrant has been met and a traffic signal should be considered if not within 300 ft of another traffic signal. Otherwise, the warrant has not been met. Go to Step 4.                                        |                                                                   |
| <b>Step 4:</b> Estimate pedestrian delay.                                                                                                                                                                                         |                                                                   |
| 4a Pedestrian crossing distance, curb to curb (ft), L                                                                                                                                                                             | 4a 56                                                             |
| 4b Pedestrian walking speed (ft.s), Sp                                                                                                                                                                                            | 4b 2.5                                                            |
| 4c Pedestrian start-up time and end clearance time (s), ts                                                                                                                                                                        | 4c 4                                                              |
| 4d Critical gap required for crossing pedestrian (s), tc = (L/Sp) + ts OR [(4a/4b) + 4c]                                                                                                                                          | 4d 26.40                                                          |
| 4e Major road volume, total of both approaches or approach being crossed if median refuge island is present during peak hour (veh.h), Vmaj-d                                                                                      | 4e 679                                                            |
| 4f Major road flow rate (veh/s), v = Vmaj-d/3600 OR [4e/3600]                                                                                                                                                                     | 4f 0.19                                                           |
| 4g Average pedestrian delay (s/person), dp = (e <sup>4f x 4d</sup> - v tc - 1) / v OR [(e <sup>4f x 4d</sup> - 4f x 4d - 1) / 4f]                                                                                                 | 4g 739.08                                                         |
| 4h Total pedestrian delay (h), Dp = (dp x Vp) / 3600 OR [(4g x 2a) / 3600]                                                                                                                                                        | 4h 12.52                                                          |
| (this is estimated delay for all pedestrians crossing the major roadway without a crossing treatment - assumes 0% compliance). This calculated value can be replaced with the actual total pedestrian delay measured at the site. |                                                                   |
| <b>Step 5:</b> Select treatment based upon total pedestrian delay and expected motorist compliance.                                                                                                                               |                                                                   |
| 5a Expected motorist compliance at pedestrian crossings in region, Comp = high or low                                                                                                                                             | 5a HIGH                                                           |

| Total Pedestrian Delay<br>Dp (4h) and Comp (5a)                                   | Treatment Category<br>(see Descriptions of Sample Treatments for examples) |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Dp ≥ 21.3h (Comp = high or low) OR<br>5.3h ≤ Dp < 21.3 h and Comp = low           | DO NOT USE RED                                                             |
| 1.3h ≤ Dp < 21.3h and Comp = high or low) OR<br>5.3 ≤ Dp < 21.3 h and Comp = high | USE ACTIVE OR ENHANCED                                                     |
| Dp < 1.3 h (Comp = high or low)                                                   | DO NOT USE CROSSWALK                                                       |

Roadway Configuration: 50' Wide, >35 mph, Vped = 3.5 ft/s



| LEGEND                                                                                                         | DESCRIPTIONS OF TREATMENT TYPE |                                              |
|----------------------------------------------------------------------------------------------------------------|--------------------------------|----------------------------------------------|
| Study Intersection                                                                                             | RED                            | ENHANCED-HIGH VISIBILITY/ACTIVE WHEN PRESENT |
| Signal                                                                                                         |                                | Active When Present                          |
| Enhanced-High Visibility/Active when Present                                                                   | • Midblock Signal              | • In Roadway Warning Lights                  |
| Red                                                                                                            | • Half Signal                  | • Passive/Pushbutton Flashing Beacons        |
| Enhanced-High Visibility/Active when Present (if high compliance expected) OR Red (if low compliance expected) |                                | • Pedestrian Crossing Flags                  |
| Striped Crosswalk                                                                                              | • HAWK                         | • Rapid Rectangular Flashing Beacons         |
| No Treatment                                                                                                   |                                | Enhanced/High Visibility                     |
|                                                                                                                |                                | • In-Street Crossing Signs                   |
|                                                                                                                |                                | • High Visibility Signs/Markings             |
|                                                                                                                |                                | • Pedestrian Refuge Islands                  |
|                                                                                                                |                                | • Raised Crosswalks                          |
|                                                                                                                |                                | • Curb Extensions                            |
|                                                                                                                |                                | • Advanced Signage                           |
|                                                                                                                |                                | • Advanced Stop/Yield Lines                  |
|                                                                                                                |                                | • Constant Flashing Yellow Beacons           |



# Appendix D

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## Traffic Signal Warrant



# Warrant 3: Peak-Hour Volumes and Delay

City of Santa Rosa  
Sonoma Ave & Sotoyome St

SRO376

|                              | Major Street               | Minor Street |
|------------------------------|----------------------------|--------------|
| Street Name                  | Sonoma Ave                 | Sotoyome St  |
| Direction                    | E-W                        | N-S          |
| Number of Lanes              | 1                          | 1            |
| Approach Speed               | 35                         | 25           |
| Date of Count:               | Tuesday, November 03, 2015 |              |
| Population less than 10,000? | No                         |              |

Scenario: AM Existing plus Project

## Warrant 3 Met?: Met when either Condition A or B is met

Condition A: Met when conditions A1, A2, and A3 are met

### Condition A1

The total delay experienced by traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one lane approach, or five vehicle-hours for a two-lane approach

Minor Approach Delay: 0.63 vehicle-hours

### Condition A2

The volume on the same minor street approach (one direction only) equals or exceeds 100 vph for one moving lane of traffic of 150 vph for two moving lanes

Minor Approach Volume: 116 vph

### Condition A3

The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches

Total Entering Volume: 1584 vph

### Condition B

The plotted point falls above the curve

Yes

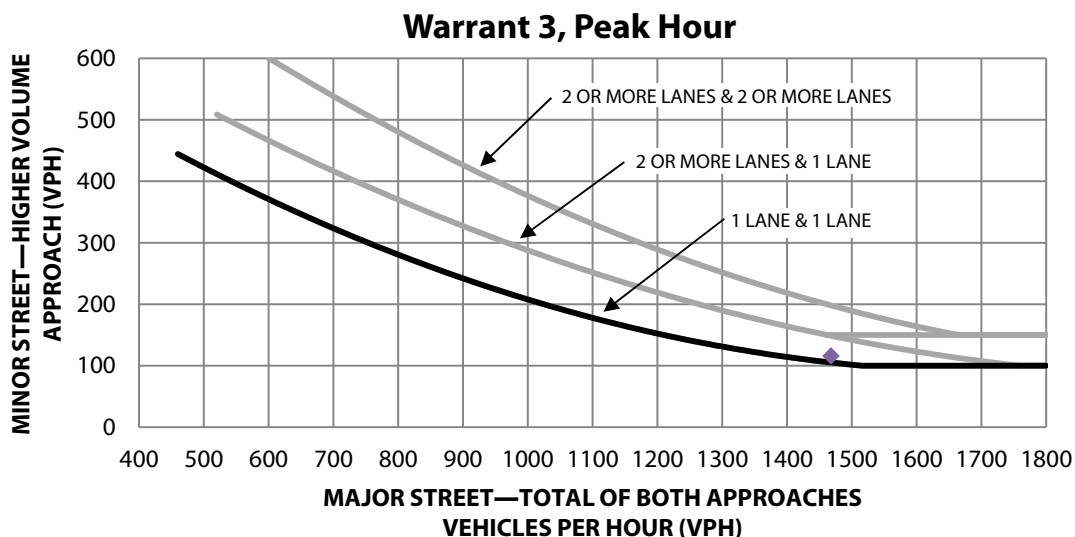
Not Met

Not Met

Met

Met

Met



# Warrant 3: Peak-Hour Volumes and Delay

City of Santa Rosa  
Sonoma Ave & Sotoyome St

SRO376

|                              | Major Street               | Minor Street |
|------------------------------|----------------------------|--------------|
| Street Name                  | Sonoma Ave                 | Sotoyome St  |
| Direction                    | E-W                        | N-S          |
| Number of Lanes              | 1                          | 1            |
| Approach Speed               | 35                         | 25           |
| Date of Count:               | Tuesday, November 03, 2015 |              |
| Population less than 10,000? | No                         |              |

Scenario: PM Existing plus Project

## Warrant 3 Met?: Met when either Condition A or B is met

Condition A: Met when conditions A1, A2, and A3 are met

### Condition A1

The total delay experienced by traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one lane approach, or five vehicle-hours for a two-lane approach

Minor Approach Delay: 2.84 vehicle-hours

### Condition A2

The volume on the same minor street approach (one direction only) equals or exceeds 100 vph for one moving lane of traffic of 150 vph for two moving lanes

Minor Approach Volume: 256 vph

### Condition A3

The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches

Total Entering Volume: 1624 vph

### Condition B

The plotted point falls above the curve

Yes

Not Met

Not Met

Met

Met

Met

