



AGENDA

**SAN RAFAEL PLANNING COMMISSION
REGULAR MEETING
TUESDAY, March 26, 2019, 7:00 P.M.
COUNCIL CHAMBERS, CITY HALL, 1400 FIFTH AVENUE
SAN RAFAEL, CALIFORNIA**

**CALL TO ORDER
PLEDGE OF ALLEGIANCE
RECORDING OF MEMBERS PRESENT AND ABSENT
APPROVAL OR REVISION OF ORDER OF AGENDA ITEMS
PUBLIC NOTIFICATION OF MEETING PROCEDURES**

URGENT COMMUNICATION

Anyone with an urgent communication on a topic not on the agenda may address the Commission at this time. Please notify the Community Development Director in advance.

CONSENT CALENDAR

1. Minutes, March 12, 2019

PUBLIC HEARING

2. 4000 Civic Center – Request for Use Permit Amendment to UP03-028 to allow a reduction in the parking requirement and allow the conversion of 38,190 sq.ft. of existing office space to medical office use. No change in building square footage or number of parking stalls is proposed. APN: 180-124-13 and 180-124-16; Office (O) Zoning District; Theresa Krueger, PSAI Realty, Applicant; SFF MEC LLC, Owner; UP18-038. Project Planner: Caron Parker

**DIRECTOR'S REPORT
COMMISSION COMMUNICATION
ADJOURNMENT**

- I. Next Meeting: April 9, 2019
- II. I, Anne Derrick, hereby certify that on Friday, March 22, 2019, I posted a notice of the March 26, 2019 Planning Commission meeting on the City of San Rafael Agenda Board.

- Sign interpreters and assistive listening devices may be requested by calling 415/485-3085 (voice) or 415/ 485-3198 (TDD) at least 72 hours in advance. Copies of documents are available in accessible formats upon request.
- Public transportation to City Hall is available through Golden Gate Transit, Line 20 or 23. Paratransit is available by calling Whistlestop Wheels at 415/454-0964.
- To allow individuals with environmental illness or multiple chemical sensitivity to attend the meeting/hearing, individuals are requested to refrain from wearing scented products.

Any records relating to an agenda item, received by a majority or more of the Agency Board less than 72 hours before the meeting, shall be available for inspection in the Community Development Department, Third Floor, 1400 Fifth Avenue, and placed with other agenda-related materials on the table in front of the Council Chamber prior to the meeting.

THE PLANNING COMMISSION WILL TAKE UP NO NEW BUSINESS AFTER 11:00 P.M. AT REGULARLY SCHEDULED MEETINGS. THIS SHALL BE INTERPRETED TO MEAN THAT NO AGENDA ITEM OR OTHER BUSINESS WILL BE DISCUSSED OR ACTED UPON AFTER THE AGENDA ITEM UNDER CONSIDERATION AT 11:00 P.M. THE COMMISSION MAY SUSPEND THIS RULE TO DISCUSS AND/OR ACT UPON ANY ADDITIONAL AGENDA ITEM(S) DEEMED APPROPRIATE BY A UNANIMOUS VOTE OF THE MEMBERS PRESENT. APPEAL RIGHTS: ANY PERSON MAY FILE AN APPEAL OF THE PLANNING COMMISSION'S ACTION ON AGENDA ITEMS WITHIN FIVE BUSINESS DAYS (NORMALLY 5:00 P.M. ON THE FOLLOWING TUESDAY) AND WITHIN 10 CALENDAR DAYS OF AN ACTION ON A SUBDIVISION. AN APPEAL LETTER SHALL BE FILED WITH THE CITY CLERK, ALONG WITH AN APPEAL FEE OF \$350 (FOR NON-APPLICANTS) OR A \$4,476 DEPOSIT (FOR APPLICANTS) MADE PAYABLE TO THE CITY OF SAN RAFAEL, AND SHALL SET FORTH THE BASIS FOR APPEAL. THERE IS A \$50.00 ADDITIONAL CHARGE FOR REQUEST FOR CONTINUATION OF AN APPEAL BY APPELLANT.

In the Council Chambers of the City of San Rafael, March 12, 2019



**Regular Meeting
San Rafael Planning Commission Minutes**

For a complete video of this meeting, go to <http://www.cityofsanrafael.org/meetings>

CALL TO ORDER

Present: Barrett Schaefer
Aldo Mercado
Sarah Loughran
Berenice Davidson
Jeff Schoppert
Jack Robertson
Mark Lubamersky

Absent: None

Also Present: Raffi Boloyan, Planning Manger
Steve Stafford, Senior Planer

PLEDGE OF ALLEGIANCE
RECORDING OF MEMBERS PRESENT AND ABSENT
APPROVAL OR REVISION OF ORDER OF AGENDA ITEMS
PUBLIC NOTIFICATION OF MEETING PROCEDURES
URGENT COMMUNICATION
CONSENT CALENDAR

1. Minutes, February 26, 2019

Mark Lubamersky moved and Jack Robertson seconded to approve Minutes as presented. The vote is as follows:

AYES: Barrett Schaefer, Aldo Mercado, Sarah Loughran, Berenice Davidson, Jeff Schoppert, Jack Robertson, Mark Lubamersky
NOES: None
ABSTAIN: None
ABSENT: None

PUBLIC HEARING

- 2. 999 3rd Street (BioMarin R&D building & Whistlestop Senior Center/Senior Housing) – Scoping hearing for the Notice of Preparation of an Environmental Impact Report (EIR) to assess the impacts of two, approximately 70-foot tall, four-story Research and Development buildings on a 133,099 SF parcel, currently a vacant lot, and a 70-foot tall, six-story senior center and affordable senior housing building with 67 senior units on a 15,000 SF portion of the northwestern corner of the parcel; APN: 011-265-01; Second/Third Mixed Use (2/3 MUE) Zone; Shar Zamanpour, Applicant; BioMarin / CCA, LLC, Owner; Downtown Activity Center neighborhood area. Case Number(s): ED18-087, ZO18-003, ZC18-002, UP18-034, SP18-006, S18-001, DA18-001. Project Planner: Sean Kennings**

Staff Report

Jeff Schoppert moved and Barrett Schaefer seconded to direct staff to prepare an Draft Environmental Report and take into consideration the written and verbal comments taken in during the scoping session. The vote is as follows:

AYES: Barrett Schaefer, Aldo Mercado, Sarah Loughran, Berenice Davidson, Jeff Schoppert,
Jack Robertson, Mark Lubamersky
NOES: None
ABSTAIN: None
ABSENT: None

3. 1200 Irwin St. (“Dominican Townhomes”) – Appeal of Planning staff’s December 7, 2018 denial without prejudice of an Environmental and Design Review Permit (ED17-073) proposing to legalize and modify miscellaneous design changes incorporated into an existing approved, constructed and occupied 15-unit multifamily residential development; APN: 011-013-05; Multifamily Residential – Medium Density (MR2) District; 524 Mission Street, LLC, owner; Casey Clements for Thompson Development, Inc., applicant and appellant; File No.: AP18-004 and ED17-073. Project Planner: Steve Stafford

1200 irwin

Jack Robertson moved and Mark Lubamersky seconded to continue item to April 9, 2019 Planning Commission meeting. The Commission directed staff to work with applicant on the following consensus items:

- 1) Change Base material and build up thicker as approved.
- 2) Change to paving color as approved.
- 3) Change to trellis as was approved.
- 4) Add trash enclosure around trash bin to match design of building.
- 5) OK to leave changes made to window color and white color on top of building

DIRECTOR’S REPORT

COMMISSION COMMUNICATION

ADJOURNMENT

ANNE DERRICK, Administrative Assistant III

APPROVED THIS ____ DAY OF _____, 2019

Sarah Loughran , Chair



SAN RAFAEL

THE CITY WITH A MISSION

Community Development Department – Planning Division

Meeting Date:	March 26, 2019
Agenda Item:	2
Case Numbers:	UP18-038
Project Planner:	Caron Parker – 415-485-3094

REPORT TO PLANNING COMMISSION

SUBJECT: 4000 Civic Center – Request for Use Permit Amendment to UP03-028 to allow a reduction in the parking requirement and allow the conversion of 38,190 sq.ft. of existing office space to medical office use. No change in building square footage or number of parking stalls is proposed. APN: 180-124-13 and 180-124-16; Office (O) Zoning District; Theresa Krueger, PSAI Realty, Applicant; SFF MEC LLC, Owner; UP18-038.

EXECUTIVE SUMMARY

In 2003, the Planning Commission approved a parking reduction (UP03-028) to convert 36,047 square feet (sf) of general office space on the second floor to medical office use, resulting in a deficit of 20 required parking spaces on site. The applicant is currently proposing to convert an additional 38,190 square feet (sf) of existing building on the first floor from general office space to medical office use. The change in use would increase the code requirement for parking on the site by 16 spaces, resulting in a parking reduction of an additional 16 spaces. The parking modification requests to allow the conversion without providing any additional parking spaces on site.

A Traffic and Parking Study was submitted by W-Trans with analysis of both the parking demand/supply and Level of Service (LOS) standards for traffic driving through nearby intersections in the project vicinity. The W-Trans report concluded the increased parking demand would be accommodated with the existing parking on site and the intersection LOS would continue to operate at acceptable levels. A detailed discussion of the traffic and parking analysis can be found on Pages 3-6 of this staff report.

The W-Trans report was reviewed by the Department of Public Works, Traffic Engineer and found to be appropriate and justified. Staff is recommending Use Permit Conditions of Approval #4, #5 and #6 in the Draft Resolution to ensure that any future conversion to additional medical office use would require a Use Permit Amendment, and that an updated parking analysis (with new parking counts) be submitted upon 80% occupancy of the first-floor tenant space to verify that the existing parking on site is adequate. Based on the analysis above, staff recommends that the Planning Commission adopt the attached resolution approving the Use Permit application with conditions.

RECOMMENDATION

It is recommended that the Planning Commission adopt the attached Resolution (Exhibit 2) approving Use Permit (UP18-038) allowing an Amendment to the previously approved Use Permit (UP03-028) for an increased parking modification of 16 spaces from the conversion of general office space to medical office use on the first floor.

PROPERTY FACTS

Address/Location:	4000 Civic Center	Parcel Number(s):	180-124-13 and 16
Property Size:	133,319 sf	Neighborhood:	North San Rafael

Site Characteristics			
	General Plan Designation	Zoning Designation	Existing Land-Use
Project Site:	Office (O)	Office (O)	Office
North:	Office	Office	Office and parking
South:	Office	Office	Office and parking
East:	Open Space, Hillside Residential	PD (1712)-WO-H	Residential
West:	N/A	N/A	Hwy 101

Site Description/Setting:

The project site is part of an area originally known as Northgate East, which is located on the east side of the Highway 101 and the Manuel T. Freitas Parkway/Terra Linda off-ramp (see Exhibit 1: Project Vicinity Map). The site is very prominent, visible from most of the North San Rafael area and is located on a graded ridge. 4000 Civic Center Drive is located to the south of an office building (4040 Civic Center Drive) and there is a one-story office building located on a parcel between the two office buildings (4020 Civic Center Drive). To the north of the project site are medical and general office buildings and the Unitarian Church of Marin. To the south of the project site is the Autodesk office building and the Marin County Civic Center. To the east of the site is the Vista Marin residential subdivision.

4000 Civic Center Drive is currently developed with a 141,001 sf, five-story building, originally approved for general office use, with a central surface parking lot and a 2-story parking structure on the east side of the site. Access to the site is either via a one-way access off Civic Center Drive or two-way access via Scettrini Drive.

BACKGROUND

In 1983, the City approved land use entitlements for the development of the existing office building, surface parking and a two-story parking structure (ED82-46). The project was approved with a total of 432 parking spaces, 79 spaces in the front of the building and the remaining 353 spaces in the parking structure at the rear (east) of the site. The parking lot was subsequently re-stripped (without planning review) and the current parking on-site is 436 spaces.

In 2003 the Planning Commission approved a Use Permit (UP03-028) for a reduction in parking to allow the conversion of 36,047 sf of existing second floor office space to medical office use and an urgent care facility for Marin General Hospital (Planning Commission Resolution No. 03-33). According to the applicant, Sutter Health (or its predecessors) has occupied the second-floor space as medical offices since 2004. Medical uses included an urgent care center, physical therapy, radiology, primary care and medical specialist services. Based on a traffic study and analysis by the City's Traffic Engineer, the approved project was subject to several conditions of approval to mitigate for the 20-parking space shortfall from the change from general office to medical office use. Conditions included restrictions in hours of operation for the medical offices, reports on traffic counts, trip generation monitoring and reporting (for 5 years), and valet parking when the medical use reached 80% capacity (a Use Permit amendment was required to eliminate monitoring report and the valet parking).

In 2015, the City approved exterior upgrades to the building façade materials and colors as well as landscaping upgrades on site (ED15-040).

The applicant has indicated that Sutter Health will be vacating the premises at the end of March 2019, and a new lease is in place with Marin General Hospital to occupy the entire second floor. The applicant is working with several potential medical services providers interested in leasing 13,190 sf of the first-floor space. Marin General Hospital has expressed an interest in leasing the remaining 25,000 sf feet of first floor space as an outpatient surgery center. The existing 3rd, 4th and a portion of the 5th floors of the building remain general office use.

PROJECT DESCRIPTION

The project proposes to convert the entire first floor of the building (consisting of 38,190 s.f.) from office use to medical office use. This change in use is desired in order to provide complementary space to the existing medical use space on the entire second floor of the building (consisting of 35,909 sf) and expected to be leased by Marin General Hospital by the end of March 2019. The applicant has provided a project description detailing the existing tenancy on site and the predicted tenancy on the 1st floor lease space (see Exhibit 3). At this time, the applicant indicates that there is strong interest from medical service providers to lease space on the first floor of 4000 Civic Center Drive for a variety of medical services, including advanced neurological therapies for children with autism and other developmental differences, radiology services and outpatient surgery center. Expected hours of operation would be generally 8:00 am to 6:00 pm Monday through Friday, for both 1st and 2nd floor prospective tenants, and 8:00 am to 1:00 pm on Saturday for the primary 1st floor tenant.

ANALYSIS

San Rafael General Plan 2020 Consistency:

Staff has evaluated the project and found it to be consistent with the following applicable General Plan 2020 Policies and Programs:

- **Policy LU-23 (Land Use Map):** The project site has an "Office" Land Use Designation. This designation encourages general offices, medical and professional offices, administrative or headquarters offices and residential uses. The proposed medical office use at the existing office building would be consistent with the Office Land Use Designation.
- **Policy NH-51 (Existing Business Areas):** *Encourages the support and upgrading of existing business areas, consistent with infrastructure needs.*

The existing building was approved for general office. However, the zoning also allows for medical office use as a permitted use. The applicant has had difficulty leasing the general office space in the building but indicated that they have medical service providers already interested in leasing the first-floor space for medical services. The proposed re-tenanting of a portion of the building would improve access to medical services to the San Rafael community. The remainder of the building would still be available to lease as general office uses.

- **Policy C-5 (Traffic Level of Service Standards):** *Requires the maintenance of adequate traffic levels of service (LOS) consistent with standards for signalized intersections in the AM and PM peak hours in order to ensure an effective roadway network.*

The proposed project would create new vehicle trips to the site, however, there is no proposed increase in building square footage on the project site. A Traffic and Parking Study was

submitted for the proposed project by W-Trans, a licensed traffic engineering firm, in December 2018 and updated in March 2019 (See Exhibit 4). The traffic study analyzed the potential impact of the anticipated new trips on specific intersections. Seven key intersections were studied to determine "Future Plus Project Conditions": a) Freitas Parkway/US101S off ramp-Del Presidio Blvd; b) Freitas Parkway/US101 N ramps; c) Civic Center Dr -RedwoodHwy/Freitas Pkwy; d) Merrydale Rd/Las Gallinas Ave; and e) Merrydale Overcrossing-Scettrini Dr/Civic Center Dr. The traffic study concluded the following:

- 1) The proposed project is expected to generate an average of 957 net new trips daily, including 62 trips during the AM peak hour (highest peak hour between 7 am to 9 am) and 88 trips during the PM peak evening hour (highest peak hour between 4 pm to 6 pm).
- 2) For future volumes, the study intersections are expected to operate acceptably during the AM and PM peak hours, at LOS D or better.
- 3) With the change from general office to medical office use, future traffic volumes in the studied intersections are expected to continue to operate acceptably.
- 4) The parking requirement for the change from general office to medical office would result in the need for 16 additional spaces. However, the study determined that the existing parking supply for the project site will remain adequate (see discussion about parking under Zoning Ordinance Consistency, Page 5).

The W-Trans report concluded that under Existing Plus Project and Future Plus Project Conditions, "the study intersections experienced an increase in delay, but remain at acceptable operating levels of service". The General Plan 2020 identifies LOS E as the Level of Service standard for the intersections at Civic Center Dr -RedwoodHwy/Freitas Pkwy, Merrydale Rd/Las Gallinas Ave and Merrydale Overcrossing-Scettrini Dr/Civic Center Dr. The W-Trans analysis shows that the LOS for these intersections will operate at LOS D or better.

The City's Traffic Engineering Division has reviewed the W-Trans study and concurs with the W-Trans report conclusion, finding that despite the slight increase in delay at the intersections studied, the increase is not a significant impact to LOS. The intersections would continue to operate within the LOS D Level of Service or better. As such, Planning staff determined the proposed project would be consistent with General Plan Policy C-5.

- **Policy C-8 (Eliminating and Shifting Peak Hours):** Supports efforts to limit traffic congestion through eliminating low occupancy auto trips, or shifting peak hour trips to off-peak hours, flexible work schedules, car and van pooling and other Transportation Demand Management approaches.

The applicant has indicated that the future 2nd floor tenant (Marin General Hospital) encourages employees to carpool whenever possible and ask they share this information with other employees when doing so. Based on their type of business, flex time and off-peak hours is not an option for 90% of the workforce, however, they do allow the remaining 10% to have flex and shift entry and exit during off peak hours. Additionally, Marin General Hospital promotes alternate means of transportation to their employees and will do so for 4000 Civic Center. The two primary sources will be Golden Gate Transit (GGT) and the Smart train. With respect to other tenants contacted, several businesses offer a Transportation Spending Account benefit to encourage carpooling and mass transit usage. This is offered to every new hire and offered every year during open enrollment. Additionally, several tenants were interested in getting information about transit options, such as the SMART train. The applicant has indicated that the site property manager will send an email the tenants with links to the various options (i.e., GGT, SMART Train, Ride Share, etc.) quarterly.

Zoning Ordinance Consistency:Chapter 14.05- Commercial and Office Land Uses

The subject property is located within the Office (O) Zoning District. Section 14.05.020 identifies medical office uses as a Permitted use (no Use Permit required) and as such, the proposed medical office use is consistent with the Office Zoning District.

Chapter 14.18 - Parking Standards

The existing building was originally approved in 1983 as a 5-story general office building with 432 parking spaces. Based on current parking counts, the site is confirmed to have 436 parking spaces. Currently, the number of parking spaces provided on this property is considered legal, non-conforming since under today's regulations, 533 spaces would be required for a general office building of this size (1 space per 250 sf of gross building area). This legal non-conforming status of the office building would allow general offices uses, those which are administrative, business and professional offices, to continue without upgrading or providing additional parking. The existing 38,190 sf of 1st floor tenant space is parked at a rate of 1:250 gross building sf for general office use (153 spaces). The proposed new medical office use would be parked at a rate of 1:225 gross building sf (169 spaces). Pursuant to Section 14.18.240.D of the Zoning Ordinance, when there is a change of occupancy or manner of operation that would increase the number of parking spaces required, additional parking must be provided for such addition, enlargement or change. In this case, the change in use of 38,190 sq. ft. from general office (1 parking space per 250 square feet) to medical office (1 space per 225 square feet) would require 16 additional parking spaces.

The Zoning Ordinance does have a provision allowing the Zoning Administrator to modify the parking requirement. Section 14.18.040.B of the Zoning Ordinance states:

"The parking requirement for any specific use listed may be modified so as to provide adequate parking which is fair, equitable, logical and consistent with the intent of this chapter. Such modification shall require an application for a Use Permit and shall be subject to review by the community development director, and public works director, and approval by the Zoning Administrator".

A parking reduction was applied for and granted for the existing 2nd floor medical office use through a Use Permit (UP03-028) approved by the Planning Commission in 2003. This Use Permit contained a Condition of Approval that required a traffic monitoring program, including the submittal of semi-annual parking studies and an attendant-assisted (valet) parking program. Discontinuation of either of these required a Use Permit Amendment by the original approval body, the Planning Commission. Further, Section 14.22.150 stipulates that *"applications for use permit amendments shall be heard and decided by the original approval body"*.

The City reviewed several parking studies subsequent to the 2003 approval and deemed that the site was operating within the use permit parameters. The project applicant reached out to the prior property owners at 4000 Civic Center Drive and were told that a valet parking operation was implemented but ultimately discontinued. Given the fact that the previous tenant (Sutter Health) is vacating the site, this Use Permit Amendment (UP18-038) will essentially be re-analyzing the site with continued medical office use on the second floor (as previously approved, with a 20-space parking shortfall) as well as for the proposed new change from general office to medial office on the 1st floor (with an additional 16-space shortfall).

A licensed traffic-engineering firm, W-Trans, reviewed the currently proposed project and prepared a traffic and parking report, dated December 19, 2018. The report was revised on March 18, 2019 and a copy of this report is attached as Exhibit 4. The W-Trans report studied both Existing Plus Project and Future Plus Project Conditions at 4000 Civic Center. Regarding traffic, staff's analysis and discussion is provided in the General Plan consistency section on Page 3-4 above. Regarding parking, W-Trans

conducted a parking occupancy survey to assess existing parking during peak periods over an eight-hour period on three (3) consecutive weekdays (Tuesday through Thursday) in July 2018. Counts were performed every 20 minutes. The report found that the peak demand observed was 393 occupied stalls. At the direction of the City's Traffic Engineer, the study was expanded to include an analysis of demand during the winter months to account for potential seasonal differences between summer and winter months. The peak demand was adjusted to account for an expected 5% increase, equating to a winter peak demand predicted at 409 stalls. This demand would still be below the 436 existing parking spaces on site. The W-Trans report concluded that the existing parking on site would be sufficient to address the parking demand for the proposed 1st floor medical office use (this includes the previously identified 20-space shortfall from the existing 2nd floor medical use).

The City's Traffic Engineer has reviewed the W-Trans report and concurs that the parking shortage can be accommodated on-site with no additional mitigation measures required. However, they have recommended including a condition of approval to allow the City to re-examine site conditions as they relate to parking supply and traffic in the future, if deemed necessary. Planning staff has therefore included the following Use Permit Conditions of Approval (COA) in the Draft Resolution:

- COA #4: Future conversion of additional general office space to medical office use (aside from the 1st and 2nd floors) shall require an amendment of this Use Permit (UP18-038) by the Planning Commission.
- COA #5: Upon 80% occupancy of the first-floor space, updated parking counts shall be required to verify that the parking on site meets the anticipated demands per the 2018 W-Trans Report. Based on the findings of the updated parking study, The City reserves the right to require an amendment to this Use Permit to include mitigation measures to reduce parking demand on site, including but not limited to the initiation of an attendant assisted (valet) parking program.
- COA #6: This Use Permit (UP18-038) may be brought up for review to address traffic or parking impacts that may occur from the proposed project or for non-compliance with these conditions of approval. If the Use Permit is called up for review and additional impacts or non-compliance are determined to exist, additional conditions of approval may be required.

Chapter 22- Use Permit

Pursuant to Zoning Ordinance Section 14.22.080, the Zoning Administrator or Planning Commission may issue a Use Permit if the following findings can be made:

1. *That the proposed use is in accord with the General Plan, the objectives of the Zoning Ordinance, and the purposes of the district in which the site is located;*
2. *That the proposed use, together with the conditions applicable thereto, will not be detrimental to the public health, safety or welfare, or materially injurious to properties or improvements in the vicinity, or to the general welfare of the City; and*
3. *That the proposed use complies with each of the applicable provisions of the Zoning Ordinance.*

Medical office use is a permitted land use in the Office Zoning District, but the need for a Use Permit is required for a parking modification, pursuant to Zoning Ordinance Section 14.18.040.B, which stipulates:

"The parking requirement for any specific use listed may be modified so as to provide adequate parking which is fair, equitable, logical and consistent with the intent of this chapter. Such modification shall require an application for a use permit and shall be subject to review by the community development director and public works director, and approval by the zoning administrator."

In this case, the approval body would be the Planning Commission, pursuant to Zoning Ordinance Section 14.22.150, which stipulates that use permit amendments shall be heard and decided by the original hearing body. Further, conditions of approval in the 2003 Planning Commission Resolution No. 03-33 required Planning Commission approval prior to discontinuance of the required semi-annual traffic studies, and also prior to eliminating valet parking. The current project is not proposing to include either of these prior conditions and therefore a Use Permit Amendment is required.

Staff has evaluated the use permit "findings" with respect to whether the modification would provide parking that is "fair, equitable, logical and consistent with the intent of this Chapter" and determined that:

1. The proposed change from 38,190 sf of general office use to medical office use is in accord with the General Plan, and consistent with the objectives of the Zoning Ordinance, and the purposes of the Office Zoning District as discussed in Pages 3-6 above. No expansion of the existing building is proposed, and the W-Trans report concluded that the existing parking 436 parking spaces on site would continue to meet the expected parking demand of 409 spaces with no significant impact on parking availability and no significant impact on nearby intersection Level of Service (LOS). The City Traffic Engineer has reviewed the W-Trans report and recommended approval of the parking modification.
2. Staff has determined that the proposed use would continue to operate as a combined general office/medical office building and would be required to comply with all Building and Fire Codes regarding occupancy and egress. The existing approved medical office use has operated for many years with no complaints from adjacent property owners.
3. The City's Traffic Engineer is not recommending any specific mitigation measures for the proposed project. However, in order to have the ability to review the Use Permit in the future, staff has recommended Conditions of Approval #4, #5 and #6 allowing the City to verify that the site operations are in compliance and the parking on site is meeting the proposed new medical office use demand for parking.

ENVIRONMENTAL DETERMINATION

The proposed project is exempt from the requirements of the California Environmental Quality Act (CEQA), pursuant to Section 15301(a) which exempts interior alterations to existing facilities.

NEIGHBORHOOD MEETING / CORRESPONDENCE

Notice of hearing for the project was conducted in accordance with noticing requirements contained in Chapter 29 of the Zoning Ordinance. A Notice of Public Hearing was mailed to all property owners and occupants within a 300-foot radius of the subject site and the Vista Marin Homeowner's Association, and all other interested parties, 15 calendar days prior to the date of all meetings, including this hearing. No comments have been received in response to the notice.

OPTIONS

The Planning Commission has the following options:

1. Approve the application as presented (*staff recommendation*)
2. Approve the application with certain modifications, changes or additional conditions of approval.
3. Continue the applications to allow the applicant to address any of the Commission's comments or concerns

4. Deny the project and direct staff to return with a revised Resolution.

EXHIBITS

1. Vicinity/Location Map
2. Draft Resolution
3. Applicant's project description narrative
4. W-Trans Traffic and Parking Study, dated March 18, 2019.

11" x 17" plans have been distributed to the Planning Commission only



Project site

EXHIBIT 1

RESOLUTION NO. -

RESOLUTION OF THE SAN RAFAEL PLANNING COMMISSION APPROVING A USE PERMIT AMENDMENT (UP18-038) TO ALLOW A 16 SPACE REDUCTION IN THE PARKING REQUIREMENT FOR THE CONVERSION OF 38,190 SQ. FT. OF EXISTING FIRST FLOOR OFFICE SPACE TO MEDICAL OFFICE USE IN THE 141,001 SQ FT OFFICE BUILDING LOCATED AT 4000 CIVIC CENTER DR. APN: 180-124-13 AND 180-124-16

WHEREAS, on October 31, 2018, PSAI Realty Partners II, applicant, submitted a Use Permit amendment application (UP18-038) to convert 38,190 sq. ft. of general office space to medical office use, requesting a reduction in the parking requirements by 16 spaces to accommodate the increased parking requirement resulting from the conversion at 4000 Civic Center Drive in the Office (O) Zoning District; and

WHEREAS, **this** Use Permit amendment request proposes to modify the previously approved Use Permit (UP03-028) approved by the Planning Commission in 2003 which allowed a reduction in the parking requirement by 20 spaces for the conversion of 36,047 sq. ft. of second floor general office space to medical office use; and

WHEREAS, a parking and traffic study analyzing the parking demands and supply and traffic impacts from the proposed conversion of general office to medical office on the 1st floor was prepared by a licensed traffic engineer, and the methodology, analysis, results and conclusion of the study were reviewed by the City Traffic Engineer and found to be justified; and

WHEREAS, upon review of the application, the project has been determined to be exempt from the requirements of the California Environmental Quality Act (CEQA) pursuant to Section 15301(a) of the CEQA Guidelines which exempts interior alterations to existing facilities; and

WHEREAS, on March 26, 2019, the San Rafael Planning Commission held a duly noticed public hearing on the proposed Use Permit (UP18-038), accepting all oral and written public testimony and the written report of the Community Development Department staff.

NOW THEREFORE BE IT RESOLVED, the Planning Commission makes the following findings relating to the Use Permit, pursuant to Zoning Ordinance Section 14.18.040.B:

Findings (UP18-038)

The Commission finds that the proposed modification of the parking requirement would provide adequate parking which is fair, equitable, logical and consistent with the intent of this chapter:

1. The proposed change from 38,190 sq. ft. of general office use to medical office use is in accord with the General Plan, and consistent with the objectives of the Zoning Ordinance, and the purposes of the Office Zoning District as discussed in the March 26, 2018 staff report. No expansion of the existing building is proposed, and the W-Trans Traffic and Parking Study concluded that the existing parking 436 parking spaces on site would continue to meet the expected parking demand of 409 spaces with no significant impact on parking availability and no significant impact on nearby intersection Level of Service (LOS). The City Traffic Engineer has reviewed the W-Trans report and recommended approval of the parking modification.

2. The proposed use would continue to operate as a combined general office/medical office building and would be required to comply with all Building and Fire Codes regarding occupancy and egress. The existing approved medical office use on the 2nd floor has operated for many years with no complaints from adjacent property owners.
3. Conditions of approval have been included to allow the City the ability to review the Use Permit in the future, and to verify that the site operations are in compliance and the parking on site is meeting the new medical office space demand.

BE IT FURTHER RESOLVED, that the Planning Commission of the City of San Rafael approves the Use Permit Amendment (UP18-038) subject to the following conditions:

Conditions of Approval (UP18-038)

Community Development Department - Planning Division

1. This Use Permit (UP03-028) approves a 16-parking space reduction in the parking requirements for the conversion of 38,190 sq. ft. of existing office space on the first floor of the 141,001 sq. ft. existing office building at 4000 Civic Center Drive. Specifically, the Use Permit allows:
 - 1st Floor medical office use
 - 2nd Floor medical office use
 - Total reduction in required parking on site by 36 parking spaces
2. The building techniques, materials, elevations and appearance of this project, as presented for approval by the Planning Commission on March 26, 2019, shall be the same as required for the issuance of a building permit. Any future additions, expansions, or conversion of additional general office space to medical office use shall be subject to the review and approval of the Community Development Director and the Planning Commission.
3. This Use Permit (UP18-038) approval shall be valid for two (2) years, or until March 26, 2021, and shall be null and void if a building permit or business license for the proposed medical office use is not issued or a time extension granted.
4. Future conversion of any additional general office space to medical office (aside from the 1st and 2nd floors approved by this use permit) requires an amendment of this Use Permit (UP18-038) by the Planning Commission.
5. Upon 80% occupancy of the first-floor space, updated parking counts shall be required to be submitted to the Planning Division and reviewed by the City Traffic Engineer to verify that the parking on site meets the anticipated demands per the 2018 W-Trans Report. Based on the findings of the updated parking study, the City reserves the right to require an amendment to this Use Permit to include mitigation measures to reduce parking demand on site, including but not limited to the initiation of an attendant assisted (valet) parking program.
6. This Use Permit (UP18-038) may be brought up for review to address traffic or parking impacts that may occur from the proposed project or for non-compliance with these conditions of approval. If the Use Permit is called for review and additional impacts or non-compliance are determined to exist, additional use permit conditions of approval may be required.

7. Construction activities shall comply with City's Noise Ordinance (Chapter 8.13).

Las Gallinas Valley Sanitary District (LGVSD)

8. Prior to issuance of a building permit, the applicant is to comply with conditions of the LGVSD, per comment letter dated February 1, 2019 previously forwarded to the applicant.

Community Development Department, Building Division

9. The design and construction of all site alterations shall comply with the 2016 California Building Code (CBC), 2016 California Plumbing Code (CPC), 2016 California Electrical Code (CEC), 2016 California Mechanical Code CCMC), 2016 California Fire Code (CFC), 2016 California Energy Code, 2016 California Green Building Standards Code and City of San Rafael Ordinances and Amendments.

10. A building permit is required for the proposed work. Applications shall be accompanied by four (4) complete sets of construction drawings to include:

- a. Architectural plans
- b. Structural plans
- c. Electrical plans
- d. Plumbing plans
- e. Mechanical plans
- f. Structural Calculations
- g. Green Building documentation
- h. Title-24 energy documentation

11. The occupancy classification, construction type and square footage of each building shall be specified on the plans. In mixed occupancies, each portion of the building shall be individually classified.

12. The proposed facility shall be designed to provide access to the physically disabled. For existing buildings and facilities when alterations, structural repairs or additions are made, accessibility improvements for persons with disabilities shall be required unless CASP report states compliant. Improvements shall be made, but are not limited to, the following accessible features:

- a. Path of travel from public transportation point of arrival
- b. Routes of travel between buildings
- c. Accessible parking
- d. Ramps
- e. Primary entrances
- f. Sanitary facilities (restrooms)
- g. Drinking fountains & Public telephones (when provided)
- h. Accessible features per specific occupancy requirements
- i. Accessible special features, i.e., ATM's point of sale machines, etc.

13. The site development of items such as common sidewalks, parking areas, stairs, ramps, common facilities, etc. are subject to compliance with the accessibility. Pedestrian access provisions should provide a minimum 48" wide unobstructed paved surface to and along all accessible routes. Items such as signs, meter pedestals, light standards, trash receptacles, etc., shall not encroach on this 4' minimum width. Also, note that sidewalk slopes and side slopes shall not exceed published

minimums. The civil, grading and landscape plans shall address these requirements to the extent possible.

14. The parking garage ceiling height shall have a minimum vertical clearance of 8' 2" where required for accessible parking.

15. Public accommodation disabled parking spaces must be provided according the following table and must be uniformly distributed throughout the site.

Total Number of Parking Spaces Provided	Minimum Required Number of H/C Spaces
1 to 25	1
26 to 50	2
51 to 75	3
76 to 100	4
101 to 150	5
151 to 200	6
201 to 300	7
301 to 400	8
401 to 500	9
501 to 1,000	Two percent of total
1,001 and over	Twenty, plus one for each 100 or fraction thereof over 1,001

16. At least one disabled parking space must be van accessible; 9 feet wide parking space and 8 feet wide off-load area. Additionally, one in every eight required handicap spaces must be van accessible.

The Planning Commission's Action is final unless it is appealed to the City Council within five (5) working days pursuant to San Rafael Municipal Code Section 14.28.030 - *Filing and time limit of appeals*.

The foregoing Resolution was adopted at the regular City of San Rafael Planning Commission meeting held on the 26th day of March 2019.

Moved by Commissioner _____ and seconded by Commissioner _____.

AYES: COMMISSIONERS

NOES: COMMISSIONERS

ABSENT: COMMISSIONERS

SAN RAFAEL PLANNING COMMISSION

ATTEST: _____
Paul A Jensen, Secretary

BY: _____
Sarah Loughran, Chair

4000 CIVIC CENTER DRIVE

USE PERMIT APPLICATION FOR CONVERSION OF 1ST FLOOR FROM OFFICE TO MEDICAL USE

PROJECT NARRATIVE – MARCH 19, 2019

The property owner of 4000 Civic Center Drive, SFF MEC LLC, desires to convert the entire first floor of the building (consisting of 38,190 s.f.) from office use to medical use.

The conversion from office to medical use is desired in order to provide complementary space to the medical use space on the entire second floor of the building (consisting of 35,909 s.f.). The second floor has been occupied by Sutter Health (or its predecessors) since 2004 under a Use Permit (UP03-028) that was granted in September 2003. The existing second floor medical facilities include an urgent care center, physical therapy, radiology, primary care and medical specialist services.

Sutter Health will vacate the second floor on March 31, 2019 at the expiration of their lease. A new lease is in place with Marin General Hospital (MGH) to occupy the entire second floor under the current medical use permit on April 1, 2019. The medical services to be provided by MGH will be largely the same as those currently provided by Sutter.

At this time there is strong interest from medical service providers to lease space on the first floor of 4000 Civic Center Drive. We have leases ready to sign for a 10,000 s.f. tenant, Cortica Care, that provides advanced neurological therapies for children with autism and other developmental differences, and a 3,200 s.f. firm, Marin PET/CT, that provides radiology services. This leaves 25,000 s.f. on the first floor. Marin General Hospital has expressed interest in locating an outpatient surgery center on this floor, and we have had interest from another surgery center operator as well.

We believe that 4000 Civic Center Drive, with an amended Use Permit, would provide a meaningful benefit to the north San Rafael community. The building is already well established in the community as a convenient source for medical services that include seven day per week urgent care, and, on weekdays, radiology, physical therapy, primary, pediatric, and ophthalmology care.

Expanding the medical services offered at 4000 Civic Center Drive will provide the community with an increased variety of treatment options in one location.

As a related aside, our building, along with the owner of 4040 Civic Center drive, recently completed a rebranding of this location as "The Hill at Civic Center Drive" resulting in a prominent and consistent signage program to make it easier for our tenants, their guests, and the community to locate the buildings (4000, 4020, 4040, and 5000) on our hill overlooking Civic Center Drive and Highway 101. This is relevant to the expansion of the medical services provided at 4000 Civic Center Drive because the enhanced signage visibility and way finding elements seamlessly guide patients directly to the building.

A traffic and parking study, dated March 18, 2019, was prepared by W-Trans. The study concluded that under the added medical use the impacted intersections are expected to operate acceptably during the a.m. and p.m. peak hours at LOS D or better.

Parking:

The parking study determined that conversion of the first floor to medical use would require 16 additional parking spaces under City of San Rafael requirements.

A parking occupancy survey was conducted to assess existing parking demand during peak periods. The outcome of this survey, when including the additional 16 parking spaces required for medical use, results in 402 parking spaces required. There are 421 parking spaces dedicated to 4000 Civic Center Drive, resulting in excess parking capacity of 19 parking spaces under this analysis.

The parking survey results are consistent with our experience. The parking facilities at 4000 Civic Center Drive have been more than adequate to accommodate the existing medical and office uses during our ownership period dating to June 2014. We feel the additional parking demand created by a conversion to first floor medical use would be accommodated by the existing parking facilities.

The current status of the Use Permit Conditions of Approval is as follows:

Note that SFF MEC, LLC purchased 4000 Civic Center Drive in June 2014, ten years after the Use Permit was granted. We don't have any documentation on how the Conditions of Approval were implemented and enforced by the prior owner.

- Parking: We were informed by the prior owner that a valet parking operation was implemented and subsequently discontinued after a period of time because there was ample self-parking to accommodate all tenants and visitors to the building.
- Traffic / Operating Hours:
 - Immediate care use (including the outpatient lab and radiology): Is out of compliance, currently open until 8:00 p.m on Monday – Friday (instead of closing at 7:00 p.m.)
 - All other approved medical uses: The current medical offices are out of compliance, with operation starting as early as 7:30 a.m. and ending as late as 7:30 p.m.

Note that these extended hours are for the Physical Therapy & Sports Fitness provider. The majority of the providers are in the 8:30 a.m. – 5:30 p.m. time frame.

A list of current operating hours for the various medical service providers is attached.

The following explains both the current and proposed management of parking demand associated with the medical use at 4000 Civic Center Drive:

Second floor occupancy and current parking status:

- The second floor, consisting of 35,909 sq. ft. is currently 100% occupied by Sutter Health and its medical use subtenants. This floor will be 100% occupied by Marin General Hospital and its medical use subtenants after Sutter Health vacates on March 31st of this year.
- The parking for the second floor Sutter Health medical use is currently managed as follows:
 - o There are 71 parking spaces and three loading zones in the grade level parking lot directly adjacent to the main building lobby (which is on the second floor). A plan of this parking lot is provided.
 - o Of these spaces 36 are marked "PATIENT" and are used by patients/visitors to the Sutter medical offices. There are also nine handicap parking stalls in this parking lot.
 - o The employees of the second floor medical offices park in the two level parking structure to the east of the building.
 - o The Sutter medical patient/visitor parking needs have been well met by the 36 PATIENT parking spaces during the 4 ½ years of SFF MEC, LLC ownership. During this period the surface lot has been active with the high turnover of parking stalls one would expect with medical offices, but there is always ample room in this lot for the patients/visitors.

Proposed parking accommodation for first floor medical use tenants:

- Additional parking stalls on the surface lot would be reserved for patients as the first floor medical space is leased. The spaces would be reserved at a rate of one space for every 1,000 sq. ft. of medical use space that is leased. This ratio is consistent with the medical patient/visitor parking stalls to medical square footage ratio for the second floor.
- Should it occur that there are not enough parking stalls available to convert to PATIENT parking the building ownership will initiate a valet parking operation to manage the additional demand. Note that entire first floor may not be leased to medical tenants (i.e., there may be some office tenants on the first floor as well.)

**MARIN EXECUTIVE CENTER
4000 CIVIC CENTER DRIVE
OCCUPANCY AS OF 02/28/19**

Use	Suite #	Tenant	RSF
OFFICE	100	VACANT	38,190
MEDICAL	200	SUTTER HEALTH	35,909
OFFICE	301	MARIN INDEPENDENT JOURNAL	6,804
OFFICE	300/320	VACANT	6,056
OFFICE	303	VACANT	4,923
OFFICE	305	VACANT	2,214
OFFICE	310	GOLDEN GATE REGIONAL CENTER	6,167
OFFICE	330	ROOTS OF PEACE	2,581
OFFICE	340	VACANT	3,501
OFFICE	360	FULCRUM LEGAL GRAPHICS	3,774
OFFICE	380	KNOWBLY LEARNING SYSTEMS	2,943
OFFICE	400	VACANT	22,015
OFFICE	500	RAYMOND JAMES	5,924
Total			141,001

**4000 CIVIC CENTER DRIVE
2ND FLOOR MEDICAL USE HOURS OF OPERATION**

- Suite 200A** **Ophthalmology**
M – F 8:30am – 5:00pm
- Suite 200B** **Prima Medical Group**
M – T 8:30am – 12:00pm
 2:00pm – 5:00pm
Friday 9:00am – 12:00pm
 2:00pm – 4:00pm
- Suite 201** **Dr. Michael Yamaguchi, Dr. Ann Toy & Sunny St. Germain**
Terra Linda Pediatrics
M – F 9:00am – 5:00pm
- Suite 205** **Sutter Pacific Medical Foundation**
M – W 8:00am – 6:30pm
Th – F 8:00 am – 5:00pm
- Suite 206** **Urgent Care**
M – F 10:00am – 8:00pm
S&S 9:00am – 5:00pm
- Suite 209** **Terra Linda Outpatient Laboratory / Radiology**
M – F 7:00am – 8:00pm
S&S 9:00am – 5:00pm
- Suite 210** **Kalmanovitz Development Center**
M – F 8:30am – 5:00pm
- Suite 214** **Physical Therapy & Sports Fitness**
Monday 8:30am – 8:30pm
Tuesday 7:30am – 7:30pm
Wednesday 7:30am – 7:30pm
Thursday 7:30am – 7:30pm
Friday 9:30am – 6:30pm

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MAR 11 2019

PLANNING



Amended Traffic and Parking Study for the Proposed Change in Use at 4000 Civic Center Drive



Prepared for the City of San Rafael

Submitted by
W-Trans

March 18, 2019

EXHIBIT 4



**TRAFFIC ENGINEERING
TRANSPORTATION PLANNING**
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Executive Summary

The project as proposed is the conversion of approximately 38,000 square feet of general office space to medical office use at 4000 Civic Center Drive in San Rafael. The project site is accessed via two driveways, one located on Civic Center Drive and the other via Scettrini Drive.

The study intersections were evaluated using *Highway Capacity Manual* (HCM) 2000 and 2010 methodologies for signalized and two-way-stop-control (TWSC) intersections.

Under Existing and Future conditions, all study intersections operate or are expected to operate at an acceptable Level of Service (LOS) of D during both the a.m. and p.m. peak hours, except for the intersections located at Freitas Parkway/Civic Center Drive-Redwood Highway and Merrydale Road/Civic Center Drive. Both intersections are expected to operate at an acceptable LOS of E during both the a.m. and p.m. peak periods.

The project is expected to generate an average of 957 new daily trips, including 62 a.m. peak hour trips and 88 p.m. peak hour trips. After taking deductions for the previous land use and adding trips from the proposed change in land use, the study intersections are anticipated to continue operating at the same levels of service as under current conditions, or LOS D or better. The addition of project traffic to Future volumes is expected cause LOS to deteriorate at the Merrydale Overcrossing-Scettrini Drive/Civic Center Drive intersections.

It is important to note that the traffic and parking study dated December 19, 2019, approved by the San Rafael Planning Commission has been amended to modify the number of parking spaces on-site associated with the project. The previous study reported the available parking supply to be 446 spaces. The correct supply is 436 spaces included in both the surface lot and parking structure; the difference of 10 spaces resulted from inclusion of spaces that are dedicated to another user on the site. As noted in the report dated December 19, 2019, based on a review of existing parking demand together with projections of parking needed for the vacant office space as well as the increase associated with the proposed land use intensification, it is anticipated that the existing parking supply would be adequate to serve the proposed uses.

Introduction

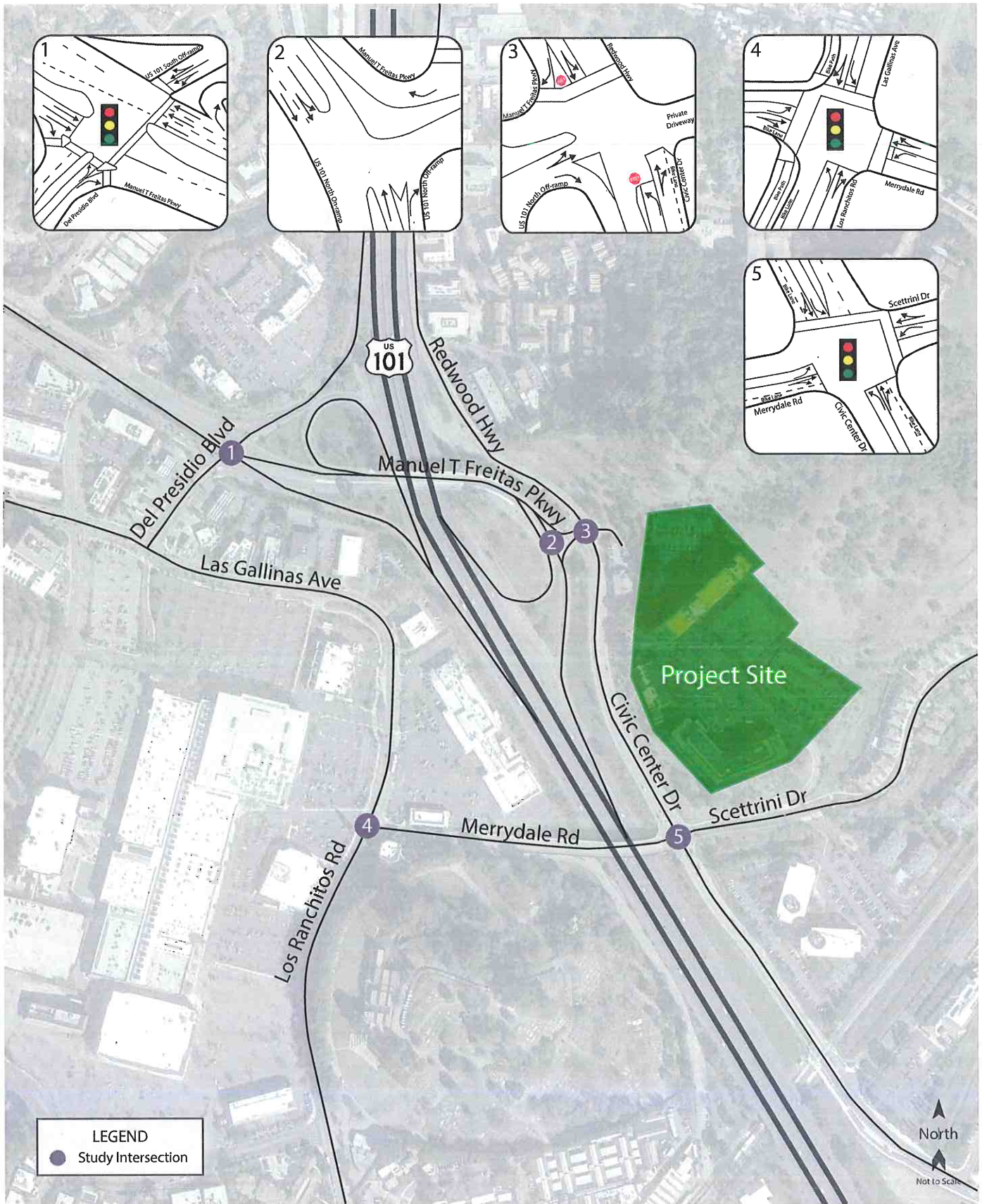
This report presents an analysis of the potential traffic impacts that would be associated with conversion of an existing office building to at 4000 Civic Center Drive in the City of San Rafael to medical office uses. The traffic study was completed in accordance with the criteria established by the city and is consistent with standard traffic engineering techniques.

Prelude

The purpose of a traffic impact study is to provide San Rafael staff and policy makers with data they can use to make an informed decision regarding the potential traffic impacts of a proposed project, and any associated improvements that would be required to mitigate these impacts to a level of insignificance as defined by the San Rafael'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 as proposed includes the conversion of 38,190 square feet of general office space to medical office space. The project site is located at 4000 Civic Center Drive in San Rafael within an existing building, as shown in Figure 1.



Traffic and Parking Study for the Proposed Change in Use at 4000 Civic Center Drive
 Figure 1 – Study Area and Existing Lane Configurations

Transportation Setting

Operational Analysis

Study Area and Periods

The study area consists of the following intersections:

1. Freitas Parkway/US 101 South Off-ramp-Del Presidio Boulevard
2. Freitas Parkway/US 101 North Ramps
3. Civic Center Drive-Redwood Highway/Freitas Parkway
4. Merrydale Road/Las Gallinas Avenue
5. Merrydale Overcrossing-Scettrini Drive/Civic Center 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

Freitas Parkway/US 101 South Off-ramp-Del Presidio Boulevard is a four-legged signalized intersection. The intersection has standard crosswalks across the Del Presidio Boulevard leg, westbound Freitas Parkway, and US 101 Southbound off-ramp legs, as well as across each channelized right-turn lane. Sidewalks are provided on both sides of Del Presidio and on the north side of Freitas Parkway. The south side of Freitas Parkway has a sidewalk that ends east of the intersection.

Freitas Parkway/US 101 North Ramps is a tee intersection with no intersection control present. The Freitas Parkway approach has sidewalks on the north side of the street, but no other pedestrian facilities are provided at the intersection.

Civic Center Drive-Redwood Highway/Freitas Parkway is a four-legged, two-way stop-controlled intersection. Redwood Highway and Civic Center Drive are the northern and southern legs; both are stop-controlled. Sidewalks are provided on both sides of the Redwood Highway and driveway legs and the east side of Civic Center Drive. One crosswalk is provided across the Redwood Highway leg and there is a Class II bicycle lane on northbound Civic Center Drive.

Merrydale Road/Las Gallinas Avenue is a four-legged, signalized intersection. Sidewalks exist on both sides of Merrydale Road while the driveway on the west side of the intersection has a sidewalk along the north side. Las Gallinas Avenue has sidewalk on the east side of the street and a Class I multi-use pathway along the west side. Las Gallinas Avenue also has a Class II bike lane in the southbound direction south of the intersection. Crosswalks are provided across the Merrydale Road, southbound Las Gallinas Avenue, and driveway legs.

Merrydale Overcrossing-Scettrini Drive/Civic Center Drive is a four-legged signalized intersection. Sidewalks exist on both sides of Scettrini Drive and on one side of Merrydale Overcrossing and Civic Center Drive. Crosswalks are provided across the Scettrini Drive and southbound Civic Center Drive legs. A Class II bike lane is provided on one side of Merrydale Overcrossing and both sides of Civic Center Drive. All approaches have bicycle detector symbol(s) at the intersection.



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

Study Roadways

Manuel T. Freitas Parkway (Freitas Parkway) is generally a four-lane, east-west oriented major arterial that connects the eastern residential and western commercial sides of US 101. The roadway has 11 to 12-foot lanes and a speed limit of 35 miles per hour. Within the project vicinity, Freitas Parkway crosses US 101 and terminates at its intersection with the US 101 Northbound Ramps/Civic Center Drive intersection.

Del Presidio Boulevard is a four-lane north-south oriented local road which connects Freitas Parkway to Las Gallinas Avenue. The road spans approximately 315 feet and has 11- to 12-foot lanes.

Civic Center Drive is a four-lane north-south oriented minor arterial between Freitas Parkway and North San Pedro Road. The roadway is characterized by 12-foot travel lanes and a posted speed limit of 30 mph.

Las Gallinas Avenue is a two-lane north-south oriented collector road providing access to Del Presidio Boulevard and Merrydale Road. In the project area, the road has a two-way left-turn lane and no posted speed limit.

Merrydale Road is a two-lane overcrossing near the project. It connects Las Gallinas Avenue to Civic Center Drive. This road has 12-foot lanes and no posted speed limit in the project area.

Scettrini Drive is a three-lane east-west oriented roadway that provided access to the project site entrance as well as a residential development. This road has 12-foot lanes and no posted speed limit.

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, 2010. This source contains methodologies for various types of intersection control, all of which are related to a measurement of delay in average number of seconds per vehicle.

The 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. During the level of service analysis for the Civic Center Drive-Redwood Highway/Freitas Parkway intersection, it was found that stop-controlled volumes on Redwood Highway and Civic Center Drive approaches exceeded the maximum values that the methodology can evaluate. This resulted in errors and skewed levels of service, thus the level of service could not be evaluated with the HCM methodology. Intersection operation at Civic Center Drive-Redwood Highway/Freitas Parkway intersection was instead evaluated with the SIMTRAFFIC application in Synchro. SIMTRAFFIC evaluates operation by simulating traffic based on inputted data.

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 the signals are coordinated or not, truck traffic, and pedestrian activity. Average stopped delay per vehicle in seconds is used as the basis for evaluation in this LOS methodology. For purposes of this study, delays were calculated using signal timing obtained from the City of San Rafael.

The ranges of delay associated with the various levels of service are indicated in Table 1.

Table 1– 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, 2010

Traffic Operation Standards

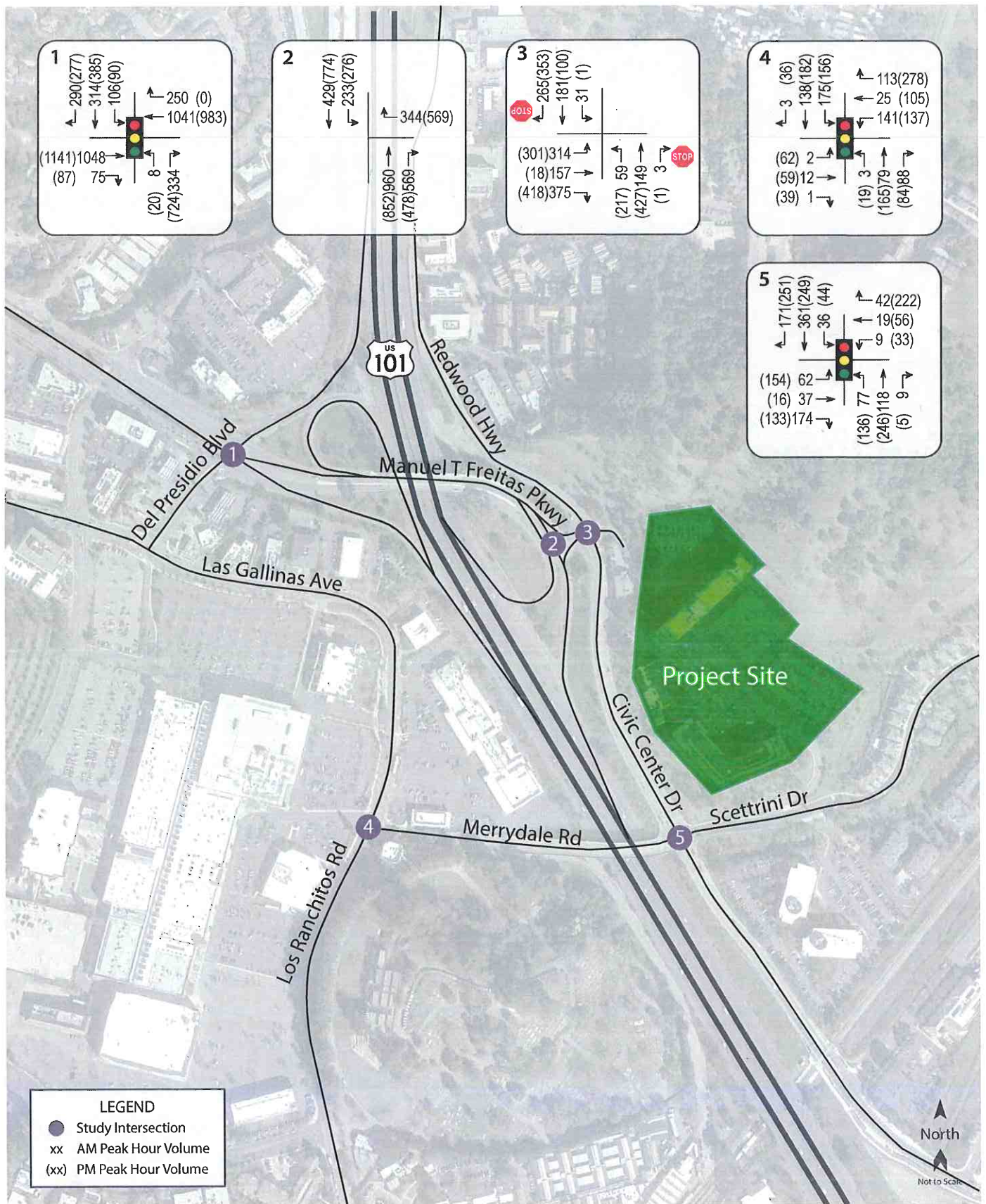
The City of San Rafael’s Level of Service (LOS) standard for intersections citywide is LOS D, with exceptions for some intersections, including the study intersections of Civic Center Drive-Redwood Highway/Freitas Parkway and Merrydale Overcrossing-Scettrini Drive/Civic Center Drive where the standard is LOS E. The project would have a significant traffic impact if the traffic generated by the project would cause an intersection currently operating at an acceptable level of service (LOS D or better, or LOS E or better) to operate below the standard (LOS E or F).

Two study intersections are on- and off- ramps to US-101. The City of San Rafael’s General Plan states that, “Signalized intersections at Highway 101 and Interstate 580 on-ramps and off-ramps are exempt from LOS standards because delay at these locations is affected by regional traffic and not significantly impacted by local measures.” The three remaining study intersections are not designated as exceptions to the citywide LOS in the General Plan, with a standard of LOS D or better.

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. Under Existing Conditions, all study intersections operate acceptably at LOS D or better (LOS E or better at Civic Center Drive-Redwood Highway/Freitas Parkway and Merrydale Overcrossing-Scettrini Drive/Civic Center Drive) during both peak periods.

The existing traffic volumes are shown in Figure 2. A summary of the intersection and approach level of service calculations is contained in Table 2, and copies of the Level of Service calculations are provided in Appendix A.



Traffic and Parking Study for the Proposed Change in Use at 4000 Civic Center Drive
Figure 2 – Existing Traffic Volumes

Table 2 – Existing Peak Hour Intersection Levels of Service

Study Intersection Approach	AM Peak		PM Peak	
	Delay	LOS	Delay	LOS
1. Freitas Pkwy/US 101S Off Ramp-Del Presidio Blvd	17.0	B	25.0	C
2. Freitas Pkwy/US 101N Ramps	2.6	A	2.4	A
3. Civic Center Dr-Redwood Hwy/Freitas Pkwy	5.6	A	6.9	A
<i>Northbound Approach (Civic Center Dr)</i>	<i>10.9</i>	<i>B</i>	<i>10.0</i>	<i>B</i>
<i>Southbound Approach (Redwood Hwy)</i>	<i>10.2</i>	<i>B</i>	<i>10.5</i>	<i>B</i>
4. Merrydale Rd/Las Gallinas Ave	14.3	B	26.2	C
5. Merrydale Overcrossing-Scettrini Dr/Civic Center Dr	23.6	C	40.0	D

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

Future volumes were projected out to the year 2040 using 2015 and 2020 volumes provided by City staff and a growth rate of 0.75 percent per year. This growth rate was approved by City staff and is comparable to data used to evaluate other projects located near US 101 interchanges in San Rafael. To arrive at the future year 2040 volumes, the growth rate was applied to the 2018 traffic counts collected for this project. To be conservative, where these volumes were less than the 2020 volumes provided by the City, the City's 2020 volumes were applied as the "floor." The 2020 volumes provided by the City included all approved projects in the area expected to be built and occupied by 2020.

Under Future conditions, all study intersections are expected to operate acceptably at LOS D or better (LOS E or better at Civic Center Drive-Redwood Highway/Freitas Parkway and Merrydale Overcrossing-Scettrini Drive/Civic Center Drive) during both peak periods. Future operating conditions are summarized in Table 3 and Future traffic volumes are shown in Figure 3.

Table 3 – Future Peak Hour Intersection Levels of Service

Study Intersection Approach	AM Peak		PM Peak	
	Delay	LOS	Delay	LOS
1. Freitas Pkwy/US 101S Off Ramp-Del Presidio Blvd	18.2	B	36.1	D
2. Freitas Pkwy/US 101N Ramps	23.5	C	4.9	A
3. Civic Center Dr-Redwood Hwy/Freitas Pkwy	9.4	B	9.8	A
<i>Northbound Approach (Civic Center Dr)</i>	<i>8.9</i>	<i>C</i>	<i>12.7</i>	<i>B</i>
<i>Southbound Approach (Redwood Hwy)</i>	<i>18.7</i>	<i>C</i>	<i>16.9</i>	<i>C</i>
4. Merrydale Rd/Las Gallinas Ave	18.9	B	42.3	D
5. Merrydale Overcrossing-Scettrini Dr/Civic Center Dr	36.6	D	44.4	D

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 as proposed consists of converting 38,190 square feet of general office space to medical office space within the existing office building located at 4000 Civic Center Drive in the City of San Rafael. The existing project area is shown in Figure 1.

Trip Generation

The anticipated trip generation for the proposed project was estimated using standard rates published by the Institute of Transportation Engineers (ITE) in *Trip Generation Manual*, 10th Edition, 2017 for "Medical-Dental Office Building" (ITE LU #720). Because the site is currently occupied by office space, the trip generation of the office space was considered. "General Office Building" rates (ITE LU #710) were applied to the existing office space.

The expected trip generation potential for the proposed project is indicated in Table 4, with deductions taken for trips made to and from the general office building at the site, which will cease with the construction of the project. The proposed use is expected to generate an average of 1,329 trips per day, including 106 trips during the a.m. peak hour and 132 trips during the p.m. peak hour. After deducting trips for the existing use, the project would be expected to generate 957 new trips on a daily basis, including 62 during the morning peak hour and 88 during the evening peak hour; these new trips represent the increase in traffic associated with the project compared to existing volumes.

Land Use	Units	Daily		AM Peak Hour				PM Peak Hour			
		Rate	Trips	Rate	Trips	In	Out	Rate	Trips	In	Out
Existing											
General Office	-38.19 ksf	9.74	372	1.16	-44	-38	-6	1.15	-44	-6	-38
Proposed											
Medical Office	38.19 ksf	34.80	1,329	2.78	106	83	23	3.46	132	29	103
Net Change			957		62	45	17		88	23	65

Note: ksf = 1,000 square feet

Trip Distribution

The pattern used to allocate net new project trips to the street network was determined by reviewing probable travel patterns based on census data census and direction and well as input from City Staff. The applied distribution assumptions and resulting trips are shown in Table 5.

Table 5 – Trip Distribution Assumptions

Route	Percent	Daily Trips	AM Trips	PM Trips
To/from the north via Civic Center Dr	20%	191	13	17
To/from the west via Merrydale Rd	10%	96	6	9
To/from the west via Freitas Pkwy	10%	96	6	9
To/from the north via US 101	15%	143	9	13
To/from the south via US 101	45%	431	28	40
TOTAL	100%	957	62	88

Intersection Operation

Existing plus Project Conditions

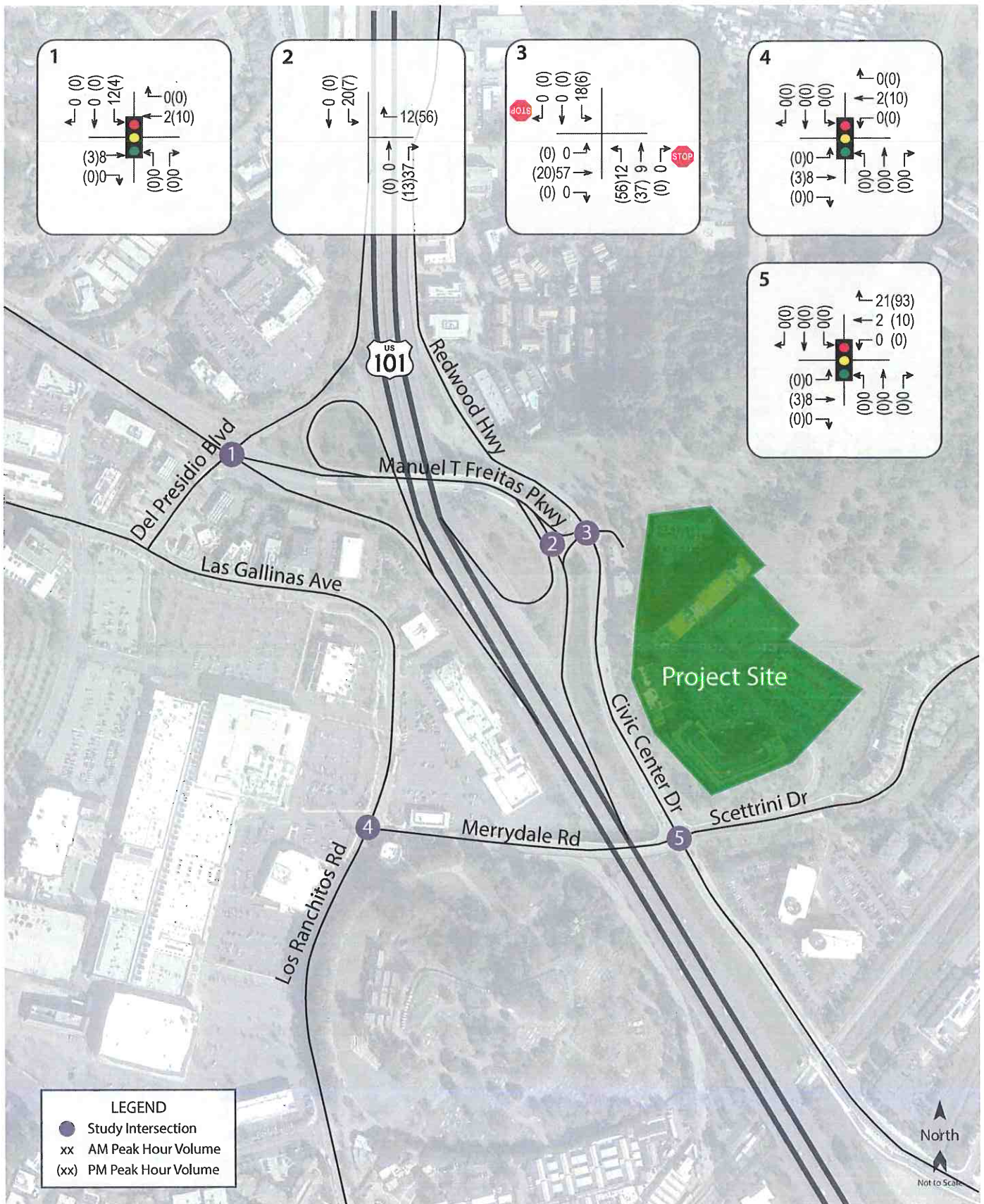
Upon the addition of project-related traffic to the Existing volumes, all study intersections are expected to continue operating acceptably overall at the same levels of service as under existing conditions. These results are summarized in Table 6. Project traffic volumes are shown in Figure 4 and Existing plus Project traffic volumes are shown in Figure 5.

Table 6 – Existing and Existing plus Project Peak Hour Intersection Levels of Service

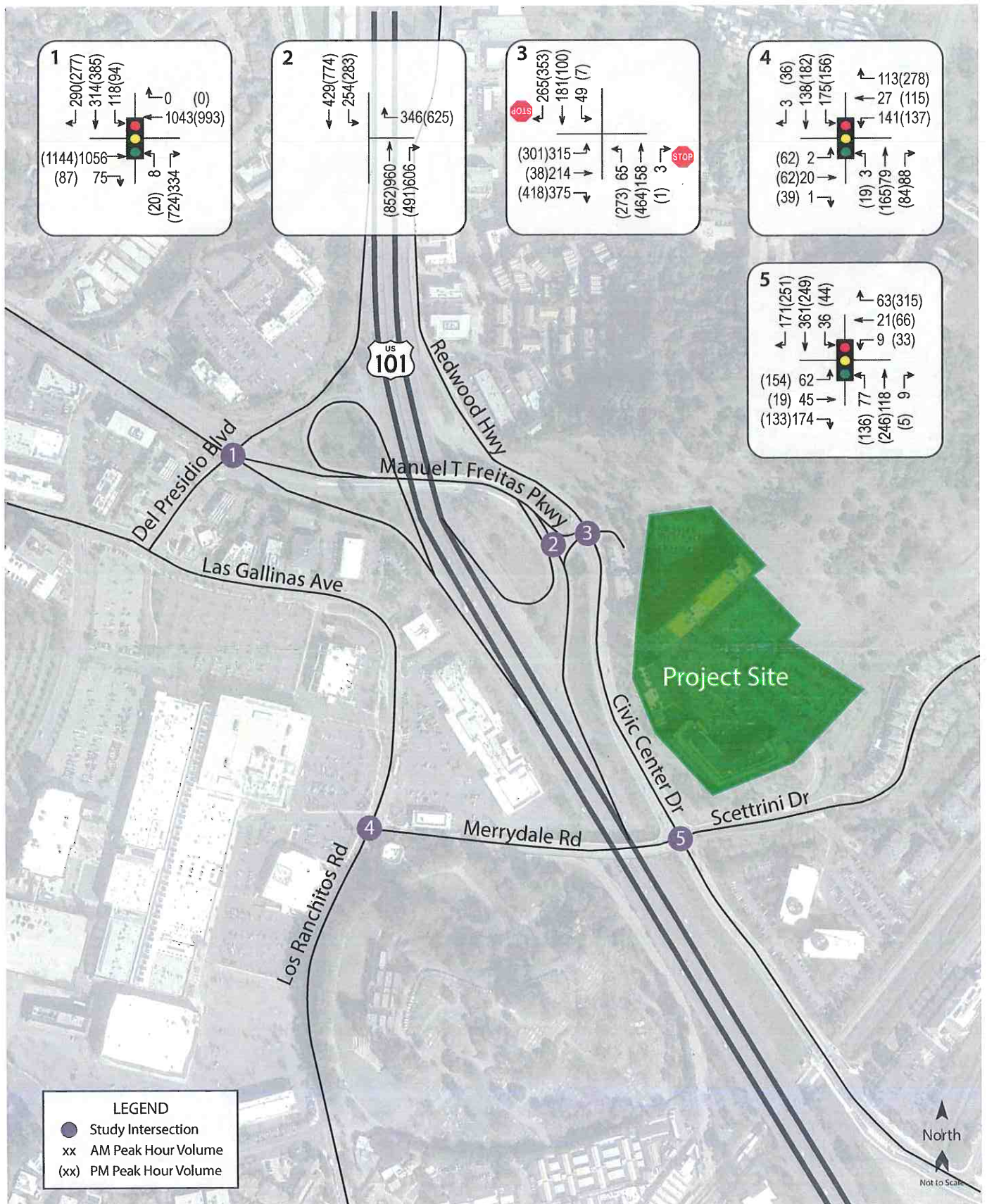
Study Intersection Approach	Existing Conditions				Existing plus Project			
	AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1. Freitas Pkwy/US 101S Off Ramp-Del Presidio Blvd	17.0	B	25.0	C	17.0	B	25.1	C
2. Freitas Pkwy/US 101N Ramps	2.6	A	2.4	A	3.1	A	3.0	A
3. Civic Center Dr-Redwood Hwy/Freitas Pkwy	5.6	A	6.9	A	7.0	A	9.7	A
<i>NB Approach (Civic Center Dr)</i>	<i>10.9</i>	<i>B</i>	<i>10.0</i>	<i>B</i>	<i>10.0</i>	<i>A</i>	<i>11.9</i>	<i>B</i>
<i>SB Approach (Redwood Hwy)</i>	<i>10.2</i>	<i>B</i>	<i>10.5</i>	<i>B</i>	<i>12.1</i>	<i>B</i>	<i>18.5</i>	<i>C</i>
4. Merrydale Rd/Las Gallinas Ave	14.3	B	26.2	C	14.5	B	26.5	C
5. Merrydale Overcrossing-Scettrini Dr/Civic Center Dr	23.6	C	40.0	D	25.9	C	39.9	D

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*

It should be noted that with the addition of project-related traffic volumes, average delay at the Merrydale Overcrossing-Scettrini Drive/Civic Center Drive decreases during the p.m. peak hour. While this is counter-intuitive, this condition occurs when a project adds trips to movements that are currently underutilized or have delays that are below the intersection average, resulting in a better balance between approaches and lower overall average delay. The project adds traffic predominantly to the right-turn movement, which has an average delay that is lower than the average for the intersection, resulting in a slight reduction in the overall average delay. The conclusion could incorrectly be drawn that the project improves operation based on this data alone; however, it is more appropriate to conclude that the project trips are expected to make use of excess capacity, so drivers will experience little, if any, change in conditions because of the project.



Traffic and Parking Study for the Proposed Change in Use at 4000 Civic Center Drive
Figure 4 – Project Traffic Volumes



Traffic and Parking Study for the Proposed Change in Use at 4000 Civic Center Drive
Figure 5 – Existing plus Project Traffic Volumes

Finding – All study intersections are expected to continue operating acceptably upon the addition of project-generated traffic, indicating a less-than-significant impact.

Future plus Project Conditions

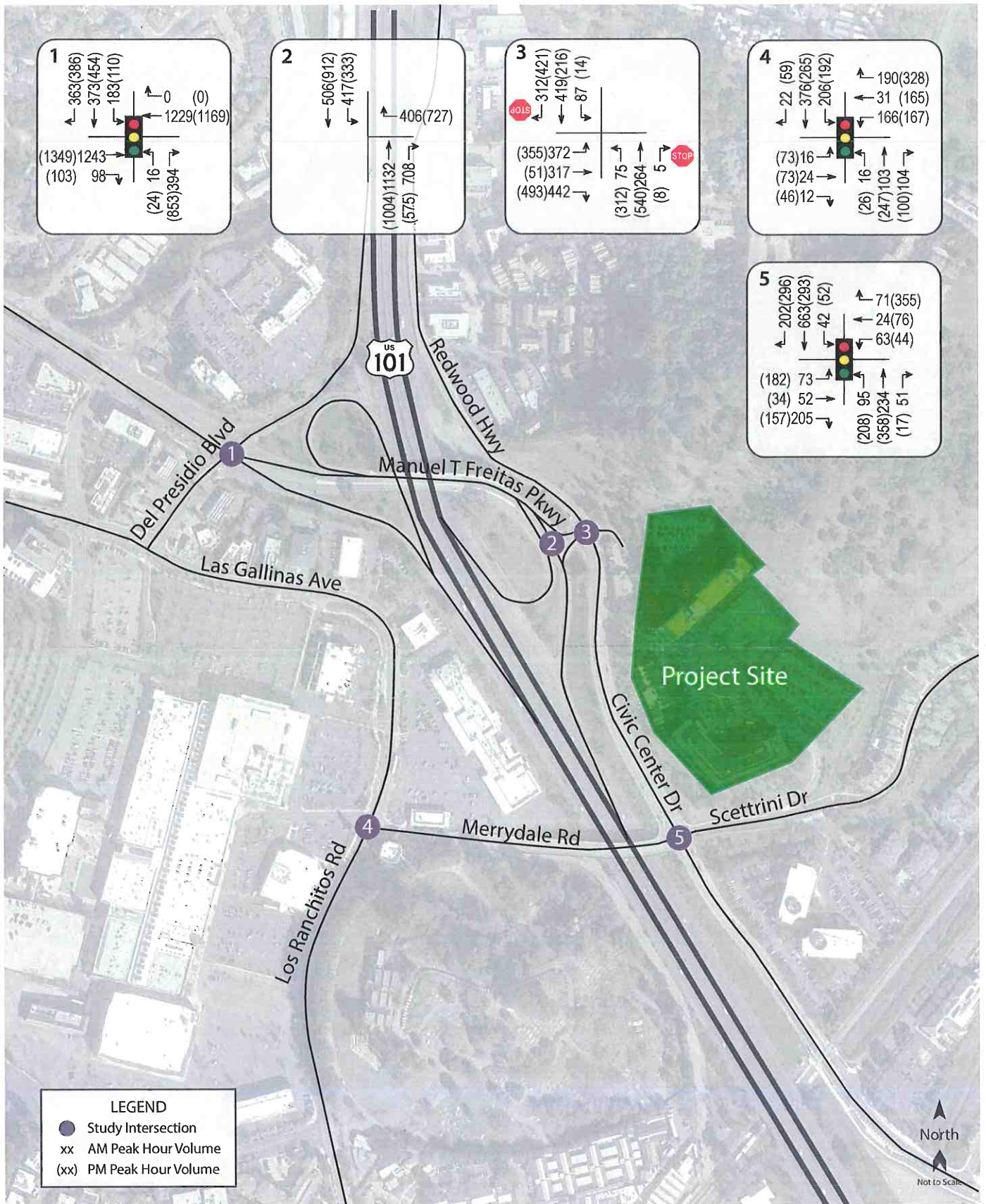
Upon the addition of project-generated traffic to the anticipated Future volumes, all study intersections are expected to operate acceptably at LOS D or better (LOS E or better at Civic Center Drive-Redwood Highway/Freitas Parkway and Merrydale Overcrossing-Scettrini Drive/Civic Center Drive) during both peak periods. Under Future plus Project Conditions, the study intersections experience an increase in delay, but remain at acceptable operating levels of service. The Future plus Project operating conditions are summarized in Table 7 and shown in Figure 6.

Table 7 – Future and Future plus Project Peak Hour Intersection Levels of Service

Study Intersection Approach	Future Conditions				Future plus Project			
	AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1. Freitas Pkwy/US 101S Off Ramp-Del Presidio Blvd	18.2	B	36.1	D	18.4	B	36.7	D
2. Freitas Pkwy/US 101N Ramps	23.5	C	4.9	A	30.3	D	7.4	A
3. Civic Center Dr-Redwood Hwy/Freitas Pkwy	9.4	A	9.8	A	11.7	B	16.4	C
<i>NB Approach (Civic Center Dr)</i>	<i>8.9</i>	<i>B</i>	<i>12.7</i>	<i>B</i>	<i>10.6</i>	<i>B</i>	<i>18.3</i>	<i>C</i>
<i>SB Approach (Redwood Hwy)</i>	<i>18.7</i>	<i>C</i>	<i>16.9</i>	<i>C</i>	<i>23.5</i>	<i>C</i>	<i>32.0</i>	<i>D</i>
4. Merrydale Rd/Las Gallinas Ave	18.9	B	42.3	D	19.1	B	43.4	D
5. Merrydale Overcrossing-Scettrini Dr/Civic Center Dr	36.6	D	44.4	D	36.9	D	50.4	D

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 – All study intersections will continue operating acceptably with project traffic added to future volumes.



Traffic and Parking Study for the Proposed Change in Use at 4000 Civic Center Drive
Figure 6 – Future plus Project Traffic Volumes

Parking

The project was analyzed to determine the required parking supply based on agency requirements and standard parking rates for the proposed change in land use. There are currently 436 parking spaces on-site allotted to the building located at 4000 Civic Center Drive which has a total floor area of 141,001 square feet. The project as proposed would not expand the current supply. The existing parking supply would continue to be shared by the various businesses operating within the office building. Because the parking required for a medical office use is higher than that for general office, analysis was performed to determine the additional demand that would be expected as well as the availability of parking to supply that demand.

Parking Requirements

Jurisdiction parking supply requirements are based on the San Rafael Municipal Code, Chapter 14.18; Parking Standards. The required parking supply is based on the land-use classification, with Medical Offices requiring parking at a ratio of 1.0 spaces per 225 square feet of gross floor area for a total of 169 parking spaces, or 16 more than would be required if the space continued to be occupied by general office uses.

Parking demand was also estimated using standard rates published by ITE in *Parking Generation*, 4th Edition, 2010 for Medical-Dental Office Building (ITE LU#720) based on the 85th percentile occupancy expected on weekdays. Based on standard rates provided by ITE, a total of 163 parking spaces would be expected to be occupied with medical office uses compared to 132 for general office use, or 31 additional spaces due to the conversion to medical office use. The expected demand and San Rafael requirements are shown in Table 8. The higher differential of 31 spaces was conservatively used for analysis purposes.

Land Use	Units	ITE Parking Generation		City of San Rafael Requirements	
		Rate	Est. Parking Demand	Rate	Spaces Required
General Office Building	38.19 ksf	3.45	132	1.0 per 250 sf	153
Medical-Dental Office Building	38.19 ksf	4.27	163	1.0 per 225 sf	169
Net Change			31		16

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

Parking Occupancy Survey

To determine if the site has sufficient capacity to serve the additional demand of up to 31 parked vehicles, existing demand was surveyed. The existing parking supply at the project site consists of 436 total parking spaces across two distinct parking areas, including one surface lot and one garage. The existing parking facilities allocate space for various vehicle sizes, as well as having designated parking stalls for businesses operating within the adjacent office buildings. The garages and surface parking lots provide a range of parking stall types including motorcycle, loading, and accessible spaces.

The parking occupancy survey was conducted to assess existing parking demand during peak periods. The parking survey was conducted over an eight-hour period on three consecutive weekdays (Tuesday through Thursday, July 17 to 19, 2018), with counts performed every 20 minutes. The peak demand observed was 312 occupied stalls at 11:40 a.m. during the Thursday survey, leaving 124 parking spaces available. Parking occupancy survey results are provided in Appendix B.

To determine if the parking supply could accommodate the change in land use, the unserved demand associated with the 14,415 square feet of space that were vacant during the survey, as well as the 31 additional spaces that would be needed for the converted medical space (based on the higher ITE rates) were added to the existing demand. Application of the City's required parking ratio of one space per 250 square feet of floor space the currently vacant space would require 58 spaces. A total of 89 spaces would be needed to provide parking for the currently vacant space as well as the additional demand associated with the conversion from general office to medical offices uses. With a minimum available supply of 124 spaces, it is anticipated that the existing supply 436 parking spaces would adequately accommodate the expected parking demand upon conversion to medical office uses based on both City and ITE standards as shown in Table 9.

Table 9 – Unadjusted Parking Analysis Summary

Land Use	Units	ITE Parking Generation		City of San Rafael Requirements	
		Rate	Est. Parking Demand	Rate	Spaces Required
General Office Building (Vacant)	14.42 ksf	3.45	50	1.0 per 250 sf	58
Net Land Use Parking Change	38.19 ksf	N/A	31	N/A	16
Observed Demand		N/A	312	N/A	312
Total Anticipated Peak Parking Demand			393		386

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

At City staff's direction, the observed parking demand was further analyzed to reflect variations in the expected parking demand due to seasonality. The Urban Land Institute's publication *Shared Parking*, 2nd Edition, 2006, includes state-of-the-practice methodologies for determining parking demand, including a comparison of monthly utilization rates. The expected demand during summer months when the parking facility was surveyed is typically 5 percent lower than the peak demand surveyed by ULI during winter months. As the peak demand observed was 312 occupied stalls, the peak demand adjusted up to 5 percent would be expected to reflect the typical variation due to seasonality and results in a total projected demand of 328 occupied stalls. It is anticipated that the existing supply of 436 parking spaces would adequately accommodate the expected parking demand upon conversion to medical office uses based on both City and ITE standards as shown in Table 10.

Table 10 – Seasonally Adjusted Parking Analysis Summary

Land Use	Units	ITE Parking Generation		City of San Rafael Requirements	
		Rate	Est. Parking Demand	Rate	Spaces Required
General Office Building (Vacant)	14.42 ksf	3.45	50	1.0 per 250 sf	58
Net Land Use Parking Change	38.19 ksf	N/A	31	N/A	16
Observed Demand		N/A	328*	N/A	328*
Total Anticipated Peak Parking Demand			409		402

Notes: sf = square feet; ksf = 1,000 square feet; * = reflects five percent increase in demand due to seasonality

Finding – the existing parking supply of 436 space will adequately accommodate the expected demand associated with conversion of uses from general office to medical office.

Conclusions

Conclusions

- The proposed project is expected to generate an average of 957 net new trips daily, including 62 trips during the morning peak hour and 88 during the evening peak hour.
- The study intersections operate acceptably overall during both peak hours under existing conditions.
- Under Future volumes the study intersections are expected to operate acceptably during the a.m. and p.m. peak hours at LOS D or better.
- Upon adding the additional trips associated with the change in land use to Existing and Future volumes, the study intersections are expected to continue operating acceptably.
- The parking supply for the project site is expected to remain adequate with the proposed change in use from general office to medical office.

Study Participants and References

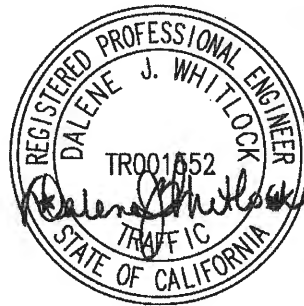
Study Participants

Principal in Charge	Dalene J. Whitlock, PE, PTOE
Assistant Planner	Andre Huff
Graphics	Alex Scrobonia
Editing/Formatting	Alex Scrobonia
Report Review	Dalene J. Whitlock, PE, PTOE

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SRA137



Appendix A


















Intersection Level of Service Calculations



HCM Signalized Intersection Capacity Analysis

1: Del Presidio Boulevard/101 SB Ramp & Freitas Parkway

08/10/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1048	75	0	1041	0	8	0	334	106	314	290
Future Volume (vph)	0	1048	75	0	1041	0	8	0	334	106	314	290
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	15	12	12	12	12	11	12	15	12	12	15
Total Lost time (s)		3.0			3.0		3.0		3.0		3.0	
Lane Util. Factor		0.95			0.91		1.00		1.00		0.95	
Frbp, ped/bikes		1.00			1.00		1.00		0.98		0.99	
Flpb, ped/bikes		1.00			1.00		1.00		1.00		1.00	
Frt		0.99			1.00		1.00		0.85		0.94	
Flt Protected		1.00			1.00		0.95		1.00		0.99	
Satd. Flow (prot)		3647			4818		1621		1617		3106	
Flt Permitted		1.00			1.00		0.21		1.00		0.99	
Satd. Flow (perm)		3647			4818		357		1617		3106	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	1092	78	0	1084	0	8	0	348	110	327	302
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	37	0	39	0
Lane Group Flow (vph)	0	1166	0	0	1084	0	8	0	311	0	700	0
Confl. Peds. (#/hr)			4						11			3
Confl. Bikes (#/hr)						2						
Turn Type		NA			NA		D.Pm		Perm	Perm	NA	
Protected Phases		2			2							4
Permitted Phases							4		4	4		
Actuated Green, G (s)		56.5			56.5		31.5		31.5		31.5	
Effective Green, g (s)		59.5			59.5		34.5		34.5		34.5	
Actuated g/C Ratio		0.60			0.60		0.34		0.34		0.34	
Clearance Time (s)		6.0			6.0		6.0		6.0		6.0	
Vehicle Extension (s)		3.0			3.0		2.0		2.0		2.0	
Lane Grp Cap (vph)		2169			2866		123		557		1071	
v/s Ratio Prot		0.32			0.23							
v/s Ratio Perm							0.02		0.19		0.23	
v/c Ratio		0.54			0.38		0.07		0.56		0.65	
Uniform Delay, d1		12.1			10.6		21.9		26.6		27.7	
Progression Factor		0.54			1.00		1.55		1.57		1.00	
Incremental Delay, d2		0.9			0.4		0.1		0.6		1.1	
Delay (s)		7.4			11.0		34.1		42.3		28.8	
Level of Service		A			B		C		D		C	
Approach Delay (s)		7.4			11.0			42.1			28.8	
Approach LOS		A			B			D			C	
Intersection Summary												
HCM 2000 Control Delay			17.0				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			100.0				Sum of lost time (s)		6.0			
Intersection Capacity Utilization			93.0%				ICU Level of Service			F		
Analysis Period (min)			15									
c Critical Lane Group												

Intersection

Int Delay, s/veh 2.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↖	↗	↖	↖
Traffic Vol, veh/h	0	334	960	569	234	429
Future Vol, veh/h	0	334	960	569	234	429
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	None
Storage Length	-	0	-	0	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	341	980	581	239	438

Major/Minor

	Minor1	Major1	Major2		
Conflicting Flow All	-	-	0	0	1561
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	-	10	-	4.12
Critical Hdwy Stg 1	-	-	10	-	-
Critical Hdwy Stg 2	-	-	-	-	10
Follow-up Hdwy	-	-	10	-	2.218
Pot Cap-1 Maneuver	0	0	-	-	423
Stage 1	0	0	-	-	-
Stage 2	0	0	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	423
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach

	WB	NB	SB
HCM Control Delay, s	0	0	8.5
HCM LOS	A		

Minor Lane/Major Mvmt

	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	423
HCM Lane V/C Ratio	-	-	-	0.564
HCM Control Delay (s)	-	-	0	24
HCM Lane LOS	-	-	A	C
HCM 95th %tile Q(veh)	-	-	-	3.4





















3: Civic Center Dr/Redwood Hwy & Manuel T Freitas Pkwy /Private Driveway Performance by approach

Approach	EB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0
Total Del/Veh (s)	1.3	10.9	10.2	5.6

HCM Signalized Intersection Capacity Analysis

4: Las Gallinas Avenue & Merrydale Road/Merrydale Overpass






















08/10/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	12	1	141	25	113	3	79	88	175	138	3
Future Volume (vph)	2	12	1	141	25	113	3	79	88	175	138	3
Ideal Flow (vphpl)	1600	1700	1700	1600	1700	1700	1600	1700	1700	1600	1700	1700
Lane Width	11	12	12	11	11	12	11	12	12	11	11	12
Total Lost time (s)	3.0	3.0		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	
Frbp, ped/bikes	1.00	1.00		1.00	0.97		1.00	0.99		1.00	1.00	
Ftpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Fr	1.00	0.99		1.00	0.88		1.00	0.92		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1441	1649		1441	1367		1441	1514		1441	1605	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1441	1649		1441	1367		1441	1514		1441	1605	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	2	13	1	150	27	120	3	84	94	186	147	3
RTOR Reduction (vph)	0	1	0	0	94	0	0	41	0	0	1	0
Lane Group Flow (vph)	2	13	0	150	53	0	3	137	0	186	149	0
Confl. Peds. (#/hr)							22			4		4
Confl. Bikes (#/hr)										1		2
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	0.8	1.3		8.0	8.5		0.8	9.5		8.6	17.3	
Effective Green, g (s)	1.8	2.5		9.0	9.7		1.8	11.4		9.6	19.2	
Actuated g/C Ratio	0.04	0.06		0.20	0.22		0.04	0.26		0.22	0.43	
Clearance Time (s)	4.0	4.2		4.0	4.2		4.0	4.9		4.0	4.9	
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lane Grp Cap (vph)	58	92		291	297		58	387		310	692	
v/s Ratio Prot	0.00	0.01		c0.10	c0.04		0.00	c0.09		c0.13	0.09	
v/s Ratio Perm												
v/c Ratio	0.03	0.14		0.52	0.18		0.05	0.35		0.60	0.22	
Uniform Delay, d1	20.5	20.0		15.8	14.2		20.5	13.5		15.7	7.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.3		0.6	0.1		0.1	0.2		2.1	0.1	
Delay (s)	20.6	20.2		16.5	14.3		20.7	13.7		17.8	8.0	
Level of Service	C	C		B	B		C	B		B	A	
Approach Delay (s)		20.3			15.4			13.9			13.4	
Approach LOS		C			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			14.3				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.47									
Actuated Cycle Length (s)			44.5				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			50.6%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

5: Civic Center Drive & Merrydale Overpass/Merrydale Road























08/10/2018

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	62	37	174	9	19	42	77	118	9	36	361	171	
Future Volume (vph)	62	37	174	9	19	42	77	118	9	36	361	171	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	12	16	12	11	12	12	11	12	12	12	11	12	
Total Lost time (s)	3.0	3.0		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		
Frbp, ped/bikes	1.00	1.00		1.00	0.98		1.00	1.00		1.00	0.99		
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Frt	1.00	0.88		1.00	0.90		1.00	0.99		1.00	0.95		
Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00		
Satd. Flow (prot)	1770	1850		1711	1641		1711	1839		1770	1701		
Fit Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00		
Satd. Flow (perm)	1770	1850		1711	1641		1711	1839		1770	1701		
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	
Adj. Flow (vph)	66	39	185	10	20	45	82	126	10	38	384	182	
RTOR Reduction (vph)	0	136	0	0	36	0	0	2	0	0	15	0	
Lane Group Flow (vph)	66	88	0	10	29	0	82	134	0	38	551	0	
Confl. Peds. (#/hr)							11			9			
Confl. Bikes (#/hr)							4			1		4	
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA		
Protected Phases	5	2		1	6		3	8		7	4		
Permitted Phases													
Actuated Green, G (s)	6.4	17.6		1.1	12.3		6.7	31.8		2.8	27.9		
Effective Green, g (s)	8.4	19.6		3.1	14.3		8.7	33.8		4.8	29.9		
Actuated g/C Ratio	0.11	0.27		0.04	0.20		0.12	0.46		0.07	0.41		
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0		
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0		
Lane Grp Cap (vph)	202	494		72	320		203	847		115	693		
v/s Ratio Prot	c0.04	c0.05		0.01	0.02		c0.05	0.07		0.02	c0.32		
v/s Ratio Perm													
v/c Ratio	0.33	0.18		0.14	0.09		0.40	0.16		0.33	0.80		
Uniform Delay, d1	29.8	20.7		33.8	24.2		29.9	11.5		32.7	19.0		
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Incremental Delay, d2	0.3	0.1		0.3	0.0		0.5	0.0		0.6	5.9		
Delay (s)	30.2	20.7		34.1	24.2		30.4	11.5		33.3	24.9		
Level of Service	C	C		C	C		C	B		C	C		
Approach Delay (s)		22.9			25.5			18.6			25.4		
Approach LOS		C			C			B			C		
Intersection Summary													
HCM 2000 Control Delay			23.6									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.54										
Actuated Cycle Length (s)			73.3									Sum of lost time (s)	12.0
Intersection Capacity Utilization			59.0%									ICU Level of Service	B
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis

1: Del Presidio Boulevard/101 SB Ramp & Freitas Parkway

08/03/2018

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		 			  				 		 		
Traffic Volume (vph)	0	1141	87	0	983	0	20	0	724	90	385	277	
Future Volume (vph)	0	1141	87	0	983	0	20	0	724	90	385	277	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Lane Width	12	15	12	12	12	12	11	12	15	12	12	15	
Total Lost time (s)		3.0			3.0		3.0		3.0		3.0		
Lane Util. Factor		0.95			0.91		1.00		1.00		0.95		
Frbp, ped/bikes		1.00			1.00		1.00		0.98		0.99		
Flpb, ped/bikes		1.00			1.00		1.00		1.00		1.00		
Frft		0.99			1.00		1.00		0.85		0.94		
Flt Protected		1.00			1.00		0.95		1.00		0.99		
Satd. Flow (prot)		3645			4818		1621		1618		3132		
Flt Permitted		1.00			1.00		0.27		1.00		0.99		
Satd. Flow (perm)		3645			4818		455		1618		3132		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	0	1189	91	0	1024	0	21	0	754	94	401	289	
RTOR Reduction (vph)	0	6	0	0	0	0	0	0	17	0	25	0	
Lane Group Flow (vph)	0	1274	0	0	1024	0	21	0	737	0	759	0	
Confl. Peds. (#/hr)			4						11			3	
Confl. Bikes (#/hr)						2							
Turn Type		NA			NA		D.Pm		Perm	Perm		NA	
Protected Phases		2			2							4	
Permitted Phases							4		4	4			
Actuated Green, G (s)		39.8			39.8		43.2		43.2		43.2		
Effective Green, g (s)		42.8			42.8		46.2		46.2		46.2		
Actuated g/C Ratio		0.45			0.45		0.49		0.49		0.49		
Clearance Time (s)		6.0			6.0		6.0		6.0		6.0		
Vehicle Extension (s)		3.0			3.0		2.0		2.0		2.0		
Lane Grp Cap (vph)		1642			2170		221		786		1523		
v/s Ratio Prot		c0.35			0.21								
v/s Ratio Perm							0.05		c0.46		0.24		
v/c Ratio		0.78			0.47		0.10		0.94		0.50		
Uniform Delay, d1		22.0			18.2		13.1		23.0		16.5		
Progression Factor		1.00			1.00		1.00		1.00		1.00		
Incremental Delay, d2		3.7			0.7		0.1		18.2		0.1		
Delay (s)		25.7			19.0		13.2		41.2		16.6		
Level of Service		C			B		B		D		B		
Approach Delay (s)		25.7			19.0			40.4			16.6		
Approach LOS		C			B			D			B		
Intersection Summary													
HCM 2000 Control Delay			25.0									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.86										
Actuated Cycle Length (s)			95.0									Sum of lost time (s)	6.0
Intersection Capacity Utilization			119.2%									ICU Level of Service	H
Analysis Period (min)			15										
c Critical Lane Group													

HCM 2010 TWSC
 2: US 101 On-/Off-Ramps & Manuel T Freitas Pkwy

08/03/2018

Intersection

Int Delay, s/veh 2.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↖	↗	↖	↖
Traffic Vol, veh/h	0	569	852	478	276	774
Future Vol, veh/h	0	569	852	478	276	774
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	None
Storage Length	-	0	-	0	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	581	869	488	282	790

Major/Minor

	Minor1	Major1	Major2		
Conflicting Flow All	-	-	0	0	1357
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	-	10	-	4.12
Critical Hdwy Stg 1	-	-	10	-	-
Critical Hdwy Stg 2	-	-	-	-	10
Follow-up Hdwy	-	-	10	-	2.218
Pot Cap-1 Maneuver	0	0	-	-	507
Stage 1	0	0	-	-	-
Stage 2	0	0	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	-	-	-	-	507
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach

	WB	NB	SB
HCM Control Delay, s	0	0	5.4
HCM LOS	A		

Minor Lane/Major Mvmt

	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	507	-
HCM Lane V/C Ratio	-	-	0.555	-
HCM Control Delay (s)	-	-	0	20.6
HCM Lane LOS	-	-	A	C
HCM 95th %tile Q(veh)	-	-	3.4	-

SimTraffic Performance Report
08/09/2018





















3: Civic Center Dr/Redwood Hwy & Manuel T Freitas Pkwy /Private Driveway Performance by approach

Approach	EB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0
Total Del/Veh (s)	1.4	10.0	10.5	6.9

HCM Signalized Intersection Capacity Analysis

4: Las Gallinas Avenue & Merrydale Road/Merrydale Overpass





















08/03/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	59	39	137	105	278	19	165	84	156	182	36
Future Volume (vph)	62	59	39	137	105	278	19	165	84	156	182	36
Ideal Flow (vphpl)	1600	1700	1700	1600	1700	1700	1600	1700	1700	1600	1700	1700
Lane Width	11	12	12	11	11	12	11	12	12	11	11	12
Total Lost time (s)	3.0	3.0		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	
Frbp, ped/bikes	1.00	1.00		1.00	0.96		1.00	0.99		1.00	1.00	
Ftpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.89		1.00	0.95		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)	1441	1568		1441	1381		1441	1568		1441	1564	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1441	1568		1441	1381		1441	1568		1441	1564	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	66	63	41	146	112	296	20	176	89	166	194	38
RTOR Reduction (vph)	0	24	0	0	99	0	0	18	0	0	7	0
Lane Group Flow (vph)	66	80	0	146	309	0	20	247	0	166	225	0
Confl. Peds. (#/hr)						22			4			4
Confl. Bikes (#/hr)									1			2
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	4.2	16.2		9.2	21.2		2.3	17.5		9.6	24.8	
Effective Green, g (s)	5.2	17.4		10.2	22.4		3.3	19.4		10.6	26.7	
Actuated g/C Ratio	0.07	0.25		0.15	0.32		0.05	0.28		0.15	0.38	
Clearance Time (s)	4.0	4.2		4.0	4.2		4.0	4.9		4.0	4.9	
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lane Grp Cap (vph)	107	392		211	444		68	437		219	599	
v/s Ratio Prot	0.05	0.05		c0.10	c0.22		0.01	c0.16		c0.12	0.14	
v/s Ratio Perm												
v/c Ratio	0.62	0.20		0.69	0.70		0.29	0.57		0.76	0.38	
Uniform Delay, d1	31.2	20.6		28.2	20.6		32.0	21.5		28.3	15.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.2	0.1		7.7	3.8		0.9	1.0		12.5	0.1	
Delay (s)	38.5	20.7		35.9	24.4		32.9	22.5		40.7	15.6	
Level of Service	D	C		D	C		C	C		D	B	
Approach Delay (s)		27.6			27.4			23.2			26.1	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay		26.2					HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio		0.69										
Actuated Cycle Length (s)		69.6					Sum of lost time (s)		12.0			
Intersection Capacity Utilization		72.1%					ICU Level of Service		C			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

5: Civic Center Drive & Merrydale Overpass/Merrydale Road

08/03/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	154	16	133	33	56	222	136	246	5	44	249	251
Future Volume (vph)	154	16	133	33	56	222	136	246	5	44	249	251
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	11	12	12	11	12	12	12	11	12
Total Lost time (s)	3.0	3.0		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	
Frbp, ped/bikes	1.00	1.00		1.00	0.98		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.87		1.00	0.88		1.00	1.00		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1829		1711	1608		1711	1857		1770	1644	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1829		1711	1608		1711	1857		1770	1644	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	164	17	141	35	60	236	145	262	5	47	265	267
RTOR Reduction (vph)	0	95	0	0	173	0	0	1	0	0	34	0
Lane Group Flow (vph)	164	63	0	35	123	0	145	266	0	47	498	0
Confl. Peds. (#/hr)						11			9			
Confl. Bikes (#/hr)						4			1			4
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	10.4	23.7		3.0	16.3		10.5	27.5		4.7	21.7	
Effective Green, g (s)	12.4	25.7		5.0	18.3		12.5	29.5		6.7	23.7	
Actuated g/C Ratio	0.16	0.33		0.06	0.23		0.16	0.37		0.08	0.30	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	278	595		108	372		271	694		150	493	
v/s Ratio Prot	c0.09	0.03		0.02	c0.08		c0.08	0.14		0.03	c0.30	
v/s Ratio Perm												
v/c Ratio	0.59	0.11		0.32	0.33		0.54	0.38		0.31	1.01	
Uniform Delay, d1	30.9	18.6		35.3	25.2		30.5	18.1		33.9	27.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.1	0.0		0.6	0.2		1.0	0.1		0.4	42.9	
Delay (s)	33.0	18.6		36.0	25.4		31.5	18.2		34.4	70.5	
Level of Service	C	B		D	C		C	B		C	E	
Approach Delay (s)		25.9			26.5			22.9			67.6	
Approach LOS		C			C			C			E	
Intersection Summary												
HCM 2000 Control Delay			40.0				HCM 2000 Level of Service				D	
HCM 2000 Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			78.9				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			77.7%				ICU Level of Service				D	
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

1: Del Presidio Boulevard/101 SB Ramp & Freitas Parkway

08/10/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑↑			↑↑↑		↘		↗		↔		
Traffic Volume (vph)	0	1048	75	0	1041	0	8	0	334	106	314	290	
Future Volume (vph)	0	1056	75	0	1043	0	8	0	334	118	314	290	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Lane Width	12	15	12	12	12	12	11	12	15	12	12	15	
Total Lost time (s)		3.0			3.0		3.0		3.0		3.0		
Lane Util. Factor		0.95			0.91		1.00		1.00		0.95		
Frbp, ped/bikes		1.00			1.00		1.00		0.98		0.99		
Flpb, ped/bikes		1.00			1.00		1.00		1.00		1.00		
Frt		0.99			1.00		1.00		0.85		0.94		
Flt Protected		1.00			1.00		0.95		1.00		0.99		
Satd. Flow (prot)		3647			4818		1621		1617		3108		
Flt Permitted		1.00			1.00		0.20		1.00		0.99		
Satd. Flow (perm)		3647			4818		347		1617		3108		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	0	1100	78	0	1086	0	8	0	348	123	327	302	
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	37	0	39	0	
Lane Group Flow (vph)	0	1174	0	0	1086	0	8	0	311	0	713	0	
Confl. Peds. (#/hr)			4						11			3	
Confl. Bikes (#/hr)						2							
Turn Type		NA			NA		D.Pm		Perm	Perm	NA		
Protected Phases		2			2						4		
Permitted Phases							4		4	4			
Actuated Green, G (s)		56.3			56.3		31.7		31.7		31.7		
Effective Green, g (s)		59.3			59.3		34.7		34.7		34.7		
Actuated g/C Ratio		0.59			0.59		0.35		0.35		0.35		
Clearance Time (s)		6.0			6.0		6.0		6.0		6.0		
Vehicle Extension (s)		3.0			3.0		2.0		2.0		2.0		
Lane Grp Cap (vph)		2162			2857		120		561		1078		
v/s Ratio Prot		0.32			0.23								
v/s Ratio Perm							0.02		0.19		0.23		
v/c Ratio		0.54			0.38		0.07		0.56		0.66		
Uniform Delay, d1		12.2			10.7		21.8		26.4		27.7		
Progression Factor		0.54			1.00		1.55		1.58		1.00		
Incremental Delay, d2		0.9			0.4		0.1		0.6		1.2		
Delay (s)		7.4			11.1		34.0		42.2		28.9		
Level of Service		A			B		C		D		C		
Approach Delay (s)		7.4			11.1			42.0			28.9		
Approach LOS		A			B			D			C		
Intersection Summary													
HCM 2000 Control Delay			17.0									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.59										
Actuated Cycle Length (s)			100.0									Sum of lost time (s)	6.0
Intersection Capacity Utilization			93.0%									ICU Level of Service	F
Analysis Period (min)			15										
c Critical Lane Group													

Intersection

Int Delay, s/veh 3.1

Movement WBL WBR NBT NBR SBL SBT

Lane Configurations		↗	↖	↗	↖	↗
Traffic Vol, veh/h	0	334	960	569	234	429
Future Vol, veh/h	0	346	960	606	254	429
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	None
Storage Length	-	0	-	0	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	353	980	618	259	438

Major/Minor Minor1 Major1 Major2

Conflicting Flow All	-	-	0	0	1598	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	10	-	4.12	-
Critical Hdwy Stg 1	-	-	10	-	-	-
Critical Hdwy Stg 2	-	-	-	-	10	10
Follow-up Hdwy	-	-	10	-	2.218	10
Pot Cap-1 Maneuver	0	0	-	-	410	-
Stage 1	0	0	-	-	-	-
Stage 2	0	0	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	410	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach WB NB SB

HCM Control Delay, s	0	0	10.3
HCM LOS	A		

Minor Lane/Major Mvmt NBT NBRWBLn1 SBL SBT

Capacity (veh/h)	-	-	-	410	-
HCM Lane V/C Ratio	-	-	-	0.632	-
HCM Control Delay (s)	-	-	0	27.7	-
HCM Lane LOS	-	-	A	D	-
HCM 95th %tile Q(veh)	-	-	-	4.2	-





















3: Civic Center Dr/Redwood Hwy & Manuel T Freitas Pkwy /Private Driveway Performance by approach

Approach	EB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0
Total Del/Veh (s)	1.3	8.6	8.9	4.7

HCM Signalized Intersection Capacity Analysis

4: Las Gallinas Avenue & Merrydale Road/Merrydale Overpass

08/10/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	12	1	141	25	113	3	79	88	175	138	3
Future Volume (vph)	2	20	1	141	27	113	3	79	88	175	138	3
Ideal Flow (vphpl)	1600	1700	1700	1600	1700	1700	1600	1700	1700	1600	1700	1700
Lane Width	11	12	12	11	11	12	11	12	12	11	11	12
Total Lost time (s)	3.0	3.0		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	
Frbp, ped/bikes	1.00	1.00		1.00	0.97		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.88		1.00	0.92		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1441	1655		1441	1369		1441	1513		1441	1605	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1441	1655		1441	1369		1441	1513		1441	1605	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	2	21	1	150	29	120	3	84	94	186	147	3
RTOR Reduction (vph)	0	1	0	0	93	0	0	41	0	0	1	0
Lane Group Flow (vph)	2	21	0	150	56	0	3	137	0	186	149	0
Confl. Peds. (#/hr)						22			4			4
Confl. Bikes (#/hr)									1			2
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	0.8	1.3		8.3	8.8		0.8	9.6		8.9	17.7	
Effective Green, g (s)	1.8	2.5		9.3	10.0		1.8	11.5		9.9	19.6	
Actuated g/C Ratio	0.04	0.06		0.21	0.22		0.04	0.25		0.22	0.43	
Clearance Time (s)	4.0	4.2		4.0	4.2		4.0	4.9		4.0	4.9	
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lane Grp Cap (vph)	57	91		296	302		57	384		315	695	
v/s Ratio Prot	0.00	0.01		c0.10	c0.04		0.00	c0.09		c0.13	0.09	
v/s Ratio Perm												
v/c Ratio	0.04	0.23		0.51	0.18		0.05	0.36		0.59	0.22	
Uniform Delay, d1	20.9	20.4		15.9	14.3		20.9	13.8		15.8	8.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.5		0.5	0.1		0.1	0.2		2.0	0.1	
Delay (s)	21.0	20.9		16.4	14.4		21.0	14.0		17.8	8.1	
Level of Service	C	C		B	B		C	B		B	A	
Approach Delay (s)		20.9			15.4			14.1			13.5	
Approach LOS		C			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			14.5			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.47									
Actuated Cycle Length (s)			45.2			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			50.6%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

5: Civic Center Drive & Merrydale Overpass/Merrydale Road

08/10/2018




















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	37	174	9	19	42	77	118	9	36	361	171
Future Volume (vph)	62	45	174	9	21	63	77	118	9	36	361	171
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	11	12	12	11	12	12	12	11	12
Total Lost time (s)	3.0	3.0		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	
Frb, ped/bikes	1.00	1.00		1.00	0.98		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Fr	1.00	0.88		1.00	0.89		1.00	0.99		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1860		1711	1623		1711	1839		1770	1701	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1860		1711	1623		1711	1839		1770	1701	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	66	48	185	10	22	67	82	126	10	38	384	182
RTOR Reduction (vph)	0	130	0	0	51	0	0	2	0	0	15	0
Lane Group Flow (vph)	66	103	0	10	38	0	82	134	0	38	551	0
Confl. Peds. (#/hr)						11			9			
Confl. Bikes (#/hr)						4			1			4
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	6.3	20.8		1.2	15.7		6.6	31.3		2.9	27.6	
Effective Green, g (s)	8.3	22.8		3.2	17.7		8.6	33.3		4.9	29.6	
Actuated g/C Ratio	0.11	0.30		0.04	0.23		0.11	0.44		0.06	0.39	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	192	556		71	376		193	803		113	660	
v/s Ratio Prot	c0.04	c0.06		0.01	0.02		c0.05	0.07		0.02	c0.32	
v/s Ratio Perm												
v/c Ratio	0.34	0.19		0.14	0.10		0.42	0.17		0.34	0.83	
Uniform Delay, d1	31.4	19.8		35.2	23.0		31.5	13.0		34.1	21.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.1		0.3	0.0		0.6	0.0		0.6	8.6	
Delay (s)	31.8	19.9		35.5	23.0		32.0	13.1		34.7	29.6	
Level of Service	C	B		D	C		C	B		C	C	
Approach Delay (s)		22.5			24.3			20.2			30.0	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	25.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	76.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	59.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1: Del Presidio Boulevard/101 SB Ramp & Freitas Parkway

08/10/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1141	87	0	983	0	20	0	724	90	385	277
Future Volume (vph)	0	1144	87	0	993	0	20	0	724	94	385	277
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	15	12	12	12	12	11	12	15	12	12	15
Total Lost time (s)		3.0			3.0		3.0		3.0		3.0	
Lane Util. Factor		0.95			0.91		1.00		1.00		0.95	
Frbp, ped/bikes		1.00			1.00		1.00		0.98		0.99	
Flpb, ped/bikes		1.00			1.00		1.00		1.00		1.00	
Frft		0.99			1.00		1.00		0.85		0.94	
Flt Protected		1.00			1.00		0.95		1.00		0.99	
Satd. Flow (prot)		3645			4818		1621		1618		3133	
Flt Permitted		1.00			1.00		0.26		1.00		0.99	
Satd. Flow (perm)		3645			4818		452		1618		3133	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	1192	91	0	1034	0	21	0	754	98	401	289
RTOR Reduction (vph)	0	6	0	0	0	0	0	0	17	0	24	0
Lane Group Flow (vph)	0	1277	0	0	1034	0	21	0	737	0	764	0
Confl. Peds. (#/hr)			4						11			3
Confl. Bikes (#/hr)						2						
Turn Type		NA			NA		D.Pm		Perm	Perm		NA
Protected Phases		2			2							4
Permitted Phases							4		4	4		
Actuated Green, G (s)		39.8			39.8		43.2		43.2		43.2	
Effective Green, g (s)		42.8			42.8		46.2		46.2		46.2	
Actuated g/C Ratio		0.45			0.45		0.49		0.49		0.49	
Clearance Time (s)		6.0			6.0		6.0		6.0		6.0	
Vehicle Extension (s)		3.0			3.0		2.0		2.0		2.0	
Lane Grp Cap (vph)		1642			2170		219		786		1523	
v/s Ratio Prot		c0.35			0.21							
v/s Ratio Perm							0.05		c0.46		0.24	
v/c Ratio		0.78			0.48		0.10		0.94		0.50	
Uniform Delay, d1		22.1			18.3		13.1		23.0		16.6	
Progression Factor		1.00			1.00		1.00		1.00		1.00	
Incremental Delay, d2		3.7			0.8		0.1		18.2		0.1	
Delay (s)		25.8			19.0		13.2		41.2		16.7	
Level of Service		C			B		B		D		B	
Approach Delay (s)		25.8			19.0			40.4			16.7	
Approach LOS		C			B			D			B	
Intersection Summary												
HCM 2000 Control Delay			25.1				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			95.0				Sum of lost time (s)		6.0			
Intersection Capacity Utilization			119.2%				ICU Level of Service		H			
Analysis Period (min)			15									
c	Critical Lane Group											

Intersection

Int Delay, s/veh 2.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↖	↗	↖	↖
Traffic Vol, veh/h	0	569	852	478	276	774
Future Vol, veh/h	0	625	852	491	283	774
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	None
Storage Length	-	0	-	0	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	638	869	501	289	790

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	-	-	0 0 1370 0
Stage 1	-	-	- - - -
Stage 2	-	-	- - - -
Critical Hdwy	-	-	10 - 4.12 -
Critical Hdwy Stg 1	-	-	10 - - -
Critical Hdwy Stg 2	-	-	- - 10 10
Follow-up Hdwy	-	-	10 - 2.218 10
Pot Cap-1 Maneuver	0	0	- - 501 -
Stage 1	0	0	- - - -
Stage 2	0	0	- - - -
Platoon blocked, %			- - - -
Mov Cap-1 Maneuver	-	-	- - 501 -
Mov Cap-2 Maneuver	-	-	- - - -
Stage 1	-	-	- - - -
Stage 2	-	-	- - - -

Approach	WB	NB	SB
HCM Control Delay, s	0	0	5.8
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	501	-
HCM Lane V/C Ratio	-	-	0.576	-
HCM Control Delay (s)	-	-	0 21.5	-
HCM Lane LOS	-	-	A C	-
HCM 95th %tile Q(veh)	-	-	3.6	-

3: Civic Center Dr/Redwood Hwy & Manuel T Freitas Pkwy /Private Driveway Performance by approach

Approach	EB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0
Total Del/Veh (s)	1.5	11.9	18.5	9.7

HCM Signalized Intersection Capacity Analysis

4: Las Gallinas Avenue & Merrydale Road/Merrydale Overpass

08/10/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	59	39	137	105	278	19	165	84	156	182	36
Future Volume (vph)	62	62	39	137	115	278	19	165	84	156	182	36
Ideal Flow (vphpl)	1600	1700	1700	1600	1700	1700	1600	1700	1700	1600	1700	1700
Lane Width	11	12	12	11	11	12	11	12	12	11	11	12
Total Lost time (s)	3.0	3.0		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	
Frbp, ped/bikes	1.00	1.00		1.00	0.96		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frft	1.00	0.94		1.00	0.89		1.00	0.95		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)	1441	1571		1441	1385		1441	1567		1441	1564	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1441	1571		1441	1385		1441	1567		1441	1564	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	66	66	41	146	122	296	20	176	89	166	194	38
RTOR Reduction (vph)	0	23	0	0	92	0	0	18	0	0	7	0
Lane Group Flow (vph)	66	84	0	146	326	0	20	247	0	166	225	0
Confl. Peds. (#/hr)						22			4			4
Confl. Bikes (#/hr)									1			2
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	6.2	18.2		9.1	21.1		2.4	17.4		9.6	24.6	
Effective Green, g (s)	7.2	19.4		10.1	22.3		3.4	19.3		10.6	26.5	
Actuated g/C Ratio	0.10	0.27		0.14	0.31		0.05	0.27		0.15	0.37	
Clearance Time (s)	4.0	4.2		4.0	4.2		4.0	4.9		4.0	4.9	
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lane Grp Cap (vph)	145	426		203	432		68	423		213	580	
v/s Ratio Prot	0.05	0.05		c0.10	c0.24		0.01	c0.16		c0.12	0.14	
v/s Ratio Perm												
v/c Ratio	0.46	0.20		0.72	0.75		0.29	0.58		0.78	0.39	
Uniform Delay, d1	30.3	20.0		29.3	22.1		32.8	22.6		29.3	16.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.8	0.1		9.7	6.5		0.9	1.3		15.0	0.2	
Delay (s)	31.1	20.1		39.0	28.6		33.7	23.9		44.3	16.7	
Level of Service	C	C		D	C		C	C		D	B	
Approach Delay (s)		24.3			31.3			24.6			28.2	
Approach LOS		C			C			C			C	

Intersection Summary

HCM 2000 Control Delay	28.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	71.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

5: Civic Center Drive & Merrydale Overpass/Merrydale Road

08/10/2018

























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	154	16	133	33	56	222	136	246	5	44	249	251
Future Volume (vph)	154	19	133	33	66	315	136	246	5	44	249	251
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	11	12	12	11	12	12	12	11	12
Total Lost time (s)	3.0	3.0		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	
Frbp, ped/bikes	1.00	1.00		1.00	0.98		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.87		1.00	0.88		1.00	1.00		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1834		1711	1599		1711	1857		1770	1644	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1834		1711	1599		1711	1857		1770	1644	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	164	20	141	35	70	335	145	262	5	47	265	267
RTOR Reduction (vph)	0	93	0	0	206	0	0	1	0	0	35	0
Lane Group Flow (vph)	164	68	0	35	199	0	145	266	0	47	497	0
Confl. Peds. (#/hr)						11			9			
Confl. Bikes (#/hr)						4			1			4
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	10.5	25.3		2.9	17.7		10.7	27.8		4.6	21.7	
Effective Green, g (s)	12.5	27.3		4.9	19.7		12.7	29.8		6.6	23.7	
Actuated g/C Ratio	0.16	0.34		0.06	0.24		0.16	0.37		0.08	0.29	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	274	621		104	390		269	686		144	483	
v/s Ratio Prot	c0.09	0.04		0.02	c0.12		c0.08	0.14		0.03	c0.30	
v/s Ratio Perm												
v/c Ratio	0.60	0.11		0.34	0.51		0.54	0.39		0.33	1.03	
Uniform Delay, d1	31.7	18.3		36.3	26.3		31.3	18.7		34.9	28.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.3	0.0		0.7	0.4		1.0	0.1		0.5	48.8	
Delay (s)	34.1	18.3		37.0	26.7		32.3	18.8		35.4	77.3	
Level of Service	C	B		D	C		C	B		D	E	
Approach Delay (s)		26.3			27.5			23.6			73.9	
Approach LOS		C			C			C			E	

Intersection Summary			
HCM 2000 Control Delay	41.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	80.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	77.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1: Del Presidio Boulevard/101 SB Ramp & Freitas Parkway

08/10/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			  				 		 	
Traffic Volume (vph)	0	1235	98	0	1227	0	16	0	394	171	373	363
Future Volume (vph)	0	1235	98	0	1227	0	16	0	394	171	373	363
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	15	12	12	12	12	11	12	15	12	12	15
Total Lost time (s)		3.0			3.0		3.0		3.0		3.0	
Lane Util. Factor		0.95			0.91		1.00		1.00		0.95	
Frbp, ped/bikes		1.00			1.00		1.00		0.98		0.99	
Flpb, ped/bikes		1.00			1.00		1.00		1.00		1.00	
Fit		0.99			1.00		1.00		0.85		0.94	
Flt Protected		1.00			1.00		0.95		1.00		0.99	
Satd. Flow (prot)		3643			4818		1621		1620		3105	
Flt Permitted		1.00			1.00		0.18		1.00		0.99	
Satd. Flow (perm)		3643			4818		309		1620		3105	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	1286	102	0	1278	0	17	0	410	178	389	378
RTOR Reduction (vph)	0	6	0	0	0	0	0	0	23	0	6	0
Lane Group Flow (vph)	0	1382	0	0	1278	0	17	0	387	0	939	0
Confl. Peds. (#/hr)			4						11			3
Confl. Bikes (#/hr)						2						
Turn Type		NA			NA		D.Pm		Perm	Perm		NA
Protected Phases		2			2							4
Permitted Phases							4		4	4		
Actuated Green, G (s)		35.8			35.8		32.2		32.2		32.2	
Effective Green, g (s)		38.8			38.8		35.2		35.2		35.2	
Actuated g/C Ratio		0.48			0.48		0.44		0.44		0.44	
Clearance Time (s)		6.0			6.0		6.0		6.0		6.0	
Vehicle Extension (s)		3.0			3.0		2.0		2.0		2.0	
Lane Grp Cap (vph)		1766			2336		135		712		1366	
v/s Ratio Prot		c0.38			0.27							
v/s Ratio Perm							0.05		0.24		0.30	
v/c Ratio		0.78			0.55		0.13		0.54		0.69	
Uniform Delay, d1		17.1			14.4		13.3		16.5		18.0	
Progression Factor		1.00			1.00		1.00		1.00		1.00	
Incremental Delay, d2		3.5			0.9		0.2		0.5		1.2	
Delay (s)		20.6			15.4		13.4		16.9		19.1	
Level of Service		C			B		B		B		B	
Approach Delay (s)		20.6			15.4		16.8				19.1	
Approach LOS		C			B		B		B		B	
Intersection Summary												
HCM 2000 Control Delay			18.2				HCM 2000 Level of Service		B			
HCM 2000 Volume to Capacity ratio			0.74									
Actuated Cycle Length (s)			80.0				Sum of lost time (s)		6.0			
Intersection Capacity Utilization			107.6%				ICU Level of Service		G			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 2010 TWSC
 2: US 101 On-/Off-Ramps & Manuel T Freitas Pkwy

08/10/2018

Intersection

Int Delay, s/veh 23.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↖	↗	↖	↖
Traffic Vol, veh/h	0	394	1132	671	397	506
Future Vol, veh/h	0	394	1132	671	397	506
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	None
Storage Length	-	0	-	0	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	402	1155	685	405	516

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	-	-	0 0 1840 0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	10 - 4.12 -
Critical Hdwy Stg 1	-	-	10 - - -
Critical Hdwy Stg 2	-	-	- - 10 10
Follow-up Hdwy	-	-	10 - 2.218 10
Pot Cap-1 Maneuver	0	0	- - ~ 330 -
Stage 1	0	0	- - - -
Stage 2	0	0	- - - -
Platoon blocked, %			- - -
Mov Cap-1 Maneuver	-	-	- - ~ 330 -
Mov Cap-2 Maneuver	-	-	- - - -
Stage 1	-	-	- - - -
Stage 2	-	-	- - - -

Approach	WB	NB	SB
HCM Control Delay, s	0	0	70.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	- ~ 330	-
HCM Lane V/C Ratio	-	-	- 1.228	-
HCM Control Delay (s)	-	-	0 160.1	-
HCM Lane LOS	-	-	A F	-
HCM 95th %tile Q(veh)	-	-	- 17.9	-

Notes
 ~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon





















3: Civic Center Dr/Redwood Hwy & Manuel T Freitas Pkwy /Private Driveway Performance by approach

Approach	EB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	1.2	0.5
Total Del/Veh (s)	1.3	8.9	18.7	9.4

HCM Signalized Intersection Capacity Analysis

4: Las Gallinas Avenue & Merrydale Road/Merrydale Overpass






















08/10/2018

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	16	16	12	166	29	190	16	103	104	206	376	22	
Future Volume (vph)	16	16	12	166	29	190	16	103	104	206	376	22	
Ideal Flow (vphpl)	1600	1700	1700	1600	1700	1700	1600	1700	1700	1600	1700	1700	
Lane Width	11	12	12	11	11	12	11	12	12	11	11	12	
Total Lost time (s)	3.0	3.0		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		
Frbp, ped/bikes	1.00	1.00		1.00	0.96		1.00	0.99		1.00	1.00		
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Frft	1.00	0.94		1.00	0.87		1.00	0.92		1.00	0.99		
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00		
Satd. Flow (prot)	1441	1558		1441	1343		1441	1520		1441	1596		
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00		
Satd. Flow (perm)	1441	1558		1441	1343		1441	1520		1441	1596		
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	
Adj. Flow (vph)	17	17	13	177	31	202	17	110	111	219	400	23	
RTOR Reduction (vph)	0	12	0	0	151	0	0	38	0	0	2	0	
Lane Group Flow (vph)	17	18	0	177	82	0	17	183	0	219	421	0	
Confl. Peds. (#/hr)						22			4			4	
Confl. Bikes (#/hr)									1			2	
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA		
Protected Phases	5	2		1	6		3	8		7	4		
Permitted Phases													
Actuated Green, G (s)	1.0	5.3		9.8	14.1		1.0	14.9		13.6	27.5		
Effective Green, g (s)	2.0	6.5		10.8	15.3		2.0	16.8		14.6	29.4		
Actuated g/C Ratio	0.03	0.11		0.18	0.25		0.03	0.28		0.24	0.48		
Clearance Time (s)	4.0	4.2		4.0	4.2		4.0	4.9		4.0	4.9		
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0		
Lane Grp Cap (vph)	47	166		256	338		47	420		346	773		
v/s Ratio Prot	0.01	0.01		c0.12	c0.06		0.01	0.12		c0.15	c0.26		
v/s Ratio Perm													
v/c Ratio	0.36	0.11		0.69	0.24		0.36	0.43		0.63	0.54		
Uniform Delay, d1	28.7	24.5		23.4	18.1		28.7	18.0		20.6	11.0		
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Incremental Delay, d2	1.7	0.1		6.4	0.1		1.7	0.3		2.8	0.4		
Delay (s)	30.5	24.6		29.7	18.2		30.5	18.3		23.4	11.4		
Level of Service	C	C		C	B		C	B		C	B		
Approach Delay (s)		26.7			23.2			19.2			15.5		
Approach LOS		C			C			B			B		
Intersection Summary													
HCM 2000 Control Delay			18.9									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.60										
Actuated Cycle Length (s)			60.7									Sum of lost time (s)	12.0
Intersection Capacity Utilization			58.7%									ICU Level of Service	B
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis

5: Civic Center Drive & Merrydale Overpass/Merrydale Road























08/10/2018

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	73	44	205	36	22	50	95	234	51	42	663	202	
Future Volume (vph)	73	44	205	36	22	50	95	234	51	42	663	202	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	12	16	12	11	12	12	11	12	12	12	11	12	
Total Lost time (s)	3.0	3.0		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		
Frbp, ped/bikes	1.00	1.00		1.00	0.98		1.00	0.99		1.00	0.99		
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Frft	1.00	0.88		1.00	0.90		1.00	0.97		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	1851		1711	1632		1711	1804		1770	1728		
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00		
Satd. Flow (perm)	1770	1851		1711	1632		1711	1804		1770	1728		
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	
Adj. Flow (vph)	78	47	218	38	23	53	101	249	54	45	705	215	
RTOR Reduction (vph)	0	128	0	0	45	0	0	5	0	0	7	0	
Lane Group Flow (vph)	78	137	0	38	31	0	101	298	0	45	913	0	
Confl. Peds. (#/hr)							11		9				
Confl. Bikes (#/hr)							4		1			4	
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA		
Protected Phases	5	2		1	6		3	8		7	4		
Permitted Phases													
Actuated Green, G (s)	6.6	19.9		4.7	18.0		9.7	74.7		6.4	71.4		
Effective Green, g (s)	8.6	21.9		6.7	20.0		11.7	76.7		8.4	73.4		
Actuated g/C Ratio	0.07	0.17		0.05	0.16		0.09	0.61		0.07	0.58		
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0		
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0		
Lane Grp Cap (vph)	121	322		91	259		159	1100		118	1009		
v/s Ratio Prot	c0.04	c0.07		0.02	0.02		c0.06	0.17		0.03	c0.53		
v/s Ratio Perm													
v/c Ratio	0.64	0.43		0.42	0.12		0.64	0.27		0.38	0.91		
Uniform Delay, d1	57.1	46.3		57.6	45.3		54.9	11.4		56.2	23.1		
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Incremental Delay, d2	8.5	0.3		1.1	0.1		6.0	0.0		0.8	11.1		
Delay (s)	65.6	46.6		58.7	45.4		60.9	11.5		56.9	34.2		
Level of Service	E	D		E	D		E	B		E	C		
Approach Delay (s)		50.9			49.8			23.8			35.2		
Approach LOS		D			D			C			D		
Intersection Summary													
HCM 2000 Control Delay			36.6				HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.77										
Actuated Cycle Length (s)			125.7				Sum of lost time (s)			12.0			
Intersection Capacity Utilization			88.8%				ICU Level of Service			E			
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis

1: Del Presidio Boulevard/101 SB Ramp & Freitas Parkway

08/10/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			  				 		 	
Traffic Volume (vph)	0	1345	103	0	1159	0	24	0	853	106	454	386
Future Volume (vph)	0	1345	103	0	1159	0	24	0	853	106	454	386
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	15	12	12	12	12	11	12	15	12	12	15
Total Lost time (s)		3.0			3.0		3.0		3.0		3.0	
Lane Util. Factor		0.95			0.91		1.00		1.00		0.95	
Frbp, ped/bikes		1.00			1.00		1.00		0.98		0.99	
Flpb, ped/bikes		1.00			1.00		1.00		1.00		1.00	
Fr		0.99			1.00		1.00		0.85		0.94	
Flt Protected		1.00			1.00		0.95		1.00		0.99	
Satd. Flow (prot)		3645			4818		1621		1618		3112	
Flt Permitted		1.00			1.00		0.20		1.00		0.99	
Satd. Flow (perm)		3645			4818		344		1618		3112	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	1401	107	0	1207	0	25	0	889	110	473	402
RTOR Reduction (vph)	0	6	0	0	0	0	0	0	17	0	10	0
Lane Group Flow (vph)	0	1502	0	0	1207	0	25	0	872	0	975	0
Confl. Peds. (#/hr)			4						11			3
Confl. Bikes (#/hr)						2						
Turn Type		NA			NA		D.Pm		Perm	Perm		NA
Protected Phases		2			2							4
Permitted Phases							4		4	4		
Actuated Green, G (s)		34.0			34.0		44.0		44.0		44.0	
Effective Green, g (s)		37.0			37.0		47.0		47.0		47.0	
Actuated g/C Ratio		0.41			0.41		0.52		0.52		0.52	
Clearance Time (s)		6.0			6.0		6.0		6.0		6.0	
Vehicle Extension (s)		3.0			3.0		2.0		2.0		2.0	
Lane Grp Cap (vph)		1498			1980		179		844		1625	
v/s Ratio Prot		c0.41			0.25							
v/s Ratio Perm							0.07		c0.54		0.31	
v/c Ratio		1.00			0.61		0.14		1.03		0.60	
Uniform Delay, d1		26.5			20.8		11.1		21.5		15.0	
Progression Factor		0.70			1.00		1.24		1.43		1.00	
Incremental Delay, d2		23.0			1.4		0.1		39.0		0.4	
Delay (s)		41.4			22.2		13.8		69.7		15.4	
Level of Service		D			C		B		E		B	
Approach Delay (s)		41.4			22.2			68.2			15.4	
Approach LOS		D			C			E			B	
Intersection Summary												
HCM 2000 Control Delay			36.1				HCM 2000 Level of Service				D	
HCM 2000 Volume to Capacity ratio			1.02									
Actuated Cycle Length (s)			90.0				Sum of lost time (s)		6.0			
Intersection Capacity Utilization			139.7%				ICU Level of Service				H	
Analysis Period (min)			15									
c Critical Lane Group												

HCM 2010 TWSC
 2: US 101 On-/Off-Ramps & Manuel T Freitas Pkwy

08/10/2018

Intersection

Int Delay, s/veh 4.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↖	↗	↖	↖
Traffic Vol, veh/h	0	671	1004	563	325	912
Future Vol, veh/h	0	671	1004	563	325	912
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	None
Storage Length	-	0	-	0	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	685	1024	574	332	931

Major/Minor

	Minor1	Major1	Major2		
Conflicting Flow All	-	-	0	0	1598
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	-	10	-	4.12
Critical Hdwy Stg 1	-	-	10	-	-
Critical Hdwy Stg 2	-	-	-	-	10
Follow-up Hdwy	-	-	10	-	2.218
Pot Cap-1 Maneuver	0	0	-	-	410
Stage 1	0	0	-	-	-
Stage 2	0	0	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	-	-	-	-	410
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach

	WB	NB	SB
HCM Control Delay, s	0	0	11
HCM LOS	A		

Minor Lane/Major Mvmt

	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	410
HCM Lane V/C Ratio	-	-	-	0.809
HCM Control Delay (s)	-	-	0	41.8
HCM Lane LOS	-	-	A	E
HCM 95th %tile Q(veh)	-	-	-	7.3





















3: Civic Center Dr/Redwood Hwy & Manuel T Freitas Pkwy /Private Driveway Performance by approach

Approach	EB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	1.7	0.5
Total Del/Veh (s)	1.5	12.7	16.9	9.8

HCM Signalized Intersection Capacity Analysis

4: Las Gallinas Avenue & Merrydale Road/Merrydale Overpass





















08/10/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	70	46	167	155	328	26	247	100	192	265	59
Future Volume (vph)	73	70	46	167	155	328	26	247	100	192	265	59
Ideal Flow (vphpl)	1600	1700	1700	1600	1700	1700	1600	1700	1700	1600	1700	1700
Lane Width	11	12	12	11	11	12	11	12	12	11	11	12
Total Lost time (s)	3.0	3.0		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	
Frbp, ped/bikes	1.00	1.00		1.00	0.96		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frft	1.00	0.94		1.00	0.90		1.00	0.96		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1441	1567		1441	1390		1441	1581		1441	1559	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1441	1567		1441	1390		1441	1581		1441	1559	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	78	74	49	178	165	349	28	263	106	204	282	63
RTOR Reduction (vph)	0	28	0	0	88	0	0	17	0	0	9	0
Lane Group Flow (vph)	78	95	0	178	426	0	28	352	0	204	336	0
Confl. Peds. (#/hr)						22			4			4
Confl. Bikes (#/hr)									1			2
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	6.0	12.9		17.4	24.3		3.0	20.6		14.0	31.6	
Effective Green, g (s)	7.0	14.1		18.4	25.5		4.0	22.5		15.0	33.5	
Actuated g/C Ratio	0.09	0.17		0.22	0.31		0.05	0.27		0.18	0.41	
Clearance Time (s)	4.0	4.2		4.0	4.2		4.0	4.9		4.0	4.9	
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lane Grp Cap (vph)	123	269		323	432		70	433		263	636	
v/s Ratio Prot	c0.05	0.06		0.12	c0.31		0.02	c0.22		c0.14	0.22	
v/s Ratio Perm												
v/c Ratio	0.63	0.35		0.55	0.99		0.40	0.81		0.78	0.53	
Uniform Delay, d1	36.3	29.9		28.1	28.1		37.8	27.8		31.9	18.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.6	0.3		1.2	39.5		1.4	10.6		12.2	0.4	
Delay (s)	43.9	30.2		29.3	67.6		39.2	38.4		44.1	18.7	
Level of Service	D	C		C	E		D	D		D	B	
Approach Delay (s)		35.5			57.7			38.5			28.1	
Approach LOS		D			E			D			C	
Intersection Summary												
HCM 2000 Control Delay			42.3			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.85									
Actuated Cycle Length (s)			82.0			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			87.1%			ICU Level of Service				E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

5: Civic Center Drive & Merrydale Overpass/Merrydale Road


















08/10/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	182	31	157	44	66	262	208	358	17	52	293	296
Future Volume (vph)	182	31	157	44	66	262	208	358	17	52	293	296
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	11	12	12	11	12	12	12	11	12
Total Lost time (s)	3.0	3.0		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	
Frbp, ped/bikes	1.00	1.00		1.00	0.98		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frft	1.00	0.87		1.00	0.88		1.00	0.99		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1847		1711	1605		1711	1848		1770	1645	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1847		1711	1605		1711	1848		1770	1645	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	194	33	167	47	70	279	221	381	18	55	312	315
RTOR Reduction (vph)	0	120	0	0	155	0	0	1	0	0	32	0
Lane Group Flow (vph)	194	80	0	47	194	0	221	398	0	55	595	0
Confl. Peds. (#/hr)						11			9			
Confl. Bikes (#/hr)						4			1			4
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	11.6	24.7		4.8	17.9		12.1	37.9		6.5	32.3	
Effective Green, g (s)	13.6	26.7		6.8	19.9		14.1	39.9		8.5	34.3	
Actuated g/C Ratio	0.14	0.28		0.07	0.21		0.15	0.42		0.09	0.37	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	256	525		123	340		256	785		160	600	
v/s Ratio Prot	c0.11	0.04		0.03	c0.12		c0.13	0.22		0.03	c0.36	
v/s Ratio Perm												
v/c Ratio	0.76	0.15		0.38	0.57		0.86	0.51		0.34	0.99	
Uniform Delay, d1	38.6	25.1		41.5	33.2		39.0	19.8		40.1	29.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	10.8	0.0		0.7	1.3		23.9	0.2		0.5	34.5	
Delay (s)	49.4	25.2		42.3	34.5		62.9	20.0		40.6	64.2	
Level of Service	D	C		D	C		E	B		D	E	
Approach Delay (s)		37.1			35.4			35.3			62.3	
Approach LOS		D			D			D			E	
Intersection Summary												
HCM 2000 Control Delay			44.4			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.83									
Actuated Cycle Length (s)			93.9			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			90.4%			ICU Level of Service				E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

1: Del Presidio Boulevard/101 SB Ramp & Freitas Parkway

08/10/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1235	98	0	1227	0	16	0	394	171	373	363
Future Volume (vph)	0	1243	98	0	1229	0	16	0	394	183	373	363
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	15	12	12	12	12	11	12	15	12	12	15
Total Lost time (s)		3.0			3.0		3.0		3.0		3.0	
Lane Util. Factor		0.95			0.91		1.00		1.00		0.95	
Frbp, ped/bikes		1.00			1.00		1.00		0.98		0.99	
Flpb, ped/bikes		1.00			1.00		1.00		1.00		1.00	
Fr		0.99			1.00		1.00		0.85		0.94	
Flt Protected		1.00			1.00		0.95		1.00		0.99	
Satd. Flow (prot)		3644			4818		1621		1620		3106	
Flt Permitted		1.00			1.00		0.18		1.00		0.99	
Satd. Flow (perm)		3644			4818		303		1620		3106	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	1295	102	0	1280	0	17	0	410	191	389	378
RTOR Reduction (vph)	0	6	0	0	0	0	0	0	23	0	6	0
Lane Group Flow (vph)	0	1391	0	0	1280	0	17	0	387	0	952	0
Confl. Peds. (#/hr)			4						11			3
Confl. Bikes (#/hr)						2						
Turn Type		NA			NA		D.Pm		Perm	Perm		NA
Protected Phases		2			2							4
Permitted Phases							4		4	4		
Actuated Green, G (s)		35.6			35.6		32.4		32.4		32.4	
Effective Green, g (s)		38.6			38.6		35.4		35.4		35.4	
Actuated g/C Ratio		0.48			0.48		0.44		0.44		0.44	
Clearance Time (s)		6.0			6.0		6.0		6.0		6.0	
Vehicle Extension (s)		3.0			3.0		2.0		2.0		2.0	
Lane Grp Cap (vph)		1758			2324		134		716		1374	
v/s Ratio Prot		0.38			0.27							
v/s Ratio Perm							0.06		0.24		0.31	
v/c Ratio		0.79			0.55		0.13		0.54		0.69	
Uniform Delay, d1		17.3			14.6		13.2		16.3		17.9	
Progression Factor		1.00			1.00		1.00		1.00		1.00	
Incremental Delay, d2		3.7			0.9		0.2		0.4		1.2	
Delay (s)		21.1			15.5		13.3		16.8		19.2	
Level of Service		C			B		B		B		B	
Approach Delay (s)		21.1			15.5		16.7				19.2	
Approach LOS		C			B		B				B	
Intersection Summary												
HCM 2000 Control Delay			18.4				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.74									
Actuated Cycle Length (s)			80.0				Sum of lost time (s)		6.0			
Intersection Capacity Utilization			107.6%				ICU Level of Service		G			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection

Int Delay, s/veh 30.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↖	↗	↖	↖
Traffic Vol, veh/h	0	394	1132	671	397	506
Future Vol, veh/h	0	406	1132	708	417	506
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	None
Storage Length	-	0	-	0	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	414	1155	722	426	516

Major/Minor

	Minor1	Major1	Major2		
Conflicting Flow All	-	-	0	0	1877
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	-	10	-	4.12
Critical Hdwy Stg 1	-	-	10	-	-
Critical Hdwy Stg 2	-	-	-	-	10
Follow-up Hdwy	-	-	10	-	2.218
Pot Cap-1 Maneuver	0	0	-	-	~ 320
Stage 1	0	0	-	-	-
Stage 2	0	0	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	-	-	-	-	~ 320
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach

	WB	NB	SB
HCM Control Delay, s	0	0	90.8
HCM LOS	A		

Minor Lane/Major Mvmt

	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	~ 320	-
HCM Lane V/C Ratio	-	-	1.33	-
HCM Control Delay (s)	-	-	0	201.1
HCM Lane LOS	-	-	A	F
HCM 95th %tile Q(veh)	-	-	20.8	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon





















3: Civic Center Dr/Redwood Hwy & Manuel T Freitas Pkwy /Private Driveway Performance by approach

Approach	EB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	8.9	3.3
Total Del/Veh (s)	1.3	10.6	23.5	11.7

HCM Signalized Intersection Capacity Analysis

4: Las Gallinas Avenue & Merrydale Road/Merrydale Overpass





















08/10/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	16	12	166	29	190	16	103	104	206	376	22
Future Volume (vph)	16	24	12	166	31	190	16	103	104	206	376	22
Ideal Flow (vphpl)	1600	1700	1700	1600	1700	1700	1600	1700	1700	1600	1700	1700
Lane Width	11	12	12	11	11	12	11	12	12	11	11	12
Total Lost time (s)	3.0	3.0		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	
Frbp, ped/bikes	1.00	1.00		1.00	0.96		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.87		1.00	0.92		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1441	1583		1441	1344		1441	1520		1441	1596	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1441	1583		1441	1344		1441	1520		1441	1596	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	17	26	13	177	33	202	17	110	111	219	400	23
RTOR Reduction (vph)	0	12	0	0	151	0	0	38	0	0	2	0
Lane Group Flow (vph)	17	27	0	177	84	0	17	183	0	219	421	0
Confl. Peds. (#/hr)						22			4			4
Confl. Bikes (#/hr)									1			2
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	1.0	5.4		10.1	14.5		1.0	15.1		14.0	28.1	
Effective Green, g (s)	2.0	6.6		11.1	15.7		2.0	17.0		15.0	30.0	
Actuated g/C Ratio	0.03	0.11		0.18	0.25		0.03	0.28		0.24	0.49	
Clearance Time (s)	4.0	4.2		4.0	4.2		4.0	4.9		4.0	4.9	
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lane Grp Cap (vph)	46	169		259	341		46	418		350	776	
v/s Ratio Prot	0.01	0.02		c0.12	c0.06		0.01	0.12		c0.15	c0.26	
v/s Ratio Perm												
v/c Ratio	0.37	0.16		0.68	0.25		0.37	0.44		0.63	0.54	
Uniform Delay, d1	29.2	25.0		23.7	18.3		29.2	18.4		20.8	11.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.8	0.2		5.8	0.1		1.8	0.3		2.5	0.4	
Delay (s)	31.1	25.2		29.5	18.4		31.1	18.7		23.4	11.5	
Level of Service	C	C		C	B		C	B		C	B	
Approach Delay (s)		27.0			23.2			19.6			15.5	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM 2000 Control Delay			19.1			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.60									
Actuated Cycle Length (s)			61.7			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			58.7%			ICU Level of Service				B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis


















5: Civic Center Drive & Merrydale Overpass/Merrydale Road

08/10/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	44	205	36	22	50	95	234	51	42	663	202
Future Volume (vph)	73	52	205	36	24	71	95	234	51	42	663	202
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	11	12	12	11	12	12	12	11	12
Total Lost time (s)	3.0	3.0		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	
Frbp, ped/bikes	1.00	1.00		1.00	0.98		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.88		1.00	0.89		1.00	0.97		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	1858		1711	1616		1711	1804		1770	1728	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1858		1711	1616		1711	1804		1770	1728	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	78	55	218	38	26	76	101	249	54	45	705	215
RTOR Reduction (vph)	0	111	0	0	64	0	0	5	0	0	7	0
Lane Group Flow (vph)	78	162	0	38	38	0	101	298	0	45	913	0
Confl. Peds. (#/hr)							11			9		
Confl. Bikes (#/hr)							4			1		4
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	6.7	18.2		6.5	18.0		9.6	76.3		6.5	73.2	
Effective Green, g (s)	8.7	20.2		8.5	20.0		11.6	78.3		8.5	75.2	
Actuated g/C Ratio	0.07	0.16		0.07	0.16		0.09	0.61		0.07	0.59	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	120	294		114	253		155	1107		118	1019	
v/s Ratio Prot	c0.04	c0.09		0.02	0.02		c0.06	0.17		0.03	c0.53	
v/s Ratio Perm												
v/c Ratio	0.65	0.55		0.33	0.15		0.65	0.27		0.38	0.90	
Uniform Delay, d1	57.9	49.5		56.8	46.4		56.0	11.4		57.0	22.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.2	1.3		0.6	0.1		7.3	0.0		0.8	10.1	
Delay (s)	67.1	50.7		57.4	46.5		63.3	11.4		57.7	32.8	
Level of Service	E	D		E	D		E	B		E	C	
Approach Delay (s)		54.4			49.5			24.4			34.0	
Approach LOS		D			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			36.9				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.79									
Actuated Cycle Length (s)			127.5				Sum of lost time (s)		12.0			
Intersection Capacity Utilization			88.8%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 1: Del Presidio Boulevard/101 SB Ramp & Freitas Parkway

08/10/2018

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	0	1345	103	0	1159	0	24	0	853	106	454	386	
Future Volume (vph)	0	1349	103	0	1169	0	24	0	853	110	454	386	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Lane Width	12	15	12	12	12	12	11	12	15	12	12	15	
Total Lost time (s)		3.0			3.0		3.0		3.0		3.0		
Lane Util. Factor		0.95			0.91		1.00		1.00		0.95		
Frbp, ped/bikes		1.00			1.00		1.00		0.98		0.99		
Flpb, ped/bikes		1.00			1.00		1.00		1.00		1.00		
Fr		0.99			1.00		1.00		0.85		0.94		
Flt Protected		1.00			1.00		0.95		1.00		0.99		
Satd. Flow (prot)		3645			4818		1621		1618		3113		
Flt Permitted		1.00			1.00		0.20		1.00		0.99		
Satd. Flow (perm)		3645			4818		341		1618		3113		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	0	1405	107	0	1218	0	25	0	889	115	473	402	
RTOR Reduction (vph)	0	6	0	0	0	0	0	0	17	0	9	0	
Lane Group Flow (vph)	0	1506	0	0	1218	0	25	0	872	0	981	0	
Confl. Peds. (#/hr)			4						11			3	
Confl. Bikes (#/hr)						2							
Turn Type		NA			NA		D.Pm		Perm	Perm		NA	
Protected Phases		2			2							4	
Permitted Phases							4		4	4			
Actuated Green, G (s)		34.0			34.0		44.0		44.0		44.0		
Effective Green, g (s)		37.0			37.0		47.0		47.0		47.0		
Actuated g/C Ratio		0.41			0.41		0.52		0.52		0.52		
Clearance Time (s)		6.0			6.0		6.0		6.0		6.0		
Vehicle Extension (s)		3.0			3.0		2.0		2.0		2.0		
Lane Grp Cap (vph)		1498			1980		178		844		1625		
v/s Ratio Prot		c0.41			0.25								
v/s Ratio Perm							0.07		c0.54		0.32		
v/c Ratio		1.01			0.62		0.14		1.03		0.60		
Uniform Delay, d1		26.5			20.9		11.1		21.5		15.0		
Progression Factor		0.72			1.00		1.31		1.47		1.00		
Incremental Delay, d2		23.6			1.4		0.1		39.0		0.4		
Delay (s)		42.7			22.3		14.6		70.6		15.4		
Level of Service		D			C		B		E		B		
Approach Delay (s)		42.7			22.3			69.1			15.4		
Approach LOS		D			C			E			B		
Intersection Summary													
HCM 2000 Control Delay			36.7									HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			1.02										
Actuated Cycle Length (s)			90.0									Sum of lost time (s)	6.0
Intersection Capacity Utilization			139.7%									ICU Level of Service	H
Analysis Period (min)			15										
c	Critical Lane Group												

HCM 2010 TWSC
 2: US 101 On-/Off-Ramps & Manuel T Freitas Pkwy

08/10/2018

Intersection						
Int Delay, s/veh	5.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↖	↗	↖	↖
Traffic Vol, veh/h	0	671	1004	563	325	912
Future Vol, veh/h	0	727	1004	575	333	912
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	None
Storage Length	-	0	-	0	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	742	1024	587	340	931

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	-	-	0	0	1611
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	-	10	-	4.12
Critical Hdwy Stg 1	-	-	10	-	-
Critical Hdwy Stg 2	-	-	-	-	10
Follow-up Hdwy	-	-	10	-	2.218
Pot Cap-1 Maneuver	0	0	-	-	405
Stage 1	0	0	-	-	-
Stage 2	0	0	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	-	-	-	-	405
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	12.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	405
HCM Lane V/C Ratio	-	-	-	0.839
HCM Control Delay (s)	-	-	0	46
HCM Lane LOS	-	-	A	E
HCM 95th %tile Q(veh)	-	-	-	7.9

3: Civic Center Dr/Redwood Hwy & Manuel T Freitas Pkwy /Private Driveway Performance by approach

Approach	EB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	7.0	1.9
Total Del/Veh (s)	1.5	18.3	32.0	16.4

HCM Signalized Intersection Capacity Analysis

4: Las Gallinas Avenue & Merrydale Road/Merrydale Overpass

08/10/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	70	46	167	155	328	26	247	100	192	265	59
Future Volume (vph)	73	73	46	167	165	328	26	247	100	192	265	59
Ideal Flow (vphpl)	1600	1700	1700	1600	1700	1700	1600	1700	1700	1600	1700	1700
Lane Width	11	12	12	11	11	12	11	12	12	11	11	12
Total Lost time (s)	3.0	3.0		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	
Frbp, ped/bikes	1.00	1.00		1.00	0.96		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.90		1.00	0.96		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1441	1570		1441	1394		1441	1581		1441	1559	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1441	1570		1441	1394		1441	1581		1441	1559	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	78	78	49	178	176	349	28	263	106	204	282	63
RTOR Reduction (vph)	0	27	0	0	82	0	0	17	0	0	8	0
Lane Group Flow (vph)	78	100	0	178	443	0	28	352	0	204	337	0
Confl. Peds. (#/hr)						22			4			4
Confl. Bikes (#/hr)									1			2
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	6.0	13.6		17.7	25.3		3.0	20.6		13.7	31.3	
Effective Green, g (s)	7.0	14.8		18.7	26.5		4.0	22.5		14.7	33.2	
Actuated g/C Ratio	0.08	0.18		0.23	0.32		0.05	0.27		0.18	0.40	
Clearance Time (s)	4.0	4.2		4.0	4.2		4.0	4.9		4.0	4.9	
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lane Grp Cap (vph)	121	280		325	446		69	430		256	625	
v/s Ratio Prot	c0.05	0.06		0.12	c0.32		0.02	c0.22		c0.14	0.22	
v/s Ratio Perm												
v/c Ratio	0.64	0.36		0.55	0.99		0.41	0.82		0.80	0.54	
Uniform Delay, d1	36.6	29.8		28.3	28.0		38.2	28.2		32.6	18.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.5	0.3		1.0	40.5		1.4	11.0		14.7	0.4	
Delay (s)	45.2	30.1		29.3	68.5		39.6	39.2		47.3	19.4	
Level of Service	D	C		C	E		D	D		D	B	
Approach Delay (s)		35.8			58.6			39.2			29.7	
Approach LOS		D			E			D			C	
Intersection Summary												
HCM 2000 Control Delay			43.4			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			82.7			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			87.1%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

5: Civic Center Drive & Merrydale Overpass/Merrydale Road

08/10/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	182	31	157	44	66	262	208	358	17	52	293	296
Future Volume (vph)	182	34	157	44	76	355	208	358	17	52	293	296
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	11	12	12	11	12	12	12	11	12
Total Lost time (s)	3.0	3.0		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	
Frbp, ped/bikes	1.00	1.00		1.00	0.98		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.88		1.00	0.88		1.00	0.99		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1851		1711	1598		1711	1848		1770	1645	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1851		1711	1598		1711	1848		1770	1645	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	194	36	167	47	81	378	221	381	18	55	312	315
RTOR Reduction (vph)	0	115	0	0	174	0	0	1	0	0	32	0
Lane Group Flow (vph)	194	88	0	47	285	0	221	398	0	55	595	0
Confl. Peds. (#/hr)						11			9			
Confl. Bikes (#/hr)						4			1			4
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	11.6	28.4		4.8	21.6		12.1	37.9		6.5	32.3	
Effective Green, g (s)	13.6	30.4		6.8	23.6		14.1	39.9		8.5	34.3	
Actuated g/C Ratio	0.14	0.31		0.07	0.24		0.14	0.41		0.09	0.35	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	246	576		119	386		247	755		154	578	
v/s Ratio Prot	c0.11	0.05		0.03	c0.18		c0.13	0.22		0.03	c0.36	
v/s Ratio Perm												
v/c Ratio	0.79	0.15		0.39	0.74		0.89	0.53		0.36	1.03	
Uniform Delay, d1	40.6	24.3		43.4	34.1		41.0	21.7		42.0	31.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	14.2	0.0		0.8	6.2		30.3	0.3		0.5	45.0	
Delay (s)	54.9	24.3		44.2	40.4		71.3	22.0		42.5	76.6	
Level of Service	D	C		D	D		E	C		D	E	
Approach Delay (s)		39.2			40.7			39.6			73.9	
Approach LOS		D			D			D			E	
Intersection Summary												
HCM 2000 Control Delay			50.4			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.89									
Actuated Cycle Length (s)			97.6			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			90.4%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

Appendix B

Parking Occupancy Survey



Parking Inventory 4000 Civic Center Drive

Traffic and Parking Study for the Proposed Change in Use at 4000 Civic Center Drive

Space Type	# of Spaces	Notes
Zone 1		
4020 Civic Center Permit only	11	
Patient Parking Only	36	
Handicap	9	
No Restriction	13	
"GGRC"	2	
"MIJ"	3	
"Tell Tale"	7	
"Reserved"	2	
"Raymond James"	3	3 Loading Areas with room for 8 to 10 vehicles
Total	86	
Zone 2 - Level 1		
No Restriction	110	
Tell Tale	65	
Total	175	
Zone 2 - Level 2		
No Restriction	110	
Tell Tale	65	
Total	175	

4000 Civic Center Drive Parking Inventory Map



San Rafael Parking Occupancy

Traffic and Parking Study for the Proposed Change in Use at 4000 Civic Center Drive

Day #1

Time	Zone 1	Zone 2		Total
		Level 1	Level 2	
9:00 AM	43	55	38	136
9:20 AM	48	61	58	167
9:40 AM	57	89	75	221
10:00 AM	63	99	83	245
10:20 AM	64	107	87	258
10:40 AM	64	106	89	259
11:00 AM	65	126	93	284
11:20 AM	68	131	93	292
11:40 AM	61	129	90	280
12:00 PM	58	115	87	260
12:20 PM	46	111	78	235
12:40 PM	47	128	82	257
1:00 PM	51	124	82	257
1:20 PM	54	122	86	262
1:40 PM	60	124	89	273
2:00 PM	67	126	93	286
2:20 PM	66	127	95	288
2:40 PM	69	129	94	292
3:00 PM	65	128	96	289
3:20 PM	63	119	95	277
3:40 PM	58	118	94	270
4:00 PM	54	116	94	264
4:20 PM	56	106	90	252
4:40 PM	50	101	89	240
5:00 PM	46	98	85	229

San Rafael Parking Occupancy

Traffic and Parking Study for the Proposed Change in Use at 4000 Civic Center Drive

Day #2

Time	Zone 1	Zone 2		Total
		Level 1	Level 2	
9:00 AM	49	47	34	130
9:20 AM	52	64	54	170
9:40 AM	60	91	64	215
10:00 AM	67	99	98	264
10:20 AM	66	117	99	282
10:40 AM	67	119	102	288
11:00 AM	64	118	104	286
11:20 AM	69	120	106	295
11:40 AM	72	121	105	298
12:00 PM	71	120	98	289
12:20 PM	67	111	87	265
12:40 PM	63	113	85	261
1:00 PM	58	112	90	260
1:20 PM	57	121	94	272
1:40 PM	65	127	98	290
2:00 PM	69	128	105	302
2:20 PM	71	126	109	306
2:40 PM	68	128	111	307
3:00 PM	64	121	110	295
3:20 PM	66	119	105	290
3:40 PM	70	115	104	289
4:00 PM	65	113	104	282
4:20 PM	59	103	102	264
4:40 PM	53	102	99	254
5:00 PM	47	99	88	234

San Rafael Parking Occupancy

Traffic and Parking Study for the Proposed Change in Use at 4000 Civic Center Drive

Day #3

Time	Zone 1	Zone 2		Total
		Level 1	Level 2	
9:00 AM	36	47	41	124
9:20 AM	46	60	52	158
9:40 AM	47	74	60	181
10:00 AM	60	94	73	227
10:20 AM	67	110	83	260
10:40 AM	71	126	89	286
11:00 AM	80	128	101	309
11:20 AM	77	129	102	308
11:40 AM	73	130	109	312
12:00 PM	68	129	97	294
12:20 PM	65	122	92	279
12:40 PM	52	117	91	260
1:00 PM	55	121	77	253
1:20 PM	59	119	85	263
1:40 PM	58	124	92	274
2:00 PM	64	125	96	285
2:20 PM	67	127	95	289
2:40 PM	61	126	94	281
3:00 PM	69	125	95	289
3:20 PM	62	124	97	283
3:40 PM	57	122	98	277
4:00 PM	58	114	99	271
4:20 PM	51	109	93	253
4:40 PM	50	106	90	246
5:00 PM	46	98	86	230